Gardening

educational program

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Authors:
Łukasz Bogucki
Gustavo Gabriel Ferrari Ortiz
Liene Brēdiķe
Judita Árendáš
Miroslava Adamcová
Taťána Iljašenková
Marius Hempel
Lisa Nesseler

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The Montessori method is a pedagogical approach that involves creating an environment that promotes the child's natural development through independent exploration and learning. Although this method is mainly related to children's education, its philosophy can also be applied to other areas of life, such as maintaining a vegetable garden or orchard. Here are some ways Montessori principles can be applied to running an orchard and vegetable garden:

1. Creating an accessible environment: As in the case of a Montessori classroom, it is worth providing a space in the garden that is accessible and understandable to everyone, including children. This means enabling children to participate in gardening by providing them with the right tools and explaining what needs to be done.

2. Independence and responsibility: Montessori places great emphasis on the development of independence and responsibility in children. In a vegetable garden, children can be encouraged to undertake simple tasks such as watering plants, removing weeds or picking fruit. Thanks to this, children learn to take care of plants and feel satisfaction from their own achievements.

3. Sensory experiences: Montessori promotes the active use of the senses for learning. A vegetable garden can provide children with a variety of sensory experiences, such as touching different plant textures, observing the colors and shapes of fruit, and smelling the scents of flowers.

4. Learning about the life cycle of plants: Montessori focuses on education through experience. In the garden, children can be shown the life cycle of plants, from planting seeds, through observing the growth and development of plants, to harvesting fruit or collecting seeds for replanting.

5. Individualization and flexibility: The Montessori method takes into account individual learning pace and styles. In the garden, it is worth encouraging children to explore and discover in a way that best suits their needs and interests. This may mean providing different types of plants to study or being able to choose your own garden activities.

6. Integrating nature and science: Montessori encourages the integration of science and nature. In the garden, you can take advantage of various learning opportunities, for example by observing nature, learning the names of plants and

animals, examining the differences between plant varieties, or experimenting with growing methods.

Applying Montessori principles to maintaining a vegetable garden or orchard can bring many benefits, both educationally and emotionally, for both children and adults. This approach can help children develop a connection with nature, an understanding of plant life processes, and the ability to care for their surroundings.

The garden and orchard are perfect places to conduct practical classes with students, which not only develop their gardening skills, but also promote a healthy lifestyle, respect for the natural environment and creativity. Here are some possible practical activities that can be organized with students in the garden and orchard:

1. Planting and caring for plants: Students can take part in the process of planting various plants in the garden and orchard. Practical classes will include soil preparation, selecting appropriate plants, planting, irrigation, weed removal and plant care.

2. Harvesting: Students may have the opportunity to collect fruits, vegetables and herbs from the garden and orchard. During these classes, they can learn when plants are ready for harvest, how to harvest them without damaging them, and how to store the harvested crops.

3. Preparing Compost: Composting is an important garden process that helps maintain soil fertility and reduce organic waste. Students can take part in preparing compost by separating organic waste, processing the composter and monitoring the decomposition process.

4. Planting ornamental plants: Students can participate in planting ornamental plants such as annual flowers, perennials and ornamental shrubs. They can also learn about garden design techniques and creating harmonious plant compositions.

5. Pruning and shaping plants: Students can learn basic techniques for trimming and shaping plants such as fruit bushes, ornamental trees and hedges. Hands-on activities include learning about gardening tools and how to prune.

6. Soil testing: Students can participate in collecting soil samples from the garden and orchard and analyzing its chemical and physical composition. Understanding the soil needs of plants is crucial for their proper growth and development.

7. Lawn care: Students can learn about lawn care, including mowing, fertilizing, watering and weed control. Hands-on activities will help them understand how to keep their lawn in good condition throughout the season.

8. Garden design: Older students can take part in designing a garden or orchard, taking into account various factors such as light, climate and soil conditions, as well as aesthetic and functional preferences.

9. Garden Tool Maintenance: Students can learn basic garden tool maintenance techniques such as cleaning, sharpening and lubrication to ensure their long life and effective performance.

10. Design and construction of garden elements: Students can take part in the design and construction of garden elements, such as flower pots, pergolas, or gazebos. These are classes that develop their manual skills and creativity.

These practical classes not only teach students practical gardening skills, but also promote a healthy lifestyle, respect for the natural environment and the development of interests in the field of gardening and agriculture.

Annual work plan:

Here is a sample annual work plan for a gardening teacher that can be adapted to specific needs and local conditions:

September October:

1. Planning: Developing a lesson plan for the entire school year, taking into account educational goals, teaching materials and teaching methods.
2. Site Preparation: A survey of the school garden or use area to assess condition and dev elop a plan to improve or change it.
3. Collecting materials: Collecting necessary gardening tools, seeds and seed potatoes and other necessary materials.
4. Gardening Basics: Begin teaching basic gardening concepts such as plant life cycle, soil types, growing methods, etc.
5. Preparatory work: Performing preparatory work for the gardening season, such as cleaning beds, preparing the composter, repairing tools.

November - December:

1. Starting a composter: Teaching children how to compost and its benefits for the garden.
2. Plant planning: Helping students plan what plants will be grown in the school

garden next season.
3. Maintenance work: Carrying out garden maintenance work such as cutting plants, removing weeds, preparing areas for new plantings.
4. Educational projects: Planning educational projects related to gardening, such as research on plants, designing a dream garden, or artwork related to gardening.
5. Greenhouse work: Teaching children about potted plants and growing in a greenhouse.

January February:

1. Cultivation planning: Plant planning for the upcoming season, including the selection of varieties, sowing and planting dates.
2. Indoor sowing: Start sowing seeds indoors if outdoor conditions are not yet favorable.
3. Teaching about fertilization: Teaching children about the importance of fertilization, types of fertilizers and their uses.
4. Winter educational activities: Planning educational activities related to gardening that can be carried out during the winter, such as theoretical lessons, films, discussions.
5. Garden Layout Design: Helping students design the garden layout for the upcoming season.

March April:

1. Preparation of beds: Preparation of beds for sowing and planting, including fertilization and improvement of soil structure.
2. Outdoor Sowing: Start sowing seeds outdoors according to the weather schedule and local conditions.
3. Planting Plants: Plant plants in the garden, teaching children proper planting techniques and spacing between plants.
4. Teaching about gardening: Teaching children about regular garden care, including watering, removing weeds and protecting plants from pests and diseases.
5. Designing Irrigation Systems: Helping students design and build simple irrigation systems.

May June:

1. Follow-up care: Continued garden care, including watering, weeding, fertilizing and pest control.
2. Harvesting fruits and vegetables: Conducting activities related to harvesting fruits and vegetables from the garden, teaching children harvesting and storage

techniques.

3. Season Assessment: Review of the gardening season, assessing successes and failures, discussing possible improvements for the future.
4. Summer projects: Planning summer gardening projects, such as research activities, clean-up activities, or construction of new garden elements.
5. End of the year: Summary of the school year, thanks to students for their work in the garden, planning activities for the next year.

July August:

1. Preparation for the next season: Preparing the garden for winter, including cleaning work and protecting plants against frost.
2. Care of previously planted vegetables, trees and fruit bushes.

Theoretical lesson plans:

I. Topic: Growing Vegetables - Basics of Gardening

Lesson goals:
1. Understanding the process of growing vegetables.
2. Learning the basic conditions needed for the growth and development of vegetables.
3. Understand the differences between different types of vegetables.
4. Become familiar with the tools and techniques needed to grow vegetables.

Materials:
1. Multimedia presentation with images of various vegetables and the process of growing them.
2. Posters or boards with the rules of growing vegetables.
3. Garden tools: spade, rake, bucket, etc.
4. Examples of vegetable seeds.

Learning methods:
1. Interactive lecture.
2. Group discussion.
3. Practical demonstration.
4. Practical exercises in the school garden (if possible).

Lesson course:
I. Introduction:
- Welcome of students and a short introduction to the topic.
- Multimedia presentation with various types of vegetables and their names.

II. Basic conditions for growing vegetables:
- Discussion of the conditions needed for the growth of vegetables: sun, water, soil, air.
- Discussion on the role of each of these factors in the plant growth process.

III. Differences between different types of vegetables:
- Discuss the differences between leaf, root, legume and fruit vegetables.
- Showing examples of each type of vegetable.

IV. Tools and techniques for growing vegetables:
- Presentation of various gardening tools and their uses.
- Discussion of basic techniques of planting, watering, fertilizing and caring for

vegetable plants.

V. Practical exercises:
- If possible, conducting practical exercises in the school garden.
- Students will have the opportunity to put on gardening gloves and use tools to plant vegetable seeds or perform other gardening activities under teacher supervision.

VI. Summary and discussion:
- A short repetition of the material discussed.
- Discussion about students' experiences during practical exercises.
- Homework: Research what vegetables can be grown at home on the windowsill or balcony and prepare a list of plants they would like to plant in the school garden.

End:
Thanking students for their participation and encouraging them to continue learning about growing vegetables at home and at school.

Note to the presenter:

1. Choosing a place

- Sun exposure: Most vegetables need at least 6-8 hours of sun per day.

- Soil: It should be well-drained and rich in organic matter. You can improve the soil by adding compost or well-rotted manure.

- Access to water: It is important that the place is easily accessible for watering.

2. Garden planning

- Vegetable selection: Choose vegetables that you like and that grow well in your climate.

- Crop rotation: Practice crop rotation to prevent soil nutrient depletion and reduce the risk of disease.

- Spacing: Make sure the plants have adequate space to grow. Spacing information can be found on seed packets.

3. Soil preparation

- Weeding: Remove any weeds from the area where you plan to plant vegetables.

- Loosening: Dig the soil to a depth of 20-30 cm to aerate it.

- Fertilization: Add compost or other natural fertilizers to improve soil structure and

provide nutrients.

4. Sowing and planting

- Seeds or seedlings: Some vegetables, such as carrots or radishes, are better sown directly into the ground, while others, such as tomatoes or peppers, can be sown in pots and then transplanted into the garden.

- Depth and distance: Sow seeds at the appropriate depth and spacing. This information is usually found on the seed package.

5. Care

- Watering: Vegetables need regular watering, especially during periods of drought. Make sure the soil is evenly moist but not soggy.

- Weeding: Regularly remove weeds that compete with vegetables for water and nutrients.

- Fertilization: Depending on your needs, you can feed the plants with organic fertilizers during growth.

- Mulching: You can use mulch to keep the soil moist and prevent weeds from growing.

6. Protection against pests and diseases

- Natural methods: Use natural methods of protection, such as introducing predatory insects, using preparations based on garlic or nettle.

- Spraying: If necessary, you can use ecological plant protection products available in gardening stores.

7. Harvesting the crops

- Timelines: Harvest vegetables at the right time to enjoy their best taste and nutritional value.

II. Topic: Growing Fruit - Basics of Gardening

Lesson goals:
1. Understanding the process of growing fruit.
2. Learning the basic requirements for the growth and care of fruit plants.
3. Getting to know different species of fruit and their characteristics.
4. Learning basic techniques for planting and caring for fruit plants.

Materials:
1. Multimedia presentation with images of various fruit species and the process of their cultivation.
2. Posters or boards with rules for growing fruit plants.
3. Garden tools: shovel, rake, pruner, etc.
4. Examples of fruit bush seedlings.

