Woodworking

educational program

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Authors:
Marcin Tomaszewski
Rathin Gotlur Manjunath
Laura Andriana Indriksone
Eva Skovajsová
Miroslav Zagrapan
Pavel Brodský
Jakob Strack
Elin Rotevatn Høgemark

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Topic: Construction of simple block candlesticks for tealight candles

Number of students: 8

Number of hours of classes: 5

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical**:** demonstration, measurement of things and method of practical classes

General objectives for practical lessons in making simple wood products for children in primary school

Development of manual and technical skills

- Students should develop their manual skills, precision and motor coordination by working with wood tools and materials.
- Learning basic woodworking techniques such as cutting, grinding, joining and finishing.

Increasing ecological awareness and respect for natural resources

- Children learn the importance of wood as a renewable raw material and learn how to use materials in a sustainable and conscious way.
- Education on the origin of wood and the importance of forest protection and sustainable management of forest resources.

Development of creativity and imagination

- Encouraging students to express their creativity by designing and creating their own unique wood products.
- Strengthening the ability to solve problems, make decisions and plan activities during the implementation of projects.

Teamwork and interpersonal skills

- Learning to cooperate and communicate in a group while working together on wood projects.
- Developing the ability to share tools and materials, help others, and make shared decisions.

Strengthening self-esteem and self-confidence

- Building self-confidence through the implementation of specific projects, from the idea to the finished product.

- Strengthening self-esteem and satisfaction with the results achieved by striving for goals and overcoming difficulties.

Introduction to safety issues

- Learning how to use carpentry tools and machines safely.
- Informing about safety procedures and encouraging compliance with health and safety rules when working with wood.

Basic knowledge of wood and its properties

- To familiarize students with different types of wood and their properties.
- Learning to recognize wood species based on features such as color, grain and hardness.

Achieving these goals will help students not only to acquire specific technical skills, but also to develop creativity, cooperation and ecological awareness, which is extremely important in today's teaching of children in primary school.

Introduction – health and safety rules when using hand tools during work in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is paramount. Working with hand tools can be safe and enjoyable if we follow a few basic health and safety rules. Here are some of the most important rules we need to follow during our lesson:

Preparation of workplace:

- **Cleanliness and tidiness:** Before we start work, let's make sure our workstation is clean and everything is in place. Avoid messes that can lead to accidents.
- **Proper lighting:** Let's make sure our workplace is well lit so we can clearly see what we are doing.

Appropriate attire and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose elements that could get caught in the tools.
- **Eye protection:** Wearing safety goggles is mandatory to protect your eyes from wood dust and possible wood splinters.

Safe use of hand tools

- **Tools in good condition:** Make sure all the tools we will be using are in good condition. Blunt tools are less safe than sharp tools.
- **Proper tool holding:** Tools should be held securely and used with both hands whenever possible to ensure stability.

- **Checking the tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Use of tools as intended:** Each tool has a specific application. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques:

- **Stable material positioning:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not slide during processing.
- **Working away from the body:** When cutting, drilling or chiselling, we always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation without applying excessive force. Movements should be controlled and uniform to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** When working with hand tools, keep full concentration and attention. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Action in case of accidents

- **Accident reporting:** In case of injury or other injury, we will inform the teacher immediately. Even minor wounds must be properly dressed.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be provided quickly if needed.

Keep in mind that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone a successful job and a lot of satisfaction from the projects!

Introduction – wood species used in classes: Oak (Quercus L.)

Properties of oak wood. Oak is one of the most durable and valued deciduous trees, often found in European forests, including Poland. These trees can live for hundreds of years, growing to a height of 30-40 meters. Oak wood is widely used in various industries due to its hardness, durability and aesthetics.

Colour and grain

Oak wood is characterized by a rich color scheme that ranges from light yellow to deep golden brown, taking on noble, darker tones with age. The grain is clear, with clear, decorative grains and often occurring knots, which gives the wood a unique, natural look. This beautiful grain is one of the features most appreciated by craftsmen and interior designers.

Hardness and density. Oak is a hard and dense wood, with a dry density of about 690-930 kg/m³. Thanks to its high hardness and high mechanical strength, oak wood is an ideal material for applications requiring high resistance to damage and loads. The hardness of the oak makes it more difficult to process compared to softer wood species, but it ensures the longevity of products made from it.

Durability. Oak wood is known for its exceptional durability. It is naturally resistant to moisture, fungi and pests, thanks to its high tannin content. This makes oak an excellent material for both indoor and outdoor applications, without the need for intensive impregnation. Compared to other types of wood, oak is extremely resistant to weather conditions, making it an ideal material for the construction of elements exposed to external factors.

Finishing. Oak wood perfectly adopts a variety of finishes. It is easily stained, varnished and oiled, which allows for a wide range of aesthetic effects. Oiling and waxing not only emphasize the natural beauty of the grains, but also increase the durability and resistance of wood to mechanical damage and the influence of external factors.

Advantages and disadvantages of using oak wood

Features:

- High hardness and durability.
- High resistance to moisture, fungi and pests.
- Beautiful, clear grain and rich colors.
- Longevity and durability of products.
- Versatility in applications.

Cons:

- Higher price compared to some other types of wood.
- Higher machining difficulty due to hardness.
- Higher weight, which may be a limitation in certain applications.

The use of oak wood

Furniture: Oak is one of the most commonly used types of wood for the production of high-quality furniture, such as tables, chairs, chests of drawers and wardrobes. Its hardness and durability make oak furniture extremely durable and can serve for many years, often passing down from generation to generation.

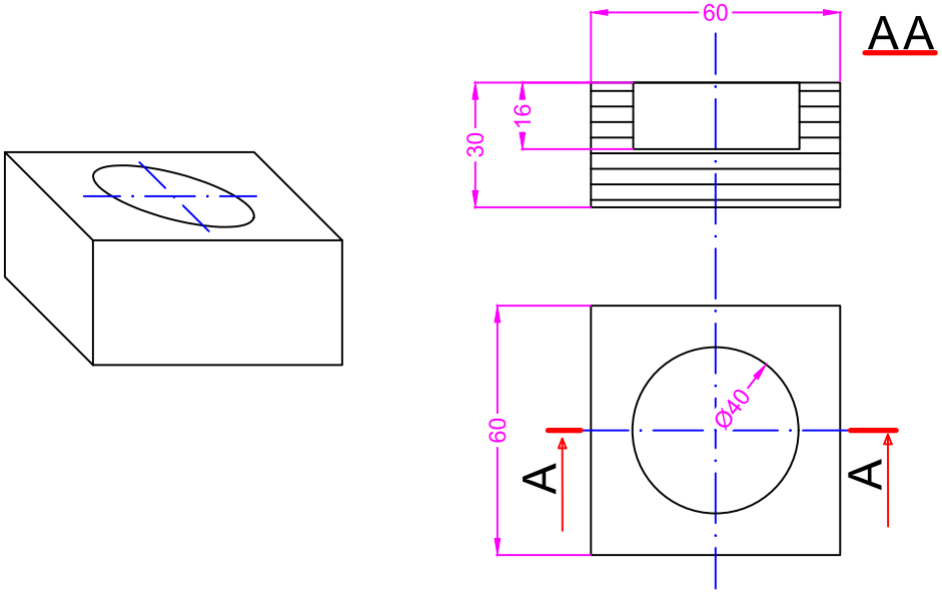
Floors and parquet: Oak wood is a great material for floors and parquet. Its high hardness ensures resistance to scratches and damage, and its natural aesthetics add elegance and warmth to any interior. Oak floors are valued for their durability and unique appearance.

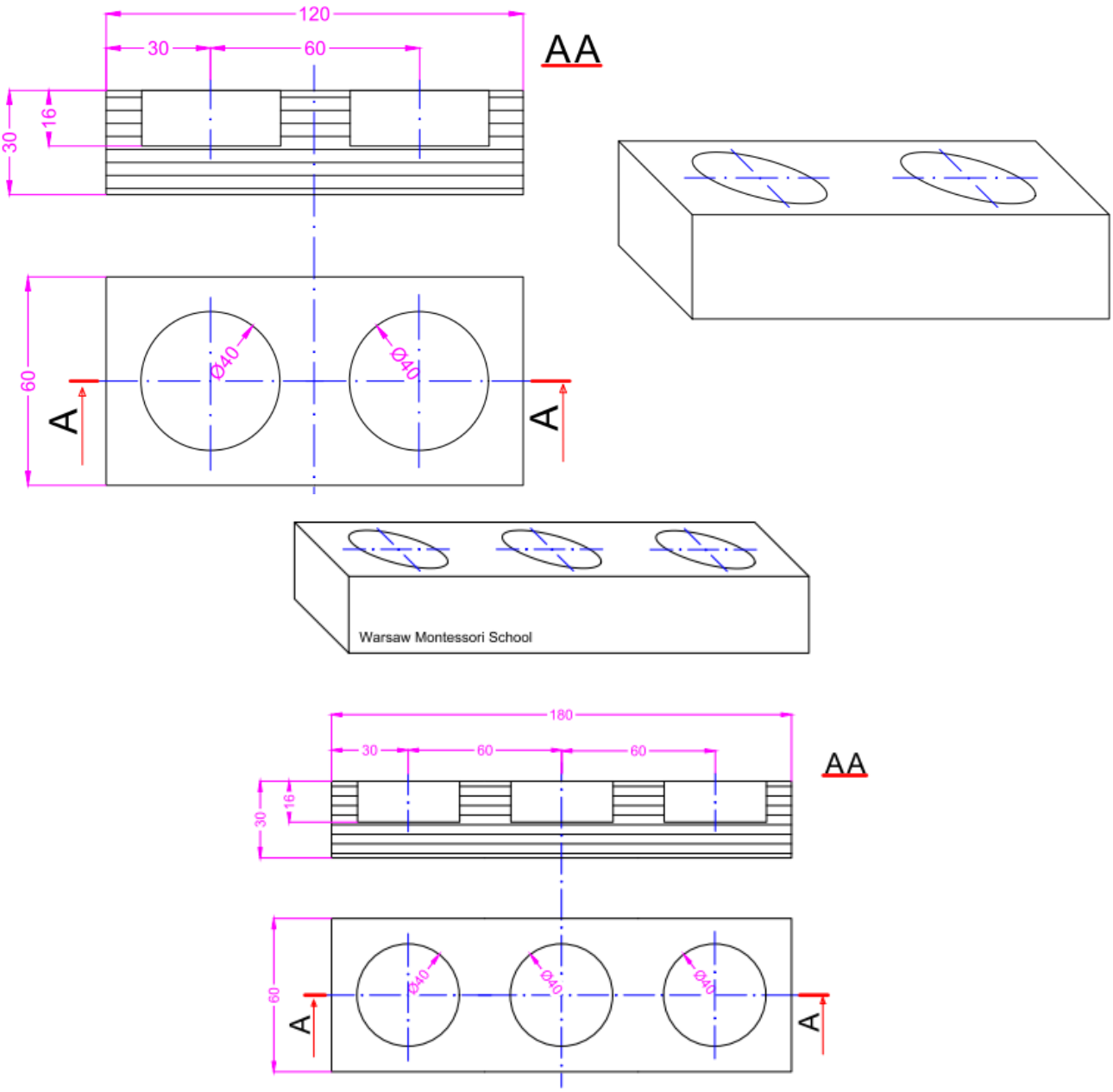
Construction and construction joinery: Oak wood is commonly used in construction, for the production of beams, roof trusses and other structural elements. Its natural

resistance to moisture and pests makes it an ideal material for building joinery, doors, windows and roofing.
Wine barrels and other alcoholic beverages: Due to its unique properties, oak wood is widely used in the production of barrels for the storage and maturation of wine, whiskey and other alcoholic beverages. The tannins contained in the oak have a positive effect on the quality and taste of the drinks stored in it.
Arts and Crafts: The beauty and durability of oak wood make it a popular material in arts and crafts and the production of decorative interior items such as picture frames, sculptures, original wall panels and other ornaments.
Oak wood, thanks to its unique mechanical and aesthetic properties, is one of the most valued and versatile materials in the wood industry. Its versatility, durability and beauty make it irreplaceable in many applications, from construction through carpentry to artistic craftsmanship.

The subject of the practical task – Construction of simple block candlesticks for tealight candles.

Sample Longform visualization





Course of classes: Presentation of the topic of classes, time about 20 minutes

- i provide the topic and objectives of the class
- i provide health and safety information,
- i would like to inform the students that the main part of the classes will be the practical execution of a set of candlesticks,
- i inform students about the type of material in which we will work and describe it.
- i provide on-the-job training for the workplace and individual tools necessary to perform it.

Ongoing training, analysis of information, drawings, time about 20 minutes

- students analyze the documentation,

- they are thinking about constructing action plans,
- they reflect on the lists of auxiliary elements, tools and devices - they reflect on the list of control and measurement devices, tools and instruments necessary to perform the task, as well as auxiliary means,

Ongoing training, demonstration
- each time at each stage of the construction, the teacher presents the method of performing each of the operations before the students start it
- each time before using the tool by students, the teacher instructs and shows how it should be used in practice,
- each time during a new operation, the teacher presents a trial work with a given tool,

Ongoing training, organization and execution, time approx. 170 min
- students, on the basis of documentation and a prepared action plan, independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students perform the task according to the instruction to perform the task,
- after completing the practical part of the exercise, students organize the workplace and secure the tools, assess the quality of their work and justify the way it is done,

Final training, approximately 15 minutes
- i discuss classes: I emphasize achievements, analyze mistakes
- i discuss the results of the work of individual student groups on the basis of the products made and justify the assessment,

Means and teaching materials:

Technical teaching aids: a workstation equipped with a carpentry table/tables tailored to the performance of the task and the number of students in the group/groups.
Hand hacksaw or backplate, drill/driver or vertical/column drill, optional pyrograph, oil brush, rags for collecting excess oil (remember that it is forbidden to leave damp oil rags in the workshop, they should be wetted and disposed of, left in a closed space in favorable conditions may spontaneously ignite).
Tools: Cylindrical drill with a diameter of 40mm, grinding cube, mitre box, pencil, angle, tape measure, P100 and P180 sandpaper.
Materials: oak square with a cross-section of 60/30mm -0.5 rm (per person), brush for applying oil,
Didactic means of work: drawing documentation of the product, notebook for students.
Occupational health and safety equipment: glasses and earmuffs for work with power tools, work clothes to prevent dirt.

Sequence of activities in the process of building the booth:

- check the dimensions of the delivered elements,
- plan the use of individual materials to make specific elements,
- cut the cantilever to the length so that three elements with lengths of 60, 120 and 180mm are created,
- according to the drawing documentation, designate places for 40mm sockets for candles,
- drill sockets for candles with a 40mm drill in all the resulting elements to a depth of 16mm - unless the candles have a different height,
- grind the resulting elements with sandpaper, starting with the gradation P100 and continuing with P180,
- gently break the edges of all elements using P180 graded paper, pay special attention to grinding the socket under the candle,
- (optional) design inscriptions or other decorations on the sides of candlesticks and burn them with a pyrograph,
- protect the resulting product with oil for internal use. The oil manufacturer's recommendations regarding the number of layers, the drying time and the period after which the coating is suitable for use must be followed.

Topic: Construction of a quadruple block candle holder for tealight candles

Number of students: 8

Number of hours of classes: 5,

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical**:** demonstration, measurement of things and practical classes method

General objectives for practical lessons in making simple wood products for primary school children.

Development of manual and technical skills

- Students should develop their manual skills, precision and motor coordination by working with tools and wood materials.
- Learning basic woodworking techniques such as cutting, sanding, joining and finishing.

Increasing ecological awareness and respect for natural resources

- Children learn the importance of wood as a renewable raw material and learn how to use materials in a sustainable and conscious way.
- Education about the origin of wood and the importance of forest protection and sustainable management of forest resources.

Development of creativity and imagination

- Encouraging students to express their creativity by designing and creating their own unique wood products.
- Strengthening the ability to solve problems, make decisions and plan activities during project implementation.

Teamwork and interpersonal skills

- Learning cooperation and communication in a group while working together on wood projects.
- Developing the ability to share tools and materials, help others and make decisions together.

Strengthening self-esteem and self-confidence

- Building self-confidence by implementing specific projects, from idea to finished product.

- Strengthening self-esteem and satisfaction with achieved results by striving for goals and overcoming difficulties.

Introduction to security issues

- Learning how to safely use carpentry tools and machines.
- Informing about safety procedures and encouraging compliance with health and safety rules when working with wood.

Basic knowledge about wood and its properties

- Introducing students to different types of wood and their properties.
- Learning to recognize wood species based on features such as color, grain and hardness.

Achieving these goals will help students not only acquire specific technical skills, but also develop creativity, cooperation and ecological awareness, which is extremely important in today's teaching of primary school children.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that may lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.

- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Ash (Fraxinus L.)

Properties of ash wood. Ash is a deciduous tree often found in European forests, including Poland. Ash trees can reach a height of up to 40 meters and live for several hundred years. Ash wood is valued in various industries for its strength, flexibility and attractive appearance.

Color and grain . Ash wood is light in color, most often from creamy white to light yellow. Corewoods can have darker shades, often with a warm brown tone. The grain of ash wood is usually expressive, with clearly visible, straight grains, which gives it an attractive appearance and makes it eagerly used in furniture and interior finishing .

Hardness and density . Ash is a hard and durable wood, with a dry density of approximately 680-720 kg/m³. It is slightly lighter than oak, but retains similar hardness and strength, making it a very useful material for a variety of applications. Its flexibility makes ash ideal for the production of elements requiring bending strength.

Durability. In terms of durability, ash wood is considered medium-durable without proper impregnation. It is less resistant to moisture, fungi and pests compared to oak, but appropriate impregnation and maintenance can significantly improve its durability. For indoor applications, its natural properties are sufficient to ensure the longevity of the products.

Finish. Ash wood accepts various types of finishes very well . They can be easily dyed, varnished, oiled and waxed, making it possible to achieve a wide range of visual effects. The distinct grain of ash wood is emphasized by various finishing techniques, which further increases its attractiveness.

Advantages and disadvantages of using ash wood
Advantages:

- High hardness and durability.
- Clear, attractive grain.
- It accepts various finishes well.
- Flexibility which is beneficial in some applications.
- Relatively easy to process compared to other hard wood species.

Defects:

- Less durability without proper impregnation.
- Greater susceptibility to moisture and pests compared to more resistant species.
- Sometimes it requires additional protection for outdoor applications.

The use of ash wood

Furniture: Ash wood is widely used in the furniture industry to produce high-quality furniture such as tables, chairs, wardrobes, chests of drawers and beds. Its durability and attractive appearance make ash furniture not only functional, but also aesthetic.

Floors and parquets: Thanks to its hardness and durability, ash wood is an ideal material for floors and parquets. Ash floors are valued for their elegant appearance

and resistance to scratches and mechanical damage, which makes them ideal for intensively used rooms.

Sports equipment and tools: The flexibility and strength of ash wood make it often used to produce sports equipment, such as skis, bows and sports clubs. These same properties make it the preferred material for making hand tools such as hammer and ax handles.

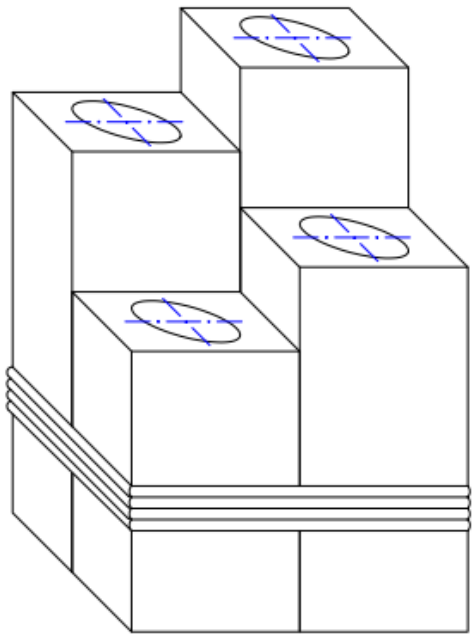
Structural elements: Ash wood is also used to produce structural elements in construction, such as beams, stairs and handrails. Its durability and attractive grain make it an ideal material for visible interior finishing elements.

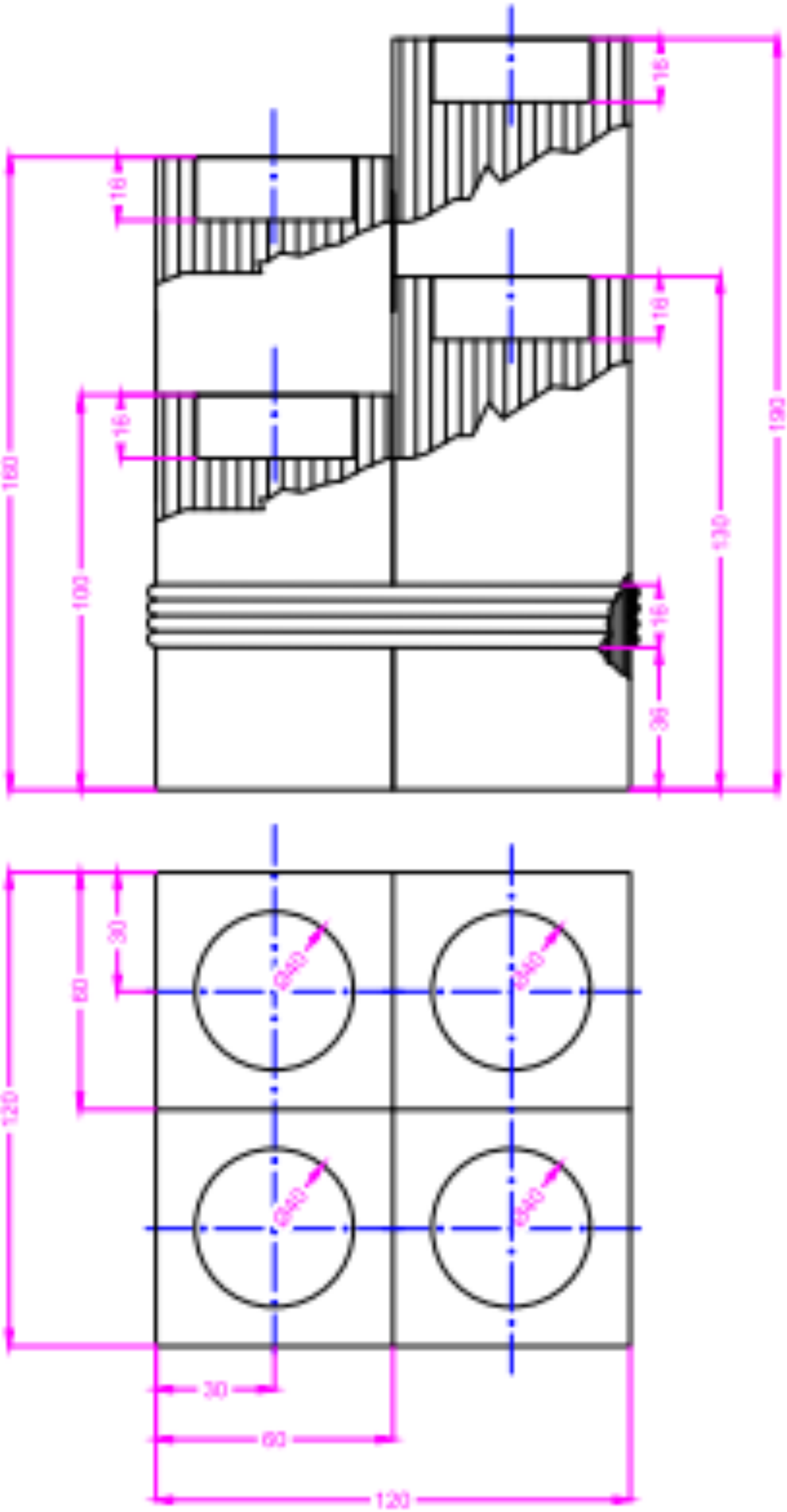
Musical instruments: Ash is also used in the production of musical instruments, especially where strength and flexibility are required. Its acoustic properties make it an excellent material for the production of guitars, drums and other stringed and percussion instruments.

Ash wood, thanks to its excellent hardness, strength and flexibility, is one of the most versatile and valued materials in the wood industry. Its natural beauty and excellent mechanical properties make it irreplaceable in many applications, from furniture and flooring to tools and musical instruments.

Topic of the practical task - Construction of a quadruple block candle holder for tealight candles .

Sample visualization:





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Course of classes: Presentation of the topic of the classes, time approximately 20 minutes

- I provide the topic and objectives of the classes
- I provide health and safety information,
- I inform students that an essential part of the classes will be practical making of a quadruple candle holder for telight candles ,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 20 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,
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Final instruction, time approximately 15 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
A hand saw or a comb saw, a drill/driver or a vertical/column drill, optionally a pyrograph , a brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave wet cloths after oil in the workshop, they should be wetted and disposed of, left in a closed space under favorable conditions they may spontaneously ignite).
Tools : Cylindrical drill with a diameter of 40 mm, grinding block, miter box, pencil, square, ruler, P100 and P180 sandpaper, knife, optional hot melt glue gun with glue sticks.
Materials : ash timber with a cross-section of 60/60 mm - 0.7 m (per person), a brush for applying oil, a natural rope, e.g. jute, approx. 4 mm thick - approx. 3mb (per person), quick-setting polyvinyl acetate wood glue ,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut the scantlings to length to create four elements with lengths of 100, 130, 160 and 190 mm,
- according to the drawing documentation, designate places for 40mm sockets for candles,
- drill sockets for candles with a drill with a diameter of 40 mm in all elements to a depth of 16 mm - unless your candles have a different height,
- sand the resulting elements using sandpaper, starting with grit P100 and continuing with grit P180,
- gently break the edges of all elements using P180 grit paper, pay special attention to sanding the candle socket,
- glue the resulting elements according to the attached documentation,
- (optional) design inscriptions or other decorations on the sides of candlesticks and burn them using a pyrograph ,
- protect the resulting product with oil for internal use. Follow the oil manufacturer's recommendations regarding the number of layers, drying time and the period after which the coating is suitable for use,
- wrap the resulting product tightly with a rope, which should be braided under the existing strapping or glued with hot melt glue.

Topic: Construction of a Christmas candle holder for tealight candles in the shape of a star

Number of students: 8

Number of hours of classes: 5,

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

General objectives for practical lessons in making simple wood products for primary school children

Development of manual and technical skills

- Students should develop their manual skills, precision and motor coordination by working with tools and wood materials.
- Learning basic woodworking techniques such as cutting, sanding, joining and finishing.

Increasing ecological awareness and respect for natural resources

- Children learn the importance of wood as a renewable raw material and learn how to use materials in a sustainable and conscious way.
- Education about the origin of wood and the importance of forest protection and sustainable management of forest resources.

Development of creativity and imagination

- Encouraging students to express their creativity by designing and creating their own unique wood products.
- Strengthening the ability to solve problems, make decisions and plan activities during project implementation.

Teamwork and interpersonal skills

- Learning cooperation and communication in a group while working together on wood projects.
- Developing the ability to share tools and materials, help others and make decisions together.

Strengthening self-esteem and self-confidence

- Building self-confidence by implementing specific projects, from idea to finished product.

- Strengthening self-esteem and satisfaction with achieved results by striving for goals and overcoming difficulties.

Introduction to security issues

- Learning how to safely use carpentry tools and machines.
- Informing about safety procedures and encouraging compliance with health and safety rules when working with wood.

Basic knowledge about wood and its properties

- Introducing students to different types of wood and their properties.
- Learning to recognize wood species based on features such as color, grain and hardness.

Achieving these goals will help students not only acquire specific technical skills, but also develop creativity, cooperation and ecological awareness, which is extremely important in today's teaching of primary school children.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that may lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.

- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Elm (Ulmus L.)

Properties of elm wood. Elm is a deciduous tree that grows in Europe, Asia and North America. Elm trees can grow to a height of 40 meters and live for hundreds of years. Elm wood is valued for its durability, flexibility and attractive appearance, which makes it widely used in various areas.

Color and grain. Elm wood is characterized by a warm, brownish-cream color, with visible shades from yellow-brown to dark brown. The grain of elm wood is distinct and decorative, with a characteristic fibrous pattern, which gives it an elegant, natural look. This grain becomes more visible after appropriate finishing, emphasizing the unique aesthetic values of this wood.




Hardness and density. Elm wood is hard and durable, with a dry density of approximately 580-700 kg/m³. It is slightly lighter than oak, but has similar mechanical strength, which makes it an excellent material for applications requiring high resistance to damage and loads. Elm also has good flexibility, which is especially valuable in certain construction and craft applications.

Durability. Elm wood is considered durable, although slightly less resistant to moisture and pests than oak wood. Without proper impregnation, it is moderately resistant to

weather conditions and attack by fungi and insects. Therefore, elm wood used outdoors requires appropriate protection to maintain its properties for many years.

Finish. Elm wood perfectly accepts various finishes, which allows for a wide range of aesthetic effects. They can be easily dyed, varnished, oiled and waxed. The clear grain and natural color of elm wood are emphasized by these techniques, which further increases its attractiveness as a material for the production of furniture and finishing elements.

Advantages and disadvantages of using elm wood
Advantages:

- High hardness and mechanical strength.
- Attractive, clear grain.
- It accepts various finishes well.
- Flexibility that benefits many applications.
- Relatively easy to process, despite its hardness.

Defects:

- Less resistance to moisture and pests compared to more resistant species.
- The need for appropriate impregnation for external applications.
- May be harder to find due to declining elm populations in some regions.

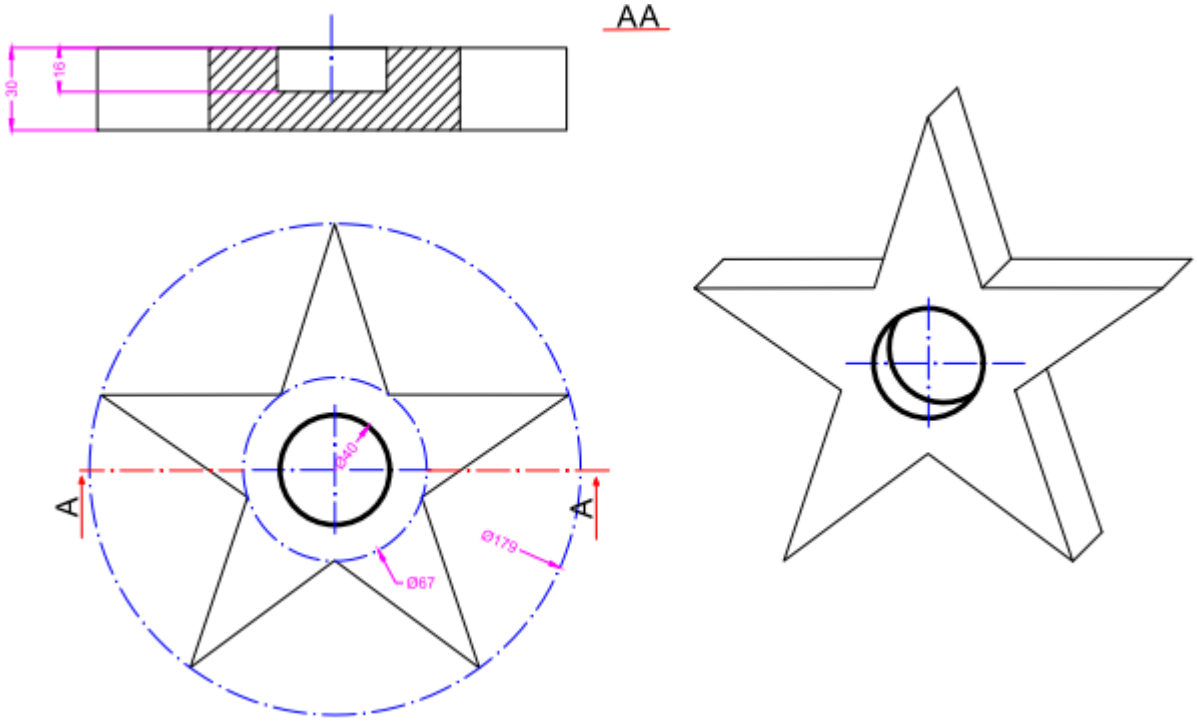
The use of elm wood
Furniture: Elm wood is valued in the furniture industry for its durability and attractive appearance. It is used to produce high-quality furniture such as tables, chairs, wardrobes, chests of drawers and beds. Elm furniture is not only functional, but also aesthetic, with a distinct grain giving it a unique character.
Floors and parquets: Elm wood is an excellent material for floors and parquets. Its hardness and flexibility ensure durability and resistance to scratches and mechanical damage. Elm floors look elegant and are very durable, which makes them ideal for living rooms and other representative rooms.
Finishing elements: Elm wood is also used to produce finishing elements such as skirting boards, wainscoting and balustrades. Its natural beauty and durability make it an excellent choice for decorative interior elements.
Crafts and Art: The attractive grain and flexibility of elm wood make it a popular material for arts and crafts and the production of decorative items such as sculptures, picture frames and decorative wall panels.
Structural elements: Due to its strength and flexibility, elm wood is used in structures where high resistance to mechanical loads is required. It is used to produce beams, stairs and other structural elements in construction.
Sports equipment: Elm wood is also used to produce various types of sports equipment due to its strength and flexibility.

Elm wood, thanks to its strength, flexibility and attractive appearance, is widely used in many industries. Its natural beauty and excellent mechanical properties make it

irreplaceable in the production of high-quality furniture, floors, construction and decorative elements.

The topic of the practical task - Construction of a Christmas candle holder for tealight candles in the shape of a star.

Sample visualization:



Course of classes: Presentation of the topic of the classes, time approximately 20 minutes

- I provide the topic and objectives of the classes
- I provide health and safety information,
- I inform students that an essential part of the classes will be the practical making of a candlestick,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

<u>Ongoing instruction, analysis of information and drawings, time approximately 20 minutes</u>

- students analyze documentation,

- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration
- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes
- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 15 minutes
- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
A hand saw or a comb saw, a drill/driver or a vertical/column drill, optionally a pyrograph , a brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave wet cloths after oil in the workshop, they should be wetted and disposed of, left in a closed space under favorable conditions they may spontaneously ignite).
Tools : Cylindrical drill with a diameter of 40 mm, grinding block, miter box, pencil, square, ruler, P100 and P180 sandpaper, compasses.
Materials : elm board dimensions 190/190/30mm (2 per person),
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth :

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- in an elm board, mark out the center and two circles, the one in which the star is inscribed and the one on which the star is described, mark out the shape of the star,
- drill a socket for the candle with a drill with a diameter of 40 mm to a depth of 16 mm - unless your candles have a different height,
- after fixing the board in a vice, cut out a star shape with a saw,
- sand the resulting element using sandpaper, starting with grit P100 and continuing with grit P180,
- gently break all edges using P180 grit paper, pay special attention to sanding the candle socket,
- (optional) design inscriptions or other decorations on the top of the candlestick and burn them using a pyrograph ,
- protect the resulting product with oil for internal use. Follow the oil manufacturer's recommendations regarding the number of layers, drying time and the period after which the coating is suitable for use.

Topic: Construction of a Christmas candle holder for tealight candles with a star shape cut out

Number of students: 8

Number of hours of classes: 5,

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

General objectives for practical lessons in making simple wood products for primary school children

Development of manual and technical skills

- Students should develop their manual skills, precision and motor coordination by working with tools and wood materials.
- Learning basic woodworking techniques such as cutting, sanding, joining and finishing.

Increasing ecological awareness and respect for natural resources

- Children learn the importance of wood as a renewable raw material and learn how to use materials in a sustainable and conscious way.
- Education about the origin of wood and the importance of forest protection and sustainable management of forest resources.

Development of creativity and imagination

- Encouraging students to express their creativity by designing and creating their own unique wood products.
- Strengthening the ability to solve problems, make decisions and plan activities during project implementation.

Teamwork and interpersonal skills

- Learning cooperation and communication in a group while working together on wood projects.
- Developing the ability to share tools and materials, help others and make decisions together.

Strengthening self-esteem and self-confidence

- Building self-confidence by implementing specific projects, from idea to finished product.

- Strengthening self-esteem and satisfaction with achieved results by striving for goals and overcoming difficulties.

Introduction to security issues

- Learning how to safely use carpentry tools and machines.
- Informing about safety procedures and encouraging compliance with health and safety rules when working with wood.

Basic knowledge about wood and its properties

- Introducing students to different types of wood and their properties.
- Learning to recognize wood species based on features such as color, grain and hardness.

Achieving these goals will help students not only acquire specific technical skills, but also develop creativity, cooperation and ecological awareness, which is extremely important in today's teaching of primary school children.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that may lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.

- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used in classes: Robinia pseudoacacia L., also known as acacia.

Properties of robinia wood. Black locust, also known as acacia, is a deciduous tree native to North America that has spread widely throughout Europe. These trees can grow to a height of 20-30 meters and are known for their hardiness and durability. Black locust wood is valued for its strength and resistance to weather conditions, which makes it ideal for both outdoor and indoor applications.

Color and grain. Black locust wood has an attractive greenish-yellow color that darkens to intense brown over time. The grain is usually clear and decorative, with visible grain, which gives the wood a unique, natural character. Additionally, black locust may have a glossy effect, which increases its aesthetic value.

Hardness and density. Black locust is one of the hardest native wood species, with a dry density of approximately 700-800 kg/m³. Its hardness exceeds oak wood, which makes it an extremely durable material, resistant to mechanical damage. This feature makes processing black locust wood more difficult, but ensures unrivaled durability of the products.

Durability . Black locust wood is known for its exceptional durability and natural resistance to moisture, fungi and pests, which makes it an excellent material for outdoor applications without the need for additional impregnation. It is often compared to tropical wood in terms of its resistance to weather conditions, which makes it ideal for building elements exposed to weather conditions.

Finish. Black locust wood accepts various types of finishes well , but due to its hardness, it requires careful preparation of the surface. They can be stained, varnished, oiled and waxed, which allows for the extraction of natural aesthetic values and additional protection of the wood. The distinct grain and characteristic colors are emphasized by these techniques, which additionally makes robinia more attractive as a finishing material.

Advantages and disadvantages of using robinia wood
Advantages:
- Exceptional hardness and durability.
- High resistance to moisture, fungi and pests.
- Attractive, clear grain and colors.
- It accepts various finishes well.
- Excellent mechanical properties.

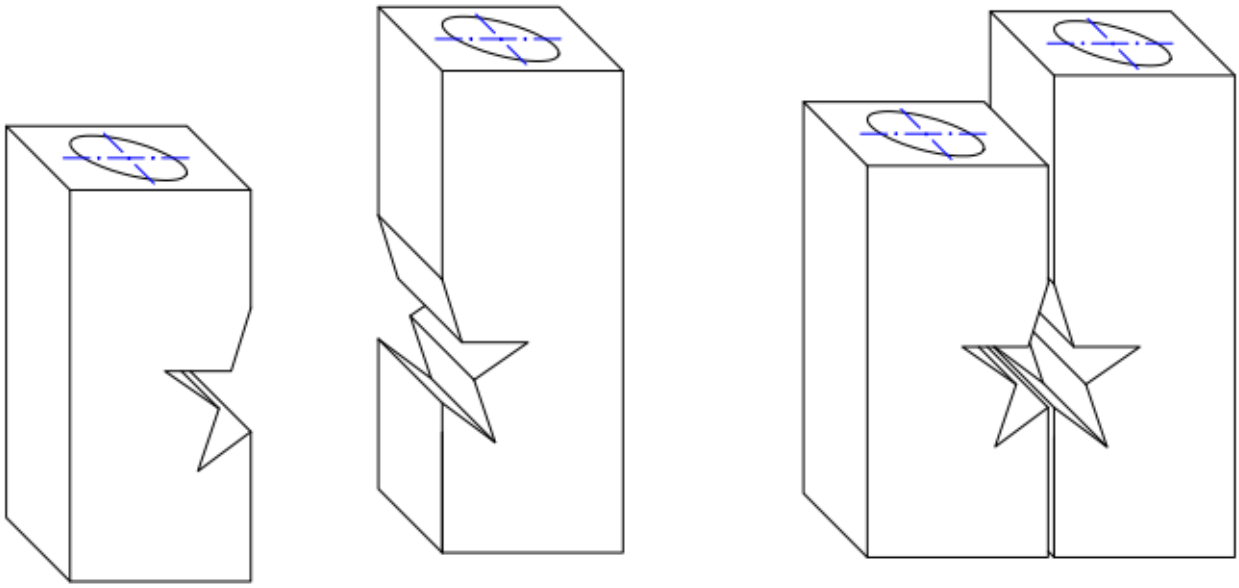
Defects:
- Higher difficulty in processing due to hardness.
- It may be harder to find and more expensive compared to other wood species.
- Sometimes it requires specialized processing tools.

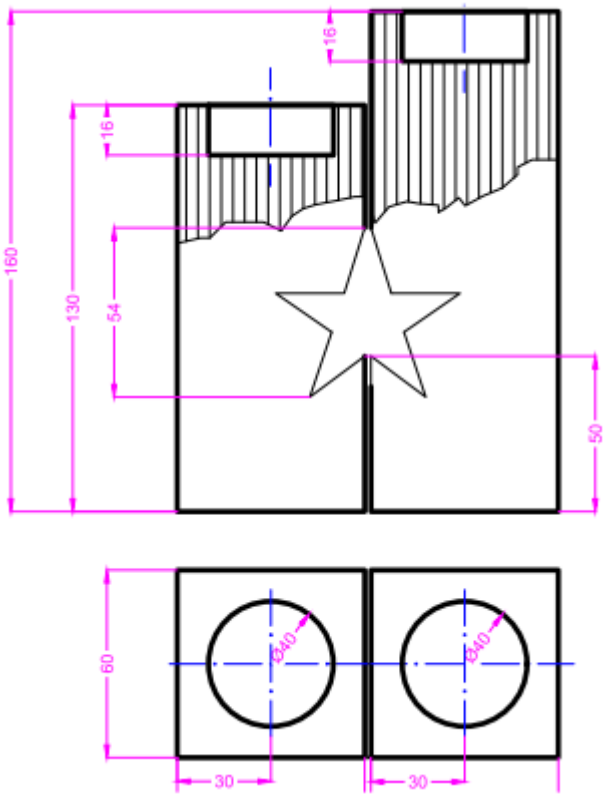
The use of robinia wood
Outdoor construction: Due to its exceptional durability and resistance to weather conditions, black locust wood is an ideal material for the construction of outdoor structures such as gazebos, pergolas, fences, terraces and bridges. The natural durability of black locust allows for long-term use without the need for intensive maintenance.
Garden furniture: Black locust wood is often used to produce garden furniture, such as benches, tables, chairs and deckchairs. Its exceptional durability ensures that this furniture retains its appearance and functionality for many years, even in difficult weather conditions.
External cladding: Robinia is perfect for external cladding of buildings, such as facades and wall coverings, because its natural resistance to weather conditions provides long-term protection and aesthetic appearance.
Floors and parquets: Black locust wood is also used to produce floors and parquets. Thanks to their hardness and durability, robinia floors are resistant to scratches and damage, which makes them ideal for intensively used rooms.
Posts and palisades: Due to its mechanical strength, black locust wood is often used to produce fence posts and palisades. Black locust posts are highly resistant to rotting and do not require additional impregnation.
Arts and crafts: Black locust wood, thanks to its attractive grain and colors, is used in artistic crafts and the production of decorative elements, such as sculptures, frames or decorative panels.

Black locust wood, thanks to its excellent mechanical and aesthetic properties, is one of the most durable and versatile materials available in the wood industry. Its exceptional resistance to weather conditions and mechanical damage make it irreplaceable in many applications, both in construction and in the production of furniture and decorative interior and garden elements.

Topic of the practical task - Construction of a Christmas candle holder for tealight candles with a star shape cut out.

Sample visualization:





Course of classes: Presentation of the topic of the classes, time approximately 20 minutes

- I provide the topic and objectives of the classes
- I provide health and safety information,
- I inform students that an essential part of the classes will be the practical making of a candlestick,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

<u>Ongoing instruction, analysis of information and drawings, time approximately 20 minutes</u>

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

<u>Ongoing instruction, demonstration</u>

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it

- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction , organization and execution, time approximately 170 minutes
- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 15 minutes
- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with carpentry table(s) adapted to the task and the number of students in the group(s).
Hand saw, cross-cut saw or comb saw, jigsaw, drill/driver, column/vertical drill, optional pyrograph , brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave damp cloths with oil in the workshop, they should be wetted and disposed of , left in a closed space under favorable conditions may spontaneously ignite).
Tools : cylindrical drill bit for wood with a diameter of 40 mm, jigsaw knives for wood, length approx. 95 mm), grinding block, miter box, pencil, square, ruler, compasses, sandpaper P100, P120 and P180,
Materials : robin timber with a cross-section of 60/60 mm - length 350 mm per person,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:
- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- using a hand saw and a miter box, cut the robin squares to create two elements: one 130 mm long and the other 160 mm long,
- mark out places for sockets in the upper faces of the resulting posts,

- drill a socket for the candle with a drill with a diameter of 40 mm to a depth of 16 mm - unless your candles have a different height,
- connect two posts together using a carpenter's clamp or fasten them together in a carpentry table, then mark out a star according to provided documentation,
- after mounting a single post in a vice, cut out a star shape using a saw or jigsaw, repeat the operation with the second post,
- sand the elements using sandpaper, starting from P100 grit and continuing to P180,
- gently break all edges using P180 grit paper, pay special attention to sanding the candle socket and the star profile,
- (optional) design inscriptions or other decorations on the side of the candlestick and burn them using a pyrograph ,
- protect the resulting product with oil for internal use. Follow the oil manufacturer's recommendations regarding the number of layers, drying time and the period after which the coating is suitable for use.
- protect the resulting product with oil for internal use. Follow the oil manufacturer's recommendations regarding the number of layers, drying time and the period after which the coating is suitable for use.

Topic: Construction of a Christmas candle holder for tealight candles with a heart shape cut out

Number of students: 8

Number of hours of classes: 5,

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

General objectives for practical lessons in making simple wood products for primary school children

Development of manual and technical skills

- Students should develop their manual skills, precision and motor coordination by working with tools and wood materials.
- Learning basic woodworking techniques such as cutting, sanding, joining and finishing.

Increasing ecological awareness and respect for natural resources

- Children learn the importance of wood as a renewable raw material and learn how to use materials in a sustainable and conscious way.
- Education about the origin of wood and the importance of forest protection and sustainable management of forest resources.

Development of creativity and imagination

- Encouraging students to express their creativity by designing and creating their own unique wood products.
- Strengthening the ability to solve problems, make decisions and plan activities during project implementation.

Teamwork and interpersonal skills

- Learning cooperation and communication in a group while working together on wood projects.
- Developing the ability to share tools and materials, help others and make decisions together.

Strengthening self-esteem and self-confidence

- Building self-confidence by implementing specific projects, from idea to finished product.

- Strengthening self-esteem and satisfaction with achieved results by striving for goals and overcoming difficulties.

Introduction to security issues

- Learning how to safely use carpentry tools and machines.
- Informing about safety procedures and encouraging compliance with health and safety rules when working with wood.

Basic knowledge about wood and its properties

- Introducing students to different types of wood and their properties.
- Learning to recognize wood species based on features such as color, grain and hardness.

Achieving these goals will help students not only acquire specific technical skills, but also develop creativity, cooperation and ecological awareness, which is extremely important in today's teaching of primary school children.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that may lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.

- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

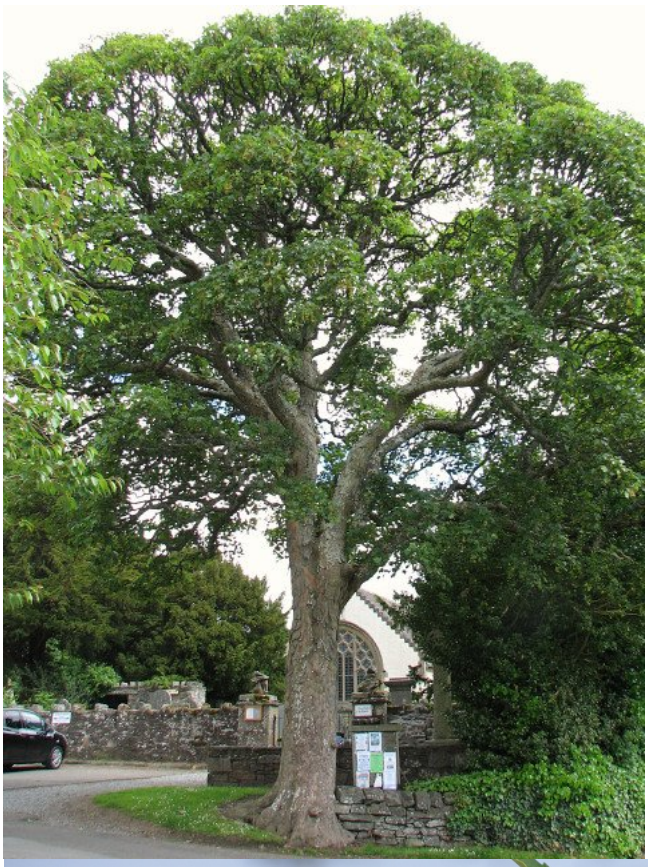
- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Jawor (Acer pseudoplatanus L.)

Properties of sycamore wood. Sycamore, also known as sycamore maple, is a deciduous tree common in Europe and western Asia. Sycamore trees can grow to a height of 30-40 meters. Sycamore wood is valued for its hardness, durability and bright, attractive colors, which makes it an ideal material for a variety of applications, both functional and decorative.

Color and grain. Sycamore wood is characterized by light, creamy-white colors with subtle, sometimes golden shades. The grain of sycamore wood is usually delicate, even and subtle, which gives it a smooth and elegant appearance. The sycamore may also have unique patterns, such as "flame" or "bird eyes", which give it a unique character and increase its aesthetic value.



Hardness and density. Sycamore wood is hard and durable, with a dry density of approximately 620-710 kg/m³. It is harder and heavier than many other hardwood species, which makes it more resistant to mechanical damage. Thanks to these

properties, sycamore is an excellent material for applications requiring high strength and durability.

Durability. In terms of durability, sycamore wood is classified as medium-durable. It is moderately resistant to moisture, fungi and pests, which means that it requires appropriate impregnation and protection when used outdoors. In indoor conditions, its natural properties are usually sufficient to ensure the longevity of products made from sycamore.

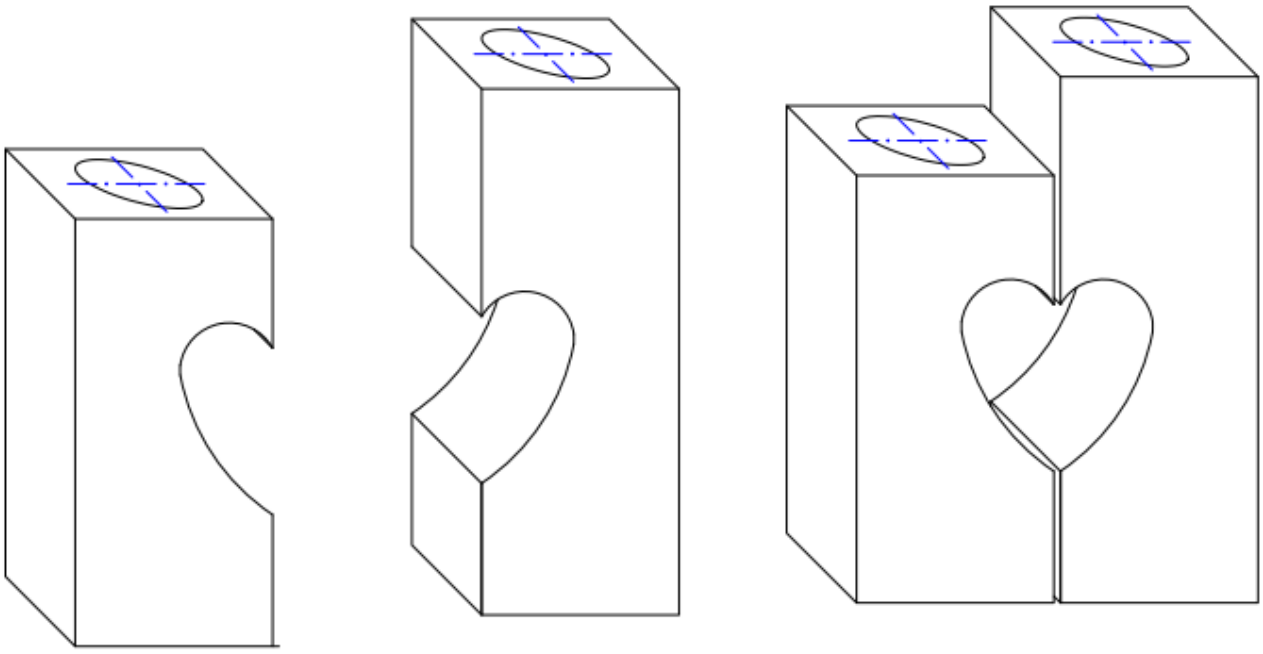
Finish. Sycamore wood accepts various types of finishes very well . They can be easily stained, varnished, oiled and painted, which allows you to achieve a wide range of aesthetic effects. The bright colors and subtle grain of sycamore wood make the finishes emphasize its natural beauty, giving it an elegant and modern look.

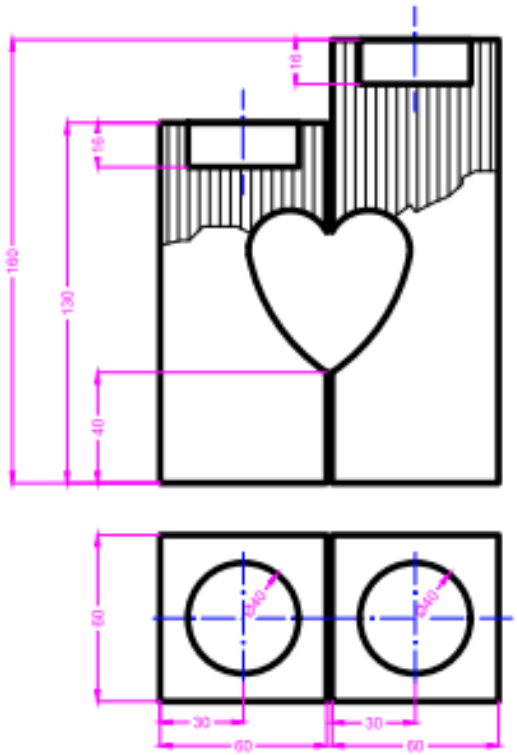
The use of sycamore wood
Furniture: Sycamore wood is widely used in the furniture industry to produce high-quality furniture such as tables, chairs, chests of drawers, wardrobes and beds. The light colors of the sycamore give the furniture an elegant and fresh look that fits perfectly with various interior styles.
Floors and parquets: Jawor is also used to produce floors and parquets. Its hardness and durability make sycamore wood floors resistant to scratches and mechanical damage, and at the same time look very elegant.
Musical instruments: Sycamore wood is used in the production of musical instruments such as violins, cellos, guitars and pianos. Its hardness, durability and acoustic properties make it an ideal material for instrument bodies and necks.
Furniture fronts and panels: Sycamore wood is used to produce furniture fronts and wall panels. Its uniform colors and subtle graining make it an excellent material for interior finishing , giving them an elegant and modern look.
Kitchen utensils: Sycamore wood, due to its hardness and smooth texture, is used to make kitchen utensils such as cutting boards, spoons and rolling pins. It is safe in contact with food and easy to keep clean.
Arts and Crafts: Sycamore wood is a popular material for arts and crafts and the production of decorative items such as sculptures, ornaments, frames and other decorative items. Its attractive colors and ease of processing make it an ideal material for precise handwork.

Sycamore wood, thanks to its exceptional hardness, durability and elegant appearance, is valued in many industries, from furniture to the production of musical instruments and artistic crafts. Its versatility and natural properties make it an excellent material for a variety of applications, both practical and decorative.

Topic of the practical task - Construction of a Christmas candle holder for tealight candles with a star shape cut out.

Sample visualization:





Course of classes: Presentation of the topic of the classes, time approximately 20 minutes

- I provide the topic and objectives of the classes
- I provide health and safety information,

- I inform students that an essential part of the classes will be the practical making of a candlestick,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 20 minutes
- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration
- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes
- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 15 minutes
- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with carpentry table(s) adapted to the task and the number of students in the group(s).
Hand saw, cross-cut saw or comb saw, jigsaw, drill/driver, column/vertical drill, optional pyrograph , brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave damp cloths with oil in the workshop, they should be

wetted and disposed of , left in a closed space under favorable conditions may spontaneously ignite).
Tools : cylindrical drill bit for wood with a diameter of 40 mm, jigsaw knives for wood, length approx. 95 mm), grinding block, miter box, pencil, square, ruler, compasses, sandpaper P100, P120 and P180,
Materials : sycamore square timber with a cross-section of 60/60 mm - length 350 mm per person,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- using a hand saw and a miter box, cut the sycamore square timber to create two elements: one 130 mm long and the other 160 mm long,
- mark out places for sockets in the upper faces of the resulting posts,
- drill a socket for the candle with a drill with a diameter of 40 mm to a depth of 16 mm - unless your candles have a different height,
- connect two posts together using a carpenter's clamp or fasten them together in a carpentry table, then mark out the heart according to provided documentation,
- after mounting a single post in a vice, cut out a heart shape with a jigsaw, repeat the operation with the second post,
- sand the elements using sandpaper, starting from P100 grit and continuing to P180,
- gently break all edges using P180 grit paper, pay special attention to sanding the candle socket and the heart profile,
- (optional) design inscriptions or other decorations on the side of the candlestick and burn them using a pyrograph ,
- protect the resulting product with oil for internal use. Follow the oil manufacturer's recommendations regarding the number of layers, drying time and the period after which the coating is suitable for use.

Topic: Construction of a block candle holder for tealight candles with a cross-shaped base

Number of students: 8

Number of hours of classes: 5,

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

General objectives for practical lessons in making simple wood products for primary school children

Development of manual and technical skills

- Students should develop their manual skills, precision and motor coordination by working with tools and wood materials.
- Learning basic woodworking techniques such as cutting, sanding, joining and finishing.

Increasing ecological awareness and respect for natural resources

- Children learn the importance of wood as a renewable raw material and learn how to use materials in a sustainable and conscious way.
- Education about the origin of wood and the importance of forest protection and sustainable management of forest resources.

Development of creativity and imagination

- Encouraging students to express their creativity by designing and creating their own unique wood products.
- Strengthening the ability to solve problems, make decisions and plan activities during project implementation.

Teamwork and interpersonal skills

- Learning cooperation and communication in a group while working together on wood projects.
- Developing the ability to share tools and materials, help others and make decisions together.

Strengthening self-esteem and self-confidence

- Building self-confidence by implementing specific projects, from idea to finished product.
- Strengthening self-esteem and satisfaction with achieved results by striving for goals and overcoming difficulties.

Introduction to security issues

- Learning how to safely use carpentry tools and machines.
- Informing about safety procedures and encouraging compliance with health and safety rules when working with wood.

Basic knowledge about wood and its properties

- Introducing students to different types of wood and their properties.
- Learning to recognize wood species based on features such as color, grain and hardness.

Achieving these goals will help students not only acquire specific technical skills, but also develop creativity, cooperation and ecological awareness, which is extremely important in today's teaching of primary school children.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.

- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used in classes: Maple (Acer spp .)

Properties of maple wood . Maple is a deciduous tree common in Europe, Asia and North America. Maple trees can grow to a height of 30-40 meters and are known for their hardness, durability and aesthetic appearance. Maple wood is valued across industries for its versatility and attractive texture.

Color and grain. Maple wood is characterized by light colors that can range from white to light yellow with delicate golden sometimes pink shades. The grain of maple wood is usually subtle and even, giving it a smooth and elegant appearance. Maple wood can also have unique patterns, such as " fladr " (wave patterns), which further enhance its aesthetic value.

Hardness and density. Maple wood is hard and durable, with a dry density of approximately 620-750 kg/m³. It is harder and heavier than many other hardwood species, which makes it more resistant to mechanical damage. These properties make maple an ideal material for applications requiring strength and durability.

Durability. In terms of durability, maple wood is classified as medium-durable. It is moderately resistant to moisture, fungi and pests, which means that it requires appropriate impregnation and protection when used outdoors. In interior applications, its natural properties are usually sufficient to ensure the longevity of the products.

Finish. Maple wood perfectly accepts various types of finishes . They can be easily stained, varnished, oiled and painted, which allows you to achieve a wide range of aesthetic effects. The bright colors and subtle grain of maple wood make it an ideal background for a variety of finishes , which further emphasizes its natural beauty.

Advantages and disadvantages of using maple wood

Advantages:

- High hardness and mechanical strength.
- Bright, uniform colors and subtle graining.
- It accepts various finishes well.
- Possibility of obtaining unique designs.
- Versatile applications in furniture and carpentry.

Defects:

- Less resistance to moisture, fungi and pests without proper impregnation.
- Average durability compared to more resistant wood species.
- May be more difficult to work with due to hardness.

The use of maple wood

Furniture: Maple wood is widely used in the furniture industry to produce a variety of furniture such as tables, chairs, chests of drawers, wardrobes and beds. The light colors of maple wood give the furniture an elegant and modern look that suits many interior styles.

Floors and parquets: Maple is also used to produce floors and parquets. Its hardness and durability make maple wood floors resistant to scratches and mechanical damage, while ensuring an elegant appearance of the interior.

Musical instruments: Maple wood is also used in the production of musical instruments such as guitars, violins, cellos and pianos. Its hardness and mechanical strength as well as good acoustic properties make it an ideal material for instrument bodies and necks.

Furniture fronts and boards: Maple wood is used to produce furniture fronts and wood-like boards. Its uniform colors and subtle grain make it a popular material for interior finishing .

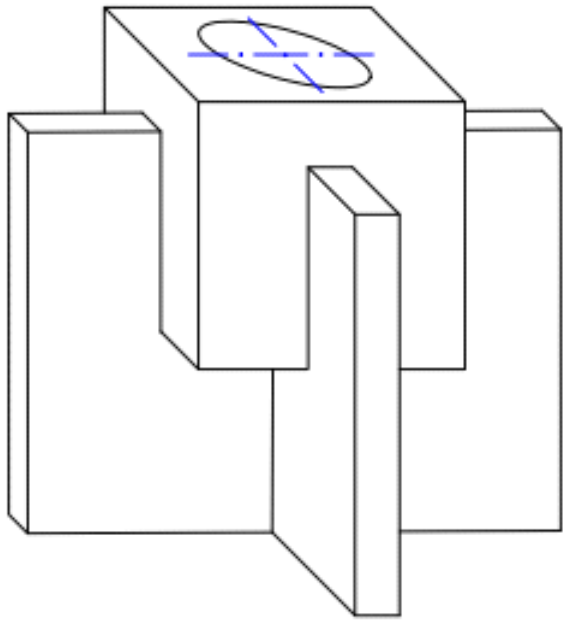
Kitchen utensils: Due to its hardness and durability, maple wood is used to make kitchen utensils such as cutting boards, spoons, spatulas and rolling pins. It is safe in contact with food and easy to keep clean.

