

Science F-2

Chapter 3 — Chemical sciences: materials, mixtures and physical change

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Objects and the materials they are made from; observable properties

This is read with the teacher. The teacher reads all the words. The child looks, says, points and does. The child does not need to read.

objects can be made of one or more different materials; these materials have observable properties —
VC2S2U04

Evidences: They describe the observable properties of the materials that make up objects.

In this topic we will:

- look at objects and say the materials they are made of (E01, E02)
- use a magnifying glass to see more detail (E03)
- sort objects by colour, hardness, texture and flexibility (E04)
- make a materials display and use property words (E06)
- go on a materials hunt with a digital camera (E07)

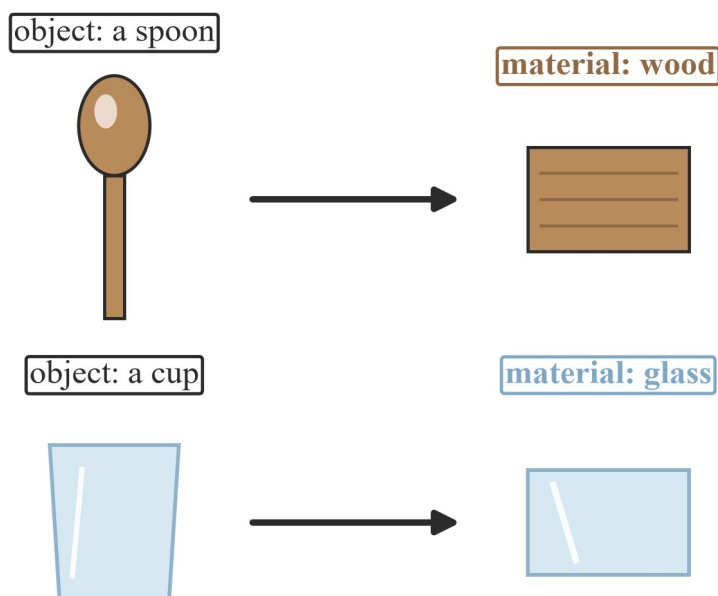
Theory

Objects and materials

An **object** is a thing you can see and touch. A spoon is an object. A cup is an object.

The **material** is what an object is made of. Wood is a material. Glass is a material.

An object is a thing. The material is what it is made of.



We can see and touch objects. The material is the stuff they are made of.

A wooden spoon matched to a piece of wood, and a glass cup matched to a piece of glass, with the words object and material.

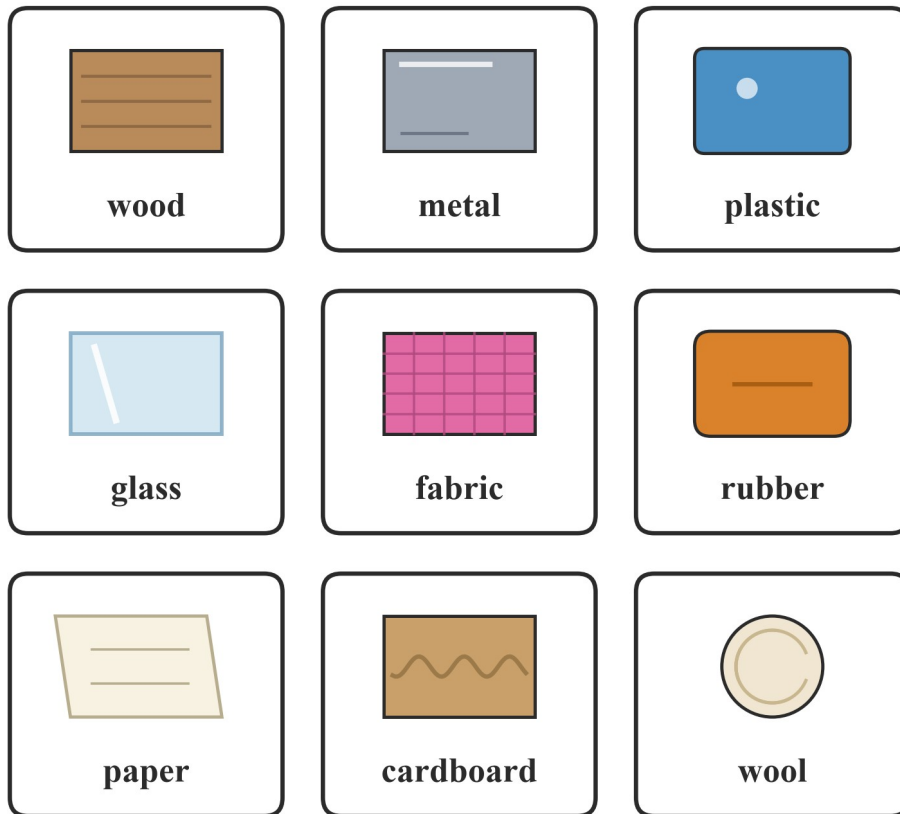
- The spoon is the object. The spoon is made of wood.
- The cup is the object. The cup is made of glass.

We can see and touch objects. The material is the stuff they are made of.

Material name cards

These are the materials we learn to name.

Material name cards



Nine name cards: wood, metal, plastic, glass, fabric, rubber, paper, cardboard and wool, each with a picture of the material.

Point to each card and say the material.

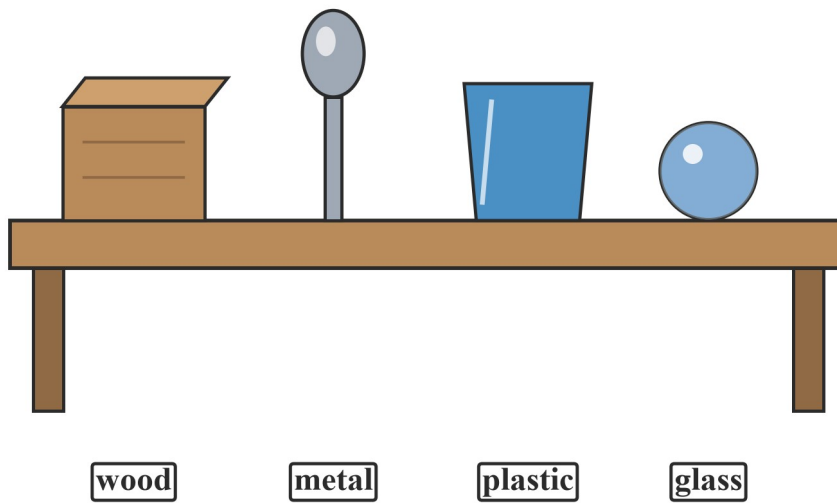
- **Wood.** Wood comes from trees. A block can be wood.
- **Metal.** Metal is hard. A spoon can be metal.
- **Plastic.** A cup can be plastic.
- **Glass.** We can see through glass. A marble can be glass.
- **Fabric.** Fabric is the material we make clothes from.
- **Rubber.** Rubber is bendy. Bendy means it bends.
- **Paper.** We draw and paint on paper.
- **Cardboard.** A box can be cardboard.
- **Wool.** Wool comes from sheep. Farm sheep in Victoria give us wool for clothes.

Source: CSIRO, Livestock, n.d. Retrieved 2026-08-20.

One material, or more than one

Some objects are made of one material.

Each of these objects is made of one material



Point to each object. Say the material.

One object, one material. The block is wood. The spoon is metal. The cup is plastic. The marble is glass.

A wood block, a metal spoon, a plastic cup and a glass marble on a table, each above its material name: wood, metal, plastic, glass.

Point to each object. Say the material. One object, one material.

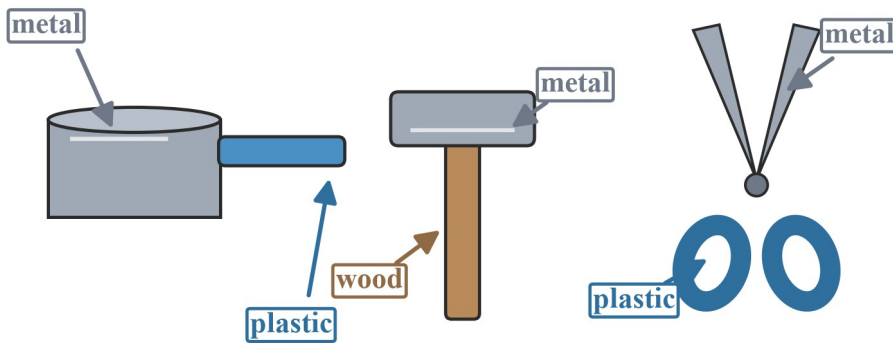
Some objects are made of more than one material.

These objects are made of more than one material

a saucepan

a hammer

scissors



Some objects have two or more materials. Name each one you can see.

A saucepan made of metal and plastic, a hammer made of metal and wood, and scissors made of metal and plastic, with a label on each material.

- A **saucepan** is a pot we cook with. The saucepan is metal and plastic.
- The hammer is metal and wood.
- The scissors are metal and plastic.

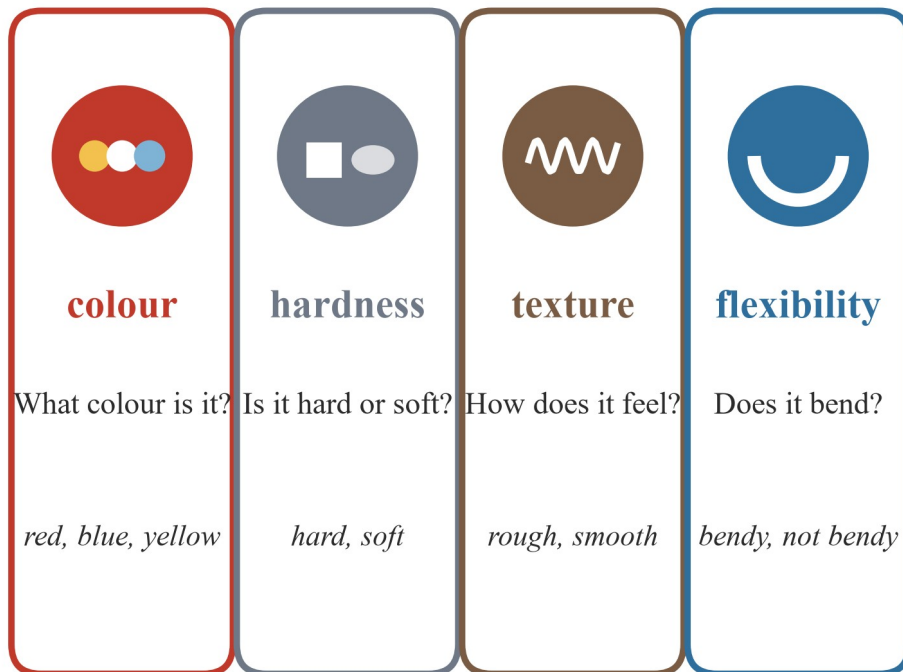
Name each material you can see.

Scissors are sharp. Only the teacher handles the scissors.

Properties we can observe

A **property** is something we can observe about a material. To **observe** means to look, feel and find out.

Four property words



A property is something you can observe about a material.

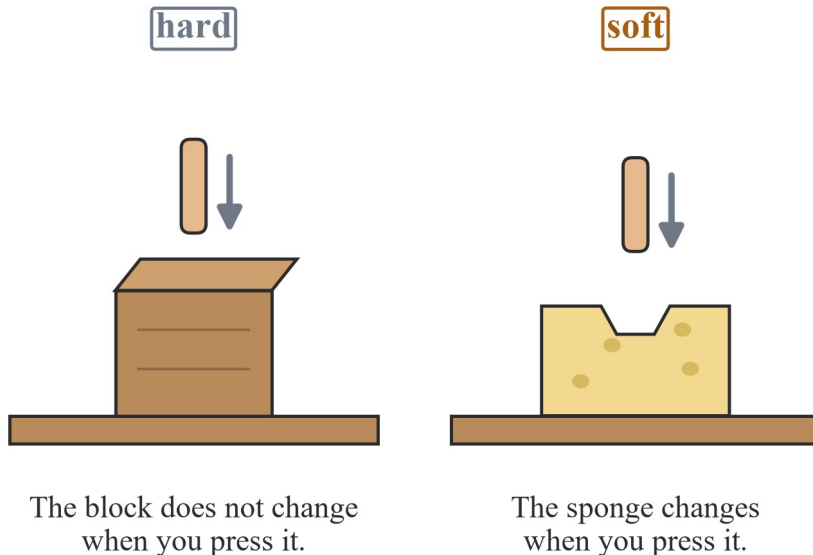
Four cards: colour (what colour is it?), hardness (is it hard or soft?), texture (how does it feel?) and flexibility (does it bend?).

- **Colour.** What colour is it? Red, blue, yellow.
- **Hardness.** Is it hard or soft? We do a press test.
- **Texture.** How does it feel? Rough or smooth. We do a feel test.
- **Flexibility.** Does it bend? Bendy or not bendy. We do a bend test.

Press test: hard or soft

A **sponge** is a soft thing we use for washing.

Press test: hard or soft?



Press gently with one finger. Then say: hard or soft?

A finger presses a wood block: the block does not change, so it is hard. A finger presses a sponge: the sponge changes, so it is soft.

Press gently with one finger.

- The block does not change when you press it. The block is **hard**.
- The sponge changes when you press it. The sponge is **soft**.