Learning methods:
1. Interactive lecture.
2. Group discussion.
3. Practical demonstration.
4. Practical exercises in the school garden (if possible).

Lesson course:
I. Introduction:
- Greeting students and introducing the topic.
- A short multimedia presentation with various types of fruit.

II. Basic requirements for growing fruit (15 minutes):
- Discussion of the basic factors needed for the growth of fruit plants: light, water, soil, temperature.
- Discussion on the impact of each of these factors on the plant growth process.

III. Various types of fruit:
- Discussion of various types of fruit, such as apples, pears, strawberries, raspberries and currants.
- Showing examples of each of these fruit species and discussing their characteristics and cultivation requirements.

IV. Planting and care techniques:
- Presentation of basic techniques for planting fruit plants, such as selecting an appropriate site, preparing the soil, planting, watering and fertilizing.
- Discuss the need to care for fruit plants, such as pruning, weed removal and pest protection.

V. Practical exercises:
- If possible, conducting practical exercises in the school garden.
- Students will have the opportunity to put on gardening gloves and use tools to plant fruit seedlings or carry out other gardening activities under the supervision of the teacher.

VI. Summary and discussion:
- A short repetition of the material discussed.
- Discussion about students' experiences during practical exercises.
- Homework: Research what fruit species are typical for a given region and prepare a list of fruits they would like to plant in the school garden.

End:
Thanking students for their participation and encouraging them to continue learning about fruit growing at home and at school.

Note to the presenter:
Growing fruit trees and bushes in the garden is a great way to enjoy fresh fruit and improve the aesthetics of the space. Below are key steps and tips for growing fruit trees and shrubs.

Choosing the right plants:
1. Type of tree/shrub:
- Fruit trees: apple trees, pear trees, plum trees, cherries, peaches, apricots.
- Fruit bushes: currants, gooseberries, raspberries, blueberries, blackberries.
2. Climate: Choose plants that are suitable for your climate. Some varieties may be more resistant to cold, others to drought.
3. Soil: Check the soil requirements for the selected plants. Most fruit trees prefer well-drained, fertile soil.

Place planning:
1. Sun exposure: Most fruit trees and shrubs need at least 6-8 hours of full sun per day.
2. Space: Provide adequate growing space both above and below ground. Plants need room for roots and crowns to grow.
3. Drainage: Choose a location with good drainage to avoid root rot.

Planting:
1. Planting date: The best time to plant fruit trees is late autumn or early spring, when the plants are dormant.
2. Preparing the hole: Dig a hole twice the size of the root ball. The bottom of

the hole should be well loosened.
3. Planting: Place the plant in the hole, cover it with soil and water well. Make sure the vaccination site (if any) is just above the soil surface.

Care:
1. Watering: Water young trees and shrubs regularly, especially in the first year after planting. Older plants may require less water, but they also need to be watered during periods of drought.
2. Fertilize: Apply organic fertilizers or specialized fruit tree fertilizers to provide adequate nutrients.
3. Mulch: Mulch helps retain moisture, control weeds and improves soil structure. Use compost, tree bark or straw.

Trimming and shaping:
1. Pruning: Regular pruning helps keep plants healthy, improves air and light flow, and increases yield. Prune dead, diseased or crossing branches.
2. Shaping: Shape the tree crowns so that they are well spread and stable. Fruit bushes can be formed in different ways, depending on the species.

Protection against pests and diseases:
1. Monitoring: Check your plants regularly for signs of disease and pests.
2. Natural methods: Use natural methods of plant protection, such as the introduction of predatory insects, the use of garlic or nettle preparations.
3. Spraying: If necessary, use ecological plant protection products available in gardening stores.

Set of fruits:

1. Harvest date: Harvest the fruit when it is fully ripe to enjoy its best taste and nutritional value.
2. Storage: Some fruits can be stored in cool, dry places, others are best eaten immediately after harvesting or processed.

III. Topic: Tools used in Gardening

Lesson goals:
1. To familiarize students with various gardening tools and their uses.
2. Learning to use gardening tools properly.
3. Understanding the importance of having the right tool for a specific garden job.
4. Encouraging the practical use of tools when working in the garden.

Materials:
1. Multimedia presentation with images of various gardening tools.
2. Actual examples of gardening tools such as spades, rakes, pruning shears, etc.
3. Posters or boards with the names and uses of gardening tools.

Learning methods:
1. Interactive lecture.
2. Group discussion.
3. Practical demonstration.
4. Practical exercises in the school garden (if possible).

Lesson course:
I. Introduction:
- Welcome students and introduction to the topic.
- A short multimedia presentation with various gardening tools.

II. Basic gardening tools:
- Discussion of various gardening tools such as:
- Spade
- Rake
- Aug
- Pruning shears
- Shoulder
- Bucket
- Garden hose
- Watering can
- Discuss the use of each of these tools in the garden.

III. Techniques for using tools correctly:
- Explaining the basic rules for the safe and effective use of gardening tools.
- Presenting proper working techniques with each tool to avoid injuries and ensure work efficiency.

IV. Practical demonstrations:

- Practical demonstration of using various gardening tools.
- Students will have the opportunity to watch the teacher demonstrate the correct use of the tools and will also be able to try out the tools themselves under the teacher's supervision.

V. Practical exercises:
- If possible, conducting practical exercises in the school garden.
- Students will have the opportunity to use gardening tools to perform simple gardening tasks such as planting plants, removing weeds and pruning branches.

VI. Summary and discussion:**
- A short repetition of the material discussed.
- Discussion about students' experiences during practical exercises with gardening tools.
- Encouragement to continue learning and practicing the use of gardening tools at home and at school.

End:
Thanking students for their participation and emphasizing the importance of knowing and being able to use gardening tools to work effectively in the garden.

Note to the presenter:
Growing a garden requires the use of various tools that make work easier and help take care of plants. Below is an overview of basic gardening tools and their uses.

Basic hand tools:
1. Shovel (spade):
- Application: Digging the soil, planting plants, transplanting, digging holes.
- Types: Straight spade (for hard soil), pointed spade (for soft soil).

2. Rake:
- Application: Raking leaves, breaking up clods of earth, leveling the soil.
- Types: Metal rake (for harder work), plastic rake (for delicate work, e.g. leaves).

3. Hoe:
- Application: loosening the soil, weeding, removing weeds.
- Types: Single- or double-bladed hoe, serrated hoe.

4. Garden claws:
- Application: Loosening the soil around plants, removing weeds.
- Types: Hand claws, long-handled claws.

5. Forks:
- Application: Moving compost, hay, loosening the soil.
- Types: Garden forks (shorter and wide), hay forks (longer and narrower).

Trimming and cutting tools:
1. Secateurs:
- Application: Cutting branches, trimming bushes and shoots.
- Types: One-handed secateurs (for thinner branches), two-handed secateurs (for thicker branches).

2. Hedge trimmer:
- Application: Trimming and shaping hedges.
- Types: Hand scissors, electric scissors, petrol scissors.

3. Garden saws:
- Application: Cutting thicker branches and limbs.
- Types: Hand saws, folding saws, telescopic saws.

Watering tools:
1. Watering cans:
- Application: Manual watering of plants, especially sensitive to a strong stream of water.
- Types: Plastic, metal watering cans, with various capacities.

2. Garden hoses:
- Application: Watering large areas, filling tanks with water.
- Accessories: Nozzles, sprinklers, hose reels.

3. Sprinklers:
- Application: Automatic watering of lawns and flowerbeds.
- Types: Rotating, pulsating, stationary sprinklers.

Soil care tools:
1. Tillers:
- Application: Loosening and mixing soil on large areas.
- Types: Manual, electric, combustion tillers.

2. Garden rollers:
- Application: Leveling the soil, compacting the lawn after sowing seeds.
- Types: Hand rollers, water rollers (can be filled with water for more weight).

Tools for transplanting and planting:

1. Garden shovels:
- Application: Planting and transplanting small plants, flowers, herbs.
- Types: Narrow, wide blades, with depth gauge.

2. Planters:
- Application: Making holes for bulbs and small plants.
- Types: Manual, automatic planters.

Protective and auxiliary tools:
1. Garden gloves:
- Application: Protection of hands against dirt, cuts and chemicals.
- Types: Gloves with rubber coating, leather, fabric.

2. Wheelbarrows:
- Application: Transport of soil, compost, garden tools.
- Types: One- or two-wheeled wheelbarrows, metal, plastic.

3. Nets and supports:
- Application: Supports for climbing plants, protection against pests.
- Types: Plastic nets, metal nets, bamboo supports.

IV. Topic: Cutting and shaping fruit trees

Lesson goals:
1. Understand the importance of pruning and shaping fruit trees for their health and productivity.
2. Learning different techniques for cutting and shaping fruit trees.
3. Learning the proper time and method of cutting and shaping fruit trees.
4. Encouraging the practical use of skills in cutting and shaping fruit trees in the garden.

Materials:
1. Multimedia presentation with images of various techniques for cutting and shaping fruit trees.
2. Actual examples of garden cutting tools, such as pruning shears, garden saw, pruner.
3. Posters or boards describing techniques for cutting and shaping fruit trees.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises in the school garden (if possible).

Lesson course:
I. Introduction:
- Greeting students and introducing the topic.
- A short multimedia presentation with various techniques for cutting and shaping fruit trees.

II. Importance of cutting and shaping fruit trees:
- Discuss the importance of cutting and shaping fruit trees for their health, shape and fertility.
- Explain why regular pruning and shaping of fruit trees is important to obtain high-quality fruit.

III. Fruit tree cutting techniques:
- Discuss various fruit tree cutting techniques such as:
- Forming cutting
- Maintenance cutting
- Rejuvenating cut
- Showing examples of each of these techniques and their application.

IV. Period of cutting and shaping fruit trees:
- Discussion of the best time to cut and shape fruit trees, depending on the species and climatic conditions.
- Explain why it is important to respect specific cutting dates at different times of the year.

V. Practical demonstration:
- Presenting a practical demonstration of cutting and shaping fruit trees using examples of real trees.
- Students will have the opportunity to observe the teacher cutting and shaping fruit trees and ask questions about techniques and principles.

VI. Practical exercises:
- If possible, conducting practical exercises in the school garden.
- Students will have the opportunity to cut and shape fruit trees on their own under the supervision of a teacher.

VII. Summary and discussion:
- A short repetition of the material discussed.
- Discussion about students' experiences during practical exercises with cutting and shaping fruit trees.
- Encouragement to continue learning and practicing cutting and shaping fruit trees at home and at school.

End:
Thanking students for their participation and emphasizing the importance of the ability to cut and shape fruit trees to maintain the health and fertility of plants.

Note to the presenter:
Pruning fruit trees and bushes is crucial for their health, growth and fruiting. Here is a detailed guide on how to prune fruit trees and shrubs.

1. Trimming tools
- Hand pruner: For thin branches and shoots.
- Two-handed pruner: For thicker branches.
- Garden saw: For very thick branches.
- Hedge trimmers: For trimming fruit bushes.

2. When to prune
- Pomegranate trees (apple trees, pear trees): It is best to prune in early spring, before the beginning of vegetation, but after the greatest frosts.
- Stone fruit trees (cherries, sweet cherries, plums): Prune in late spring or early

summer, after fruiting, to minimize the risk of infection.
- Fruit bushes (currants, gooseberries, raspberries): Prune in early spring or after fruiting, depending on the species.

