Working Plan

Exploring Soil Quality and Eco-Friendly Improvement

<table>
<tr><td>Title : Exploring Soil Quality and Eco-Friendly Improvement</td><td>Time : 4-5 sessions</td></tr>
<tr><td>Teacher: Ministro Rossella</td><td></td></tr>
<tr><td colspan="2">Subject : Science, Maths, Social Studies, Geography, Geometry</td></tr>
<tr><td colspan="2">Aim:
• To understand the factors that influence soil quality.
• To examine and assess soil quality through ecological methods.
• To develop eco-friendly strategies for improving soil quality.</td></tr>
<tr><td colspan="2">Key CS elements: decomposition, pattern recognition, abstraction, practicing algorithms</td></tr>
<tr><td colspan="2">Age group : 4th graders, 9-10 year olds</td></tr>
<tr><td>Learning situations: Laboratory and integrated teaching
Use of the disciplinary classroom-scientific laboratory
Microlearning
Scientific method for STEM
Tinkering
Debate</td><td>Activity type : observation, analysis, implementation</td></tr>
<tr><td colspan="2">Resources:
• Soil testing kits
• Gardening tools (e.g., shovels, trowels)
• Plants and seeds
• Whiteboard and markers
• Classroom computer with internet access</td></tr>
<tr><td colspan="2">Learning development:</td></tr>
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1. Decomposition

Activity 1: Understanding Soil Factors (45 minutes)

- Divide the class into groups and assign each group a specific factor that influences soil quality (e.g., pH levels, organic matter content, moisture).
- Instruct students to research and present information about their assigned factor, including its importance and impact on plants and ecosystems.

2. Pattern Recognition

Activity 2: Soil Testing (60 minutes)

- Demonstrate how to use soil testing kits to analyze soil samples collected from different locations around the school or community.
- Guide students in recognizing patterns in the test results, such as identifying areas with acidic or alkaline soil, nutrient deficiencies, or moisture issues.

3. Abstraction

Activity 3: Eco-Friendly Soil Improvement (45 minutes)

- Abstract the concept of eco-friendly soil improvement by discussing practices like composting, mulching, and planting cover crops.
- Explore the abstraction of sustainable agriculture techniques, such as no-till farming, crop rotation, and natural pest control.

4. Algorithm Design

Activity 4: Creating Eco-Friendly Soil Improvement Plans (60 minutes)

- Have students work in pairs to design algorithms or step-by-step plans for improving the soil quality in a specific area of the school or community.
- Encourage them to consider the factors identified in Activity 2 and apply eco-friendly techniques from Activity 3.

Example

Algorithm: Designing Eco-Friendly Soil Improvement Plans

Objective: To create step-by-step plans for improving soil quality in a specific area using eco-friendly techniques.

Step 1: Select the Target Area

- Identify and describe the specific area within the school or community where soil improvement is needed.

- Consider factors such as current soil condition, sunlight, water availability, and the intended use of the area (e.g., garden, green space).

Step 2: Soil Assessment
- Conduct soil tests to determine the current soil quality.
- Record data on pH levels, nutrient content, moisture, and any other relevant factors.
- Identify any soil issues that need addressing (e.g., acidity, nutrient deficiencies, compaction).

Step 3: Research Eco-Friendly Techniques
- Research and compile a list of eco-friendly soil improvement techniques and practices.
- Consider options such as composting, mulching, cover cropping, and organic fertilizers.
- Evaluate which techniques are most suitable for addressing the identified soil issues.

Step 4: Develop a Step-by-Step Plan
- Create a detailed, step-by-step plan for improving the soil quality in the target area.
- Include specific actions, materials needed, and a timeline for implementation.
- Ensure that the plan addresses the soil issues identified in Step 2.

Step 5: Consider Sustainability
- Incorporate sustainable practices into the plan, such as minimizing waste, conserving water, and promoting biodiversity.
- Emphasize the importance of long-term soil health and ecological balance.

Step 6: Budget and Resources
- Estimate the budget required for implementing the plan, if applicable.
- Identify the necessary resources, including tools, materials, and labor.
- Explore potential sources of funding or donations to support the project.

Step 7: Presentation and Feedback
- Prepare a presentation of the soil improvement plan to share with the class or community.
- Include the rationale behind the chosen techniques and the expected benefits.
- Seek feedback and suggestions for improvement from peers and teachers.

Step 8: Implementation and Monitoring

- Implement the soil improvement plan in the selected area.
- Monitor the progress of the project, regularly checking soil quality indicators.
- Adjust as needed based on ongoing assessments.

Step 9: Documentation and Evaluation

- Keep thorough records of the project's implementation, including any challenges faced and solutions applied.
- Evaluate the project's impact on soil quality and ecological health.
- Reflect on the lessons learned and the effectiveness of the chosen techniques.

Step 10: Sharing Results

- Share the results of the soil improvement project with the school or community.
- Highlight the positive outcomes and the importance of eco-friendly practices.
- Encourage others to adopt similar approaches to soil improvement.

Assessment:

- Students will present their soil improvement plans, explaining how they considered soil factors, applied eco-friendly techniques, and addressed any issues related to soil quality.
- Assess students' understanding of the concepts and their ability to apply computational thinking principles to real-world ecological problems.

Expected results: Increased knowledge of soil quality factors and their impact.

- Ability to use ecological methods to assess soil quality.
- Development of eco-friendly soil improvement strategies.
- Improved awareness of ecological issues and the importance of sustainable practices.

Notes: