

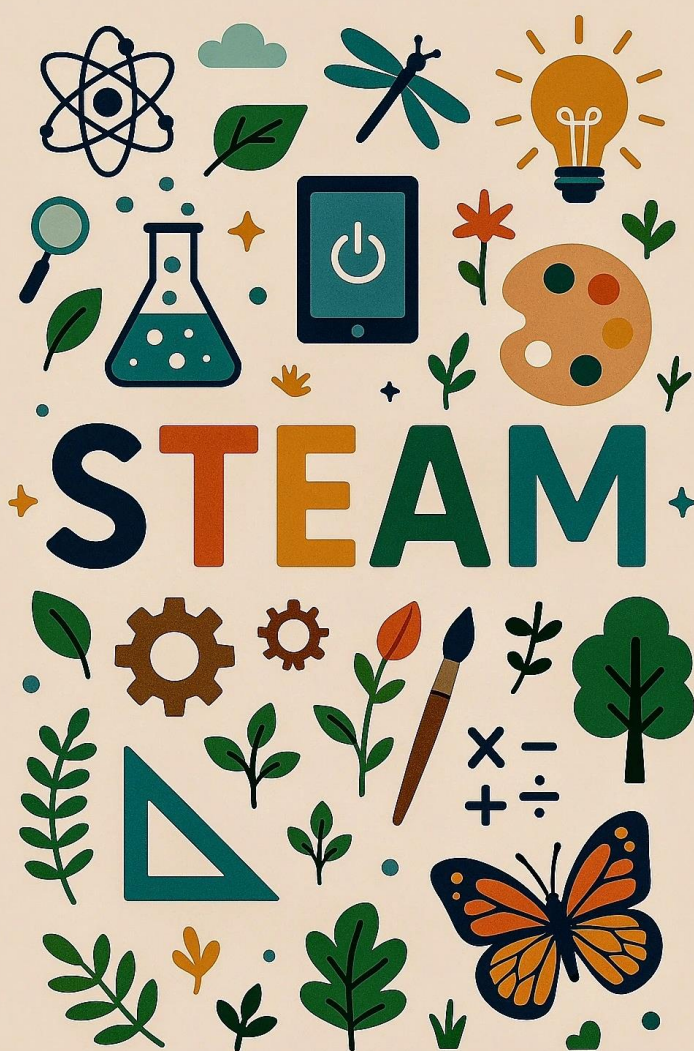


Lesson Plan

Our Dream Outdoor Classroom

Science, Technology, Engineering, Art and Mathematics

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STEAM Focus: Science, Technology, Engineering, Arts, Mathematics

Ages: 9-12 years

Keywords: Outdoor learning space, Student-led design, STEAM project, Hands-on learning, Cross-curricular integration, Real-world problem-solving, Environmental sustainability

Duration: 6–8 week project

Project-based learning: Weekly sessions, Timeframe (90 minutes per week)

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“STEAM - take it outside!”

Scenario

Palade School has several outdoor learning opportunities both near the school and further away, but most of these have been created without involving students or the school community. There are few outdoor learning spots close to the school, and during good weather, competition arises between both teachers and students for their use. Usually, the issue is resolved by giving priority to the teacher who first expresses interest in using the space. However, it sometimes happens that multiple classes wish to use the same spot at the same time.

This project offers a chance to improve the situation by creating a new learning space together with the help of students—one that best meets their needs and wishes. The focus is on students aged 9–12, who will collaboratively design and build a new outdoor classroom near the school as part of their collaborative project.

Students aged 9–12 are invited to collaboratively imagine, design, and build a multifunctional outdoor learning space on their school grounds. This space is intended to enhance their connection to nature, support learning in different subjects, and offer a peaceful, inspiring place for outdoor activities. The project is framed as a real-world design challenge where students take on the roles of designers, engineers, artists, and ecologists.

STEAM Areas:

Science: Ecosystems, plants, material properties, sustainability.

Technology: Measuring tools, digital tools for research and presentation.

Engineering: Design process, prototyping, construction, problem-solving.

Art: Aesthetic planning, design, creative expression using materials.

Mathematics: Measurement, planning, geometric shapes, data analysis, budgeting (simplified).