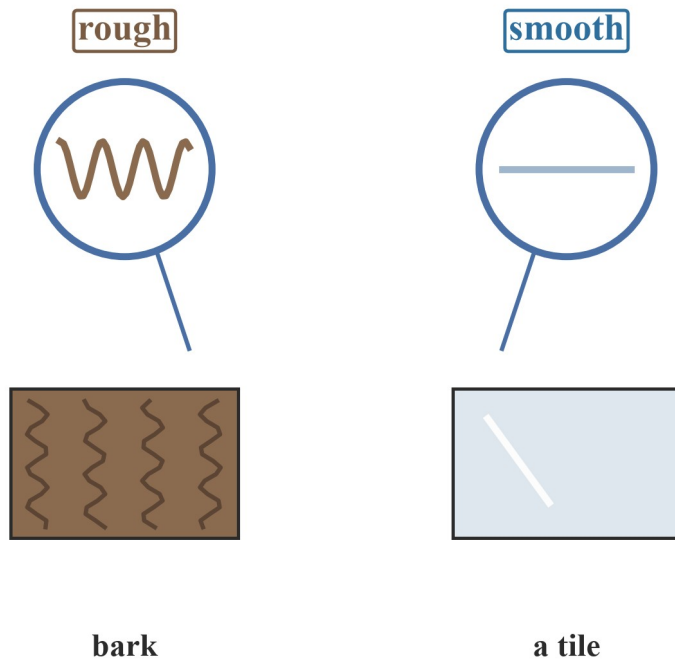
Never put materials in your mouth. We never taste the things we test.

Feel test: rough or smooth

The **surface** is the outside of a thing. Rub your finger gently across the surface.

The **bark** is the outside skin of a tree. A **tile** is a hard, flat piece. Tiles are on floors and walls.

Feel test: rough or smooth?



Rub your finger gently across. The circles show each surface up close.

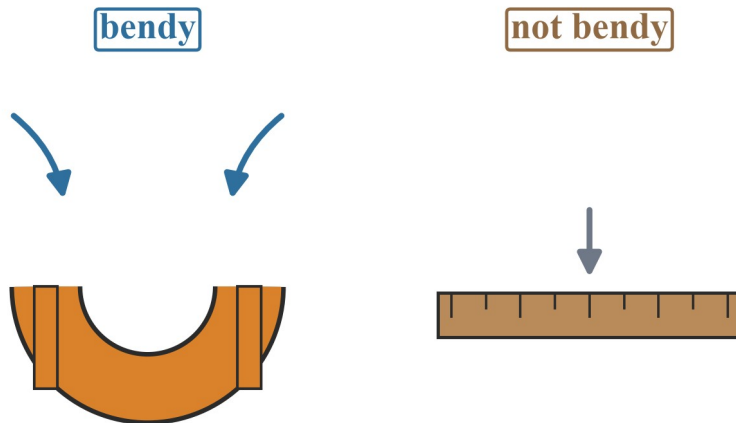
Bark and a tile; circles show each surface up close. The bark is rough and the tile is smooth.

- The bark feels bumpy. The bark is **rough**.
- The tile feels even. The tile is **smooth**.

Bend test: bendy or not bendy

A **tube** is long and round, like a piece of hose. A **ruler** is a straight tool. We use it to draw straight lines.

Bend test: bendy or not bendy?



The rubber tube bends.

The wood ruler does not bend.

Try to bend each one gently. Do not snap it.

A rubber tube in a U shape: bendy. A wood ruler that stays straight: not bendy.

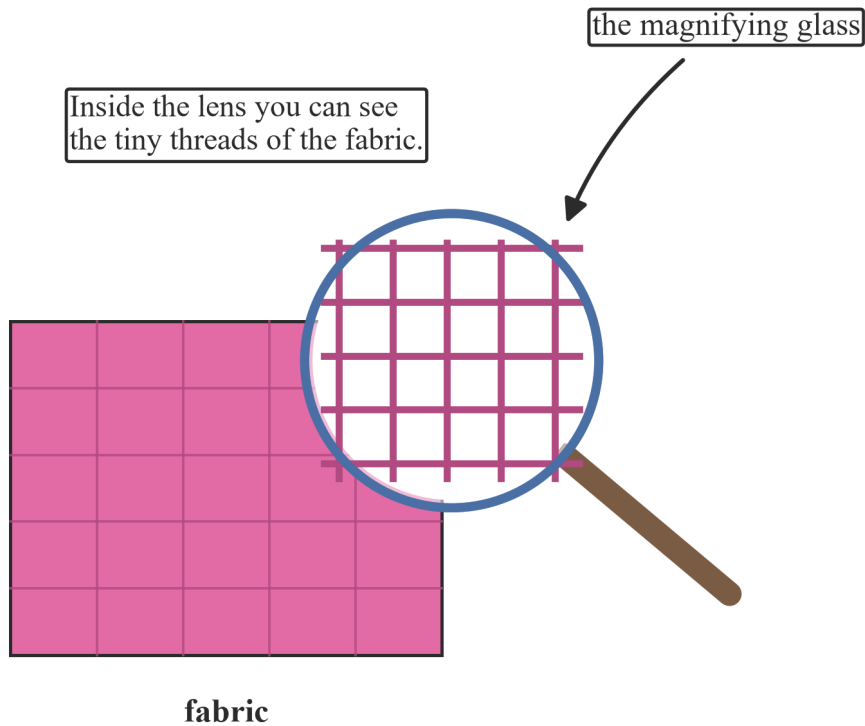
- The rubber tube bends. It is **bendy**.
- The wood ruler does not bend. It is **not bendy**.

Bend gently. Do not snap. To **snap** is to break in half.

See more with a magnifying glass

A magnifying glass is a tool. It makes small things look big. The **lens** is the part you look through.

A magnifying glass helps you see very small things



A magnifying glass is a tool. It makes small things look big.

A magnifying glass over a piece of fabric; inside the lens you can see the tiny threads of the fabric.

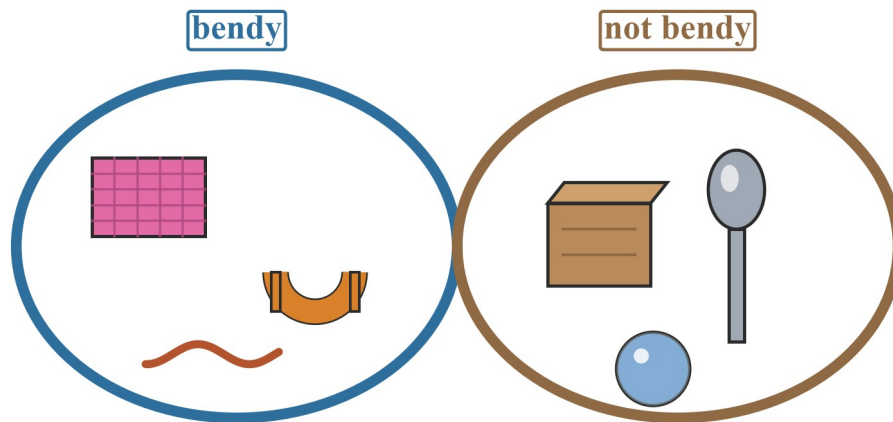
A **thread** is like a very small string. With our eyes alone, the fabric looks even. With the magnifying glass, we can see the tiny threads. The magnifying glass helps us observe more **detail**.

Never look at the Sun with a magnifying glass. Never look straight at the Sun.

Sort by one property

When we sort, we use one rule. Say the rule out loud.

Sort by one property: bendy or not bendy?



fabric, rubber tube, string wood block, metal spoon, glass marble

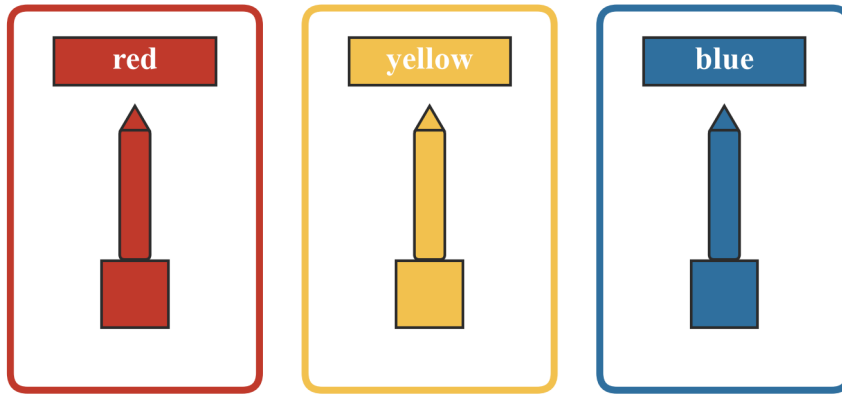
One rule for this sort: does it bend? Say the rule out loud.

Two hoops: the bendy hoop holds fabric, a rubber tube and string; the not bendy hoop holds a wood block, a metal spoon and a glass marble.

The rule is: does it bend? Fabric, the rubber tube and string are bendy. The wood block, the metal spoon and the glass marble are not bendy.

The marble is small. It must never go in your mouth.

Sort by colour



The same crayons and blocks, sorted by their colour.

Say the rule: what colour is it?

The same crayons and blocks sorted by colour into three cards: red, yellow and blue.

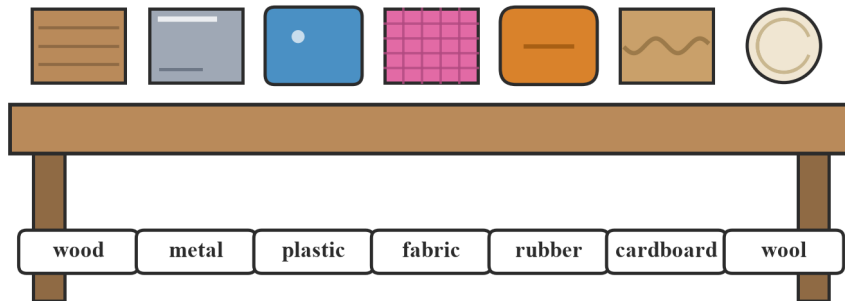
The rule is: what colour is it? The same things make different groups when the rule changes.

Our materials display

A **display** is things put out so we can look at them.

Our materials display

Make a display. Put out the materials. Say the name of each one.



Each material sits with its name card.

A table display: pieces of wood, metal, plastic, fabric, rubber, cardboard and wool, each with its name card.

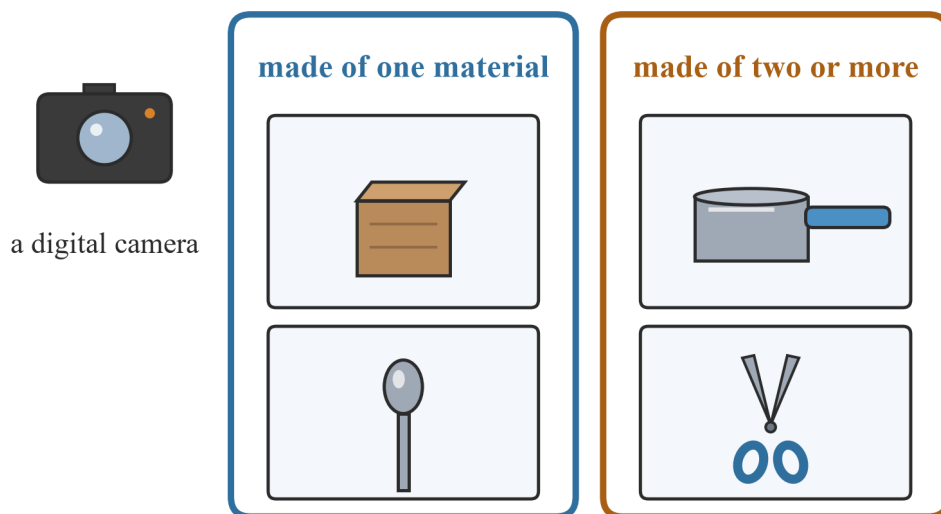
Make a display. Put out the materials. Say the name of each one. Then say a property of each one. *The fabric is soft. The wood is not bendy. The metal is hard.*

Glass can break. If something breaks, do not touch it. Tell the teacher.

Materials hunt

A **hunt** is a game where we look for things. We go on a materials hunt with a digital camera.

Materials hunt: sort the photos



Take photos of objects on the hunt. Then sort the photos into these two groups.

One material, or two or more materials?

A digital camera, and two groups of photos: made of one material (a wood block, a metal spoon) and made of two or more (a saucepan, scissors).

Take photos of objects on the hunt. Then sort the photos into two groups.

- Made of one material: the block, the spoon.
- Made of two or more materials: the saucepan, the scissors.

One material, or two or more materials? Say how you know.

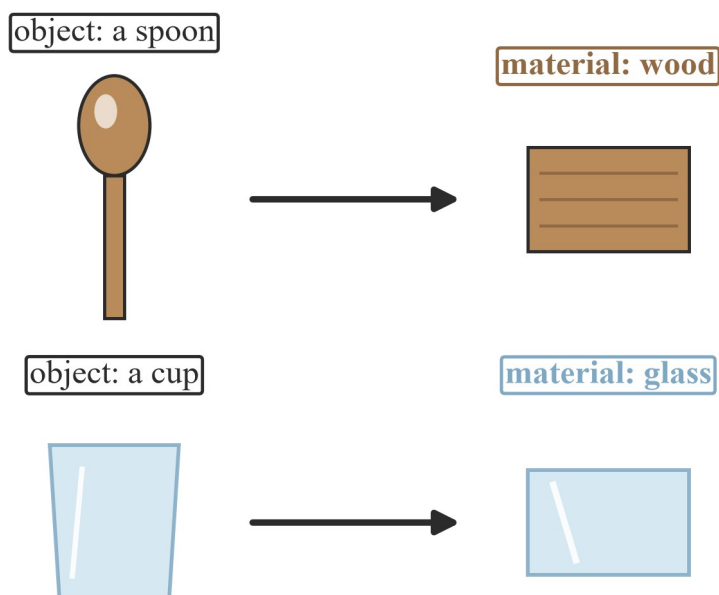
Worked examples

Do these with the teacher. Use what you can see here.

