

Paper Properties: A science lesson for children aged 5 – 7

Teacher Guide



This science lesson has been designed for use with children aged 5 – 7 but could be adapted to use with younger or older children. The PowerPoint presentation can be edited to suit the needs of your learners.

The Lesson's aims

- **To investigate and compare some properties of everyday materials, paper and wood** – Children will learn describe and compare paper and wood, and consider which objects are made from these two materials and why.
- **To carry out a scientific investigation and record the results** – Children will investigate how strong six different types of paper are and record their results in a simple table.

Background information

Sustainably managed forests

Children will be introduced to sustainably managed forests for paper production. Sustainably managed forests are crucial for paper production, providing a reliable and renewable source of wood fibre while ensuring ecological and social benefits.

Key facts about sustainably managed forests for paper production

Renewable resource

Paper production relies on a renewable resource, trees, which are replenished through sustainable forestry practices.

Biodiversity and ecosystem services

Well-managed forests preserve biodiversity and provide essential ecosystem services, such as carbon sequestration and clean water.

Growing forests

European forests are growing, with new growth exceeding harvested wood, ensuring a sustainable supply of timber for paper production. Between 2005 and 2020, European forests grew by 58,390 square kilometres – that's an area bigger than Switzerland and amounts to over 1,500 football pitches every day!

Certification

Certification programmes like FSC® and PEFC ensure responsible sourcing, traceability, and adherence to sustainable forestry standards.

Circular economy

The paper life cycle is a well-functioning system which minimises waste, with high paper recycling rates. The European paper recycling rate is 79% and 83% of paper packaging is recycled.

Low carbon intensity

Paper production, especially when utilising renewable energy and recycled fibre, has a surprisingly low carbon intensity. The print and paper industry is one of the lowest industrial greenhouse gas emitters in Europe, accounting for just 0.8% of emissions in 2022.

Reduced water consumption

The paper industry is constantly working to reduce water consumption and implement water management practices. In 2022, around 90% of the water used in the European paper industry was returned to its source (having been reused within the mill before being suitably treated), with the remainder either evaporated, staying within the product, or bound up in solid waste.

Environmental benefits

Sustainable forest management helps to mitigate climate change by absorbing carbon dioxide and preserving forest ecosystems.

Social and economic benefits

Well-managed forests support local livelihoods and contribute to the broader economy through the production of paper and paper-based products.

Sources

- FSC® [What Is Sustainable Forestry?](#)
- PEFC [What Is Sustainable Forest Management?](#)
- Two Sides [Myths & Facts Booklet](#)
- WWF [Why Forests Are So Important](#)
- Forest Europe [State of Europe's Forests 2020](#)
- Love Paper [The Paper Fact File](#)

Resources needed:

- Paper Properties Presentation
- Six different types of paper: we recommend REY® paper, tissue paper, toilet paper, kitchen roll, newspaper and wrapping paper
- Rulers and pencils
- Scissors
- Hole punches (one per group, if possible)
- Paperclips (one per group)
- Yoghurt pots (one per group)
- String (approx. 50 cm per group)
- Weights (this could be coins, marbles or any alternative, uniform in size and weight)
- Which Paper Is the Strongest? Activity Sheet

You might also like to have some wood or objects made from wood for children to look at and handle.

Preparation

You will need to make holes in the yoghurt pots before the lesson – two in each, at the top, on either side of the pot. Children can then thread their string through these holes to form a handle.

You might also wish to prepare the strips of paper for your class and punch holes in the ends, depending on the age and ability of your pupils, and how much support they need, or depending on the time you have available to carry out the investigation.

The Lesson sequence

Use the PowerPoint presentation to guide children through the lesson. You'll find useful notes on each slide in the presentation which expand on ideas and suggest relevant explanations, questions and points for discussion.

Slide 2	<p>Introduce the lesson and tell the children that in this lesson, they will be learning about paper.</p> <p>Explain that paper and wood are both materials we get from trees, and that they are both used to make objects. If you have items made from paper and wood for the children to look at, encourage them to observe, describe and compare them.</p> <p>Ask them to look at the images on this slide and talk about why paper is good for making certain products and wood is good for making other products.</p> <p>Ask the children if some of the products in the paper set could be made from wood and vice versa. Can they explain why, for example, wrapping paper couldn't be made from wood and why a cooking spoon or birdhouse made from paper wouldn't be a very good idea.</p>
Slides 3 - 7	<p>These slides provide children with a little background information on where paper comes from and how, when sourced responsibly, from sustainably managed forests, it is a renewable resource.</p>
Slides 8 - 10	<p>Use these slides to explain the process of making paper.</p>

Slide 11	Ask the children to compare paper and wood again, thinking carefully about their respective properties. Use the questions on the slide and ask children to vote on their answers. Go on to encourage children to provide reasoning for their choices.
Slides 12 - 16	<p>Use these slides to take children through the process they will follow to carry out their paper investigations. Run through the equipment and resources they will need and the method they will follow by demonstrating what they need to do.</p> <p>Assign groups and remind children about successful group work. Hand out a Which Paper Is the Strongest? Activity Sheet to each group. Alternatively, you may wish each child to complete a sheet as evidence for their science book or folder.</p>
Slide 17	Discuss the results from the investigation, using the questions on this slide. Ask children to consider what the investigation has revealed, and whether it was an accurate and fair test. If the results varied between groups, ask children to consider why this might be and what could be done differently to ensure greater accuracy.
Slide 18	Recap on what the children have learnt in this lesson and how paper's properties make it perfect for so many different uses. Read through the facts about paper on this slide to end the lesson.
Slide 19	End the lesson by sharing the video on this slide with the children to embed the learning about how REY® sources and makes paper. You can read out the information to the children if you wish to, as the video plays.