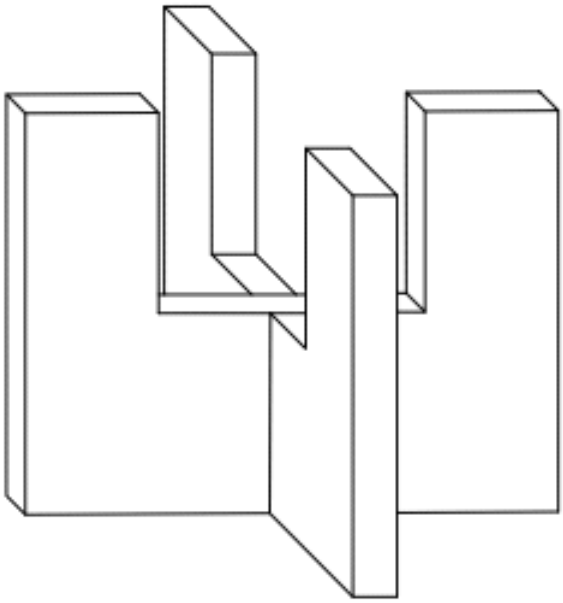
Arts and crafts: Maple wood, thanks to its attractive colors and ease of processing, is a popular material in artistic crafts. It is often used to produce sculptures, frames, decorative panels and other decorative elements.

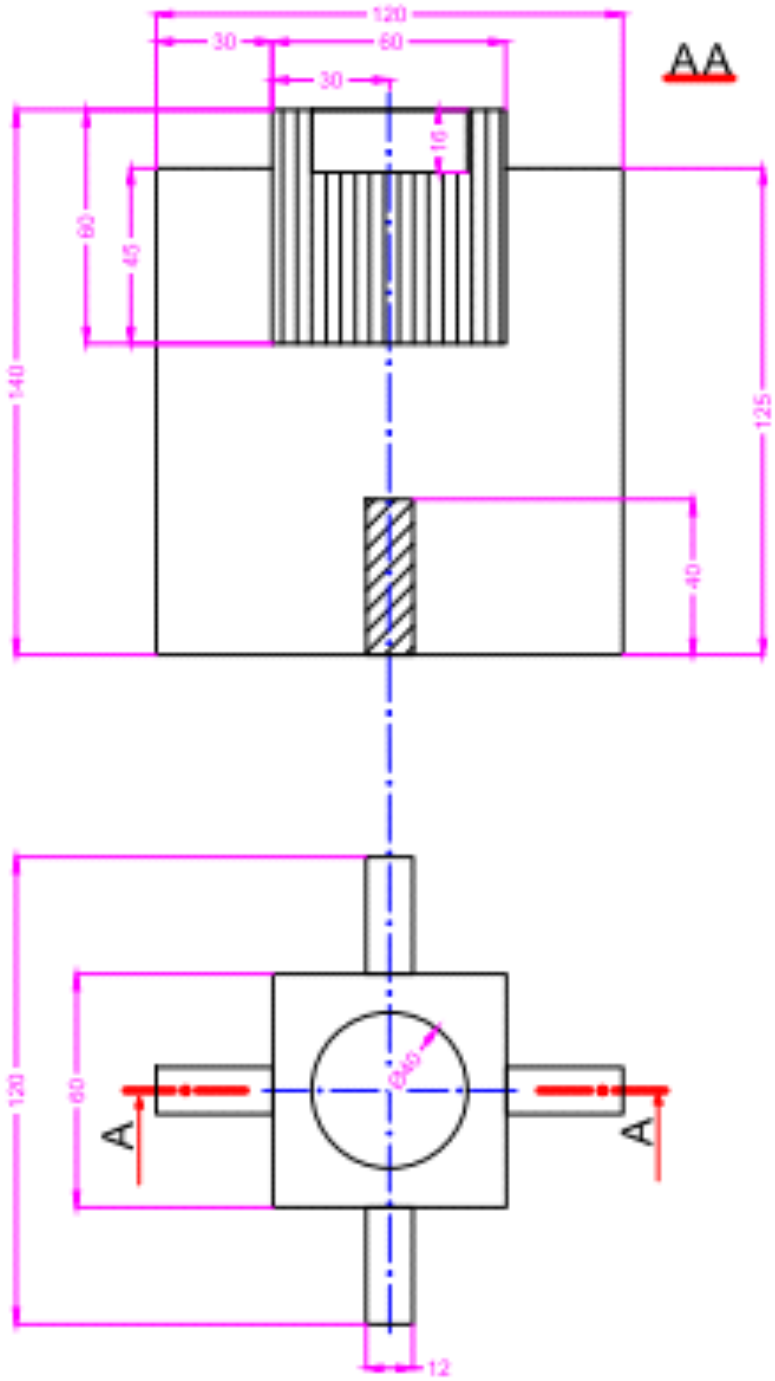
Maple wood, thanks to its exceptional hardness, durability and elegant appearance, is valued in many industries, from furniture to the production of musical instruments and artistic crafts. Its versatility and natural properties make it an ideal material for a variety of applications, both practical and decorative.

Topic of the practical task - Construction of a block candle holder for tealight candles with a cross-shaped base.

Sample visualization:







Course of classes: Presentation of the topic of the classes, time approximately 20 minutes

- provide the topic and objectives of the classes
- provide health and safety information,
- inform students that an essential part of the classes will be the practical making of a candlestick,
- inform students about the type of material we will work with and describe it.

- provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 20 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it

- each time before students use the tool, the teacher instructs and shows how to use it in practice,

-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 15 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with carpentry table(s) adapted to the task and the number of students in the group(s).

Longitudinal circular saw, hand saw or comb saw, jigsaw, drill/screwdriver, column/vertical drill, optional pyrograph , brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave wet cloths left with oil in the workshop, you should wet them and dispose of them, if left in a closed space under favorable conditions they may spontaneously combust).

Tools : cylindrical drill bit for wood with a diameter of 40 mm, jigsaw knives for wood, length approx. 95 mm), grinding block, miter box, pencil, square, ruler, compasses,

sandpaper P100, P120 and P180, carpentry chisel with a width of 12 mm , wooden mallet.
Materials : oak square timber with a cross-section of 60/60 mm - length 230 mm for three people, maple board with dimensions 280/120/12 mm,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- using a hand saw and a miter box, cut the oak scantlings to create one 90 mm long element,
- mark out a place for a nest in the upper face of the resulting post,
- drill a socket for the candle with a drill with a diameter of 40 mm to a depth of 16 mm - unless your candles have a different height,
- cut the maple board to create two elements, each 125 mm long,
- mark out the cutout for the candlestick block and the cross connection in the slats,
- cut with a hand saw and then carve out a cutout for the candlestick block and the cross connection,
- sand the resulting elements using sandpaper, starting with grit P100 and continuing to P180,
- gently break all edges using P180 grit paper,
- (optional) design inscriptions or other decorations on the side of the candlestick and burn them using a pyrograph ,
- assemble the resulting product into a whole,
- if the fit is good, the product elements can be pressed together, if the gaps are too great, glue all three elements together, starting from gluing the maple elements of the cross, then gluing the candlestick block, use polyvinyl acetate carpentry glue for gluing (remember to do the gluing before finishing with oil , and before oiling, make sure that there are no glue stains on the surface of the product),

- protect the resulting product with oil for internal use. Follow the oil manufacturer's recommendations regarding the number of layers, drying time and the period after which the coating is suitable for use.

Topic: Construction of a hanging bird feeder

Number of students: 8
NUMBER OF Hours: 5
Goals:

- Understanding why birds need our help in winter by learning about changes in their environment.
- Enriching knowledge about the species of birds that hibernate in our area and what their specific nutritional needs are.
- Learning the right choice and placement of feeders that will ensure the safety of birds and protect them from predators.
- Promoting care for animals and the environment by regularly feeding birds and observing their behaviour.
- Encouraging involvement in collective activities, such as the "Birds around us" project, where children can monitor bird species in their area.

Lessons on feeding birds can not only be educational, but can also inspire students to act responsibly towards the environment and other living beings.

Form of classes: group and individual
Teaching methods: verbal: story/talk/instruction, practical**:** demonstration, measurement of things and method of practical classes

Introduction -the subject of the practical task:

Feeding birds in winter can have many positive effects for both birds and the environment. Here are some information about the legitimacy and necessity of feeding birds in winter:

- Lack of natural food sources: Winter can be a difficult time for birds, as natural food sources such as insects, grass seeds, or fruits are limited or inaccessible.
- Help conserve energy: Finding food in the harsh conditions of winter requires extra energy from the birds. Feeding birds saves them valuable resources for survival.
- Improving the condition of birds: Regular provision of adequate food allows birds to maintain good physical condition and immunity, which increases their chances of surviving the winter.
- Observation and learning: Feeding birds is a great opportunity to observe the different species of birds, their behavior and hierarchy in the group. For children, it can also be an opportunity to learn about ecosystems and interdependencies in nature.

- Conservation of biodiversity: By supporting birds in winter, we help maintain species diversity and ensure the balance of ecosystems.

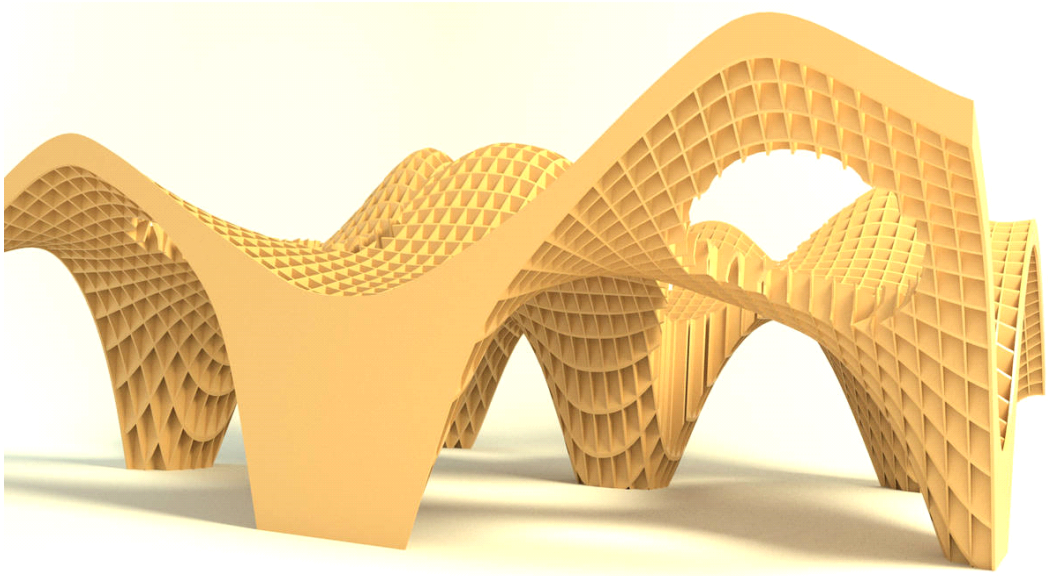
Feeding birds in winter is essential to ensure their chances of survival, and at the same time it can be a wonderful and educational activity for people, especially children.

It is important to note that feeding birds in winter should be conscientious and systematic for several important reasons:

- Birds' dependence on food supply: As birds begin to rely on feeding, they become dependent on food supply on a regular basis. Suddenly stopping feeding can lead to malnutrition and trouble getting food.
- Respect for new hierarchies in the group of birds: Systematic feeding allows birds to establish a hierarchy in the area of the feeder and minimize potential fights for food.
- Pests and predators: Systematic feeding helps keep the area around the feeder clean and minimizes the risk of attracting pests such as rats or mice, and predators that can threaten birds.

In view of the above reasons, it is important that the feeding of birds in winter takes place conscientiously, regularly and with full commitment to provide birds with stable conditions for survival in difficult times.

Introduction - material used in classes. **Plywood**,



Plywood is a carpentry material composed of thin layers of wood, called "floats", glued under high pressure and high temperature. Thanks to its construction, plywood is characterized by high strength and dimensional stability, which makes it an excellent material for use in the production of furniture, veneers, interior elements as well as in vehicle construction and construction.

Plywood is available in different thicknesses and types, depending on the application. It can be made of different types of wood, which affects its strength and aesthetic qualities. Plywood also has good resistance to impact, shrinkage and swelling, which makes it a stable material for carpentry work.

In carpentry, plywood is often used to make furniture frames, moulds for castings, reinforcements in wooden structures and as a finishing material in the form of veneered plywood. Thanks to its properties, plywood is a versatile and durable material, popular among carpenters and furniture manufacturers.

By using different adhesives to bond individual layers of plywood together, we can obtain different types of plywood:

- Waterproof plywood - this plywood is characterized by very high resistance to moisture and weather conditions. It is ideal for outdoor applications such as boat construction, bathroom wall cladding or façade elements.
- Phenolic plywood (film) - this type of plywood has a film coating of plastic (usually phenolic) on one or both of its surfaces, which makes it very durable and resistant to moisture. It is often used for the production of construction formwork, floors, garden furniture or outdoor buildings.
- Impregnated plywood - this plywood has been specially impregnated to increase its resistance to moisture and mold. It is often used in construction, especially for the production of structural elements, terraces, fences or floor structures.
- Marine plywood - is a type of plywood with very high resistance to moisture and marine conditions. It is used in the construction of boats, yachts, platforms and other structures exposed to constant contact with water.
- Dry plywood - plywood used at home, where there is no risk of increased moisture. It is used for the production of furniture elements, recently often used for the production of entire loft-style furniture. It can be used for the production of packaging, transport boxes as well as structural and utility elements.

The choice of the right type of plywood in terms of moisture resistance depends on the specific application and operating conditions, so it is important to choose the right material for a given project to ensure the durability and strength of the structure.
Plywood comes in a variety of sheet sizes and thicknesses, and standard dimensions may vary by manufacturer and region. Here are some examples of sheet sizes and plywood thicknesses:

Plywood sheet sizes:

- The standard plywood sheet size is 1220mm x 2440mm (4ft x 8ft).
- Other sizes are also possible, in Poland there are formats such as 1250 mm x 2500 mm, 1500 mm x 3000 mm and custom dimensions tailored to the customer's needs.

Plywood thicknesses:

- Plywood is available in various single layer thicknesses, ranging from very thin layers of about 1 mm up to thicknesses of up to 30 mm or more.
- The most commonly used thicknesses of plywood sheets are: 4 mm, 6 mm, 9 mm, 12 mm, 15 mm, 18, 21, 28 and 36 mm but I can be . The thickness of plywood is adapted to the specific application, design and strength requirements.

The dimensions of the sheets and the thickness of the plywood can be adapted to the individual needs of customers, which allows for the flexible use of this material in

various carpentry and construction projects, as well as in other areas of the industrial industry.

For our task, the best material will be waterproof plywood.

The subject of the practical task - the construction of a breeding beech for a hedgehog.

Sample Longform visualization

Course of classes: Presentation of the subject of classes, time about 30 minutes

- i provide the topic and objectives of the class
- i provide information on the advisability of creating a bird feeder and emphasize the need to systematically feed the birds and keep the feeder clean,
- i would like to inform students that the main part of the class will be the practical construction of a bird feeder (s),
- i inform students about the type of material in which we will work and describe it.
- i provide on-the-job training for the workplace and individual tools necessary to perform it.

Ongoing training, analysis of information, drawings, time about 15 minutes
- students analyze the documentation,
- they are thinking about constructing action plans,
- they reflect on the lists of auxiliary elements, tools and devices - they reflect on the list of control and measurement devices, tools and instruments necessary to perform the task, as well as auxiliary means,

Ongoing training, demonstration
- each time at each stage of the construction, the teacher presents the method of performing each of the operations before the students start it
- each time before using the tool by students, the teacher instructs and shows how it should be used in practice,
- each time during a new operation, the teacher presents a trial work with a given tool,

Ongoing training, organization and execution, time approx. 170 min
- students, on the basis of documentation and a prepared action plan, independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students perform the task according to the instruction to perform the task,
- after completing the practical part of the exercise, students organize the workplace and secure the tools, assess the quality of their work and justify the way it is done,

Final training, time about 10 minutes
- i discuss classes: I emphasize achievements, analyze mistakes
- i discuss the results of the work of individual student groups on the basis of the products made and justify the assessment,

Means and teaching materials:

Technical teaching aids: a workstation equipped with a carpentry table/tables tailored to the performance of the task and the number of students in the group/groups.

Circular saw or hand saw, jigsaw (optional), drill driver.

Tools: set of drill bits for wood (diameters 3, 5, 12mm), jigsaw blades (fine tooth for wood-based materials, length 75mm), grinding cube, mitre box, countersink, pencil, angle bar, tape measure, sandpaper P100 and P180.

Materials: plywood board 18mm 232/232mm, plywood board 18mm 600/160mm, plywood board 18mm 550/122mm, plywood board 12mm 158/158 (for two feeders), pine peg with a diameter of 12mm and a length of 70mm, screws 3/45mm (17pcs), screws 3/25mm (5pcs), wood glue D4.

Didactic means of work: drawing documentation of the product, notebook for students.

Occupational health and safety equipment: glasses and earmuffs for work with power tools, work clothes to prevent dirt.

Sequence of activities in the process of building the booth:

- check the dimensions of the delivered elements,
- plan the use of individual materials to make specific elements,
- cut the 18mm plate with a width of 160mm to a length of 298mm one piece and 280mm the other,
- cut the 18mm plate with a width of 122mm to a length of 250mm one piece and 232mm the other,
- cut a 12mm board with dimensions of 155/156mm diagonally into halves to form two isosceles triangles,
- designate places for through holes for hanging the feeder with a diameter of 5 mm in the back (rear wall) of the feeder,
- designate places for a 12mm diameter hole for the peg in the triangular element on the front of the feeder (blind hole drilled to a depth of approx. 10mm),
- designate places for mounting holes for screws in the elements of the visor, triangular front trim and bottom/side plates with a drill with a diameter of 3mm,
- drill in designated places,
- ream with a conical countersink all holes with a diameter of 3 mm from the outside (looking at the location of the element in the design),
- grind the resulting elements with sandpaper, starting with P120 gradation and continuing with P180,
- cut the sharp edges of the triangular front plate, approx. 3/3mm phase,
- gently break the edges of all elements using P120 graded paper,
- assemble the bottom, back and sides of the feeder using screws with a length of 45mm, starting with screwing all elements to the back of the structure and then screwing them together,

- mount the triangular front molding to the resulting structure with screws 25mm long,
- using glue, place a 12mm pin in the triangular front molding,
- the resulting structure can be additionally protected with impregnants for external use in the color of your choice. It is recommended that the internal elements on which the food will rest should be left unfinished.

Topic: Building a small hotel for insects

Number of students: 8

Number of hours of classes: 5

General goals:

1. **Developing ecological awareness:** students should understand the role of insects in the ecosystem and the importance of protecting biodiversity.
2. **Increasing knowledge about insects:** introducing students to various species of insects and their functions in nature.
3. **Promoting pro-ecological activities:** showing students how their actions can contribute to protecting the natural environment.

Specific objectives:

Knowledge:

- **Learning about insects and their role:** students will be able to name the species of insects that use hotels (e.g. mason bees, ladybugs, lacewings) and describe their role in the ecosystem (pollination of plants, control of pest populations).
- **Understanding Threats:** Students will learn what threats await insects in today's environment (pesticides, habitat loss, climate change) and why building insect hotels can help them.

Skills:

- **Building Insect Hotels:** Students will learn how to build a simple insect hotel step by step using readily available materials.
- **Observation skills:** students will be able to observe and document the life of insects in constructed hotels by conducting simple field research.

Form of classes: individual or in pairs

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction – topics of the practical task:

Why is it important to protect insects by building hotels for them?

Biodiversity protection

Insects are a key component of our planet's biodiversity. They are one of the most diverse groups of organisms and play a vital role in maintaining the health of ecosystems. By building hotels for insects, we help maintain species diversity, which is necessary for the stability and functioning of nature.

Pollination of plants

Many insects, such as bees and butterflies, act as pollinators. Pollination is an essential process for plant reproduction and therefore for the production of fruits and vegetables. Without pollinating insects, many plant species, including agricultural crops, would not be able to reproduce, which could threaten human food security.

Pest population control

Some insects, such as ladybugs and lacewings, play an important role in controlling plant pest populations. By consuming aphids and other pests, these insects help maintain ecological balance and reduce the need for pesticides, which can be harmful to the environment and human health.

Soil health

Detritivorous insects , such as some beetles and ants, contribute to the decomposition processes of organic matter. Their activities are crucial to soil health because they help with nutrient cycling, improve soil structure and support plant growth.

Education and environmental awareness

By building insect hotels, we can increase environmental awareness among society. These activities provide an opportunity to educate about the importance of insects and the need to protect biodiversity. They can also inspire you to take other pro-ecological actions and a sustainable lifestyle.

Mitigating the negative impacts of urbanization and agriculture .

As a result of urbanization and intensive agricultural practices, natural insect habitats are often destroyed. Building insect hotels helps provide shelter and a place to breed in areas where natural shelters are limited or destroyed. They constitute small ecosystems that can attract various species of insects, supporting their survival.

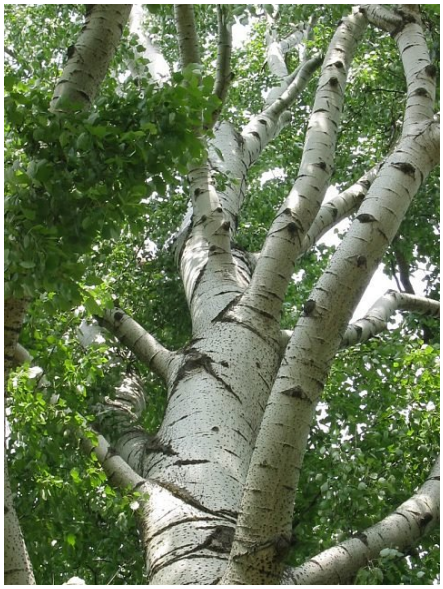
Support for populations of endangered species

Some insect species are particularly vulnerable to extinction due to environmental changes. Insect hotels can provide essential shelter and breeding conditions for

these endangered species, supporting their populations and helping to protect them.

Building insect hotels is a simple but effective way to support these small but essential members of our ecosystems. Through these activities, we contribute to protecting biodiversity, supporting agriculture, protecting soil health and environmental education, which have long-term benefits for all of us and our planet.

Introduction – wood species used during classes: Poplar (Populus L.)



Properties of poplar wood . Poplar is a deciduous tree commonly found in areas of the northern hemisphere, including Poland. These trees grow quickly and can reach a height of up to 30 meters. Poplar wood, due to its properties, is used in various industries, although it is not as popular as oak, beech or pine wood.

Color and grain

Poplar wood is characterized by light, white and cream colors, which may sometimes have slight yellowish or gray shades. The grain of the poplar is delicate and relatively even, which gives it a subtle, elegant look. Depending on the species, the wood may contain small, scattered knots that add to its natural charm.

Hardness and density

Poplar wood is soft and light, with a dry density of approximately 370-470 kg/m³. For this reason, it is easy to process, but its softness limits its use in places exposed to high mechanical loads. Poplar, although light, has moderate bending and compressive strength, which makes it an adequate material for specific applications.

Durability

In terms of durability, poplar wood is classified as a non-durable wood. It is susceptible to moisture, fungi and pests, which requires additional impregnation and protection, especially for outdoor applications. Standard uses of poplar wood are usually limited to interior applications, where the risk of contact with moisture is lower.

Finish

Poplar wood takes a variety of finishes well. It is easy to stain, varnish and paint, which allows you to achieve a wide range of aesthetic effects. It is also suitable for oiling, which further highlights the natural beauty of the wood and increases its durability.

Advantages and disadvantages of using poplar wood

Advantages:

- Lightness and ease of processing.
- Bright colors, giving elegance.
- Low price and good availability.
- Good susceptibility to staining and other finishes.
- Fast tree growth, which makes poplar a renewable raw material.

Defects:

- Low durability and moisture resistance.
- Susceptibility to fungi and pests.

- Lower mechanical strength.
- May require additional impregnation and protection for outdoor applications.

The use of poplar wood

Chipboard and plywood: Poplar wood is commonly used to produce chipboard and plywood. Due to its lightness and ease of processing, it is an excellent raw material for this type of materials, which are widely used in furniture, construction and other industries.
Furniture: Although not as hard as beech or oak wood, poplar wood is used in the production of light furniture, especially those that are not exposed to heavy mechanical loads. Poplar furniture is characterized by a bright, aesthetic appearance and is easy to finish.
Decorative elements: Bright colors and delicate grains make poplar wood an ideal material for the production of decorative elements, such as skirting boards, wainscoting or various types of wooden decorations.
Packaging and crates: Due to its lightness, poplar wood is often used for the production of crates and packaging. Its relatively low price and ease of processing make it a practical choice for single-use and reusable packaging.
Musical instruments: Although less frequently, poplar wood is also used in the production of musical instruments where lightness and delicacy of structure are required, such as guitar bodies.

Poplar wood, despite certain limitations related to its durability and strength, is widely used thanks to its lightness, aesthetics and ease of processing. As a versatile and economical material, it is eagerly used in various industries where its properties are properly taken into account and used.

Topic of the practical task – Building a small hotel for insects

Sample visualization:

Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- I provide the topic and objectives of the classes
- I provide information on the advisability of creating insect hotels and emphasize the protection of insects,
- I inform students that an essential part of the classes will be the practical construction of an insect hotel,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with carpentry table(s) adapted to the task and the number of students in the group(s).
A longitudinal circular saw or a hand saw or a comb saw, a drill/driver, pruner.
Tools : wood drills with diameters of 3, 5, 8 and 10 mm, extended carpentry drills or augers with diameters of 8 and 10 mm, grinding block, countersink, pencil, square, ruler, sandpaper P100, P120 and P180, carpentry clamps with a length 300-500mm -4 pieces,
Materials : poplar board 400/140/18mm, poplar board 700/120/18mm, screws 3/45mm (6 pieces), screws 3/30mm (4 pieces), section of log/pine or spruce pole with diameter: approx. 100mm -0, 12 meters, bamboo poles diameter 10-20 mm - approx. 15 meters, optional calamus stalks.
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making an insect hotel:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut the roof elements from a 140mm wide poplar board to the length: two elements: 160mm one and 178mm the other,
- cut elements from a 120mm wide poplar board to length: two elements forming the sides 185mm (cut with a slight allowance) and one for the floor 160mm,
- cut according to the attached drawing at an angle of 45 to the sides for the installation of the roof slope,
- cut to a length of 120mm: using a bamboo cutter saw,
- designate places for through holes for mounting screws with a diameter of 3 mm in the sides of the hotel and the roof,
- make through holes for mounting screws with a diameter of 3 mm in the elements mentioned above (it is very important to first make a through hole for the screw core in the element through which the screw will pass , screwing in the screw without such a prepared hole is possible, but such a procedure may damage/break the element while tightening the screw),
- all holes with a diameter of 3 mm from the outside with a countersink under the screw head (looking at the location of the element in the project),
- sand the resulting elements using sandpaper, starting with grit P120 and continuing with grit P180,
- gently break the sharp edges of all elements using P120 grit paper,
- assemble all five elements of the structure using 30 and 45 mm long screws, starting from the two elements forming the roof slope,
- using a drill and screwdriver, using a drill with a diameter of 10 mm, make a through hole in the roof slope according to the attached drawing for hanging the hotel,
- using a drill/driver, using extended drills with diameters of 5 and 8 mm, make through holes in the pole with a diameter of 100 mm,
- If necessary, perform additional surface grinding, removing any post-installation irregularities and scratches caused by drilling or screwing in screws,
- fill the resulting hotel space according to the attached sketch with cut bamboo stalks, placing an element made of a drilled pole in the central place,

Topic: Building a nesting box for swifts

Number of students: 8

Number of class hours: 5 or 10 (depending on the tools available to the facility, whether they are manual or mechanical),

Lesson Objectives:

- Environmental education: Familiarize children with the importance of building nesting boxes for birds, as well as the general needs and habits of birds.
- Creativity and practical skills: Increase manual skills through hands-on nest box building, which develops creativity and construction skills.
- Social Awareness: Encourage teamwork and cooperation so that children can build a nest box together, learning to act for the good of the community and nature.
- Responsibility and care for the environment: Encourage care for the environment and develop a sense of responsibility for the nature around us by creating a concrete project to support birds.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical**:** demonstration, measuring things and hands-on activity method

Introduction-Themes of the practical task:

Setting up nesting boxes for birds has a positive impact on both humans and ecology. Here are some of the main benefits:

- Controlling pest populations: Birds from nesting boxes consume large amounts of insects and other pests, helping to naturally reduce their populations. This reduces the need for pesticides and chemicals, which benefits the environment.
- Increasing biodiversity: Creating conditions for bird breeding through nest boxes supports species diversity in the area. This increases the stability of the ecosystem and maintains the natural balance.
- Popularization of ecology: nesting boxes provide an excellent opportunity to educate the public about the role of birds in the ecosystem and the need to protect the environment. Through them, people can better understand and appreciate the importance of harmony between humans, birds and nature.

As a result, setting up nesting boxes for birds has positive consequences both for people, by improving quality of life and environmental awareness, and for the ecosystem, supporting biodiversity and environmental health.

Introduction -wood species used in class. Common **pine**, s. common (*Pinus sylvestris L.*).

Properties of pine wood. The pine tree is one of the most popular species growing in native forests. It is able to live up to 500 years, and grow - up to 120. However, it is not only in Poland that pine wood has gained great popularity. The raw material is used all over the world in the broader furniture industry, as pine furniture is often characterized by its desirable lightness. In addition, structural pine wood is also used for the construction of summer houses and more. The wide use and popularity of this raw material is due to its great properties - pine wood is elegant, although cheap, lightweight, but durable.

Color and grain. Raw pine wood will be recognized by its light, pale yellow color. Darker, honey-colored pine wood can occur in the heartwood (inner) zone. The grain is delicate, and the rings usually occur steadily. The excellent exposure of knots is due to the individual characteristics of pine wood - in this wood the successive stages of growth (early and late) are visible.

Hardness and density. The density of pine is similar to that of spruce and larch and is about 450-470kg/m3 in the dry state. The weight of pine wood allows its versatile use in the furniture and construction industry.

Durability. Pine boards are known for their durability. In typological terms, they are in the category of medium-durability wood - together with fir and spruce, among others. It is considered more durable than the wood of linden, aspen, chestnut, sycamore, birch and poplar, among others.

Finishing. Pine is a relatively sensitive wood that does not tolerate the strongest finishes. Nevertheless, among the various types of conifers found in Poland, it tolerates impregnation relatively well.

Advantages and disadvantages of using pine wood. Each type of wood has its stronger and weaker points. The most important properties of pine wood, which are appreciated on the market, are:

- high elasticity,

- relatively low price,
- high durability,
- An interesting, mild color scheme,
- easy to process (although more difficult than, for example, spruce),
- Pine wood furniture does not require advanced care.

The pine tree also has some disadvantages. The most important are:

- longer drying process (spruce can dry up to ten times shorter),
- low calorific value and sparking (when considering firewood),
- and strength from competing conifers,
- The possibility of curved and bent fibers.