3. Pruning techniques

Fruit trees:
a) Formative pruning:
- First year: Shorten the main shoot to a height of about 80-100 cm. Select 3-4 of the strongest side shoots and shorten them to a length of 30-40 cm.
- Second year: Select the main shoot and shorten it by about 30 cm. Shorten the side shoots by half their length.

b) Light cropping:
- Remove dead, diseased and damaged branches.
- Remove branches that cross and grow towards the center of the crown to improve airflow and light.

c) Rejuvenation Pruning:
- Apply every few years to stimulate the growth of new shoots.
- Shorten older, less fruit-bearing branches to strong side shoots.

Fruit bushes:
a) Currants and gooseberries:
- First year: Shorten all shoots by half.
- Subsequent years: Remove the oldest shoots (3-4 years old) at the ground level to stimulate the growth of new shoots. Shorten side shoots by 1/3 of their length.

b) Raspberries:
- Summer raspberries: After fruiting, remove all fruiting shoots at the ground level. Leave new shoots for next year.
- Autumn raspberries: After fruiting (in autumn), cut all the shoots to the ground. New shoots will grow in spring and bear fruit in autumn.

4. Trimming steps
1. Clean your tools: Make sure your tools are clean and sharp to prevent the spread of disease.
2. Remove dead and diseased branches: Always start by removing dead, diseased or damaged branches.
3. Remove intersecting and inward-growing shoots: To improve airflow and light access.
4. Prune healthy shoots: Always cut above a healthy bud that is facing outward to

maintain the natural shape of the tree or shrub.
5. Control height: Shorten the main shoot to control height and promote lateral growth.

5. Care after pruning
- Watering: Make sure your plants have enough water, especially during dry periods.
- Fertilization: Fertilize plants with compost or special fertilizers for fruit trees and shrubs to support regeneration and growth.
- Disease control: Check your plants regularly for signs of disease and pests. Use appropriate plant protection products if necessary.

V. Topic: Rare Vegetables and Fruits

Lesson goals:
1. Familiarizing students with a variety of vegetables and fruits not commonly known.
2. Learning about the nutritional value and health properties of rare vegetables and fruits.
3. Encouraging students to experiment with different varieties of vegetables and fruits in their diet.
4. Promoting ecological awareness by promoting plant diversity.

Materials:
1. Multimedia presentation with images of rare vegetables and fruits.
2. Sample samples of rare vegetables and fruits (if available).
3. Posters or boards with information about the nutritional value and health benefits of rare vegetables and fruits.

Learning methods:
1. Interactive lecture.
2. Group discussion.
3. Tasting show.
4. Research in pairs or small groups.

Lesson course:
I. Introduction:
- Greeting students and introducing the topic.
- A short multimedia presentation with a variety of rare vegetables and fruits.

II. Discussion of the variety of rare vegetables and fruits:
- Discussion of various types of vegetables and fruits not commonly known, such as:
- Vegetables: kohlrabi, kale, parsnip, rutabaga, rhubarb, Jerusalem artichoke
- Fruits: pomegranate, fig, fig cactus, kiwano, goji fruit
- Discussion of the characteristics of each of these vegetables and fruits and their use in the kitchen.

III. Nutritional value and health benefits:
- Discuss the nutritional value of rare vegetables and fruits, such as high content of vitamins, minerals and antioxidants.
- Discuss the health benefits of eating these vegetables and fruits, such as strengthening the immune system, improving digestion, and supporting heart health.

IV. Tasting show:
- Preparing small portions of various rare vegetables and fruits for students to taste.
- Students will have the opportunity to try different flavors and textures and express their opinions on the taste and appearance of each fruit and vegetable.

V. Studies in pairs or small groups:
- Divide students into pairs or small groups and assign each group one of a rare vegetable or fruit to explore more closely.
- Students will research information about the origin, culinary uses, and health benefits of a given vegetable or fruit.

VI. Summary and discussion:
- A short repetition of the material discussed.
- Discussion of students' experiences during tasting and research.
- Encouragement to experiment with various rare vegetables and fruits in the diet and to look for new ways to use them in the kitchen.

End:
Thanking students for their participation and emphasizing the importance of exploring a variety of vegetables and fruits for health and environmental awareness. Encouragement for further exploration and experimentation with new flavors and culinary experiences.

Rare vegetables:

1. Jerusalem artichoke (Jerusalem artichoke)
- Description: The tuber of a sunflower plant, resembling ginger.
- Cultivation: Prefers well-drained soil and full sun. It is resistant to cold.
- Uses: It can be boiled, baked, fried or eaten raw. It has a nutty flavor.

2. Salsify (thistle)
- Description: A root vegetable with long, white roots resembling a parsnip.
- Cultivation: Likes a sunny position and well-drained soil. Sowing in early spring.
- Uses: Boiled, baked or fried, tastes similar to oysters.

3. Cardoon (Spanish artichoke)
- Description: Closely related to the artichoke, it has large, fleshy stems.
- Cultivation: Grows best in warm climates, in well-drained soil.
- Uses: The stems can be eaten raw, cooked or baked. They have a slightly bitter taste, similar to artichokes.

4. Pak Choi (bok choy)

- Description: Chinese cabbage with green leaves and white stems.
- Cultivation: Likes cooler conditions and well-drained, moist soil.
- Application: Can be used in stir-fry, soups and salads. It has a delicate, slightly bitter taste.

5. Romanesco
- Description: A variety of cauliflower with a characteristic fractal appearance.
- Cultivation: Requires well-drained soil and full sun. It is grown similarly to cauliflower.
- Uses: Can be boiled, baked, fried or eaten raw. It has a delicate, nutty flavor.

Rare fruits:
1. Cherymoja (Peruvian flask)
- Description: A fruit with a creamy consistency and a sweet, tropical flavor, reminiscent of a mixture of bananas and pineapples.
- Cultivation: Prefers a warm climate and well-drained soil. Difficult to grow in colder climates.
- Use: Eaten raw, added to desserts and drinks.

2. Pitaya (dragon fruit)
- Description: Cactus fruit with bright pink or yellow skin and white or red flesh with black seeds.
- Cultivation: Requires a warm climate and well-drained, sandy soil.
- Uses: Eaten raw, added to salads, cocktails and desserts.

3. Jackfruit (breadfruit)
- Description: Large fruit with soft, sweet flesh and a characteristic smell.
- Cultivation: Requires a tropical climate and well-drained soil.
- Uses: Eaten raw, used in desserts, and the unripe flesh as a meat substitute in vegetarian dishes.

4. Atemoja
- Description: A hybrid of cherimoji and cheryma, with a creamy consistency and sweet taste.
- Cultivation: Requires a warm climate and well-drained soil.
- Use: Eaten raw, ideal for desserts.

5. Salak (snake fruit)
- Description: Fruit with brown, scaly skin and sweet and sour flesh.
- Cultivation: Grows in tropical climates, in moist, well-drained soil.
- Use: Eaten raw, added to fruit salads.

VI. Topic: Soil pH testing

Lesson goals:
1. Understanding the importance of soil pH for plant growth.
2. Learning the method of measuring soil pH.
3. Understanding the effects of different pH levels on plant health.
4. Encouraging students to consciously monitor and regulate the pH of the soil in their gardens or crops.

Materials:
1. Soil samples from different areas (if available).
2. Soil pH testers or pH measurement kits (available in gardening stores).
3. Multimedia presentation with graphics and charts regarding soil pH.
4. Posters or boards with basic information about soil pH and its effect on plants.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises with soil pH measurement.

Lesson course:
I. Introduction:
- Welcome students and introduction to the topic.
- A short multimedia presentation with basic information about soil pH and its importance for plants.

II. The importance of soil pH for plant growth:
- Discussion of the importance of soil pH for the availability of nutrients for plants.
- Explain how different pH levels can affect plant health and growth.

III. Soil pH measurement methods:
- Introducing different methods of measuring soil pH, such as soil pH testers and pH kits.
- Step-by-step discussion of how to measure soil pH using available tools.

IV. Interpretation of measurement results:
- Explain the pH range of soil from acidic to alkaline.
- Discuss how different pH levels can affect different types of plants.

V. Practical demonstration:
- Showing a practical example of measuring soil pH using available tools.

- Students will have the opportunity to observe how the teacher measures soil pH and interprets the results.

VI. Practical exercises:
- Dividing students into small groups and conducting practical exercises with soil pH measurement.
- Students will have the opportunity to independently measure soil pH using pH testers or pH kits.

VII. Summary and discussion:
- A short repetition of the material discussed.
- Discussion on the importance of monitoring soil pH in plant crops.
- Encouragement to further investigate and experiment with soil pH in gardens or crops.

End:
Thanking students for participating and emphasizing the importance of monitoring soil pH for plant health and growth. Encouragement for further research and experimentation on soil and its effects on plants.

Note to the presenter:
Testing soil pH is crucial for healthy plant growth because soil pH affects nutrient availability. Here are detailed instructions on how to test soil pH:

Tools and materials:
1. Soil pH test kit:** Available in gardening stores, contains test tubes, indicator solutions, pipettes and colorful comparison tables.
2. Digital pH meter: Electronic device for measuring soil pH.
3. pH test strips: Indicator papers that change color depending on the soil pH.
4. Soil sample containers: Clean plastic or glass containers.
5. Distilled Water: Used to prepare soil samples.
6. Spade: For collecting soil samples.
7. Notebook and pen: For writing down results.

Step 1: Preparing the place
1. Selecting Sampling Sites: Select several different locations in your garden to obtain a representative soil sample. Avoid places directly next to compost, fertilizers or other sources of contamination.
2. Mark places: Mark selected places so that you can easily identify them later.

Step 2: Soil sampling
1. Digging holes: In each selected place, dig a hole about 10-15 cm deep (for

annual plants) or 20-30 cm deep (for perennial plants).
2. Sampling: Take soil samples from the side of the hole, avoiding the surface and bottom layer. Take about 1 cup of soil from each location.
3. Mixing Samples: If you are collecting samples from several locations, mix them thoroughly in a clean container to obtain one representative soil sample.

Step 3: Preparation of samples for testing
1. Cleaning samples: Remove rocks, roots and other debris from the soil.
2. Drying: If the soil is very wet, spread it in a thin layer on a clean surface and allow it to dry at room temperature.

Step 4: Soil pH test

Method 1: Soil pH test kit
1. Preparing the solution: Follow the instructions on the kit package, this usually involves mixing a specified amount of soil with distilled water in a test tube.
2. Adding the indicator: Add a few drops of the indicator solution to the test tube.
3. Mixing: Cap the tube and shake thoroughly.
4. pH Reading: Compare the color of the solution to the color chart on the kit to determine the soil pH.

Method 2: Digital pH meter
1. Calibration: Calibrate the pH meter according to the manufacturer's instructions, usually using calibration solutions of known pH.
2. Sample preparation: Mix the soil sample with distilled water in a 1:2 ratio (1 part soil to 2 parts water) and mix thoroughly.
3. Measurement: Immerse the pH meter electrode in the solution, wait a few minutes until the pH value stabilizes, and then read the result on the display.

