Out and Learn

Extracurricular Activities Toolkit

IMPRESUM:

2025

Publisher: Civil Society Organization Eco Logic

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Art Natural Sciences Technology Social Science

INTRODUCTION

Extracurricular activities are a powerful way for students to explore new areas of interest and develop a range of skills that go beyond what is taught in the classroom. These activities, particularly those that involve hands-on learning in real-life contexts, offer valuable opportunities for students to engage with the world around them. The “Out and Learn” toolkit focuses on providing such interactive experiences, aiming to foster creativity, problem-solving, teamwork, empathy, responsibility, leadership and environmental awareness.

However, one of the challenges educators often face is creating learning experiences that are both engaging and relevant to students’ lives, while also taking into account cultural and national differences. Traditionally, students have had limited input into the design of their educational materials, and there has been little collaboration between teachers and students to create learning resources. To address this gap, the “Games, Resources, Environment, Entrepreneurship, and Education“ project has developed a toolkit that features extracurricular activities designed by both teachers and students. These activities are focused on key subject areas, including Social Sciences, Natural Sciences, Arts, and Technology, with an emphasis on creating a more interactive, student-centered learning environment.

The “Out and Learn” toolkit is designed to be a comprehensive guide for educators and students, providing ready-to-use resources and activities that promote hands-on learning, collaboration, and creativity. It is organized into two sections: one for primary schools and one for secondary schools, ensuring that the activities are age-appropriate and cater to different developmental stages. Each activity is designed to foster the development of essential skills, such as scientific inquiry, creative thinking, and teamwork, while encouraging students to explore new concepts through interactive and outdoor learning experiences.

Whether it’s through creating art with natural materials, conducting scientific experiments, or exploring social sciences through role play and environmental awareness campaigns, this toolkit offers a variety of activities that promote both academic and personal growth. The goal is not just to provide a set of activities but to inspire future collaboration between teachers and students, making the learning process more engaging, dynamic, and impactful for everyone involved.

By integrating outdoor learning with classroom knowledge, students are given the chance to connect with their environment, work as a team, and learn through hands-on experiences. This holistic approach to education aims to prepare students for future academic and life challenges, equipping them with the skills they need to succeed both in school and beyond. The “Out and Learn” toolkit is more than just a collection of activities. It’s an opportunity for students to engage with the world around them in new and exciting ways, while developing a range of skills that will serve them well in their academic and personal lives.

We hope that this toolkit will inspire teachers and students to come together, collaborate, and create meaningful learning experiences that extend beyond the walls of the classroom, fostering a deeper understanding of the world around them. Welcome to the “Out and Learn” journey!

Let's dress up the tree

Skills and knowledge least appropriate to outdoor learning

Observation skills – Noticing the subtle changes in nature, particularly in trees, throughout the seasons.

Creativity – Expressing seasonal changes through art, encouraging students to creatively represent the changing landscape.

Teamwork – Collaborating with peers to complete the project and share ideas.

Fine motor skills – Using scissors, paint, and glue to create and assemble the artwork.

Critical thinking – Understanding the reasons behind seasonal changes and how these changes affect nature.

Environmental awareness – Gaining knowledge of the environment and the importance of understanding nature's cycles.

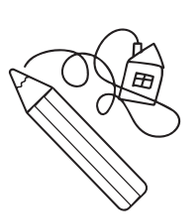
Problem-solving – Figuring out how to represent different seasons creatively with materials collected.

Communication skills – Discussing observations with peers and the teacher, explaining changes in the landscape.

Patience – Observing gradual changes and revisiting the artwork throughout the year.

Scientific understanding – Learning about the growth cycles of trees and how seasonal changes impact the environment.

Key Words



Seasons

Nature observation

Tree changes

Creativity

Handicrafts

Collaboration

Seasonal transformations

Art

Natural materials

Environmental awareness

Learners' objectives (filed by teachers)

To observe and track the changes in trees throughout the year

To develop creativity by following nature's changes over time

To understand how trees change in each season

To explore the seasonal transformations in nature through hands-on activities

Learners' needs (filed by students)

Opportunities to improve practical handicraft skills

Time for teamwork and collaboration

Understanding how nature changes over time

Developing knowledge of various tree species throughout the year

Learning to use colors and brushes to express observations

Subject

Art

Natural Sciences

Type of activity

Visualization of changes in nature through the seasons

Topic

Let's dress up the tree

Target group

Primary school children aged 6-9

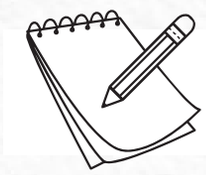
Group number

4 Groups with 4-5 students

Duration

During all school year (all seasons)

Necessary materials



4 white paper A3 size

Paints and brushes

Scissors

Strong glue

Double sided Self-stick dots

A method of attaching the hummers paper securely to the wall

Trees in the schoolyard

References and further reading

https://www.education.com/worksheet/article/the-four-seasons/

Instructions:

Initial Landscape Creation (First Week)

1. **Preparation:** Provide each group with an A3 size sheet of white paper. Each group is responsible for painting their own version of the landscape they can see outside their classroom window.

2. **Background:** Ask students to paint the sky, the ground (earth), and the initial tree structure they see outside. The tree should be represented by its trunk and branches—no leaves or flowers at this stage.

3. **Mark the Season:** Students should label the season they are representing (e.g., Spring, Summer, Fall, Winter) on the top of their landscape. At this stage, the tree should appear to be dormant or leafless, depending on the time of year.

4. **Display:** After finishing their painted background, attach each of the 4 landscapes on the classroom wall, ensuring that they are easily accessible for the students to add more elements throughout the year.

Collecting Seasonal Items

1. **Explore Outside:** Over the coming weeks, students should go outside and collect items from the trees and nature surrounding their school (e.g., leaves, seeds, flowers, sticks, etc.). These should be items that clearly represent the current season (e.g., green leaves in Spring, colorful autumn leaves in Fall, snowflakes or pinecones in Winter).

2. **Observation:** While collecting, students should observe how the trees look. Discuss how trees change over time and how weather influences this.

3. **Important Note:** Teachers should guide students to collect only safe and environmentally-friendly materials. No damage should be caused to the trees or plants in the process.

Adding Seasonal Elements to the Tree (As Seasons Progress)

1. **Return to the Classroom:** Once students have collected their seasonal items, return to the classroom and prepare to add the collected materials to the landscapes they painted earlier.

2. **Affix Materials:** Using the double-sided self-stick dots or glue, students will attach the items they've collected to the painted tree. For example:

- Spring: Add flowers, green leaves, and grass around the base of the tree.
- Summer: Add fuller leaves, small flowers, and other seasonal elements that appear during summer.
- Autumn: Add fallen leaves, maybe some acorns, and the colors associated with fall.

- Winter: Add snow (using cotton or white paper), bare branches, and possibly pinecones.

3. **Additional Creativity:** Students can also add any extra creative elements that reflect each season (e.g., birds for Spring, pumpkins for Fall).

Discussion and Reflection

1. **Teacher Explanation:** After adding the seasonal elements, the teacher will lead a discussion about why trees and the environment change during the year.

- How does the weather influence the tree's growth?
- Why do leaves fall in Autumn?
- What happens to the tree in Winter?

2. **Updates:** Each time a new season begins, the teacher should encourage students to observe and update their trees accordingly, ensuring that the classroom art wall reflects the ongoing natural changes outside.

Final Presentation (End of School Year)

Final Reflection: At the end of the school year, students will present their completed landscapes and explain how their tree and the environment changed across the seasons. They can reflect on how their art evolved over time and what they've learned about nature.

With older children the landscape can be shown and then followed the changes of several different trees in the school yard.

Volcanoes – Earth's geologic architects

Skills and knowledge least appropriate to outdoor learning

Creativity: They will use their imagination to design and construct a model of a volcano, incorporating artistic elements to represent different features of volcanoes..

Scientific Inquiry: The activity involves experimenting with the reaction between baking soda and vinegar to simulate a volcanic eruption, encouraging students to observe and understand cause-and-effect relationships in nature.

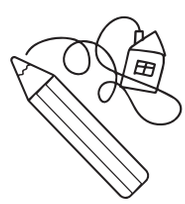
Research and Knowledge Application: By researching different types of volcanoes and understanding their physical characteristics, students will connect theoretical knowledge of volcanoes to practical application.

Practical Craft Skills: Through the hands-on building process, students will develop skills in cutting, gluing, assembling, and painting as they create their volcano models.

Attention to Detail: While decorating the volcano and preparing the eruption, students will develop attention to detail in their artistic design and scientific execution.

Environmental Awareness: Students will learn about natural processes (volcanic eruptions) and environmental impact, promoting an understanding of Earth's geology and ecosystem.

Key Words



Volcanoes

Ecosystem

Geology

Natural Sciences

Chemical Reaction

Teamwork

Creativity

Hands-on Learning

Scientific Inquiry

Environmental Awareness

Learners' objectives (filed by teachers)

To encourage students to explore and observe volcanic processes through hands-on experiments.

To develop students' creativity by allowing them to design and construct their own volcano models.

To strengthen scientific inquiry by engaging students in the research and experimentation of volcano behavior.

To foster understanding of Earth's geological processes by studying different types of volcanoes and their eruptions.

To demonstrate the application of chemistry through the creation of an erupting volcano with baking soda and vinegar.

To build practical crafting skills such as cutting, gluing, and painting in a creative and educational context.

To raise environmental awareness by connecting natural processes with real-world environmental considerations.

Learners' needs (filed by students)

Improving skills for practical handicrafts.

Opportunity for teamwork and collaboration.

Hands-on learning opportunities to engage with scientific concepts in a fun and interactive way.

Subject

Technology

Natural Sciences

Type of activity

Hands-on Experimentation

Topic

Volcanoes - Earth's geologic architects

Target group

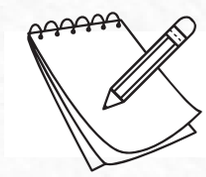
Primary school children aged 11-14

Group number

Group of 3-5 students

Duration

1,5 to 2 hours



Necessary materials

A plastic water bottle (from 1L or 1,5 L)

Cardboard

A plate or something circular to trace a perfect circle

Scissors

Glue gun

Old newspaper

Aluminum foil

Craft paint: brown, black, grey, green, red, yellow

Paper masking tape

Paintbrush

Baking Soda

Food coloring

Vinegar

Funnel

References and further reading

https://www.youtube.com/shorts/TFR-CfCjW_I

https://supersimple.com/article/make-a-volcano/

https://www.youtube.com/watch?v=WgktM2luLok&list=PLQInTldJs0ZQmYcKNCB-Tiv2Ea64Qg0GJo&index=2

Instructions:

1. Introduction (5-10 minutes)

Briefly introduce the topic of volcanoes: What are volcanoes? What is an eruption?

Explain how volcanoes are formed and the role they play in the Earth's geology.

Talk about how chemical reactions can create eruptions, like how baking soda and vinegar create an eruption in the classroom activity.

2. Constructing the Volcano Model (30 minutes)

- Prepare the base:

Take a large piece of cardboard and use a plate to trace a circle on it. This circle will be the base of your volcano.

Cut out the circle using scissors.

- Secure the bottle:

Place an empty plastic water bottle in the center of the circle (this will be the volcano's "vent").

Tape it down securely so it doesn't move.

- Build the volcano shape:

Crumple up pieces of old newspaper and glue them around the plastic bottle to form the volcano's structure.

Use masking tape to secure and shape the newspaper into a cone around the bottle.

- Decorate your volcano:

Once the shape is secure, use paint to decorate your volcano to resemble a real one. You can use colors like brown, gray, red, yellow, or green.

Add details like moss (for trees), rocks, or other decorations to make your volcano look more realistic.

3. Prepare the Eruption Experiment (10 minutes)

- Prepare the eruption mixture:

Using a funnel, pour 3-4 tablespoons of baking soda into the plastic bottle.

Mix some food coloring with vinegar in a separate container (to give your lava color).

- Perform the eruption:

Pour the vinegar mixture into the bottle with the baking soda, using the funnel.

Watch as the reaction creates a “lava” eruption!

4. Reflection and Cleanup (15 minutes)

Discuss the process: Ask students what they learned about volcanoes and the science behind the eruption.

Reflection questions:

What did you find interesting about how the volcano erupted?

What role do you think volcanoes play in the Earth’s ecosystem?

Cleanup: Ensure that all materials are cleaned up and that any leftover baking soda or vinegar is properly disposed of.

Build a bridge

Skills and knowledge least appropriate to outdoor learning

Problem-Solving – Students will need to think critically about how to design and build a bridge that can hold weight, testing their ideas and adjusting their designs as they go.

Creativity – Designing a bridge using everyday materials encourages innovative thinking and creative approaches to engineering.

Teamwork & Collaboration – Working in small groups, students will practice communication, coordination, and collaboration to complete the task.

Planning & Organization – Teams will need to plan the structure of their bridge, considering the materials available and how to distribute weight effectively.

Critical Thinking – Testing the bridge and analyzing what worked or didn't will help students evaluate their designs and adapt their strategies.

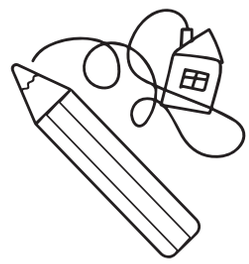
Communication – Students will need to discuss ideas within their teams, listen to each other's suggestions, and explain their reasoning for design choices.

Hands-on Construction Skills – Using tools like scissors, glue, and tape, students will practice fine motor skills and learn to handle materials to build their projects.

Measurement & Testing – Using a measuring tape to test the length of the bridge and experimenting with weight limits will develop skills in measurement and scientific testing.

Resilience & Adaptability – Facing challenges during testing (like the bridge breaking) teaches students to adapt their designs and approach failure as a learning opportunity.

Confidence in Presentation – Discussing the process and presenting their bridge design will help students gain confidence in public speaking and sharing their ideas with peers.



Key Words

Outdoor Learning	Bridge Design
Creative Expression	Testing
Teamwork	Weight Distribution
Problem-solving	Collaboration
Engineering	Innovation

Learners' objectives (filed by teachers)

To develop creative expression through design and engineering.

To appreciate different artistic forms by blending engineering with creativity.

To build confidence in presenting ideas and designs to others.

To reinforce scientific and mathematical concepts (force, measurement).

To promote hands-on learning through active participation in building.

To apply basic engineering principles to real-world problems.

Learners' needs (filed by students)

Opportunities to express creativity in a supportive environment.

Tasks that are hands-on and involve active participation.

A variety of materials and resources for inspiration.

Subject

Technology

Type of activity

Problem-solving through simple engineering

Topic

Build a bridge

Target group

Primary school children aged 9-14

Group number

Group of 3-4 students

Duration

1,5 to 2 hours

Necessary materials

- Cardboard or styrofoam (for the car body)
- Plastic bottle caps or small wheels (for the wheels)
- Skewer sticks or straws (for the axles)
- Tape and glue
- Paper or light fabric
- Scissors
- String
- Markers or colored tape for decoration
- Fan or natural wind source for testing
- Measure tape (for distance measurement).

References and further reading

Browne, D. “Kid Engineers: How to Build and Design Simple Machines”

Instructions:

Each group must design and build a bridge at least 30 cm long, strong enough to hold a small toy car.

1. Introduction and Preparation (10-15 minutes)

Explain to the students that they will work in teams to design and build a bridge that can support a toy car. Emphasize the importance of teamwork, creativity, and problem-solving.

Distribute the materials to each group (cardboard, styrofoam, plastic bottle caps, skewers, tape, scissors, etc.). Make sure each group has a measuring tape for distance measurement and some way to add weight (e.g., small objects, paper clips).

Divide students into teams of 3-4 members. Encourage them to work collaboratively by assigning roles (e.g., designer, builder, tester, note-taker).

2. Planning and Sketching (15-20 minutes)

Encourage students to brainstorm ideas and plan their bridge design before they start building.

Have students sketch their ideas on paper. They should think about:

- Materials: Which materials will they use for the body, axles, and wheels?
- Weight Distribution: How will they ensure the bridge is strong enough to hold weight? What design features will help with stability?
- Design Challenges: What challenges do they anticipate in building their bridge

Walk around the groups and provide guidance if needed. Encourage them to discuss ideas with their team and ask guiding questions (e.g., “How will your bridge hold the toy car?” or “What happens if the bridge is too weak in the middle?”).

3. Building the Bridge (30-40 minutes)

Allow students to put their ideas into action by constructing the bridge.

Teams will build their bridge using the materials provided. Ensure they are using the right tools (scissors, glue, tape) safely. During the building process, encourage the students to test their bridge design as they go by adding small weights or checking the bridge’s stability. If students encounter problems (e.g., the bridge is too weak or unstable), encourage them to rethink their design and adapt it accordingly.

Keep track of time so that all teams have enough time to finish building.

4. Testing the Bridge (15-20 minutes)

Test the bridges and evaluate how well each design holds up under pressure.

Once the bridges are built, have each team test their bridge by placing a toy car on it.

Gradually add weight (e.g., coins, small objects) to each bridge to see how much it can hold before breaking.

Record how much weight each bridge can hold before failure, and make note of any key observations during the testing.

Remind students to document the results of the test (e.g., which bridge held the most weight).

5. Group Discussion and Reflection (20-25 minutes)

Reflect on the activity to discuss what was learned, challenges faced, and potential improvements for future designs.

After testing, have each group present their bridge to the class. They should explain:

- Their design process and choices.
- What challenges they encountered during building and testing.
- How they worked together as a team.

Lead a group discussion with guiding questions:

- What worked well in your design? Why?
- What didn't work as expected? How did you adapt?
- How did teamwork help (or hinder) your design process?
- What changes would you make to your bridge if you could redesign it?

Facilitate the discussion, encouraging students to share their thoughts openly.

Provide feedback on their teamwork, creativity, and problem-solving skills.

Reinforce the importance of collaboration, reflection, and learning from mistakes.

6. Wrap-up and Conclusion (5-10 minutes)

Recap what students learned about engineering, design, teamwork, and problem-solving.

Highlight the importance of creativity and adaptability in overcoming challenges.

Encourage students to think about how they might apply these skills to real-world situations or future projects.

Building Bridges of Friendship

Skills and knowledge least appropriate to outdoor learning

Social Skills: Students learn how to interact respectfully and kindly with others, fostering positive relationships.

Empathy: By discussing and practicing kindness, students better understand and relate to others' emotions.