Skills and Competencies

- Collaboration
- Creativity
- Critical thinking
- Communication
- Responsibility
- Observation skills
- Planning and design
- Reflection



Learning Activities

- Brainstorming
- Sketching and drawing plans
- Measuring and budgeting
- Researching materials
- Building and construction
- Testing and feedback
- Presentation and reflection

Learning Outcomes:

By the end of the project, students will be able to:

- Collaborate in a group towards a common goal.
- Conduct simple observations and gather information about the outdoor area.
- Generate ideas and participate in brainstorming sessions.
- Create simple plans and sketches for the learning space.
- Use various measuring tools and materials during the construction of the learning space.
- Analyze the properties of different materials and assess their suitability for outdoor use.
- Present their ideas and contributions to the project.
- Understand the importance of outdoor learning and its connection to various school subjects.
- Value the natural environment and sustainable practices.

Goals

This project is designed to foster both academic and personal growth by engaging students in a meaningful, hands-on learning experience. The goals are grounded in STEAM education and support the development of essential 21st-century skills. Through the process of designing and building an outdoor learning space, students will not only deepen their understanding of science, technology, engineering, art, and mathematics but also strengthen their ability to work collaboratively, think critically, and act responsibly.



To support this holistic learning experience, the goals are divided into two key areas:

In terms of cognitive goals, students will be able to:

- Apply interdisciplinary knowledge from the STEAM fields to solve real-world problems.
- Analyze and evaluate the properties of different materials for suitability in outdoor use.
- Understand and apply key concepts such as sustainability, measurement, geometry, and the design process.
- Generate, plan, and revise creative ideas using sketches, models, and digital tools.
- Conduct observations and simple experiments to gather relevant data.
- Reflect on their learning, identify challenges, and adjust their strategies accordingly.
- Transfer their learning to new contexts, such as future design or environmental projects.

Regarding socio-emotional support, we would like students to be able to:

- Collaborate effectively in diverse teams by listening actively, sharing responsibilities, and valuing others' perspectives.
- Express their thoughts and ideas confidently in both spoken and visual forms.
- Manage emotions constructively, especially during problem-solving, disagreements, or unexpected challenges.
- Demonstrate empathy, patience, and encouragement in group interactions.
- Build resilience by coping with setbacks and continuing to work toward shared goals.
- Develop a sense of ownership and responsibility for their environment and their learning.
- Reflect on their group dynamics and personal contributions to improve future collaboration.

Transfer Goals

Students will be able to independently use their learning to:

- Design and implement creative solutions to real-life problems.
- Evaluate the sustainability and impact of their actions on the environment.
- **Work effectively in teams to plan and complete complex tasks.**
- **Adapt their thinking and strategies in unfamiliar situations.**
- **Manage emotions, build resilience, and demonstrate responsibility during collaborative work.**



Understandings

Students will understand that:

- Outdoor spaces can enhance learning and well-being.
- Different materials have distinct properties that make them more or less suitable for specific uses.
- Sustainable choices benefit both the environment and the community.
- Successful design requires planning, testing, and revision.
- Learning happens not only in the classroom but also through active, hands-on experiences.
- **Collaboration requires respect, shared responsibility, and clear communication.**
- **Self-reflection helps improve learning outcomes and personal growth.**

Essential Questions

- How can we design an outdoor learning space that is both functional and inspiring?
- What makes a material sustainable or suitable for outdoor use?
- How do different school subjects connect in real-world problem-solving?
- What responsibilities do we have when working with our environment?
- How do we learn best when working with others?
- How can we respond constructively to challenges and setbacks?

Students Will Know

- Properties of materials (durability, biodegradability, safety).
- Basic principles of measurement and geometry.
- Steps in the design and engineering process.
- How to conduct simple scientific observations and gather data.
- How to use planning and presentation tools (sketching, digital slides, etc.).
- **Strategies for effective teamwork and communication.**
- **Basic concepts of emotional awareness and self-regulation.**



Students Will Be Able to

- Plan, design, and construct elements of a learning environment.
- Use tools safely and accurately under supervision.
- Collaborate with others to solve problems creatively.
- Present ideas to an audience using visual and verbal communication.
- Reflect on their learning process and outcomes.
- **Demonstrate empathy, patience, and respect during group work.**
- **Identify emotions and manage frustration or disagreement constructively.**

Inclusion & Support: Strategies for Students with Special Educational Needs (SEN)

This hands-on, student-centered project offers a flexible structure that allows for the full participation of students with diverse learning needs. The teacher's role is to create an inclusive and supportive learning environment where every student feels valued and involved. This project is ideal for inclusive education – it supports collaboration, a wide range of skills, and individual strengths. Focus on the learning process rather than a perfect final product, and provide SEN students with meaningful roles, positive experiences, and the joy of participation.