The use of pine wood

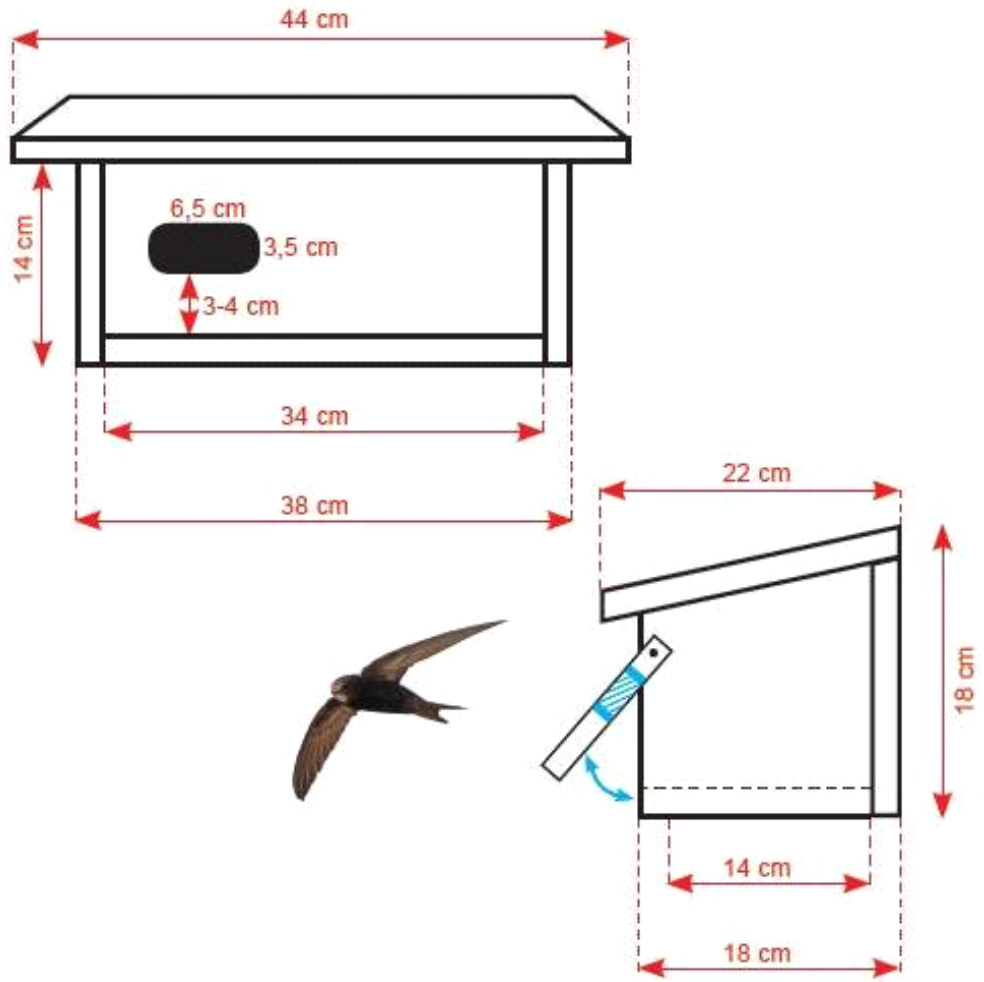
The properties of pine wood make it widely used in many sectors of the economy. It is used for furniture, as well as for room floors and terraces. Due to its good burning properties and relatively low price, pine firewood is also very popular. However, pine for burning in a stove causes sparks, so it is recommended to use it only outdoors or in indoor but closed hearths.

Garden Architecture. Pine wood is used for gazebos, pergolas and various types of garden furniture. Due to its light weight, pine wood yields lightweight products that are easy to move, although potentially less durable than, for example, furniture made from spruce. This aspect is very important for larger garden structures such as summer houses, garages and sheds, where safety is a key factor.

Furniture and doors. The manufacture of furniture and doors is also a popular application. Unpainted furniture, left in natural white and yellow tones, looks perfect in rustic-style interiors, among others.

Flooring and decking. Pine wood is characterized by its high resilience, which, together with its lightness and relatively low price, makes it a great raw material for the production of floorboards, parquets and panels. Pine boards for flooring look great, so they are becoming increasingly popular.

The topic of the practical task - building a nesting beech for the hedgehog.


44 cm
14 cm
6,5 cm
3,5 cm
3-4 cm
34 cm
38 cm
22 cm
18 cm
14 cm
18 cm

Example visualization:

Course of classes: Introduction of the topic of the class, time about 30 min

- I give the topic and objectives of the class
- I provide information on the desirability of hedgehog houses,
- I inform the students that an essential part of the class will be the practical construction of the hedgehog box(es),
- I inform students about the type of material we will be working in and describe it.
- I provide job instruction for the work site and the particular tools needed to perform.

Ongoing instruction, analysis of information, drawings, time about 20 minutes
- Students analyze the documentation,
- Are thinking about constructing action plans,
- reflect on the lists of components, tools and auxiliary equipment - reflect on the list of equipment, tools and control and measuring instruments and aids necessary for the task,

Ongoing instruction, demonstration
- each time at each stage of construction, the teacher demonstrates how to perform each operation before the students proceed with it
- each time before students use the tool, the teacher instructs and demonstrates how it should be used in practice,
-Each time with a new operation, the teacher presents a sample work with the given tool,

Ongoing instruction, organizing and execution, time approximately 380 minutes
- students, on the basis of documentation and prepared plan of action, independently gather at their workstations the tools necessary to perform the task, the necessary measuring instruments, supplies and auxiliary materials,
- Students perform the task according to the instructions for the task,
- after completing the practical part of the exercise, students clean up the workplace and secure the tools, evaluate the quality of the work they have done and justify the way it was done,

Final instruction, time about 20 minutes
- I discuss classes: highlight achievements, analyze mistakes
- I discuss the results of the work of each student group on the basis of the products made and justify the evaluation,

Teaching resources and materials:
Technical didactic means: a workstation equipped with a carpenter's table(s) adapted to the task and the number of students in the group(s).
Circular longitudinal saw or saw handheld planer, jigsaw, drill/driver.
Tools: a set of wood drill bits (diameters 3,5,8mm), a 35mm diameter cylindrical drill bit,
Jigsaw blades (fine wood tooth, 75mm long), sanding block, bevel box, conical countersink, pencil, protractor, tape measure, P100 and P180 sandpaper.
Materials: pine board 420/200/20mm, pine board 360/140/20mm pine board 1200/180/20mm, pine strip 600/40/20mm, pine strip 80/20/20mm, screws 3/50mm(24pcs), screws 3/35mm(6pcs).

Didactic means of work: drawing documentation of the product, notebook for students.
Health and safety equipment: goggles and earmuffs for working with power tools, work clothes to protect against dirt.

The sequence of activities in the process of making a booth:

- Check the dimensions of the supplied components,
- plan the use of specific materials to make specific items,
- Cut a 200mm wide board to a length of 420mm,
- Cut a 180mm wide board into lengths: 340mm -2pcs and 180mm 2pcs,
- Cut a 140mm wide board into lengths: 340mm,
- cut a strip of 40mm wide to a length of 280mm -2pcs
- Determine locations for through-holes for screws with a shank diameter of 3mm in the following elements: sides, roof, rear, mounting strips and trim,
- Determine the locations for the through holes for hanging the shed with a diameter of 5 or 8mm,
- Determine the drilling locations for the oblong hole, which is the inlet to the shed for a 35mm diameter drill bit,
- Make two drill holes with a 35mm diameter drill bit in the door,
- Connect the two holes made with35mm a using a jigsaw so that an oblong hole is formed,
- Make all 3 mm diameter bores in predetermined locations,
- make two drill holes with a diameter of 5 or 8 mm for hanging the shed in the mounting strips,
- Ream with a countersink all holes with a diameter of 3mm from the outside (looking at the location of the element in the design),
- Sand the resulting parts with sandpaper, starting with a gradation of P120 and continuing with P180,
- Gently break the edges of all the elements with P120-grained paper, special attention should be paid to sanding the bird hole,
- assemble with 50mm long screws the bottom, back, sides and door (remembering that the door is installed only in the upper part so that it can tilt downwards towards the front)
- To the resulting structure, install the roof and trim with 50mm long screws,
- Mount the mounting strips to the resulting structure using 35mm long screws,
- check the operation of the moving parts of the structure (swing bar and door),

  - The resulting structure can be further protected with impregnants for external use in the color of your choice. It is recommended that the interior elements be left unfinished.

Topic: Building a hotel for insects

Number of students: 8

Number of classes: 10

General goals:

- **Developing ecological awareness:** students should understand the role of insects in the ecosystem and the importance of protecting biodiversity.
- **Increasing knowledge about insects:** introducing students to various species of insects and their functions in nature.
- **Promoting pro-ecological activities:** showing students how their actions can contribute to protecting the natural environment.

Specific objectives:

Knowledge:

- **Learning about insects and their role:** students will be able to name the species of insects that use hotels (e.g. mason bees, ladybugs, lacewings) and describe their role in the ecosystem (pollination of plants, control of pest populations).
- **Understanding Threats:** Students will learn what threats await insects in today's environment (pesticides, habitat loss, climate change) and why building insect hotels can help them.

Skills:

- **Building Insect Hotels:** Students will learn how to build a simple insect hotel step by step using readily available materials.
- **Observation skills:** students will be able to observe and document the life of insects in constructed hotels by conducting simple field research.

Form of classes: group, one hotel for a group of 2-3 people

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction – topics of the practical task:

Why is it important to protect insects by building hotels for them?

Biodiversity protection

Insects are a key component of our planet's biodiversity. They are one of the most diverse groups of organisms and play a vital role in maintaining the health of ecosystems. By building hotels for insects, we help maintain species diversity, which is necessary for the stability and functioning of nature.

Pollination of plants

Many insects, such as bees and butterflies, act as pollinators. Pollination is an essential process for plant reproduction and therefore for the production of fruits and vegetables. Without pollinating insects, many plant species, including agricultural crops, would not be able to reproduce, which could threaten human food security.

Pest population control

Some insects, such as ladybugs and lacewings, play an important role in controlling plant pest populations. By consuming aphids and other pests, these insects help maintain ecological balance and reduce the need for pesticides, which can be harmful to the environment and human health.

Soil health

Detritivorous insects , such as some beetles and ants, contribute to the decomposition processes of organic matter. Their activities are crucial to soil health because they help with nutrient cycling, improve soil structure and support plant growth.

Education and environmental awareness

By building insect hotels, we can increase environmental awareness among society. These activities provide an opportunity to educate about the importance of insects and the need to protect biodiversity. They can also inspire you to take other pro-ecological actions and a sustainable lifestyle.

Mitigating the negative impacts of urbanization and agriculture .

As a result of urbanization and intensive agricultural practices, natural insect habitats are often destroyed. Building insect hotels helps provide shelter and a place to breed in areas where natural shelters are limited or destroyed. They constitute small ecosystems that can attract various species of insects, supporting their survival.

Support for populations of endangered species

Some insect species are particularly vulnerable to extinction due to environmental changes. Insect hotels can provide essential shelter and breeding conditions for

these endangered species, supporting their populations and helping to protect them.

Building insect hotels is a simple but effective way to support these small but essential members of our ecosystems. Through these activities, we contribute to protecting biodiversity, supporting agriculture, protecting soil health and environmental education, which have long-term benefits for all of us and our planet.

Introduction – wood species used during classes: Spruce (Picea abies L.)

Properties of spruce wood. Spruce is one of the most common coniferous trees in European forests, reaching a height of up to 50 meters. It is a very popular raw

material in the wood industry due to its versatile use and mechanical and aesthetic properties.

Color and grain

Spruce wood is characterized by light, pale yellow colors, which may acquire a slightly honey tint over time. Whiter shades are also often found, which makes it a desirable material for interiors where light colors dominate. The grain of spruce wood is delicate and even, with small, subtle knots, which add to its elegance.

Hardness and density

Spruce wood has medium hardness and a dry density of approximately 350-450 kg/m³. It is a lighter wood than beech, which makes it more versatile for a variety of applications in both construction and the furniture industry. Its relatively low density makes it an easy material to process.

Durability

Spruce wood is classified as medium-durable , similar to pine. It is less resistant to moisture and pests compared to some other species of deciduous and coniferous trees, so it often requires additional impregnation, especially when used outdoors.

Finish

Spruce is a wood that is well suited for finishing . It easily accepts stains, varnishes and paints, so you can achieve a wide range of visual effects. It is also suitable for oiling and waxing, which increases its durability and resistance to external factors.

Advantages and disadvantages of using spruce wood

Advantages:

- Relatively low density and weight.
- Uniform, bright colors.
- Easy mechanical processing.
- Good availability and low price.
- Good insulating properties.

Defects:

- Less durability without proper impregnation.
- Greater susceptibility to rot and pests.
- Tends to crack and twist when dried incorrectly.

- Low hardness compared to some other species.

The use of spruce wood

Construction: Spruce is widely used as a construction material in construction. It is used to build walls, roofs, ceilings and structural elements of houses, gazebos and other structures. Its light weight and ease of processing make it a popular choice for various applications in small garden architecture.
Furniture: Spruce wood is also a popular material in the furniture industry, especially for the production of light furniture and wall panels. The bright colors of spruce fit perfectly into modern and Scandinavian interior designs.
Flooring and laminate flooring: Although spruce is not as strong as oak or beech, it is often used to make flooring and laminate flooring, especially in less trafficked areas. Its flexibility gives spruce floorboards a certain bounce, which adds comfort.
Musical instructions and tools: Thanks to its low density and good acoustic properties, spruce wood is an ideal material for the production of musical instruments such as violins, guitars and pianos.
Kitchen utensils and packaging: Spruce wood is also used to produce kitchen utensils such as cutting boards and various types of packaging. Its light structure and good machinability make it an ideal raw material for the production of everyday items.

Due to its lightness, accessibility and versatility of applications, spruce wood is widely used in many areas of life. It is an easy-to-process, aesthetic and economical material, which makes it a popular choice in both the construction and furniture industries.

Topic of the practical task – Building a hotel for insects

Sample visualization:

Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- provide the topic and objectives of the classes
- provide information on the advisability of creating insect hotels and emphasize the protection of insects,
- inform students that an essential part of the classes will be the practical construction of an insect hotel,
- inform students about the type of material we will work with and describe it.
- provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 20 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it

- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 380 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 20 minutes

- discuss the classes: I highlight achievements, analyze mistakes
- discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with carpentry table(s) adapted to the task and the number of students in the group(s).
A longitudinal circular saw or a hand saw, a jig saw, a jigsaw, a drill/driver, an upholstery stapler, pruners, and diagonal wire cutting pliers.
Tools : wood drills with diameters of 3, 5, 8 and 10 mm, extended drills or carpentry bits with diameters of 8 and 10 mm, jigsaw knives for wood, length 75 mm), grinding block, miter box, countersink, pencil, square, ruler, sandpaper P100, P120 and P180, carpentry clamps 500-800mm long - 4 pieces,
Materials : spruce board 800/160/18mm, spruce board 2800/140/18mm, spruce strip width 45mm, thickness 12-18mm -1mb, spruce beam with a cross-section of 100/100mm (can be ordered in multiples for several structures) -160mm long, screws

3/45mm (58pcs), 3/30mm screws (12pcs), upholstery staples for a stapler, 6-10mm long. Pine or spruce logs/poles with diameters: approx. 100mm - 0.5m, approx. 50mm - 0.5m, gardening net to protect the structure: approx. 2m ^{2} , bamboo poles diameter 10-20mm - approx. 30 meters, calamus stems, pine cones, straw.
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making an insect hotel:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut all elements from a 140mm wide spruce board to length: two sides (340mm), four horizontal partitions (324mm), four vertical partitions 100mm high, front plate 136mm,
  - cut the rear vertical partition with a height of 100 mm to a width of 62 mm and the front panel with a height of 136 mm to a width of 98 mm,
  - cut the sides of the structure according to the drawing at an angle of 45 degrees , for fixing the roof,
- cut 160mm wide spruce board elements to length: two elements forming the roof (340mm one and 358mm second),
- cut the wind board elements made of 45mm wide spruce strip to length: two 390mm elements,
- using a miter box and a hand saw or a ridge saw, cut the wind board elements made of a 45 mm wide spruce strip at an angle of 45 degrees to a length of 385 mm, please also remember that these two elements are mirror images of each other - one right, the other left),
- cut a 100/100mm spruce beam to a length of 140mm,
- cut to a length of 140 mm: using a cutter saw, all sticks, bamboo and, using pruners, reeds and straw,
- cut poles with a diameter of 100 and 50 mm to a length of 140 mm,
- designate places for through holes for mounting screws with a diameter of 3 mm in the sides of the hotel, wind strips, roof boards, partitions and front panel,
- make through holes for mounting screws with a diameter of 3 mm in the elements mentioned above (it is very important to first make a through hole for the screw core in the element through which the screw will pass , screwing in the screw without such a prepared hole is possible, but such a procedure may damage/break the element while tightening the screw),
- all holes with a diameter of 3 mm from the outside with a countersink under the screw head (looking at the location of the element in the project),
- make extreme through holes with a drill with a diameter of 8 mm in the front strip,

- Using a jigsaw, saw an 8 mm wide oblong hole in the front strip, based on the 8 mm diameter holes previously made,
- sand the resulting elements using sandpaper, starting with grit P120 and continuing with grit P180 ,
- gently break the sharp edges of all elements using P120 grit paper,
- assemble the third and fourth horizontal partition from the bottom, with a 100mm high vertical partition located between them in the middle, using 45mm long screws. Before starting the assembly, fasten the structures using carpenter's clamps,
- assemble the two remaining vertical partitions with the rear wall between them using 45mm screws; before starting to screw together, fasten the structures using carpentry clamps,
- assemble the second, third and fourth horizontal partitions, counting from the bottom, together with the partition structure located between them, assembled at the point above, using 45mm long screws, before starting the screwing, fasten the structures using carpenter's clamps,
- assemble the lower horizontal partition and sides to the resulting structure using 45mm screws,
- use 45mm long screws to assemble two roof elements,
- use 30mm long screws to attach the roof to the resulting structure,
- use 45mm long screws to attach the front wind strips,
- using 30mm long screws, screw on the front board with the previously made flat hole,
- using a drill/driver, using extended drills with diameters of 5 and 8 mm, make through holes in the spruce beam and poles cut to length 100 and 50 mm,
- insert a 100/100mm spruce beam under the roof slope and then use 45mm long screws to screw it from above to the roof slope,
- the resulting structure can be protected with impregnations for external use in the color of your choice. It is recommended to leave the internal elements of the hotel unfinished.
- cut the wire mesh, which should be placed on the entire back of the hotel structure and in its front part between the third and fourth horizontal partitions,
- attach the cut wire mesh to the back of the insect hotel using staples and a stapler,
- If necessary, perform additional surface grinding, removing any post-installation irregularities and scratches caused by drilling or screwing in screws,
- fill the created spaces of the hotel according to the attached sketch: lower space - three poles with a diameter of 100 mm filled with sticks and calamus stalks, side spaces at the height of the front strip - cut bamboo stalks, stop between the third and fourth horizontal partition, the right side filled with straw and the left one

with cones, supplement the gables of the hotel next to the spruce beam with cut bamboo stalks,

- secure the space filled with straw and pine cones from the front with a previously cut wire mesh, fastening it with staples and a stapler.

Topic: Construction of the "Tree" feeder

Number of students: 8

Number of classes: 10

Lesson goals:

1. Understanding why birds need our help in winter by learning about changes in their environment.
2. Enriching knowledge about the species of birds that winter in our area and what specific nutritional needs they have.
3. Learning the proper selection and location of feeders that will ensure the safety of birds and protect them from predators.
4. Promoting care for animals and the natural environment by regularly feeding birds and observing their behavior .
5. Encouraging involvement in collective activities, such as the 'Birds Around Us' project, where children can monitor bird species in their area.

Lessons on feeding birds can not only be educational, but can also inspire students to act responsibly towards the environment and other living beings.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction – topics of the practical task:

Feeding birds in winter can have many positive effects for both the birds and the environment. Here is some information about the validity and necessity of feeding birds in winter:

1. Lack of natural food sources: Winter can be a difficult time for birds because natural food sources such as insects, grass seeds and fruit are limited or unavailable.
2. Helps conserve energy: Searching for food in harsh winter conditions requires extra energy from birds. Feeding birds allows them to save valuable resources for survival.
3. Improving the condition of birds: Regular provision of appropriate food allows birds to maintain good physical condition and immunity, which increases their chances of surviving the winter.
4. Observation and learning: Feeding birds is an excellent opportunity to observe different species of birds, their behavior and hierarchy in the group. For children, it may also be an opportunity to learn about ecosystems and interconnections in nature.

5. Protecting biodiversity: By supporting birds in winter, we help maintain species diversity and ensure the balance of ecosystems.

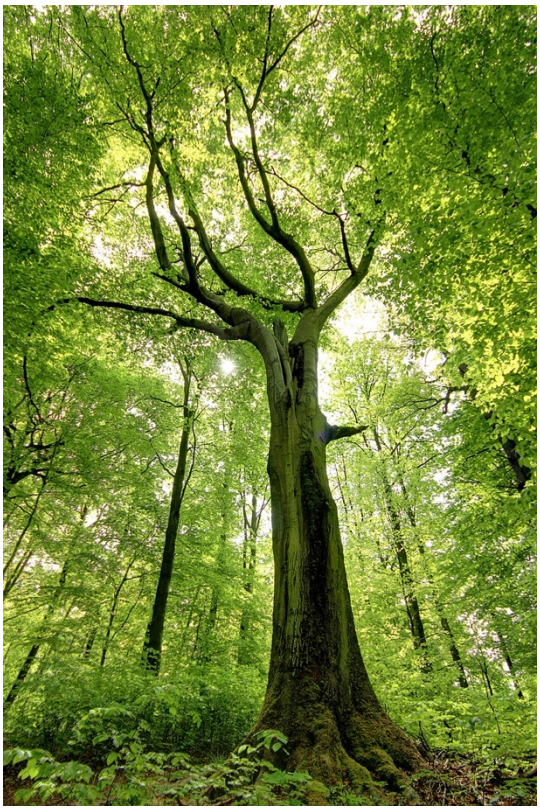
Feeding birds in winter is important to ensure their survival, and at the same time it can be a great and educational activity for people, especially children.

It is important to note that feeding birds in winter should be conscientious and systematic for several important reasons:

1. Bird Dependence on Supplied Food: Once birds begin to rely on feeding, they become dependent on regularly supplied food. Sudden interruption of feeding may lead to malnutrition and difficulties in obtaining food.
2. Respecting new hierarchies in a group of birds: Systematic feeding allows birds to establish a hierarchy around the feeder and minimize potential fights for food.
3. Pests and predators: Regular feeding helps keep the area around the feeder clean and minimizes the risk of attracting pests such as rats and mice, as well as predators that may threaten the birds.

Due to the above reasons, it is important that feeding birds in winter is carried out conscientiously, regularly and with full commitment to provide the birds with stable conditions for survival in this difficult period.

Introduction – wood species used during classes: Beech (Fagus sylvatica L.)



Properties of beech wood

The beech tree is one of the most common tree species in European deciduous forests. Beech can live up to about 300 years, reaching a height of up to 40 meters. Beech wood is very popular in the furniture industry and carpentry due to its mechanical and aesthetic properties.

Color and grain

Raw beech wood is characterized by light, white and yellow colors, which may acquire warm honey shades over time. The grain of beech wood is rather subtle and even, which makes it a good material for interior finishing where a uniform appearance is desired. The beech has a small number of knots, which further emphasizes its uniform appearance.

Hardness and density

Beech wood is known for its high hardness and durability. The dry density is approximately 700-720 kg/m³, which makes it a higher strength class compared to pine wood. The high density and hardness of beech make it popular for the production of furniture, floors and other elements exposed to high mechanical loads.

Durability

Beech falls into the category of medium-durable wood . Like other hardwood species, it requires appropriate impregnation and processing to increase its resistance to weather conditions. Compared to pine, beech is less resistant to biodegradation, so its outdoor use requires additional protection.

Finish

Beech wood is perfect for various types of finishing . It accepts staining, varnishing and oiling well, which allows you to achieve various visual effects. Beech, thanks to its hardness and uniform grain, is eagerly used to produce elegant, high-quality furniture.

Advantages and disadvantages of using beech wood

Advantages:

- High hardness and durability.
- Bright, uniform color.
- Possibility of various finishes .
- Versatility in applications.
- Good machinability despite hardness.

Defects:

- Less resistance to weather conditions without proper impregnation.
- Greater weight compared to pine wood.
- Relatively higher price.
- Tends to warp if not dried properly.

The use of beech wood

Furniture and doors: Beech is one of the most frequently used wood species in the production of furniture and doors. Thanks to its durability and aesthetics, it is used in the production of solid tables, chairs, wardrobes and kitchen elements. Furniture made of beech is characterized by durability and high quality.
Floors and stairs: Due to its hardness, beech wood is an ideal material for floors and stairs. Beech parquet floors and stairs are not only aesthetic, but also very durable, resistant to scratches and mechanical damage.
Building elements: Beech wood, after appropriate impregnation, can also be used as a construction material in construction and interior finishing , such as wainscoting or skirting boards.
Kitchen utensils and toys: Due to its durability and safety in contact with food, beech is often used to produce kitchen utensils such as cutting boards, spoons and other accessories. Because it is not susceptible to chipping, it is also a great material for making children's toys.

Beech wood, like other types of wood, has its unique features and uses. Its hardness, aesthetics and finishing possibilities make it invaluable in many areas of the wood industry.

Topic of the practical task - Construction of a feeder with side walls in the shape of a tree

Sample visualization:

Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- I provide the topic and objectives of the classes
- I provide information on the advisability of creating a bird feeder and emphasize the need to systematically feed the birds and keep the feeder itself clean,
- I inform students that an essential part of the classes will be the practical construction of a bird feeder/feeders,

- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,
- students prepare a template for the side of the feeder.

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 395 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with carpentry table(s) adapted to the task and the number of students in the group(s).
A longitudinal circular saw or a hand saw or a comb saw, a jigsaw, a drill/screwdriver.
Tools : wood drills with diameters of 3, 8 and 10 mm, jigsaw knives (fine tooth for wood-based materials, narrow blade approx. 3 mm for large curves, length 75 mm), grinding

block, miter box, countersink, pencil, square, ruler, sandpaper P60, P80, P100, P120 and P180, carpentry clamps 300-500mm long - 4 pieces,
Materials : Beech board 220/200/18mm, Beech board 200/200/25mm - 2 pieces (it is important that the fiber arrangement in the board runs at an angle of 45 degrees to the longitudinal axis of the board), beech facade board (wainscoting) width 80mm, thickness 12mm - 1.8 m, beech angle with a cross-section of 30/20 mm, wall thickness 5 mm -0.8 m, beech strip 600/35/12 mm, screws 3/45 mm (13 pieces), screws 3/25 mm (27 pieces).
Teaching resources : drawing documentation of the product, notebook for students, tracing paper.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- please remember that the arrangement of fibers in the sides should be oblique (at an angle of 45 degrees) to the longitudinal axis of the element!!!, this is important for the element made in this way to be sufficiently durable after cutting with a jigsaw,
- use tracing paper to transfer the drawing of the side of the feeder to the side boards,
- when transferring the shape of the side using tracing paper, you should also remember that both elements are mirror images of each other, i.e. when put together, they should have the same fiber arrangement,
- make through auxiliary holes for the jigsaw blade using drills with diameters of 8 and 10 mm in places of closed curves where it will not be possible to cut from the side of the element,
- insert the jigsaw blade through the holes and cut them out with the jigsaw,
- using a jigsaw, cut out all the curves of the side of the feeder to create the shape of a tree,
- cut 35 mm wide beech strips to a length of 270 mm (two pieces),
- cut an 80mm wide beech facade board to a length of 270mm (six pieces),
- cut the four outermost façade boards lengthwise so that after assembly (each slope is made of three elements), the resulting roof slopes are 146 and 158 mm, respectively,
- cut the beech angles with the excess to a length of 170 mm (four pieces),
- using a miter box and a hand saw or a ridge saw, cut the angles to a length of 165 mm at an angle of 45 degrees (remember that the shorter side of the angle should run vertically to the feeder structure and the wider side should rest flat on the roof, when cutting the angles at an angle of 45 degrees, also remember that two sets

of angles should be made, which are mirror images of each other - one right, the other left),
- designate places for through holes for mounting screws with a diameter of 3 mm in the sides of the feeder, beech strips, facade boards and masking angles,
- for the screw core in the element through which the screw will pass , screwing in the screw without such a prepared hole is possible, but such a procedure may damage/break the element when tightening the screw) ,
- all holes with a diameter of 3 mm from the outside with a countersink under the screw head (looking at the location of the element in the project),
- sand the resulting elements using sandpaper, starting with P120 grit and continuing with P180, special attention should be paid to sanding the curves of the sides of the elements creating the shape of a tree, this operation should start with P60 or P80 grit paper and then continue with smaller grit papers up to P180 and obtain satisfactory surface quality,
- gently break the sharp edges of all elements using P120 grit paper,
- assemble the bottom and sides of the feeder using 45mm long screws, before assembling, fasten the structures using carpentry clamps,
- using 45mm long screws, screw the beech strips to the resulting structure, before screwing, fasten the structures with carpenter's clamps,
- assemble two roof slopes from previously cut facade boards,
- using 25mm long screws, screw the roof surface to the sides of the feeder, remembering that the internal width between the sides is 220mm, before starting the screwing, fasten the structure with carpenter's clamps,
- tighten the masking angles to the created feeder structure,
- if necessary, perform additional surface grinding, removing any post-installation irregularities and scratches caused by drilling or screwing in screws,
- the resulting structure can be additionally protected with impregnations for external use in the color of your choice. It is recommended that the internal elements on which the food rests be left unfinished.

Topic: Building a base for storing eggs

Number of students: 8

Number of hours of classes: 5,

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

General objectives for practical lessons in making simple wood products for primary school children

Development of manual and technical skills

- Students should develop their manual skills, precision and motor coordination by working with tools and wood materials.
- Learning basic woodworking techniques such as cutting, sanding, joining and finishing.

Increasing ecological awareness and respect for natural resources

- Children learn the importance of wood as a renewable raw material and learn how to use materials in a sustainable and conscious way.
- Education about the origin of wood and the importance of forest protection and sustainable management of forest resources.

Development of creativity and imagination

- Encouraging students to express their creativity by designing and creating their own unique wood products.
- Strengthening the ability to solve problems, make decisions and plan activities during project implementation.

Teamwork and interpersonal skills

- Learning cooperation and communication in a group while working together on wood projects.
- Developing the ability to share tools and materials, help others and make decisions together.

Strengthening self-esteem and self-confidence

- Building self-confidence by implementing specific projects, from idea to finished product.
- Strengthening self-esteem and satisfaction with achieved results by striving for goals and overcoming difficulties.

Introduction to security issues

- Learning how to safely use carpentry tools and machines.
- Informing about safety procedures and encouraging compliance with health and safety rules when working with wood.

Basic knowledge about wood and its properties

- Introducing students to different types of wood and their properties.
- Learning to recognize wood species based on features such as color, grain and hardness.

Achieving these goals will help students not only acquire specific technical skills, but also develop creativity, cooperation and ecological awareness, which is extremely important in today's teaching of primary school children.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.

- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction - type of wood used in classes: European walnut (Juglans regia L.)

Properties of European walnut wood. European walnut, also known as walnut, is a deciduous tree commonly found in Europe. These trees can grow to a height of 25-35 meters and are valued for their exceptionally decorative wood and excellent mechanical parameters. European walnut wood is eagerly used in furniture making, artistic carpentry and other applications requiring aesthetics and durability.

Color and grain. European walnut wood has beautiful, warm colors that can range from light to dark brown, often with shades of purple or gray. The grain of walnut wood is clear and very decorative, with wavy or straight grains and the possibility of dark stripes. This natural appearance emphasizes the attractiveness of wood and gives each product a unique character.

Hardness and density. European walnut wood is hard and durable, with a dry density of approximately 640-720 kg/m³. It is generally lighter and less hard than oak, but still offers excellent mechanical properties, making it an ideal material for a variety of applications requiring strength and wear resistance.

Durability. In terms of durability, European walnut wood is considered moderately durable, but a well-protected surface can ensure a long service life. It is moderately resistant to moisture, fungi and pests, so when used outdoors it requires appropriate impregnation and maintenance. In indoor conditions, its natural properties are usually sufficient to ensure the longevity of the products.

Finish. European walnut wood perfectly accepts various types of finishes . They can be easily stained, varnished, oiled and waxed, allowing for a wide range of aesthetic effects. Light to dark shades of walnut wood and distinct graining make the finishes emphasize its natural beauty and elegance, giving the products a unique character.

Advantages and disadvantages of using European walnut wood
Advantages:

- Attractive, warm colors and clear grain.
- High hardness and mechanical strength.
- It accepts various finishes well.
- Ease of processing compared to harder wood species.

- High aesthetic value and elegant appearance.

Defects:
- Less resistance to moisture and pests without proper impregnation.
- Average durability compared to more resistant wood species.
- May be more expensive and harder to find in large quantities.

The use of European walnut wood.