Collaboration: Working in groups encourages teamwork and the sharing of ideas to achieve a common goal.

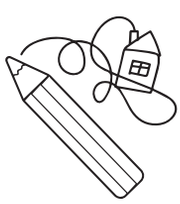
Communication: Students improve their ability to express themselves and listen to others in both discussions and role plays.

Self-expression: The activity allows students to express their feelings and ideas creatively through drawing and role playing.

Emotional Intelligence: The activity enhances students' ability to understand, manage, and reflect on their own emotions and those of others.

Creativity: Students design and decorate their "Bridge of Friendship," expressing their ideas through art.

Key Words



Friendship

Kindness

Trust

Support

Social Skills

Empathy

Collaboration

Creativity

Role Play

Self-expression

Learners' objectives (filed by teachers)

To foster understanding of the importance of friendship and develop social and emotional skills.

To encourage students to practice kindness and develop qualities like trust, communication, and support.

To provide students with tools to express themselves creatively through drawing and role play.

Learners' needs (filed by students)

Opportunities for self-expression and creativity to explore social emotions in a safe environment.

Activities that allow teamwork and collaboration in a supportive, interactive setting.

Simple tools and materials that let them explore their feelings about friendship in a hands-on way.

Subject

Social Sciences

Art

Type of activity

Interactive Group Activity

Role Play

Topic

Building Bridges of Friendship

Target group

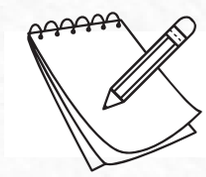
Primary School Students (Ages 6-10)

Group number

Small groups (4-6 students): Students can work in groups to share ideas and collaborate, or the entire class can participate together in discussions and creative activities.

Duration

30-45 minutes



Necessary materials

Paper and markers/crayons: For drawing or writing messages.

Friendship “Bridge” Template: A drawing or outline of a bridge that students will decorate.

Stickers, gems, or small craft supplies: To decorate the “bridge” and make it more creative and personal.

Friendship Card: Cards where students can write compliments or things they like about each other.

References and further reading

“The Invisible String” by Patrice Karst (A lovely story about how friendship connects people no matter the distance)

How to be a good friend https://www.youtube.com/watch?v=4ai7ckER2os

A short story about true friendship

Instructions:

1.Introduction to Friendship (10-15 minutes):

Begin by discussing the concept of friendship. Ask students:

- What does it mean to be a good friend?
- How do we show kindness and care for our friends?
- What makes a friendship strong?

Discuss qualities of a good friend, such as listening, helping, sharing, and showing kindness. You can read a short story about friendship (like “The Berenstain Bears: Big Sisters and Little Sisters” or “Frog and Toad Are Friends”), then ask students about their own experiences.

2. Building Bridges of Friendship (20 minutes):

Each student needs to create their own “Bridge of Friendship” using a drawing of a simple bridge (this can be provided as a template, or students can draw their own).

- On the bridge, students write qualities of a good friend (e.g., “kind,” “supportive,” “trustworthy”).
- Students decorate their bridges with symbols of friendship (hearts, stars, colorful patterns).

Then, in small groups, students can share what they wrote on their bridge and explain why those qualities are important for being a good friend.

3. Role Play (10-15 minutes):

Have students engage in a short role play where they practice being a good friend. Provide them with scenarios that might happen in real life, like:

- Helping a friend who feels sad.
- Inviting someone to play when they are alone.
- Saying sorry when they accidentally hurt a friend’s feelings.

After each scenario, ask the students how the friendship was improved through kindness, communication, and understanding.

4. Reflection and Sharing (5-10 minutes):

Gather students together and ask them to reflect on the activity:

- What does a good friendship look like?
- How can they show their friends they care?

- Why is it important to be kind and respectful in friendships?

Encourage students to share a compliment or something nice about the friends in their group or the class.

5. Friendship Cards

Give each student a “Friendship Card” where they can write a nice message or compliment to a friend. This could be something simple like, “You are kind and fun to play with!” or “I like how you always share with others.” The cards can be given to a classmate or saved for later.

Lemon Art and Science: The Power of Citrus

Skills and knowledge least appropriate to outdoor learning

Creative Thinking – Encouraging students to use lemons in artistic ways, allowing them to think outside the box and express themselves through art.

Scientific Inquiry – Developing an understanding of chemical reactions, such as the fizzing reaction between lemon juice and baking soda, fostering curiosity and experimentation.

Problem-Solving – Finding creative ways to integrate both art and science in the activity, and troubleshooting any challenges that arise during the process.

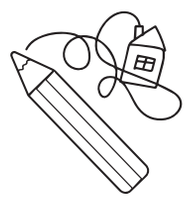
Collaboration and Teamwork – Working together in groups to share ideas, complete tasks, and observe reactions, fostering cooperative learning.

Observation Skills – Learning to observe and describe changes during the experiment, enhancing attention to detail.

Hands-on Learning – Engaging with the physical materials (lemons, baking soda, paint) to gain practical experience and develop motor skills.

Environmental Awareness – Recognizing the natural properties of materials like lemons and understanding their role in both art and science.

Key Words



Creativity

Science Exploration

Artistic Expression

Chemical Reactions

Hands-on Learning

Collaboration

Observation

Experimentation

Critical Thinking

Nature

Learners' objectives (filed by teachers)

To develop an understanding of acids and bases by exploring the chemical properties of lemons and baking soda.

To foster creativity through the use of natural materials (lemons) in artistic projects, such as creating prints and designs.

To integrate art and science by engaging students in both artistic expression and scientific exploration.

To develop hands-on skills in both art (painting, drawing) and science (experimenting with natural substances).

Learners' needs (filed by students)

Opportunities to express creativity by making art with natural items while learning about scientific reactions.

A clear understanding of the scientific concepts involved, like acidity and chemical reactions, through simple experiments.

Time and space to experiment freely and creatively, with guidance to ensure safe handling of materials.

To engage in a process that connects both the arts and sciences, allowing for exploration and discovery in an interactive setting

Subject

Art

Natural Sciences

Type of activity

Interactive Group Activity

Role Play

Topic

“Lemon Art and Science: The Power of Citrus”

Target group

Primary School Students (Ages 6-10)

Duration

30-45 minutes

Group number

Small groups (4-6 students): Students can work in groups to share ideas and collaborate, or the entire class can participate together in discussions and creative activities.

Necessary materials

Paper and markers/crayons: For drawing or writing messages.

Friendship “Bridge” Template: A drawing or outline of a bridge that students will decorate.

Stickers, gems, or small craft supplies: To decorate the “bridge” and make it more creative and personal.

Friendship Card: Cards where students can write compliments or things they like about each other.

References and further reading

The Magic School Bus: Inside the Human Body by Joanna Cole

https://www.pinterest.com/pin/338474346943298 92/

https://www.pinterest.com/pin/551691023122569272/

Instructions:

1. Introduction to Lemons (10 minutes)

Introduce the students to lemons, explaining that they are an acidic fruit. Discuss what acidity is and how it affects the pH levels.

Use the term “pH scale” to explain how some substances are acidic, neutral, or basic (alkaline).

Show how lemon juice reacts when mixed with baking soda (creating bubbles and a fizzing reaction).

2. Lemon Print Art Creation (20 minutes)

Step 1: Give each student a lemon, a piece of paper, and some paint brushes.

Step 2: Have the students cut their lemons in half. Using the exposed lemon flesh, they can dip it into paint (watercolors work best for this).

Step 3: Let the students press the lemon halves onto the paper to create prints, much like a stamp. They can use different colors to create citrus-themed artwork.

Optional: Students can also use lemon slices to create patterns, and they can use markers to draw around their prints to enhance their designs.

3. Exploring Lemon Juice Chemistry (15 minutes)

Step 1: After creating their prints, have the students use lemon juice and baking soda to explore a simple chemical reaction.

Step 2: Give each student a small bowl with some baking soda in it and a spoon of lemon juice to pour on top.

Step 3: Watch the students observe the fizzing reaction and explain that the acid in lemon juice (citric acid) reacts with the baking soda (a base) to create carbon dioxide gas.

4. Discussion and Reflection (10 minutes)

Ask the students to reflect on their artwork and the science experiment:

What did you notice when the lemon juice reacted with the baking soda?

How do you think the acid in lemons can be used in art?

Discuss how both art and science are about creativity and discovery, and how different subjects can work together.

Nature's Palette: Creating Art with Found Objects

Skills and knowledge least appropriate to outdoor learning

Environmental Awareness: Understanding the natural environment and its importance, fostering a sense of respect for nature.

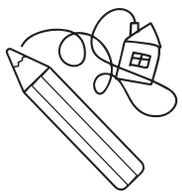
Creative Thinking: Using natural materials to inspire creativity and develop unique artistic expressions.

Sustainability Knowledge: Understanding the concept of reusing and repurposing materials to reduce waste and promote eco-friendly practices.

Collaboration and Teamwork: Working together to gather materials, share ideas, and support one another in the creative process.

Problem-Solving: Finding creative ways to combine materials and overcome challenges in the artistic process.

Key Words



Nature

Art

Creativity

Sustainability

Recycled Materials

Fine Motor Skills

Self-Expression

Teamwork

Environmental Awareness

Observation

Learners' objectives (filed by teachers)

To encourage creativity and self-expression by guiding students to create unique artwork using natural and recycled materials.

To develop fine motor skills through hands-on activities like cutting, gluing, and arranging small objects.

To promote teamwork and collaboration by encouraging students to share materials, ideas, and support one another throughout the creative process.

To foster environmental awareness by engaging students in the use of natural elements.

Learners' needs (filed by students)

Need to understand the concept of upcycling by learning how everyday materials can be transformed into valuable art, fostering creativity and sustainability.

Need to understand the concept of upcycling by learning how everyday materials can be transformed into valuable art, fostering creativity and sustainability.

Subject

Art

Natural Sciences

Type of activity

Creative Nature Exploration

Topic

Nature's Palette: Creating Art with Found Objects

Target group

Ages 8–11

Group number

More than 20 students

Duration

2 hours

Necessary materials

Lemons (cut in halves or slices)

Small bowls or containers (for mixing and observing reactions)

Spoons or droppers (for applying lemon juice)

Paper (plain white works best for printing)

Watercolor paints (or any non-toxic paint)

Paintbrushes

Markers or crayons (for decorating around the lemon prints)

Aprons or smocks (optional but helpful to keep clothes clean)

Baking soda

Lemon juice (freshly squeezed from the lemons)

Measuring spoons or pipettes (for adding lemon juice)

References and further reading

https://artfulparent.com/nature-art-for-kids/

Instructions:

Preparation:

Schedule a short, supervised nature walk for students to collect natural materials like leaves, sticks, and pebbles. Emphasize respect for the environment, avoiding damage to plants or wildlife.

Provide each student with a base for their artwork, such as a piece of cardboard or canvas.

Step-by-Step Process:

1. Introduction:

Discuss how art can be inspired by nature and show examples of artwork using natural materials.

Highlight how reusing and repurposing found objects aligns with sustainable practices.

2. Collection (Optional):

During the nature walk, students gather materials for their artwork.

Back in the classroom, lay out all materials and sort them into categories (e.g., leaves, stones, twigs).

3. Creating the Art:

Students design their pieces using the materials collected, arranging them on the base in creative ways (e.g., creating animals, landscapes, or abstract designs).

Use glue or tape to secure the objects.

Optionally, students can paint or add details with markers to enhance their creations.

4. Reflection:

Each student presents their artwork to the group, explaining the materials they used and the story behind their piece.

5. Evaluation:

Discuss how nature can inspire creativity and how using found objects helps reduce waste.

Encourage peer feedback to build confidence and appreciation for diverse artistic expressions.

Build a Simple Robot with Recycled Materials

Skills and knowledge least appropriate to outdoor learning

Understand Basic Robotics and Electronics: Students will learn how motors, circuits, and batteries work together to create movement.

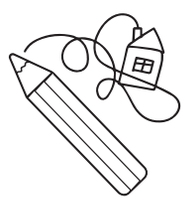
Develop Problem-Solving Skills: Students will troubleshoot design and functionality issues while building their robots.

Encourage Creativity and Innovation: Students will design and construct unique robots using recycled materials, fostering imaginative thinking.

Enhance Engineering and Hands-On Skills: Students will gain experience in assembling components, securing electrical connections, and constructing simple mechanical structures.

Inspire Interest in STEM Fields: Students will develop curiosity about robotics, technology, and engineering as potential future career paths.

Key Words



Robotics

Innovation

Recycled Materials

STEM

Engineering

Creativity

Problem-Solving

Electronics

Teamwork

Sustainability

Learners' objectives (filed by teachers)

To help students develop a deeper understanding of mechanical design through the process of building and testing a functional robot.

To encourage students to think critically about design challenges.

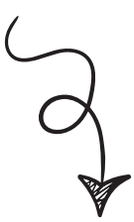
To build students' organizational skills.

To teach students about the environmental impact of waste and how innovative use of recycled materials can help reduce this impact.

Learners' needs (filed by students)

Need to collaborate and communicate effectively with team members to share ideas and divide tasks.

Need to boost confidence in using tools and technology.



Subject

Technology

Type of activity

STEM

Topic

Build a Simple Robot with Recycled Materials

Target group

Ages 8–11

Group number

More than 20 students

Duration

2 hours

Necessary materials

Small motors (from toy kits or old devices)

Batteries and battery holders

Insulated wires

Recycled materials (e.g., cardboard boxes, bottle caps, plastic containers, straws)

Glue, tape, and scissors

Markers or paint for decoration

Safety goggles

References and further reading

https://www.sciencebuddies.org/

Websites like Science Buddies, Tinkercad Circuits, and Adafruit Learning System have interactive tutorials.

Instructions:

Preparation:

Discuss basic concepts of robotics, including how motors work and how robots can help in daily life.

Gather recycled materials and simple electronic components in advance.

Step-by-Step Process:

1. Introduction:

Explain the goal of the activity: to build a basic robot using recycled materials that can move or perform a simple task.

2. Plan the Robot:

Students sketch a design for their robot, deciding on its shape, function, and materials needed.

3. Build the Structure:

Using recycled materials, students create the body of the robot.

Encourage creativity, such as using bottle caps for wheels or straws for arms.

4. Add Electronics:

Help students connect the motor to the battery using insulated wires.

Attach the motor to the robot body to enable movement (e.g., spinning wheels or a vibrating base for motion).

Ensure all connections are secure and safe.

5. Decorate the Robot:

Students personalize their robots with markers, paint, or additional recycled materials.

6. Test the Robots:

Turn on the motor and observe how the robots move.

Encourage students to modify their designs to improve functionality.

7. Reflection and Evaluation:

Discuss what worked well, what challenges arose, and how students overcame them.

Highlight the importance of recycling and innovation in technology.

From Seed to Sprout: Exploring the Wonders of Plant Growth

Skills and knowledge least appropriate to outdoor learning

Observation Skills – Noticing changes in the composting process, plant growth, and other natural elements.

Documentation Skills – Recording observations in journals, noting details such as changes in color, texture, and volume of the compost.

Measurement Skills – Measuring the layers in the jar or tracking the growth of plants over time.

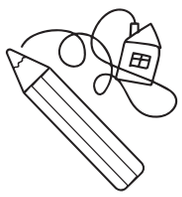
Critical Thinking – Analyzing changes in the composting process, considering what's affecting plant growth, and making connections to environmental sustainability.

Collaboration – Working with others to share observations, discuss findings, and brainstorm ideas for further projects.

Environmental Awareness – Understanding the importance of sustainable practices like composting and waste reduction.

Hands-on Skills – Using tools effectively to create composting setups.

Key Words



Composting

Plant Growth

Sustainability

Environmental Awareness

Organic Waste

Recycling

Observation

Documentation

Soil Health

Outside learning

Learners' objectives (filed by teachers)

To understand the plant life cycle

To explore the composting process

To develop observation and documentation skills

Learners' needs (filed by students)

To learn as much as possible about composting

To explore new methods and uncover the possibilities that nature provides

Subject

Natural Sciences

Type of activity

Waste Management Activity

Topic

From Seed to Sprout: Exploring the Wonders of Plant Growth

Target group

Ages 8–11

Group number

More than 20 students

Duration

2 hours

Necessary materials

Wide-mouth glass jars (one per student)

Organic yard debris (fallen leaves, grass clippings, soil)

Old newspaper

Fruit and vegetable peels, cores, and scraps

1 cup rainwater per jar

Permanent markers

References and further reading

Encourage students to explore related resources, such as:

Plant Growth Experiments for Kids

Instructions:

Pre-Activity Preparation:

1. Inform Students:

Notify students the day before the activity to save their food scraps from lunch, such as banana peels and apple cores.

2. Dress Code:

Advise students to dress appropriately for outdoor exploration, as they will be handling natural materials.

Step-by-Step Process:

1. Distribute Materials:

Provide each student with a jar, a permanent marker, and necessary materials (soil, shredded newspaper, food scraps, dead leaves, grass clippings, and water).

2. Layer Building:

- Start by adding a handful of soil into the jar as the base layer.
- Next, place a small layer of shredded newspaper.
- Add the food scraps that students saved from lunch.
- Add a layer of dead leaves and grass clippings on top of the food scraps.
- Repeat the layering process until the jar is nearly full, making sure to balance the layers for proper decomposition.

3. Add Water and Cap:

Pour a small amount of rainwater into the jar, ensuring that it is moist but not soaked. Cap the jar, then poke small holes in the lid to allow airflow for the composting process.

4. Label and Mark:

- Students should write their names on the jar lid with the permanent marker.
- Draw a fill line to mark the top of the ingredients.

Placement:

- Place the jars on a sunny windowsill where they are visible but out of reach from students. This allows the compost to begin breaking down with sunlight exposure.

Observation and Evaluation:

1. Weekly Observations:

Students will observe and record changes in the composting jars weekly. They will mark the new “top line” as the contents settle and decompose.

2. Discussion and Evaluation:

During follow-up sessions, students will discuss their observations and share insights. Educators will evaluate students’ engagement and understanding based on their observations and reflections.

Mapping my community

Skills and knowledge least appropriate to outdoor learning

Critical Thinking - Students will learn to analyze the significance of different places in their community.

Collaboration and Teamwork - Working in groups, students will develop the ability to collaborate, share ideas, and combine their efforts to create a community map.

Creativity- Students will engage their creative abilities in illustrating landmarks, labeling features, and adding colors and symbols to make their maps visually appealing.

