

LESSON PLAN

Experiment "Soluble-insoluble"

In this activity students will learn about substances and their solubility in water, especially, which substances dissolve in water and which do not.

**Recommended
age for this game**

Learning Objectives



**45-60
min**

Duration

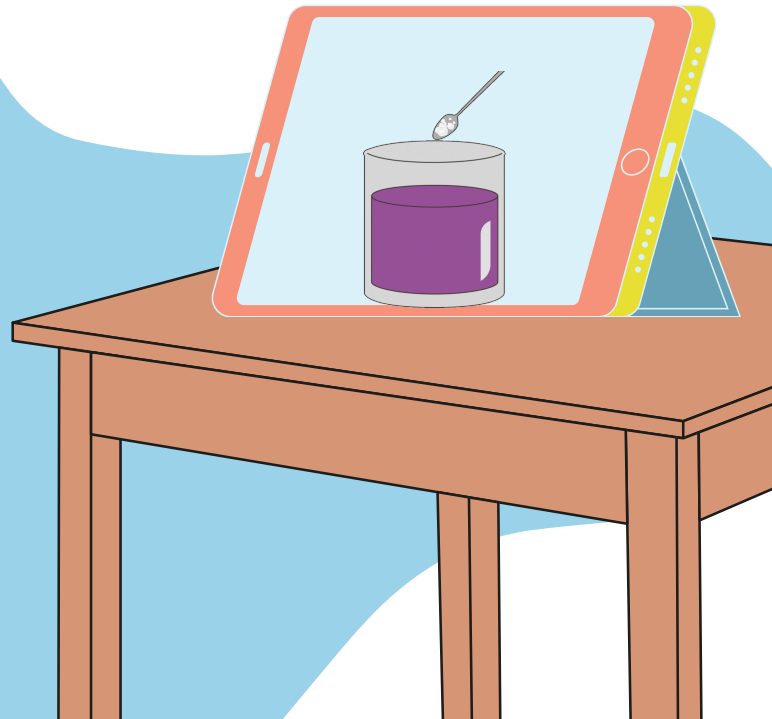
**6-9
years**



- Students will understand why some substances do not dissolve in water and what happens to those that do dissolve.
- Students do an experiment on the solubility of substances.

Materials and tools needed

- 7 plastic containers
- Water
- A handful of sand, salt, sugar, ground coffee, instant coffee, rice, and honey.
- A spoon.
- Other materials (e.g. toothpaste, laundry detergent or citric acid.)



Guidance for Teachers

Activity description

By completing this task, students will use 7 containers with water and selected substances to determine which of them dissolve in water and which do not. Students will find out that different substances dissolve in water differently. They can also experiment with various other materials, such as toothpaste, laundry detergent, and citric acid. This activity is designed to foster curiosity, encourage experimentation, and apply STEM concepts using a variety of materials and tools.

Guidance for Teachers



Preparation

- 7 plastic containers
- Prepare a demonstration on how certain substances dissolve in water, which ones do not, and what happens. (See [video in references](#))
- Prepare the class for hands-on experiments and make sure each student has the necessary materials.

Implementation steps

INTRO:

- Briefly explain what is the solubility of substances.
- Help students prepare the water containers and materials for the experiment. Explain how the experiment will be done.
- Encourage them to observe other selected substances and their solubility in water.

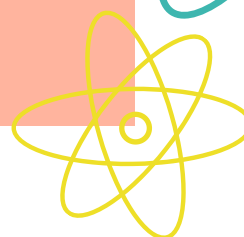
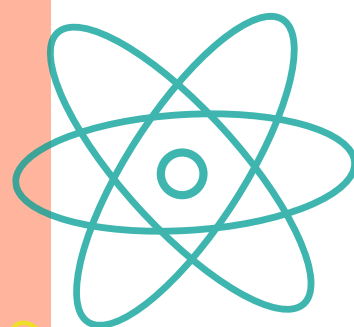
Guidance for Teachers

Discuss the situations when we encounter these substances in reality and why it is important to know their solubility properties in water.



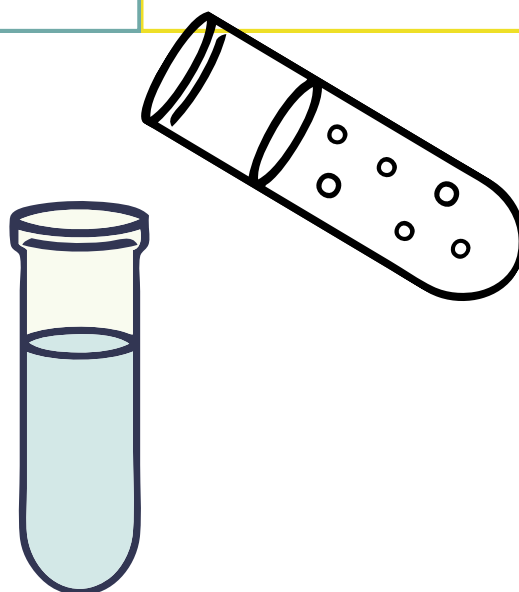
Follow-up and reflection

- Quiz: Create an interactive quiz (e.g., “Kahoot”) to test students’ understanding of the concepts of “Soluble-Insoluble.” (see [Annex 1](#))
- Evaluation: Review the experiments completed by students to assess whether the students understood the solubility of substances in water.
- Discussion: Ask students to share their thoughts, observations:
 - **What surprised them?**
 - **What difficulties they had?**
 - **What they did not understand?**
 - **Was the experiment successful?**



Student Activities

Activity description	Expected outcome	Technology integration
Experiment "Soluble-insoluble"	Students will understand how some substances dissolve and others do not dissolve in water.	Use the necessary and appropriate tools to do the experiment.
Group project: "Solvent-non-solubility" challenge	Students will apply their knowledge to conduct a water solubility test.	Use digital tools to document and present your experiments (e.g. Microsoft Powerpoint, Google slides, Canva).
Interactive quiz on the solubility of substances in water	Students will consolidate their learning through assessment and feedback.	Use the interactive quiz platform "Kahoot".
Do the "Soluble-Insoluble" experiment with the materials we use in everyday life	Students will test other materials and understand which ones dissolve and which ones don't.	Use models to determine solubility so the experiment can be done in the classroom.



Reflective questions for students

- What did you learn about experiment "Soluble-insoluble" that surprised you?
- What challenges did you face and how did you solve them?
- What was the most interesting thing you've learned during this experiment?
- How would you improve your experiment if you had more time and materials?



Differentiation ideas

Advanced students

- Ask advanced students to create data tables, for example, to list the time it took for a substance to dissolve.

Students with special needs

- Use tactile tools to test the process so that the process is understandable and the result is enjoyable.

Tips

- Provide clear instructions
- Before students begin the experiment, introduce them to safe behavior during it and provide some examples.
- Promote teamwork among the students
- Walk around the classroom regularly to offer your support
- Acknowledge each student's success



Additional materials and references

Video: Why Does Water Dissolve Sugar?

Video: Absorption and dissolving with sugar cubes in water experiment

Interactive game: Soluble or insoluble?

Video: How Solubility and Dissolving Work



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ANNEX 1

Questions for the quiz

1. Does sugar dissolve in water?

- Yes (correct answer)
- No

2. If you put rice in water, will it magically disappear or stay floating/swelling?

- It will disappear
- It will stay (correct answer)

3. Does rice dissolve in water?

- Yes (correct answer)
- No

4. What happens when you mix honey with water?

- It disappears completely (correct answer)
- It sinks but doesn't mix

5. What material is insoluble in water?

- Salt
- Flour
- Plastic (correct answer)