1. General Principles

- **Differentiated activities based on ability:** Provide flexible tasks tailored to different levels, such as simplified instructions, visual supports, or extra time.
- **Clear structure and routine:** Keep activities predictable, well-organized, and supported with visual aids.
- **Scaffolded support:** Start with more guidance and gradually reduce it to build independence.
- **Team support:** Place SEN students in supportive groups with empathetic and guiding peers.



2. Specific Strategies by Project Phase

WEEK 1: Introduction and Idea Generation

- Use **picture cards or visual prompts** (e.g., photos of outdoor classrooms) to spark ideas.
- Allow students to share ideas through **drawing, hands-on modeling, or short verbal explanations**.
- **SEN students** can work **one-on-one with a support teacher or in a small guided group**.

WEEK 2: Planning and Design

- Support measuring and sketching with **visual aids** (e.g., grid paper, templates, measuring guides).
- Use **tablets or digital tools** if helpful for design (drag-and-drop, scale adjustments).
- Provide **step-by-step instructions** with symbols or color coding for clarity.

WEEK 3: Material Research and Budgeting

- Explore material properties through **tactile and hands-on exploration** (e.g., touch, bend, compare).
- Use visuals and manipulatives for budgeting (e.g., **images with prices**, toy money, simplified charts).

WEEKS 4–6: Building and Designing

- Assign tasks based on ability – some students can measure, others can hand over tools or sort materials.
- Use **color-coded stations or symbols** for guiding students between tasks.
- Allow for **shorter work periods** with clear start and end points.
- Ensure **all tool use is supervised**, and offer **extra adult support** if needed.

WEEK 7: Testing and Feedback

- Let students test the space through **game-like activities** (e.g., discovery hunt, measuring challenges).
- Collect feedback using **emotion cards, pictograms**, or simple questions with answer choices.



WEEK 8: Presentation and Reflection

- Allow for diverse presentation formats: **drawings, models, photo galleries, short videos.**
- SEN students may present individually or as part of a group, using **prepared support tools** (scripts, images, slides).
- Use **sentence starters** for reflection (e.g., “I learned that...”, “I enjoyed when...”) and let them finish or illustrate the response.

3. Additional Recommendations

- Collaborate with the **special education teacher or support staff** to adapt materials and share strategies.
- Use **visual schedules, simplified language, and pictorial worksheets** to support understanding.
- Celebrate all progress – give **positive, specific, and immediate feedback.**
- Create a **calm and supportive physical space**, and allow breaks or quiet corners when needed.

Pedagogical Approach:

- **Project-Based Learning (PBL):** Centered around a real-world task with tangible outcomes.
- **Inquiry-Based Learning:** Encourages observation, questioning, and exploration.
- **Collaborative Learning:** Students work in groups with shared responsibilities.
- **Constructivist Approach:** Learners build knowledge through active experience.
- **Experiential Learning:** Emphasis on learning by doing and reflecting.
- **Integrated Curriculum:** Combines multiple disciplines in a holistic way (STEAM).

Learning Modes:

- **Individual work:** Reflections, initial brainstorming, sketches.
 - **Pair work:** Peer feedback, observations.
 - **Small group work:** Planning, building, testing, problem-solving.
 - **Whole class activities:** Brainstorming, presentations, feedback sessions.
 - **Outdoor learning:** Observations, construction, testing the space.
 - **Digital work:** Research, presentations, documentation.
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Learning Activities (by weeks):

Depending on students' ideas and the class schedule, group work will take place either within individual classes or collaboratively between classes. The introduction to the topic and open discussions will initially be conducted separately in each class. Teachers will then create a joint plan to determine when group discussions and preparatory work will be carried out together with other classes. In the final phase of the project, the construction of the outdoor learning space will also be organized either by class or jointly, depending on the ideas, the timetable, and the plan developed by the teachers.

Week 1: Introduction and Idea Generation (Science, Art, Engineering)

- Introduction to the project, explanation of goals and expectations.
- Joint exploration of the outdoor area: existing elements, potential locations, strengths, and challenges.
- Brainstorming session: “What is our dream outdoor learning space?” – individually and in groups.
- Sharing ideas and creating initial sketches.

Week 2: Planning and Design (Mathematics, Engineering, Art)

- Forming groups based on interests (e.g., design, construction, materials, presentation).
- Creating more detailed plans and sketches in groups.
- Measuring the outdoor area and estimating the required space.
- Initial selection of materials and discussion of their properties.