Worked example 1 — name the object and the material

Look at the spoon and the cup.

An object is a thing. The material is what it is made of.



We can see and touch objects. The material is the stuff they are made of.

A wooden spoon matched to a piece of wood, and a glass cup matched to a piece of glass, with the words object and material.

Working

Say why

Point to the spoon. The spoon is an object.

An object is a thing we can see and touch.

The spoon is made of wood.

The material is what it is made of.

Point to the cup. The cup is an object.

An object is a thing we can see and touch.

The cup is made of glass.

The material is what it is made of.

∴ The spoon is an object made of wood. The cup is an object made of glass.

Worked example 2 — one material or more than one?

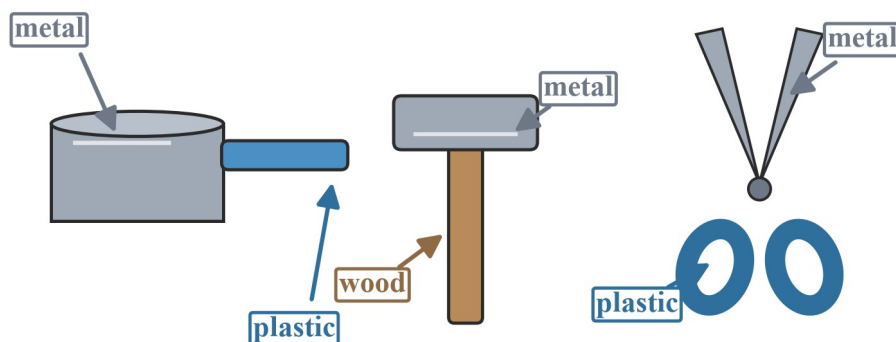
Look at the saucepan.

These objects are made of more than one material

a saucepan

a hammer

scissors



Some objects have two or more materials. Name each one you can see.

A saucepan made of metal and plastic, a hammer made of metal and wood, and scissors made of metal and plastic, with a label on each material.

Working

Say why

The pot part is metal.

Metal is one material.

The handle is plastic.

Plastic is a second material.

The saucepan has two materials.

Metal and plastic.

∴ The saucepan is made of more than one material: metal and plastic.

Worked example 3 — which property word?

I press the sponge. It changes when I press it. Which property word is this?

Working

Say why

The test is a press test.

Pressing tells us hard or soft.

Hard or soft is hardness.

Hardness is the property word.

The sponge changes, so it is soft.

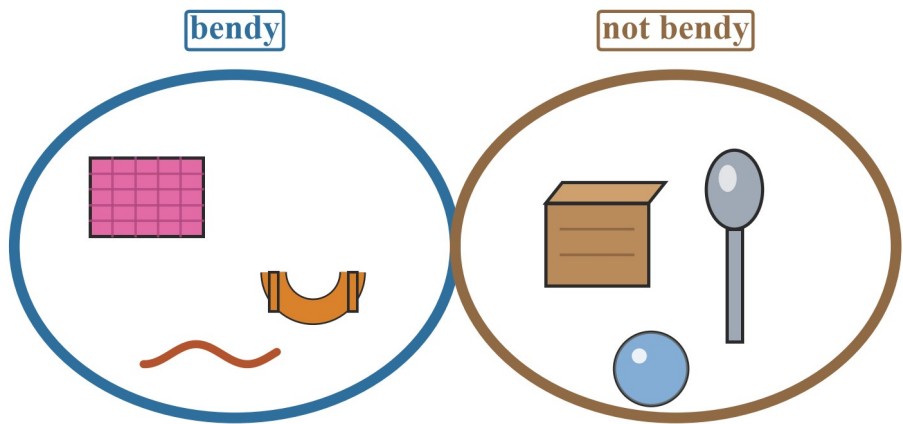
Soft is a word for hardness.

∴ The property word is hardness. The sponge is soft.

Worked example 4 — sort with a rule

Sort the string into a hoop.

Sort by one property: bendy or not bendy?



fabric, rubber tube, string wood block, metal spoon, glass marble

One rule for this sort: does it bend? Say the rule out loud.

Two hoops: the bendy hoop holds fabric, a rubber tube and string; the not bendy hoop holds a wood block, a metal spoon and a glass marble.

Working

Say why

Say the rule: does it bend?

One rule for the sort.

The string bends.

Bendy things go in the bendy hoop.

Put the string with fabric and the rubber tube.

Same rule, same hoop.

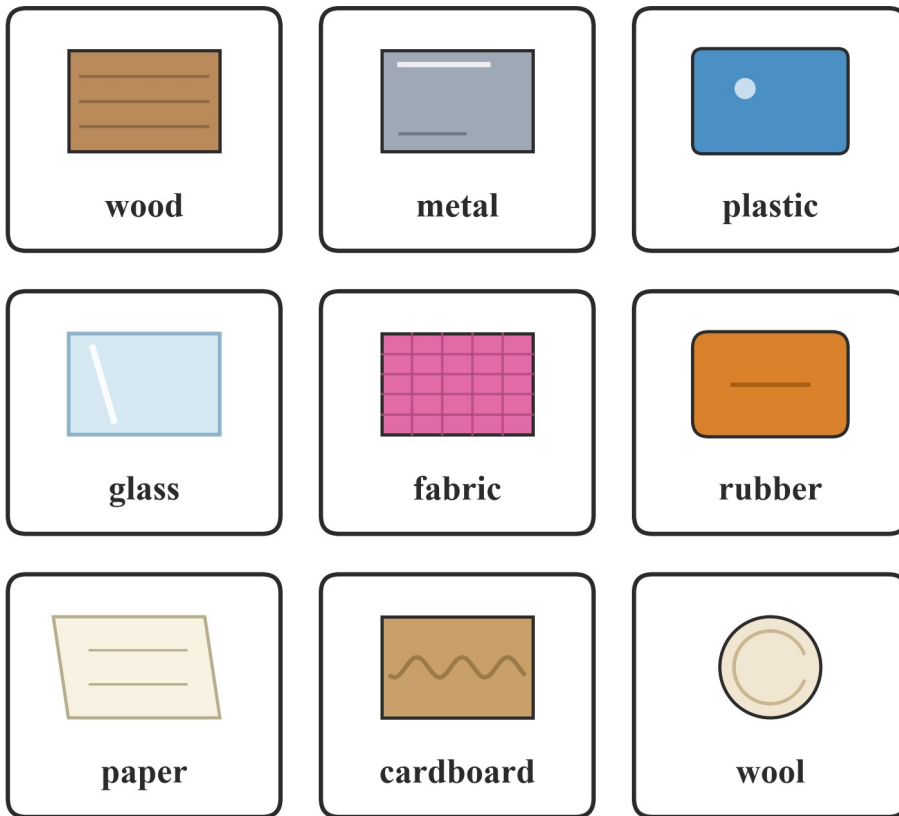
∴ The string is bendy. It goes in the bendy hoop.

Practice questions

The teacher reads all the words. The child says or does the answer. The teacher puts the answer down.

Q1. (Foundation) Look at the material name cards.

Material name cards

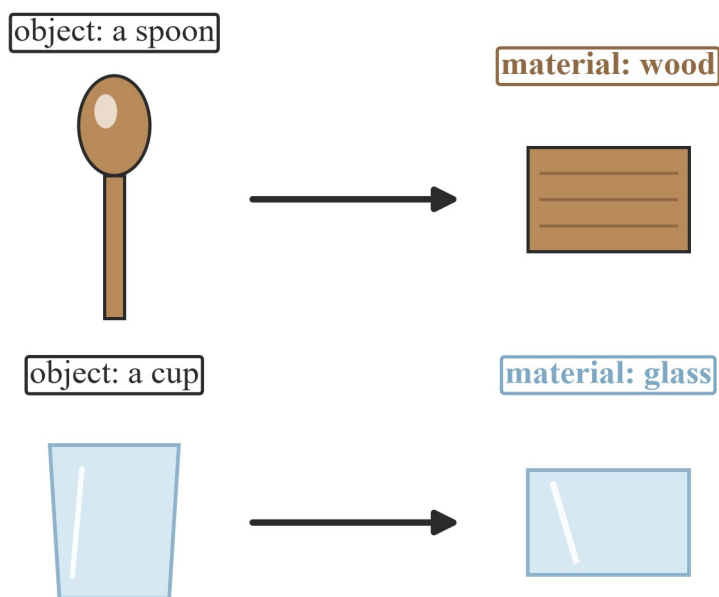


Nine name cards: wood, metal, plastic, glass, fabric, rubber, paper, cardboard and wool, each with a picture of the material.

- Point to the card for wool.
- Point to the card for metal.
- Say three materials.

Q2. *(Foundation)* Look at the spoon and the cup.

An object is a thing. The material is what it is made of.



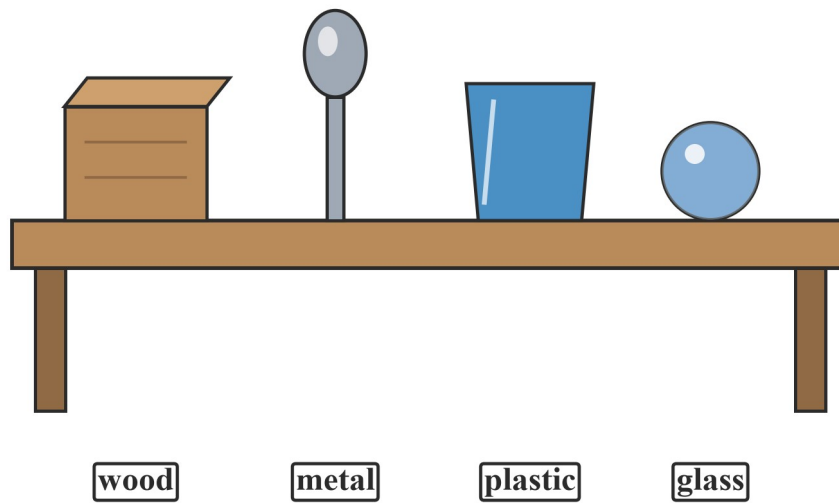
We can see and touch objects. The material is the stuff they are made of.

A wooden spoon matched to a piece of wood, and a glass cup matched to a piece of glass, with the words object and material.

- Point to the object made of glass.
- Say the material of the spoon.

Q3. (Foundation) Look at the objects made of one material.

Each of these objects is made of one material



Point to each object. Say the material.

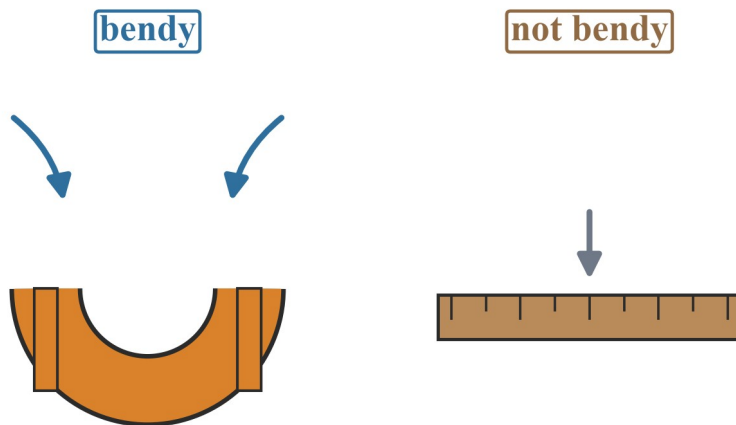
One object, one material. The block is wood. The spoon is metal. The cup is plastic. The marble is glass.

A wood block, a metal spoon, a plastic cup and a glass marble on a table, each above its material name: wood, metal, plastic, glass.

- Point to the object made of plastic.
- Point to the object made of metal.
- Say the material of the marble.

Q4. (Foundation) Look at the bend test.

Bend test: bendy or not bendy?



The rubber tube bends.

The wood ruler does not bend.

Try to bend each one gently. Do not snap it.

A rubber tube in a U shape: bendy. A wood ruler that stays straight: not bendy.

- Point to the bendy thing.
- Point to the not bendy thing.

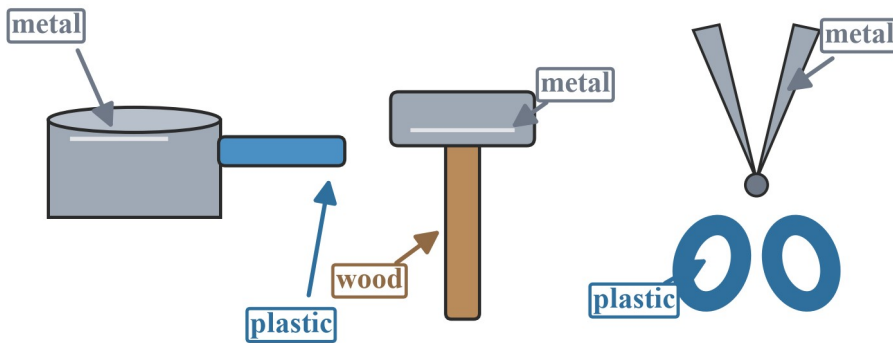
Q5. (Level 1) Look at the objects made of more than one material.