Method 3: pH test strips
1. Sample preparation: Mix the soil sample with distilled water in a 1:1 or 1:2 ratio.
2. Mixing: Allow the sample to settle for a few minutes.
3. Measure: Immerse the test strip in the solution for a specified period of time (usually a few seconds), then compare the color of the strip with the color chart on the packaging.

Step 5: Interpret the results
- pH Scale: The pH scale ranges from 0 to 14, with 7 being neutral. Values below 7 indicate acidic soil and values above 7 indicate alkaline soil.
- Acidic soil: pH below 7 (e.g. blueberries prefer pH 4.5-5.5).
- Neutral soil: pH around 7 (e.g. most vegetables).
- Alkaline soil: pH above 7 (e.g. asparagus prefers pH 7-8).

Step 6: Corrective actions

1. Raising pH (alkalization):

- Add lime (calcium carbonate) to the soil according to the instructions on the package. Check the pH regularly to avoid excessive c d.

2. Lowering pH (acidification):

- Add elemental sulfur or acidic peat to the soil. Use as directed, monitoring pH regularly.

VII. Topic: Setting up a composter

Lesson goals:
1. Understand the importance of composting in recycling organic waste.
2. Learning the process of setting up a composter.
3. Learning about the types of materials suitable for composting.
4. Encouraging students to become practically involved in composting as a form of environmental protection.

Materials:
1. Multimedia presentation with images of the composting process.
2. Posters or boards with basic information about composting.
3. Sample samples of compostable materials: plant residues, leaves, grass, etc.
4. Compost containers or barrels.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises in setting up a composter.

Lesson course:
I. Introduction:
- Greeting students and introducing the topic.
- A short multimedia presentation with basic information about composting and its importance for environmental protection.

II. Importance of composting:
- Discuss the importance of composting in recycling organic waste.
- Explain why composting is beneficial for the environment and as an alternative method of waste disposal.

III. The process of setting up a composter:
- Step-by-step discussion of the process of setting up a composter, including:
- Choosing the right place for the composter.
- Choosing the right compost container or barrel.
- Adding layers of different compostable materials.
- Maintaining appropriate moisture levels and compost turnover.

IV. Composting materials:
- Discuss the different types of materials suitable for composting, such as plant debris, leaves, grass, mulch, etc.

- An explanation of why some materials are better for composting than others.

V. Practical demonstration:
- Showing a practical example of setting up a composter.
- Students will have the opportunity to observe how the teacher sets up the composter and adds different layers of compostable materials.

VI. Practical exercises:
- Dividing students into small groups and conducting practical exercises in setting up a composter.
- Students will have the opportunity to set up a composter themselves under the supervision of a teacher.

VII. Summary and discussion:
- A short repetition of the material discussed.
- Discussion about the importance of composting for the environment and ways students can get involved in composting in their homes or communities.
- Encourage further research and practice in composting.

End:
Thanking students for their participation and emphasizing the importance of composting as a form of environmental protection. Encouragement to continue to engage in the practice of composting in your environment.

Note to the presenter:
Establishing a composter is an excellent way to process organic waste and enrich the soil with valuable nutrients. Here are detailed instructions on how to set up a composter:

1. Choosing the right place:
1. Location: Choose a place in the garden that is easily accessible but not directly visible. Ideally, the site should be partially shaded and have good drainage.
2. Soil: Place the composter directly on the soil, which will allow microorganisms and earthworms to freely enter and exit. If you must place the composter on a hard surface, add a layer of soil or old compost to the bottom.

2. Choosing a composter:
1. Open composter: Consists of wooden pallets, metal mesh or plastic panels. It is easy to make and cheap.
2. Closed composter: Ready-made plastic or metal containers with a lid. They are more aesthetic and protect the compost against pests.
3. Rotating composter: Barrels or containers on stands that can be rotated. They

speed up the composting process by mixing regularly.

3. Composting materials:

Green materials (nitrogen-rich)
- Leftover fruit and vegetables
- Freshly cut grass
- Coffee grounds and tea bags
- Vegetable peelings
- Leaves

Brown materials (carbon rich)
- Dry leaves
- Twigs and branches
- Cardboard (no plastic or paint)
- Newspapers (without colored paint)
- Straw and hay
- Wood shavings

Materials to avoid
- Milk products
- Meat and fish
- Fats and oils
- Sick plants
- Pet feces

4. Creating compost

1. Layers: Start with a layer of brown materials (about 15-20 cm), then add a layer of green materials (about 10-15 cm). Continue alternating layers.
2. Humidity: The compost should be as moist as a sponge. If it is too dry, add water. If too wet, add more brown materials.
3. Aeration: Stir the compost with a fork or shovel every few weeks to provide oxygen to the microorganisms.

5. Compost care

1. Temperature Monitoring: Composting generates heat. The optimal compost temperature is from 50 to 70°C. If the temperature drops, stir the compost and add more green materials.
2. Moisture check: Check the compost moisture regularly. Add water during dry periods and protect from excessive rain during wet periods.
3. Shredding materials: The smaller the fragments, the faster they will decompose. Shred larger pieces of branches and other materials.

6. Ready compost

1. Maturing time: Depending on conditions and care, the compost may be ready for use within 3-12 months.
2. Use: Ready compost should have a uniform, dark color and an earthy smell. It can be used to enrich the soil, as mulch for plants or as an addition to a potting soil mixture.

7. Problems and solutions

1. Bad smell: Too much moisture or lack of oxygen. Add more brown materials and mix in the compost.
2. Composting too slow: Lack of appropriate proportions of materials. Make sure there is enough green and brown material and mix the compost regularly.
3. Pests: Closed compost bins or covering with materials that may attract pests.

VIII. Topic: Experiments in Gardening

Lesson goals:
1. Understanding the importance of experimentation in the development of horticulture.
2. Learning basic methods of planning and conducting gardening experiments.
3. Encouraging students to conduct experiments on their own in their gardens.
4. Developing the ability to observe, analyze data and draw conclusions based on experimental results.

Materials:
1. Multimedia presentation with examples of gardening experiments.
2. Posters or boards with basic information about experimentation methods.
3. Notebooks for keeping records of experiments.
4. Examples of plant seeds, soil, containers for growing plants, etc.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises in planning and conducting experiments.

Lesson course:
I. Introduction:
- Welcome students and introduce the topic.
- Discuss the importance of experimentation in developing new plant cultivation techniques and improving crop yields.

II. Experiment planning:
- Discuss the basic steps in planning an experiment, including:
- Formulating the research question.
- Designing a controlled experimental group and a control group.
- Selection of independent and dependent variables.
- Determining measurement and data collection methods.

III. Conducting the experiment:
- Discuss the practical aspects of conducting an experiment, including:
- Selection of appropriate materials and tools.
- Setting up the experiment and applying appropriate conditions.
- Regular monitoring and data collection.

IV. Results analysis:

- Discussing the process of analyzing data collected during the experiment.
- Drawing conclusions based on the collected data and comparing the experiment results with expectations.

V. Examples of gardening experiments:
- Presenting some examples of simple gardening experiments, such as:
- The influence of different types of fertilizers on plant growth.
- Effect of different lighting conditions on seed germination.
- The influence of different watering methods on plant yield.
- Discussion of the results and conclusions resulting from these experiments.

VI. Practical exercises:
- Dividing students into small groups and conducting practical exercises in planning and carrying out a simple gardening experiment.
- Students will have the opportunity to design and conduct experiments on their own under the supervision of a teacher.

VII. Summary and discussion:
- A short repetition of the material discussed.
- Discussion of students' experiences during practical exercises and examples of gardening experiments.
- Encouragement to continue learning and experimenting in the garden.

End:
Thanking students for their participation and emphasizing the importance of experimentation in developing gardening skills and finding new techniques for growing plants. Encouragement for further research and experimentation in gardening.

Note to the presenter:
Experimenting in the garden can be a great way to learn and discover new methods of growing plants. Here are some examples of experiments that can be carried out in the garden:

1. Experiment with different types of soil:
Objective:
Checking how different types of soil affects plant growth.
Method:
1. Choose one plant: It can be a vegetable, a flower or a herb.
2. Prepare different types of soil: For example, sandy soil, clay soil, compost soil and soil mix.
3. Plant the plants: Plant the same plant in several containers, each with different

soil.
4. Monitor growth: Record plant height, number of leaves, flowering and fruiting times.
Conclusions:
Compare how different types of soil affect plant health and growth.

2. Irrigation experiment
Objective:
Checking how different irrigation methods affect plant growth.
Method:
1. Choose one plant: You can choose, for example, tomatoes.
2. Prepare different irrigation methods: Traditional watering with a watering can, drip irrigation, sprinkling, underground irrigation.
3. Divide the plants: Plant the plants in several sections, each section will be watered with a different method.
4. Monitor growth: Record plant growth, leaf appearance, flowering time and yield.
Conclusions:
Compare the effectiveness of different irrigation methods.

3. Experiment with fertilizers
Objective:
Checking how different types of fertilizers affect plant growth.
Method:
1. Choose one plant: It can be a vegetable, a flower or an herb.
2. Prepare different fertilizers: Organic (compost, manure), chemical (nitrogen, phosphorus, potassium) and no fertilizer (control).
3. Divide the plants: Plant the plants in several sections, each section will be fertilized with a different fertilizer.
4. Monitor growth: Record plant height, number of leaves, flowering and fruiting times.
Conclusions:
Compare the effects of different fertilizers on plant growth and health.

4. Mulching experiment:
Objective:
Checking how different types of mulch affect soil moisture and plant growth.
Method:
1. Choose one plant: It can be a vegetable, a flower or an herb.
2. Prepare different types of mulch: Straw, bark, leaves, compost, synthetic mats and no mulch (control).
3. Divide the plants: Plant the plants in several sections, each section mulched with

a different material.
4. Monitor growth and soil moisture: Record plant growth, leaf appearance, soil moisture levels, flowering time and yield.
Conclusions:
Compare how different types of mulch affect soil moisture and plant growth.

5. Experiment with companion plants
Objective:
Checking how different combinations of plants affect their mutual growth and health.
Method:
1. Choose plants: For example, tomatoes and basil, carrots and onions, beans and corn.
2. Prepare the sections: Plant the plants in sections, each section with a different combination of companion plants.
3. Monitor growth: Record plant growth, leaf appearance, flowering time, plant health (presence of pests and diseases), yield.
Conclusions:
Compare how different plant combinations affect each other's growth and health.

6. Experiment with the influence of light on plant growth
Objective:
Check how different light levels affect plant growth.
Method:
1. Choose one plant: It can be a vegetable, a flower or a herb.
2. Prepare different lighting conditions Full sun, partial shade, shade.
3. Divide the plants: Plant the plants in different sections with different light levels.
4. Monitor growth: Record plant height, leaf appearance, flowering and fruiting times.
Conclusions:
Compare how different light levels will affect plant growth and health.

IX. Topic: Establishing Hydroponic Crops

Lesson goals:
1. Understanding the basic principles and benefits of hydroponic growing.
2. Learning the process of setting up a hydroponic growing system.
3. Learning about different hydroponic cultivation methods.
4. Encouraging students to experiment with hydroponic cultivation to increase crop efficiency and productivity.

Materials:
1. Multimedia presentation with examples of hydroponic cultivation systems.
2. Posters or boards with basic information about hydroponic cultivation.
3. Examples of devices and materials used for hydroponic cultivation: water tanks, hydroponic substrate, plants, etc.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises in setting up a hydroponic cultivation system.

Lesson course:
I. Introduction:
- Greeting students and introducing the topic.
- Discussion of the importance of hydroponic cultivation and its benefits for the environment and the efficiency of plant production.

II. Basics of hydroponic cultivation:
- Discuss the basic principles of hydroponic growing, including:
- No soil: plants grow in a water solution or hydroponic medium.
- Providing nutrients through a water solution with fertilizers.
- Monitoring the pH and nutrient levels in the solution.

III. Hydroponic cultivation methods:
- Discuss various hydroponic growing methods such as:
- Systems placed: NFT (Nutrient Film Technique), placed on stones, in hydroton.
- Immersion systems: systems with floats, aeroponic systems.
- Discussion of the advantages and disadvantages of each of these methods.

IV. Setting up a hydroponic growing system:
- A step-by-step presentation of the process of setting up a hydroponic cultivation system.

- Discussion on choosing the right water tank, hydroponic substrate, plants for cultivation, etc.
- Showing a practical example of setting up a hydroponic cultivation system.

V. Practical exercises:
- Dividing students into small groups and conducting practical exercises on setting up a hydroponic cultivation system.
- Students will have the opportunity to set up a hydroponic cultivation system on their own under the supervision of a teacher.

VI. Summary and discussion:
- A short repetition of the material discussed.
- Discussion about the benefits and challenges of hydroponic growing and how students can get involved in hydroponic growing.
- Encouragement to continue learning and experimenting with hydroponic farming at home or school.

End:
Thanking students for their participation and emphasizing the importance of hydroponic cultivation as a modern method of plant production. Encouragement to continue experimenting and developing hydroponic growing skills.

Note to the presenter:
Hydroponic cultivation is a method of growing plants without the use of soil, where the plant roots are immersed in a water solution rich in nutrients. This is an effective way to grow plants, especially in places with limited space or difficult soil conditions. Here is a detailed guide on how to set up a hydroponic garden:

1. Choosing a hydroponic system
There are several different hydroponic systems. The choice depends on your budget, available space and the type of plants you want to grow. Here are the most popular systems:
1. NFT system (Nutrient Film Technique):
- The nutrient solution flows in a thin layer through the plant roots placed in inclined pipes or channels.
2. DWC (Deep Water Culture) system:
- Plant roots are immersed in oxygenated water with a nutrient solution.
3. ebb and flow system:
- The nutrient solution periodically floods the plant roots and then flows away, allowing the roots to oxygenate.
4. Aeroponic system:
- Plant roots are suspended in the air and regularly sprayed with a nutrient solution.

5. Wick system:
- The nutrient solution is transported to the roots using the wick. It is a simple and cheap system.

2. Selection and purchase of components
Basic components:
1. Container for the nutrient solution
- The tank where the nutrient solution will be stored.
2. Water pump:
- For circulating nutrient solution in NFT, ebb and flow, and DWC systems.
3.Aerator:
- For aerating the solution in DWC systems.
4. Pipes and fittings:
- For transporting the nutrient solution between the tank and the plants.
5. Mat or mesh pots:
- To support plants.
6. Growing medium:
- For example, perlite, vermiculite, coconut, hydroton.

3. Preparation of the nutrient solution
Nutrients:
1. Macronutrients:
- Nitrogen (N), phosphorus (P), potassium (K)
2. Micronutrients:
- Calcium (Ca), magnesium (Mg), sulfur (S), iron (Fe), manganese (Mn), boron (B), molybdenum (Mo), copper (Cu), zinc (Zn)

Preparation:
1. Buy a ready-made nutrient solution: Available in gardening stores.
2. Prepare the solution according to the instructions: Add the appropriate amount of concentrate to distilled or filtered water.
3. Check the pH of the solution: The optimal pH is between 5.5 and 6.5. Use a pH meter to check the pH and adjust it as necessary.

4. System installation
1. Set up the solution tank:
- Place the tank on a stable surface.
2. Connect the water pump and aerator:
- Place the pump in the tank and connect to the transport pipes. In a DWC system, also place an aerator in the tank.

3. Place pipes or ducts:

- Mount the pipes or ducts on a rack or other elevated structure, making sure they are sloped in the NFT system.

4. Install mesh pots and medium:
- Place mesh pots in pipes or channels, filling them with your chosen growing medium.

5. Planting plants
1. Plant selection:
- To start with, it is worth choosing plants that are easy to grow, such as lettuce, spinach, herbs (basil, mint), strawberries.
2. Preparation of seedlings:
- You can use cuttings or seeds. Place the seedlings in growing medium in mesh pots.

6. Maintenance and monitoring
1. Nutrient Solution Check:
- Check the solution level regularly and top up if necessary. Control pH and nutrient levelsAir:
– Make sure the solution is well aerated, especially in DWC systems.
3. Lighting:
- Provide plants with adequate lighting. Indoor hydroponic growing often requires LED or fluorescent lights.

4. Mixing and flow:
- Stir the solution regularly and monitor the water flow to prevent pipe clogging.

7. Harvest

1. Growth monitoring:
- Check your plants regularly for signs of disease, pests and nutrient deficiencies.

2. Harvest:
- Harvest when the plants are ripe. Remember to be careful not to damage the root systems of other plants.

Summary

Setting up a hydroponic grow requires an initial amount of work and investment in equipment, but it offers many benefits, such as rapid plant growth, greater control over growing conditions, and saving space. With proper planning and regular maintenance, you can enjoy healthy, fresh crops all year round.

X. Topic: Establishing and Running a Vineyard

Lesson goals:
1. Understanding the process of establishing and running a vineyard.
2. Learning about the climatic and soil requirements for viticulture.
3. Learning basic vine breeding practices.
4. Encouragement to explore the field of winemaking as a form of agricultural enterprise.

Materials:
1. Multimedia presentation with images of the process of establishing and running a vineyard.
2. Posters or boards with basic information about vine breeding.
3. Sample breeding materials: vine seedlings, gardening tools, fertilizers, etc.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises in the school garden (if available).

Lesson course:
I. Introduction:
- Welcome students and introduction to the topic.
- Discussion of the importance of winemaking as a branch of agriculture and its role in culture and economy.

II. Soil and climatic requirements:
- Discussion of the basic soil and climatic requirements for viticulture.
- Explain why the right choice of soil and location is crucial to the success of a vineyard.

III. Selecting varieties and establishing a vineyard:
- Discussion of different grape varieties and their suitability for different conditions.
- An explanation of the process of establishing a vineyard, including:
- Choosing the right location.
- Soil preparation.
- Planting vine seedlings.
- Construction of supports for plants.

IV. Running a vineyard:
- Discussion of basic grapevine breeding practices, such as:

- Plant care: watering, fertilizing, protection against pests and diseases.
- Cutting and shaping vines.
- Harvesting and processing of grapes.

V. Practical demonstration:
- Showing a practical example of running a vineyard, if possible in a school or on a local wine farm.
- Students will have the opportunity to observe how a vineyard is run and ask questions about grape growing practices.

VI. Practical exercises:
- If possible, carry out practical exercises in the school garden, such as planting vine seedlings or pruning vines.
- Students will have the opportunity to participate in practical activities related to running a vineyard.

VII. Summary and discussion:
- A short repetition of the material discussed.
- Discussion about students' experiences during the practical demonstration and practical exercises.
- Encouragement to continue learning and exploring the field of winemaking.

End:
Thanking students for their participation and emphasizing the importance of winemaking as a form of agricultural enterprise. Encouragement to further interest in the topic and experiment with viticulture in the future.

Annual Outline of Practical Classes in Tomato Growing

General Purpose:
Familiarizing participants with the practical aspects of tomato cultivation and developing the skills necessary to conduct this type of business.

Specific Objectives:

1. Learning about different tomato varieties and their suitability for different climatic and soil conditions.
2. Learning how to prepare soil for growing tomatoes.
3. Familiarization with the process of planting and caring for tomatoes.
4. Teaching techniques for irrigation, fertilization and protection of tomatoes against diseases and pests.
5. Developing skills related to harvesting and storing crops.
6. Encouraging experimentation and gaining practical experience in growing tomatoes.

Schedule:
Month 1-2: Soil Preparation:
- Discussion of soil requirements for growing tomatoes.
- Preparing the site for cultivation, including selecting the right location and preparing the soil by loosening it, enriching it with organic fertilizers and adjusting the pH.

Month 3-4: Variety Selection and Planting:
- Discussion of different tomato varieties and their suitability to local conditions.
- Overview of available varieties and selection of those best suited to the planned cultivation site.
- Practical classes on planting tomatoes in prepared soil.

Month 5-6: Plant Care:
- Learn tomato care techniques, including tying, pruning and weeding.
- Discussion of irrigation and fertilization techniques for tomatoes.
- Familiarization with the basics of identifying and controlling tomato diseases and pests.

Month 7-8: Flowering and Fruiting:
- Observation of the flowering and fruiting process of tomatoes.
- Teaching about the importance of pollination and providing appropriate conditions for its preservation.
- Practical classes in plant care during the period of intensive growth and fruiting.

Month 9-10: Harvesting
- Learning tomato harvesting techniques, including ripeness assessment and harvesting methods.
- Discussion of methods of storing and preserving tomatoes.

Month 11-12: Season Summary and Evaluation
- Summary of experiences from the entire tomato growing season.
- Evaluation of the results achieved and discussion of conclusions for the future.
- Planning possible further activities or projects related to tomato cultivation.

Comments:
- Each meeting should contain both theoretical and practical elements to enable participants to fully understand the tomato growing process.
- Wherever possible, participants should be encouraged to engage in hands-on activities on their own to gain valuable experience.
- It is important to ensure appropriate plant protection products and the safety of participants during practical work.

Note to the presenter:
Growing tomatoes in a greenhouse can be very rewarding because it provides better control over growing conditions and protection from adverse weather conditions and pests. Here's a step by step on how to do it:

Greenhouse preparation:
1. Choosing a Location: Make sure the greenhouse gets plenty of sunlight for at least 6-8 hours a day.
2. Soil preparation: The soil should be well-drained, rich in organic matter and with a pH of 6-6.8. You can add compost or well-rotted manure.
3. Disinfect the greenhouse: Before planting tomatoes, it is a good idea to disinfect the greenhouse to prevent the development of diseases.

Sowing and planting:
1. Sowing seeds: Sow tomato seeds in small containers in early spring, about 6-8 weeks before the planned transplanting to the greenhouse. The sowing depth should be approximately 0.5 cm.
2. Pickling: When the seedlings have 2-3 leaves, move them to larger containers to give them more room to grow.
3. Transplanting into the greenhouse: Transplant the seedlings into the greenhouse when they are about 15-20 cm tall and the risk of frost has passed. The spacing between plants should be approximately 50-60 cm.

Plant care:
1. Watering: Water tomatoes regularly, keeping the soil moist, but avoid overwatering to prevent root rot. It is best to water in the morning.
2. Fertilization: Use fertilizers rich in potassium, phosphorus and nitrogen. Organic fertilizers such as compost or manure are also beneficial.
3. Holding the plants: It is best to grow tomatoes with supports, e.g. stakes or strings, so that the plants are stable and the fruit does not touch the ground.
4. Removing side shoots: Remove side shoots (shoots) regularly to allow the plant to focus its energy on fruit production.
5. Greenhouse Ventilation: Maintain adequate ventilation to prevent overheating and fungal diseases. Open windows or doors can provide better air circulation.

