QER for Schools

QER Science Lesson – Year 4

Properties and uses of common materials

NOTES

Properties help us to understand many of the common objects around us. Understanding what they are made of helps us to appreciate where they come from.

In this lesson, students will:

- participate in a workstation activity to identify properties of common materials
- consider where these materials come from, and particularly that plastic is made from oil

LESSON-LEVEL CONTENT DESCRIPTIONS

The Australian Curriculum: Year4

Science Understanding

Chemical sciences: Natural and processed materials have a range of physical properties; These properties can influence their use (ACSSU074).

Elaborations:

- describing a range of common materials, such as metals or plastics, and their uses
- investigating a particular property across a range of materials
- selecting materials for uses based on their properties

Use and influence of science: Science knowledge helps people to understand the effect of their actions (ACSHE062).

Elaborations:

- investigating how a range of people, such as clothing designers, builders or engineers use science to select appropriate materials for their work
- exploring how science has contributed to a discussion about an issue such as loss of habitat for living things or how human activity has changed the local environment

Year 4 achievement standard

By the end of Year 4 students pose questions about their world and predict possible outcomes from investigations. They describe how they and others use science to ask questions and make predictions. They record observations and measurements and identify patterns in data, including cause-and-effect relationships. They describe situations where science understanding can influence their own and others' actions. Students use the properties of materials to explain how objects and materials behave. They identify changes to the observable world and suggest explanations for the motion of objects.

LESSON OUTCOMES

The assessment focus of this lesson is formative: The classroom activities provide an opportunity for students to generate evidence with which the teacher can establish the student's progress towards understanding the concepts that are being developed in this lesson.

Science Outcomes	Literacy Outcomes	Numeracy Outcomes
Students may/should be able to:		
• identify properties of common materials • state where common materials come from	• listen • read • view • write • speak	• collect data • interpret data • measure using informal units

BACKGROUND INFORMATION

Plastic is produced from oil. After the oil is refined it is heated in a high-temperature furnace. A chemical called a catalyst is added to produce 'fluff', a powdered material which resembles laundry detergent. Fluff is blended with other materials and then melted and formed into small pellets to be made into plastic products.

PREPARATION LIST

- create a series of workstations around the room with various household objects made from metal, paper, plastic, rubber, glass, wood and fabric
- copy the sheets Properties of everyday materials

ACTIVITY SEQUENCE

1. Introduce the lesson by discussing the meaning of common properties of materials, such as "waterproof", "flexible", "strong" and transparent.
2. Divide students into groups, explain the workstation activity and hand out the sheets Properties of everyday materials.
3. When students have completed the first table in their groups, they can fill in the second one individually.
4. Discuss plastic and how it is sourced from oil.

OPPORTUNITIES FOR CONDUCTING FORMATIVE ASSESSMENT

- Observe student responses on activity sheets.

LINKS TO OTHER LEARNING AREAS

The following suggested activities may be used to provide a link between the content of this unit and that of other learning areas, in particular those related to Mathematics, English and ICT.

- quantify some properties on a mathematical scale of one to ten (how flexible? how strong?)

ADDITIONAL RESOURCES

- www.qervisitorcentre.com.au – Extensive overview of QER New Fuels Development Centre, including video snippets, animations, graphs, maps and explanations relating to:
  - Australia's fuel challenge
  - QER and sustainability
  - benefits for Australians
  - turning oil shale into fuel

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