These objects are made of more than one material

a saucepan

a hammer

scissors



Some objects have two or more materials. Name each one you can see.

A saucepan made of metal and plastic, a hammer made of metal and wood, and scissors made of metal and plastic, with a label on each material.

- a. The saucepan is metal and ____
- b. The hammer is metal and ____
- c. The scissors are metal and ____

Q6. (Level 1) Circle the material that is bendy.

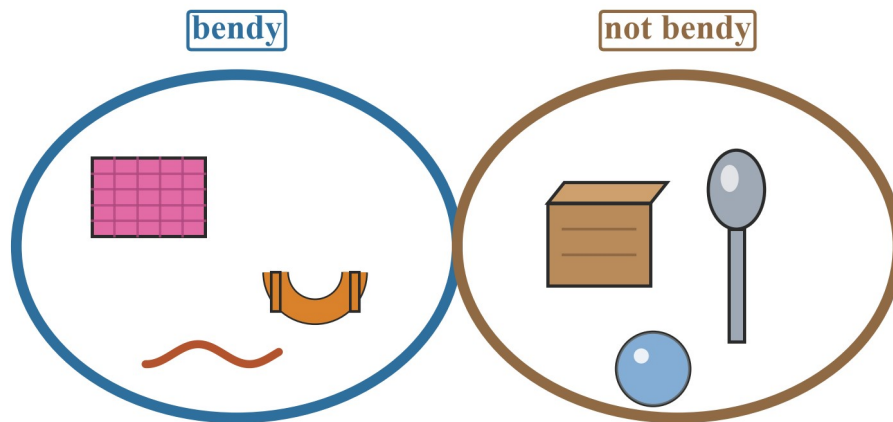
rubber · wood · glass

Q7. (Level 1) *It feels rough.* Which property word is this? Circle one.

colour · texture · hardness

Q8. (Level 1) A tile goes in a hoop.

Sort by one property: bendy or not bendy?



fabric, rubber tube, string wood block, metal spoon, glass marble

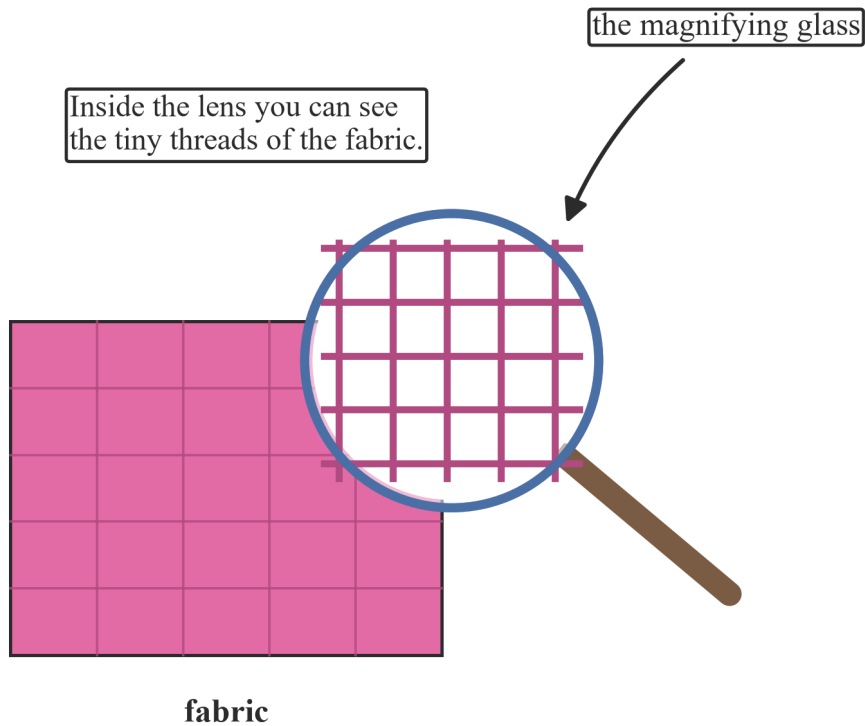
One rule for this sort: does it bend? Say the rule out loud.

Two hoops: the bendy hoop holds fabric, a rubber tube and string; the not bendy hoop holds a wood block, a metal spoon and a glass marble.

- Say the rule for this sort.
- Say which hoop the tile goes in.

Q9. (Level 2) Look at the magnifying glass.

A magnifying glass helps you see very small things



A magnifying glass is a tool. It makes small things look big.

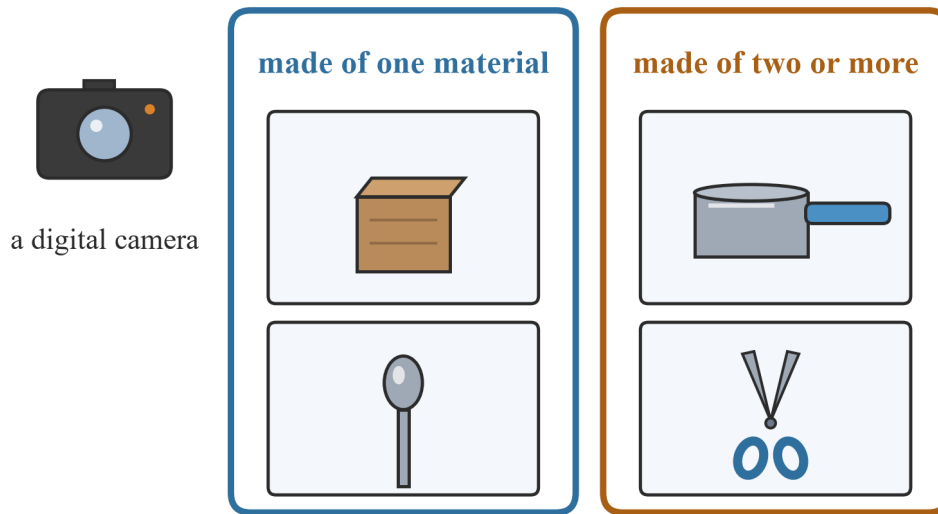
A magnifying glass over a piece of fabric; inside the lens you can see the tiny threads of the fabric.

- Say what you see inside the lens.
- Say why we use a magnifying glass.

Q10. (Level 2) Say two properties of rubber.

Q11. (Level 2) Look at the photos from the materials hunt.

Materials hunt: sort the photos



Take photos of objects on the hunt. Then sort the photos into these two groups.

One material, or two or more materials?

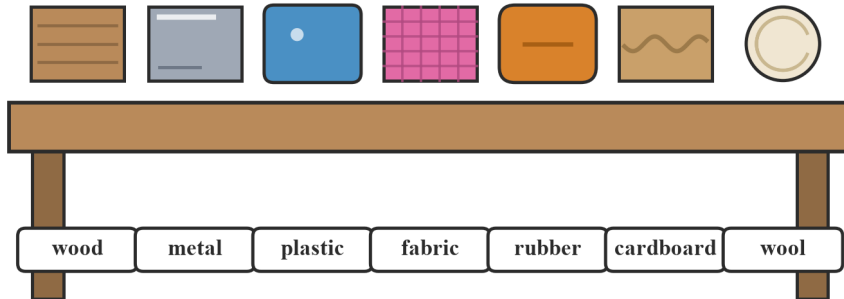
A digital camera, and two groups of photos: made of one material (a wood block, a metal spoon) and made of two or more (a saucepan, scissors).

- The spoon goes in which group? Say how you know.
- The scissors go in which group? Say how you know.

Q12. (Level 2) Look at the materials display.

Our materials display

Make a display. Put out the materials. Say the name of each one.



Each material sits with its name card.

A table display: pieces of wood, metal, plastic, fabric, rubber, cardboard and wool, each with its name card.

- Pick two materials. Say the name of each one.
- Say one property of each one.

Answers

Q1. a. the wool card b. the metal card c. any three, e.g. wood, plastic, rubber.

Q2. a. the cup b. wood.

Q3. a. the cup b. the spoon c. glass.

Q4. a. the rubber tube b. the wood ruler.

Q5. a. plastic b. wood c. plastic.

Q6. rubber.

Q7. texture.

Q8. a. does it bend? b. the not bendy hoop.

Q9. a. the tiny threads of the fabric b. it makes small things look big, so we see more detail.

Q10. any two of: bendy, soft, smooth. (any true properties)

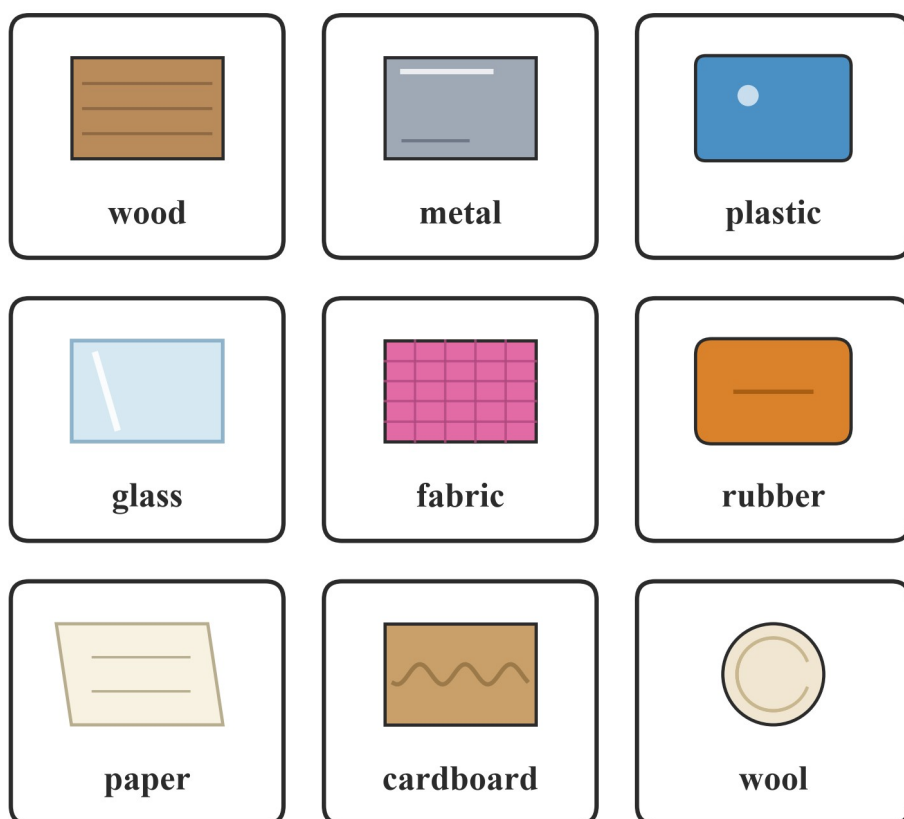
Q11. a. one material — the spoon is all metal b. two or more — metal and plastic.

Q12. e.g. a. rubber and wood b. the rubber is bendy; the wood is not bendy. (any true pair)

Fully-worked solutions

Q1.

Material name cards



Nine name cards: wood, metal, plastic, glass, fabric, rubber, paper, cardboard and wool, each with a picture of the material.

- Point to the card that says *wool*.
- Point to the card that says *metal*.
- Say any three names: wood, metal, plastic, glass, fabric, rubber, paper, cardboard, wool.

∴ The cards name the nine materials.

Q2.

- The cup is made of glass. Point to the cup.
- The spoon is made of wood.

∴ The cup is the glass object, and the spoon is wood.

Q3.

- The cup is plastic. Point to the cup.
- The spoon is metal. Point to the spoon.
- The marble is glass.

∴ Plastic: the cup. Metal: the spoon. The marble is glass.

Q4.

- The rubber tube bends. Point to the rubber tube.
- The wood ruler does not bend. Point to the ruler.

∴ Bendy: the rubber tube. Not bendy: the wood ruler.

Q5.

- a. The saucepan is metal and plastic.
- b. The hammer is metal and wood.
- c. The scissors are metal and plastic.

∴ a. plastic b. wood c. plastic.

Q6.

Rubber bends, so rubber is bendy. Wood and glass do not bend.

∴ Circle rubber.

Q7.

Rough and smooth are words for how a thing feels. How it feels is texture.

∴ The property word is texture.

Q8.

- a. The rule is: does it bend?
- b. The tile does not bend, so it is not bendy.

∴ The tile goes in the not bendy hoop.

Q9.

- a. Inside the lens we see the tiny threads of the fabric.
- b. A magnifying glass makes small things look big, so we observe more detail.

∴ Threads; it helps us see more detail.

Q10.

Rubber bends, so it is bendy. Rubber changes when we press it, so it is soft.

∴ Two properties of rubber: bendy and soft.

Q11.

- a. The spoon is made of one material, metal. It goes in the one material group.
- b. The scissors are made of metal and plastic. They go in the two or more group.

∴ Spoon: one material. Scissors: two or more.

Q12.

- a. Pick two name cards, e.g. rubber and wood.
- b. Say a property of each: the rubber is bendy; the wood is not bendy.

∴ Any true name and property pair is right.

Combining materials for a purpose; when a mixture differs from its parts

This is read with the teacher. The teacher reads all the words. The child looks, says, points and does. The child does not need to read.

materials can be combined in a variety of ways for particular purposes; the properties of objects and mixtures can differ from the properties of the materials from which they are made — VC2S2U05

Evidences: They provide examples of objects and mixtures that are made from a combination of materials, and distinguish between the properties of objects or mixtures and those of the materials from which they are made.

