Experimenting with Saturation

Objectives:

- Understand the concept of soil saturation and its implications in flooding and drought situations.

- Develop scientific skills through observation and analysis of experimental results.

STEP BY STEP

Before starting

The teacher introduces the topic of soil saturation, explaining how drought and heavy rainfall impact the environment. Articles and images depicting both drought and flood scenarios are shown to the class.

The definition of drought can be shared or researched in their science books:

Drought: a prolonged period of little to no rainfall.

Students then discuss in groups how water behaves in the soil and what happens when the ground is already saturated. The class is encouraged to reflect through the following guiding questions:

- *What happens when dry soil receives a lot of water?*
- *How can soil saturation lead to flooding problems?*

Tempo di esperimenti

The teacher prepares the area for the experiment and divides the class into groups of 4-5 students, ensuring each group has access to the necessary materials. Each group receives:

- *Two transparent plastic containers (preferably with a flat bottom for easy observation).*
- *Dry soil and pre-moistened soil (the latter can be prepared in advance by wetting the soil and letting it sit).*
- *Water in a pitcher for easy pouring.*
- *A timer to record time.*
- *A ruler to measure the water level.*

Preparation Phase

Before starting, each group briefly discusses their objectives and formulates a hypothesis about what will happen when water is poured into the two containers. The teacher can stimulate discussion with questions such as:

- “Which container do you think will absorb the water more quickly?”
- “What do you think will happen to the water in both cases?”

During this phase, it’s important for students to write down their observations and predictions, creating a document that records the scientific process.

Execution Phase

Each group begins the experiment by following these steps:

1. **Fill the Containers:**

- Place the dry soil in one container until it's about two-thirds full.
- Put the moist soil in the other container, using the same amount of soil for a fair comparison.

2. **Pour the Water:**
   - Slowly pour the same amount of water (e.g., 200 ml) into both containers. Students can use a measuring cup to ensure accuracy.
3. **Observe and Record:**
   - Once the water is poured, groups start the timer and observe how long it takes for the water to be fully absorbed into the soil. They should also note the level of water remaining in the container after a set time (e.g., 10 minutes).
4. **Measure the Level:**
   - Use the ruler to measure how much of the soil is still visible above the water in both containers, recording the data in an easily readable format, such as a table.

Results Sharing

After the experiment, each group shares their observations and analyzes the results. The teacher guides a discussion on:

- *What was the difference between the dry soil and the moist soil?*
- *Why is water not absorbed by the dry soil?*
- *What implications does this have for water management and flood issues?*

Students can now create a poster or a digital presentation illustrating the results of the experiment, connecting their observations to the themes of drought and flooding. They can include graphs, images, and brief explanations to communicate their findings clearly and engagingly.

Concluding thoughts

The teacher concludes the activity by inviting students to reflect on the importance of soil saturation and its impact on events like droughts and floods. During this phase, an open discussion is encouraged, allowing students to express their ideas and considerations.

Guiding Questions:

- *What strategies can we adopt to improve water absorption in the soil?*
- *How can agricultural practices influence soil saturation and water management?*
- *What can we learn from countries facing issues with droughts and floods?*
- *How can we raise awareness in our community about sustainable water resource management?*