Disease and pest control:
1. Fungal diseases: Check your plants regularly for symptoms of fungal diseases such as powdery mildew and blight. Use appropriate fungicides or natural plant protection products.
2. Pests: Monitor for pests such as aphids and spider mites and use appropriate pesticides or natural predators.

Set of fruits:

1. Harvest: Harvest tomatoes when they are fully ripe and intensely colored. Regular harvesting promotes further fruiting.
2. Storage: Store tomatoes in a cool, dry place. Avoid storing in the refrigerator as it may reduce their flavor.

Additional tips:

- Variety of varieties: Choose different varieties of tomatoes for a variety of flavors and better yields.
- Crop rotation: If possible, rotate your tomato plants in the greenhouse every year to prevent disease build-up in the soil.

Growing tomatoes in a greenhouse requires some care, but the reward is tasty, juicy fruit all season long.

Annual Outline of Practical Classes in Tomato Growing

General Purpose:

Familiarizing participants with the practical aspects of tomato cultivation and developing the skills necessary to conduct this type of business.

Specific Objectives:
1. Learning about different tomato varieties and their suitability for different climatic and soil conditions.
2. Learning how to prepare soil for growing tomatoes.
3. Familiarization with the process of planting and caring for tomatoes.
4. Teaching techniques for irrigation, fertilization and protection of tomatoes against disease and pests.
5. Developing skills related to harvesting and storing crops.
6. Encouraging experimentation and gaining practical experience in growing tomatoes.

Schedule:
Month 1-2: Soil Preparation
- Discussion of soil requirements for growing tomatoes.
- Preparing the site for cultivation, including selecting the right location and preparing the soil by loosening it, enriching it with organic fertilizers and adjusting the pH.

Month 3-4: Variety Selection and Planting
- Discussion of different tomato varieties and their suitability to local conditions.
- Overview of available varieties and selection of those best suited to the planned cultivation site.
- Practical classes on planting tomatoes in prepared soil.

Month 5-6: Plant Care
- Learn tomato care techniques, including tying, pruning and weeding.
- Discussion of irrigation and fertilization techniques for tomatoes.
- Familiarization with the basics of identifying and controlling tomato diseases and pests.

Month 7-8: Flowering and Fruiting
- Observation of the flowering and fruiting process of tomatoes.
- Teaching about the importance of pollination and providing appropriate conditions for its preservation.
- Practical classes in plant care during the period of intensive growth and fruiting.

Month 9-10: Harvesting
- Learning tomato harvesting techniques, including ripeness assessment and harvesting methods.

- Discussion of methods of storing and preserving tomatoes.

Month 11-12: Season Summary and Evaluation
- Summary of experiences from the entire tomato growing season.
- Evaluation of the results achieved and discussion of conclusions for the future.
- Planning possible further activities or projects related to tomato cultivation.

Comments:
- Each meeting should contain both theoretical and practical elements to enable participants to fully understand the tomato growing process.
- Wherever possible, participants should be encouraged to engage in hands-on activities on their own to gain valuable experience.
- It is important to ensure appropriate plant protection products and the safety of participants during practical work.

Notes for the presenter:

Perfect fertilization and growing conditions for tomatoes can be crucial for their healthy growth and abundant harvest. Here are some key points:

Tomato growing conditions:

- **Light:**
  - Tomatoes need at least 6-8 hours of full sunlight per day to thrive and bear fruit.
- **Temperature:**
  - Tomatoes grow best in warm climates. The optimal temperature for growth is around 21-27°C during the day and 15-18°C at night.
- **Soil:**
  - The soil should be well-draining, fertile and with an optimal pH (approx. 6.0-6.8).
  - Adding compost or manure before planting tomatoes can improve soil structure and fertility.
- **Support:**
  - Tomatoes are vines, so they need support such as racks, cages, or other structures to help the plants support themselves and grow vertically.
- **Protection against diseases and pests:**
  - Monitoring plants regularly and responding quickly to signs of disease or pests is key. Natural plant protection products such as plant-based oil soap solutions can be used.

Fertilizing tomatoes:

Nitrogen (N):

In the initial phase of growth, tomatoes need more nitrogen for the development of leaves and stems.

Phosphorus (P):

Phosphorus is important for root development and flowering. It helps to provide strong roots and aids in flower production.

Potassium (K):

Potassium is necessary for fruit development and plant resistance to stressful conditions such as drought or diseases.

Trace elements:

Providing the plants with access to microelements such as magnesium, iron, copper and zinc is also crucial for their health and development.

Fertilization methods:

- **Organic fertilizers:**
  - Compost, manure or green manure can provide plants with the nutrients they need, improve soil structure and increase the water-holding capacity.
- **Artificial fertilizers:**
  - You can use multi-component fertilizers adapted to vegetables, taking into account the dosage recommendations on the packaging.

Plant care:

- **Regular watering:**
  - Tomatoes need regular but moderate watering to prevent the soil from drying out.
- **Weed removal and pruning:**
  - Regularly removing weeds and trimming unnecessary twigs can improve air circulation and reduce the risk of disease.
- **Monitoring and response:**
  - Monitor plants regularly to quickly spot any problems and take appropriate remedial measures.

Providing appropriate growing conditions and regular fertilization of tomatoes will contribute to healthy plant growth and an abundant and tasty harvest of tomatoes.

Annual Outline of Pepper Growing

General Purpose:
Familiarizing participants with the practical aspects of pepper cultivation and developing the skills necessary to conduct this type of activity.

Specific Objectives:
1. Understanding the soil, climate and light requirements of peppers.
2. Learning the process of establishing and caring for a pepper plantation.
3. Learning about different varieties of peppers and their suitability for different conditions.
4. Getting to know the techniques of irrigation, fertilization and protection of peppers against diseases and pests.
5. Developing skills related to harvesting, storing and processing crops.
6. Encouraging experimentation and gaining practical experience in growing peppers.

Schedule:
Month 1-2: Soil Preparation
- Assessment of soil properties and preparation of the site for cultivation.
- Loosening the soil, removing weeds and enriching it with nutrients.

Month 3-4: Variety Selection and Planting
- Discussion of different pepper varieties and their requirements.
- Selection of varieties suitable for local conditions and planned cultivation.
- Practical classes on planting pepper seedlings in prepared soil.

Month 5-6: Plant Care
- Learning pepper care techniques, including pruning, removing side shoots and watering.
- Discussion of irrigation and fertilization methodologies, as well as monitoring plants for diseases and pests.

Month 7-8: Flowering and Fruiting
- Observation of the flowering and fruiting process of peppers.
- Learning about the importance of pollination and encouraging its support.
- Plant care during the period of intensive growth and fruiting.

Month 9-10: Harvesting
- Techniques for harvesting peppers at the right moment of ripeness.
- Discussion of methods of storing and processing crops, such as drying, pickling or freezing.

Month 11-12: Evaluation and Planning
- Summary of experiences from the entire pepper growing season.
- Evaluation of the results achieved and discussion of conclusions for the future.
- Planning next steps and activities related to growing peppers in the next season.

Comments:
- It is worth providing appropriate technical support and expertise in the field of phytosanitary problems, as well as advice on the selection of varieties.
- It is also recommended to carry out regular inspections and monitor the condition of plants throughout the growing season.

Notes for the presenter:
Pepper growing conditions and appropriate fertilization are crucial for obtaining healthy plants and abundant harvests. Here are some key points regarding the growing conditions and fertilization of peppers:

Pepper growing conditions:

1. **Climate and temperature:**
    - Peppers grow best in warm climates. The minimum temperature at which pepper plants grow well is around 15-18°C, and the optimal temperature for growth and flowering is 25-30°C.
    - If possible, avoid sudden changes in temperature and drafts, which can weaken the plants.
2. **Light:**
    - Peppers require at least 6-8 hours of full sun per day. The more light, the better the growth and yield.
3. **Soil:**
    - The soil should be well-drained, rich in nutrients and slightly acidic (pH around 6-6.8).
    - Additionally, the soil should be well drained to avoid water stagnation, which can lead to root diseases.
4. **Watering:**
    - Maintain regular watering, especially during the growing and fruiting periods, to keep the soil evenly moist.
    - Avoid over-watering, which can lead to root rot.
5. **Protection against pests and diseases:**
    - Monitor plants regularly for signs of diseases and pests such as aphids, spider mites and downy mildew. Use appropriate plant protection

products if necessary.

Pepper fertilization:

1. **Nitrogen (N):**
    - Nitrogen is necessary for the growth of the plant and green parts such as leaves. At the beginning of pepper growth, you can apply a fertilizer containing a higher nitrogen ratio.
2. **Phosphorus (P):**
    - Phosphorus is important for root development and flowering. Phosphorus fertilization is especially important at the beginning of cultivation to support the development of the root system.
3. **Potassium (K):**
    - Potassium supports healthy growth and ripening of fruit. During pepper fruiting, it is recommended to use fertilizers rich in potassium.
4. **Microelements:**
    - Pepper plants may also need micronutrients such as magnesium, boron, copper, iron, manganese and zinc. Universal fertilizers for vegetables may contain appropriate amounts of these elements.
5. **Fertilizer use:**
    - Fertilizers can be used in several ways: by watering, using granulated fertilizers scattered around the plant or using liquid fertilizers dissolved in water and administered regularly.
6. **Organic fertilization:**
    - Organic fertilizers such as compost, manure or seaweed fertilizers can provide your pepper plant with additional nutrients and improve soil structure and health.

Observing appropriate growing conditions and regular fertilization are key to obtaining healthy pepper plants and abundant harvests. Monitoring plants, responding to soil and environmental needs, and using appropriate fertilizers are key factors in the success of growing peppers.

Annual Outline of Cucumber Growing Practice

General Purpose:
Practical introduction of participants to the process of growing cucumbers in order to acquire the skills necessary to conduct this type of activity.

Specific Objectives:
1. Learning about different varieties of cucumbers and their suitability for different climatic and soil conditions.
2. Learning how to prepare soil for growing cucumbers.
3. Familiarization with the process of planting and caring for cucumbers.
4. Teaching techniques of irrigation, fertilization and protection of cucumbers against diseases and pests.
5. Developing skills related to harvesting and storing crops.
6. Encouraging experimentation and gaining practical experience in cucumber cultivation.

Internship Schedule:
Month 1-2: Soil Preparation
- Discussion of soil requirements for growing cucumbers.
- Preparing the site for cultivation, including selecting the right location and preparing the soil by loosening it, enriching it with organic fertilizers and adjusting the pH.

Month 3-4: Variety Selection and Planting
- Discussion of different varieties of cucumbers and their suitability for local conditions.
- Overview of available varieties and selection of those best suited to the planned cultivation site.
- Practical classes on planting cucumbers in prepared soil.

Month 5-6: Plant Care
- Learning cucumber care techniques, including pruning, shoring and weeding.
- Discussion of irrigation and fertilization techniques for cucumbers.
- Familiarization with the basics of identifying and controlling cucumber diseases and pests.

Month 7-8: Flowering and Fruiting
- Observation of the flowering and fruiting process of cucumbers.
- Teaching about the importance of pollination and providing appropriate conditions for its preservation.
- Practical classes in plant care during the period of intensive growth and fruiting.

Month 9-10: Harvesting
- Learning cucumber harvesting techniques, including ripeness assessment and harvesting methods.
- Discussion of methods of storing and preserving cucumbers.

Month 11-12: Season Summary and Evaluation
- Summary of experiences from the entire cucumber growing season.
- Evaluation of the results achieved and discussion of conclusions for the future.
- Planning possible further activities or projects related to cucumber cultivation.

Comments:
- Each meeting should contain both theoretical and practical elements to enable participants to fully understand the cucumber growing process.
- Wherever possible, participants should be encouraged to engage in hands-on activities on their own to gain valuable experience.
- It is important to ensure appropriate plant protection products and the safety of participants during practical work.

Notes for the presenter:

The ideal fertilization and growing conditions for cucumbers may vary depending on region and soil type, but here are general rules:

Cucumber growing conditions:

1. **Light and temperature:**
    - Cucumbers grow best in full sun, but can tolerate light shade.
    - The optimal temperature for cucumbers is between 24°C and 32°C during the day, but the plants can survive in a wider range.
2. **Soil:**
    - The soil should be fertile, well-drained and with a pH of 6 to 7.5.
    - Adding compost or manure improves soil structure and provides nutrients.
3. **Humidity:**
    - Cucumbers need regular watering, especially during dry periods. Avoid excessive drying of the soil, which can lead to bitterness in the fruit.
4. **Supports:**
    - For climbing cucumbers, it is recommended to use supports such as trellises or nets to support the plants and make it easier to pick the fruit.

Fertilizing cucumbers:

1. **Nitrogen, phosphorus, potassium:**
    - Cucumbers need balanced fertilizers, but nitrogen, phosphorus and potassium are particularly important:
        - Nitrogen (N) supports the growth of plants and leaves.
        - Phosphorus (P) helps in the development of roots and fruits.
        - Potassium (K) affects the overall resistance of plants to diseases and fruit quality.
2. **Organic fertilizers:**
    - Applying compost, manure or other organic fertilizers ensures a long-term supply of nutrients and improves soil structure.
3. **Fertilization according to the growth phase:**
    - Introduce fertilizers gradually depending on the needs of the plants. For example, early in the season, cucumbers need more nitrogen for leaf growth, while during the flowering and fruiting phases, phosphorus and potassium are more important.
4. **Fertilization regularity:**
    - Fertilization should be regular, but in moderation to avoid excessive accumulation of salts in the soil, which can lead to over-salting problems.

Providing appropriate growing conditions and proper fertilization will help cucumbers grow healthily and productively, providing tasty and juicy fruit throughout the season.

Crops in the Greenhouse

Lesson goals:
1. Understanding the importance of greenhouse crops in agriculture.
2. Learning about the different types of crops that can be grown in greenhouses.
3. Learning about the benefits and challenges of growing crops in greenhouses.
4. Encouragement to explore the field of greenhouse agriculture as an alternative form of plant production.

Materials:
1. Multimedia presentation with examples of crops in greenhouses.
2. Posters or boards with basic information about greenhouse farming.
3. Examples of agricultural materials used in greenhouse crops: seeds, substrates, fertilizers, etc.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Case study.

Sample lesson:
I. Introduction:
- Welcome students and introduce the topic.
- Discussion on the importance of greenhouse agriculture as a method of plant production.

II. Types of crops in greenhouses:
- Discussion of the different types of crops that can be grown in greenhouses, such as:
- Leaf vegetables (lettuce, spinach).
- Fruit vegetables (pepper, tomato).
- Ornamental plants (cut flowers, potted plants).
- Green herbs.
- Presenting the advantages and challenges of each type of cultivation.

III. Benefits and challenges:
- Discuss the benefits of growing in greenhouses, such as:
- Control of environmental conditions.
- Increased production efficiency.
- Protection of plants against unfavorable weather conditions.
- Discussion on challenges such as investment costs, climate management and

pest protection.

IV. Practical demonstration:
- Showing a practical example of growing in a greenhouse, if possible at a school or on a local farm.
- Students will have the opportunity to see different types of crops in a greenhouse and learn about the requirements and processes involved in growing them.

V. Group discussion:
- Moderated discussion on the advantages and challenges of growing in greenhouses.
- Students can share their thoughts on the potential application of greenhouse farming in their region.

VI. Case study:
- Conducting a case study of a specific farm or enterprise dealing with crops in greenhouses.
- Students will be asked to identify the key success factors and challenges of running such a business.

VII. Summary:
- A short repetition of the material discussed.
- Summary of the main concepts and conclusions from the lesson.
- Encouragement to continue learning about greenhouse farming and exploring the possibilities in this field.

End:
Thanking students for their participation and emphasizing the importance of greenhouse farming as an alternative form of crop production. Encouragement of further interest in the topic and experiment with different types of crops in greenhouses.

Growing Herbs

Lesson goals:
1. Understanding the importance of growing herbs in cooking, medicine and horticulture.
2. Learning about different species and varieties of herbs and their properties and uses.
3. Learning basic techniques for growing herbs at home or in the garden.
4. Encouragement to grow herbs on your own and use them in your daily diet and care.

Materials:
1. Multimedia presentation with information about growing herbs.
2. Posters or boards with basic information about selected herb species.
3. Examples of herb seeds or seedlings, soil, pots, organic fertilizers.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises in planting and caring for herbs.

Lesson course:
I. Introduction:
- Welcome students and introduction to the topic.
- Discussion on the importance of herbs in cooking, medicine and gardening.

II. Selection of herb species:
- Presentation of various species of herbs and their properties and uses.
- Discussion of the criteria for selecting appropriate species for growing at home or in the garden.

III. Preparation for cultivation:
- Discussion of the basic soil, light and climate requirements for growing herbs.
- Selection of appropriate pots, substrate and place for cultivation.

IV. Establishing herb cultivation
- Practical classes in starting herb cultivation, including:
- Filling pots with soil.
- Planting herb seeds or seedlings.
- Watering and placing plants in appropriate conditions.

V. Herb care:
- Discussion of basic herb care techniques, such as:
- Regular watering and fertilization.
- Soil care and weed removal.
- Pruning and shaping plants.

VI. Use of herbs:
- Discussion on different ways to use fresh herbs in cooking, medicine and cosmetics.
- Discussion of techniques for drying and storing herbs to preserve their aroma and medicinal properties.

VII. Practical exercises:
- Students will be asked to perform simple care activities related to growing herbs, such as watering, pruning and fertilizing.

VIII. Summary and discussion:
- A short repetition of the material discussed.
- Encouragement to continue experimenting with growing herbs at home or in the garden.
- Sharing ideas on how to use herbs in your daily diet and care.

End:
Thanking students for their participation and emphasizing the importance of growing herbs as a form of self-supply and promoting a healthy lifestyle. Encouragement to continue learning and experimenting with different species of herbs.

Notes for the presenter:
Perennial and annual herbs in the garden can be a beautiful and practical element. Here are some examples of perennial and annual herbs you can grow:

Perennial herbs:

1. **Mint (Mentha spp.):** Mint is easy to grow and grows well in sun or partial shade. It can spread, so it is worth planting it in pots or in a specially prepared place in the garden.
2. **Rosemary (Rosmarinus officinalis):** Rosemary is an intensely aromatic herb and requires a sunny position and well-drained soil. It can grow up to 1-2 meters high.
3. **Oregano (Origanum vulgare):** Oregano is an herb with a strong flavor and aroma, ideal for growing in a sunny position. Requires well-draining soil.
4. **Thyme (Thymus vulgaris):** Thyme is a small, aromatic plant that likes sunny

positions and well-drained soil.

5. **Parsley (Petroselinum crispum):** Parsley is a biennial plant but acts as a perennial because it can overwinter in temperate climates. Requires moderately moist soil and partial shade.

Annual herbs:

1. **Basil (Ocimum basilicum):** Basil is an annual plant that needs a warm, sunny position and regular watering. It can be grown both in the ground and in pots.
2. **Fennel (Anethum graveolens):** Fennel is an annual plant that grows best in a sunny position and well-drained soil. It can reach quite a high height.
3. **Marjoram (Origanum majorana):** Marjoram is an annual plant that requires a sunny position and well-draining soil. It is easy to grow and has a delicate flavor.
4. **Parsley root (Apium graveolens):** Parsley root is a plant that prefers warm, humid climates.

Professional Crop Irrigation

Lesson goals:
1. Understanding the importance of adequate irrigation for plant growth and yield.
2. Learning about various methods and techniques of professional irrigation of crops.
3. Learning about tools and systems used in professional irrigation.
4. Encouraging a conscious approach to water management in agriculture.

Materials:
1. Multimedia presentation with examples of irrigation systems.
2. Posters or boards with basic information about various irrigation methods.
3. Examples of tools and materials used in professional irrigation: drip systems, sprinklers, soil moisture sensors, etc.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Case study.

Lesson course:
I. Introduction:
- Welcome students and introduce the topic.
- Discussion on the importance of irrigation for the growth, development and yield of plants.

II. Irrigation methods:
- Presentation of various irrigation methods used in professional agriculture, such as:
- Drip systems.
- Sprinklers.
- Underground irrigation systems.
- Hydronics.
- Discussion of the advantages and disadvantages of each of these methods.

III. Irrigation tools and systems:
- Introducing the various tools and systems used in professional irrigation, including:
- Automatic irrigation systems with programming.
- Soil moisture sensors.
- Water consumption monitoring systems.
- Discussion of their functions and applications.

IV. Practical demonstration:
- Showing a practical example of a professional irrigation system, if possible at a school or on a local farm.
- Students will have the opportunity to see various elements of the irrigation system and learn how they work in practice.

V. Group discussion:
- Moderated discussion on the advantages and challenges of using different irrigation methods and systems.
- Students can share their thoughts on the most effective and economical solutions.

VI. Case study:
- Conducting a case study of a selected farm using advanced irrigation systems.
- Students will be asked to identify the key success factors and challenges of irrigation in this particular case.

VII. Summary:
- A short repetition of the material discussed.
- Summary of the main concepts and conclusions from the lesson.
- Encouragement to continue learning and experimenting with different irrigation methods.

End:
Thanking students for their participation and emphasizing the importance of professional irrigation for the efficiency of plant production. Encouragement of further interest in the topic and explore the possibilities related to professional irrigation of crops.

Growing Vegetables in Pots

Lesson goals:
1. Understanding the possibilities of growing vegetables in pots.
2. Learning about the most suitable species of vegetables for growing in pots.
3. Learning basic techniques for growing vegetables in pots.
4. Encouragement to grow your own vegetables at home or on the balcony.

Materials:
1. Multimedia presentation with information about growing vegetables in pots.
2. Posters or boards with examples of vegetables suitable for growing in pots.
3. Examples of flower pots, planting soil, seeds or vegetable seedlings.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises in establishing crops in pots.

Lesson course:
I. Introduction:
- Welcome students and introduction to the topic.
- Discussing the importance of growing vegetables in pots as a gardening, culinary and ecological form.

II. Vegetable selection:
- Presentation of various types of vegetables suitable for growing in pots.
- Discuss criteria for selecting vegetables, such as pot size, amount of sunlight and water needs.

