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Materials Detectives





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Materials Detectives

One object can use several materials



THE IDEA

A chair is an object; wood is a material. A chair may have a wooden seat and metal screws. Different parts can need different properties.

Name the object first, then the material in each part. Looking shiny does not prove that something is metal.

CHECK YOUR THINKING

Which word names a material?

A Chair

B Wood

B. Wood is something an object can be made from. A chair names the object and its use.

A RELATED EXAMPLE

Follow a material to its source

Materials have stories before they reach us. Wood comes from trees. Many metals are extracted from ores in the ground. Much ordinary glass is made using silica-rich sand and other ingredients. People process the starting materials. A glass tumbler is not simply a handful of loose sand.

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Natural does not mean alive



THE IDEA

A rock is natural but not living. A tree and a rock occur in nature. A wooden stool is made by people using a natural material.

“Natural or made by people” is a different question from “living or non-living”. Do not mix the two sorts.

CHECK YOUR THINKING

Must a natural thing be alive?

A Yes

B No

B. Water, rocks and air are natural non-living examples. A material's source does not decide whether an object is alive.

A RELATED EXAMPLE

A property helps explain a choice

Cloth bends; a thick wooden board is usually stiff. Flexible cloth can move with a body. A stiff tabletop supports things without folding easily. The same property can help one job and hinder another. There is no best material for every object.

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Translucent means light without a clear view



THE IDEA

A blur is different from a sharp outline. The frosted sheet lets light through but scatters it. The flower appears blurred.

This is translucent. An opaque board blocks the view and transmits very little visible light through its thickness.

CHECK YOUR THINKING

Which sample is translucent?

A The frosted sheet with a blurred flower

B The clear sheet with a sharp flower

A. Translucent materials pass light but do not provide a clear image through them.

A RELATED EXAMPLE

Transparent means a clear view

Light passes through with a clear image. Through the clear sheet, the flower's outline is easy to see. Clear glass and some clear plastics can be transparent. Not every piece of glass is transparent. Frosting, colour and other changes affect what we can see.

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A solid can bend and still be solid



THE IDEA

A solid does not freely fill its container. A pebble holds its shape. Cloth can fold, and rubber can bend, but they are still solids.

“Solid” does not mean impossible to reshape. Material behaviour needs more than one clue.

CHECK YOUR THINKING

Can a solid change shape when pushed or bent?

A Yes

B No

A. Many solids deform under force. They do not flow freely like a liquid in everyday conditions.

A RELATED EXAMPLE

One clue may not settle the material

A shiny spoon might be coated. A metal spoon and shiny-coated plastic can look similar. A maker's material information may settle the question. A tapping sound can be another clue, but shape affects sound too. We do not hit glass or taste unknown objects to identify them.

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Air is matter too



THE IDEA

We cannot usually see air, but it takes up space. Air inside a closed balloon helps keep it expanded. Air is a mixture of gases that spread into the space available.

An empty-looking cup usually contains air. It is not completely empty just because no liquid is visible.

CHECK YOUR THINKING

Does invisible always mean absent?

A No

B Yes

A. Air can be present without being seen. Its effects give us evidence.

A RELATED EXAMPLE

A liquid takes the container's shape

Changing height need not change the amount. Water in a narrow cup can stand higher than the same amount in a wide cup. If nothing spills or is added, pouring changes the shape, not the amount. The illustration shows this idea, not a measured volume scale.

ONE LAST CHALLENGE

Would the same property help both jobs?

A window must let you see a tree outside. A cupboard door must hide what is inside.



THE REVEAL

Choose clear glass for the window and an opaque panel for the cupboard.

The window needs to transmit a clear image. The cupboard panel needs to block the view.

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