













Topic: Combinations of materials

Investigating objects made from combined materials

Lesson concepts

-   Different materials can be combined, including by mixing, for a particular purpose
-   Science involves asking questions and describing changes
-  People use science in their daily lives
-   Questions can be responded to, posed and predictions made
-   Investigations can explore and answer questions
-  Information can be sorted
-   Observations and ideas can be communicated

Today students will:

- understand that materials can be combined to make objects for a particular purpose.

Resources

Sheets

Sheet 7 — Record 'materials', 'properties' and 'uses' chart (saved from previous lesson)

Sheet 14 — Combined materials

Sheet 15 — Combined 'materials', 'properties' and 'uses' chart

Sheet 16 — Investigations can answer questions

Find and prepare

Word cards

Science journal or scrapbook

A variety of everyday objects made from a combination of materials, for example: pencil (wood, graphite), belt (leather, metal), shirt (fabric, plastic buttons)

Plastic document sleeve with a sheet of printed paper inside

Padded postage bag

Fabric bag with plastic lining or plastic base

Chocolate wrapper made of foil and paper

Key terms

combination

For definitions and explanations of terms, please see the [Glossary](#).

Lesson

Learning alerts

Be aware of students thinking that materials are used for their visual appeal rather than to suit a purpose.

Suggested next step for learning

- Ensure students understand that the purpose of using the particular material is more important than the visual appeal.

Review properties of materials

1. Display **Sheet 7** — [Record 'materials', 'properties' and 'uses' chart](#) from the previous lesson.
 - a. Review with students their understanding of materials, properties and uses.

Material	Properties	Uses
leather	smooth, flexible, strong	wallet belt
metal	smooth, shiny, strong, waterproof	coin can
paper	smooth, shiny	book box
fabric	soft, flexible, rough	t-towel shorts shirt
wood	hard, smooth, strong	broom handle bowl carving
glue	wet, sticky	glue materials of different strengths

Focus questions

Q. I am thinking of a material that is soft. What material could it be?

A. For example: fabric

Q. I am thinking of a material that is smooth. What material could it be?

A. For example: leather, metal

Identify objects made from combined materials

2. Display a variety of everyday objects made from a combination of materials, for example: pencil (wood, graphite), belt (leather, metal), shirt (fabric, plastic buttons).
 - a. Ask students to consider what materials are used in the objects.

Focus questions

Q. What is this object?

A. For example: pencil

Focus questions (continued)

- Q. *How is it used in everyday life?*
 A. For example: for writing
- Q. *What materials are used in the object?*
 A. For example: wood and graphite

- b. Ask students to consider the purpose of combining materials.

Focus questions

- Q. *How is each material used in the object? What is its purpose?*
 A. For example: The wood makes it easy to hold the pencil. The graphite is the part that writes.
- Q. *Why are these two materials used in combination?*
 A. For example: The wood would not be able to write on its own. The graphite would be too difficult to hold and would break on its own.
- Q. *How do you think the materials were combined?*
 A. For example: They made a hole in the wood and glued the graphite inside.

- c. Invite students to ask 'What would happen if ...?' questions about changing one of the materials, and predict results of changing that material.

Focus questions

- Q. *What would happen if the pencil was made of fabric instead of wood?*
 A. The pencil would be too soft and would flop over. It would be too difficult to hold.
- Q. *What other materials are suitable for belts to be made from, instead of leather?*
 A. For example: plastic, fabric

Investigate objects made from combined materials

3. Display objects made by combining two materials: plastic document sleeve with sheet of paper inside, padded postage bag, fabric bag with plastic lining, chocolate wrapper made of foil and paper.

- a. Provide time for students to examine the objects.

Focus questions

Q. *What are the objects used for?*

A. For example: To carry the shopping.

Q. *What materials are the objects made from?*

A. For example: Fabric on the outside and plastic in the middle.

Q. *What are the properties of the materials that make them suitable for the purpose?*

A. For example: The fabric is light and flexible, and the plastic stops things leaking.

- b. Explain to students that they will conduct an investigation into these objects made from combined materials.

4. Display **Sheet 14 — Combined materials**.

- a. Show students how to complete **Sheet 14 — Combined materials** for the first object, the plastic sleeve, by:
- ticking the plastic and paper boxes
 - answering the question 'Why have these materials been combined?' (For example: To protect the paper from getting wet or dirty.)
- b. Allow time for students to complete the sheet.

5. Display **Sheet 15 — Combined 'materials', 'properties' and 'uses' chart**.

- a. Explain to students that they will complete the sheet using the results of the investigation recorded on **Sheet 14 — Combined materials**.
- b. Allow time for students to complete the sheet. For example:

	Materials	Properties	Uses
Plastic sleeve	Plastic	Transparent, water-resistant	Stops the paper getting wet and dirty; can see the paper through it
	Paper	Light, printed on	Can write on it

Understand that investigations can provide answers to questions in everyday life

Say to students

Many of the objects used in our everyday lives have been invented for a particular purpose.

What questions do you think scientists may have asked when they were inventing the products investigated?

Focus questions

Q. Why was a padded postage bag invented?

A. For example: So you could send objects through the post without them being damaged.

Q. What question would a scientist have asked in inventing this object?

A. For example: How can I send an object through the post without it being damaged? What would happen if I wrapped the object in bubble wrap?

Q. What material has properties that would protect an object from being damaged if it was dropped?

A. For example: foam, bubble wrap, cotton wool

6. a. Display **Sheet 16** — [Investigations can answer questions](#).
- b. Instruct the students to complete the sheet for one of the objects examined (plastic sleeve, padded envelope, carry bag, chocolate wrapper).

Say to students

There are many more objects that could be invented for use in everyday lives.

7. Invite students to suggest objects that could be invented to suit a purpose and questions that could be asked. For example, ask 'What if ...?' questions about combining materials for a purpose such as 'What would happen if I combined _____ and _____ to make a book that I could read in the pool?'