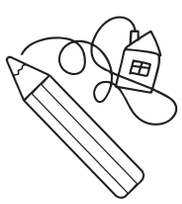
Communication Skills - Practice verbal communication skills.

Observation Skills - Will help students understand the significance of local landmarks and features.

Empathy and Social Awareness - By reflecting on the roles of various community members and how people help each other, students develop empathy.

Research Skills - Students will practice basic research skills by gathering information, analyzing it, and using it in their projects.

Key Words



Community

Mapping

Landmarks

Geography

Social Structure

Teamwork

Creativity

Empathy

Outdoord learning

Inclusion

Learners' objectives (filed by teachers)

To recognize the importance of shared spaces and local landmarks

To explore the roles people play in a community

To foster creativity through map design

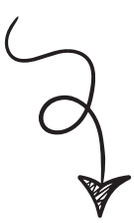
To strengthen social science skills by reflecting on community dynamics

Learners' needs (filed by students)

To understand basic concepts of community and geography

To observe and record important landmarks and features in their community

To explore the roles and contributions of people within their community



Subject

Social Sciences

Type of activity

Exploring

Topic

Mapping my community

Target group

Ages 8–11

Group number

More than 20 students

Duration

2 hours

Necessary materials

Large sheets of paper or poster boards

Colored markers, crayons, and pencils

Printed maps of the local area (if available)

Stickers or small sticky notes

Glue and scissors

Cameras or smartphones (optional, for capturing local landmarks)

References and further reading

Teaching Kids About Communities

Local Map-Making Activities for Children

Instructions:

Prepare a simple presentation introducing maps, what they represent, and how they are used to understand a community.

Arrange a short, supervised walk around the school neighborhood (if possible).

Step-by-Step Process:

1. Introduction: Start with a discussion about what makes up a community, such as homes, schools, parks, shops, and other important places.

2. Neighborhood Exploration (Optional): Take a short walk around the school area, pointing out key landmarks like a post office, fire station, or park. Students can take notes or photos to remember what they see.

3. Community Mapping Activity:

Divide students into small groups and provide each group with a large sheet of paper or poster board.

Ask them to draw a basic map of their community, starting with the school at the center.

Encourage them to add features they saw during the walk or know about, such as their homes, parks, stores, or other landmarks.

Use stickers or small sticky notes to mark places they think are especially important, such as places where people gather or provide services.

4. Creative Elements: Students can add illustrations, labels, or symbols to make their maps more engaging and colorful.

5. Presentation: Each group presents their map to the class, explaining why they chose certain landmarks and their importance to the community.

6. Reflection and Evaluation:

Discuss as a class:

What makes a community strong?

How do people in a community help one another?

What could be improved in their community?

The Journey from Lunch to Compost

Skills and knowledge least appropriate to outdoor learning

Environmental Awareness - Students will learn the importance of recycling and composting in reducing waste and promoting sustainability. They will understand how their actions impact the environment.

Sustainability Practices - The activity teaches students how to manage food waste sustainably by converting it into compost, which can later be used for growing plants or enriching soil.

Critical Thinking and Problem-Solving - The composting process requires students to think about how different materials interact..

Hands-on Scientific Inquiry - Students will engage in scientific observations, such as monitoring decomposition, noting changes, and understanding natural processes that happen in composting.

Self-Reflection and Motivation - The activity encourages students to reflect on their motivations for recycling and composting, helping them understand intrinsic (internal) and extrinsic (external) factors that influence behavior.

Collaboration and Communication - Students may work together, share insights, and observe each other's composting experiments, enhancing teamwork and communication skills.

Key Words

Composting	Motivation to Act
Sustainability	Organic Waste
Recycling	Food Waste
Environmental Awareness	Green Behavior
Behavioral Change	Innovation

Learners' objectives (filed by teachers)

To enhance environmental awareness and foster a desire to learn about sustainable development.

To encourage sustainable behaviors related to food waste.

To develop innovative skills in identifying opportunities and creating strategies to address green challenges, such as composting from lunch waste to school composting.

To explore key factors influencing sustainable behavior, focusing on both intrinsic and extrinsic motivations for recycling and composting.

Learners' needs (filed by students)

To gain a thorough understanding of the composting process.

To engage in self-reflection and recognize personal motivations for recycling and composting.

To explore innovative approaches and discover the benefits that nature offers.

Subject

Social Sciences

Natural Sciences

Type of activity

Composting

Topic

The Journey from Lunch to Compost

Target group

8-11 years old students

Group number

more than 20 students

Duration

2 hours

Necessary materials

One wide-mouth glass jar for each student

Organic yard waste (e.g., fallen leaves, grass clippings, and soil)

Used newspaper

Fruit and vegetable peels, cores, and scraps

1 cup of rainwater

A permanent marker for labeling

References and further reading

https://greenmountainfarmtoschool.org/wp-content/uploads/2016/01/Guide-to-Staring-a-School-Compost-Program.pdf

https://www.tomsofmaine.com/good-matters/thinking-sustainably/activities-to-teach-composting-for-kids

Instructions:

1. Introduction to Recycling and Composting:

Begin by explaining the importance of recycling and composting. Provide a brief overview of how composting works and why it is a key practice for reducing waste and promoting environmental sustainability. Discuss the benefits of composting, such as improving soil quality and reducing the amount of waste sent to landfills. Outline the steps the students will follow during the activity to transform their lunch leftovers into compost.

2. Introduction to Motivation:

Introduce the concept of motivation, explaining its role in encouraging sustainable behaviors. Discuss the difference between intrinsic motivation (being motivated by internal factors such as a sense of personal responsibility or the desire to help the environment) and extrinsic motivation (being motivated by external rewards or recognition). Encourage students to think about which types of motivation drive them to take part in recycling and composting efforts.

3. Distributing Materials:

Provide each student with a wide-mouth glass jar, which they will use as their composting container. Along with the jar, give each student a notebook where they can record their observations, document the steps they take, and reflect on their personal motivations for composting and recycling.

4. Starting the Composting Process:

Step 1: Each student will begin by placing a handful of soil at the bottom of their jar to create a base for their composting materials.

Step 2: Next, have the students add a layer of old newspaper, followed by their lunch leftovers such as fruit and vegetable scraps (e.g., banana peels, apple cores).

Step 3: On top of the food scraps, add a layer of organic yard debris, such as dead leaves, grass clippings, or small twigs.

Step 4: Repeat these layers of soil, newspaper, food scraps, and yard debris until the jar is mostly full.

5. Customizing the Mixture:

Encourage the students to feel free to customize their composting jars based on their preferences—such as adding extra newspaper or limiting the amount of fruit scraps. However, remind them that one jar should remain as a control mixture to monitor as a standard, allowing for comparison.

6. Adding Rainwater and Sealing the Jar:

Once the jars are filled with composting materials, each student will add one cup of rainwater to moisten the mixture. They should then seal the jar with its lid. Using a permanent marker, each student will write their name on the lid for identification. They should also poke several small holes in the lid to allow oxygen to flow into the jar, which is necessary for the composting process. Lastly, students should draw a line on the glass to mark the top of the mixture as a reference point for future observations.

7. Placement of the Jars:

Instruct the students to place their jars on a sunny windowsill in the classroom, ensuring the jars are visible but out of reach. This will allow the composting process to begin, while giving students the opportunity to observe any changes over time.

8. Ongoing Observation and Reflection:

Over the next few weeks, students will monitor their composting jars. Every two weeks, they should mark a new line on the glass to show the “new” top of the mixture as the organic matter breaks down. Encourage them to reflect on the changes and write their observations in their notebooks.

It is suggested that this activity take place outdoors during late autumn. Over approximately 12 weeks, the organic material will transform into nutrient-rich soil, which can then be used for a springtime school garden project.

9. Activity Evaluation:

At the end of the activity, gather feedback from the students about their experience. Ask them what they learned about composting, recycling, and their personal motivations to be more sustainable. Additionally, observe their engagement throughout the activity and review their notebooks for insights on their understanding and reflections on the process.

Roots of Change

Skills and knowledge least appropriate to outdoor learning

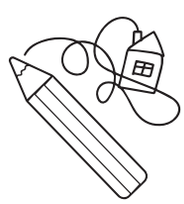
Environmental Awareness - Students will gain a deeper understanding of the environment and their role in sustainability.

Responsibility and Time Management - Students will learn to manage their time by regularly tending to their garden, ensuring the plants receive proper care such as watering, weeding, and observing changes.

Motor Skills - Gardening involves various physical tasks, such as digging, planting, and handling tools. These activities help students develop both fine and gross motor skills as they interact with the materials and work with their hands.

Creativity and Innovation - As students create their own garden, they can express creativity.

Key Words



Gardening	Nature-based learning
Planting	Hands-on learning
Sustainability	Outdoor education
Environmental awareness	Environmental stewardship
Green habits	Nature conservation

Learners' objectives (filed by teachers)

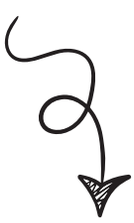
To enhance students' understanding of environmental issues and the importance of sustainable practices.

To encourage students to adopt and maintain eco-friendly habits in their daily lives.

Learners' needs (filed by students)

To learn about the process of planting and taking care of plants.

To explore creative ways to contribute to eco-friendly practices.



Subject

Natural Sciences

Type of activity

Gardening

Topic

Roots of Change

Target group

8-11 years old students

Duration

2 hours

Group number

more than 16 students

Necessary materials

A seed bottle (for accurate water dosage)

A bag of soil

A planting pot

A pipette

Reusable cardboard cylindrical container

A clay pot with a saucer

A soil mixture (peat and compost)

Gardening tools (such as a trowel and rake)

References and further reading

https://natura-la-pachet.ro/collections/trusa-plantare-cre%C8%99te-propriul-co-pac-floare

Instructions:

1. Introduction to the Activity

Begin by introducing the concept of planting and its importance in promoting environmental awareness and green behaviors. Explain that students will be planting a flower or plant. This helps emphasize the significance of conservation.

2. Distribute Planting Kits

Provide each student with a complete planting kit,

3. Guidance on Planting

- Instruct students to follow the steps outlined in the user guide:
    - Place the soil in the pot and create a small hole for planting the seed.
    - Have students carefully plant the seed from the bottle into the soil and water it with the pipette, ensuring they apply the correct amount of water.
    - Encourage them to be gentle and handle the plants with care throughout the process.

4. Setting Up the School Garden

- Once the plants have grown in their pots and reached the appropriate size, gather the students to transplant them into a designated garden area within the school yard. This is an opportunity to teach students about the timing and conditions required for transplanting plants.
- Ensure that students are actively involved in deciding the right spots for their plants in the garden, based on factors like sunlight and space.

5. Monitoring and Ongoing Care

- After transplanting, assign groups of students to monitor the plants' growth and ensure they are watered and cared for regularly. You may want to set up a rotating schedule where different groups take responsibility for maintaining the garden.
- Encourage students to observe changes in the plants and keep a journal of their progress. This fosters responsibility and helps students connect with nature.

6. Evaluation

- At the end of the activity, evaluate the success of the project through student feedback and direct observations. Reflect with students on what they have learned about gardening, sustainability, and plant care. You can also assess their engagement and participation throughout the process.
- Encourage students to share their thoughts on the experience and any insights they gained about environmental responsibility and green habits.

Trash to Trend: The Recycled Fashion Show

Skills and knowledge least appropriate to outdoor learning

Creativity - Using recycled materials to design and create original clothing items.

Problem-solving - Finding innovative ways to transform everyday objects into art.

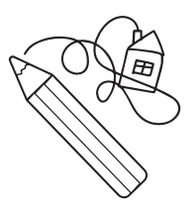
Practical skills - Working with materials like fabric, paper, and other recyclables to create something new.

Collaboration - Working together with peers to share ideas and create fashion items.

Environmental awareness - Understanding the importance of reusing and recycling to reduce waste.

Design skills - Learning how to plan, sketch, and assemble a clothing design.

Key Words



Recycling

Sustainability

Creativity

Fashion Design

Environmental Awareness

Upcycling

Eco-friendly Habits

Innovation

Art and Craft

Outdoor learning

Learners' objectives (filed by teachers)

To raise awareness about the environmental impact of fast fashion and its role in pollution.

To foster a willingness to adopt sustainable practices by recycling and reusing materials.

To encourage creativity in designing unique and functional clothing using recycled materials.

Learners' needs (filed by students)

To explore creative ways to transform old items into fashionable pieces.

To express personal style while focusing on sustainability and environmental impact.

Subject

Art

Natural Sciences

Type of activity

Upcycling

Topic

Trash to Trend: The Recycled Fashion Show

Target group

8-11 years old students

Group number

more than 15 students

Duration

2 hours

Necessary materials

Old t-shirts (brought from home)

Recycled outdoor items (such as plastic bottles, cans, and other reusable materials)

Crepe paper

Scissors

Glue or tape

Fabric markers or paints (optional for decoration)

Buttons, beads, or other embellishments (optional)

Sewing supplies (thread, needles, or fabric glue for those who wish to sew)

A large surface for working (table or workspace)

Area for showcasing the final creations

References and further reading

https://varthana.com/school/creative-recycling-projects-for-students-turning-trash-into-treasure/

https://www.thecooldown.com/green-home/no-sew-fashion-elementary-school-students/

Instructions:

1. Pre-Class Preparation:

- Bring Old T-Shirts: Each student should bring one or more old t-shirts from home. These will serve as the base for their clothing design.
- Collect Recyclable Items: Students will go outside to collect materials from their surroundings. This could include things like plastic bottles, cans, newspapers, cardboard, or other items that can be reused or recycled. Encourage students to think creatively about what could be incorporated into their designs.

2. Discussion about Fast Fashion:

- Before beginning their work, the teacher will lead a discussion about the environmental impacts of fast fashion. Topics will include:
    - How fast fashion contributes to pollution.
    - The importance of sustainable practices in fashion.
    - Ways to reduce waste, such as recycling and upcycling old clothes.
    - How students can give new life to old clothing and reduce their environmental footprint by reusing and recycling materials.

3. Design and Creation:

- Students will use the materials they've collected to design and create their own outfits or accessories.
- Encourage creativity! Students can cut, glue, or decorate their clothing as they like. The goal is to create something unique and original using recycled materials.

4. Fashion Show

- Once students have completed their creations, they will present their designs in a fashion show. Each student will have the opportunity to explain their design and what materials they used, as well as how their work aligns with the sustainability theme.

5. Evaluation:

- After the fashion show, the teacher will evaluate the designs based on:
    - Creativity and Originality: How unique and innovative is the clothing design?
    - Sustainability Theme: How well does the design align with the recycling and upcycling theme? Were recycled materials effectively used?

6. Feedback

The teacher will provide positive feedback and suggestions for improvement. Every effort will be appreciated, and the emphasis will be on creativity and sustainable practices.

A future idea could involve creating a student jury to evaluate their peers' creations and award prizes based on various categories.

Chemical Transformations Induced by Water Pollution

Skills and knowledge least appropriate to outdoor learning

Critical Thinking - Analyzing the chemical processes that occur in polluted water and understanding the impact on the environment.

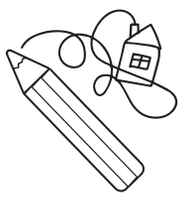
Scientific Observation - Observing and documenting changes in water quality through hands-on experiments.

Environmental Awareness - Gaining a deeper understanding of the importance of clean water and protecting the environment.

Communication Skills - Presenting findings and conclusions through group discussions and presentations.

Hands-on Learning - Developing practical skills by performing experiments with real materials, enhancing learning through physical interaction.

Key Words



Water Pollution

Chemical Processes

pH Levels

Filtration

Outdoor learning

Contaminants

Environment

Sustainability

Polluted Water

Experimentation

Learners' objectives (filed by teachers)

To help students understand the chemical processes that occur in polluted water.

To raise awareness about climate change and the importance of protecting the environment, specifically in relation to preventing water pollution.

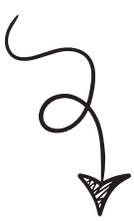
To educate students on the significance of preserving the environment and promote the development of sustainable habits and behaviors.

Learners' needs (filed by students)

To explore and learn chemistry through hands-on experiments.

To engage with chemistry in a fun and interactive way through exploration and play.

To understand the importance of protecting water resources and the environment.



Subject

Technology

Natural Sciences

Type of activity

Experiment

Topic

Chemical Transformations Induced by Water Pollution

Target group

from 12 to 14 years old students

Group number

more than 15 students

Duration

3 hours

Necessary materials

Pipette: Used for accurately measuring and transferring liquids.

pH measuring tool or pH strips: To check the acidity or alkalinity of the water.

Dried dirt (from the ground): To simulate polluted water.

Bleach: To disinfect the filtered water.

Two glasses: For holding the water samples during the experiment.

Tap water: Used as a control sample for comparison.

Spoon: For mixing or handling materials.

Two pieces of filter paper: For filtering out impurities from the water.

Funnel: To pour liquids without spilling.

References and further reading

https://www.instructables.com/Filtration-Experiment-Clean-Your-Own-Dirty-Water/

https://www.youtube.com/watch?v=Lj1Lm9DpjdU

Instructions:

1. Preparation: The activity will take place in nature, near a lake with polluted water. Schedule a walk around the lake. The lake will be chosen by the students, depending on what they know about the pollution situation in their area.

2. Collection (Optional): The lake will be explored, if necessary the bottles or other objects found on the edge of the lake will be collected.

3. Introduction: Discuss about causes of water pollution: Oil spills. Agriculture. Industrial waste. Wastewater and sewage. Continue the discussion about how water pollution can be prevented; the students will also contribute with ideas about ways to prevent it. Highlight this domestic practices that every person can adopt:

-Use the minimum amount of detergent and/or bleach when you are washing clothes or dishes.

- Use only phosphate free soaps and detergents. Minimize the use of pesticides, herbicides, fertilizers.

- Do not dispose of these chemicals, motor oil, or other automotive fluids into the sanitary sewer or storm sewer systems

4. Experiment:

-Testing the pH level of water,

The pH of the lake water will be tested using special pH strips/instruments. They will discuss the pH of potable water and what happens when the pH of the water drops below 5.6, becoming much too acidic and causing irreversible changes in the epithets.

- Filtration experiment – from dirty to clean. Present the aim of the experiment: to separate mud from water using filtration, but also purify the water afterwards

5. Steps:

1. Mix the dirt and water into one of the clear glasses. Mix until water is brown.

2. Fold the filter paper in half, and then in half again. You should end up with a cone shape. Place inside the funnel.

3. Put the other glass onto a flat surface and hold the funnel over it. Fill the cone filter paper (inside the funnel) halfway full of dirty water.