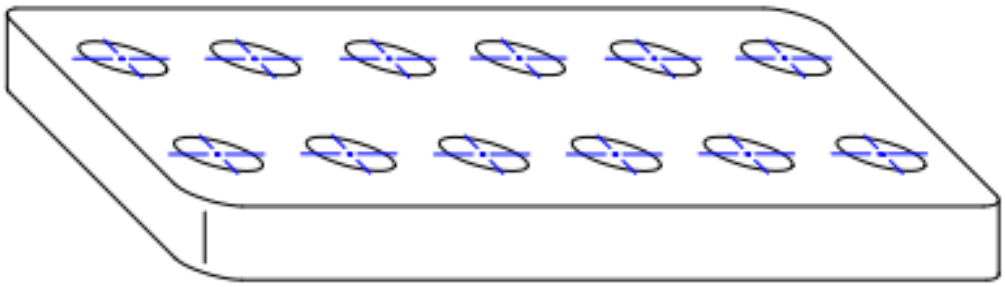
High-quality furniture: European walnut wood is widely used in the furniture industry to produce luxury furniture such as tables, chairs, chests of drawers, wardrobes and beds. Its eye-catching grain and rich colors give the furniture an elegant and prestigious look.

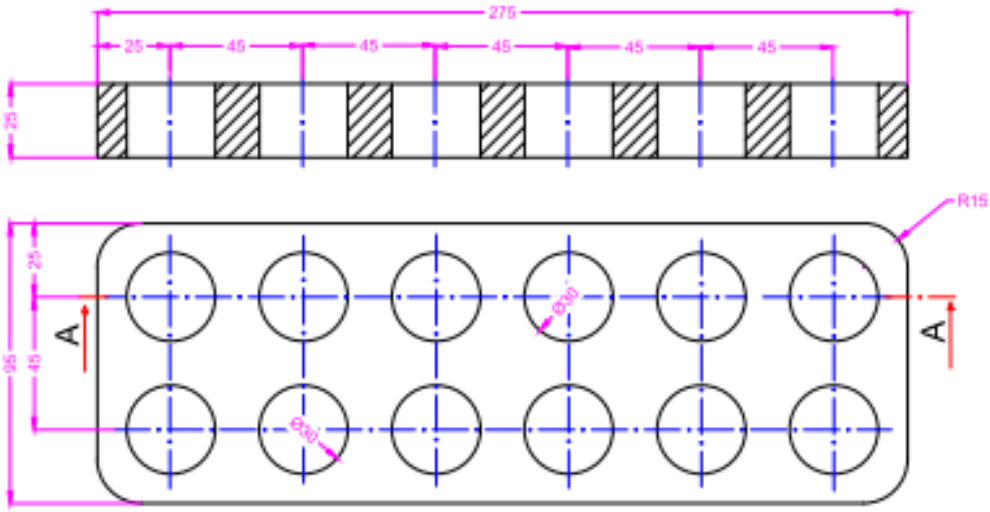
Floors and parquets: Walnut is also used to produce high-quality floors and parquets. Its hardness and durability make walnut floors durable, while at the same time adding elegance to interiors thanks to their natural appearance.
Musical instruments: European walnut wood is used in the production of musical instruments such as guitars, pianos, cellos and violins. Its hardness, durability and excellent acoustic properties make it an ideal material for instrument bodies and necks.
Finishing elements: European walnut wood is used to produce exclusive finishing elements such as wall panels, wainscoting and skirting boards. Its natural beauty gives interiors a luxurious and elegant character.
Furniture fronts and panels: European walnut wood is used to produce furniture fronts and decorative panels. Its attractive grain and colors make it an ideal material for interior finishing .
Kitchen utensils: European walnut, thanks to its hardness and elegant appearance, is used to produce high-quality kitchen utensils such as cutting boards, spoons and rolling pins.
Arts and crafts: European walnut wood is a popular material in arts and crafts. It is often used to produce sculptures, ornaments, frames and other decorative elements. Its rich colors and ease of processing make it an ideal material for creating both practical and artistic objects.

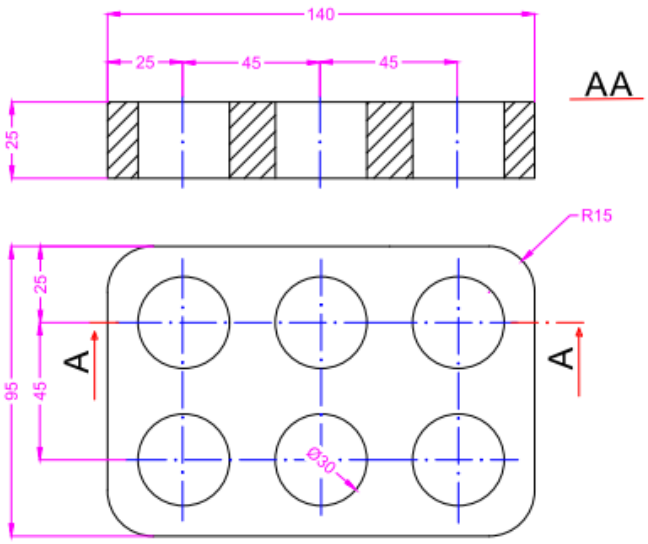
European walnut wood, with its unique aesthetics, hardness and durability, is valued in many industries, from furniture to the production of musical instruments and artistic crafts. Its versatility and natural properties make it an excellent material for a variety of applications requiring both aesthetic appearance and practical utility.

Topic of the practical task – Construction of a base for storing eggs.

Sample visualization:







Course of classes: Presentation of the topic of the classes, time approximately 20 minutes

- I provide the topic and objectives of the classes
- I provide health and safety information,
- I inform students that the main part of the class will be the practical construction of a set of two bases for storing eggs,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 20 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 15 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
A hand saw or comb saw, a universal circular saw, a jigsaw, a drill/screwdriver or a vertical/column drill, optionally a pyrograph , a brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave wet cloths with oil in the workshop, you should wet them and dispose of them, if left in a closed space under favorable conditions they may spontaneously combust).
Tools : Cylindrical drill with a diameter of 30 mm, jigsaw knives for wood, length approx. 75 mm), grinding block, miter box, pencil, square, ruler, P100 and P180 sandpaper.
Materials : walnut board with a cross-section of 125/25mm - 0.4mb (per person), a brush for applying oil,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- using a hand saw and a miter box or a circular saw, cut the walnut board to length to create two elements with lengths of 275 and 140 mm,
- according to the drawing documentation, designate places for through holes with a diameter of 30 mm,
- make through holes with a cylindrical drill with a diameter of 30 mm in all designated places (it is recommended to screw the drilled element to the bottom of the second, "waste" board with clamps so that the drill passing through our element does not cause tearing of the material),
- mark rounded corners with a radius of 15 mm,
- round the corners using a jigsaw,

- sand the resulting elements using sandpaper, starting with grit P100 and continuing with grit P180,
- gently break the edges of all elements using P180 grit paper, pay special attention to sanding the edges of holes and rounded corner surfaces,
- (optional) design inscriptions or other decorations on the sides of candlesticks and burn them using a pyrograph ,
- protect the resulting product with oil for internal use. Follow the oil manufacturer's recommendations regarding the number of layers, drying time and the period after which the coating is suitable for use.

Topic: Building a Christmas tree with space to hang two baubles

Number of students: 8

Number of hours of classes: 5

Lesson goals:

- Developing creativity and imagination by creating your own unique decorations.
- Improving manual skills and hand-eye coordination through art work.
- Encouraging collaboration and the exchange of ideas between students when creating decorations.
- Introducing children to Christmas traditions by making decorations related to them.
- Emphasizing the value of manual work and enjoying the results of one's own work by decorating the classroom with decorations created by children.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

<u>Appropriate preparation of the workplace</u>

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

<u>Appropriate clothing and equipment</u>

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Larch (Larix spp .)

Properties of larch wood. Larch is a coniferous tree found in colder regions of the northern hemisphere, including Europe, Asia and North America. Larch trees can grow to a height of 30-40 meters. Larch wood is valued for its exceptional durability, hardness and resistance to weather conditions, which makes it an ideal material for both interior and exterior applications.

Color and grain . Larch wood has attractive, warm colors that can range from light brown to red-brown. The grain of larch wood is clear, with even, often straight grains that give the wood an elegant and natural look. Also characteristic of larch are the darker colors of summer and spring growth, which enhances the decorativeness of this wood.

Hardness and density. Larch wood has high hardness and a dry density of approximately 590-650 kg/m³. It is harder and heavier than many other species of coniferous wood, which makes it more durable and resistant to mechanical damage. Thanks to these properties, larch is an ideal material for applications requiring strength and longevity.

Durability. Larch is known for its exceptional durability. This wood is naturally resistant to moisture, fungi and pests, which makes it an excellent material for outdoor applications without the need for intensive impregnation. Its resistance to weather conditions is comparable to tropical wood, thanks to which larch is widely used in construction and garden architecture.

Finish. Larch wood takes a variety of finishes well. They can be stained, varnished, oiled and waxed, which allows you to achieve the desired aesthetic effects. The clear grain and beautiful colors of larch are additionally emphasized by these finishing techniques, which increases the aesthetic value of the wood.

Advantages and disadvantages of using larch wood
Advantages:

- High hardness and mechanical strength.
- Natural resistance to moisture, fungi and pests.
- Attractive, warm colors and clear grain.
- It accepts various finishes well.
- Longevity and durability of products.

Defects:

- May be more difficult to work with due to hardness.
- Often higher price compared to other species of coniferous wood.
- Greater weight which may be a limitation in certain applications.

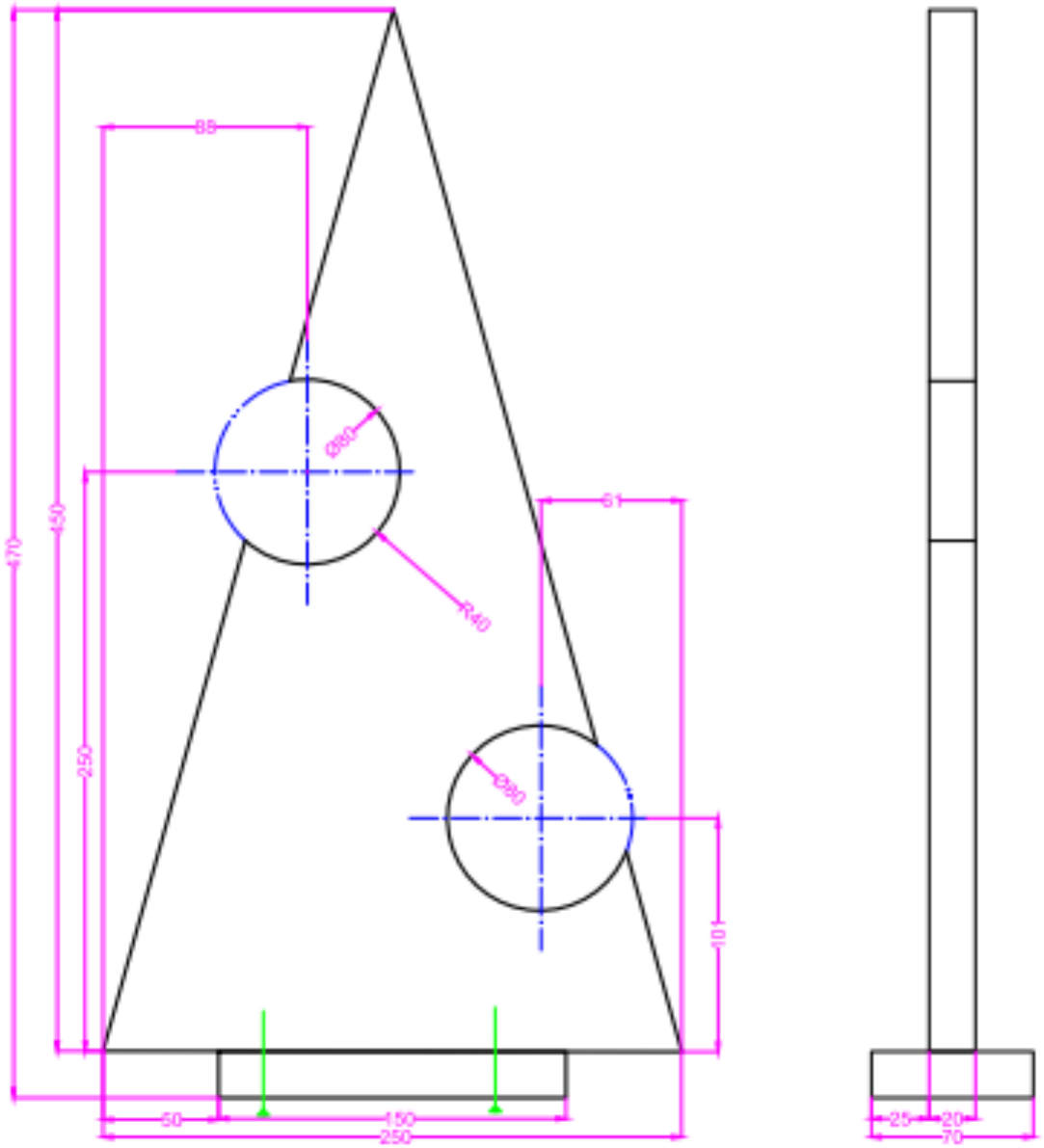
The use of larch wood
External construction: Larch wood is widely used in external construction, for structures such as facades, terraces, gazebos, pergolas and bridges. Its natural resistance to weather conditions makes it an excellent material for outdoor use, where high durability and resistance are required.
Garden furniture: Larch is often used to make garden furniture, including benches, tables, chairs and deck chairs. Its natural durability and aesthetics ensure the durability of the furniture even in difficult weather conditions.
Floors and parquets: Larch wood is also used to produce floors and parquets. Its hardness and durability make it an ideal material for floors that are resistant to

scratches and mechanical damage, while ensuring an elegant appearance of interiors.
Structural elements: Larch is used to produce various structural elements such as beams, rafters and joists. Its strength and resistance to external factors make it an ideal material for load-bearing and roof structures.
Interior cladding: Due to its decorative colors, larch wood is often used for interior finishing such as wall panels, wainscoting and skirting boards. Its natural warmth and aesthetics add character and coziness to the interior.
Boats and small ships: Larch wood, thanks to its waterproof properties, is traditionally used for building boats and small ships. Its durability and resistance to moisture make it an ideal material for the hulls and decks of watercraft.

Larch wood, thanks to its exceptional durability, hardness and beautiful appearance, is one of the most valued materials in construction, furniture and garden architecture. Its versatility and natural resistance make it an ideal choice for a variety of applications requiring durability and aesthetics.

The topic of the practical task - Building a Christmas tree with space to hang two baubles .

Sample visualization:



Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- I provide the topic and objectives of the classes
- I inform students that the main part of the classes will be the practical construction of a Christmas tree from wood,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,

- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
A longitudinal circular saw, a hand saw, a jigsaw, a drill/driver with a articulated head or an angle attachment.
Tools : set of wood drills (diameters 3, 2 mm), drill/hole saw with a diameter of 80 mm, jigsaw knives (fine tooth for wood, length 75mm), grinding block, miter box, countersink, pencil, square, ruler, P100 and P180 sandpaper.
Materials : larch board 1000/260/25mm (for two people), larch strip 350/70/20mm (for two people), screws 3/50mm (2 pieces), screws with eye 2.8/12mm (2 pieces).
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth :

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut a 260 mm wide board to a length of 470 mm,
- cut a 70 mm wide strip to a length of 150 mm,
- designate places for through holes for screws with a shank diameter of 3 mm in a 70 mm strip,
- Trace the shape of a Christmas tree into the board,
- designate places for through holes to place a bubble with a diameter of 80 mm,
- designate places for holes to attach screws with bubble rings ,
- make holes with a hole saw with a diameter of 80 mm,
- make holes with a diameter of 3 mm in the 70 mm strip,
- make holes with a diameter of 2 mm in the upper part of the previously made 80 mm holes (they will be used to screw in screws with an eye for hanging the bubble),
- drill holes with a diameter of 3 mm from the outside with a countersink (looking at the location of the element in the project),
- using a saw, jigsaw or hand saw, cut out the oblique shape of the Christmas tree,
- sand the resulting elements using sandpaper, starting with grit P120 and continuing with grit P180,
- gently break the edges of all elements using P120 grit paper, pay special attention to sanding the edges of the bubble holes ,
- assemble the base to the Christmas tree body using 50mm long screws,
- screw eye screws into the resulting structure in the upper part of the 80mm holes made,
- the resulting structure can be additionally colored with wood impregnations, coloring oils or acrylic paints for interior use in the color of your choice, or painted with colorless oil, leaving the color of the wood and emphasizing its natural color.

Topic: Building a Christmas tree with a place to hang a bauble

Number of students: 8

Number of hours of classes: 5

Lesson goals:

- Developing creativity and imagination by creating your own unique decorations.
- Improving manual skills and hand-eye coordination through art work.
- Encouraging collaboration and the exchange of ideas between students when creating decorations.
- Introducing children to Christmas traditions by making decorations related to them.
- Emphasizing the value of manual work and enjoying the results of one's own work by decorating the classroom with decorations created by children.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Alder (Alnus spp .)

Properties of alder wood. Alder is a deciduous tree that grows mainly in Europe, Asia and North America. Alder trees can reach a height of up to 25 meters. Alder wood is known for its softness, ease of processing and warm colors, which makes it popular in many areas, both in carpentry and artistic crafts.

Color and grain. Alder wood is exceptionally decorative. When freshly cut, its color ranges from light, yellowish-white to red-orange, which darkens over time and acquires warm, golden-honey shades. The grain of alder wood is subtle, with straight grains and local darker spots, which gives an elegant and natural look.

Hardness and density. Alder wood has medium hardness and is quite light, with a dry density of approximately 510-550 kg/m³. Although it is not as hard as oak, it is durable enough for many applications while offering ease of workability. Alder combines moderate mechanical strength and good workability, which makes it valued in crafts and furniture.

Durability. Alder wood is classified as medium-durable, with average resistance to moisture, fungi and pests compared to harder wood species such as oak or robinia. For this reason, alder wood, if used outdoors, requires appropriate impregnation and protection to maintain its properties for a long time.

Finish. Alder wood perfectly accepts various types of finishes , which allows you to achieve a wide range of aesthetic effects. They can be easily stained, varnished, oiled and waxed. Thanks to its uniform structure and subtle grain, the finishes can emphasize its natural beauty, giving it an elegant look.

Advantages and disadvantages of using alder wood

Advantages:

- Medium hardness and good mechanical strength.
- Warm, decorative colors and subtle graining.
- It accepts various finishes well.
- Ease of processing and shaping.
- Lightweight and easy to carry.

Defects:

- Less resistance to moisture, fungi and pests without proper impregnation.
- Average durability compared to harder wood species.
- Requires additional protection for outdoor applications.

The use of alder wood

Furniture: Alder wood is widely used in the furniture industry to produce a variety of furniture such as tables, chairs, chests of drawers, wardrobes and beds. Its warm colors and subtle grain give the furniture an elegant and cozy look that suits many interior styles.

Paneling and wainscoting: Thanks to its decorative colors and ease of processing, alder wood is often used for interior finishing in the form of wall panels and wainscoting. Its natural warmth and elegance add character to the interior.

Musical instruments: Alder wood is also used in the production of musical instruments, especially where a light structure and ease of processing are desired. It is used in the production of electric and bass guitar bodies, thanks to its good resonance characteristics.

Kitchen utensils: Due to its safety in contact with food and ease of processing, alder wood is used to produce kitchen utensils such as cutting boards, spoons and spatulas.

Plywood and boards: Alder wood is also often used to produce plywood and wood-like boards. Its moderate hardness and uniform structure make it an ideal construction and furniture material.

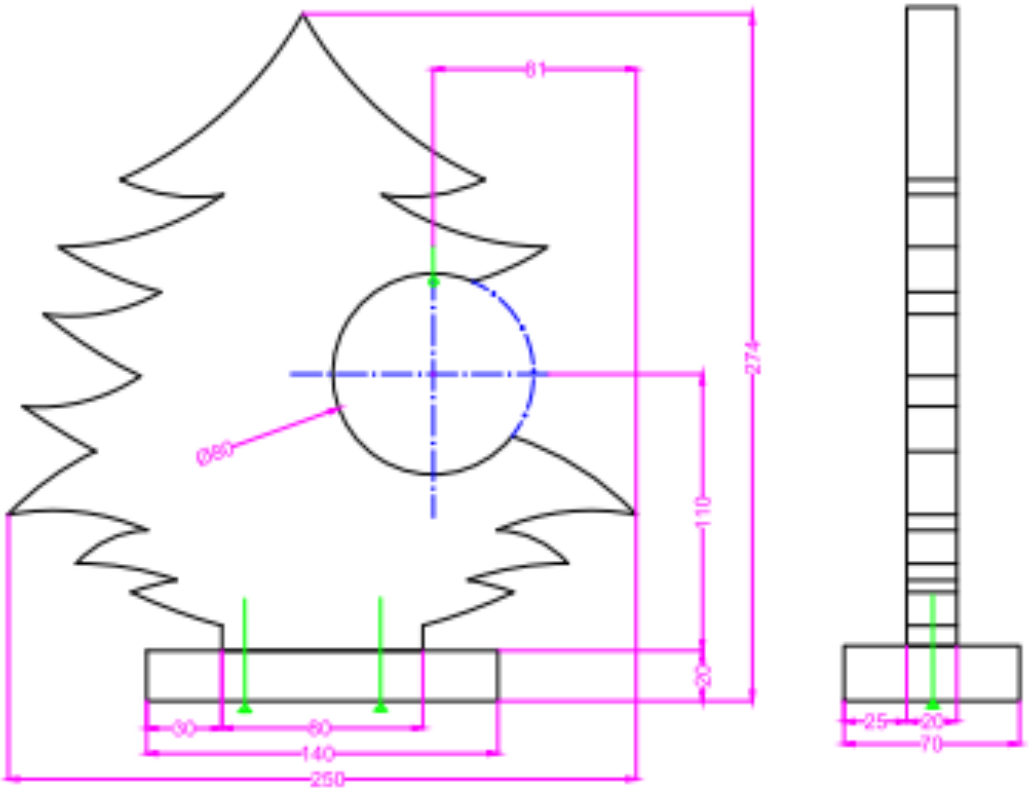
Sculpture and art: Alder wood, thanks to its ease of processing and attractive colors, is a popular material in artistic crafts. It is often used for sculptures, ornaments, frames and other decorative items.

Alder wood, thanks to its attractive colors, medium hardness and ease of processing, is valued in many industries, from furniture to artistic crafts. Its versatility

makes it an ideal material for a variety of applications, both practical and decorative.

The topic of the practical task - Building a Christmas tree with a place to hang a bauble .

Sample visualization:



Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- I provide the topic and objectives of the classes
- I inform students that the main part of the classes will be the practical construction of a Christmas tree from wood,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it

- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
A longitudinal circular saw, a hand saw, a jigsaw, a drill/driver with a articulated head or an angle attachment.
Tools : set of wood drills (diameters 3, 2 mm), drill/hole saw with a diameter of 80 mm, jigsaw knives (fine tooth for wood, length 75mm), grinding block, miter box, countersink, pencil, square, ruler, sandpaper P100, P120 and P180.
Materials : alder board 700/260/20mm (for two people), alder strip 350/70/20mm (for two people), screws 3/50mm (2 pieces), screws with eye 2.8/12mm (piece).
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut a 260 mm wide board to a length of 274 mm,
- cut a 70 mm wide strip to a length of 140 mm,

- designate places for through holes for screws with a shank diameter of 3 mm in a 70 mm strip,
- Trace the shape of a Christmas tree into the board,
- designate places for a through hole to place a bubble with a diameter of 80 mm,
- mark a place for the hole to attach the screw with the bubble ring ,
- make a hole with a hole saw with a diameter of 80 mm,
- make holes with a diameter of 3 mm in the 70 mm strip,
- make a hole with a diameter of 2 mm in the upper part of the previously made 80 mm hole (it will be used to screw in a screw with an eye for hanging the bubble),
- drill holes with a diameter of 3 mm from the outside with a countersink (looking at the location of the element in the project),
- use a jigsaw to cut out the shape of a Christmas tree,
- sand the resulting elements using sandpaper, starting with grit P100 and continuing with P120 and P180,
- gently break the edges of all elements using P120 grit paper, pay special attention to sanding the edges of the bubble hole ,
- assemble the base to the Christmas tree body using 50mm long screws,
- screw a screw with an eye into the resulting structure in the upper part of the 80 mm hole,
- the resulting structure can be additionally colored with wood impregnations, coloring oils or acrylic paints for interior use in the color of your choice, or painted with colorless oil, leaving the color of the wood and emphasizing its natural color.

Topic: Building a Christmas tree with a star

Number of students: 8

Number of classes: 10

Lesson goals:

- Developing creativity and imagination by creating your own unique decorations.
- Improving manual skills and hand-eye coordination through art work.
- Encouraging collaboration and the exchange of ideas between students when creating decorations.
- Introducing children to Christmas traditions by making decorations related to them.
- Emphasizing the value of manual work and enjoying the results of one's own work by decorating the classroom with decorations created by children.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

<u>Appropriate preparation of the workplace</u>

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

<u>Appropriate clothing and equipment</u>

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

<u>Safe use of hand tools</u>

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Cherry (Prunus avium L.)

Properties of cherry wood. Cherry is a valued wood species with many uses. It is widely used both in the furniture industry and in the production of finishing elements, musical instruments, sculptural elements and in artistic crafts.

Color and grain: Cherry wood is characterized by beautiful, warm colors, usually in shades of red, brown and gold. The grain is subtle and elegant, with delicate, expressive jars that give the wood a unique look.

Hardness and Density: Cherry wood is relatively hard, with a moderate density, making it suitable for processing and finishing. Its density is usually higher than pine wood, which makes it solid and durable.
Durability: In terms of durability, cherry wood is a medium-durability species. Properly protected and maintained cherry wood can retain its attractiveness and durability for years.
Finish: Cherry wood is an excellent material for various types of painting and varnishing finishes. It reacts perfectly to stains, varnishes, oils and waxes, which allows you to achieve various aesthetic effects. Its natural color and grain make the finishes emphasize its elegance and uniqueness.

Advantages and disadvantages of using cherry wood:

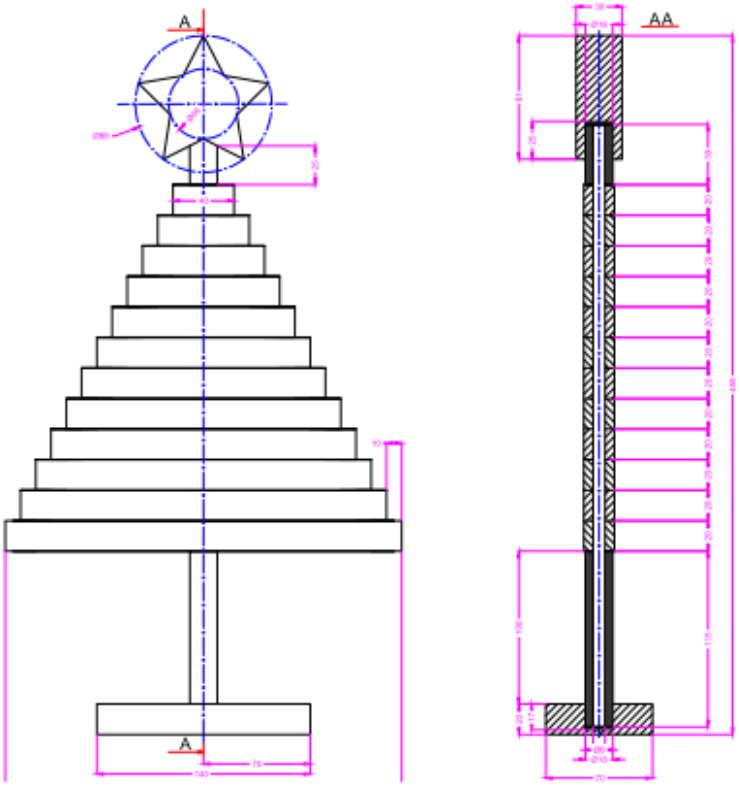
Advantages:
- Warm and rich colors.
- Relatively good hardness and durability.
- Perfect for finishing with painting and varnishing materials.
- High aesthetic value and elegant appearance.
- Relatively easy to work with compared to some harder woods.

Defects:
- Average durability compared to more resistant wood species.
- May require appropriate impregnation and maintenance, especially for outdoor applications.
- More expensive and less available than some more popular wood species.

Cherry wood is used in the production of high-quality furniture, floors, finishing elements, musical instruments, sculptures, decorations and in artistic crafts. Its elegance and durability make it a valued raw material in many areas of crafts and industry.

Topic of the practical task - Building a Christmas tree with a star.

Sample visualization:



Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- I provide the topic and objectives of the classes

- I inform students that the main part of the classes will be the practical construction of a Christmas tree from wood,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 20 minutes
- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration
- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 380 minutes
- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 20 minutes
- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
Universal circular saw, hand saw, jigsaw, drill/driver,

Tools : wood drill - diameter 3.8 mm, extended wood drill - diameter 8 mm, cylindrical drill with a diameter of 18 mm, jigsaw knives (fine tooth for wood, length 75 mm), grinding block, miter box, countersink, pencil , square, ruler, sandpaper P100, P120 and P180, compasses, brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave wet cloths after oil in the workshop, they should be wetted and disposed of, left in a closed space under favorable conditions they may spontaneously ignite).
Materials : Cherry strip with a cross-section of 20/20/-2mb, cherry strip 500/70/20mm (for three people), cherry board 350/100/30mm (for three people), screws 3/50mm (2 pieces), glue for wood, quick-drying polyvinyl acetate , wooden dowel (pine or beech) diameter 8mm -0.5mb, wooden dowel (beech) diameter 18mm -0.2mb,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut a 100 mm wide board intended for the star to a length of 100 mm,
- cut a 70 mm wide strip to a length of 140 mm,
- cut wooden dowels: 8 millimeter to a length of 355 mm, and 18 millimeter, two pieces, to a length of 115 mm and 39 mm,
- cut cherry strips with a cross-section of 20/20 mm, 12 pieces, the largest being 260 mm long and the shortest 40 mm with 20 mm gradations from the longest to the shortest,
- mark places for 8mm through holes in 20/20mm strips in the center of each of the created elements,
- designate a place for the 18mm hole for the star (element 100/100/30) and the base (70mm wide strip),
- mark places for through holes with 8 mm wooden dowels with a diameter of 18 mm,
- Mark the shape of a Christmas tree in element 100/100/30,
- make holes with a hole saw with a diameter of 18 mm in the element intended for the star and the base,
- make holes with a diameter of 8 mm in 20/20 mm strips,
- use an 8 mm extended drill to make holes with a diameter of 8 mm in 18 mm thick wooden dowels,
- using a saw, jigsaw or hand saw, cut out the oblique shape of the Christmas tree,

- sand the resulting elements using sandpaper, starting with grit P100, P120 and continuing with P180,
- gently break the edges of all elements using P120 grit paper, pay special attention to sanding the edges of the star,
- using a small amount of glue, assemble (stuff) the 8mm wooden dowel, 19mm wooden dowels and all 20/20mm strips together, all in accordance with the drawing documentation,
- mount the base and star to the resulting one,
- after waiting for it to dry (approx. 30 minutes), inspect the resulting structure and perform any grinding work in order to obtain a suitably smooth surface of the product,
- paint the resulting structure with colorless oil, leaving the color of the wood and emphasizing its natural color.

Topic: Building a Christmas tree from slats

Number of students: 8

Number of hours of classes: 5

Lesson goals:

- Developing creativity and imagination by creating your own unique decorations.
- Improving manual skills and hand-eye coordination through art work.
- Encouraging collaboration and the exchange of ideas between students when creating decorations.
- Introducing children to Christmas traditions by making decorations related to them.
- Emphasizing the value of manual work and enjoying the results of one's own work by decorating the classroom with decorations created by children.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Fir (Abies spp .)

Properties of fir wood. The fir is a coniferous tree commonly found in the northern part of the hemisphere, mainly in the mountainous regions of Europe, Asia and North America. Fir trees can reach a height of up to 60 meters. Fir wood is valued for its relatively low density, ease of processing and aesthetic appearance, which makes it widely used in construction, furniture and many other areas.