In this topic we will:

- look at a shoe, toys and rain clothes, and say why each part is made of its material (E01, E03)
- mix food like jelly, ice cream and cake, and watch how the mixture changes (E02)
- add different amounts of water to sand, and test our sandcastles (E05)
- use our four-step plan every time we combine materials: predict, do, observe, compare (E01)

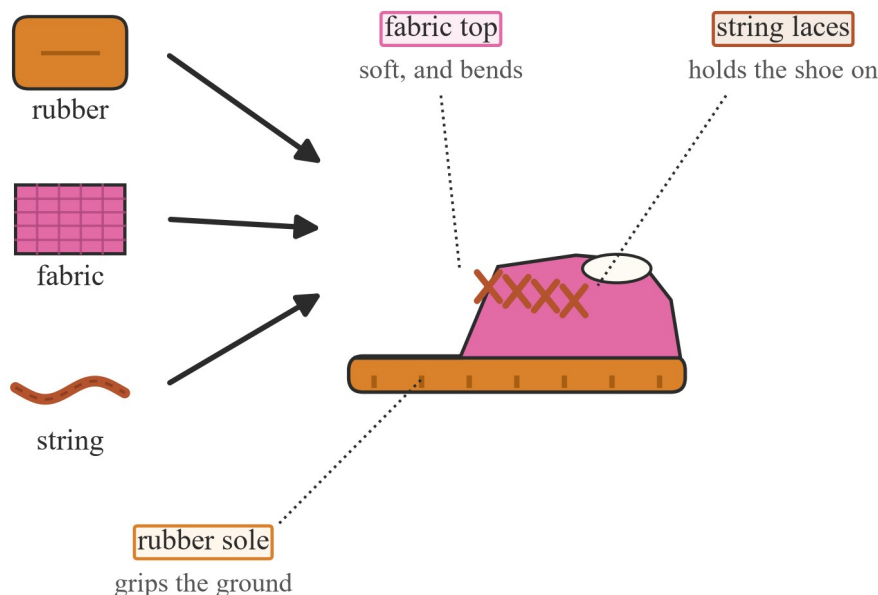
Theory

Putting materials together for a job

To **combine** means to put together. People combine materials for a job.

People combine materials for a job

A shoe is three materials put together



One job for the shoe. Each material does its own part of the job.

A rubber piece, a fabric piece and a string are combined to make one shoe. Labels show the rubber sole grips the ground, the fabric top is soft and bends, and the string laces hold the shoe on.

A shoe is three materials put together.

- The **sole** is the bottom of the shoe. The sole is rubber. Rubber **grips** the ground. To grip means to hold on, so your foot does not slip.

- The top is fabric. Fabric is soft, and it bends when your foot bends.
- The **laces** are the strings you tie. The laces hold the shoe on your foot.

One job for the shoe. Each material does its own part of the job.

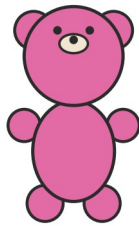
Why is each toy made of that material?

Why is each toy made of that material?



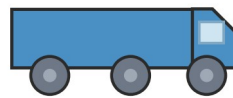
rubber

Rubber bounces.
So the ball bounces.



soft fabric

Fabric is soft.
Good to hug.



hard plastic

Plastic is hard.
It keeps its shape.

Each material is good for its job.

Say: which part of each toy, and why that material?

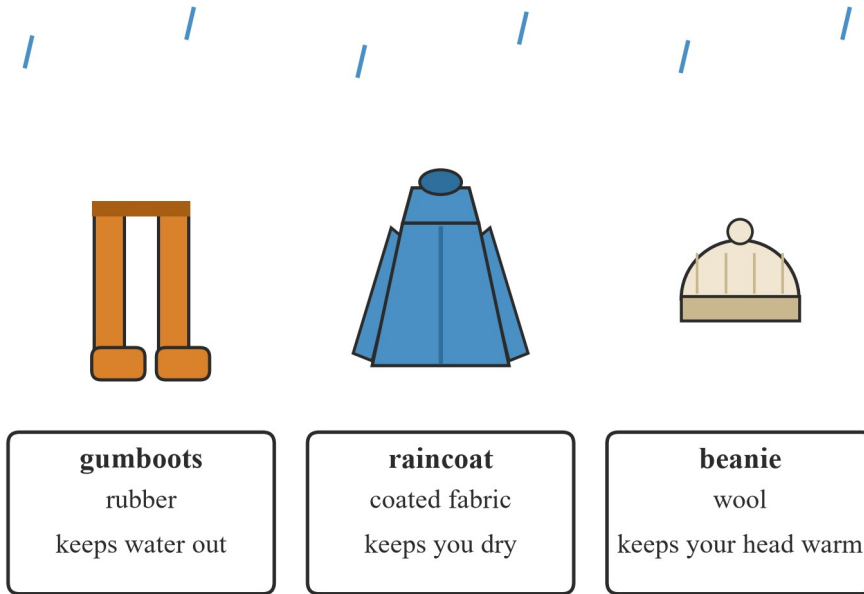
A rubber ball, a soft fabric teddy and a hard plastic truck, with a card under each toy: rubber bounces so the ball bounces; fabric is soft, good to hug; plastic is hard, it keeps its shape.

- The ball is rubber. Rubber bounces, so the ball bounces.
- The **teddy** is a soft toy bear. It is soft fabric. Fabric is soft, so the teddy is good to hug.
- The truck is hard plastic. Plastic is hard, so the truck keeps its shape.

Say: which part of each toy, and why that material?

Clothes for a rainy day

Clothes for a rainy day — materials with a job



People pick materials for the job. On a rainy day, the job is: keep dry.

Gumboots, a raincoat and a beanie under falling rain. Cards say: gumboots are rubber and keep water out; the raincoat is coated fabric and keeps you dry; the beanie is wool and keeps your head warm.

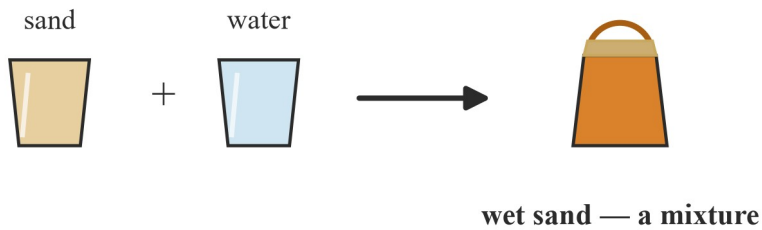
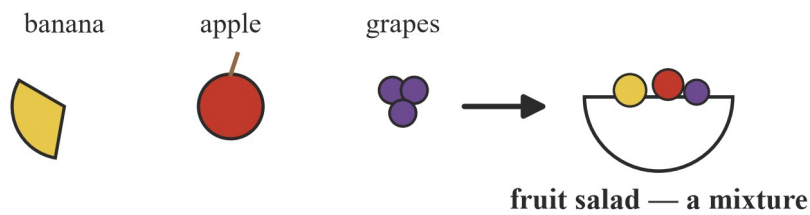
- **Gumboots** are boots you wear in the rain. They are rubber. Rubber keeps water out, so your feet stay dry.
- The **raincoat** is fabric with a coat on it. A **coated** material has a thin skin that keeps water out. The raincoat keeps you dry.
- The **beanie** is a soft hat for your head. It is wool. Wool is warm, so your head stays warm.

People pick materials for the job. On a rainy day, the job is: keep dry and keep warm.

What is a mixture?

A **mixture** is two or more materials put together.

A mixture is two or more materials put together



In both mixtures, you can still see the parts.

Sand and water. Banana, apple and grapes. The parts are put together.

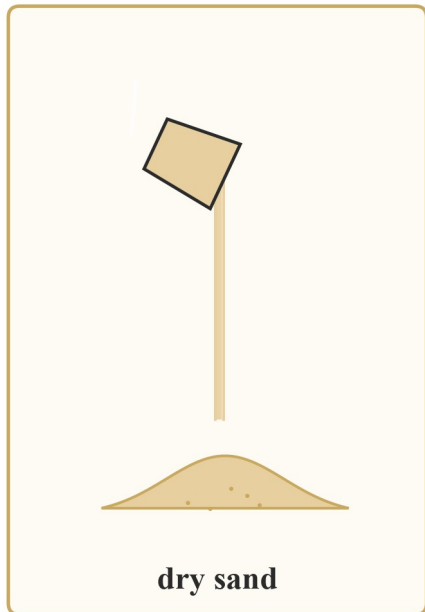
Banana, apple and grapes go into a bowl to make fruit salad, and sand and water go into a bucket to make wet sand. In both mixtures you can still see the parts.

- Fruit salad is a mixture. The parts are banana, apple and grapes. You can still see the parts.
- Wet sand is a mixture. The parts are sand and water. You can still see the parts.

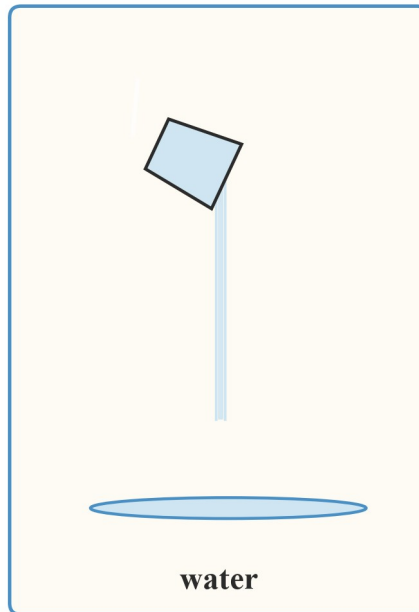
The parts on their own

The parts on their own

It runs. It does not hold a shape.



It runs. It takes the shape of its cup.



On their own, the parts cannot make a sandcastle.

Dry sand pours from a cup and makes a flat pile. Water pours from a cup and goes out flat. On their own, the parts cannot make a sandcastle.

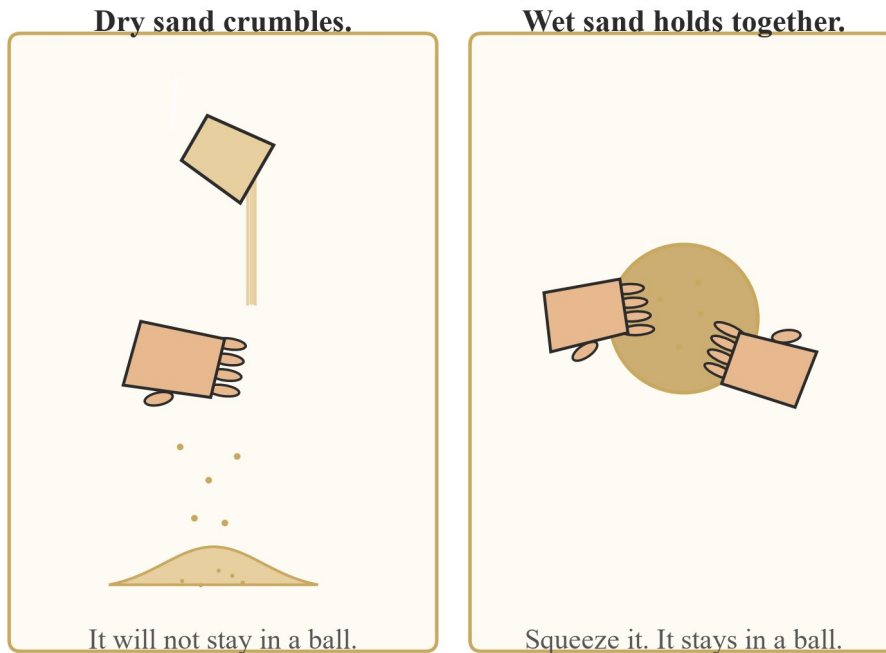
- Dry sand runs. It does not hold a shape. It makes a flat pile.
- Water runs. It goes out flat. It takes the shape of its cup.

On their own, the parts cannot make a sandcastle.

The mixture is different

To **squeeze** means to press together, like two hands pressing a ball.

Squeeze test: dry sand and wet sand



The mixture can do something new: it holds a shape when you squeeze it.

Squeeze test. Dry sand crumbles through the fingers and will not stay in a ball. Two hands squeeze wet sand and it stays in a ball.

- Dry sand **crumbles**. To crumble means to break into little bits. It will not stay in a ball.
- Wet sand holds together. Squeeze it. It stays in a ball.

The mixture can do something new. It holds a shape when you squeeze it. The parts cannot do that on their own.

Different amounts of water, different sandcastles

We add water with a **scoop**. A scoop is a small cup we use to measure. We use the same scoop each time, so we can count the water.

Different amounts of water, different sandcastles

0 scoops of water



too dry
it crumbles

3 scoops of water



just right
it holds its shape

8 scoops of water



too wet
it goes out flat

Same sand. Different amounts of water. Different results.

Three buckets of sand with 0, 3 and 8 scoops of water. Too dry, it crumbles; just right, it holds its shape as a sandcastle; too wet, it goes out flat.