4. Watch it drip through the filter paper and funnel. Your other glass should be filled up with clean water.

5. Once that has finished filtering, repeat steps 3 & 4, but using the other piece of filter paper. Rinse out the leftover dirty water and switch it with the glass full of dirty water, so that the glass of filtered water is in your hand, and the other is underneath the funnel.

6. Re-pour the filtered water into the funnel and watch it drip into the clean glass.

7. When done, add 2 drops of bleach (which contains chlorine) to your filtered water. Stir for 1 minute.

8. Analyse together with students what happened when we poured the dirty water into the filter paper: the dirt didn't go through the filter, but the water did.

Reflection and evaluation: Formulate with the students the main conclusions from the experiments. Also discuss with them how these conclusions can be applied in everyday life.

The experiments can be extended as a group project for homework. Students will document and prepare materials to conduct their own experiments with polluted water. After completing the experiments, students will create a PowerPoint presentation showcasing their findings and the results of their group projects.

Floristic and faunal nature reserve

Skills and knowledge least appropriate to outdoor learning

Observation skills – Identifying and noting plant and animal characteristics in their natural habitat

Environmental literacy – Understanding ecosystems, biodiversity, and conservation principles

Visual documentation – Using photography to capture and illustrate scientific observations

Confidence – Gaining independence through active participation in a real-world setting

Learners' objectives (filed by teachers)

To promote the conservation of biodiversity and the protection of natural habitats and protected natural areas

To observe, explore and learn about insects, plants and animals in a protected area/ nature reserve

To understand the role of human in conservation of biodiversity

Learners' needs (filed by students)

To learn as much as possible about biodiversity and visit such a protected area/ reservation

Subject

Natural Sciences

Type of activity

Extracurricular activity – natural science

Topic

Floristic and faunal nature reserve

Target group

students from 14 to 17 years old

Group number

more than 25 students

Duration

4 hours

Necessary materials

Computers, mobile phones/cameras, papers and pens.

References and further reading

Their homework will be to create a botanical atlas or zoological/ ornithological atlas made up of data and photos taken by students (to print their photos) data collected by them from the visit to the natural reservation. The botanical/ zoological / ornithological atlases will be displayed so that other students from other classes can explore them.

Apps and websites that students can use for their investigation journal:

“Seek” by iNaturalist - in addition to plants, it also recognizes insects, birds, spiders, and other animals. It searches based on your geographic region. The students can point their Smartphone at it and move it around as it scans the object they want. For plants, they can point at the leaves or flowers. It is free for both iOS and Android

https://www.inaturalist.org/pages/seek_app .

The Google Lens website is also for recognizing plants , the students can use their camera, an image, or a screenshot.

https://lens.google/

Instructions:

1. Preparation: A protected area will be identified near the school, which they are going to visit. Before the visit, the students will prepare an investigation journal, which will include the following information that they must identify during the trip: what species they can observe (animals, insects and plants), the type of habitat and the protected area. The journal will also have a photo area, where they will take pictures of animals, insects and plants. They will work in groups of 5 students to complete the investigation journal.

2. Introduction: The activity will start with a brief presentation on what a protected area is with emphasis on the conservation of biodiversity that is essential not only for its value in itself, but also because it provides us with clean air, fresh water, quality soils and crop pollination, among other things. It helps us fight climate change and adapt to it, also contributing to reducing the negative impact. We, humans, are part of it and depend on all its other elements to survive and we are responsible for ensuring the sustainability of these areas. Also it will be mentioned the food chain that we can identify in a habitat and the special features that we can observe in the fauna and flora of a protected area.

3. Visit: A visit to the nature reserve will be made. Students guided by the teacher will explore the reserve and complete the investigation journal together with their team. They will also use cameras/phones to take photos of animals, insects, and plants and try to identify the food chain. The teacher will provide them with information about the fauna and flora around them, but they will also use different websites/applications to recognize plants, animals, birds, and insects, and document the journal with specific information.

4. Follow-up and conclusions: They will return to the classroom and the investigation journal will be transcribed in digital format, where students will transfer the written information along with the photos taken. To complete the journal, they will use a botanical atlas as well as a zoological and ornithological atlas, and/or various applications/sites available online that help you identify certain plants and animals (including insects and birds).

5. Reflection and evaluation: Students will answer to the following questions:

1. Can you identify a food chain or food web in the visited habitat?
2. What effect do you think protecting/ conservation the area has on the habitat?
3. What main characteristics could you identify regarding the fauna and flora explored?
4. What do you think is the role of humans in the sustainability of this habitat?
5. How did you work as a team?

Bug Hunt Adventure

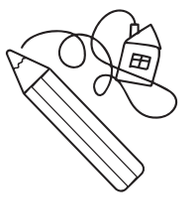
Skills and knowledge least appropriate to outdoor learning

Observational skills - Paying attention to the small features of insects (size, color, movement).

Teamwork - Talking with group members about what they see and think.

Communication skills - Talking about what they observe and sharing their findings.

Key Words



Observation

Insects

Geography

Ecology

Teamwork

Communication

Cultural Significance

Sustainability

Ecosystems

Human Impact

Learners' objectives (filed by teachers)

To understand the impact of geography on insect distribution and how different landscapes (e.g., forests, deserts, urban areas) support different insect species.

To explore how human activities influence insect populations (e.g., agriculture, urbanization, climate change) and their effects on ecosystems and human life.

To learn about the cultural significance of insects in different societies, including their role in food, mythology, and symbolism.

Learners' needs (filed by students)

To develop skills in observation and critical thinking by examining details and making connections.

To practice communication and presentation skills by sharing thoughts and discussing findings with others.

To enhance creativity and problem-solving abilities through activities like sketching or interpreting observations.

Subject

Social science

Natural Sciences

Type of activity

Observational activity

Topic

Bug Hunt Adventure

Target group

Primary school children aged 9-14

Group number

Groups of 3-5 students

Duration

1,5 hour

Necessary materials

Magnifiers

Insect observation sheet

Pens, colours

Maps

References and further reading

https://www.nationalgeographic.com/animals/topic/insects

https://blog.entomologist.net/what-is-the-role-of-insects-in-society.html

https://www.researchgate.net/publication/318637759_The_Importance_of_Insects_Science_and_Society

Instructions:

1. Introduction (10 minutes):

- **Geography and Insects:** Discuss how different insects are found in different regions based on geography (e.g., deserts, rainforests, urban areas).
- Explain the **impact of insects on humans**—from pollination and agriculture to health (disease transmission) and culture (symbolism in mythology, food, etc.).

2. Observation and Social Science Focus:

Team Work & Observation:

- Students explore various areas to observe insects, using magnifiers and recording:
  - Insect name, location, physical characteristics, and behavior.
  - Social Science questions: How does the geography of your area influence the insects you see? How do these insects affect human societies (economy, agriculture, health)?

Local & Global Connections:

- Ask students to compare local insects to those in different regions of the world and explore their significance in human cultures (e.g., bees for pollination or mosquitoes for disease spread).

3. Group Discussion:

- Share findings and discuss the economic, cultural, and environmental impact of insects.
- Reflect on how insects are integral to global ecosystems and human societies, considering geographical influences (e.g., pest management in agriculture, traditional use of insects).

4. Conclusion:

- Summarize how insects are crucial to geography, human societies, and the environment.
- Briefly discuss the global and local challenges posed by insects (e.g., climate change, invasive species).

Bird feeder

Skills and knowledge least appropriate to outdoor learning

Problem-Solving - Deciding how to design and construct the feeder with available materials.

Collaboration - Working together as a team to complete the activity.

Attention to Detail - Carefully measuring, cutting, and assembling the feeder parts to ensure functionality.

Creativity - Personalizing and decorating the bird feeder, allowing students to express their ideas.

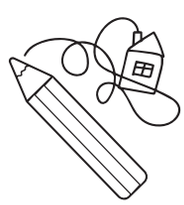
Practical Skills - Handling tools like scissors, knives, and funnels safely and effectively.

Critical Thinking - Understanding the role of each element in the bird feeder's design, such as the perch or seed dispensing holes.

Environmental Awareness - Learning how actions like feeding birds contribute to a balanced ecosystem.

Observation - Monitoring the feeder for bird activity and learning about local bird species.

Key Words



Bird Feeder

Sustainability

Environment

Creativity

Teamwork

Nature

Outdoor Learning

Recycling

Hands-on Activity

Ecology

Learners' objectives (filed by teachers)

To learn about the importance of birds in ecosystems and how feeding them helps during challenging seasons.

To increase awareness of recycling and upcycling by repurposing plastic bottles for an eco-friendly project.

To explore the concepts of ecology by understanding how natural elements like bird feeders contribute to a balanced environment.

To learn about the intersection of nature and technology.

Learners' needs (filed by students)

Need for collaborative opportunities to work in groups, share ideas, and combine their skills to achieve a common goal

Need for hands-on opportunities

Subject

Technology

Natural science

Type of activity

Creative activity

Topic

Bird feeder

Target group

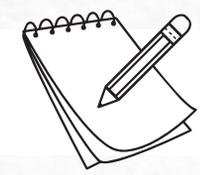
Primary school children aged 9-14

Duration

2 hours

Group number

Group of 3-5 students (each group will make one bird feeder)



Necessary materials

Plastic bottles

Twine or wire

Sets of chopsticks

Scissors or a knife

Duct tape

Funnel

Birdseed

References and further reading

https://thegrasspeople.com/why-its-important-to-feed-wild-birds/?srsltid=Afm-BOoq9F40EMZ4ZDKOCGeDra5v-Ze425AecWKKWE50LFSnqbuWNESyz

https://www.countrysideclassroom.org.uk/resources/907

Instructions:

1. Prepare the Bottle:

Clean the plastic bottles and remove any labels. This ensures a clean and neat appearance for the bird feeder.

2. Create the Hanging Loop:

Turn the bottle upside down (so the bottom is now facing up).

Ask the students if they think you should use scissors or a knife to cut or poke two small holes in the bottom.

Safety Note: Explain why it's important to handle scissors and knives carefully, emphasizing the need for caution while cutting.

3. Make the Hanging Loop:

Thread a piece of twine or wire through one hole and out the other hole.

Tie the twine or wire loosely to form a loop for hanging the bird feeder. The bottom of the bottle will now act as the top of the feeder.

4. Create Perch Holes:

Using scissors or a knife, cut or poke two holes on opposite sides of the bottle, approximately 5 cm below the bottle cap.

Ensure that the holes are large enough for a chopstick to fit through.

Insert a chopstick through each hole to serve as a perch for the birds to sit on.

5. Create Seed Dispensing Holes:

Cut or poke two more holes, about 4 cm above each perch. These holes will allow the birds to access the seeds inside the feeder.

6. Add the Birdseed:

Turn the bottle right-side up.

Unscrew the bottle cap and use a funnel to fill the bottle halfway with birdseed.

Screw the cap back on to secure the birdseed inside.

7. Hang the Bird Feeder:

Turn the bottle back over (with the holes at the top).

Tie the twine or wire to a tree branch or hang it outside a window using a secure knot.

8. Watch and Observe:

Encourage the students to observe the birds that come to the feeder. They can take notes or draw pictures of the birds they see.

Photography Nature Walk

Skills and knowledge least appropriate to outdoor learning

Creative Expression - Students will learn how to convey ideas, emotions, and stories through images, allowing them to express their unique perspectives.

Observation Skills - The activity encourages students to observe their surroundings

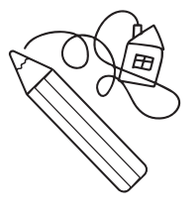
Storytelling - Photography teaches students to convey a narrative or message through images, enhancing their ability to communicate visually.

Critical Thinking - Students will develop the ability to think critically about what to capture, why they are capturing it, and what their photos say about the subject matter.

Confidence - By showcasing their work in an exhibition, students will build self-confidence in their creative abilities and learn to appreciate their artistic expressions.

Cultural Awareness - Through photography, students can explore and capture a wide range of environments and perspectives, fostering a greater awareness of diversity and the world around them.

Key Words



Photography

Artistic Expression

Creativity

Observation

Storytelling

Nature

Inspiration

Composition

Exhibition

Landscape

Learners' objectives (filed by teachers)

To enhance students' creativity by encouraging them to express themselves artistically through photography.

To teach basic photography techniques such as composition, lighting, and framing, using simple tools like cameras or smartphones.

To encourage collaboration and communication through group discussions where students share their photos and impressions.

To promote environmental awareness by capturing nature, architecture, and landscape photography during an outdoor walk.

To introduce students to the concept of visual storytelling by showing how photos can communicate ideas and emotions without words.

Learners' needs (filed by students)

Need to engage in hands-on, practical activities that allow them to actively participate in creating and capturing moments in their environment.

Need to collaborate and work as a team, sharing ideas and assisting each other.

Subject

Art

Type of activity

Photography

Topic

Photography Nature Walk

Target group

Primary school children aged 10-14

Group number

20 students

Duration

1 hour

Necessary materials

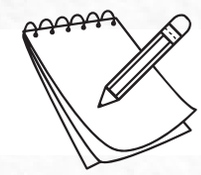


Photo camera or cell phones

References and further reading

https://www.everlearning.ca/photography-and-teens-using-photos-as-a-way-to-express-and-explore/

https://www.youtube.com/watch?v=V7z7BAZdt2M

Instructions:

Preparation for Teachers (Before the Activity)

1. Basic Photography Techniques:

Teach students the fundamental photography techniques such as composition, lighting, and framing.

2. Simple Camera or Smartphone Tips:

- Demonstrate how to use the camera or smartphone's focus and zoom functions.
- Show students how to adjust exposure settings if their device allows it.
- Explain how to avoid common mistakes like blurriness by holding the camera steady or using a tripod..

3. Materials Check:

- Ensure that all students have access to a camera or smartphone with a working camera.
- Verify that all devices are fully charged and ready to use.

4. Outdoor Location:

- Choose a location that offers a variety of photographic opportunities (nature, architecture, etc.) and is safe for children to explore.
- Plan for a route that encourages curiosity and observation, such as areas with varied landscapes, interesting textures, or items that might provoke thought (pollution, wildlife, etc.).

5. Prepare for Exhibition:

- Set up a space for the photo exhibition.
- Make sure there are materials to print or display the photos (printouts, display boards, etc.).

Activity Instructions for Students

1. Outdoor Photography Walk (35 minutes):

Divide students into small groups or let them work individually (depending on your preference). Each student should take their camera or smartphone and find at least five things that inspire them to photograph.

2. Ideas for Inspiration:

- Nature: Plants, flowers, trees, or animals.
- Pollution: Trash, deforestation, or other environmental issues.

2. Remind students to think about the basic techniques you've discussed as they take their photos

3. Encourage students to take time to observe their surroundings before snapping pictures. Sometimes a good shot requires patience and finding the right angle.

3. Group Reflection & Sharing (15 minutes):

Once the walk is finished, gather the students in a group to share their photos and reflect on their experience.

4. Photography Exhibition (Optional):

Print or display the students' photos in a designated area (classroom or hallway).

You may also organize a brief feedback session where students can comment on what they liked about each other's work or what stood out to them.

PLANT AND PROTECT: MAKING SEED BALLS

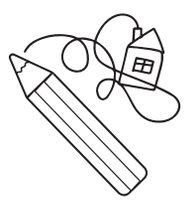
Skills and knowledge least appropriate to outdoor learning

Environmental Awareness - Understanding the impact of actions on the environment.

Teamwork - Collaborating with others to complete tasks and share ideas.

Creativity - Developing new ideas and solutions for planting.

Key Words



Sustainability	Planting
Environmental Conservation	Ecosystems
Creativity	Gardening
Teamwork	Seed Bombs
Hands-on Activity	Natural Science

Learners' objectives (filed by teachers)

To understand the concept of sustainability and the importance of environmental conservation.

To develop teamwork and collaboration skills by working together to achieve a common goal.

To foster creativity through hands-on activities that encourage problem-solving.

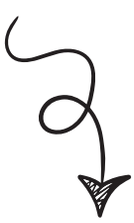
To learn about the role of plants and nature in maintaining healthy ecosystems.

Learners' needs (filed by students)

To have fun while learning through hands-on activities

To learn how plants grow and why nature is important

To be creative while helping the planet



Subject

Natural Sciences

Type of activity

Seed balls

Topic

Plant and Protect: Making Seed Balls

Target group

Primary school children aged 9-14

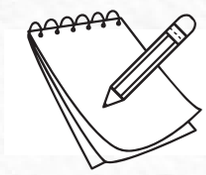
Group number

Students can be separated in two group (one can work with flower seeds another with aromatic herbs seeds)

Duration

1 hours

Necessary materials



- aromatic herbs seeds
- flower seeds
- clay
- compost
- water
- syringe

References and further reading

https://seedbomb.ie/2015/02/the-history-of-seed-bombs/

Instructions:

- Separate seeds on big paper
- Create a small ball from the clay (2,5 cm big)
- Prepare the compost
- Once you have separated all above-mentioned materials you can start creating you seed balls
- Take a clay and with the help ow your palms make it become a flat circle (your hand should be a little bit wet)
- Place a small amount of compost on it
- Take 3-4 seeds and place it inside of compost
- Add few drops of water
- Carefully close the clay in a ball making sure everything remains inside.
- Once you have created the balls you can throw them in the places you would like the plans to grow.

Scavenger hunt in nature

Concepts, skills and knowledge least appropriate to outdoor learning

Observation Skills – Identifying and differentiating between scavengers and intruders in nature.

Critical Thinking – Analyzing the role of scavengers in ecosystems and distinguishing beneficial organisms from harmful ones.

Teamwork and Collaboration – Working together with peers to solve problems and achieve common goals.

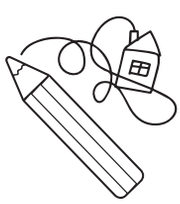
Research Skills – Collecting and organizing information about scavengers and their environmental roles.

Communication – Explaining and presenting findings clearly to the class.

Creativity – Using imagination to interpret and explain the role of scavengers in nature.

Environmental Awareness – Gaining a deeper understanding of biodiversity, conservation, and ecological balance.

