9. SUSTAINABLE MATERIALS: WHICH PACKAGING?

1.5–2 HOURS

Children discuss the importance of minimising the quantity of raw materials that we use to make single use packaging. They then explore a range of possible packaging materials before finding out about an innovative solution that one company is developing. They then test different types of paper as potential packaging for soap and shampoo bars.

TYPE OF ENQUIRY

Carrying out fair and comparative test

OBJECTIVES

Compare everyday materials on the basis of their properties (Y5 materials)

Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. (Y5 materials)

Build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials (Y5 non statutory guidance)

Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. (UKS2 Working Scientifically)

Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (UKS2 Working Scientifically)

TOP TIP

When planning your lesson, where possible, it is a good idea to choose just one content knowledge and one working scientifically objective to focus on depending upon the learning needs of your class. This will enable you to focus your support on the learning objectives rather than trying to teach them all at the same time.

Any recording done by the children should reflect the learning objectives that you have chosen; for example if the Working Scientifically focus is to 'take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate' this should be what is recorded. Other aspects of the investigation can be done orally.

SCIENCE VOCABULARY

paper, dissolve, undissolved, change, soluble, property

RESOURCES

per group of 4, unless otherwise stated

- A selection of empty packaging including different types of plastic, card, metal and cellophane (or show **Presentation slide 2**).
- **Activity Sheet 10** Optional: create a set of cards
- 3 x squares of at least two types of soluble paper such as Solvy or Super Solvy (at least 10cm^2)
- 2-3 squares of other paper samples, e.g. brown paper, tissue paper, cellophane, greaseproof paper, polythene or crepe paper. (NB: Exact 10cm^2 size squares reduces the number of variables children need to consider controlling. A range of sizes could be offered, if preferred.)
- translucent beakers or clear plastic cups (200 ml or larger)
- Small pieces of soap (these could be cut from a larger bar or the bars from hotel rooms would work well)
- Access to somewhere to wash hands
- **Activity Sheet 11** (optional scaffolding for children)
- **Presentation: Which packaging?**

SAFETY GUIDANCE

Ensure that all packaging materials are clean and that there are no sharp edges.

Any spills should be wiped up promptly to prevent slipping.

PRIOR KNOWLEDGE / EXPERIENCE

Children will have compared and grouped materials together, according to whether they are solids, liquids or gases.

They will have set up simple practical enquiries, comparative and fair tests.

ACTIVITY NOTES

Introduction: Show children either the image on **presentation slide 2** or the packaging samples you have provided. Ask them to talk about the different materials they can see and their different properties. Discuss each material's properties that have led to them to be used as packaging materials.

Activity Sheet 10 starts with a matching excercise, which can be done be drawing connections on the sheet, or by matching pre-prepared cards. Ask children to see if they can match the materials cards to the product cards. Ask them to consider what different properties have to be taken into consideration when choosing packaging materials and whether some products are trickier to package than others.

Explain that all of this packaging has been developed by scientists to solve different problems and challenges. Scientists continue to explore and develop exciting ways to overcome new challenges, including reducing our environmental impact. Show the video clip on **presentation slide 3** which shows how important it is to reduce our use of packaging materials such as plastic. This is because recycling is of limited impact when addressing the problem of waste.

MAIN ACTIVITY:

Distribute the paper samples and invite children to describe them, their properties, their similarities and differences. The children consider each material's use(s) based on their own experience of different kinds of paper.

Share the letter (on **Presentation slide 4**) from Innospec which asks for the children's support to find a material that could be used to wrap shampoo bars.

Give children time to work in their groups to plan their tests and to consider how they will report their findings to Innospec.

They may find it helpful to use the table on **Activity Sheet 11**. However, depending upon the confidence of the children you may decide to let them decide for themselves (i) how many tests to conduct and (ii) how to present their findings.

If children's results and covering letters are sent to ***ciec@york.ac.uk*** they will receive a response from the company.

BACKGROUND INFORMATION

You may be interested to read about some of the innovations that are in the pipeline to reduce the environmental impact of personal hygiene products such as soap and shampoo.

EXTENSION OR HOME-BASED ACTIVITIES

Remind children of the phrase 'reduce, reuse, recycle' and ask them if they can explain why it is more important to reduce and reuse rather than recycle.

Challenge them to find a product or packaging that is currently single use and to see if they could design an innovative new product which could be used instead.

QUESTIONS FOR THINKING

- Why is it more important to reduce and reuse rather than recycle?
- Where does single use plastic go?
- How can scientists help us to tackle environmental problems?
- What can we do to tackle environmental problems?

INDUSTRY LINKS AND AMBASSADORS

There is a branch of science known as Green Chemistry. Green chemists focus their research on finding innovative ways to tackle environmental problems such as waste and pollution. You can find out more about one such science solution in the CIEC publication Potatoes to Plastics. If you were able to find a Green Chemist to come into your classroom they would be able to tell your children about the work that they do and the difference that they make.

www.york.ac.uk/ciec/resources/primary/potatoes-to-plastics

CROSS CURRICULAR LINKS

English: Children write persuasive texts to help people understand the benefits of using a solid shampoo in a soluble wrapper.

Design Technology: Children explore and evaluate the range of packaging that is currently used for personal care products.