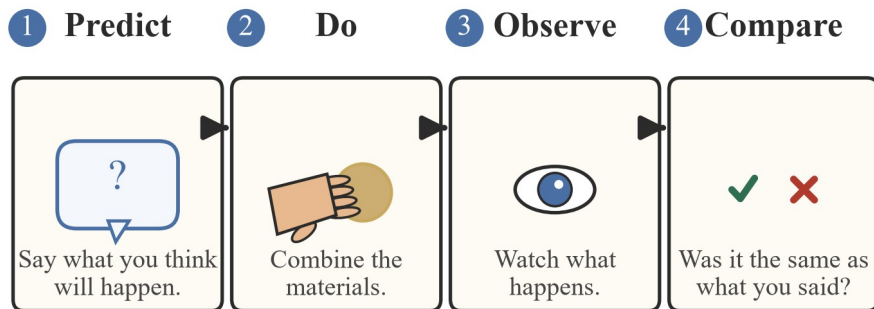
- 0 scoops: too dry. It crumbles. No sandcastle.
- 3 scoops: just right. It holds its shape. A sandcastle.
- 8 scoops: too wet. It goes out flat. No sandcastle.

Same sand. Different amounts of water. Different results.

Our sandcastle test

Every time we combine materials, we use our four-step plan.

Our plan when we combine materials



Follow these four steps every time you combine materials.

A different result is not a mistake. It is something to talk about.

Our four-step plan. Predict: say what you think will happen. Do: combine the materials. Observe: watch what happens. Compare: was it the same as what you said?

- **Predict.** Say what you think will happen.
- **Do.** Combine the materials.
- **Observe.** Watch what happens.
- **Compare.** Was it the same as what you said?

We test three cups of sand. Cup A gets 0 scoops of water. Cup B gets 3 scoops. Cup C gets 8 scoops. We squeeze each one. Here is our **record**. A record is what we write down to remember.

Our sandcastle test — an example record

cup	scoops of water	did it hold its shape?
A	0	✗
B	3	✓
C	8	✗

Tick yes, or cross no, after each test.

Cup B held its shape. Cups A and C did not. Why? Say what you think.

An example record table. Cup A with 0 scoops gets a cross, cup B with 3 scoops gets a tick, cup C with 8 scoops gets a cross. Cup B held its shape.

Cup B held its shape. Cups A and C did not.

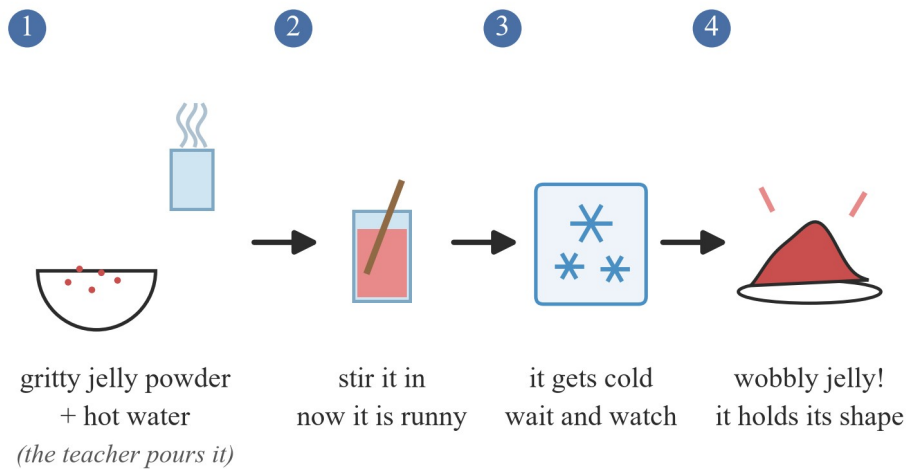
Wash your hands after you touch sand.

Food mixtures

Food can be mixed to make new things. We watch with our eyes and our nose. We do not taste in science.

Jelly.

Making jelly: the mixture changes as it gets cold



The parts were gritty and runny. The mixture is wobbly.

Hot water is for the teacher. We observe; we do not taste in science.

Making jelly in four steps: gritty jelly powder plus hot water that the teacher pours; stir it in and it is runny; it gets cold; wobbly jelly that holds its shape. Hot water is for the teacher; we do not taste in science.

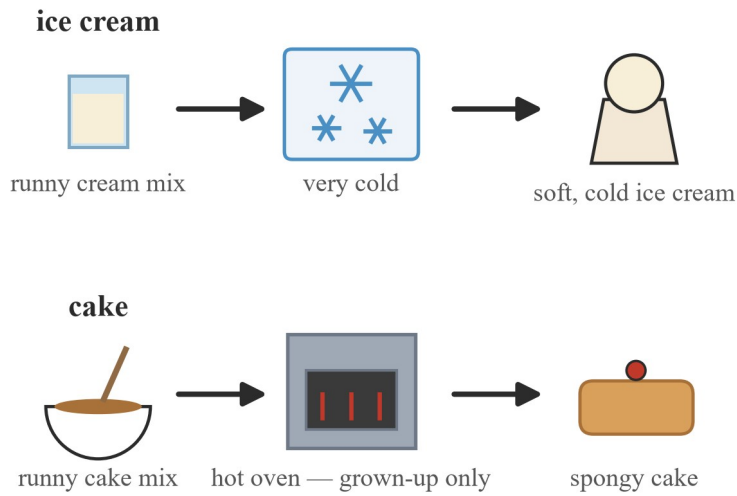
- The **powder** is lots of tiny bits, like sand. It is **gritty**. Gritty means it feels like lots of tiny bits.
- The teacher adds hot water and stirs it in. Now it is **runny**. Runny means it runs, like water.
- It gets cold. Then it is **wobbly** jelly. Wobbly means it moves when you shake it.

The parts were gritty and runny. The mixture is wobbly. The mixture is not like its parts.

Hot water is for the teacher to pour.

Ice cream and cake.

More food mixtures



Each mixture is not like its parts. Runny mix becomes soft ice cream.

Runny cake mix becomes spongy cake. We observe with our eyes and nose.

A runny cream mix gets very cold and becomes soft, cold ice cream. A runny cake mix goes in a hot oven, grown-up only, and becomes spongy cake.

- A runny cream mix gets very cold. It becomes soft, cold ice cream.
- A runny cake mix goes in a hot oven. A grown-up uses the oven. It becomes **spongy** cake. Spongy means soft, like a sponge, with tiny holes.

Each mixture is not like its parts.

Parts and mixture — say what is different

part or mixture	what is it like?
dry sand	It runs. It does not hold a shape.
water	It runs. It goes out flat.
sand + water mixture	It holds a shape when you squeeze it.

The mixture can do something the parts cannot do on their own.

Sand alone does not hold a shape. Water alone does not hold a shape.

Sand and water together can hold a shape.

A table. Dry sand runs and does not hold a shape. Water runs and goes out flat. The sand and water mixture holds a shape when you squeeze it.

Point to each row. Say what is different.

- Dry sand does not hold a shape.
- Water does not hold a shape.
- The sand and water mixture holds a shape when you squeeze it.

The mixture can do something the parts cannot do on their own.

Worked examples

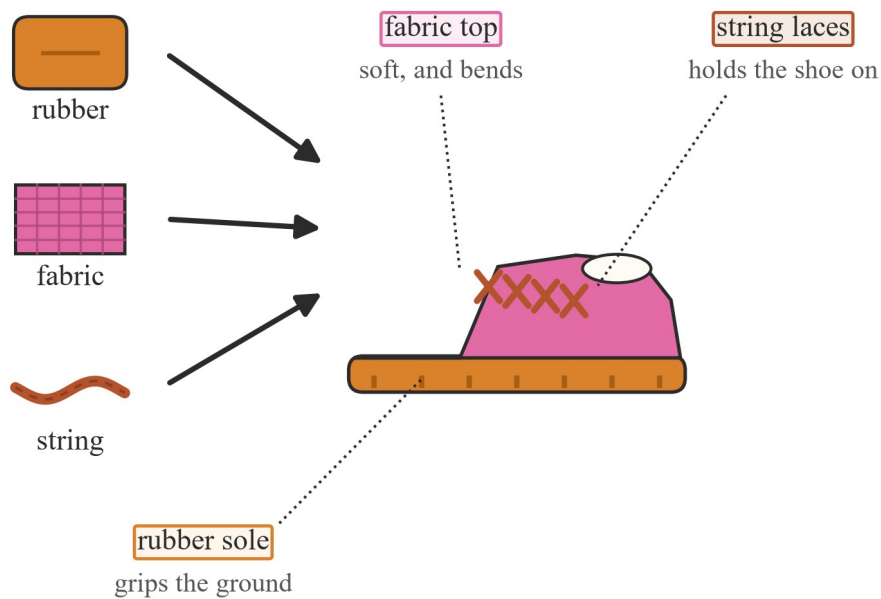
Do these with the teacher. Use what you can see here.

Worked example 1 — why is each part of the shoe that material?

Look at the shoe.

People combine materials for a job

A shoe is three materials put together



One job for the shoe. Each material does its own part of the job.

A rubber piece, a fabric piece and a string are combined to make one shoe. Labels show the rubber sole grips the ground, the fabric top is soft and bends, and the string laces hold the shoe on.

Working

Say why

Point to the sole. The sole is rubber.

Rubber grips the ground, so your foot does not slip.

Point to the top. The top is fabric.

Fabric is soft, and it bends when your foot bends.

Point to the laces. The laces are string.

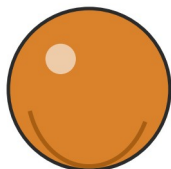
String ties, so it holds the shoe on.

∴ Each part of the shoe is made of the material that is good for its job.

Worked example 2 — why is the teddy fabric?

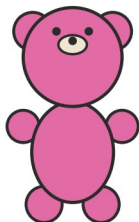
Look at the toys.

Why is each toy made of that material?



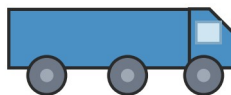
rubber

Rubber bounces.
So the ball bounces.



soft fabric

Fabric is soft.
Good to hug.



hard plastic

Plastic is hard.
It keeps its shape.

Each material is good for its job.

Say: which part of each toy, and why that material?

A rubber ball, a soft fabric teddy and a hard plastic truck, with a card under each toy: rubber bounces so the ball bounces; fabric is soft, good to hug; plastic is hard, it keeps its shape.

Working

Say why

The teddy is for hugging.

A hug should be soft.

Fabric is soft.

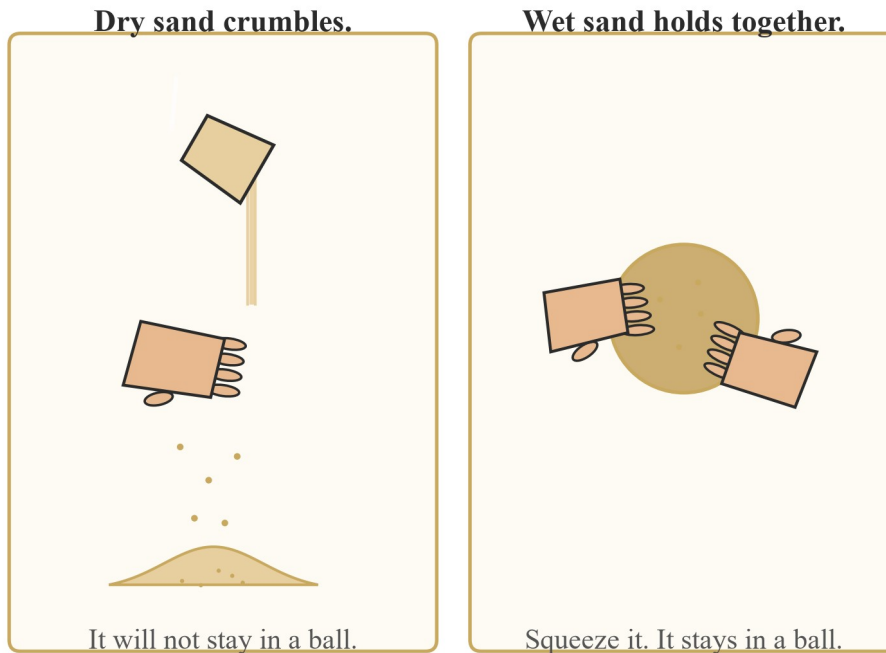
Soft is good for a hug.

∴ The teddy is fabric, because fabric is soft and good to hug.

Worked example 3 — is the mixture like its parts?

Squeeze dry sand. Squeeze wet sand.

Squeeze test: dry sand and wet sand



The mixture can do something new: it holds a shape when you squeeze it.

Squeeze test. Dry sand crumbles through the fingers and will not stay in a ball. Two hands squeeze wet sand and it stays in a ball.

Working

Say why

Dry sand crumbles. It will not stay in a ball.

Sand on its own does not hold a shape.

Water goes out flat.

Water on its own does not hold a shape.

Wet sand stays in a ball when you squeeze it.

The mixture can hold a shape.

∴ The mixture is not like its parts. It can do something new.

Worked example 4 — which cup makes a sandcastle?

Look at the record.

Our sandcastle test — an example record

cup	scoops of water	did it hold its shape?
A	0	✗
B	3	✓
C	8	✗

Tick yes, or cross no, after each test.

Cup B held its shape. Cups A and C did not. Why? Say what you think.

An example record table. Cup A with 0 scoops gets a cross, cup B with 3 scoops gets a tick, cup C with 8 scoops gets a cross. Cup B held its shape.

Working

Say why

Cup A: 0 scoops. Cross.

Too dry. It crumbles.

Cup B: 3 scoops. Tick.

Just right. It holds its shape.

Cup C: 8 scoops. Cross.

Too wet. It goes out flat.