III. Preparation for cultivation:
- Discuss the basic steps in preparing for growing vegetables in pots, including:
- Choosing the right pot and soil for planting.
- Choosing the right place on the balcony or in the garden.
- Preparing pots for planting by ensuring drainage.

IV. Establishing crops in pots:
- Practical classes on establishing crops in pots, including:
- Filling the pots with soil.
- Planting vegetable seeds or seedlings.
- Irrigation and placing pots in appropriate conditions.

V. Care of crops in pots:
- Discussion of basic techniques for caring for vegetables in pots, such as:
- Regular watering and fertilization.
- Removal of weeds and dead plant parts.
- Protection against pests and diseases.

VI. Group discussion:
- Moderated discussion on the advantages and challenges of growing vegetables in pots.
- Students can share their experiences and ideas about growing their own plants in pots.

VII. Practical exercises:

- Students will be asked to perform simple care activities related to growing vegetables in pots, such as watering and removing weeds.

VIII. Summary:
- A short repetition of the material discussed.
- Summary of the main concepts and conclusions from the lesson.
- Encouragement to continue learning and experimenting with growing your own vegetables in pots.

End:
Thanking the students for their participation and emphasizing the importance of growing vegetables in pots as a way to promote a healthy lifestyle and provide food independently. Encouragement to further interest in the topic and explore the possibilities of growing your own vegetables in pots.

Application of Horticultural Agrotextiles in Plant Crops

Lesson goals:
1. Understanding the importance of horticultural agrotextiles in agriculture.
2. Learning about the various uses of agrotextiles in plant cultivation.
3. Learning about the benefits and limitations of using agrotextiles.
4. Encouraging a conscious approach to the selection and use of agrotextiles in crops.

Materials:
1. Multimedia presentation with information about horticultural agrotextiles.
2. Examples of agrotextile samples.
3. Posters or boards with basic information on various uses of agrotextiles.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Case study.

Lesson course:
I. Introduction:
- Welcome students and introduce the topic.
- Discussing the importance of horticultural agrotextile as a material used in agriculture.

II. Types of agrotextile:
- Presentation of various types of agrotextiles available on the market.
- Discussion of the properties and applications of each type of agrotextile.

III. Application of agrotextile:
- Discussion of various applications of agrotextiles in plant crops, such as:
- Setting up a place for growing vegetables.
- Protecting plants against weeds.
- Protection of plants against pests and diseases.
- Soil moisture control.

IV. Benefits and limitations:
- Discussion of the benefits of using agrotextile, such as:
- Improved soil quality.
- Increasing crop productivity.
- Reducing the use of pesticides.

- Discussion on the limitations and potential negative effects of using agrotextiles, such as limited biodegradation and higher costs.

V. Practical demonstration:
- Showing a practical example of the use of agrotextiles in plant cultivation, if possible at a school or on a local farm.
- Students will have the opportunity to see how agrotextiles are used to protect plants and improve growing conditions.

VI. Group discussion:
- Moderated discussion on the advantages and challenges of using agrotextiles in plant cultivation.
- Students can share their experiences using agrotextiles or express their concerns or questions about this material.

VII. Case study:
- Conducting a case study of a selected farm using agrotextiles in its crops.
- Students will be asked to identify the benefits and limitations of using agrotextiles in this specific case.

VIII. Summary:
- A short repetition of the material discussed.
- Summary of the main concepts and conclusions from the lesson.
- Encouragement to continue learning about agrotextiles and experiment with its applications in practice.

End:
Thanking students for their participation and emphasizing the importance of horticultural agrotextile as a versatile tool in plant cultivation. Encouragement of further interest in the topic and explore various possibilities related to the use of agrotextiles in agriculture.

Notes for the presenter:
Agrotfabric, also called agro fabric, is a useful material in gardening, especially when growing plants. It is a type of material made of polypropylene or polyester that has many applications in plant protection, regulation of plant growth, and protection against pests and weather conditions. Here are some detailed uses of agrotextiles in gardening:

1. **Protection against cold and frost:**
    - Agrotextile can be used to protect plants against low temperatures in early spring or late autumn. Covering plants with agrotextile creates a barrier that retains the heat emitted by the soil, protecting the plants

against frost.

2. **Pest protection:**
    - Agrotfabric acts as a physical barrier that can protect plants from insects and birds that can damage plants and fruits.
3. **Plant growth regulation:**
    - By allowing air, water and light access to plants, agrotextile promotes their even growth and development. Additionally, it can help reduce weed growth.
4. **Protection against excessive sunlight:**
    - Agrotcan fabric can be used to partially shade plants, protecting them from excessive sunlight, which may lead to overheating and damage to the plants.
5. **Use as a cover for sowing:**
    - When sowing seeds, agrotextile can be used to create a cover that prevents the seeds from being washed away by rain and protects against damage by birds.
6. **Improving growing conditions:**
    - Agrotextile can be used to improve growing conditions by retaining moisture in the soil while preventing excessive erosion.

How to use agrotextile in practice:

- **Assembly and installation:** When unrolling the agrotextile, it should be placed over the plants, avoiding direct contact with them. It can be attached to supports or wooden battens to keep it in place.
- **Plant care:** Regularly check the condition of plants under the agrotextile to ensure appropriate growth conditions and prevent possible damage.
- **Seasonality:** Agrotextile can be used seasonally, depending on the needs of plants and weather conditions. For example, in spring it is applied at night to protect plants from night frosts.

The use of agrotextiles in horticulture requires understanding the needs of specific plants and adaptation to climatic and soil conditions. Thanks to its versatility and effectiveness, agrotextile is a popular choice among gardeners who care about the health and development of their plants.

Organic and Artificial Fertilization in Horticulture

Lesson goals:
1. Understanding the importance of fertilization for plant growth and development.
2. Learning the differences between organic and artificial fertilization.
3. Learning about different types of organic and artificial fertilizers.
4. Encouragement to consciously choose fertilizers appropriate for specific crops.

Materials:
1. Multimedia presentation with information on organic and artificial fertilization.
2. Examples of organic and artificial fertilizers.
3. Posters or boards with basic information on the differences between organic and artificial fertilizers.

Learning methods:
1. Interactive lecture.
2. Practical demonstration.
3. Group discussion.
4. Practical exercises in fertilizer application.

Lesson course:
I. Introduction:
- Welcome students and introduce the topic.
- Discussing the importance of fertilization for the growth, development and yield of plants.

II. Organic fertilization vs. artificial fertilization:
- Discuss the differences between organic and artificial fertilization, including:
- Sources of origin (natural vs. synthetic).
- Chemical composition.
- Mode of action.
- Impact on the environment.

III. Types of organic fertilizers:
- Introducing the different types of organic fertilizers such as:
- Compost.
- Manure.
- Green fertilizers (e.g. plant fertilizers, nettle).
- Commercial organic fertilizers (e.g. bone meal, seaweed fertilizers).

IV. Types of artificial fertilizers:
- Discuss the different types of fertilizers such as:

- Nitrogen fertilizers.
- Phosphorus fertilizers.
- Potash fertilizers.
- Multi-component fertilizers.
- Indication of their chemical composition and action.

V. Use of fertilizers in practice:
- Practical classes in fertilizer application, including:
- Selecting the right fertilizer for specific crops.
- Methods of application (e.g. scattering, irrigation, injection).
- Dosage and frequency of use.

VI. Group discussion:
- Moderated discussion on the advantages and challenges of using organic and artificial fertilizers.
- Students can share their experiences with fertilization and express their opinions on preferences regarding the type of fertilizers.

VII. Case study:
- Carrying out a case study of a selected farm using organic or artificial fertilization.
- Students will be asked to identify the benefits and challenges of using a specific type of fertilization.

VIII. Summary:
- A short repetition of the material discussed.
- Summary of the main concepts and conclusions from the lesson.
- Encouragement to continue learning about fertilization and consciously choose fertilizers appropriate for specific crops.

End:
Thanking students for their participation and emphasizing the importance of fertilization for the efficiency of plant production. Encouragement of further interest in the topic and explore different types of fertilization and their applications in gardening practice.

Note to the presenter:
Fertilizers play a key role in supporting plant growth by providing them with essential nutrients. They can be divided into two main categories: natural fertilizers and artificial (mineral) fertilizers. Here is a brief overview of each type of fertilizer:

Natural fertilizers:

1. **Compost:** This is an organic fertilizer made from decaying plant and food remains and other organic materials. Compost provides plants with nutrients,

improves soil structure and supports healthy soil microbiology.

2. **Manure:** Comes from the decaying feces of animals (mainly cattle or chickens). It is rich in nitrogen, phosphorus, potassium and other microelements. Manure is mainly used to fertilize vegetable gardens and agricultural fields.
3. **Mulch:** This is a layer of organic material (e.g. straw, leaves, peat) spread over the soil surface that not only retains moisture and reduces weed growth, but also releases nutrients as it decomposes.
4. **Green Manure Fertilizers:** Some plants, such as clover, phacelia and common vetch, can be grown and then incorporated into the soil as green manure, providing nitrogen and improving soil structure.

Artificial fertilizers (mineral):

1. **Nitrogenous:** They contain nitrogen in a form that is easily absorbed by plants (e.g. saltpeter, urea). Nitrogen is necessary for the growth of plant leaves and shoots and for protein synthesis.
2. **Phosphorus:** They contain phosphorus in an absorbable form (e.g. superphosphate, phosphates). Phosphorus supports the development of roots and flowering of plants.
3. **Potassium:** They contain potassium in an easily digestible form (e.g. potassium chloride, potassium sulfate). Potassium regulates water processes in plants and influences their resistance to environmental stresses.
4. **Microelements:** These fertilizers contain trace elements, i.e. microelements such as iron, copper, zinc, manganese, boron and molybdenum, which are necessary for healthy plant growth, although they are needed in small amounts.

Differences between natural and artificial fertilizers:

- **Source:** Natural fertilizers come from organic plant or animal materials, while artificial fertilizers are synthetically produced.
- **Bioavailability:** Natural fertilizers are often slower acting because they require time for organic materials to break down, while artificial fertilizers are quickly absorbed by plants.
- **Ecology:** Natural fertilizers are more environmentally friendly and tend to benefit soil structure and health, while excessive use of artificial fertilizers can lead to groundwater pollution and eutrophication.

Optimal fertilization depends on the type of plants, soil type and local climatic conditions. The balanced use of both natural and artificial fertilizers can contribute to healthy plant growth and increased yields, while minimizing negative environmental impacts.

Project completion:

Implementing our gardening lessons at a Montessori primary school was not only educational, but also inspiring. Children had the opportunity not only to learn about plants and the ecosystem, but also to experience the pleasure of working in the garden. Each participant had the opportunity to observe how their efforts bore fruit in the form of blooming flowers and healthy vegetables. This experience will certainly remain in their memories for a long time.

Summary of the project:

During the project, children had the opportunity to learn about various aspects of gardening, from soil preparation and sowing to plant care and harvesting. Learning responsibility for nature and developing teamwork skills were also important elements. Through this activity, children not only gained practical knowledge, but also strengthened their ecological awareness and understanding of the importance of maintaining balance in nature. This project was not only educational, but also brought a lot of joy and satisfaction to both the students and the teacher involved in its implementation.