Key Words



Biodiversity

Scavengers

Ecosystems

Intruders

Environmental Conservation

Observation Skills

Teamwork

Critical Thinking

Nature Interaction

Ecological Balance

Learners' objectives (filed by teachers)

Developing an understanding of biodiversity and the role of scavengers in ecosystems

Enhancing observation, identification, and teamwork skills

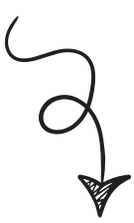
Fostering critical thinking by distinguishing between beneficial organisms (scavengers) and non-beneficial entities (intruders)

Learners' needs (filed by students)

Learn about biodiversity in an engaging, hands-on way

Work in teams to solve problems

Activities that incorporate movement and interaction with their environment



Subject

Natural Sciences

Type of activity

Interactive research

Topic

Scavenger hunt in nature

Target group

High school students

Group number

4-6 students per group

Duration

2 hours

Necessary materials

Cards with scavengers of nature (in the cards there are also “intruders” to make it more interesting and dynamic)

Scavenger Hunt List (printed)

Notebook and pens

References and further reading

“The Hidden Life of Trees” by Peter Wohlleben – Explores how ecosystems work, with an emphasis on the interconnectedness of species.

Link to book on Amazon

“The Ecology of Scavengers” by Stephen R. Humphrey – A detailed study on the role of scavengers in ecosystems.

Environmental Protection Agency (EPA) – Resources on biodiversity, ecosystems, and conservation strategies.

What Is The Role Of Scavengers In An Ecosystem? - Biology For Everyone

Instructions:

1. Introduction (10-15 minutes)

Introduce students to the concept of scavengers, their role in ecosystems, and the importance of biodiversity.

- Briefly explain what scavengers are and how they contribute to ecosystems by cleaning up organic material (e.g., dead plants, animals, waste).
- Discuss how scavengers are beneficial to the environment and distinguish them from harmful intruders or invasive species.
- Explain the activity's goal: To participate in a scavenger hunt, identify scavengers in nature, and learn how they maintain ecological balance.
- Review the "Scavenger Hunt List" and what is expected in their observations and group discussions.

2. Organizing the Students (10 minutes)

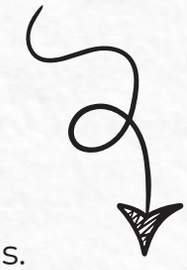
Form groups and prepare for the scavenger hunt.

- Divide the class into groups of 4-6 students.
- Provide each group with a "Scavenger Hunt List" which includes a list of scavenger species (e.g., certain insects, fungi, and animals) and "intruders" (non-beneficial organisms or invasive species).
- Each group will identify and describe the scavenger they find and explain its role in nature.
- Inform students that some cards will represent scavengers, while others will represent intruders to make the activity more dynamic and challenging.

3. Scavenger Hunt (60 minutes)

Allow students to explore the outdoor area and engage in the hands-on activity of identifying scavengers and intruders.

- Hide the cards around the outdoor area. Each card will have an image and brief description of either a scavenger or an intruder.
- The students will go in search of these cards. When a group finds a card, they must:
    - Record the item found on their scavenger hunt list.
    - Explain how they identified the scavenger (e.g., physical characteristics, behavior) and its role in cleaning up nature (e.g., decomposing organic matter, recycling nutrients).
    - For intruders, they should explain why the organism is not beneficial and its impact on the ecosystem (e.g., invasive species harming biodiversity)..
    - Students can use notebooks to jot down observations and interesting facts they discover.



4. Presentation and Discussion (20-30 minutes)

Review findings and discuss the ecological role of scavengers.

- Once the hunt is completed, have each group present their findings.
- For each scavenger card found, the group should explain:
  - How they identified the scavenger.
  - The contribution of the scavenger to maintaining ecological balance and cleaning nature (not just air purification, but also soil and water cleanliness).
  - For each intruder card found, explain why it is harmful and its effect on the ecosystem.
- Set a time limit for each group to present (e.g., 10 minutes per group).
- Facilitate a group discussion on the importance of biodiversity and the role of scavengers in maintaining a healthy ecosystem. Discuss how scavengers help recycle nutrients, reduce waste, and maintain ecological health. Talk about conservation efforts to protect these vital species.

5. Conclusion (10 minutes)

Summarize key learnings and reinforce the importance of biodiversity and environmental conservation.

- Conclude the activity by summarizing the role of scavengers in ecosystems. Emphasize the importance of protecting biodiversity and maintaining a balance in nature.
- Highlight the role of human activities in disrupting these natural processes (e.g., habitat destruction, pollution) and how we can help through conservation efforts.
- Encourage students to reflect on how they can contribute to protecting ecosystems in their own lives.

Breathe Clean: Exploring Air Quality and Pollution

Skills and knowledge least appropriate to outdoor learning

Critical Thinking: Analyzing the impact of air quality on health and the environment.

Data Collection and Analysis: Gathering and interpreting air quality data using tools and resources.

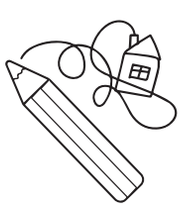
Observation Skills: Identifying and assessing sources of air pollution in the environment.

Teamwork and Collaboration: Working together to collect data, share findings, and discuss solutions.

Problem-Solving: Developing strategies to prevent or reduce air pollution.

Communication: Presenting observations, sharing ideas, and discussing solutions in a group setting.

Key Words



Air Quality Monitoring

Environmental Science

Pollution Prevention

Ecological Impact

Health Risks

Environmental Observation

Data Analysis

Sustainable Solutions

Group Collaboration

Environmental Education

Learners' objectives (filed by teachers)

To understand the concept of the Air Quality Index (AQI) and its relevance to environmental health.

To develop skills in collecting and interpreting environmental data..

To inspire solutions-oriented discussions on how to reduce air pollution in local communities.

Learners' needs (filed by students)

To receive clear explanations of air quality concepts and their importance.

To have hands-on opportunities to observe and engage with their environment.

To access tools and resources for gathering real-time air quality data.

To have a chance to discuss and share ideas about how to improve air quality and prevent pollution.

To participate in collaborative activities that allow them to work together and solve environmental problems.

Subject

Natural Sciences

Type of activity

Observational activity

Topic

Breathe Clean: Exploring Air Quality and Pollution

Target group

High school students

Group number

4-6 students per group

Duration

30-45 minutes

Necessary materials

Air quality index-AQI chart (printed)

Notebook and pens

Smartphone applications for monitoring air quality

References and further reading

“Silent Spring” by Rachel Carson

Global Health Observatory (WHO) - Air pollution data portal
https://www.who.int/data/gho/data/themes/air-pollution

Application:IQAir AirVisual | Air Quality
https://play.google.com/store/apps/details?id=com.airvisual&hl=en-US

Instructions:

1. Discussion (10 minutes):
Begin with a discussion on air quality and its importance for both health and the environment. Explain how air pollution can affect people's health and the ecosystem.

2. AQI Presentation (10 minutes):
Present the Air Quality Index (AQI) chart and go over the different categories (Good, Moderate, Unhealthy, etc.). Explain what each category means and how they relate to health risks.

3. Observation Walk (15 minutes):
Take a short walk outside to observe the environment. Ask students to look for sources of air pollution, such as traffic, factories, waste, or construction sites.

4. Data Collection (10-15 minutes):
Using smartphone apps or local AQI resources, students will gather current air quality data. They should record their observations and AQI readings in their notebooks, noting the air quality and any pollution sources they identified.

5. Discussion (10 minutes):
After collecting data, facilitate a group discussion on air pollution prevention. Encourage students to share their thoughts on actionable solutions for improving air quality in their communities.

Impulsive Buying and Its Consequences

Concepts, skills and knowledge least appropriate to outdoor learning

Critical Thinking – Analyzing and evaluating the impact of impulsive buying and consumerism on the environment.

Research Skills – Gathering and analyzing information from various sources to understand the issue better.

Collaboration – Working with others in groups to discuss, research, and present findings.

Problem-Solving – Developing solutions to reduce impulsive buying and its environmental effects.

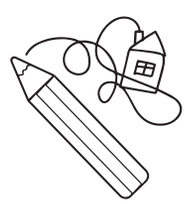
Communication – Presenting research and ideas clearly to the class through discussions and presentations.

Creative Thinking – Brainstorming creative solutions to address consumerism and promote sustainability.

Awareness and Reflection – Becoming more aware of personal consumer behaviors and reflecting on how they can make more sustainable choices.

Ethical Decision-Making – Understanding te ethical implications of consumer behaviors and the responsibility of being a conscious consumer.

Key Words



Impulsive Buying

Consumerism

Environmental Impact

Overconsumption

Sustainability

Ethical Consumerism

Psychological Factors

Social Factors

Waste

Critical Thinking

Learners' objectives (filed by teachers)

To understand the psychological, social, and economic factors that drive impulsive buying behavior.

To analyze how impulsive buying contributes to environmental degradation through overproduction, waste, and unsustainable consumption.

To critically assess the environmental impact of consumer culture and develop awareness of ethical consumerism.

To foster critical thinking regarding marketing techniques and their effects on consumer choices.

To enable students to discuss ways in which individuals and societies can reduce impulsive buying behaviors to protect the environment.

Learners' needs (filed by students)

To understand how consumer behaviors, such as impulsive buying, impact the environment.

To become aware of our role in contributing to waste, pollution, and resource depletion.

To understand how personal decision-making connects to broader societal impacts, especially regarding sustainability.

Subject

Social Science Economics, Sociology

Natural Science

Type of activity

Interactive Discussion and Research Activity

Topic

Impulsive Buying and Its Consequences

Group number

Small to medium groups: Ideally groups of 4-6 students. Groups can research, discuss, and develop their findings together, which encourages collaboration.

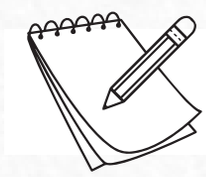
Target group

High School Students (typically ages 15-18)

Duration

2-3 hours (this could be a one-time class session or span across multiple sessions, with students working on different aspects of the activity each day).

The activity can be extended as an ongoing project where students track their own impulsive buying behaviors over a week or month and analyze the results.



Necessary materials

Access to the internet for research (for accessing articles, videos, and case studies on impulsive buying and its environmental effects).

Paper, markers, and presentation materials (for creating posters or presentations for advocacy).

Survey Tools (optional): If students are interested, they could conduct a simple survey on impulsive buying behaviors among peers and analyze the data.

References and further reading

“The Consumer Society: Myths and Structures” by Jean Baudrillard (Explores the impact of consumerism on society).

“The High Price of Materialism” by Tim Kasser (A psychological look at consumer culture and its negative effects).

Environmental Protection Agency (EPA) - Consumer Behavior and Waste: Look for online resources or studies about the environmental impact of overconsumption and the waste cycle.

“Buyology: Truth and Lies About Why We Buy” by Martin Lindstrom (A deep dive into the psychology behind consumer buying behavior).

Instructions:

1. Introduction (15-20 minutes):

Introduce the topic of impulsive buying and its psychological, social, and environmental effects. Discuss how advertising, peer pressure, and consumer culture can drive impulsive purchases.

2. Group Research (30-40 minutes):

Divide students into small groups. Assign each group a specific aspect to research:

The psychology behind impulsive buying.

How impulsive buying leads to overproduction, waste, and environmental harm.

The role of marketing in encouraging impulsive buying.

Case studies or real-world examples of companies and products contributing to unsustainable consumerism.

3. Data Gathering (Optional, 15-30 minutes): If possible, students could conduct a brief survey among their peers to understand buying behaviors. They could ask questions about triggers for impulsive purchases, product categories, and feelings after making impulse buys.

4. Creative Solutions (20-30 minutes): Have students brainstorm and create solutions or action steps for individuals and society to combat impulsive buying. What could consumers do? How can retailers be more responsible in their marketing? How could the government or society encourage sustainable consumption? They could present their solutions in a variety of formats (posters, digital presentations, or pamphlets).

5. Group Presentations (20-30 minutes): Each group presents their findings and solutions to the class. Encourage open discussion afterward on each group's ideas.

6. Reflection (5-10 minutes): Close with a reflection on how students' own behaviors can contribute to or reduce impulsive buying, and how they can make environmentally conscious choices in the future.

Recycled Masterpieces: Art for the Planet

Concepts, skills and knowledge least appropriate to outdoor learning

Creativity – Expressing ideas through artistic projects using recycled materials.

Teamwork – Collaborating with peers to create a collective art installation.

Problem-Solving – Figuring out how to use various materials in artistic ways.

Critical Thinking – Reflecting on how to convey messages of sustainability and environmental impact through art.

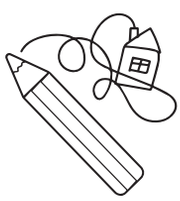
Practical Skills – Using tools like glue, scissors, and utility knives to assemble and create the artwork.

Communication – Explaining artistic choices and the message behind the artwork to others.

Environmental Awareness – Understanding the importance of recycling and reducing waste through art.

Adaptability – Experimenting with different materials and techniques to enhance creativity.

Key Words



Upcycled Art

Sustainability

Recycling

Environmental Impact

Creative Expression

Collaborative Art

Visual Arts

Hands-on Learning

Teamwork

Social Commentary

Learners' objectives (filed by teachers)

To foster creativity and artistic expression through the use of recycled materials.

To engage students in sustainability and environmental consciousness by using upcycled materials to create art.

To help students practice practical, hands-on skills such as cutting, gluing, and assembling materials.

To provide an opportunity for students to express their individuality and personal ideas in a group setting.

Learners' needs (filed by students)

A space where they can express themselves creatively without the pressure of traditional academic formats.

Opportunities to work together and learn from peers in a non-formal, supportive environment.

Materials that are easily accessible and can be repurposed for art.

Time and guidance to explore different ways to use recycled materials in their artwork.

Subject

Art

Natural Sciences

Type of activity

Non-formal Creative Project

Collaborative Art Installation

Topic

Recycled Masterpieces:
Art for the Planet

Group number

This activity can be done with the whole class or in smaller groups, depending on the space and the number of students. A group of around 10-15 students is ideal for collaborative work.

Target group

High School Students
(typically ages 15-18)

Duration

1-2 hours per session (could extend over several sessions, depending on the complexity of the piece and student involvement)

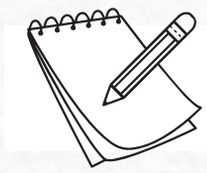
This could span a week or more, depending on available free time and class schedule, with students working on the project during non-formal time slots (lunch breaks, after school, etc.).

References and further reading

"Upcycled Art: 25 Creative Projects Made from Recycled Materials"
by Tanya L. Zimmerman

"The Art of Upcycling: Creating Art from Recycled Materials"
by Jennifer Morgan

https://www.pinterest.com/hometalk/upcycling/



Necessary materials

Large cardboard sheets (to create the base of the wall installation)

Recycled materials such as:

- Egg cartons
- Popsicle sticks
- Paper towel or toilet paper rolls
- Plastic bottle caps
- Old magazines and newspapers
- Buttons, fabric scraps, buttons
- Broken CDs or old electronic components

Paint, markers, or other coloring tools

Glue, tape, scissors, and utility knives

Protective covers for the floor and surrounding area (to protect against paint and glue spills)

Instructions:

1. Introduction and Setup (10-15 minutes)

Introduce the concept of upcycled art, sustainability, and using art as a form of social commentary. Begin by discussing the value of recycling and sustainability. Explain how art can be a powerful tool to communicate environmental messages. Show examples of upcycled art and discuss the idea of transforming waste materials into something beautiful and meaningful. Set up the base wall: Secure large cardboard sheets on a wall or board, which will serve as the foundation for the collaborative art piece.

2. Gathering Materials (10-15 minutes)

Allow students to either bring their own recycled materials from home or collect items from a central collection point in the school (e.g., egg cartons, popsicle sticks, paper towel rolls, plastic bottle caps, old magazines, fabric scraps, buttons, etc.).

Emphasize the importance of choosing materials that can represent different environmental themes (e.g., waste, nature, pollution, recycling).

3. Collaborative Work and Creative Process (40-60 minutes)

Allow students to experiment and collaborate to create the artwork while fostering teamwork and creative expression.

As students work, circulate around the groups and offer guidance, asking questions like, “What message do you want to communicate with your piece?” or “How can you use these materials to enhance your theme of sustainability?”

Allow for group collaboration—students should be encouraged to discuss ideas and come to a consensus about how to integrate their materials into the installation.

4. Reflection and Revision (15-20 minutes)

Help students reflect on their collective art piece and make revisions based on group discussions.

After the initial creative session, encourage students to step back and view the artwork as a whole. Ask guiding questions:

- What does your artwork represent about sustainability and recycling?
- Does it communicate the environmental message you intended?
- Are there any areas you’d like to add to or adjust to make the piece stronger?

Allow students to revise their work, add new materials, or make adjustments based on feedback and reflection.

5. Finalization and Presentation (10-15 minutes)

Conclude the project with a final unveiling and provide students the opportunity to explain their artistic choices and messages.

Once the artwork is complete, prepare the wall for presentation. Ensure the piece is securely attached and looks polished.

Have each student or group explain their individual or collective contributions. Ask them to discuss:

- The materials they used and how they chose them.
- The environmental or social message their artwork conveys.
- How the collaborative process influenced their creative decisions.

Encourage students to reflect on how the project increased their awareness of sustainability and the role of art in raising environmental consciousness.

6. Optional Extension and Wrap-Up (5-10 minutes)

End the activity with a brief discussion or group reflection on what they learned about sustainability, recycling, and the creative use of materials.

Encourage students to think of ways they can continue incorporating recycled materials into their daily lives and art projects.

If time allows, consider inviting other classes or school staff to view the artwork and learn more about its message.

Measuring the Height using an Indian Clinometer

Concepts, skills and knowledge least appropriate to outdoor learning

Measurement Skills – Using the clinometer and tape measure to determine tree height and girth.

Practical Handicraft Skills – Creating a simple clinometer from everyday materials.

Critical Thinking – Analyzing the growth patterns of trees over time and identifying seasonal changes.

Teamwork – Collaborating in small groups to measure and record data, and share responsibilities.

Research and Inquiry – Identifying tree species using research tools and resources, such as internet or teacher assistance.

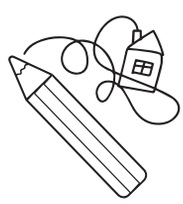
Data Recording and Analysis – Keeping accurate records of tree measurements and analyzing the data collected.

Observation Skills – Paying close attention to the environment and noting changes in tree dimensions over time.

Scientific Method – Conducting a study by selecting variables, making observations, and drawing conclusions based on data.