∴ Cup B makes a sandcastle. The right amount of water matters.

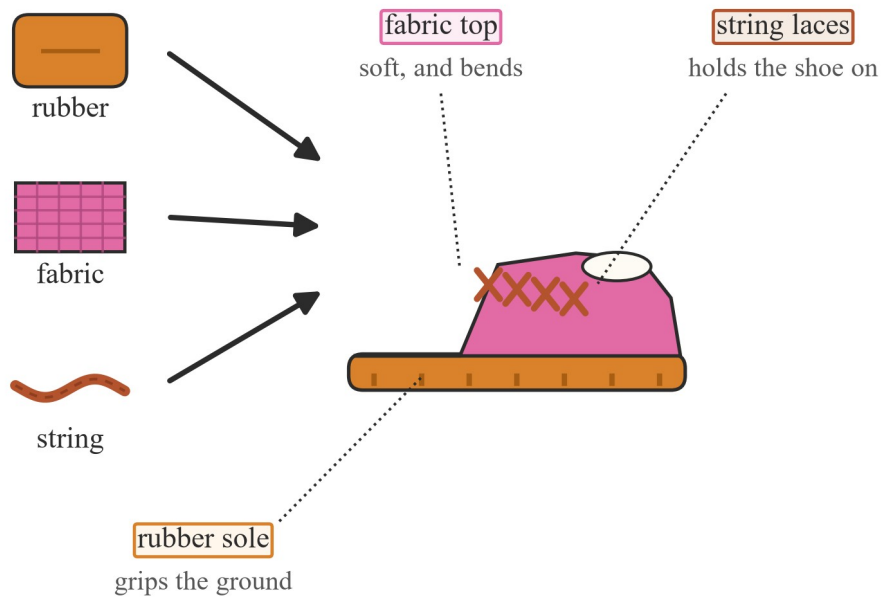
Practice questions

The teacher reads all the words. The child says or does the answer. The teacher puts the answer down.

Q1. (Foundation) Look at the shoe.

People combine materials for a job

A shoe is three materials put together



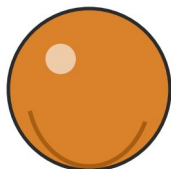
One job for the shoe. Each material does its own part of the job.

A rubber piece, a fabric piece and a string are combined to make one shoe. Labels show the rubber sole grips the ground, the fabric top is soft and bends, and the string laces hold the shoe on.

- Point to the rubber sole.
- Point to the string laces.
- Say what the fabric top is like.

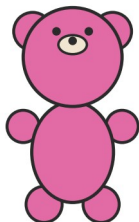
Q2. (Foundation) Look at the toys.

Why is each toy made of that material?



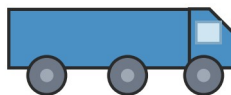
rubber

Rubber bounces.
So the ball bounces.



soft fabric

Fabric is soft.
Good to hug.



hard plastic

Plastic is hard.
It keeps its shape.

Each material is good for its job.

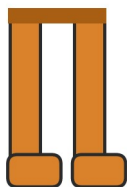
Say: which part of each toy, and why that material?

A rubber ball, a soft fabric teddy and a hard plastic truck, with a card under each toy: rubber bounces so the ball bounces; fabric is soft, good to hug; plastic is hard, it keeps its shape.

- Point to the toy made of rubber.
- Point to the toy made of hard plastic.
- Say why the teddy is fabric.

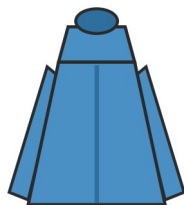
Q3. (Foundation) Look at the rain clothes.

Clothes for a rainy day — materials with a job



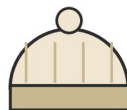
gumboots

rubber
keeps water out



raincoat

coated fabric
keeps you dry



beanie

wool
keeps your head warm

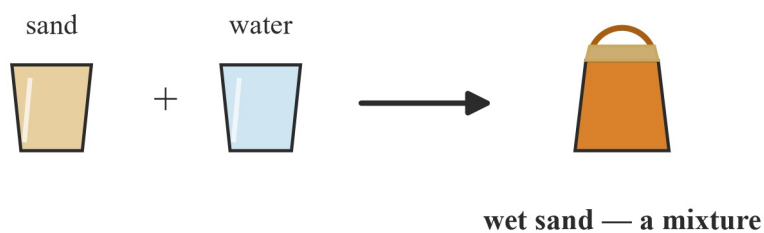
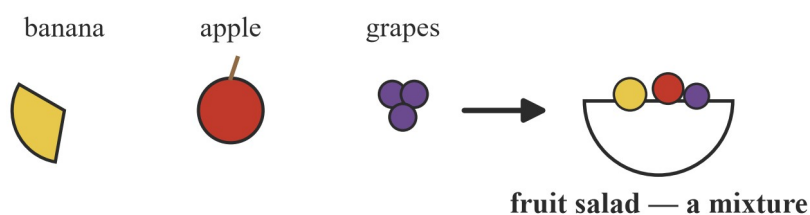
People pick materials for the job. On a rainy day, the job is: keep dry.

Gumboots, a raincoat and a beanie under falling rain. Cards say: gumboots are rubber and keep water out; the raincoat is coated fabric and keeps you dry; the beanie is wool and keeps your head warm.

- Point to the beanie.
- Say what the beanie is made of.
- Say what the gumboots do for your feet.

Q4. (Foundation) Look at the mixtures.

A mixture is two or more materials put together



In both mixtures, you can still see the parts.

Sand and water. Banana, apple and grapes. The parts are put together.

Banana, apple and grapes go into a bowl to make fruit salad, and sand and water go into a bucket to make wet sand. In both mixtures you can still see the parts.

- Point to the mixture with fruit in it.
- Point to the mixture with water in it.
- Say the parts of the fruit salad.

Q5. (Level 1) Look at the parts and the mixture.

Parts and mixture — say what is different

part or mixture	what is it like?
dry sand	It runs. It does not hold a shape.
water	It runs. It goes out flat.
sand + water mixture	It holds a shape when you squeeze it.

The mixture can do something the parts cannot do on their own.

Sand alone does not hold a shape. Water alone does not hold a shape.

Sand and water together can hold a shape.

A table. Dry sand runs and does not hold a shape. Water runs and goes out flat. The sand and water mixture holds a shape when you squeeze it.

- Dry sand does not hold ____
- Water goes out ____
- The mixture holds a shape when you ____ it.

Q6. *(Level 1)* Look at the three mixes.

Different amounts of water, different sandcastles

0 scoops of water



too dry
it crumbles

3 scoops of water



just right
it holds its shape

8 scoops of water



too wet
it goes out flat

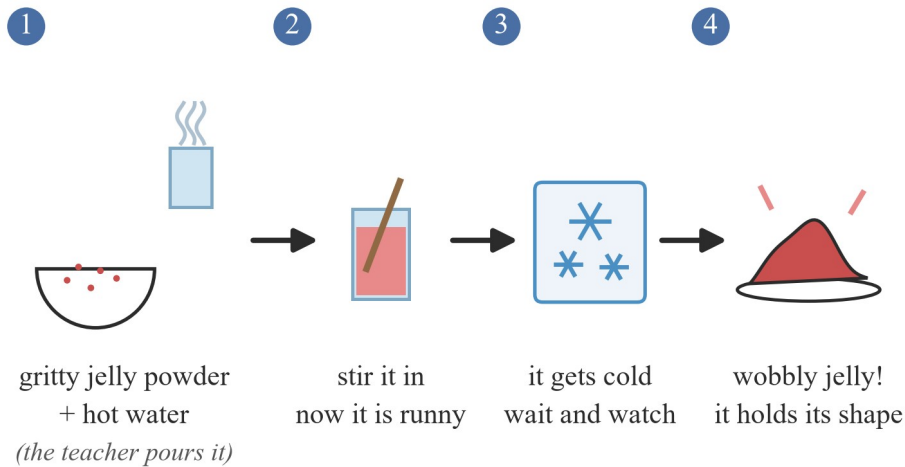
Same sand. Different amounts of water. Different results.

Three buckets of sand with 0, 3 and 8 scoops of water. Too dry, it crumbles; just right, it holds its shape as a sandcastle; too wet, it goes out flat.

- Circle the cup that is just right.
- Say how many scoops of water it had.
- Say what happens to the mix with 8 scoops.

Q7. (Level 1) Look at the jelly steps.

Making jelly: the mixture changes as it gets cold



The parts were gritty and runny. The mixture is wobbly.

Hot water is for the teacher. We observe; we do not taste in science.

Making jelly in four steps: gritty jelly powder plus hot water that the teacher pours; stir it in and it is runny; it gets cold; wobbly jelly that holds its shape. Hot water is for the teacher; we do not taste in science.

- Say what the powder is like before the water goes in.
- Say what the mixture is like after it gets cold.
- Say who pours the hot water, and why.

Q8. (Level 1) Gumboots are rubber. Say the job, and say why rubber is good for it.

Q9. (Level 2) Look at the record.

Our sandcastle test — an example record

cup	scoops of water	did it hold its shape?
A	0	✗
B	3	✓
C	8	✗

Tick yes, or cross no, after each test.

Cup B held its shape. Cups A and C did not. Why? Say what you think.

An example record table. Cup A with 0 scoops gets a cross, cup B with 3 scoops gets a tick, cup C with 8 scoops gets a cross. Cup B held its shape.

- Cup A did not hold its shape. Say why.
- Cup C did not hold its shape. Say why.
- Cup B held its shape. Say what was different about cup B.

Q10. (Level 2) Wet sand is a mixture. Say two ways the mixture is different from its parts.

Q11. (Level 2) Pick one: jelly, ice cream or cake.

- Say what the parts were like.
- Say what the mixture is like.

Q12. (Level 2) You want to build a tall sandcastle.

- Say how much water you will use, and why.
- Draw your sandcastle. Point to it and say: it holds its shape.

Answers

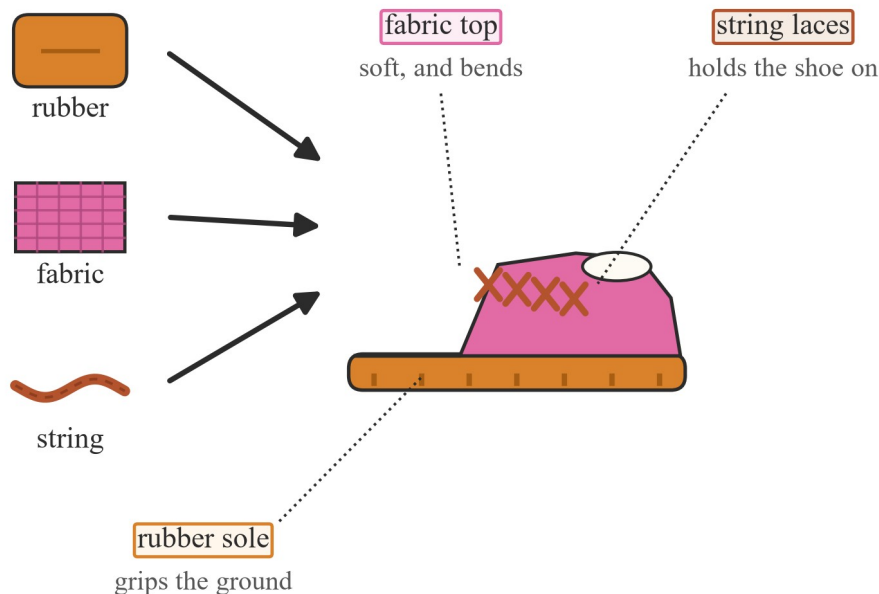
- Q1.** a. the bottom of the shoe b. the strings at the top c. soft, and it bends.
- Q2.** a. the ball b. the truck c. fabric is soft, so the teddy is good to hug.
- Q3.** a. the hat on the right b. wool c. they keep water out, so your feet stay dry.
- Q4.** a. the fruit salad b. the wet sand c. banana, apple and grapes.
- Q5.** a. a shape b. flat c. squeeze.
- Q6.** a. the middle cup b. 3 c. it goes out flat; no sandcastle.
- Q7.** a. gritty b. wobbly c. the teacher; hot water is not for children.
- Q8.** The job is to keep water out. Rubber keeps water out, so gumboots are rubber.
- Q9.** a. too dry — it crumbles b. too wet — it goes out flat c. it had the right amount of water, 3 scoops, so it held its shape.
- Q10.** any two of: it holds a shape when you squeeze it; it stays in a ball; dry sand crumbles and water goes out flat, but the mixture holds together.
- Q11.** e.g. jelly: a. the powder is gritty, and the water is runny b. the jelly is wobbly, and it holds its shape.
- Q12.** a. about 3 scoops, the same as cup B, because just right holds its shape b. the drawing shows a sandcastle that holds its shape.

Fully-worked solutions

Q1.

People combine materials for a job

A shoe is three materials put together



One job for the shoe. Each material does its own part of the job.

A rubber piece, a fabric piece and a string are combined to make one shoe. Labels show the rubber sole grips the ground, the fabric top is soft and bends, and the string laces hold the shoe on.

- Point to the bottom of the shoe. That is the rubber sole.
- Point to the strings at the top. Those are the string laces.
- The fabric top is soft, and it bends when your foot bends.

∴ Sole: rubber. Laces: string. Top: soft fabric.

Q2.

- The ball is rubber. Point to the ball.
- The truck is hard plastic. Point to the truck.
- Fabric is soft, so the teddy is good to hug.

