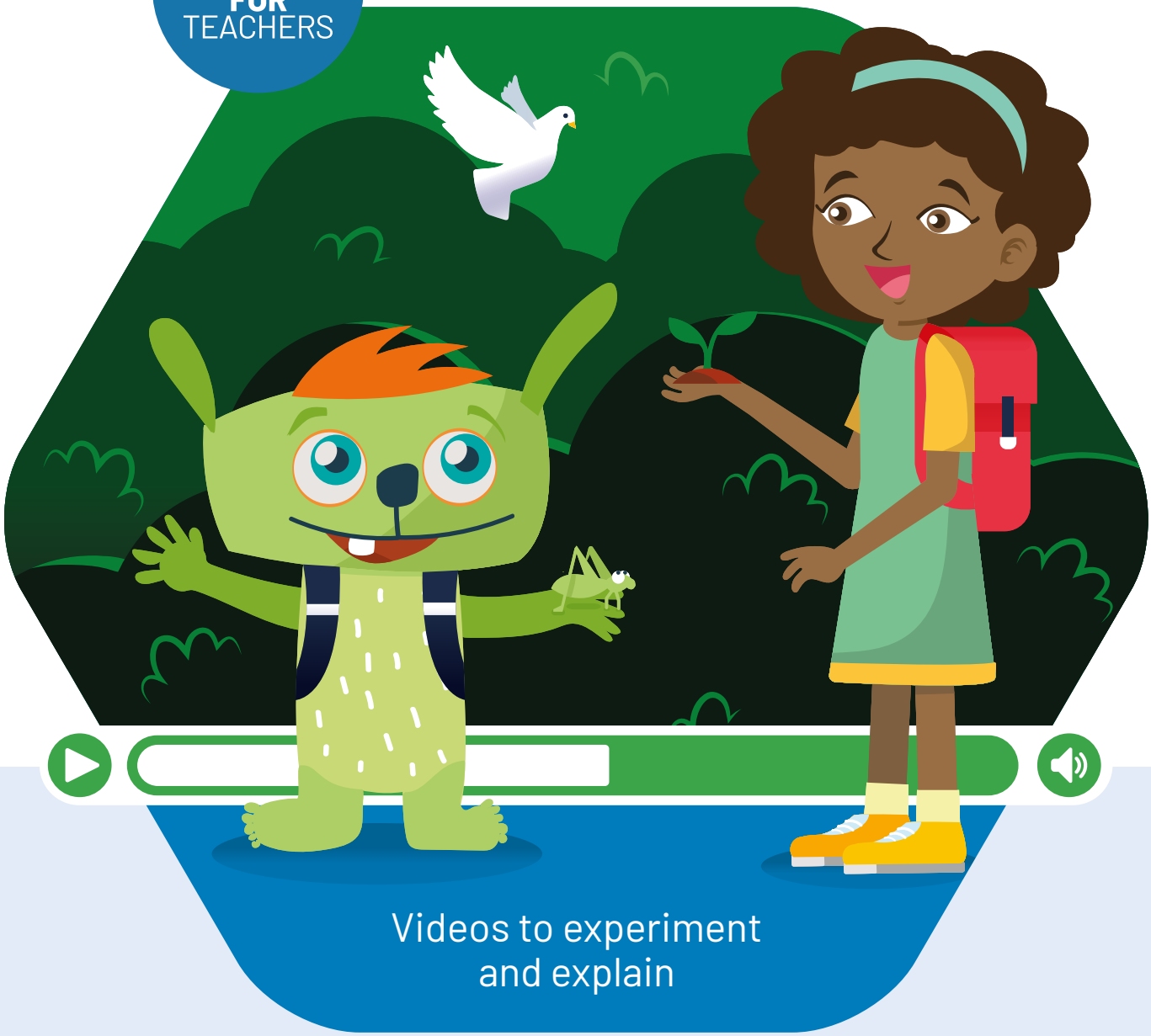
SCIENCE ON STAGE GERMANY

Together for STEM Education

FROM TEACHERS FOR TEACHERS



Videos to experiment and explain

Save our nature – Let's explore together

Discover, research, understand

Free teaching materials & experiments – easy to implement

science-on-stage.eu/save-our-nature

Discover – Research – Understand

Do you **teach children up to the age of 12?** Are you looking for **exciting materials on the topics of STEM and the environment?** Our simple experiments and free, editable worksheets give scientific topics **a real life everyday context!**

Experiments made easy

- Step-by-Step guides for low-cost experiments
- Experiment videos for direct use in the classroom

Focus on sustainability

- Materials for Education for Sustainable Development (ESD)
- Topics such as climate change, recycling & states of matter

Promoting competences

- Inquiry-based learning & critical thinking
- Differentiated for all learning levels
- Suggestions for career orientation

Just try it out & get inspired!