Environmental Awareness – Understanding tree growth cycles and the effects of seasons on trees.

Key Words



Clinometer

Tree Measurement

Trigonometry

Growth Patterns

Tree Species

Environmental Science

Problem-Solving

Data Analysis

Seasonal Changes

Engineering

Learners' objectives (filed by teachers)

To develop the ability to design and construct simple measuring instruments like a clinometer.

To understand and apply basic principles of measurement and angle determination.

To strengthen data collection and recording skills by monitoring changes in tree height and girth over time.

To increase awareness of environmental changes through direct observation and measurement of trees.

Learners' needs (filed by students)

Opportunity for hands-on, interactive learning in a natural setting.

Collaboration with peers for teamwork and shared learning experiences.

A chance to apply practical math and science skills in a real-world context.

Understanding of how to observe and track changes in nature, specifically trees, over time.

Time to observe and reflect on the data collected, developing insights about the environment.

Subject

Natural Sciences

Techonology

Type of activity

Practical Science Experiment &
Outdoor Measurement Activity

Topic

Measuring the Height using
an Indian Clinometer

Target group

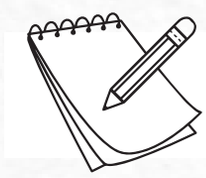
Secondary school children
aged 15-18

Group number

Group of 2-3 students
(each group will follow
changes in height and width
of different types of trees)

Duration

1 to 1,5 hours



Necessary materials

A protractor
Scissors
A drink straw
String/thread
Small stone/ rubber
Tape measure

References and further reading

https://brainchase.com/build-clinometer/
https://mappingaround.in/indian-clinometer/

Instructions:

1. Introduction

Show a video or provide a demonstration of how to make a simple clinometer using basic materials. You can use the following resources to help guide this process:

Building a Clinometer

Using an Indian Clinometer

2. Constructing the Clinometer:

- Protractor: This will be used to measure the angle of elevation.
- Drink Straw: Attach it horizontally to the protractor to help aim at the top of the tree.
- String or Thread: Attach a piece of string at the bottom of the protractor to allow it to hang freely and measure the angle of elevation.
- Small Stone or Rubber: Attach it to the end of the string to ensure the string hangs down vertically, helping you to measure accurately.

3. Measuring the Tree's Height

1. Go Outdoors: Take your clinometer and go outside to the nearest forest, park, or school yard that has various tree species.
2. Select Trees: Choose a few representative trees (preferably taller trees or larger bushes). The students should work in pairs or small groups of 2-3.
3. Using the Clinometer: Stand at a certain distance (about 10-15 feet) from the tree, holding the clinometer so the string hangs straight down.

- Aim the straw at the top of the tree while keeping the protractor flat and parallel to the ground.
- The angle at which the string aligns is the angle of elevation to the top of the tree. Record the angle.

4. Distance Measurement: Use the tape measure to calculate the horizontal distance from where you are standing to the base of the tree.

4. Calculate the Tree's Height

1. Using Trigonometry: Apply the formula for calculating the height of the tree using trigonometry: $\text{Height of Tree} = \tan(\text{Angle of Elevation}) \times \text{Distance from Tree}$

- This will give you the approximate height of the tree.

2. Recording Data: Students should record the height and girth (circumference) of each tree they measure in their notebooks. If possible, take note of the tree species as well.

Long-Term Observation

1. Monthly Tracking: Students can choose to track the same trees over several months and note any changes in their height and girth. This will allow them to study seasonal growth patterns.
2. Data Collection: Record monthly measurements and analyze the seasonal changes in tree height and width. Discuss how the trees' growth corresponds with the changing seasons.

5. Analysis

Identify Growth Patterns: As a group, students can compare the growth data of the different trees they tracked. They should analyze during which periods of the year the trees grow the most. For example, they may notice that trees grow most in Spring and Summer.

6. Conclusion

At the end of the project, students should summarize their findings, discuss the implications of their measurements, and reflect on how tree growth patterns vary by species and environmental conditions.

Greenhouse School Investigation Project

Concepts, skills and knowledge least appropriate to outdoor learning

Basic Plant Biology – understanding how environmental condition influence on plant growth with basic knowledge for photosynthesis and plant respiration.

Basic Construction Skills – Creating a simple greenhouse from everyday materials.

Environmental Factors and Their Impact on Plant Growth – Analyzing how each of these factors – temperature, light, humidity, air circulation etc, affect plant growth.

Collaboration and Communication – Share responsibilities and understand the importance of teamwork on a group project, collaborating in small groups to measure and record data.

Basic Tools for Plant Care – to provide the correct care for plants in a greenhouse.

Observation and Analytical Thinking – Knowing how to interpret observations about plants, analyzing data to make comparisons and conclusions.

Observation Skills – Paying close attention to the environment and noting changes in plants over time.

Scientific Method – Conducting a study by selecting variables, making observations, and drawing conclusions based on data.

Sustainability and Environmental Awareness – Understanding the role of greenhouse in sustainable agriculture and environmental impact of agricultural practices..

Key Words

Greenhouse

Sustainable agriculture

Agricultural practices

Photosynthesis

Plant respiration

Sustainability

Environmental Awareness

Environmental Science

Problem Solving

Data Analysis

Environmental Factors

Investigate

Learners' objectives (filed by teachers)

To gain practical experience in designing and building a greenhouse.

To investigate how a greenhouse environment impacts plant growth.

To focus on understanding the scientific principles behind plant growth, learning how to design and test experiments, collecting and analyzing data.

To enhance critical thinking, communication, and problem-solving skills

To increase awareness of the environmental contribution of the greenhouse to sustainable agriculture, water conservation, and food security.

Learners' needs (filed by students)

Access to the right materials to build mini-greenhouses.

Understanding of Scientific Concepts and methods with basic principles of plant growth, greenhouse effect and role of environmental factors on different types of plants.

Collaboration and teamwork with peers for divide tasks effectively, such as construction the greenhouse, monitoring plant growth, analyzing data and shared learning experiences.

A chance to apply practical math and science skills in a real-world context.

To understand the environmental impact of the greenhouse and how they contribute to sustainable agriculture and food security.

Observe and discuss the data collected and relate them with real-world and eco-friendly farming techniques.

Subject

Natural Sciences

Technology

Type of activity

Practical Science Experiment & Outdoor Measurement Activity

Topic

Greenhouse School Investigation Project

Target group

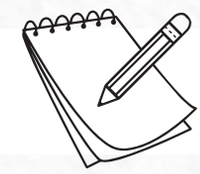
High school students

Duration

1 to 1,5 hours

Group number

Group of 2-3 students (divide tasks effectively between students groups, such as construction the greenhouse, monitoring plant growth, analyzing data and shared learning experiences)



Necessary materials

Clear plastic or plastic wrap (for walls and roof)

Plastic or glass containers (clear plastic box, aquarium, or even a plastic bottle) can be used for the base structure

Soil (potting mix)

Small plants or seeds (like herbs, flowers, or veggies)

You can add rocks or small pebbles, or make a holes on the plastic bottle or on the plastic container (for drainage)

Scissors or utility knife (to cut the plastic bottles or wrap)

Tape (optional, to secure the plastic in place)

Simple thermometer

Several small potting or cardboard toilet paper tubes (or cardboard)

References and further reading

https://www.youtube.com/watch?v=Y35PVCHVQcM&t=8s

https://www.youtube.com/watch?v=_V1gYhGExGQ

https://www.youtube.com/watch?v=IknyxHiEzs8

https://youtube.com/shorts/UvYqInhTsNA?si=CElM6dnsoIQZ1r7z

https://www.youtube.com/watch?v=rvYhiksTiJY

Instructions:

1. Introduction: First, study the videos linked below, which will help you decide what model of greenhouse you will construct, according to the conditions you have in your school building or yard:

https://www.youtube.com/watch?v=Y35PVCHVQcM&t=8s

https://www.youtube.com/watch?v=_V1gYhGExGQ

https://www.youtube.com/watch?v=IknyxHiEzs8

https://youtube.com/shorts/UvYqInhTsNA?si=CElM6dnsoIQZ1r7z

https://www.youtube.com/watch?v=rvYhiksTiJY

2. Constructing the Clinometer:

- **Choose a container:** Pick a clear plastic container, a small fish tank, or even a large plastic bottle (who you will cut in half). It should be transparent so sunlight can pass through.
- **Prepare the drainage:** Add a small layer of rocks or pebbles at the bottom of the container. This will prevent water from accumulating and help with drainage. Also you can poke small holes in the plastic for ventilation and drainage if you use plastic containers or bottles.
- **Fill with soil:** Add the soil on top of the rocks, filling the container about halfway, depending on the size of your container. Optionally you can use small pottings or cardboard toilet paper tubes like pottings.
- **Plant your seeds or small plants:** Good options include fast-growing plants. You can plant seeds like herbs (basil, mint), small flowers, or small vegetables (like lettuce). If you're using small plants, just place them gently into the soil.
- **Create the greenhouse cover:**
  - If you're using a plastic box, you can use the lid, or if not, you can create a cover by wrapping the top with clear plastic wrap.

    - Secure it with tape or use rubber bands to make sure it's tight and won't fall off.
    - If you're using a plastic bottle, you can cut it in half and use the top half as a cover, leaving the bottom as your base. Measuring the Tree's Height
    - Your mini greenhouse place puts it in a sunny spot: Set your mini greenhouse in a place with plenty of light. Most plants need sunlight to grow, so find a bright spot near a window, on a school yard, or on the terrace.
- **Water regularly:** Keep the soil moist but not too wet. You can water it with a small spray bottle to avoid over-watering.
- **Watch it grow:** Keep an eye on your plants! The mini greenhouse will help trap moisture and heat, encouraging plant growth even in cooler weather.

3. Investigate

You can teste how different environmental factors affect plant growth inside your mini greenhouse (for example: amount of light, monitor the temperature inside the greenhouse and surrounding space with using a simple thermometer, amount of water, soil type, etc.).

4. Design the Experiment

- **Formulate a hypothesis** (Example: "If plants are grown in a greenhouse, they will grow faster than plants grown outside of the greenhouse due to more consistent temperature and humidity".
- **Provide three experimental groups of plants:**
    - **Control Group:** one group of plants that you will keep outside the greenhouse as a comparison
    - **Experimental Group:** that are the plants inside in the greenhouse
    - **Variables:** keep track of the amount of light, temperature, humidity, and watering schedule.
- **Collect Data:** record your observation daily or weekly (measure the height of the plants, measure temperature and humidity regularly, take note of the health of the plants, record how often you water and the type of light etc.).
- **Analyze Result:** after a set period, compare the growth of the plants inside the greenhouse with the control group outside the greenhouse, then create graphs or charts to show your data visually.
- **Conclusion:** Discuss how different environmental factors impacted your plants development and how your investigation results and scientific methods can be applied to real-world scenarios.

Sun-Powered Creations: Building Solar Gadgets

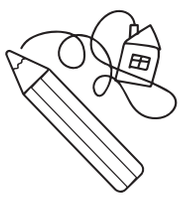
Skills and knowledge least appropriate to outdoor learning

Promote Innovation and Problem-Solving: Students will apply creative thinking to design and build solar-powered gadgets, developing their problem-solving skills by experimenting with different materials and designs.

Understand Renewable Energy Concepts: Students will gain a fundamental understanding of renewable energy, focusing on solar power, and how it can be harnessed to power gadgets and devices.

Encourage Sustainability through Recycling: Students will explore the importance of recycling by using recycled material.

Key Words



Solar energy

Renewable resources

Sustainability

Innovation

Recycled materials

Electronics

Outdoor learning

Problem-solving

Teamwork

Environmental impact

Learners' objectives (filed by teachers)

To learn basic electronics and circuitry, including how to wire solar panels to re-chargeable batteries and how solar power can be used to charge or operate small devices.

Learners' needs (filed by students)

Need to explore sustainable technologies and their applications in real-world settings.

Subject

Techonology

Type of activity

Green learning

Topic

Sun-Powered Creations:
Building Solar Gadgets

Target group

Ages 12–16

Group number

More than 20 students

Duration

3 hours
(can be extended over multiple sessions for more complex designs)

Necessary materials

Solar panels (small, portable)

Rechargeable batteries

Small motors or circuits (optional for advanced projects)

Tools for assembling (screwdrivers, pliers)

Recycled materials (e.g., plastic bottles, cardboard, old gadgets)

Wire, tape, and other simple electrical components

Multimeter for testing (optional)

Computers/tablets for research

References and further reading

https://sunvivalguide.com/practical-solar-powered-diy-projects/

https://www.youtube.com/watch?v=gV1tESSpm-A

Instructions:

Preparation:

Discuss the importance of renewable energy, focusing on solar power as an eco-friendly and sustainable energy source.

Introduce basic concepts of how solar panels work, including how they convert sunlight into electricity.

Explain how solar power can be used to power small devices or gadgets, and explore the benefits of using solar technology for a sustainable future.

Step-by-Step Process:

1. Planning the Project:

Students work in small groups and decide on the gadget or device they would like to power using solar energy (e.g., a small fan, light, or mobile charger).

Have them brainstorm creative ways to use recycled materials to build the body or housing for their devices, emphasizing the importance of reducing waste.

2. Building the Gadget:

Students begin assembling their solar-powered gadgets using small solar panels and rechargeable batteries.

They will wire the solar panels to the battery, ensuring the device can charge or operate when exposed to sunlight.

Encourage students to experiment with different types of recycled materials to create the structure of their device.

3. Testing and Adjusting:

Once the gadgets are built, students will test them outdoors, ensuring the solar panels receive sufficient sunlight to power the devices.

If needed, students can troubleshoot and adjust their designs to improve performance, learning through trial and error.

4. Reflection and Presentation:

After the devices are tested, students will present their projects to the group, explaining how they incorporated solar power and recycled materials.

Each group reflects on the challenges they faced during the activity and how they solved them.

5. Reflection and Evaluation:

Evaluate the projects based on creativity, functionality, and how well the devices align with sustainable principles (solar energy and recycling).

Encourage students to discuss how they might improve their designs and use solar technology in real-world applications.

Urban Canvas: Bringing Street Art to Life

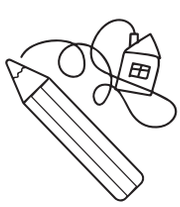
Skills and knowledge least appropriate to outdoor learning

Develop Collaborative and Communication Skills: Through teamwork, students will learn how to communicate their creative ideas, listen to others, and work together to achieve a shared artistic vision.

Enhance Artistic Skills and Techniques: Students will improve their painting skills, experimenting with various techniques.

Promote Creative Thinking and Problem-Solving: Students will be challenged to think creatively about their mural's theme, design, and layout, while considering how to convey a clear message through visual art.

Key Words



Street Art

Mural

Creativity

Collaboration

Community

Artistic skills

Expression

Public art

Social messages

Teamwork

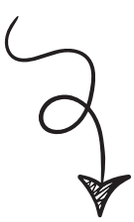
Learners' objectives (filed by teachers)

To learn how street art shows social, political, and cultural ideas, and how it helps communities express themselves and create change.

To understand how to design and create large murals, including planning, dividing work, and making sure the artwork comes together as a whole.

Learners' needs (filed by students)

Need to understand how the art can connect with and positively impact their local community.



Subject

Art

Type of activity

Street Art Mural Creation

Topic

Urban Canvas: Bringing Street Art to Life

Target group

Ages 14–16

Group number

More than 20 students

Duration

3 hours
(can be spread over multiple sessions)

Necessary materials

Large canvas or mural board (or a designated wall for the mural)

Spray paints, acrylic paints, brushes, and markers

Sketching materials (pencils, erasers)

Painter's tape and stencils (optional)

Drop cloths or protective coverings

Digital camera or phone (for documentation)

Protective gloves and aprons

References and further reading

https://streetartcities.com/

Instructions:

Preparation:

Discuss the history and cultural impact of street art, including different styles like graffiti, stencils, and mural art.

Explore how street art conveys messages, builds community, and reflects social issues.

Explain the guidelines for creating a mural: respecting public space, designing with purpose, and using colors and shapes to communicate effectively.

Step-by-Step Process:

1. Introduction to Street Art:

Present examples of famous street artists like Banksy or Shepard Fairey, and discuss how their work blends art with social and political messages.

2. Designing the Mural:

In small groups, students brainstorm themes for the mural (e.g., social justice, environmental awareness, local culture).

Each group sketches a design on paper, considering the space, colors, and messages they want to communicate.

3. Planning the Mural Layout:

Once designs are finalized, create a grid or outline on the mural canvas or wall using light pencil marks.

Plan how to break down the design into sections, so each student can contribute to different parts.

4. Creating the Mural:

Students work together to paint the mural, using spray paint for large areas and acrylic paint or markers for details.

Encourage them to experiment with different techniques like blending, layering, and stencil work.

5. Documentation:

Throughout the process, students take photos to document the creation of the mural. After completion, they create a photo essay or video to share the story behind the artwork.

6. Reflection and Evaluation:

Once the mural is complete, have students reflect on their experience, discussing what they learned about teamwork, art techniques, and the power of visual communication.

Evaluate the mural based on creativity, collaboration, and how effectively it communicates its chosen theme.

Splash of Science: Exploring Water Quality in Our Ecosystems

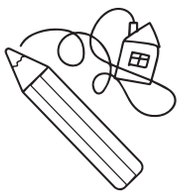
Skills and knowledge least appropriate to outdoor learning

Enhance Observation and Analytical Skills: Students will improve their ability to observe and document data, identifying water characteristics and comparing results from different locations.

Learn to Use Scientific Equipment: Students will become familiar with basic scientific tools such as water testing kits, thermometers, magnifying glasses, and microscopes.

Key Words

Water Quality	Data Collection
Ecosystem	Sustainability
Fieldwork	Aquatic Life
Pollution	Biodiversity
Environmental Awareness	Water Testing



Learners' objectives (filed by teachers)

To understand water quality parameters that influence water quality, including pH, turbidity, nitrates, and phosphates, and how these affect ecosystems.

To help students connect local water quality to global environmental issues.

Learners' needs (filed by students)

Need to increase environmental awareness and understand their role in protecting and maintaining the natural world, particularly in the context of water resources.