Week 3: Material Research and Budgeting (Science, Technology, Mathematics)

- Exploring various natural and recyclable materials (properties, durability, eco-friendliness).
- Creating a simple budget (existing vs. needed materials).
- Researching sustainable construction methods (if needed).

Weeks 4–6: Building and Designing (Engineering, Art, Technology)

- Building and designing the learning space according to plans in group rotations.
 - Processing materials (simple tasks under teacher supervision).
 - Constructing structures (benches, tables, etc.).
 - Adding aesthetic elements.
 - Following safety guidelines.
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Week 7: Finishing and Testing (All STEAM fields)

- Installing final details.
- Testing the learning space with various learning activities based on teachers' needs to conduct outdoor lessons.
- Collecting feedback from students and teachers.
- Making improvements if needed.

Week 8: Presentation and Reflection (Technology, Art, Communication)

- Official opening of the learning space to the school community.
- Project presentation (e.g., slideshow, posters, short presentations).
- Individual and group reflection on the process, lessons learned, and outcomes.

Week	Activity plan	Focus Areas
1	Project introduction in grades 4-6, exploring school grounds, idea generation, individual and group sketches	Science, Art, Engineering
2	Group formation by interest and age groups (design/build/materials/presentation), detailed planning and measuring the space	Math, Art, Engineering
3	Investigate sustainable materials, compare options, create a basic budget	Science, Technology, Math
4-6	Construction and creative building in groups, supervised tool use, add artistic elements	Engineering, Technology, Art
7	Final touches, testing for learning use, feedback gathering and adjustments	All STEAM
8	Presentations to school community, reflection journals, group debrief	Technology, Communication, Art



Teaching Resources and Materials: (dependent on student ideas, may include):

Natural materials:

Stumps, large stones, branches, bamboo, clay, sand, soil, plants (e.g., seedlings, seeds).

- **Recyclable materials:**

Old tires (for seating or garden beds), wooden pallets, plastic bottles (for vertical gardens), glass jars (for insect hotels).

- **Construction materials (if needed):**

Wooden boards, screws, nails (used under supervision), cement (for small jobs).

- **Tools:**

Shovels, rakes, saws (used under supervision), hammers (used under supervision), measuring tapes, levels, gloves, safety glasses.

- **For planning and presentation:**

Paper, pencils, markers, paints, rulers, computers if needed, internet access for research and presentations, camera for documentation.

- **Other:**

Plant labels, string, tape.

Important Notes for the Teacher:

- **Safety:**

Carefully consider safety guidelines for using tools and materials before starting. Students must always work under teacher supervision and use necessary protective equipment.

- **Student Involvement:**

Involve students in every stage from idea generation to construction and presentation. This increases motivation and responsibility.

- **Flexibility:**

The project should be flexible and adaptable to student interests, abilities, and available resources.

- **Cross-curricular Integration:**

Focus on integrating different STEAM fields. For example, math for measuring and planning, science for studying material properties, etc.

- **Environmental Sustainability:**

Encourage the use of recyclable and natural materials and consideration of environmental impact.



- **Collaboration:**

Collaborate with other teachers (e.g., art, science) and involve parents or local experts if possible.

Possible Examples of Final Learning Products

- Completed outdoor learning space (with seating, tables, and learning tools)
- Student-designed sketches and construction plans
- Posters or visual displays explaining the project process
- Slideshow presentations documenting each project phase
- Photo gallery showing the before–during–after stages
- Student-written reflections or journals on their learning journey
- Short video documentary about the project
- Material research reports or sustainability analyses
- Budget plans and material lists
- Collaborative artwork or decorations made from natural/recycled materials
- Peer feedback forms or self-assessment rubrics
- Public presentation or guided tour for the school community

Assessment:

Since the learning activity involves collaboration between multiple classes and may also include other participants, such as parents or specialists, formal assessment is not the primary focus. Instead, the teacher observes students’ motivation and provides feedback to them as needed throughout the process.

Teacher Guide

Student Problem Map: Guiding Questions for Open Discussion

As we begin our journey toward designing Our Dream Outdoor Learning Space, it’s important to take time to explore the challenge from many perspectives. The Student Problem Map is a creative thinking tool that helps us do just that. Through open discussion and visual mapping, students are encouraged to look at the problem not just as something to solve, but as an exciting opportunity to imagine, innovate, and collaborate.