These teaching modules have been developed by teachers from nine countries together with the non-profit educational initiativeScience on Stage Germany – practical, inclusive and with an inquiry based approach.

Water Works
From the water cycle to water protection

Eco-Motion
Exploring sustainable energy sources

Climate Action
How climate change is changing land, water and ice

Flora Focus
Exploring and learning from plants

Waste to Worth
Compost and the use of natural materials

What our materials offer

- Hands-on examples & concrete experiments with instructions
- Experiment and explanatory videos
- Editable worksheets
- Information on career orientation
- Differentiated teaching approach

Editable worksheets

Are you looking for worksheets on scientific topics related to Education for Sustainable Development (ESD)?

Our materials offer you editable and free worksheets on interesting and everyday scientific topics for download.

How does a sailboat move?

Wind is a renewable form of energy. It can be used to move a sailing boat, for example.

Various forms of energy have to be converted into other forms of energy to generate wind and to move the boat.

Put the sentences in the correct order below.

1. ____
2. ____
3. ____
4. ____

The sun heats up the air. | Cold air flows in. | Warm air rises. | The flowing air pushes the boat.

Check

What can we compost?

Below you see various items. Which ones can we compost? Which ones can we recycle?

Recycling Composting

1

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Find out which method works best!

Colour the stars (☆) depending on how effective each cleaning method was.

- 5 stars ☆☆☆☆☆: I loved it!
- 1 star ☆: It was not so great.

Method	Draw the object	Colour the stars (1-5)
Spoon		☆☆☆☆☆
Cotton ball		☆☆☆☆☆
Pipette		☆☆☆☆☆
Wooden tongs		☆☆☆☆☆

1

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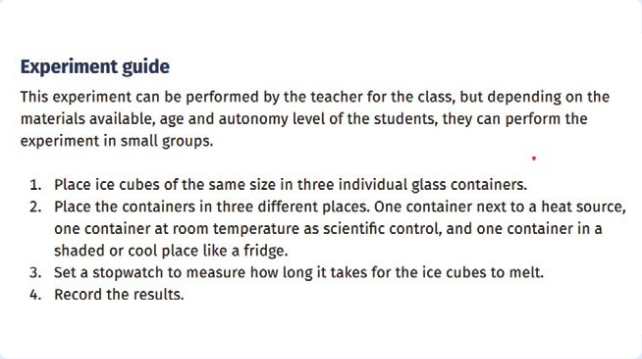
Experiment and explanatory videos

Do you want your students to conduct experiments in class?

Our materials introduce you to low-cost and easy-to-conduct experiments with step-by-step instructions. This allows you to integrate experiments into your lessons with little effort, even if you have no experience with them.

Do you want to carry out experiments, but don't have the materials or time to do so?

You can integrate our experiment videos directly into your lessons, observe what happens together with your students and discuss what you have seen.



Experiment guide

This experiment can be performed by the teacher for the class, but depending on the materials available, age and autonomy level of the students, they can perform the experiment in small groups.

1. Place ice cubes of the same size in three individual glass containers.
2. Place the containers in three different places. One container next to a heat source, one container at room temperature as scientific control, and one container in a shaded or cool place like a fridge.
3. Set a stopwatch to measure how long it takes for the ice cubes to melt.
4. Record the results.

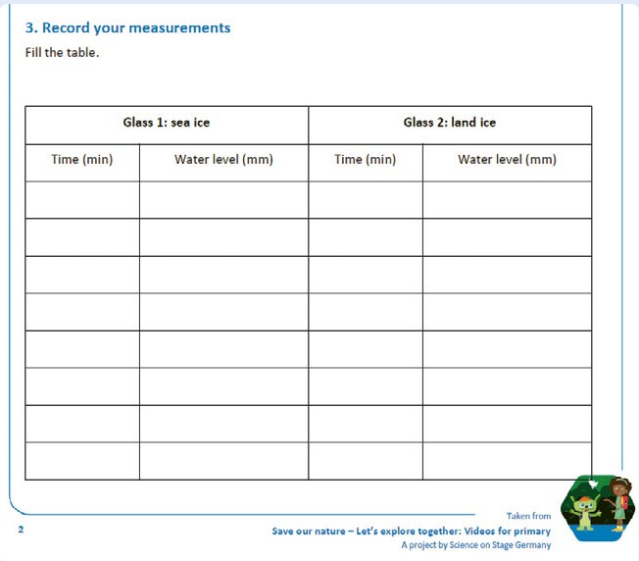
Promoting key competences, inquiry-based learning, addressing all learning levels

Would you like to promote STEM competences in your lessons?