Subject

Natural Sciences

Type of activity

Water quality testing

Topic

Splash of Science: Exploring Water Quality in Our Ecosystems

Target group

Ages 12–16

Group number

More than 20 students

Duration

Initial activity: 3 hours;
Follow-up: 1 hour for data analysis and reflection

Necessary materials

Water testing kits (pH, turbidity, nitrate, and phosphate strips)

Glass jars or plastic containers for collecting water samples

Thermometers

Magnifying glasses

Notebooks and pens for data recording

Rubber gloves

Field guides for identifying aquatic life

Portable microscopes (optional)

References and further reading

https://www.nationalgeographic.org/society/

Instructions:

Preparation:

Choose a nearby pond, river, or lake as the study site. Obtain necessary permissions for the activity.

Discuss the importance of water quality and its impact on ecosystems and human life. Introduce the parameters to be tested (e.g., pH, nitrates).

Step-by-Step Process:

1. Fieldwork:

Take students to the chosen water body with the required materials.

Divide students into small groups, assigning each group specific tasks (e.g., sample collection, testing, observation).

Collect water samples from different locations within the site.

2. Testing and Observation:

Test for water quality parameters like pH, turbidity, and nitrate levels using testing kits.

Use magnifying glasses or microscopes to observe microorganisms or sediments in the water.

Record temperature and any observable characteristics of the water (e.g., color, smell).

3. Documentation:

Students document their findings, including test results, observations, and sketches of aquatic life.

4. Analysis and Discussion:

Back in the classroom, groups analyze their data, compare results, and discuss factors affecting water quality, such as pollution or natural processes.

Propose solutions for improving water quality and protecting local ecosystems.

5. Reflection and Evaluation:

Encourage students to reflect on the importance of monitoring and preserving water resources.

Evaluate the activity by discussing what they learned and how they can apply it in daily life or future studies.

Building Utopia: Designing Your Dream Sustainable Community

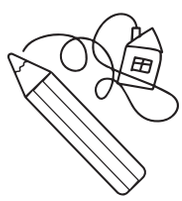
Skills and knowledge least appropriate to outdoor learning

Develop Critical Thinking and Problem-Solving Skills: Students will apply critical thinking to address the challenges of designing a community that balances environmental, social, and economic needs.

Enhance Research and Information Gathering: Students will use various sources, including the internet and real-world examples, to research sustainable practices and incorporate them into their community designs.

Foster Teamwork and Collaboration: Students will work in small groups, developing their collaboration and communication skills as they design and present their sustainable communities.

Key Words



Sustainability

Community

Social equity

Environmental conservation

Renewable energy

Economic opportunity

Urban planning

Teamwork

Creativity

Learners' objectives (filed by teachers)

To understand the components of a Sustainable Community including environmental conservation, social equity, and economic vitality.

Learners' needs (filed by students)

Need to build an understanding of how urban planning can influence social behavior, economic opportunities, and environmental impact.

Subject

Social Sciences

Type of activity

Community Design

Topic

Building Utopia: Designing Your Dream Sustainable Community

Target group

Ages 12–16

Duration

2 hours

Group number

More than 20 students

Necessary materials

Large poster boards or cardboard

Markers, colored pencils, and pens

Sticky notes and index cards

Access to the internet (for research)

Construction paper, scissors, glue

Optional: cardboard boxes, building blocks, or other craft materials

References and further reading

https://education.reboottheFuture.org/

Instructions:

Preparation:

Begin by discussing the key concepts of sustainable communities, including social, economic, and environmental factors.

Provide examples of real-world communities and their approaches to sustainability.

Step-by-Step Process:

1. Introduction to Sustainability:

Present an overview of the components that make a community sustainable: social equity, economic opportunity, environmental preservation, and good governance.

2. Group Work:

Divide students into small groups. Each group is tasked with designing a fictional community, keeping sustainability in mind.

Groups should decide on their community's features, such as:

Energy sources (renewable or non-renewable)

Transportation systems (public transport, biking, walking)

Housing (eco-friendly building materials, green spaces)

Economy (local businesses, job opportunities)

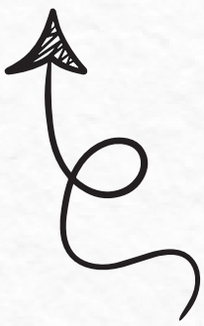
Education and healthcare systems

3. Creating the Design:

Students use poster boards or cardboard to create a visual representation of their community.

They should include maps, drawings, or even 3D models (using craft materials) to showcase the layout and features of their community.

Encourage them to use sticky notes to highlight key aspects of their design and how they contribute to sustainability.



4. Presentation:

Each group presents their community to the class, explaining the decisions they made and how they promote sustainability in social, economic, and environmental areas.

5. Reflection and Evaluation:

After the presentations, lead a class discussion on the challenges and rewards of designing a sustainable community.

Encourage students to reflect on how the activity deepened their understanding of the complexities involved in creating a balanced society

Step into Art: The Power of Walking

Concepts, skills and knowledge least appropriate to outdoor learning

Creativity - Students will practice making art using different materials.

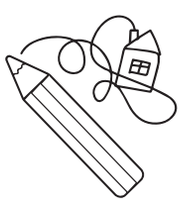
Teamwork - Students will learn to work together and share ideas with their group.

Communication - Students will explain their artwork and ideas to others.

Mindfulness - Students will learn to focus on their surroundings and feelings during the walk.

Emotional Awareness - Students will recognize how physical activity can affect their emotions.

Key Words



Walking	Physical Activity
Health	Wellness
Creativity	Collaboration
Art	Reflection
Mental Clarity	Inspiration

Learners' objectives (filed by teachers)

To understand the benefits of walking

To foster creativity through movement

To learn the connection between physical activity and emotional well-being

To encourage teamwork and collaboration

To build artistic skills

To improve presentation skills

To increase awareness of environmental impact

Learners' needs (filed by students)

To understand the emotional benefits of physical activity

To express personal reflections through art

To improve observation skills during physical activities

To connect with nature and surroundings during the walk

Subject

Art

Social Sciences

Type of activity

Art and walking

Topic

Step into Art: The Power of Walking

Target group

students from 14 to 17 years old

Group number

more than 15 students

Duration

3 hours

Necessary materials

A3 boards

Colored crayons/pens

Magazines (for cutting out images)

Scissors

Glue

Sticks

Video projector

PowerPoint presentation

Notebooks or journals for personal reflections

Camera (optional, for capturing inspiring moments during the walk)

References and further reading

https://youtu.be/3Ka7B3hCg08?si=5-y9VNnuSJzIYaS3

https://www.youtube.com/watch?v=R4_JCLMcHMw

https://youtu.be/yJ4ty7kbq-0?si=q8EMYtMw6Y0rq9b6

Instructions:

1. Introduction to the Activity:

- **Presentation**: Start with a PowerPoint presentation introducing the health benefits of walking, focusing on both the physical and mental effects. Explain how walking can help with stress reduction, improved mood, and mental clarity. Discuss how physical movement, like walking, can influence creativity and inspire art.
- **Class Discussion:** Engage students in a discussion about how physical movement might be linked to their creative process. Prompt them with questions like: “How does being active make you feel emotionally?” “Can movement help you generate new ideas or enhance your creativity?”
- **Artistic Inspiration:** Share examples of how artists and creatives have used movement and physical activity to fuel their work. Discuss the concept of ‘art in motion’ – how dynamic movements can translate into static forms of art.

2. Team Formation and Creative Brief:

- Divide students into teams of 5-6 people. Each team will collaborate on an art project that will depict their collective experiences of walking. Encourage students to think about the walk as a metaphor for movement, both physical and emotional.
- Assign each team a specific theme to explore through their artwork, such as:
    - **The Journey:** Focus on the physical route taken during the walk, using visual elements like paths, trails, or abstract representations of movement.
    - **Personal Reflections:** Students represent the emotional and mental impact of walking—how it feels mentally and emotionally, using color, shapes, and form.
    - **Health and Wellness:** Students focus on the health benefits, creating art that illustrates how walking affects the body, energy levels, and mood.
    - **Nature and Surroundings:** Focus on the natural elements students see while walking, such as trees, skies, or patterns in nature that represent the grounding, calming effect of walking.

3. Walking Exercise:

- **The Walk:** Lead the students on a 5 km walk (approximately 6577 steps) around the school grounds, a nearby park, or a safe, scenic route. During the walk, encourage students to pay attention to how their body feels , the thoughts that arise, and the things they observe around them. It is recommended that this activity be carried out on World Walking Day, which is on October 6.
- **Mindful Observation:** As they walk, ask students to make mental notes of their physical sensations and emotional reactions. Encourage them to jot down

short reflections in their notebooks. They can document anything that stands out to them during the walk, from feelings of relaxation to insights they have about their own physicality.

- **Optional Photography:** If possible, allow students to take photos of things that inspire them during the walk, whether it's the scenery, interesting patterns, or moments that trigger emotions.

4. Creating the Art:

- After the walk, students will return to the classroom or designated art space and begin working on their art projects. Each group will use the materials provided (art supplies, magazines, etc.) to create a piece of artwork that represents their experiences and reflections during the walk.
- Encourage students to incorporate elements of the walk that had an emotional or creative impact on them. For example, they might depict how the motion of walking inspired a sense of flow, how nature and movement are intertwined, or how walking contributes to overall health.
- Group Collaboration: Emphasize the importance of collaboration within their groups. Students should discuss their individual reflections and decide how best to represent them visually as a team.

5. Gallery Walk and Reflection:

- **Gallery Walk:** Once the artworks are complete, display them in the classroom or hall for a "gallery walk." Each group will have a chance to present their artwork to the class, explaining how the walk and their artistic process influenced the piece.
- **Group Reflection:** After the presentations, guide students through a group reflection. Ask questions such as:
  - How did the walk influence your art?
  - What emotions or thoughts were triggered by the movement?
  - How does physical activity affect your ability to express creativity?
  - What connections can you make between walking, creativity, and overall well-being?

Explore and Conserve: A Biodiversity Investigation

Concepts, skills and knowledge least appropriate to outdoor learning

Scientific Observation - The ability to closely observe and document the characteristics of species, habitats, and ecological interactions in the field.

Environmental Awareness - Understanding of the importance of biodiversity, ecosystems, and conservation efforts to protect natural habitats.

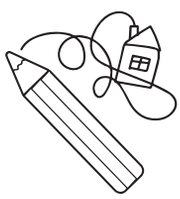
Data Collection and Documentation - Effectively recording information in investigation journals, taking photos for documentation, and organizing data for later review and analysis.

Teamwork and Collaboration - The ability to work well in teams, share responsibilities, and collaborate on data collection, discussion, and analysis during the activity.

Ecological Knowledge - Understanding of ecological concepts, such as food chains, ecosystems, and the roles of various species in maintaining biodiversity.

Technological Proficiency - Using apps and digital tools for species identification, data collection, and analysis of findings.

Key Words



Biodiversity

Conservation

Protected Area

Nature Reserve

Ecosystems

Flora

Fauna

Species Identification

Environmental Education

Outdoor Learning

Learners' objectives (filed by teachers)

To promote biodiversity conservation and the protection of natural habitats.

To understand the role of humans in preserving biodiversity..

To foster teamwork and collaboration during the field trip.

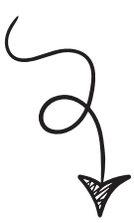
To use digital tools

Learners' needs (filed by students)

To learn about biodiversity and its importance for ecosystems.

To explore a protected natural area and observe plants, animals, and insects.

To develop skills in scientific observation and data collection.



Subject

Natural Sciences

Type of activity

Biodiversity Investigation

Topic

Explore and Conserve:
A Biodiversity Investigation

Target group

students from 14 to 17 years old

Group number

more than 25 students

Duration

4 hours

Necessary materials

Paper and pens (for investigation journals)

Mobile phones or cameras

Botanical, Zoological, and Ornithological Atlases

Computers (for digital transcription)

References and further reading

Seek by iNaturalist:

This free app allows students to identify plants, insects, birds, spiders, and other animals by simply pointing their smartphone at them. It works based on your geographic region, making it easy to identify species in real-time. Students can scan the object they want to identify, whether it's a leaf, flower, or animal. The app provides instant results and educational information.

Available on iOS and Android:

https://www.inaturalist.org/pages/seek_app .

Google Lens:

Google Lens allows students to identify plants, animals, and other objects by using their smartphone's camera. Students can take a photo, use an image, or upload a screenshot to the website to get instant identification. It's a great tool for recognizing various species during their investigation.

Available on iOS and Android:

https://lens.google/

Instructions:

1. Preparation:

- **Identify a Protected Area:** Choose a nearby nature reserve or protected area for the field trip.
- **Investigation Journals:** Before the visit, ensure students prepare their Investigation Journals. Each journal should have sections for:
  - Observations of plants, animals, and insects.
  - Habitat descriptions.
  - A photo section to document findings.

2. Introduction (Before the Visit):

- Presentation: Briefly explain the importance of protected areas and biodiversity conservation.
- Discuss food chains, ecosystems, and the role of humans in conservation.
- Introduce students to apps/websites (e.g., Seek by iNaturalist, Google Lens) to help identify species.

3. During the Visit:

- Guided Exploration: Lead the students through the nature reserve, helping them identify species and understand their role in the ecosystem.
- Group Work: Split students into teams of 5. Each team will work together to fill out their Investigation Journals.
- Document Findings: Encourage students to take photos of observed species and use apps like Seek by iNaturalist or Google Lens for identification.
- Provide information on local fauna and flora as needed.

4. Follow-up (After the Visit):

- Transcription of Journals: Have students transfer their handwritten notes and photos into digital format. Ensure they add any missing species information using reference materials or apps.
- Use of Atlases: Provide access to Botanical, Zoological, and Ornithological Atlases for further research.

5. Reflection and evaluation:

- Can you identify a food chain or food web in the visited habitat?
- What effect do you think protecting/ conservation the area has on the habitat?
- What main characteristics could you identify regarding the fauna and flora explored?
- What do you think is the role of humans in the sustainability of this habitat?
- How did you work as a team?

6. Homework:

1.Atlas Creation:

- Students will create a Botanical, Zoological, or Ornithological Atlas using the data and photos they collected during the nature reserve visit.
- Ensure students print their photos and include them in the atlas alongside their notes on the species observed.

2.Display of Atlases:

- Once completed, the atlases will be displayed in the school for other students from different classes to explore and learn from.
- Encourage students to share their findings and engage with others about the importance of biodiversity conservation.

Let's have a bicycle day!

Concepts, skills and knowledge least appropriate to outdoor learning

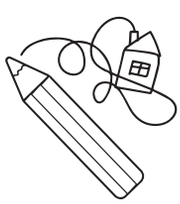
Collaboration - Working in teams to brainstorm, design, and present their bicycle ideas will improve their teamwork and communication skills.

Critical Thinking - Students will think critically about sustainable transportation, environmental impact, and how to solve real-world problems related to green transport.

Environmental Awareness - Students will learn about the importance of reducing pollution, using green transport, and taking care of the environment.

Social Responsibility - By promoting alternative transport and contributing to a more sustainable city, students will develop a stronger sense of social responsibility.

Key Words



Green transport

Sustainable cities

Environmental responsibility

Alternative transportation

Bicycle design

Social responsibility

Pollution reduction

Creative solutions

Civic engagement

Eco-friendly transportation

Learners' objectives (filed by teachers)

To understand the importance of green transport and its role in reducing pollution.

To become more environmentally responsible citizens by promoting sustainable modes of transportation.

To promote social interactions and foster a sense of belonging and collective responsibility toward a sustainable future.

To introduce the concept of sustainable cities and encourage students to think about how their actions can shape more environmentally conscious communities.

Learners' needs (filed by students)

To use bicycles and other forms of alternative transportation for a greener and healthier lifestyle.

To contribute ideas for building a more sustainable city through green transport solutions.

Subject

Social Sciences

Natural sciences

Type of activity

Social Responsibility

Topic

Let's have a bicycle day!

Target group

students from 14 to 16 years old

Group number

more than 15 students

Duration

2 hours

Necessary materials

Bicycles (for students who own them)

Natural materials (from the environment for bicycle design competition)

Recycled materials (for students without bicycles to create models)

Pens and paper (for note-taking and reflections)

Markers or art supplies (for design work, if needed)

Prizes (symbolic awards for the best bicycle designs)

References and further reading

https://competition.adesignaward.com/ada-category.php?C=72

Instructions:

1. Introduction:

Start the activity with a presentation about alternative transportation methods, emphasizing the social and environmental benefits of sustainable cities and communities. Discuss how community actions—like biking, walking, and carpooling—can have a positive impact not only on the environment but also on social connections within the local community.

2. Bicycle Design Competition:

Group Division: Divide students into small teams for a bicycle design competition. The challenge is to find creative, sustainable transportation solutions using natural and recycled materials. This team activity encourages social collaboration and problem-solving.

Designing Bicycles: Students will work together to modify or design bicycles that are more environmentally friendly, visually appealing, and functional. For those without bicycles, they will build models using natural or recycled materials, which fosters a sense of teamwork and creativity.

Presentations: After designing the bicycles, each team will present their creation to the class, explaining the innovative aspects, the materials used, and how the design contributes to a greener, more sustainable future. Students will have the chance to test each other's bicycles and offer feedback, further promoting social interaction and teamwork.

Prizes: Symbolic prizes will be given to the most original and creative bicycles.

3. Reflection and Evaluation:

After the activity, have students reflect on their experience and answer the following questions:

What does a sustainable city (in terms of biking, walking, or using public transportation/carpooling) mean to you, and how does it impact the community?

1. How can this "Bicycle Day" encourage social connections and create a sense of collective responsibility toward the environment?
2. How can you continue to incorporate environmentally responsible actions into your daily life, and how can you encourage your peers to do the same?
3. A future suggestion could be to organize a bike trip to a nearby location, providing students with the chance to experience the enjoyment of alternative transportation firsthand.

Educational field trip

Concepts, skills and knowledge least appropriate to outdoor learning

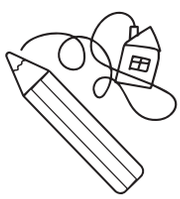
Environmental Awareness – Understanding the impact of renewable energy on reducing CO_2 emissions promotes responsible attitudes toward sustainability.

Critical Thinking – Analyzing the strengths and weaknesses of solar energy through a SWOT analysis fosters thoughtful evaluation and problem-solving.

Teamwork and Communication – Collaborating during field observations and group discussions builds social and interpersonal skills.

Career Awareness – Meeting professionals in the renewable energy field sparks interest in STEM careers and green technologies.

