Australian Curriculum

YEAR 2

AGES 7–8

RIC PUBLICATIONS

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# SCIENCE: A STEM APPROACH

AC

Biological sciences

Chemical sciences

Earth and space sciences

Physical sciences

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

SAMPLE - NOT FOR SALE

RIC-6172 7.6/1257

# Teacher notes

**Science inquiry focus:**
What are materials? What properties do materials have?

**Science Inquiry Skills:**
- Questioning and predicting QP
- Planning and conducting PC
- Processing and analysing data and information PA
- Evaluating E
- Communicating C

**Science as a Human Endeavour:**
- Students observe objects, ask questions about and describe properties of materials.
- Students understand that science is used in daily life, such as when appropriate materials are used for objects.

**Technology/Engineering/Mathematics links:**
- classifying materials by properties
- engaging in an interactive website

**Assessment focus:**
- Use page 44 as a diagnostic assessment to gauge the level of prior knowledge about materials.
- The completed student worksheet on page 45 may be used as a formative assessment activity. Note any observations from the discussion at Step 6 about what students know about materials and how they can be changed.

## Background information

- A material is any substance with specific properties that goes into the makeup of a physical object. Objects can be made of one or more materials, such as paper, wood, glass or metal.
- Materials can be used as they occur naturally (natural materials), or can be created by people (processed materials); for example, oil is used to make plastic and sand is heated to make glass.
- Materials have properties—basic or essential attributes that can distinguish them from other materials and which can be detected using the senses. The property of a material is a description of its characteristics.
- Some common properties include hardness (resistance to scratching and pressure), strength (the amount of force needed to break the material by pushing or pulling down), toughness (resistance to breaking by cracking), elasticity (ability to return to its original shape when a force is removed), absorbency (ability to soak up a liquid), waterproofness (resistance to liquids), and transparency (ability to be seen through).

## Resources

- A variety of objects from home and/or school—glass; clear, plastic food wrap; jug of water; wooden ruler; plastic ruler/cup/mug; lump of playdough; saucepan; copper wire; sheet or paper/book; rubber band; hair ribbon; brick/length of wood/wooden building block; baking paper; paper towel; rubber balloon (deflated); fabric, such as cotton, used for making dresses and such
- Online game—Desert Island materials at <http://tinyurl.com/a5oylzo>
- Copy of page 44 for each group of students
- Sufficient copies of page 45

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978-1-925431-95-7

# Lesson plan

**Introduction:**

1. Display a selection of objects at the front of the classroom for students to discuss (see Resources). *What are materials? What materials are these objects made from? How would you describe them? What are properties of materials?* In small groups, students spend five minutes, using page 44 to list as much as they know about materials. **QP** **PA**

**Development:**

2. *What properties do materials have?* As a class, play the Desert Island materials game at <https://tinyurl.com/a5oylzo>. Select the hard level where students have to identify the objects made using a given material—metal, wood, plastic, natural material or made by people. Discuss with students how they would describe each material. *What words would you use to describe metal? Wood* etc.? **PC**
3. Set up eight stations with one object made from a different material at each station, for small groups to rotate around. Each station will also require a cup of water with a dropper in it so students can test the properties of being waterproof or absorbent. Provide students with a copy of page 45 to complete individually. **PC** **PA**

   Differentiation
   - Less capable students can simply place a tick or cross on the observation sheet.
   - More capable students can be encouraged to write additional descriptive words, rather than just placing a tick or cross.
4. Play the Desert Island materials game again, but this time select the very hard level. At this level, students choose appropriate materials to build a raft. Discuss questions including: *Why does the raft need to float? What other materials float? Why does a sail need to be light and stretchy? What other materials could be used to make a sail? Why does a mast need to be strong? Why do you need a material that is light and soft to sit on? What other materials are soft?* **PC** **PA**

**Reflection:**

5. As a class, discuss the materials and properties of the objects from each station and compare responses. **E** **C**
6. Compare observations with their initial thoughts from the beginning of the lesson. Students can add anything they may have learnt to the page. *Why do we need different materials? What other things can be made from the materials you observed?* **PA** **C**

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# Topic wheel

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# Properties of materials

Touch and observe the objects. Use the water dropper to test whether each object is waterproof or absorbent.

| *Object* | *Material* | Properties of the material ✔ or ✘ | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | strong | waterproof | stretchy | bendy | absorbent | see-through | soft | smooth |
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