With our materials, you can promote the skills "asking research questions" , "expressing assumptions" and "investigating, observing and documenting", for example.

Do you want to enable inquiry-based learning, encourage your students to think critically and work in teams?

Our materials give you the opportunity to implement this. They show you how to promote critical thinking skills and offer you suggestions for differentiated approaches to address all learning levels.



3. Record your measurements

Fill the table.

Glass 1: sea ice		Glass 2: land ice	
Time (min)	Water level (mm)	Time (min)	Water level (mm)

2

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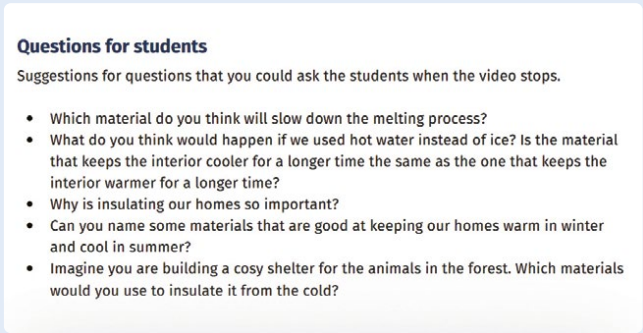
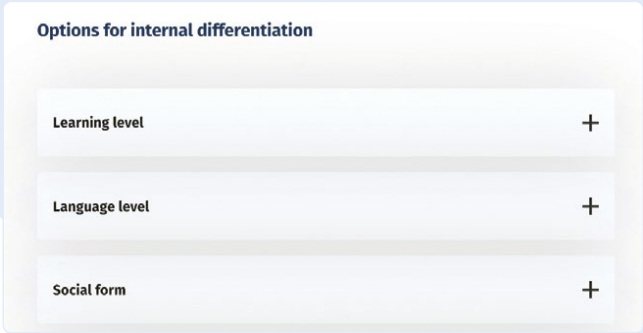


Questions for students

Suggestions for questions that you could ask the students when the video stops.

- Which material do you think will slow down the melting process?
- What do you think would happen if we used hot water instead of ice? Is the material that keeps the interior cooler for a longer time the same as the one that keeps the interior warmer for a longer time?
- Why is insulating our homes so important?
- Can you name some materials that are good at keeping our homes warm in winter and cool in summer?
- Imagine you are building a cosy shelter for the animals in the forest. Which materials would you use to insulate it from the cold?



Options for internal differentiation

Learning level +

Language level +

Social form +

Scientific background information on sustainability topics

Would you like to cover topics such as the water cycle, the effects of climate change on our nature or recycling in your lessons?

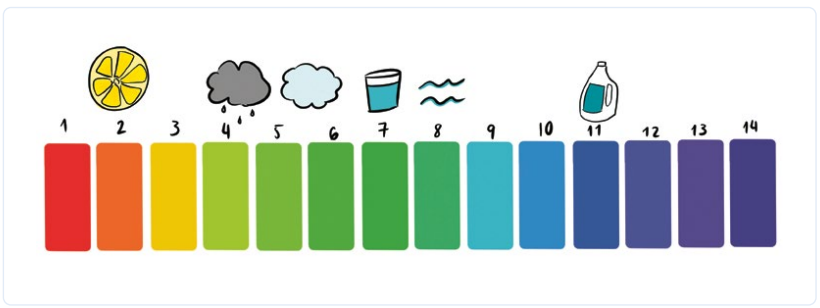
Our materials provide you with scientific background information on these topics.

Biodegradable plastics

Bioplastics derived from renewable resources like corn starch, sugarcane, or cellulose offer a viable alternative to conventional plastics. These materials can be designed to biodegrade under certain conditions, reducing their environmental footprint. However, it's essential to ensure that biodegradable plastics degrade efficiently in real-world environments and don't contribute to microplastic pollution.