Key Words



Solar energy

Renewable resources

Photovoltaic panels

Sustainability

Green energy

CO2 emissions

Environmental impact

Renewable technology

Energy efficiency

Hands-on learning

Learners' objectives (filed by teachers)

To understand the benefits of solar energy

To explain how solar panels work

To encourage interest in renewable energy

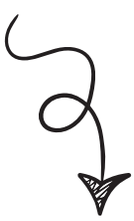
To promote environmental responsibility

Learners' needs (filed by students)

Learn the benefits of solar panels

Understand how solar panels work

Increase interest in renewable energy



Subject

Technology

Type of activity

Educational field trip

Topic

Out and Learn

Target group

14-17 years old

Group number

more than 15 students

Duration

2 hours

Necessary materials

At least 1 solar panel system/photovoltaic system
(for demonstration purposes)

Pens and sheets (for note-taking, calculations, and reflection)

Calculator (for calculations of energy capacity and CO2 emissions)

Access to statistical data from the solar panel company (for CO2 emission calculations)

Presentation materials (e.g., projector, slides, or printed materials for introduction)

Safety gear (if visiting installation sites, e.g., helmets, gloves, etc.)

References and further reading

https://www.slideshare.net/slideshow/presentation-renewable-energy-resources-138941071/138941071

Instructions:

1. Preparation:

- Arrange a visit to a company that installs solar panels. During the visit, students will either see solar panels at the company's facility or visit homes where panels have been installed to observe the installation process.
- If a field visit is not possible, consider having a virtual tour or inviting an expert to explain how solar panels work.

2. Introduction:

- Start the activity with a brief presentation on renewable energy, focusing on solar energy. Explain the concept of green energy and its environmental benefits, such as reducing pollution and conserving natural resources.
- Discuss the importance of using renewable energy sources, like solar power, to create a sustainable future.

3. Exercise:

- During the visit, ask students to calculate the energy production of solar panels. Use this simple formula:
  - Number of solar panels x 2.3 KW = Total energy produced (in KW)

    - Convert KW to MWh to understand how much energy is generated.
- Ask students to think about how much CO2 emissions could be saved by using solar panels. For example, each solar panel can save approximately 2.85 tons of CO2 per year.
    - The teacher can guide students on how to calculate the savings, based on the number of panels installed.

4. Expansion:

- If possible, collaborate with local organizations or authorities involved in installing solar panels in underserved communities. Arrange a visit to these areas to learn how solar energy benefits both the environment and the community.
- Discuss how solar panels improve living conditions and save money while reducing environmental impact.

5. Reflection and Evaluation:

- After the visit, students will reflect on their experience by answering questions such as:
    - What did you learn about how solar panels work?
    - Why is solar energy important for the environment?
    - How can solar panels help reduce CO2 emissions?
- To deepen their understanding, students will perform a simple SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) of solar energy. This helps them think critically about its potential benefits and challenges in the real world.

The activity can be expanded by organizing visits to photovoltaic parks, where students can engage in discussions with engineers to deepen their understanding of solar energy systems.

Knit Together: Crafting Creativity and Connection

Concepts, skills and knowledge least appropriate to outdoor learning

Knitting Techniques - Learn to knit/purl stitches and follow patterns to create projects.

Problem-Solving - Modify patterns as needed.

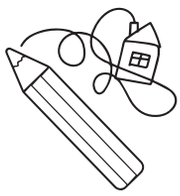
Creativity - Experiment with colors, textures, and designs to express personal style.

Focus and Concentration - Attention to detail and improve concentration.

Collaboration and communication - Work together, teach, and share tips to enhance social skills.

Cultural Awareness - Gain insight into the history and cultural significance of knitting.

Key Words



Knitting

Creativity

Focus

Collaboration

Problem-Solving

Concentration

Art

Crafting

Cultural Awareness

Social Connections

Learners' objectives (filed by teachers)

To learn knitting techniques, such as casting on, knitting, purling, and binding off, in order to build a strong base for creating projects.

To enhance problem-solving abilities by learning to identify and correct mistakes in knitting.

To express creativity through knitting projects by experimenting with different yarns, colors, and patterns to design unique and personal items.

To build focus and patience by paying close attention to details while knitting, practicing mindfulness, and developing the ability to persist through repetitive tasks.

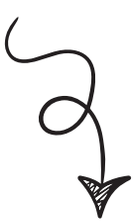
Learners' needs (filed by students)

To learn a new creative skill and express personal style through knitting.

To build social connections by working together with peers in a fun, collaborative environment.

To improve focus and concentration through a hands-on activity that requires careful attention to detail.

To have a relaxing and stress-relieving activity that promotes mental well-being.



Subject

Art

Type of activity

Craft Activity

Topic

Scavenger hunt in nature

Target group

High school students

Group number

The number of participants in the knitting club can vary, and groups can be organized according to skill level: beginner, intermediate, or advanced.

Duration

2 hours

Necessary materials

Yarns (in various colors and textures)

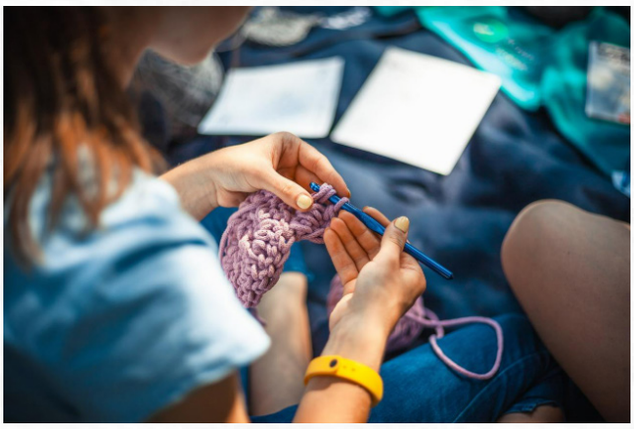
Bamboo or wooden knitting needles

Scissors

Measuring tape

Yarn needle (for finishing)

Stitch markers (optional)



References and further reading

ttps://sheepandstitch.com/how-to-knit/

https://www.youtube.com/watch?v=hM5M2Fu0RtY&t=2s

Instructions:

1. Introduction:

Purpose: Start by introducing the objectives of the knitting club to the students, explaining the benefits of knitting (e.g., creativity, stress relief, focus) and how they will progress through different levels (beginner to advanced).

Group Formation: Organize the students into different groups based on their skill level (beginner, intermediate, advanced). Provide a brief overview of the basic skills and materials required.

2. Instruction:

Teaching Basic Skills: Demonstrate basic knitting techniques (e.g., casting on, knit stitch, purl stitch, and binding off). Guide the students through each technique step by step, offering individual help as needed.

Advanced Techniques (for advanced groups): For more experienced students, introduce intermediate techniques like cable knitting or working with patterns. Allow them to work on more complex projects (hats, socks, etc.).

Pairing: Encourage experienced students to work in pairs with beginners to provide peer support and foster collaboration.

3. Practice:

Allow students to practice knitting during the session, either individually or in pairs. Encourage them to work on small projects like scarves or dishcloths. Walk around to offer assistance, correct mistakes, and provide guidance.

Provide support on common knitting mistakes (e.g., dropped stitches, uneven tension). Teach students how to recognize and fix their mistakes independently.

4. Sharing and Collaboration:

Discussion of Progress: Set aside time for students to share their work, ideas, and challenges. Encourage them to talk about what they've learned and any techniques they find challenging.

Idea Exchange: Create a space for students to exchange project ideas, patterns, and personal tips. This can help foster creativity and build a sense of community within the club.

5. Self-Assessment:

Allow students to reflect on their own progress. Ask them what they learned, what they found challenging, and what they would like to learn next. This can help you assess their engagement and understanding.

School journal

Concepts, skills and knowledge least appropriate to outdoor learning

Writing and Communication Skills - Students learn to write clear, engaging articles, improving both writing and verbal communication.

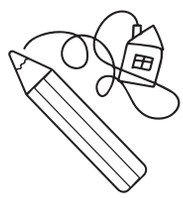
Critical Thinking and Analysis - Students will analyze information, reflect on observations, and evaluate different perspectives.

Research and Information Gathering - Students will develop skills in gathering accurate information and verifying sources for their articles.

Digital Literacy (Blogging/Publishing) - Students will learn how to use blogging platforms and publish content online, developing technical skills.

Time Management and Organization - Students will manage deadlines, create schedules, and balance multiple tasks while organizing their work.

Key Words



Writing and Communication Skills

Critical Thinking and Analysis

Research and Information Gathering

Digital Literacy

Collaboration and Teamwork

Time Management and Organization

Creative Writing and Visual Storytelling

Leadership and Responsibility

Ethical Understanding (Journalism Ethics)

Environmental Awareness

Learners' objectives (filed by teachers)

To learn how to write and publish the articles

To understand journalism fundamentals: the core principles of journalism, including accuracy, objectivity, and ethical reporting.

Learners' needs (filed by students)

To engage in hands-on activities that allow students to actively participate in creating and sharing news.

To collaborate and work as a team, exchanging ideas and supporting each other in the process.

To develop communication skills, both in writing and sharing information with others.

To gain practical experience in journalism and digital publishing

Subject

Technology

Social Sciences

Type of activity

School journal

Topic

School journal

Target group

High school students

Duration

2 to 3 weeks: This allows enough time for students to learn the basics of journalism, create and write articles, gather any necessary media (like images), review and edit content, and publish it on the school blog

Group number

The group can be formed from at least 3 students (if there is a big interest the more groups can be created and each group will inform about different activities such as sport, extracurricular activities, general news...)

Necessary materials

Blog (create one or use one your school already have)

Computer

References and further reading

https://comm.gatech.edu/resources/writers/5ws

Instructions:

1. Create the Journalism Team:

Once the school's journalism team is formed, provide a training session on the basic principles of journalism, including writing articles, ethical standards, and understanding the role of a journalist.

Topics to cover: How to write an article, how to search for copyright-free photos, and how to publish articles on the blog.

2. Develop an Editorial Calendar:

As a team, students need to create an editorial calendar or plan that outlines when articles will be published and who is responsible for writing which article. This calendar should include key school events, news, and deadlines.

3. Write and Review Articles:

Students write articles based on the editorial calendar. The articles should cover relevant and timely information about school events, activities, or general news.

After writing, students submit their articles to the teacher for review.

4. Publish the Articles:

After receiving feedback, students need to make necessary revisions and then publish the final version of their article on the blog or digital platform. The teacher will guide them on how to format and upload their articles correctly.

5. Provide Ongoing Support:

Throughout the process, the teacher should provide support and guidance when needed, helping students refine their work, issues, and ensure the final content is of high quality.

Caring for Animals: Volunteering at Shelters

Concepts, skills and knowledge least appropriate to outdoor learning

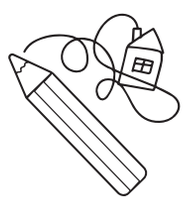
Teamwork and Collaboration - Students will work together in groups, learning to coordinate efforts, communicate effectively, and help each other complete tasks.

Responsibility and Accountability - Taking care of animals and maintaining a clean and safe environment teaches students to be responsible for the well-being of others, whether human or animal.

Empathy and Compassion - By caring for animals in shelters, students will develop a deeper understanding of empathy and compassion, especially towards vulnerable animals in need of attention and care.

Community Engagement - Volunteering in an animal shelter helps students understand the importance of community service and will gain awareness of the challenges facing animal shelters and the importance of animal welfare, adoption campaigns, and the need for community support.

Key Words



Animal Care

Volunteering

Teamwork

Empathy

Community Engagement

Social Responsibility

Animal Welfare

Compassion

Shelter Support

Social Science

Learners' objectives (filed by teachers)

To take care of animals by providing necessary care, learning about different animals, and understanding their social needs.

To explore the relationship between humans and animals and how social structures like animal shelters support community well-being.

Learners' needs (filed by students)

To develop teamwork skills through collaborative volunteering efforts.

To understand and practice compassion and social responsibility towards animals and community members.

Subject

Social science

Type of activity

Animal Shelter Volunteering

Topic

Caring for Animals: Volunteering at Shelters

Target group

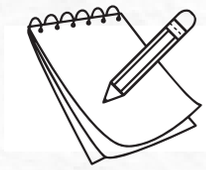
High school students

Duration

2 hours

Group number

There is no set number for the group size. If one animal shelter cannot accommodate all the volunteers, multiple shelters can be involved. Alternatively, if only one shelter is available, students can be divided into smaller groups, with each group focusing on a specific activity such as walking dogs, feeding animals, cleaning, or spending time with the animals.



Necessary materials

The materials required will depend on the specific animal shelter, but typically, no materials are needed from the students.

References and further reading

https://www.humanevma.org/volunteering

https://blog.collegevine.com/extracurricular-activities-with-animals-for-high-schoolers

Instructions:

1. Research Local Animal Shelters:

Begin by researching nearby animal shelters to identify the volunteer tasks they offer. Shelters typically need assistance with walking dogs, cleaning, feeding, and spending time with the animals. Some shelters may also offer opportunities for students to assist with adoption events or animal welfare awareness campaigns.

2. Inform Students:

Once you've gathered the necessary information, share the volunteer opportunities with your students. Explain the significance of social responsibility and how volunteering at animal shelters can positively impact both the community and the students' personal growth.

3. Create Volunteer Groups:

Organize students into smaller groups, assigning them specific tasks based on the shelter's needs. If there are more students than one shelter can accommodate, consider partnering with additional shelters or have groups rotate through different tasks. Tasks could include walking dogs, feeding animals, cleaning their living spaces, or spending time interacting with the animals.

4. Volunteering at the Shelter:

During the volunteer session, students will actively participate in caring for the animals, gaining hands-on experience in animal welfare. Encourage students to reflect on their role in supporting animal care and the broader societal importance of shelters. Prompt them to observe how the shelter operates and how humans play a vital role in animal welfare.

A Trash Pickup Challenge

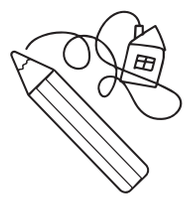
Skills and knowledge least appropriate to outdoor learning

Teamwork and Collaboration - Students will work together in groups to collect and sort trash, learning to communicate and coordinate effectively.

Environmental Responsibility - By participating in the trash collection and sorting process, students will gain a deeper understanding of the impact of waste on the environment and the importance of proper waste management.

Problem-Solving - While sorting and collecting trash, students may encounter challenges, such as identifying recyclable materials or working with limited time, encouraging critical thinking and decision-making skills.

Key Words



Waste Management	Community Service
Recycling	Teamwork
Pollution Awareness	Sorting Waste
Environmental Responsibility	Environmental Impact
Sustainability	Eco-friendly Practices

Learners' objectives (filed by teachers)

To understand the impact of waste pollution on the environment.

To engage in environmental activities that promote proper waste management.

Learners' needs (filed by students)

Need to understand the importance of waste management and how their actions can positively or negatively affect the environment.

Need to develop skills in sorting waste properly and identifying recyclable materials, which are crucial for sustainable living.

Need for a sense of responsibility to their local community.

Subject

Natural Sciences

Type of activity

Environmental Awareness Campaign

Topic

A Trash Pickup Challenge

Target group

High school students

Group number

It is recommended to have multiple groups for this activity, as it will be organized as a competition. Depending on the total number of participants, form groups with a minimum of 3 members each.

Duration

2 hours

Necessary materials

Gloves (for garbage collection)

Garbage bags (for collecting and sorting trash)

Garbage pliers (for picking up trash)

Labels (optional, to label the different categories of waste for sorting)

References and further reading

https://www.unep.org/interactives/beat-waste-pollution/

Instructions:

Before the Activity:

1. Prepare the Area:

- Choose an outdoor space (school grounds, park, or any safe area) where trash can be easily collected. Ensure it is safe for students and accessible for the teams.

2. Gather Necessary Materials:

- Collect gloves, garbage bags, and garbage pliers for each team.
- Have extra bags for waste disposal in case the teams collect more than anticipated.
- If necessary, prepare labels or stickers for categorizing waste (plastic, paper, glass, metal). You may want to bring a large trash bin for items that don't fall into the main categories.

3. Safety Precautions:

- Ensure all students wear gloves to protect their hands from sharp objects or harmful substances.
- Remind students not to pick up hazardous waste (e.g., broken glass, needles, chemicals) and to notify a teacher if they find anything dangerous.
- Set clear guidelines on respecting the environment, e.g., not damaging plants or disturbing wildlife during the collection process.

During the Activity:

1. Group Formation and Briefing (10-15 minutes):

- Split the students into small teams of at least 3 members. Make sure teams are balanced and diverse in terms of skills and abilities.
    - Explain the purpose of the activity: to raise awareness about waste pollution, practice waste sorting, and promote teamwork.
    - Assign each team an area to clean. Ensure the boundaries are clear so each team knows their task.
- Provide each team with necessary materials (gloves, bags, pliers, etc.).
    - Give a quick demonstration of how to use the tools properly (e.g., how to handle garbage pliers safely).
    - Explain the sorting process: plastic, paper, metal, glass, and other recyclables. If possible, provide a visual guide or example of common recyclable items.

2. Set the Challenge:

- Start the timer for 1 hour. Remind students that they should focus on collecting and sorting the trash simultaneously.
-
- Circulate between groups to offer assistance, remind them to focus on sorting, and help identify recyclable materials.
- Encourage students to work together as a team, communicating effectively to maximize their efficiency.

After the Activity:

1. Wrap-Up and Tallying Results

- Once the timer goes off, instruct the teams to return to a central meeting spot with their bags of sorted trash.
- As teams present their collections, check the sorting for accuracy and quantity:
  - Correctly sorted: Reward teams for proper sorting and attention to detail.
  - Improperly sorted: Gently guide teams to correct the mistakes and provide educational tips on proper waste management.
- Tally the results:
  - Count the number of bags each team has collected and check if they were sorted into the right categories.
  - Ensure the amount of garbage collected and sorted is weighed or measured.

2. Declare the Winning Team:

The winning team will be the one that collects the **most correctly sorted trash.** Announce the winners and give them the opportunity to choose the location for the next activity.

Offer positive feedback to all teams, focusing on what they learned about waste management and teamwork.

Reflection and Discussion:

Ask students to reflect on the activity. Possible questions for the discussion:

- What did you learn about the impact of waste on the environment?
- How did you feel about sorting different types of waste? Was it easy or challenging?
- Why is it important to recycle and manage waste properly?
- How can we apply this knowledge in our daily lives?
- Discuss what went well in terms of teamwork and communication. If appropriate, allow students to discuss challenges they faced during the activity and brainstorm solutions.


GReeen