This activity supports students in developing a deeper understanding of the design challenge by breaking it down into four key areas: identifying the core problem, exploring possible causes, generating creative solutions, and considering the broader impact of their ideas. It encourages learners to think critically, communicate their ideas, and reflect on both practical and emotional aspects of the outdoor space they want to create.

Working as a class or in small groups, students will co-construct a large visual “map” of ideas using guiding questions provided for each section. This map will grow organically as students contribute their thoughts, drawings, and connections. It is not about finding one correct answer, but about exploring a wide range of possibilities.

The goal is to foster a safe, inclusive, and imaginative environment where all students feel empowered to share their voices. This process builds essential 21st-century skills—such as problem-solving, empathy, collaboration, and systems thinking—while also laying a strong foundation for the practical steps to come in the project.

At the end of the activity, students and teachers can identify key themes or ideas that will guide the design and construction phases of the project. This helps ensure that the final outdoor learning space is not only functional and beautiful, but also meaningful and relevant to the learners who helped shape it.

Tips for Facilitating the Problem Map Activity:

- Use large paper or a whiteboard so everyone can contribute.
- Have a student scribe or allow students to draw their own idea branches.
- Use color-coded post-its or markers to show different categories (Problems, Causes, Solutions, Benefits).
- Keep it open-ended and non-judgmental—value all contributions.
- After the map is complete, help students identify 3–5 key focus points for the rest of the project (e.g., seating, shelter, natural materials, subject integration).

1. Define the Challenge (Main Problem/Need)

Place this at the center of your map. Write the main question in large letters:

How can we create an inspiring and functional outdoor learning space for our school?



Ask guiding questions:

- What is missing from our schoolyard right now?
- Why do we need a special place for outdoor learning?
- What makes a space comfortable and inspiring?
- What should students be able to do there (sit, learn, observe nature, create, relax)?

2. Explore Causes (Why the Problem Exists)

Branch out from the central problem. Ask:

- Why don't we currently have a good outdoor learning space?
- Are there any barriers (space, budget, safety, lack of materials)?
- What challenges could we face when designing or building it?
- Do we understand what makes a space sustainable or useful?

Encourage students to think in terms of:

- **Physical barriers** (space, terrain)
- **Resources** (tools, materials)
- **Knowledge** (what we need to learn first)
- **Teamwork** (how to collaborate effectively)

3. Imagine Possibilities (Solutions & Features)

On a new set of branches, explore:

- What features could our dream learning space include?
 - How can we make it beautiful and eco-friendly?
 - What natural and recycled materials could we use?
 - What are some creative elements (insect hotels, plant labels, stone circles)?
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- What subjects can we learn in this space? (e.g., science experiments, art projects)

Encourage “wild” ideas and divergent thinking. No idea is too big or too small at this stage.

4. Consider Benefits (Why It Matters)

Ask:

- How will this space help students learn better?
- How can it improve our connection to nature?
- How does it help the school community?
- How can this space show respect for the environment?

Encourage students to think emotionally and socially as well as academically.

Optional Prompts to Spark Deeper Thinking:

- What would make this space unique to our school?
- What would make students want to use this space every day?
- How can we design something that’s fun and functional?
- How can we make sure everyone in our class contributes to the final design?
- What are examples of inspiring outdoor places you’ve seen or visited?

Worksheet for students aged

“Think and Share – Your Own Ideas” My Dream Outdoor Classroom

For independent work

This worksheet will help you think deeply and creatively about our outdoor learning space project. You’ll explore ideas, challenges, and why this project matters. You can write, draw, or do both—whatever helps you express your thinking best! **Feel free to write just key words or short notes.**



1. What's the Big Question? *How can we create a fun and useful outdoor learning space for our school?*

- Draw or write your ideas about what this space could look like or include.
- Think about what would make it fun, comfortable, and helpful for learning.

2. What's Stopping Us? *Let's explore the challenges.*

- Do we have enough space?
- Do we have the materials or money?
- What do we need to learn first?
- How can we work well together?

3. What Could We Make? *Time to imagine the possibilities!*

- Places to sit and learn
- Trees, flowers, or logs
- Insect hotels, rock circles
- What lessons could happen outside?

4. Why Does It Matter? *Now think about the impact.*

- Helps us learn in new ways
- Connects us to nature
- Makes school more fun
- Shows we care for the environment



Focus Points for Our Design. *After you've filled out the sections above, pick 5 ideas you think are the most important for our final design.*

1. _____

2. _____

3. _____

4. _____

5. _____