Compostable packaging

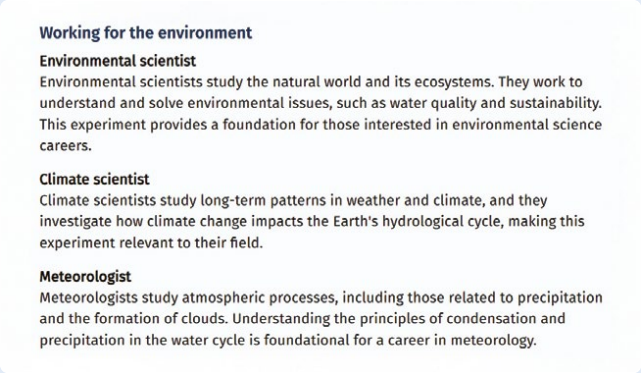
Compostable materials, such as compostable paper or plant-based plastics, provide a sustainable option for packaging and tableware. These items can break down into organic matter in composting facilities, contributing to soil health and reducing waste sent to landfills. However, infrastructure for industrial composting must be expanded to accommodate these materials effectively.



Suggestions for career orientation

Would you like to introduce career orientation in the classroom?

Our materials offer you suggestions for selected videos that show professions that combine STEM and environmental topics.

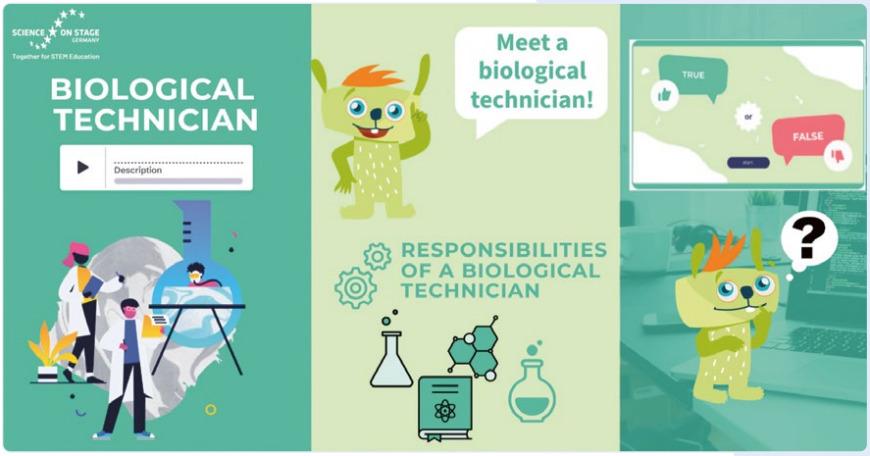


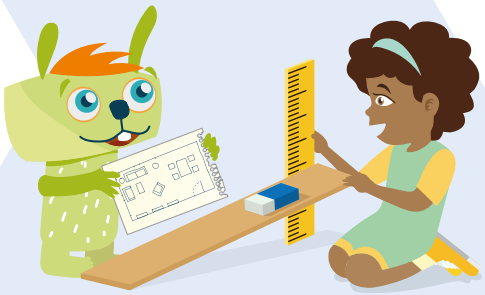
Working for the environment

Environmental scientist
Environmental scientists study the natural world and its ecosystems. They work to understand and solve environmental issues, such as water quality and sustainability. This experiment provides a foundation for those interested in environmental science careers.

Climate scientist
Climate scientists study long-term patterns in weather and climate, and they investigate how climate change impacts the Earth's hydrological cycle, making this experiment relevant to their field.

Meteorologist
Meteorologists study atmospheric processes, including those related to precipitation and the formation of clouds. Understanding the principles of condensation and precipitation in the water cycle is foundational for a career in meteorology.





Teaching materials

Science on Stage offers free teaching materials developed by European teachers for teachers on topics such as language support and experimentation or AI in science lessons. You can find them at:
www.science-on-stage.eu/primary-school

Join in – get in contact with your country and meet dedicated colleagues

All information at:
www.science-on-stage.eu/countries

A project by

SCIENCE ON STAGE GERMANY

Together for STEM Education

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Main supporter:

GESAMTMETALL
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Science on Stage is a non-profit association that promotes the exchange between teachers of all school types across national borders. Join in – as a teacher, as a sponsor, as a partner – together for STEM education.

Learn more about Science on Stage Europe – The European Network for Science Teachers

Newsletter

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