Color and grain. Fir wood is characterized by light colors that can range from whitish to light yellow. The grain of fir wood is delicate and subtle, with straight and even grain, which gives it a uniform and aesthetic appearance. Fir wood often does not contain many knots, which increases its aesthetic value and makes it an excellent material for many applications.

Hardness and density. Fir wood is relatively soft and light, with a dry density of approximately 440-470 kg/m³. It is lighter than oak wood, which makes it easier to process and transport. Due to its medium hardness, fir wood is durable enough for many applications, but may be less resistant to intense mechanical stress.

Durability. In terms of durability, fir wood is classified as medium-durable. It is moderately resistant to moisture, fungi and pests, which means that it requires appropriate impregnation and protection when used outdoors. In interior applications, its natural properties are usually sufficient to ensure the longevity of the products.

Finish. Fir wood accepts various types of finishes well . They can be easily stained, varnished, oiled and painted, which allows you to achieve a wide range of aesthetic effects. The uniform and light color of fir wood makes it an ideal background for various finishes , which can emphasize its natural beauty.

Advantages and disadvantages of using fir wood
Advantages:

- Lightness and ease of processing.
- Bright, uniform colors and delicate graining.
- It accepts various finishes well.
- Cost effective for many applications.
- Versatile applications in construction and carpentry.

Defects:

- Less resistance to moisture, fungi and pests without proper impregnation.
- Average durability compared to harder wood species.
- Lower mechanical strength compared to more resistant species.

The use of fir wood

Construction: Fir wood is widely used in construction, especially for interior structures such as walls, ceilings and floors. Its lightness and ease of processing make it a popular material for building wooden houses, gazebos and other light structures.

Furniture: Fir wood is also used in the furniture industry to produce a variety of furniture such as tables, chairs, wardrobes and chests of drawers. The light colors of fir wood give the furniture lightness and elegance, which fits perfectly with various interior styles.

Interior Cladding: Thanks to its light color and fine grain, fir wood is often used for interior finishes such as wall paneling, wainscoting and skirting boards. Its natural warmth and aesthetics add character and coziness to the interior.

Structural elements: Due to its lightness and strength, fir is used to produce structural elements such as beams, rafters and joists. It is an excellent material for the construction of supporting roof structures and load-bearing walls.

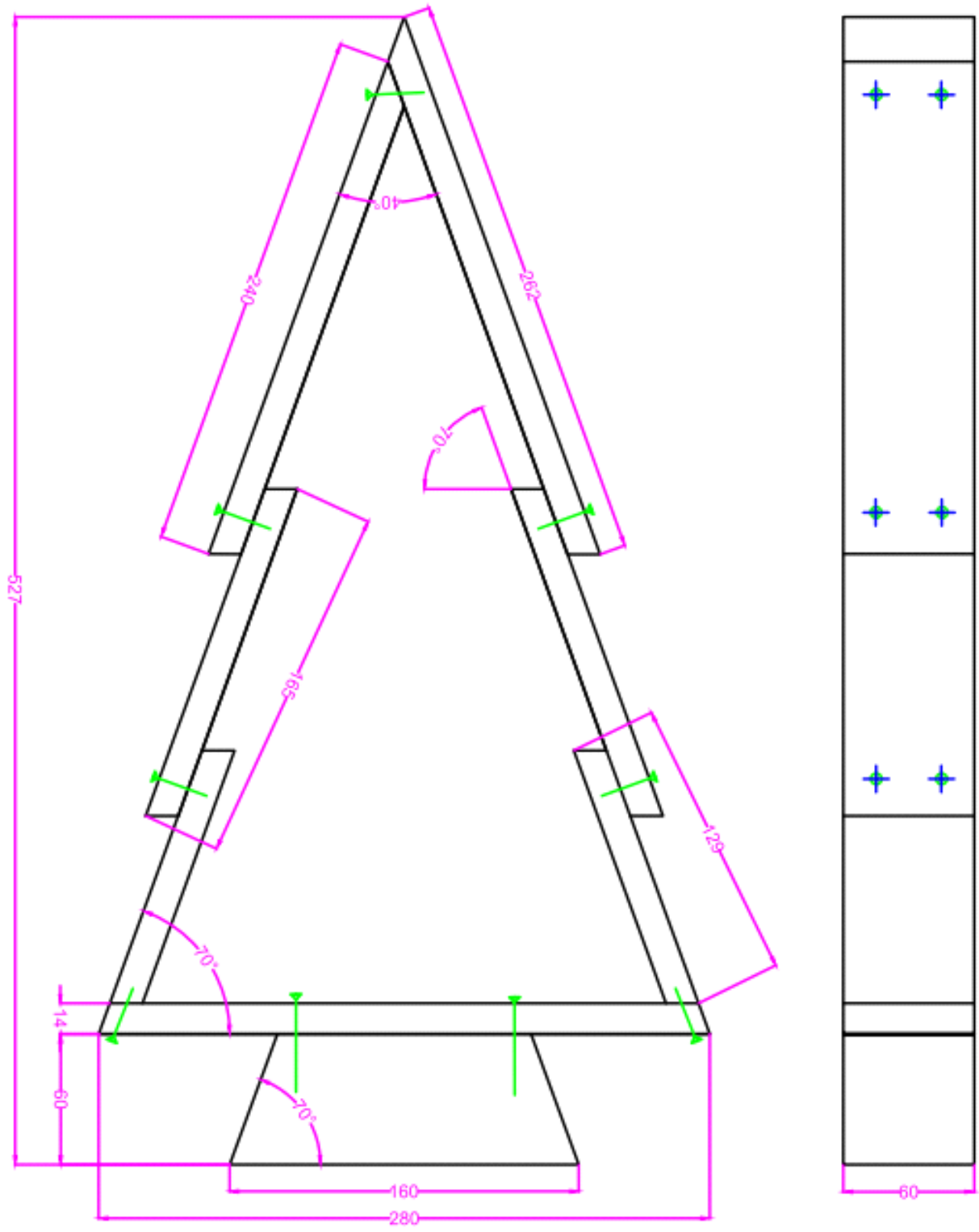
Crates and packaging: Fir wood, thanks to its lightness and ease of processing, is an ideal material for crates, pallets and other wooden packaging. It is widely used in the transport and logistics industry.

Musical instruments: Fir wood is also used in the production of some musical instruments, especially where lightness and ease of processing are desired. It is used to produce a variety of instrument components such as bodies and soundboards.

Due to its lightness, bright colors and ease of processing, fir wood is widely used in many industries, from construction to furniture and artistic crafts. Its natural properties make it an ideal material for a variety of both practical and decorative uses.

The topic of the practical task - Building a Christmas tree from slats.

Sample visualization:



Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- provide the topic and objectives of the classes
- inform students that the main part of the classes will be the practical construction of a Christmas tree from wood,

- inform students about the type of material we will work with and describe it.
- provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- discuss the classes: I highlight achievements, analyze mistakes
- discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
Universal circular saw, hand saw, drill/driver,

Tools : wood drill - 3 mm diameter, grinding block, miter box with 70 and 40 degree angles, countersink, pencil, square, ruler, sandpaper P100, P120 and P180, brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave wet oil cloths in the workshop, they should be wetted and disposed of; if left in a closed space under favorable conditions, they may spontaneously combust).
Materials : Fir strip with a cross-section of 60/14mm -1.5mb, fir beam with a cross-section of 60/60mm -0.5mb (for three people), screws 3/50mm (4 pieces), screws 3/25mm (14 pieces),

Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- using a miter box, cut all 60 mm wide strips intended for the bottom and sides of the Christmas tree, pay special attention to the cutting angles in individual elements,
- using a miter box, cut a fir beam with a cross-section of 60/60 mm and a length of 160 mm, pay special attention to the cutting angles in individual elements,
- designate places for 3mm through holes in 60/14mm strips and 60/60mm beam,
- make holes with a diameter of 3 mm in the 60/14 mm strips and in the 60/60 mm beam,
- all holes with a diameter of 3 mm from the outside with a countersink under the screw head (looking at the location of the element in the project),
- sand the resulting elements using sandpaper, starting with grit P100, P120 and continuing with P180,
- gently break the edges of all elements using P120 grit paper,
- screw together the 60/14mm strips into the shape of a Christmas tree according to the drawing provided,
- inspect the resulting structure and perform any grinding work in order to obtain a suitably smooth surface of the product,

- paint the resulting structure with colorless oil, leaving the color of the wood and emphasizing its natural color, or paint it with acrylic paints.

Topic: Building wooden toys - a kitten on wheels

Number of students: 8

Number of hours of classes: 5

Lesson goals:

- Developing creativity and imagination by creating your own unique decorations.
- Improving manual skills and hand-eye coordination through art work.
- Encouraging collaboration and the exchange of ideas between students when creating decorations.
- Emphasizing the value of manual work and enjoying the results of one's own work by decorating the classroom with decorations created by children.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.

- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Linden (Tilia spp .)

Properties of linden wood. Linden is a deciduous tree widely distributed in Europe, Asia and North America. Linden trees can reach heights of up to 30 meters and are known for their softness and ease of workability, which makes linden wood popular in a variety of craft and artistic applications.

Color and grain . Linden wood is characterized by a uniform, light color, most often cream-white to light yellow. The grain of linden wood is subtle and quite even, which gives it a smooth and elegant look. The wood usually does not contain many

knots, which makes it an excellent material for carving and other precision applications.

Hardness and density. Linden wood is soft and light, with a dry density of approximately 450-490 kg/m³. Due to its softness, linden is one of the easiest wood species to work with, which makes it an ideal raw material for carving, cutting and other precise handicrafts. However, the softness of linden also means that it is less resistant to mechanical damage and is not suitable for applications requiring high strength.
Durability. In terms of durability, linden wood is classified as medium-durable . It is less resistant to moisture, fungi and pests compared to harder wood species, such as oak or robinia. Therefore, linden wood, if used outdoors, requires appropriate impregnation and protection to maintain its properties and durability for a long time.

Finish. Linden wood accepts various types of finishes very well . They can be easily stained, painted, varnished and waxed, which allows you to achieve the intended aesthetic effect. The uniform texture and subtle grain make the linden tree perfect for precise finishing and artistic work where a smooth and even appearance is desired.

Advantages and disadvantages of using linden wood
Advantages:
- Soft and easy to handle by hand.
- Uniform, light color and subtle grain.
- Excellent adaptability to various finishes.
- Perfect for precise sculpture and artistic work.
- Light and easy to carry.

Defects:
- Low resistance to mechanical damage.
- Less durability, susceptibility to moisture, fungi and pests.
- Lower durability compared to harder wood species.
- Requires additional impregnation and protection for outdoor applications.

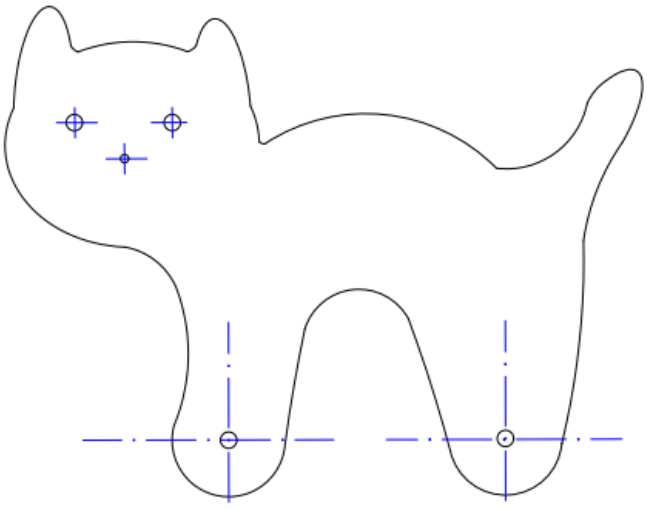
The use of linden wood
Sculpture and art: Due to its softness and ease of processing, linden wood is widely used in sculpture, artistic carpentry and the production of ornaments and decorations. It is a favorite material of sculptors who value it for its ease of forming and its smooth surface, which is suitable for precise detailing.
Musical instruments: Basswood is used in the production of some musical instruments, especially where ease of processing and weight are important. It is used to produce sound elements and decorative instruments.
Furniture: Linden wood is used to produce light furniture and decorative elements such as cabinet fronts, strips and carved details. Its lightweight properties enable easy transport and installation.

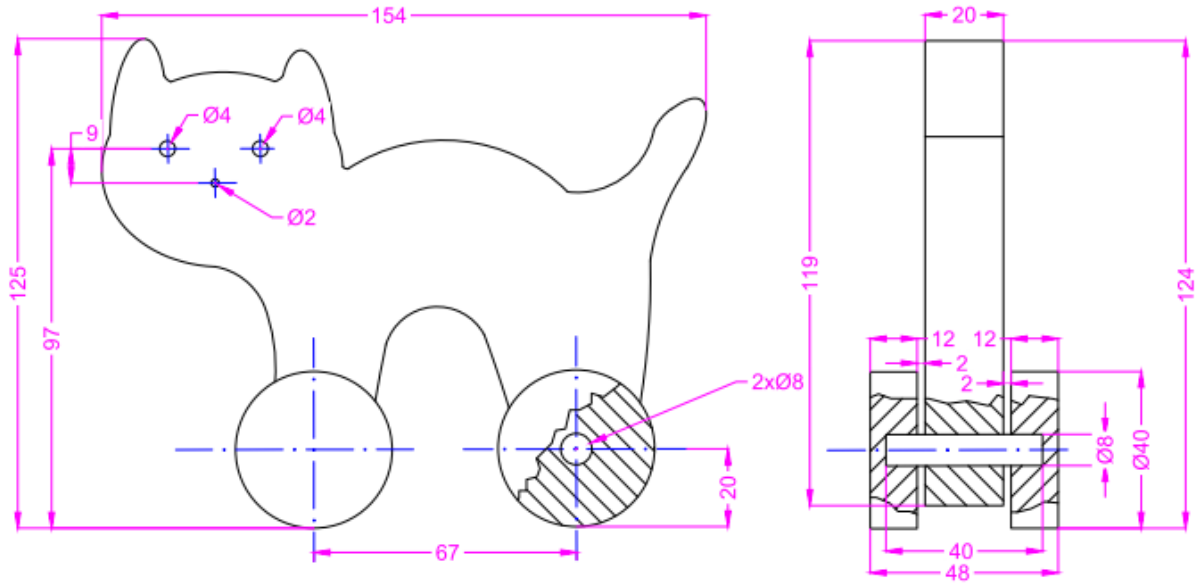
Kitchen utensils: Linden wood, thanks to its softness and safety in contact with food, is used to produce kitchen utensils such as wooden spoons, cutting boards and other accessories.
Model making: Due to its ease of processing, linden wood is popular in model making, both as a hobby and professionally. It is used to create architectural models, ships, airplanes and other precise structures.

Linden wood, thanks to its softness, lightness and ease of processing, is a favorite material among craftsmen, artists and modeling enthusiasts. Its unique properties make it ideal for precise manual, decorative and utility work, where a smooth, even structure and aesthetic appearance are required.

The topic of the practical task - Building wooden toys - a kitten on wheels

Sample visualization:





Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- I provide the topic and objectives of the classes
- I inform students that an essential part of the classes will be the practical construction of a toy for a child,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task ,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
Longitudinal circular saw, hand saw, jigsaw, drill/driver.
Tools : a set of wood drills (diameters 8, 4, 2 mm), tapered jigsaw knives with a width of approx. 3-4 mm for precise cutting (fine tooth for wood, length 75 mm), grinding block, pencil, square, ruler, sandpaper P100, P120 and P180, optional pyrograph , brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave damp oil cloths in the workshop, they should be wetted and disposed of, if left in a closed space under favorable conditions they may spontaneously combust).
Materials : linden board 500/120/20mm (for three people), beech dowel with a diameter of 8mm - 15cm long, beech dowel with a diameter of 40mm -12cm long, quick-setting wood glue, can be polyvinyl acetate .
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut a 120mm wide board to a length of 160mm,
- cut a beech dowel with a diameter of 40 mm to a length of 12 mm - four pieces,
- cut a beech dowel with a diameter of 8 mm to a length of 40 mm - two pieces,
- mark places for through holes with a diameter of 2, 4 and 8 mm in the linden board,
- trace the shape of a kitten into the board,

- mark places for holes in beech discs,
- make through holes 2, 4 and 8 mm in the toy body (you need to slightly drill the 8 mm hole for the wheel axles so that the 8 mm pin can rotate freely),
- make blind holes with a diameter of 8 mm in the beech discs,
- use a jigsaw to cut out the shape of the kitten's body,
- sand the resulting elements using sandpaper, starting with grit P100 and continuing with P120 and P180,
- gently break the edges of all elements using P120 grit paper,
- the elements created in this way can optionally be burned using a pyrograph ,
- put the axles (8 mm pins through the holes in the body),
- glue the discs forming the toy's wheels using a small amount of glue (be careful not to let excessive amounts of glue flow out of the wheels and immobilize the ability to rotate),
- before assembly, the resulting structure can be additionally colored with wood impregnation, coloring oils or acrylic paints for interior use in the color of your choice, or painted with colorless oil, leaving the color of the wood and emphasizing its natural color.

Topic: Construction of stands for decorative flower tubes

Number of students: 8

Number of hours of classes: 5

Lesson goals:

- Developing manual skills through practical making of coasters.
- Promoting creativity and artistic expression.
- Integration of knowledge in the field of visual and technical arts.
- Sensitivity to aesthetics and beauty in the surroundings.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction to the lesson topic:

Specific objectives:

- Students will learn various carpentry techniques used to create coasters.
- Students will gain the ability to independently plan and implement a handicraft project.
- Students will develop their skills in working with different types of wood.
- Students will learn to use tools and accessories for shaping and decorating.
- Students will be able to evaluate the aesthetics and functionality of the created coasters.

Educational goals:

- Developing an attitude of patience and accuracy.
- Teamwork and sharing experience with other class participants.
- Strengthening your self-esteem by implementing your own projects.
- Raise awareness of the sustainable use of natural resources and recycling of materials.

The impact of plants on human health and well-being:

Improving air quality:

- Plants absorb carbon dioxide and release oxygen, which improves indoor air quality.
- Some plants have the ability to remove toxins and chemical pollutants from the air, which has a beneficial effect on health.

Reducing stress and improving well-being:

- Contact with plants and nature has a proven impact on reducing stress levels.
- The sight and care of plants has a soothing effect on the nervous system, which can lead to lower blood pressure and improved mental well-being.

Increased creativity and concentration:

- Plants in the workplace or study improve concentration and creativity.
- Being in a green environment can stimulate the mind and improve work efficiency.

Better air humidity:

- Plants increase air humidity through transpiration, which can reduce the symptoms of dry skin and respiratory irritation.

Stimulation of the senses and improvement of mood:

- Plants stimulate various senses - visually, smell and even touch.
- The aesthetics of plants and flowers indoors can bring positive energy, improve mood and reduce feelings of depression.

Therapeutic benefits:

- Horticultural therapy , i.e. horticultural therapy, is used as a method to support mental and physical health.
- It helps in coping with diseases, rehabilitation and reducing anxiety and depression.

Thanks to these goals and understanding the impact of plants on human health and well-being, students will be able to not only develop their artistic skills, but also increase awareness of the importance of the nature around us.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.

- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

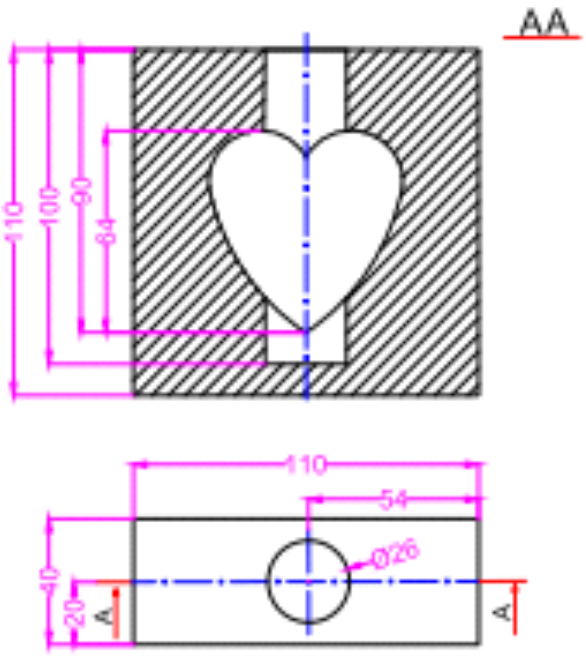
- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Type of wood used in classes : During classes, we will use known wood species to compare how they differ from each other during the processing stage, during and after finishing. For classes we will use species such as: oak, walnut, ash, robinia, sycamore,

Topic of the practical task - Construction of stands for decorative test tubes for flowers.

Sample visualization: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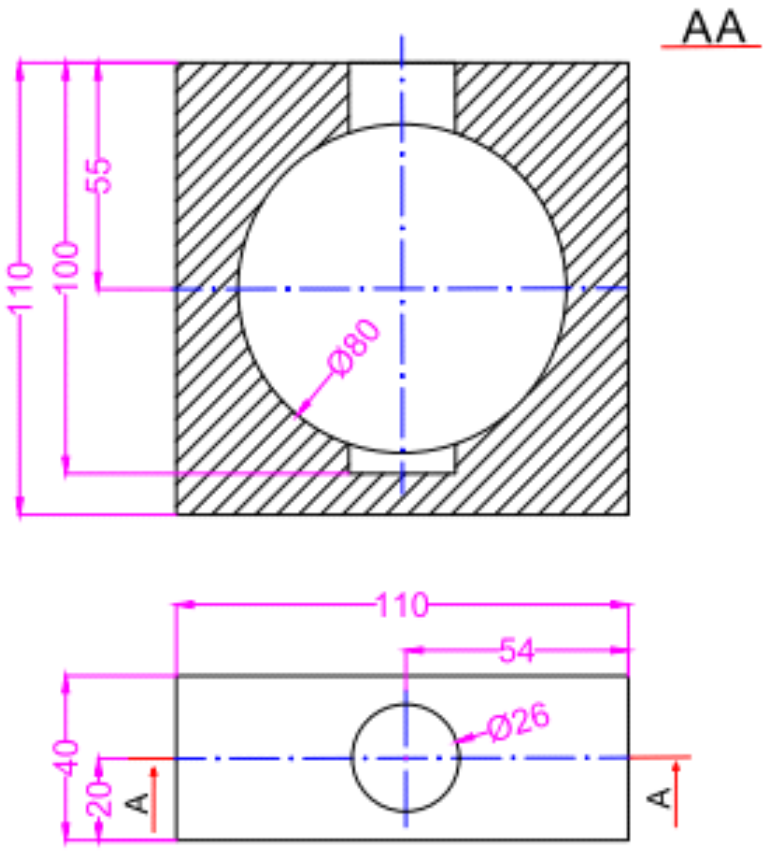
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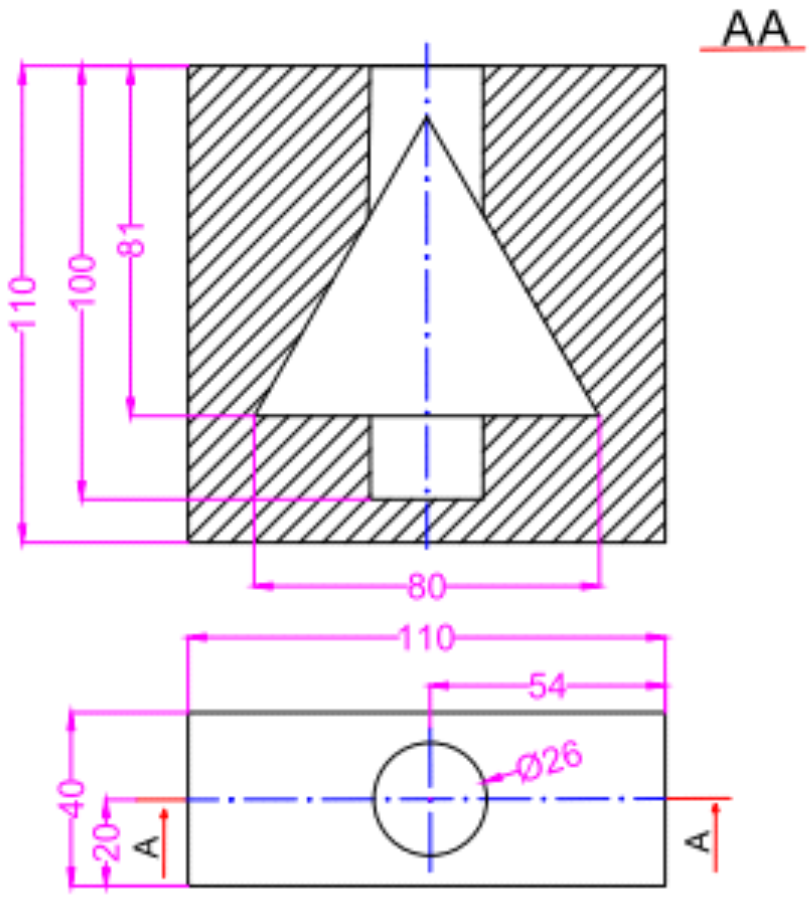


Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- provide the topic and objectives of the classes
- inform students that the main part of the class will be the practical construction of three stands for decorative flower test tubes,
- inform students about the type of material we will work with and describe it.
- provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,

- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it

- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- discuss the classes: I highlight achievements, analyze mistakes
- discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
Longitudinal circular saw, hand saw, jigsaw, drill/driver.
Tools : Cylindrical drill bit for wood 26 mm and drilling length up to 120 mm, drill/hole saw with a diameter of 80 mm, jigsaw knives (fine tooth for wood, length 95 mm), grinding block, miter box, pencil, square, ruler, sandpaper P100, P120 and P180, optionally pyrograph , brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave wet cloths left with oil in the workshop, they should be wet and disposed of; if left in a closed space under favorable conditions, they may spontaneously combust).
Materials : hardwood board with dimensions 350/110/40 mm (for one person for three pieces of stands, it is recommended that students exchange elements so that

everyone works in three different species), glass beaker/test tube for plants with a diameter of 25 mm and a length 120mm -3 pieces, natural oil for internal use,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth :

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut a 110 mm wide board to a length of 110 mm – three pieces,
- cut a 70 mm wide strip to a length of 140 mm,
- designate places for holes with a diameter of 26 mm,
- trace circle, heart and triangle patterns in the elements,
- make a hole with a hole saw with a diameter of 80 mm,
- cut out heart and triangle shapes using a jigsaw (it is recommended to drill the base with a drill with a diameter of approx. 12-15 mm in the place of waste/in the middle of the figure to pass the jigsaw blade),
- sand the resulting elements using sandpaper, starting with grit P100 and continuing with P120 and P180,
- gently break the edges of all elements using P120 grit paper, pay special attention to sanding the edges of the figures,

- paint the resulting structure with colorless oil, leaving the color of the wood and emphasizing its natural color,
- embed the beaker/test tube into the resulting structure.

Other examples of decorative flower test tube holders:

Topic: Making an occasional heart-shaped board

Number of students: 8

Number of hours of classes: 5

Lesson goals:

- Developing creativity and imagination by creating your own unique decorations.
- Improving manual skills and hand-eye coordination through art work.
- Encouraging collaboration and the exchange of ideas between students when creating decorations.
- Emphasizing the value of manual work and enjoying the results of one's own work by decorating the classroom with decorations created by children.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

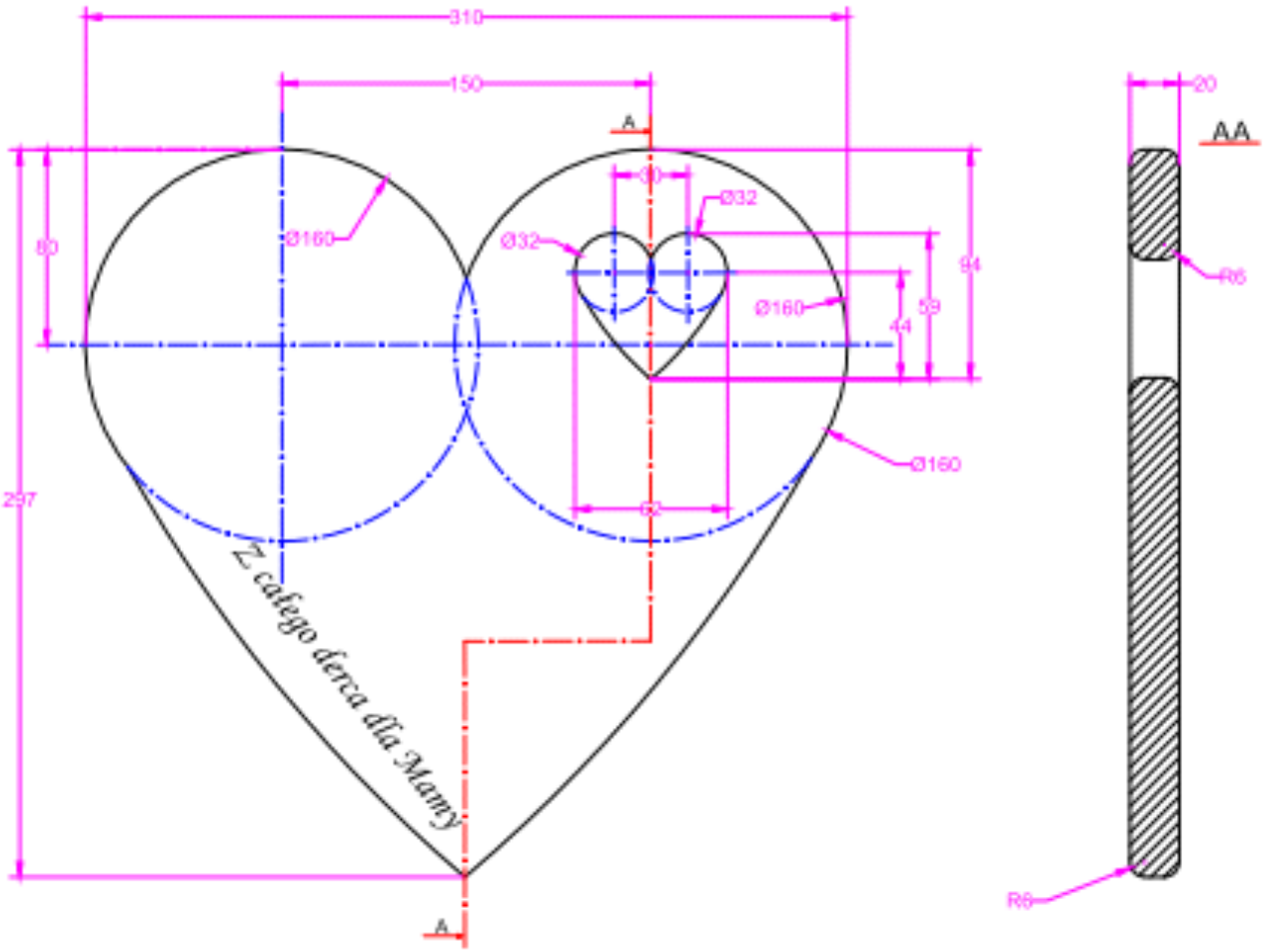
- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Type of wood used during classes : During classes, we will use a type of wood known from previous classes, i.e. European walnut, you can also use Polish species of fruit wood such as apple, pear, plum or cherry, although they are difficult to obtain, but their colors make that they look phenomenal in such projects.

Topic of the practical task – Making an occasional heart-shaped board.

Sample visualization:



Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- provide the topic and objectives of the classes
- inform students that the main part of the classes will be the practical making and finishing of a decorative occasional heart,
- inform students about the type of material we will work with and describe it.
- provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,

- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it

- each time before students use the tool, the teacher instructs and shows how to use it in practice,

-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- discuss the classes: I highlight achievements, analyze mistakes
- discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
A longitudinal circular saw, a jigsaw, a manual router with a bearing cutter with a radius of 5 or 6.5 mm, a drill/driver or a vertical/column drill, optionally a pyrograph , a brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave damp oil cloths in the workshop, they should be wetted and disposed of, if left in a closed space under favorable conditions they may spontaneously combust), quick-drying wood glue (polyvinyl acetate), carpentry clamps at least 200 mm long, wooden mallet, carpentry chisel with a width 16-20mm.
Tools : drill/hole saw or cylindrical drill with a diameter of 32 mm, jigsaw knives (fine tooth for wood, length 75 mm), grinding block, pencil, compasses, square, ruler, sandpaper P100, P120 and P180.
Materials : fruit wood board 1000/320/20 mm (for cutting three hearts per person), colorless natural oil or oil-wax ,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut a 320 mm wide board to a length of 320 mm,
- designate places for through holes with a diameter of 32 mm,
- Trace a heart shape into the board and a place for a heart-shaped hole,
- make holes with a drill with a diameter of 32 mm,
- use a jigsaw to cut out the shape of the inner and outer heart,
- grind the resulting elements using sandpaper, starting with grit P100 and continuing with P120 and P180, the greatest attention should be paid to the shape of the heart, as any unevenness will affect the course and quality of milling,
- mill all external and internal edges with a router with a cutter with a diameter of 5-6.5 mm and a bearing,
- using a chisel , round the bottom of the heart-shaped hole to make it look like a profile in its upper part (during milling, for technological reasons, the bearing will not allow the edge of the inner heart to be fully rounded , so you must complete this operation manually),
- sand all the resulting curved surfaces using sandpaper, starting with grit P100 and continuing with P120 and P180,

- paint the resulting structure with colorless oil, leaving the color of the wood and emphasizing its natural color, adjust the drying time and the method of operation to the manufacturer's recommendations.

Topic: Making an occasional heart-shaped wall decoration

Number of students: 8

Number of hours of classes: 5

Lesson goals:

- Developing creativity and imagination by creating your own unique decorations.
- Improving manual skills and hand-eye coordination through art work.
- Encouraging collaboration and the exchange of ideas between students when creating decorations.
- Emphasizing the value of manual work and enjoying the results of one's own work by decorating the classroom with decorations created by children.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

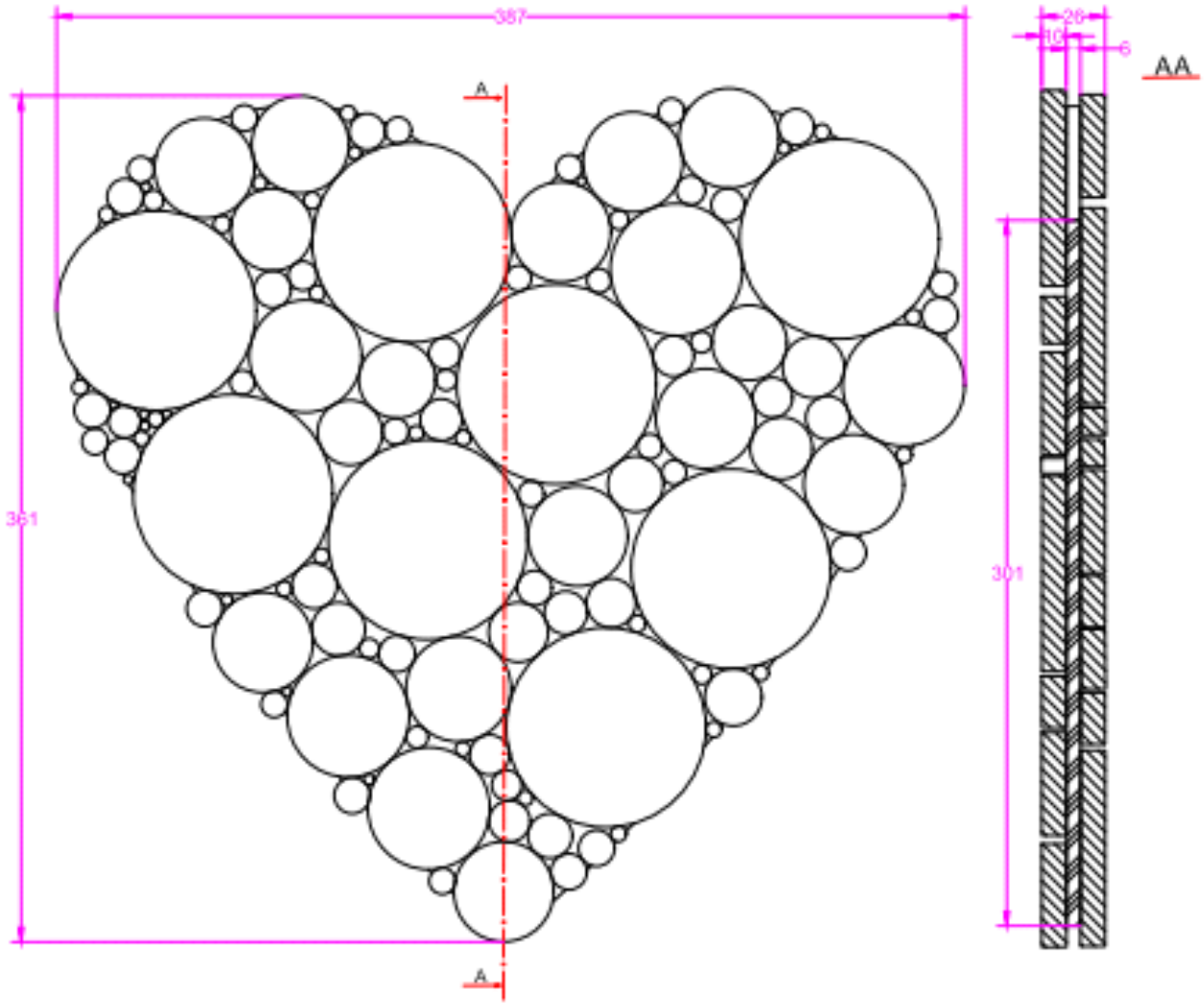
- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Type of wood used during classes : During classes, we will use wood species known from previous classes, i.e. apple tree, pear tree, you can also use other species such as oak, ash, black locust or elm, and we will use a plywood board for the structure base. To complete the project, we will not need sawn timber (commercial wood), but different sizes of dry branches of the trees mentioned above.

Topic of the practical task – Making an occasional wall decoration in the shape of a heart.

Sample visualization:
Depending on the scale used, the product can be a wall decoration or, for example, a table mat on a micro scale can become a coaster for glasses.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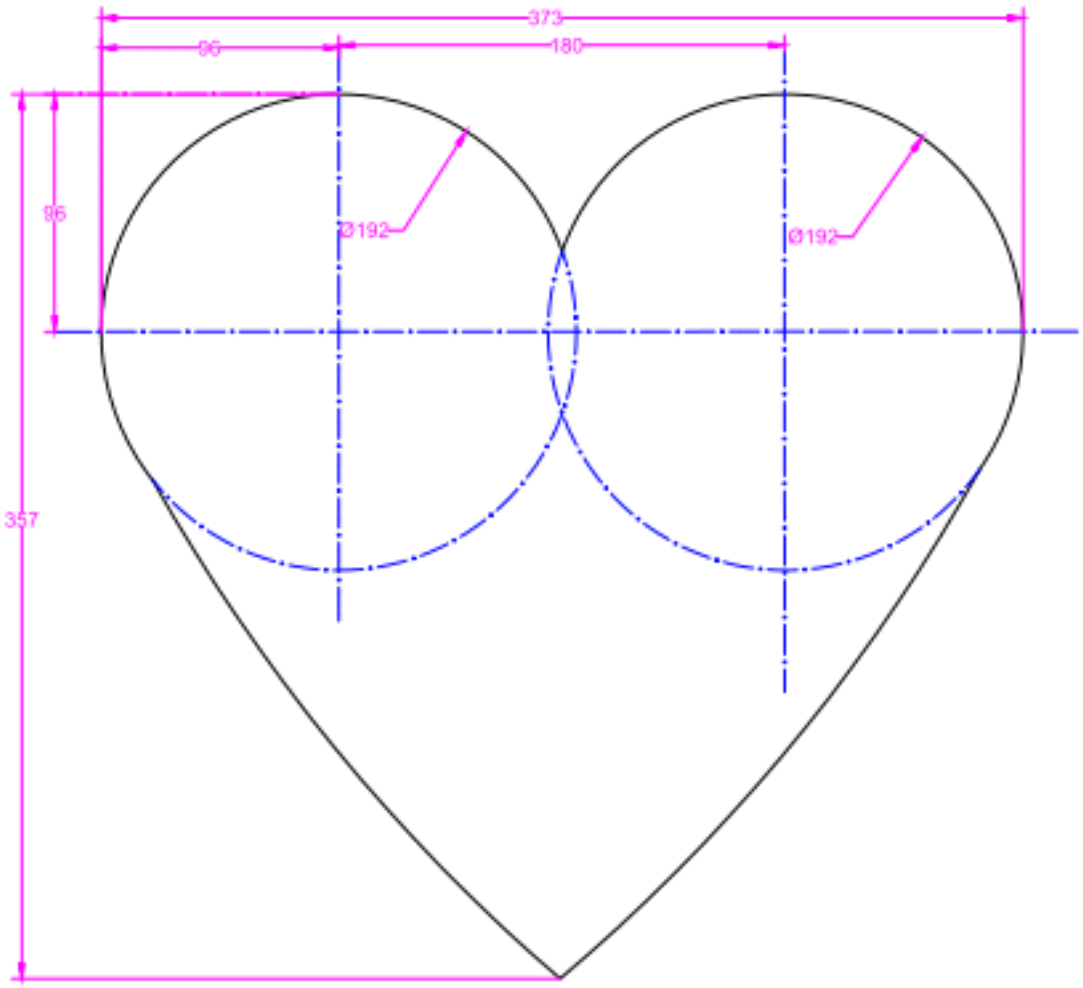


Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- provide the topic and objectives of the classes
- inform students that the main part of the classes will be the practical making and finishing of a decorative occasional heart,
- inform students about the type of material we will work with and describe it.
- provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it

- each time before students use the tool, the teacher instructs and shows how to use it in practice,

-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
A hand saw for wood, a jigsaw, an orbital sander for wood, an optional pyrograph , a gun for applying hot melt glue, a brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave damp cloths with oil in the workshop, please wet them and dispose of them, left in a closed space under favorable conditions they may spontaneously combust),
Tools : jigsaw knives (fine tooth for wood, length 75mm), sanding block, pencil, square, ruler, sandpaper for hand sanding P100, P120 and P180, sandpaper for an orbital sander P100, P120 and P180, compass.
Materials : plywood 350/350 mm, dry branches of various types of wood 1000/320/20 mm, colorless natural oil or oil-wax , hot glue sticks,
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,

- plan the use of particular materials to make specific elements,
- trace a heart shape in the board,
- cut out a heart shape using a jigsaw,
- using a hand saw in a miter box, cut the branches into 10-15 mm discs, but make sure that they all have the same thickness,
- sand the board using P120 grit sandpaper,
- At this point, you can paint the plywood base with acrylic paint if you want to obtain the desired background color of the structure,
- stick the discs on a heart-shaped plywood base, follow the drawing and the arrangement of the discs will be dictated by the available sizes of branches, remember that the above operation should be performed both on the right and left side of the product (this way we will avoid bending our plywood) for the left side we can use more common and easier to obtain wood species such as linden, pine, spruce or poplar,
- sand both surfaces of the resulting structure using sandpaper, starting with grit P100 and continuing with P120 and P180,

- paint the resulting structure with colorless oil, leaving the color of the wood and emphasizing its natural color, adjust the drying time and operation method to the manufacturer's recommendations.

Topic: Building a box for herbs or vegetables

Number of students: 8

Number of hours of classes: 5

Lesson goals:

Technical and manual skills:

- Students will learn how to safely use carpentry tools,
- Students will be able to measure materials themselves and cut them accurately according to instructions.
- Students will acquire the ability to assemble wooden elements, including screwing, joining and fastening boards.
- Students will be able to work in groups, sharing responsibilities and collaborating to complete the task.

Project planning and implementation:

- Students will learn to plan work step by step, in accordance with a previously prepared box design.
- Students will learn how important it is to carefully prepare materials and tools before starting work.

Principles of ecology and sustainable development:

- Students will learn what species of herbs can be grown in home gardens and what soil and environmental requirements they have.
- Students will be aware of the benefits of organic crops and their impact on the environment

Creativity and aesthetics:

- Students will be able to express their creativity by decorating and painting herb boxes.
- Students learn basic finishing techniques such as sanding, painting and varnishing wood.
- Students will be encouraged to design unique patterns and decorations, which will develop their artistic skills.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Introduction to the lesson topic:

Specific objectives:

- Students will learn various carpentry techniques used to create coasters.
- Students will gain the ability to independently plan and implement a handicraft project.
- Students will develop their skills in working with different types of wood.
- Students will learn to use tools and accessories for shaping and decorating.
- Students will be able to evaluate the aesthetics and functionality of the created coasters.

Educational goals:

- Developing an attitude of patience and accuracy.
- Teamwork and sharing experience with other class participants.
- Strengthening your self-esteem by implementing your own projects.
- Raise awareness of the sustainable use of natural resources and recycling of materials.

Introduction to the topic of the lesson on working with herbs:

Positive effects of having your own organic herb gardens

Promotion of a healthy lifestyle:

- Growing herbs brings fresh, healthy ingredients to the kitchen, encouraging the consumption of natural products free from pesticides and chemicals.
- Fresh herbs are rich in vitamins, minerals and antioxidants that support health and well-being.

Savings and economy:

- Having your own herbs allows you to save money that would be spent on buying ready-made products in the store.
- Your own herb garden may be cheaper in the long run than buying fresh herbs regularly.

Education and development:

- Herb care gives you the opportunity to learn about plants, their growth cycles, requirements and health benefits.
- Growing herbs can be an excellent opportunity to learn responsibility and discipline, especially among young people.

Environmental Protection:

- Organic herb gardens promote sustainable agricultural practices such as composting and water conservation.
- Growing local and seasonal plants reduces the need for transport of food products, which reduces CO2 emissions.

Aesthetics and relaxation:

- Herb gardens can be a beautiful addition to your garden, balcony or kitchen, adding aesthetics and natural beauty.
- Gardening has a relaxing effect and can help reduce stress, improving your overall mental and emotional well-being.

Self-sufficiency and satisfaction:

- Growing your own herbs gives you a sense of self-sufficiency and is a source of great satisfaction from harvesting your own crops.
- The pleasure of preparing your own dishes with fresh herbs can increase your interest in cooking and healthy eating.
- Having your own organic herb gardens brings numerous health, financial and ecological benefits, as well as promoting education and personal development.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

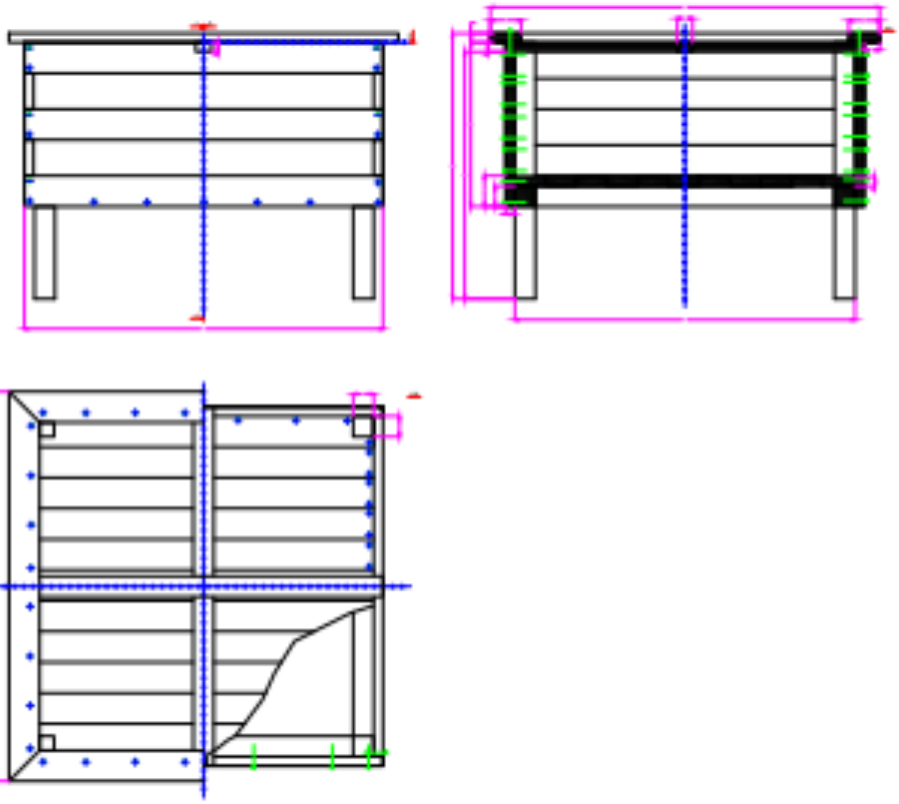
- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Type of wood used during classes : During classes, we will use a type of wood known from previous classes, i.e. alder, because it is a relatively cheap material and, when it comes to native species, it copes well with outdoor conditions

Topic of the practical task – Building a box for herbs or vegetables.

Sample visualization:



Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- I provide the topic and objectives of the classes
- I inform students that an essential part of the class will be building a box for herbs or vegetables,
- I inform students about the type of material we will work with and describe it.
- I provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes
- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration
- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it
- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes
- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes
- I discuss the classes: I highlight achievements, analyze mistakes
- I discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
Longitudinal circular saw, optional miter circular saw, hand saw, drill/driver,

Tools : wood drill bit with a diameter of 3 mm, countersink, grinding block, miter box, pencil, square, ruler, sandpaper P100, P120 and P180, optional pyrograph, brush for applying impregnation, stapler, staples adapted to the stapler with a length of 8-10mm, carpentry clamps at least 800mm long - 4 pieces, carpentry chisel 20mm wide, wooden mallet,
Materials : alder strip with a cross-section of 60/18 mm - 28 m, alder strip with a cross-section of 40/18 mm - 1.5 m, alder square timber with a cross-section of 40/40 mm - 5 m, coloring wood impregnation, thick gardening foil - approx. 2 m^2.
Teaching resources : drawing documentation of the product, notebook for students. - 0.75L
Occupational health and safety protection : glasses and earmuffs for working with power tools, nitrile gloves to protect hands when painting with impregnation, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut 60 mm wide strips to a length of 780 mm - four pieces, to a length of 700 mm - ten pieces, to a length of 664 mm - 21 pieces (10 for shorter wall elements and 11 for the floor
- cut 40 mm wide strips to a length of 700 mm - two pieces,
- cut square timbers with a cross-section of 40/40 mm to a length of 482 mm - four pieces, to a length of 584 mm - four pieces,
- cut at an angle of 45 four top strips constituting the top frame of the box to a length of 760 mm,
- designate places for through holes for screws with a core diameter of 3 mm in external wall strips, 40/20 mm division strips, and floor strips,
- make holes with a drill with a diameter of 3 mm,
- drill out all holes with a diameter of 3 mm from the outside with a countersink (looking at the location of the element in the project),
- sand the resulting elements using sandpaper, starting with grit P100 and continuing with P120 and P180,
- gently break the edges of all elements using P120 grit paper,
- Using the drawing documentation, screw together elements with a cross-section of 40/40 mm, i.e. legs and square timber constituting the base for the floor of the box,
- screw the strips constituting the side walls to the resulting structure,
- tighten the strips constituting the box floor to the resulting structure,
- using the drawing documentation, mark out a socket for inserting 40/20 mm dividing strips (4 sockets, each in the upper part of each wall),
- mark out a place for the cutout for the overlap (cross connection at a 90-degree angle) two 40/20 mm dividing strips,

- cut the sockets marked in the above two points with a saw,
- chisel out excess material in the joints cut above to create joints between the elements,
- put two dividing strips together (crosswise),
- mount the resulting cross in the box using screws,
- use screws to install the strips cut to the 45° angle , forming the top frame of the box,
- inspect the external and upper surfaces of the resulting structure, if necessary, carry out grinding until a satisfactory final effect is obtained,
- paint the resulting structure with colorless oil or impregnation,
-after the product dries, install gardening foil inside the box using a stapler and staples.

Topic: Making an Easter decoration in the form of a wooden bunny on a stand

Number of students: 8

Number of hours of classes: 5

Lesson goals:

- Developing students' creativity and manual skills by creating Easter decorations.
- To familiarize students with the traditions and symbolism of Easter.
- Strengthening the skills of planning and implementing artistic projects.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical **:** demonstration, measurement of things and practical classes method

Specific objectives:

Technical and manual skills:
Using tools:

- Students will learn to safely use basic carpentry tools such as saws, drills, hammers, files and sandpaper.
- Students will be able to properly select tools for appropriate work, such as cutting, drilling, grinding and assembly.

Precise machining of materials:

- Students will learn techniques for measuring and cutting different types of wood to make small decorative elements.
- Students will learn techniques for sanding and smoothing wooden surfaces to prepare them for painting or varnishing.

Creativity and aesthetics:
Decoration design:

- Students will design their own Christmas decorations, including traditional elements and their own ideas.
- Students will learn various decorative techniques such as painting, engraving, burning and stained glass on wood.

Project implementation and finishing:

- Students will make Christmas decorations on their own, implementing their projects step by step.
- Students will learn how to use different types of finishes , such as varnishes, acrylic paints, stains, and methods of protecting wood against damage.

Tradition and culture:
Exploring the symbolism of Easter:

- Students will learn about the meaning and symbolism of traditional Easter decorations, such as Easter eggs, lambs, bunnies, palm trees and spring flowers.
- Students learn various decorating techniques and patterns related to Easter and regional traditions.

Cooperation and work organization:
Work in groups:

- Students will work in small groups, learning to cooperate, share tasks and take responsibility for various stages of the project.
- Developing communication skills and solving problems together while working on decorations.

Organization of the workplace:

- Students will learn how to organize their workplace in the workshop, ensuring order, safety and effective use of tools and materials.
- Students will attach importance to the safe storage of tools and materials and maintaining order in the workplace.

Positive effects of creating your own Christmas decorations:
Development of manual and artistic skills:

- Creating Christmas decorations allows you to develop artistic skills, spatial imagination and manual precision.

Increasing self-esteem:

- Students gain a sense of satisfaction and fulfillment when they see the effects of their work, which positively affects their self-esteem and motivation to continue learning.

Understanding and cultivating traditions:

- Creating Christmas decorations is an opportunity to learn and cultivate cultural traditions, which strengthens social and family bonds.

Strengthening cooperation:

- Working on projects in groups teaches cooperation, responsibility and communication, which is extremely important in the development of children's social skills.

Relaxation and stress reduction:

- Creative manual activities have a relaxing effect and can help reduce tension and stress, improving the overall emotional state of students.

Introduction - health and safety rules when using hand tools while working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is the most important thing. Working with hand tools can be safe and pleasant if we follow a few basic occupational health and safety rules. Here are some of the most important rules that we must follow during our lesson:

Appropriate preparation of the workplace

- **Cleanliness and order:** Before we start work, make sure that our workstation is clean and everything is in its place. Let's avoid mess that can lead to accidents.
- **Proper lighting:** Make sure your workspace is well lit so that you can clearly see what you are doing.

Appropriate clothing and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose items that could catch on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect your eyes from wood dust and possible wood chips.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Blunt tools are less safe than sharp ones.
- **Holding Tools Properly:** Tools should be held firmly and used with both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Using tools as intended:** Every tool has a specific purpose. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not move during processing.
- **Working Away from the Body:** When cutting, drilling or chiseling, always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation, without using excessive force. Movements should be controlled and even to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** Full concentration and attention must be maintained when working with hand tools. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Procedure in the event of an accident

- **Reporting Accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be administered quickly if necessary.

Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with the completed projects!

Introduction – wood species used during classes: Red oak (Quercus rubra L.)

Properties of red oak wood : it is a valued wood species, widely used around the world, especially in North America. This deciduous tree can live for 200 to 300 years and reach a height of up to 25-35 meters. Red oak wood is known for its durability, aesthetics and various applications in the furniture, construction and decorative industries.


Color and grain: Red oak wood has a warm, reddish-brown color that may darken over time. The grain is distinct and varied, often with a wood radius and straight grain, giving the wood an elegant and natural appearance. Compared to pine, the grain of red oak is more expressive.

Hardness and density: Red oak is a hard and dense wood, with a dry density of approximately 700-770 kg/m³. This makes it much heavier and harder than pine wood, and slightly lighter and softer than European oak, which makes it more resistant to mechanical damage and wear. Thanks to its durability, red oak is an ideal material for furniture, floors and structures exposed to heavy loads.

Durability: Red oak wood is considered durable and resistant to weather conditions and pests. It belongs to the category of very durable wood, and its natural properties protect against moisture, fungi and insects. Compared to pine, red oak is much more durable.

Finish: Red oak perfectly accepts various types of finishes , such as staining, varnishing, oiling and waxing. Thanks to its natural structure and aesthetics, this wood looks attractive both in its raw state and after finishing processing. Ease of finishing allows you to create products with a variety of styles and visual effects. Pine wood, although also easy to process, is more sensitive to strong finishing agents.

Advantages and disadvantages of using red oak wood:
Advantages:

- High strength and hardness.
- Attractive, warm colors and clear grain.
- High durability and resistance to pests.
- Excellent finishing properties.

- High aesthetic value and elegant appearance.

Defects:
- Higher price compared to less durable wood species.
- Greater density and weight may make transportation and processing more difficult.
- Less availability in some regions.

Applications of red oak wood:

Red oak wood is widely used in various economic sectors. Thanks to its unique properties, it is used in:

Furniture and doors . Red oak is a popular raw material for the production of high-quality furniture, doors and furniture fronts. Its durability and aesthetics make furniture and doors made of this wood both functional and elegant.

Floors and parquets . Red oak wood is one of the best materials for the production of floors and parquets. Its durability and abrasion resistance make red oak floors long-lasting and give the interior a prestigious look.

Finishing elements . Red oak is an ideal material for exclusive finishing elements such as skirting boards, wainscoting and window sills. Thanks to their elegance and durability, red oak wooden finishing elements emphasize the aesthetics and quality of interiors.

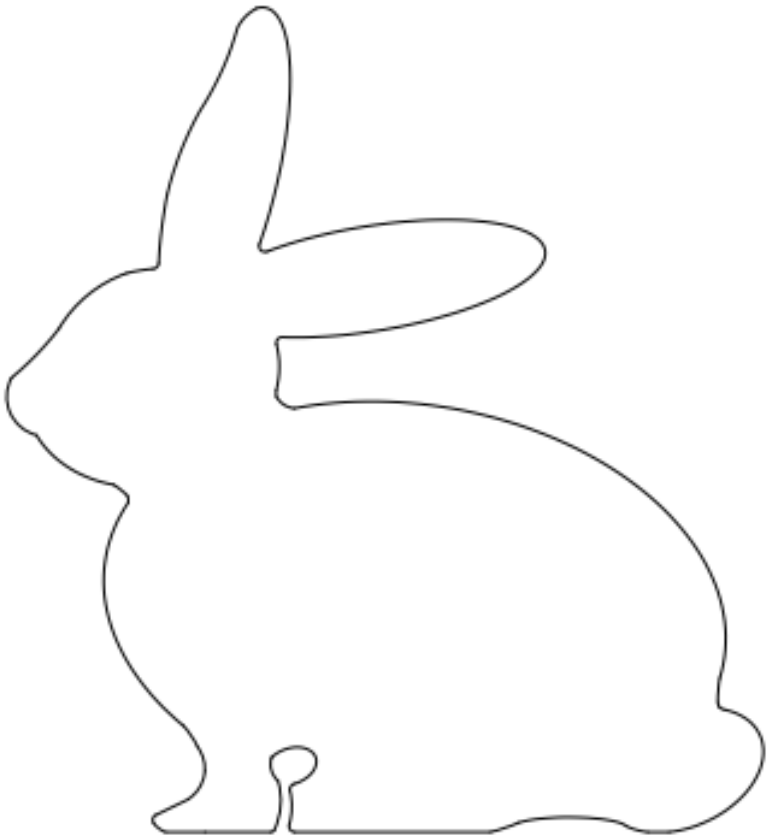
Architectural structures. Red oak wood is used in construction for the construction of roofs, beams and other load-bearing elements. Its strength and resistance to weather conditions make it an excellent construction material.

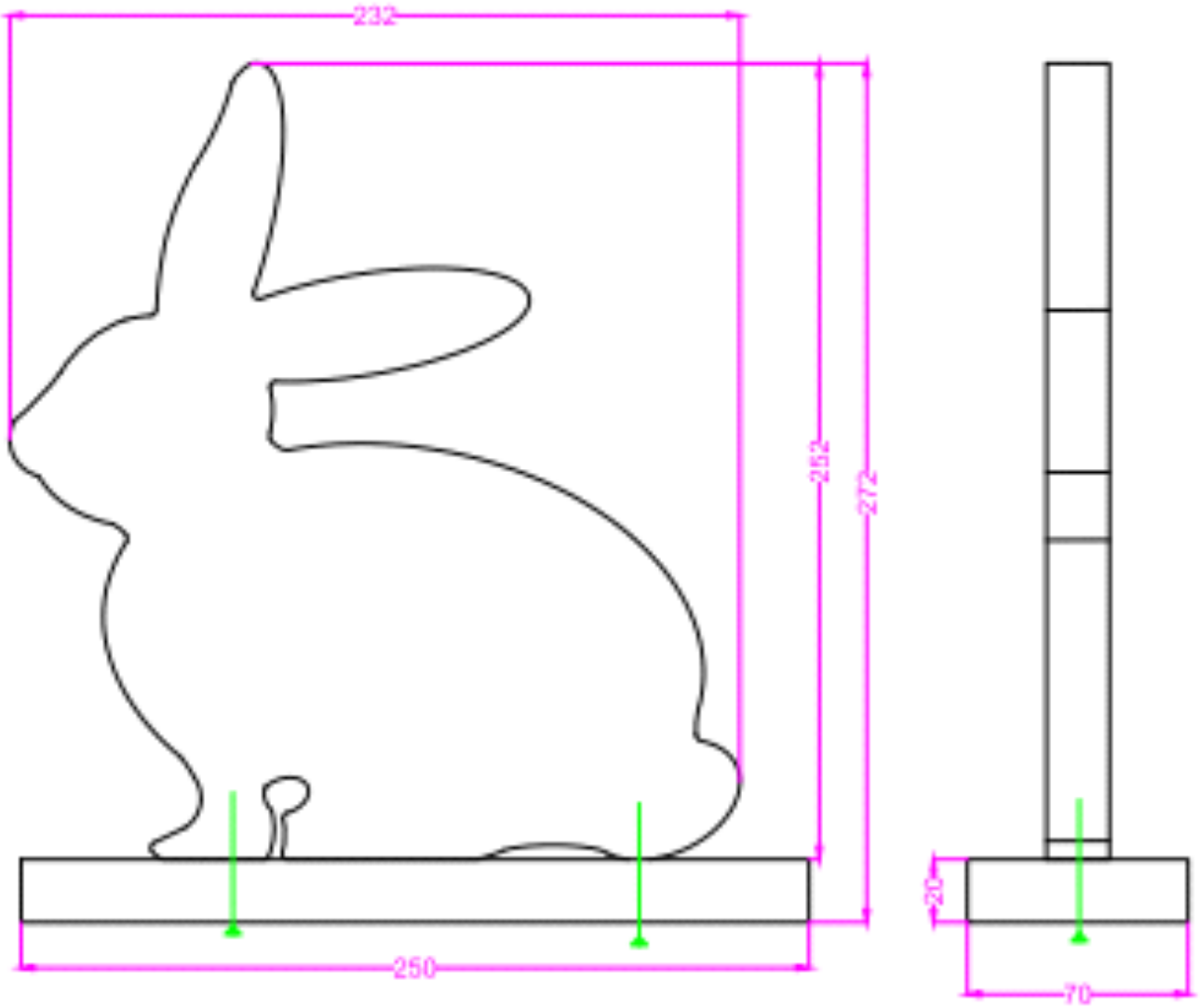
Arts and crafts. Red oak is used in artistic crafts, in the production of sculptures, decorations and other artistic elements. Its natural aesthetics and durability make it eagerly used by craftsmen and artists.

Thanks to its unique properties, red oak is a valued material in many areas, from furniture to construction and artistic crafts. It is a type of wood that combines aesthetics, durability and functionality.

The topic of the practical task - Making an Easter decoration in the form of a wooden bunny on a stand

Sample visualization:





Course of classes: Presentation of the topic of the classes, time approximately 30 minutes

- provide the topic and objectives of the classes
- inform students that the main part of the classes will be a practical task consisting in making an Easter decoration in the form of a hare,
- inform students about the type of material we will work with and describe it.
- provide on-the-job instructions for the workplace and the individual tools necessary to make them.

Ongoing instruction, analysis of information and drawings, time approximately 15 minutes

- students analyze documentation,
- are considering developing action plans,
- think about lists of elements, tools and auxiliary devices - think about the list of devices, tools and control and measurement instruments and auxiliary resources necessary to perform the task,

Ongoing instruction, demonstration

- each time at each stage of creating the structure, the teacher presents how to perform each operation before the students start doing it

- each time before students use the tool, the teacher instructs and shows how to use it in practice,
-each time with a new operation, the teacher presents trial work with a given tool,

Ongoing instruction, organization and execution, time approximately 170 minutes

- based on documentation and a prepared action plan, students independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students complete the task in accordance with the instructions for completing the task,
- after completing the practical part of the exercise, students tidy up the workplace and secure tools, assess the quality of their work and justify how it was done,

Final instruction, time approximately 10 minutes

- discuss the classes: I highlight achievements, analyze mistakes
- discuss the results of the work of individual student groups based on the products made and justify the assessment,

Teaching resources and materials:

Technical teaching resources : workstation equipped with a carpentry table/tables adapted to the task and the number of students in the group/groups.
Longitudinal circular saw, hand saw, jigsaw, drill/screwdriver, pyrograph , brush for applying oil, cloths for collecting excess oil (please remember that it is forbidden to leave wet cloths with oil in the workshop, they should be wetted and disposed of, left in a closed space under favorable conditions may spontaneously ignite),
Tools : a set of wood drill bits (diameters 10, 3, 2 mm), jigsaw knives (fine tooth for wood, length 75 mm), grinding block, miter box, countersink, pencil, square, ruler, sandpaper P100, P120 and P180 .

Materials : oak board 900/240/20mm (for three people), oak strip 800/70/20mm (for three people), screws 3/50mm (2 pieces), colorless oil or oil-wax .
Teaching resources : drawing documentation of the product, notebook for students.
Occupational health and safety protection : glasses and earmuffs for working with power tools, work clothes to protect against getting dirty.

The sequence of actions in the process of making a booth:

- check the dimensions of the delivered elements,
- plan the use of particular materials to make specific elements,
- cut a 240 mm wide board to a length of 255 mm,
- cut a 70 mm wide strip to a length of 250 mm,
- designate places for through holes for screws with a shank diameter of 3 mm in a 70 mm strip,
- trace the shape of a hare into the board,
- make a hole with a hole saw with a diameter of 80 mm,
- make holes with a diameter of 3 mm in the 70 mm strip,
- drill holes with a diameter of 3 mm from the outside with a countersink (looking at the location of the element in the project),
- use a jigsaw to cut out the shape of a hare,
- sand the resulting elements using sandpaper, starting with grit P100 and continuing with P120 and P180,
- gently break the edges of all elements using P120 grit paper, pay special attention to sanding the curvilinear planes of the hare shape,
- assemble the base to the body of the hare figurine using 50mm long screws,

- paint the resulting structure with colorless oil, leaving the color of the wood and emphasizing its natural color, adjust the drying time and the method of operation to the manufacturer's recommendations.

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Topic: making an Easter decoration in the form of a wooden bunny with an egg

Number of students: 8

Number of class hours: *5*

Lesson Objectives:

- Developing students' creativity and manual skills by creating Easter decorations.
- Familiarizing students with the traditions and symbolism of Easter.
- Strengthening the ability to plan and implement art projects.

Form of classes: group and individual

Teaching methods: verbal: story/talk/instruction, practical**:** demonstration, measuring things and hands-on activity method

Specific Objectives:

Technical and manual skills:
Use of tools:

- Students will learn how to safely use basic carpentry tools such as saws, drills, hammers, files and sandpaper.
- Students will be able to properly select tools for appropriate work, such as cutting, drilling, grinding and assembly.

Precision material processing:

- Students will learn techniques for measuring and cutting different types of wood to make small decorative items.
- Students will learn techniques for sanding and smoothing wooden surfaces to prepare them for painting or varnishing.

Creativity and aesthetics:
Ornament Design:

- Students will design their own Christmas decorations, incorporating traditional elements and their own ideas.
- Students will learn various decorative techniques, such as painting, engraving, burning and stained glass on wood.

Implementation and finishing of the project:

- Students will make Christmas decorations on their own, taking their projects step by step.

- Students will learn how to use different types of finishes, such as varnishes, acrylic paints, stains, and methods to protect wood from damage.

Tradition and Culture:
Learning about the symbolism of Easter:

- Students will learn about the meaning and symbolism of traditional Easter decorations, such as Easter eggs, lambs, bunnies, palms and spring flowers.
- Students will learn a variety of techniques and decorating patterns related to Easter and regional traditions.

Cooperation and work organization:
Working in groups:

- Students will work in small groups, learning how to cooperate, share tasks and take responsibility for different stages of the project.
- Develop communication skills and solve problems together while working on decorations.

Workplace organization:

- Students will learn how to organize the workstation in the workshop, taking care of order, safety and efficient use of tools and materials.
- Students will attach importance to the safe storage of tools and materials and maintaining order in the workplace.

Positive effects of making your own Christmas decorations:
Development of manual and artistic skills:

- Creating Christmas ornaments allows to develop artistic skills, spatial imagination and manual precision.

Improve self-esteem:

- Students gain a sense of satisfaction and fulfillment by seeing the result of their work, which has a positive effect on their self-esteem and motivation to continue learning.

Understanding and cherishing traditions:

- Creating Christmas decorations is an opportunity to learn about and nurture cultural traditions, which strengthens social and family ties.

Strengthening cooperation:

- Working on projects in groups teaches cooperation, responsibility and communication, which is extremely important in the development of children's social skills.

Relaxation and stress reduction:

- Creative manual activities have a relaxing effect and can help reduce tension and stress, improving the overall emotional state of students.

Introduction - health and safety rules for the use of hand tools when working in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is paramount. Working with hand tools can be safe and fun if we follow a few basic health and safety (OSH) rules. Here are some of the most important rules to follow during our lesson:

Proper preparation of the workstation

- **Cleanliness and order:** Before we start work, let's make sure our workstation is clean and everything is in its place. Let's avoid clutter, which can lead to accidents.
- **Proper lighting:** Let's make sure our workspace is well lit so we can clearly see what we are doing.

Proper attire and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and has no loose parts that could snag on tools.
- **Eye protection:** Wearing safety glasses is mandatory to protect the eyes from wood dust and possible wood splinters.

Safe use of hand tools

- **Tools in good condition:** Let's make sure that all the tools we will use are in good condition. Dull tools are less safe than sharp ones.
- **Proper tool holding:** Hold tools securely and use both hands whenever possible to ensure stability.
- **Checking tools before use:** Before starting work, we carefully check tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Use tools as intended:** Each tool has a specific use. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

Work techniques

- **Stable positioning of the material:** The wood you are working on should be well fixed on a workbench or in a vise so that it does not move during processing.
- **Working in a direction away from the body:** When cutting, drilling or chiseling, always work in a direction away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** use hand tools in moderation, not using excessive force. Movements should be controlled and even to avoid accidental damage to the material or tools.

Taking care and attention

- **Concentration:** When working with hand tools, maintain full concentration and attention. Do not talk to others or engage in other activities.
- **Rest breaks:** If you feel tired, take a break. Fatigue can lead to mistakes and accidents.

Handling an accident

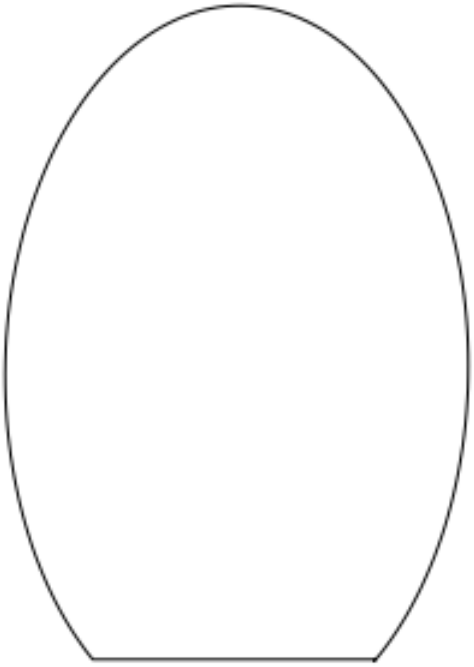
- **Reporting accidents:** In the event of a cut or other injury, inform the teacher immediately. Even minor wounds must be properly treated.
- **First aid kit:** A first aid kit should be available at the work site so that first aid can be administered quickly if needed.

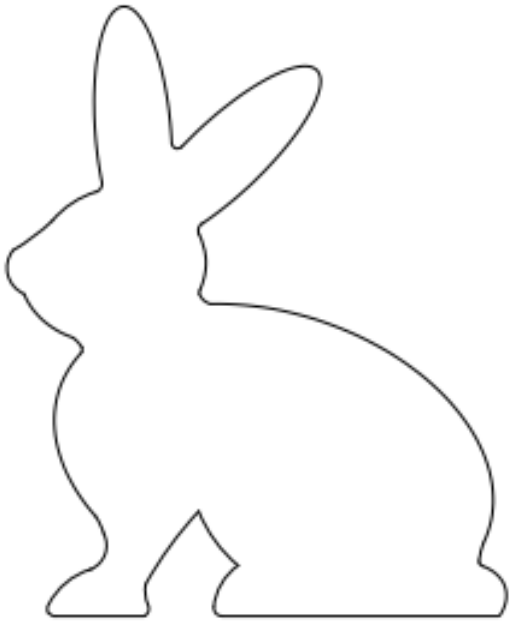
Remember that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone successful work and a lot of satisfaction with their projects!

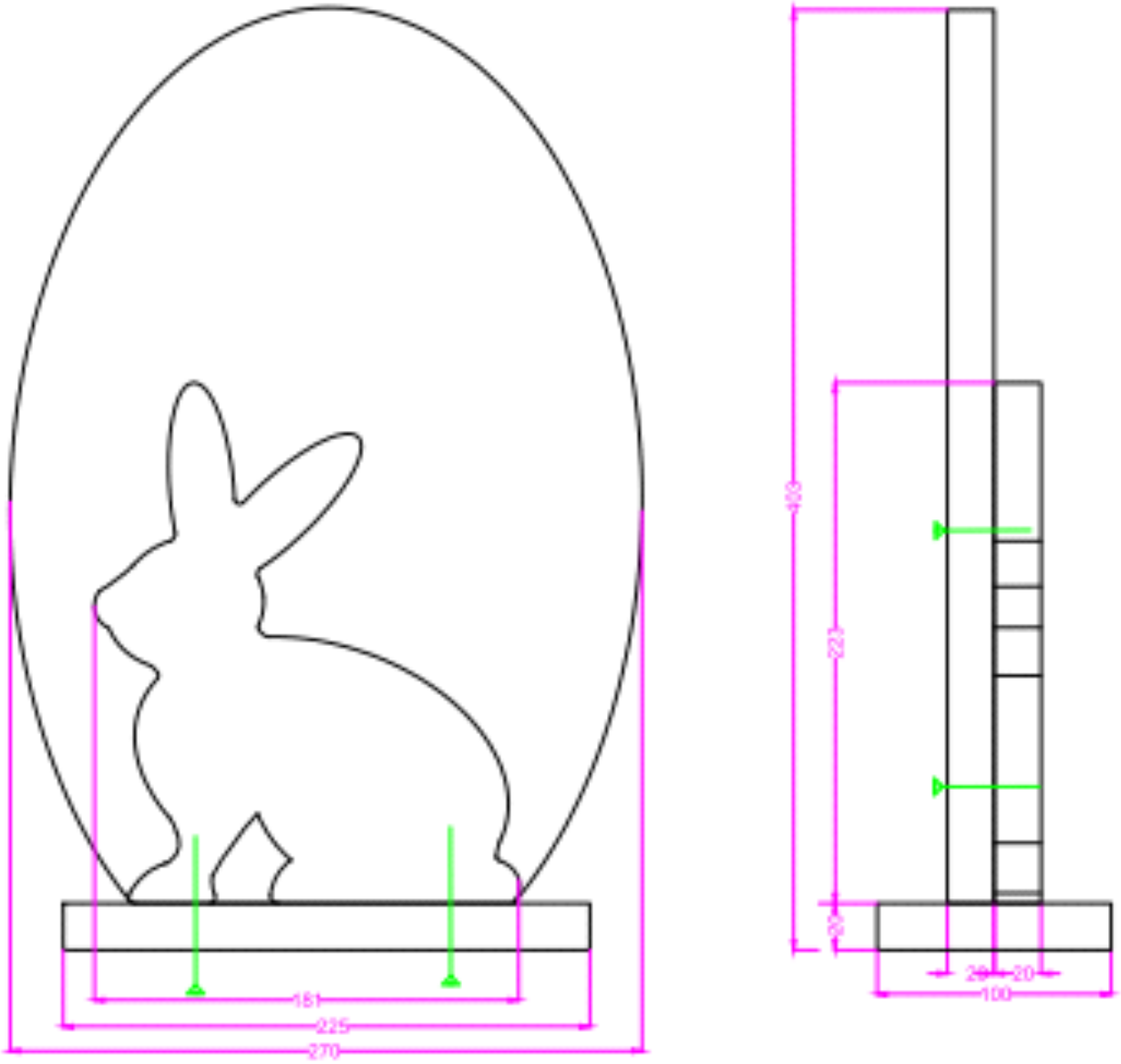
Wood species used in class: In this class we will use wood species known from previous classes. The idea is to use a variety of colors of the materials used. For example, I will suggest sycamore wood for the base and Eggs, and I propose to make the hare from much darker robinia or oak wood.

Practical task topic - Making an Easter decoration in the form of a wooden bunny with an egg

Example visualization:







Course of classes: Introduction of the topic of the class, time about 30 min

- I give the topic and objectives of the class
- I inform students that an essential part of the class will be a practical one involving making an Easter decoration in the form of an Easter bunny with an Easter egg,
- I inform students about the type of material we will be working in and describe it.
- I provide job instruction for the work site and the particular tools needed to perform.

Ongoing instruction, analysis of information, drawings, time about 15 minutes

- Students analyze the documentation,

- Are thinking about constructing action plans,

- reflect on the lists of components, tools and auxiliary equipment - reflect on the list of equipment, tools and control and measuring instruments and aids necessary for the task,

Ongoing instruction, demonstration

- each time at each stage of construction, the teacher demonstrates how to perform each operation before the students proceed with it

- each time before students use the tool, the teacher instructs and demonstrates how it should be used in practice,

-Each time with a new operation, the teacher presents a sample work with the given tool,

Ongoing instruction, organizing and execution, time approximately 170 minutes

- students, on the basis of documentation and prepared plan of action, independently gather at their workstations the tools necessary to perform the task, the necessary measuring instruments, supplies and auxiliary materials,
- Students perform the task according to the instructions for the task,
- after completing the practical part of the exercise, students clean up the workplace and secure the tools, evaluate the quality of the work they have done and justify the way it was done,

Final instruction, time about 10 minutes

- discuss classes: highlight achievements, analyze mistakes
- discuss the results of the work of each student group on the basis of the products made and justify the evaluation,

Teaching resources and materials:

Technical didactic means: a workstation equipped with a carpenter's table(s) adapted to the task and the number of students in the group(s).
Circular circular saw lengthwise, hand saw panel saw, jigsaw, drill/driver, pyrograph, brush for applying oil, rags for collecting excess oil (note that it is forbidden to leave damp oil rags in the workshop, they must be wet and disposed of, left in an enclosed space in favorable conditions may spontaneously combust),
Tools: a set of wood drill bits (diameters 10, 3, 2mm), jigsaw blades (fine wood tooth, 75mm long), sanding block, bevel box, conical countersink, pencil, protractor, meter, sandpaper P100, P120 and P180.
Materials: sycamore plank 900/280/20mm (for two people), robin plank 600/160/20mm (for two people), sycamore strip 500/100/20mm (for two people), screws 3/50mm(2pcs), screws 3/35mm(2pcs), clear oil or oil wax, quick-drying wood glue.

Didactic means of work: drawing documentation of the product, notebook for students.
Health and safety equipment: goggles and earmuffs for working with power tools, work clothes to protect against dirt.

The sequence of activities in the process of making a booth:

- Check the dimensions of the supplied components,
- plan the use of specific materials to make specific items,
- Cut a 280mm wide sycamore plank to a length of 380mm,
- Cut a 160mm wide robin board to a length of 230mm,
- Cut a 100mm wide sycamore strip to a length of 225mm,
- Determine through-hole locations for screws with a shank diameter of 3mm in the 100mm strip and 280mm board,
- Trace hare and egg shapes in the boards,
- Make holes with a diameter of 3 mm,
- Ream holes with a countersink with a diameter of 3mm on the outside (looking at the location of the element in the design),
- Using a jigsaw, cut out the shape of the hare and the egg,
- Sand the resulting parts with sandpaper starting with a P100 gradation and continuing with P120 and P180,
- Gently break the edges of all pieces using P120-grained paper, special attention to sanding the curved planes of the shape of the hare and egg,
- Assemble the hare-shaped element to the egg with 35mm long screws (grease the elements with a thin layer of glue before assembly),
- Assemble with 50mm long screws the base to the previously bolted structure,
  - paint the resulting structure with clear oil leaving the color of the wood and emphasizing its natural color, the drying time and method of operation should be adjusted according to the manufacturer's recommendations.

Topic: Making an Easter decoration in the form of a set of wooden napkin holders

Number of students: 8
NUMBER OF Hours: 5
Goals:

- Developing students' creativity and manual skills by creating Easter decorations.
- Introducing students to the traditions and symbolism of Easter.
- Strengthening the skills of planning and implementing artistic projects.

Form of classes: group and individual
Teaching methods: verbal: story/talk/instruction, practical**:** demonstration, measurement of things and method of practical classes
The specific goals are as follows:

Technical and manual skills:
Use of the tools:

- Students will learn how to use basic carpentry tools such as balls, drills, hammers, files and sandpaper safely.
- Students will be able to properly select tools for appropriate work, such as cutting, drilling, grinding and assembly.

Precision machining of materials:

- Students will learn techniques for measuring and trimming different types of wood to make small decorative elements.
- Students will learn the techniques of sanding and smoothing wooden surfaces to prepare them for painting or varnishing.

Creativity and aesthetics:
Designing ornaments:

- Students will design their own Christmas decorations, taking into account traditional elements and their own ideas.
- Students will learn various decorative techniques such as painting, engraving, burning and stained glass on wood.

Implementation and finishing of the project:

- Students will independently make Christmas decorations, step by step realizing their projects.
- Students will learn how to use different types of finishes, such as varnishes, acrylic paints, stains, and methods of protecting wood from damage.

Tradition and culture:

Getting to know the symbolism of Easter:

- Students will learn about the meaning and symbolism of traditional Easter decorations such as Easter eggs, lambs, bunnies, palms and spring flowers.
- Students will learn a variety of decorating techniques and patterns related to Easter and regional traditions.

Cooperation and organization of work:
Group work

- Students will work in small groups, learning how to collaborate, share tasks and take responsibility for the different stages of the project.
- Develop communication skills and problem solving together while working on ornaments.

Workplace Organization

- Students will learn how to organize the workplace in the workshop, taking care of order, safety and effective use of tools and materials.
- Students will pay attention to the safe storage of tools and materials and the maintenance of order in the workplace.

Positive effects of creating your own Christmas decorations:
Development of manual and artistic skills:

- Creating Christmas decorations allows you to develop artistic abilities, spatial imagination and manual precision.

Raising self-esteem:

- Students gain a sense of satisfaction and fulfillment by seeing the effect of their work, which positively affects their self-esteem and motivation for further learning.

Understanding and nurturing traditions:

- Creating Christmas decorations is an opportunity to get to know and cultivate cultural traditions, which strengthens social and family ties.

Strengthening cooperation:

- Working on projects in groups teaches cooperation, responsibility and communication, which is extremely important in the development of children's social skills.

Relaxation and stress reduction:

- Creative manual activities have a relaxing effect and can help reduce tension and stress, improving students' overall emotional state.

Introduction – health and safety rules when using hand tools during work in a carpentry workshop

Today we will be working with wood, which is very exciting, but remember that safety is paramount. Working with hand tools can be safe and enjoyable if we follow a few basic health and safety rules. Here are some of the most important rules we need to follow during our lesson:

Preparation of workplace:

- **Cleanliness and tidiness:** Before we start work, let's make sure our workstation is clean and everything is in place. Avoid messes that can lead to accidents.
- **Proper lighting:** Let's make sure our workplace is well lit so we can clearly see what we are doing.

Appropriate attire and equipment

- **Clothing:** Wear work clothes or an apron that covers the body and does not have loose elements that could get caught in the tools.
- **Eye protection:** Wearing safety goggles is mandatory to protect your eyes from wood dust and possible wood splinters.

Safe use of hand tools

- **Tools in good condition:** Make sure all the tools we will be using are in good condition. Blunt tools are less safe than sharp tools.
- **Proper tool holding:** Tools should be held securely and used with both hands whenever possible to ensure stability.
- **Checking the tools before use:** Before starting work, we carefully check the tools for damage. If we notice a damaged tool, we do not use it and inform the teacher.
- **Use of tools as intended:** Each tool has a specific application. We use hand tools only for the purposes for which they are intended. We never use a chisel as a hammer or a saw as a chisel.

- **working techniques: Stable material positioning:** The wood we are working on should be well fixed on the workbench or in a vice so that it does not slide during processing.
- **Working away from the body:** When cutting, drilling or chiselling, we always work away from the body to minimize the risk of injury if the tool slips.
- **Even and controlled movements:** We use hand tools in moderation without applying excessive force. Movements should be controlled and uniform to avoid accidental damage to material or tools.

Exercise caution and attention

- **Concentration:** When working with hand tools, keep full concentration and attention. We do not talk to others or engage in other activities.
- **Rest breaks:** If we feel tired, we take a break. Fatigue can lead to mistakes and accidents.

Action in case of accidents

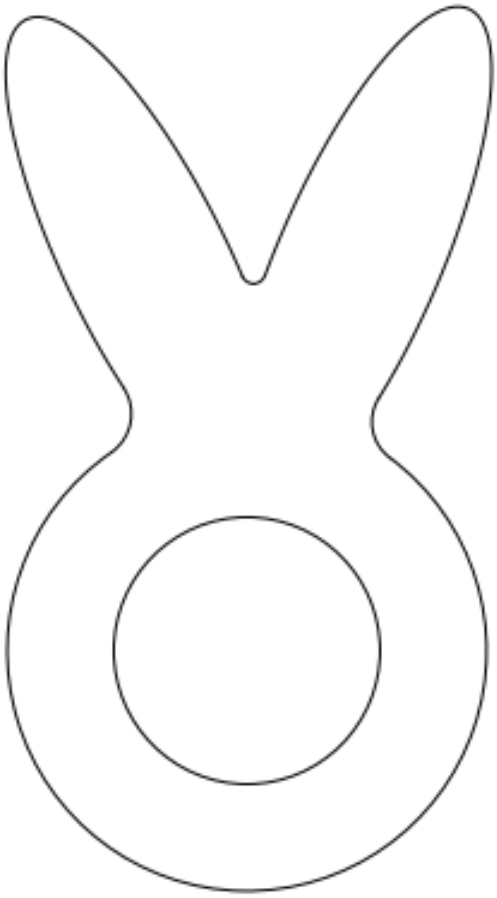
- **Accident reporting:** In case of injury or other injury, we will inform the teacher immediately. Even minor wounds must be properly dressed.
- **First aid kit:** A first aid kit should be available at the workplace so that first aid can be provided quickly if needed.

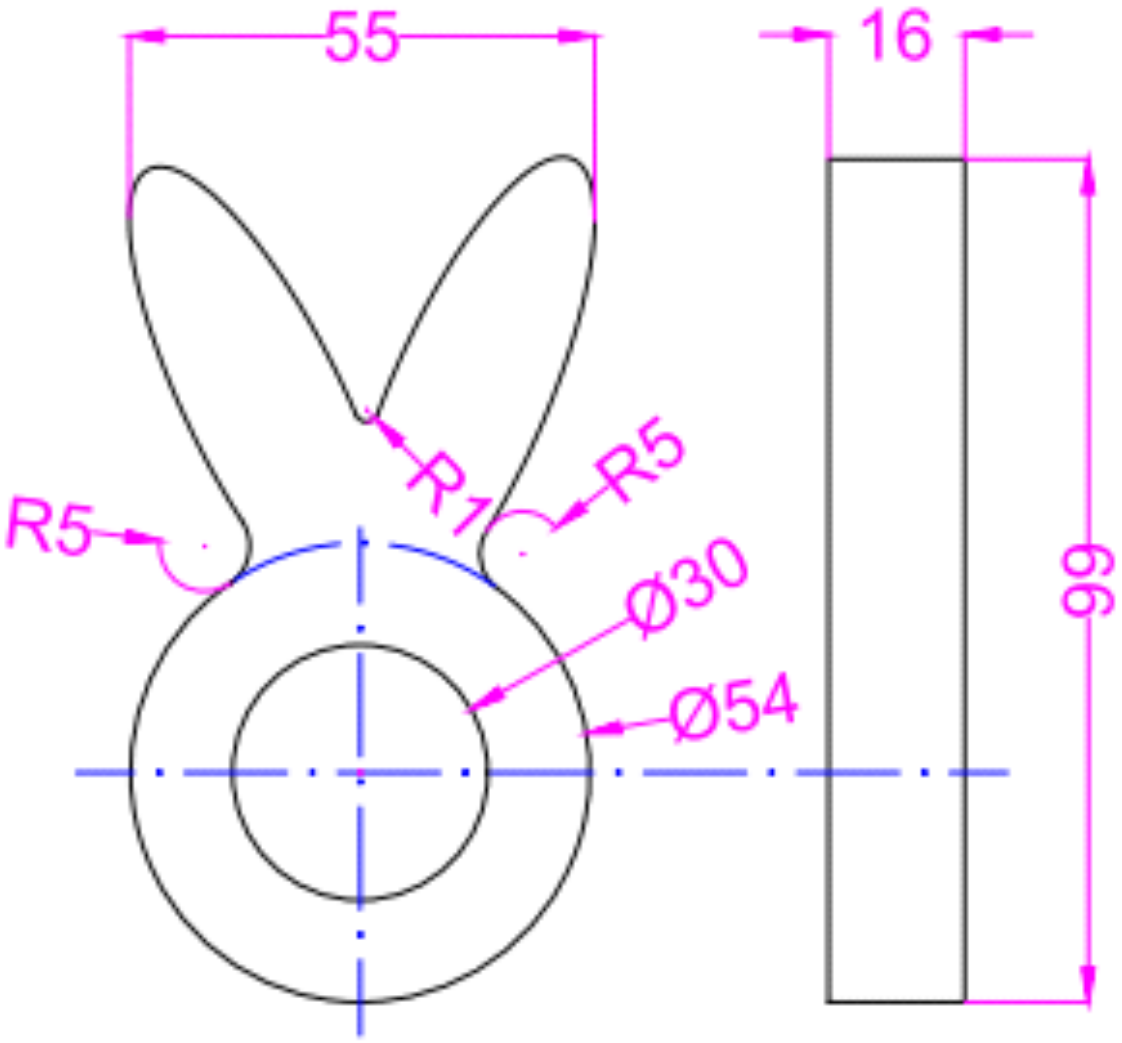
Keep in mind that following these rules will help us all work safely and effectively. Working with wood can be great fun and learning if we are responsible and careful. I wish everyone a successful job and a lot of satisfaction from the projects!

Wood species used in classes: In classes, we will use wood species known from previous classes. Hard colorful species such as robinia, oak, walnut or fruit trees can be used for this type.

Practical task topic – Making an Easter decoration in the form of a set of wooden napkin holders

Sample visualization





Course of classes: Presentation of the subject of classes, time about 30 minutes

- provide the topic and objectives of the class
- i would like to inform students that the main part of the class will be a practical task consisting in making an Easter decoration in the form of a set of six napkin holders,
- inform students about the type of material in which we will work and describe it.
- provide on-the-job training for the workplace and individual tools necessary to perform it.

Ongoing training, analysis of information, drawings, time about 15 minutes
- students analyze the documentation,
- they are thinking about constructing action plans,
- they reflect on the lists of auxiliary elements, tools and devices - they reflect on the list of control and measurement devices, tools and instruments necessary to perform the task, as well as auxiliary means,

Ongoing training, demonstration
- each time at each stage of the construction, the teacher presents the method of performing each of the operations before the students start it
- each time before using the tool by students, the teacher instructs and shows how it should be used in practice,
- each time during a new operation, the teacher presents a trial work with a given tool,

Ongoing training, organization and execution, time approx. 170 min
- students, on the basis of documentation and a prepared action plan, independently collect at their workstations the tools necessary to perform the task, the necessary measuring instruments, consumables and auxiliary materials,
- students perform the task according to the instruction to perform the task,
- after completing the practical part of the exercise, students organize the workplace and secure the tools, assess the quality of their work and justify the way it is done,

Final training, time about 10 minutes
- i discuss classes: I emphasize achievements, analyze mistakes
- i discuss the results of the work of individual student groups on the basis of the products made and justify the assessment,

Means and teaching materials:

Technical teaching aids: a workstation equipped with a carpentry table/tables tailored to the performance of the task and the number of students in the group/groups.
Longitudinal circular saw, hand saw, jigsaw (it is recommended to perform this task with a hair saw), drill-drill (it is recommended to use a vertical/column drill for this task), pyrograph, brush for applying oil, cloth for collecting excess oil (remember that it is forbidden to leave damp oil cloths in the workshop, they should be wetted and disposed of, left in an enclosed space in favorable conditions may spontaneously ignite),
Tools: a set of drill bits for wood (diameters 10, 2mm), a cylindrical drill bit with a diameter of 30mm, jigsaw blades (tapered width approx. 3mm, fine tooth for wood,

length 75mm), a grinding cube, a mitre box, a pencil, an angle bar, a tape measure, sandpaper P100, P120 and P180.

Materials: 650/60/16mm cherry strip, colourless oil or oil wax,

Didactic means of work: drawing documentation of the product, notebook for students.

Occupational health and safety equipment: glasses and earmuffs for work with power tools, work clothes to prevent dirt.

Sequence of activities in the process of building the booth:

- check the dimensions of the delivered elements,
- plan the use of individual materials to make specific elements,
- trace the strip on six equal fields,
- designate places for through holes of 30mm in the cherry strip,
- trace the shapes of the six handles in the strip,
- make holes with a diameter of 30 mm (remember to place a piece of inferior quality wood on the left side before drilling to avoid tears when the drill passes to the other side),
- divide/saw the cherry strip into six parts, each of which is traced and there is already a 30mm hole in each,
- use a jigsaw to cut the outer shape of the handle,
- grind the resulting elements with sandpaper, starting with the gradation P100 and continuing with P120 and P180,
- gently break the edges of all elements using P120 graded paper, special attention should be paid to grinding the curvilinear planes of the handle shape,

- paint the resulting elements with colorless oil, leaving the color of the wood and emphasizing its natural color, drying time and method of operation to adapt to the manufacturer's recommendations.