∴ Ball: rubber. Truck: plastic. Teddy: fabric, because it is soft.

Q3.

- Point to the hat on the right. That is the beanie.
- The beanie is wool.
- The gumboots keep water out, so your feet stay dry.

∴ Beanie: wool. Gumboots keep your feet dry.

Q4.

- Point to the bowl. The fruit salad is the mixture with fruit in it.
- Point to the bucket. The wet sand is the mixture with water in it.
- The parts of the fruit salad are banana, apple and grapes.

∴ Fruit salad and wet sand are both mixtures, and you can still see the parts.

Q5.

Parts and mixture — say what is different

part or mixture	what is it like?
dry sand	It runs. It does not hold a shape.
water	It runs. It goes out flat.
sand + water mixture	It holds a shape when you squeeze it.

The mixture can do something the parts cannot do on their own.

Sand alone does not hold a shape. Water alone does not hold a shape.

Sand and water together can hold a shape.

A table. Dry sand runs and does not hold a shape. Water runs and goes out flat. The sand and water mixture holds a shape when you squeeze it.

- Dry sand does not hold a shape.
- Water goes out flat.
- The mixture holds a shape when you squeeze it.

∴ a. a shape b. flat c. squeeze.

Q6.

Different amounts of water, different sandcastles

0 scoops of water



too dry
it crumbles

3 scoops of water



just right
it holds its shape

8 scoops of water



too wet
it goes out flat

Same sand. Different amounts of water. Different results.

Three buckets of sand with 0, 3 and 8 scoops of water. Too dry, it crumbles; just right, it holds its shape as a sandcastle; too wet, it goes out flat.

- Circle the middle cup. It is just right.
- It had 3 scoops of water.
- The mix with 8 scoops is too wet. It goes out flat. No sandcastle.

∴ Just right: 3 scoops. Too wet: it goes out flat.

Q7.

- Before the water goes in, the powder is gritty.
- After it gets cold, the mixture is wobbly.
- The teacher pours the hot water. Hot water is not for children.

∴ Gritty parts become a wobbly mixture; the teacher pours the hot water.

Q8.

The job of gumboots is to keep water out. Rubber keeps water out.

∴ Gumboots are rubber because rubber is good for the job.

Q9.

Our sandcastle test — an example record

cup	scoops of water	did it hold its shape?
A	0	✗
B	3	✓
C	8	✗

Tick yes, or cross no, after each test.

Cup B held its shape. Cups A and C did not. Why? Say what you think.

An example record table. Cup A with 0 scoops gets a cross, cup B with 3 scoops gets a tick, cup C with 8 scoops gets a cross. Cup B held its shape.

- Cup A had 0 scoops. It was too dry, so it crumbles.
- Cup C had 8 scoops. It was too wet, so it goes out flat.
- Cup B had 3 scoops. That was just right, so it held its shape.

∴ Too dry crumbles; too wet goes out flat; just right holds its shape.

Q10.

Dry sand crumbles. Water goes out flat. Wet sand holds together and keeps a shape when you squeeze it.

∴ Two ways: the mixture holds a shape, and it stays in a ball. The parts cannot do that on their own.

Q11.

e.g. jelly.

- The parts were gritty powder and runny water.
- The mixture is wobbly, and it holds its shape.

∴ The mixture is not like its parts.

Q12.

- I will use about 3 scoops, the same as cup B, because just right holds its shape.
- Draw a sandcastle with a flag on top. Point to it and say: it holds its shape.

∴ The right amount of water makes a sandcastle that holds its shape.

Changing materials physically without changing what they are

This is read with the teacher. The teacher reads all the words. The child looks, says, points and does. The child does not need to read.

materials can be changed physically by different actions without changing their material composition, including by bending, twisting, stretching, crushing, squashing and breaking into smaller pieces — VC2S2U06

Evidences: They identify ways to change materials without changing their material composition.

In this topic we will:

- change paper and see it is still paper (E02)
- bend, twist, stretch, crush, squash and break materials (E02)
- crush a chalk stick and ask: is the powder still chalk? (E03)
- twist strands of wool to make a strong thread (E01)
- fold paper to make a plane that can fly (E01)
- play an odd-one-out game with materials (E05)

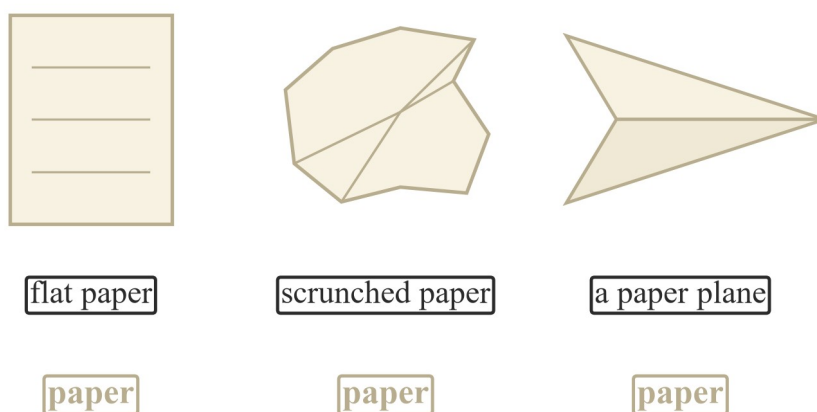
Theory

Changed — but the same material

A **material** is what a thing is made of. Paper is a material. Wool is a material.

We can change a material. Then it looks different.

Changed — but still the same material



They look different. They are all paper. The material stayed the same.

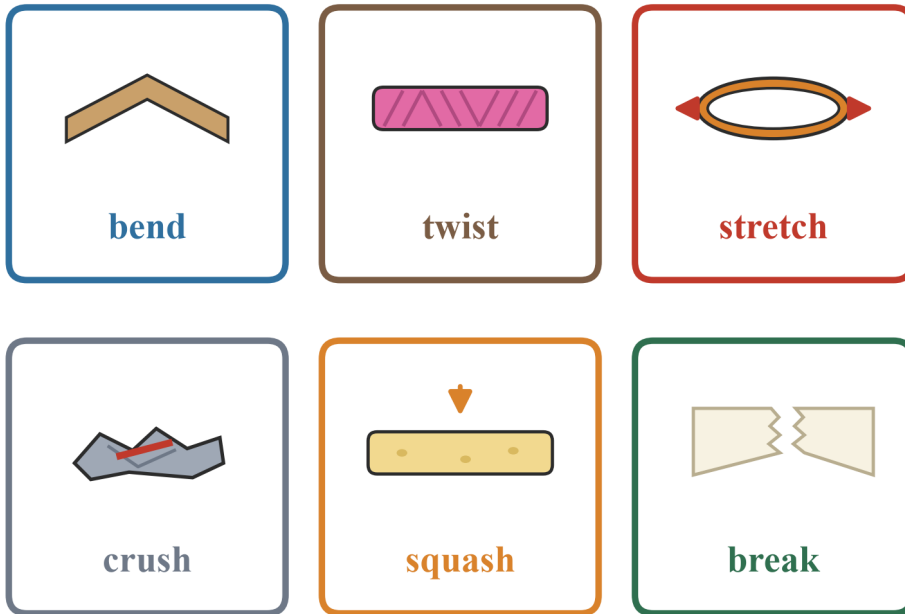
Three pictures: flat paper, scrunched paper and a paper plane. They look different, but each one has the same word under it: paper.

To **scrunch** means to squeeze a thing into a ball. We scrunch the paper. We fold the paper into a plane. They look different. They are all paper. The material stayed the same.

Six actions

Six **actions** can change a material. An action is a thing we do.

Six actions that change materials



Each action changes how a material looks. The material stays the same.

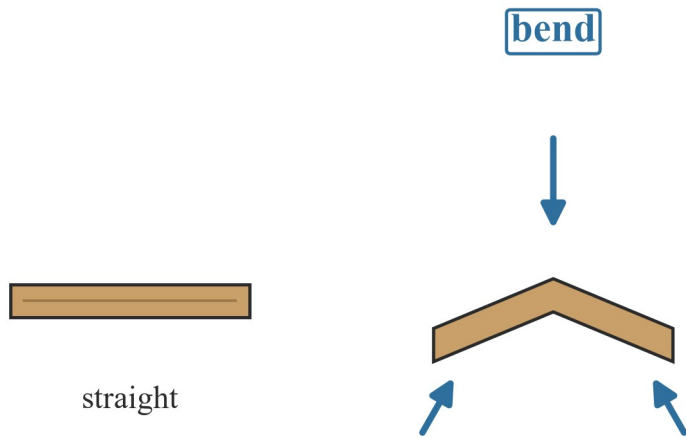
Six cards, one for each action: bend, twist, stretch, crush, squash and break.

We learn each one. After each action, the material is still the same material.

Bend

Cardboard is the material boxes are made of.

Bend



This strip is straight.

Bend it. Now it has a corner.

Bend: push one way to make it not straight. It is still cardboard.

A cardboard strip that is straight, and the same strip after a bend, with a corner.

To **bend** means to push a thing so it is not straight. The strip is straight. Bend it. Now it has a corner. It is still cardboard.

Bend gently. Do not snap the strip.

Twist

Fabric is the material we make clothes from.

Twist

twist



a strip of fabric



The ends turn different ways.

Twist: hold the ends and turn them different ways.

The fabric changed shape. It is still fabric.

A strip of fabric. The two ends turn different ways, so the strip twists.

To **twist** means to hold the ends and turn them different ways. The fabric changed shape. It is still fabric.

Stretch

A **rubber band** is rubber in a circle. We put it around things.

Stretch

stretch



short



long

Stretch: pull it to make it longer.

Stretch gently. The band is still rubber.

A rubber band. Arrows pull out at each end, and the band gets long.

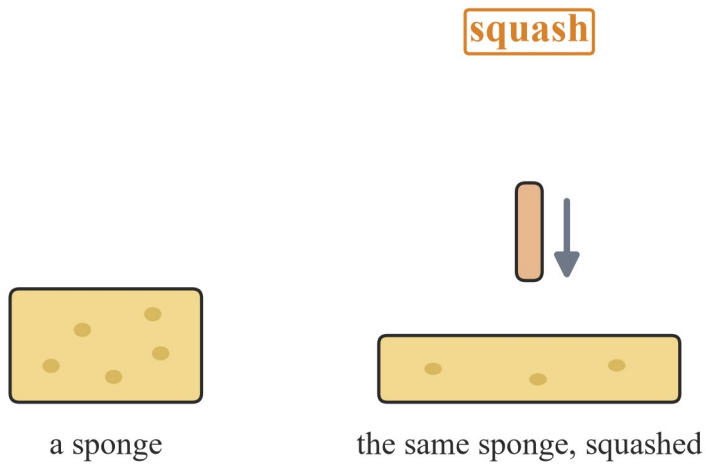
To **stretch** means to pull a thing to make it longer. Stretch the band gently. It gets long. It is still rubber.

Stretch gently. Let go slowly, not fast.

Squash

A **sponge** is a soft thing we use for washing.

Squash



Squash: press it to change its shape.

The sponge changed shape. It is still sponge.

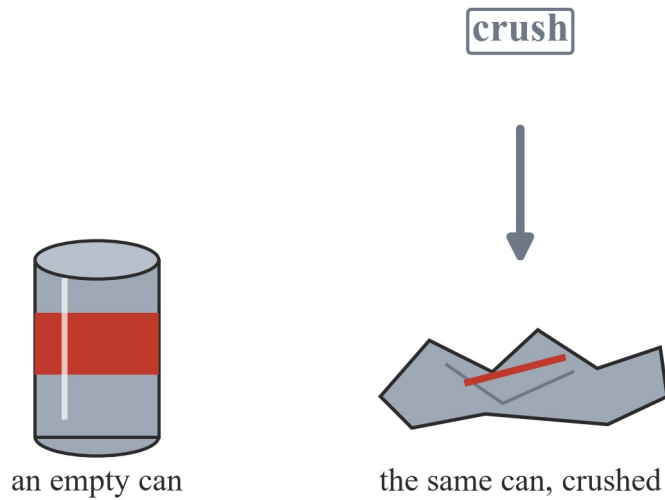
A sponge, and the same sponge pressed flat.

To **squash** means to press a thing to change its shape. Squash the sponge. It changed shape. It is still sponge.

Crush

A **can** holds drinks. A can with nothing in it is an empty can.

Crush



Crush: press very hard.

The can changed shape. It is still metal.

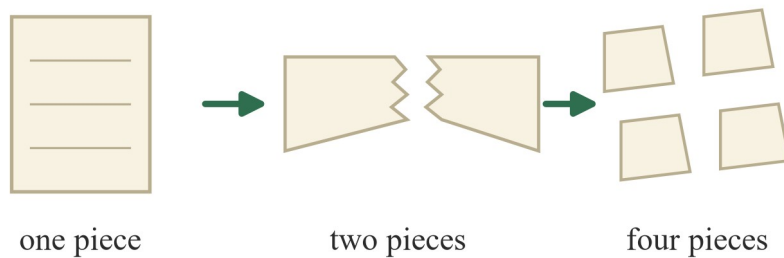
An empty drink can, and the same can pressed flat and bumpy.

To **crush** means to press a thing very hard. Crush the can. It changed shape. It is still metal.

Only the teacher crushes the can. A can can be sharp.

Break into smaller pieces

break



Break: tear it into smaller pieces.

The pieces are smaller. They are still paper.

One piece of paper, then the paper in two pieces, then in four pieces.

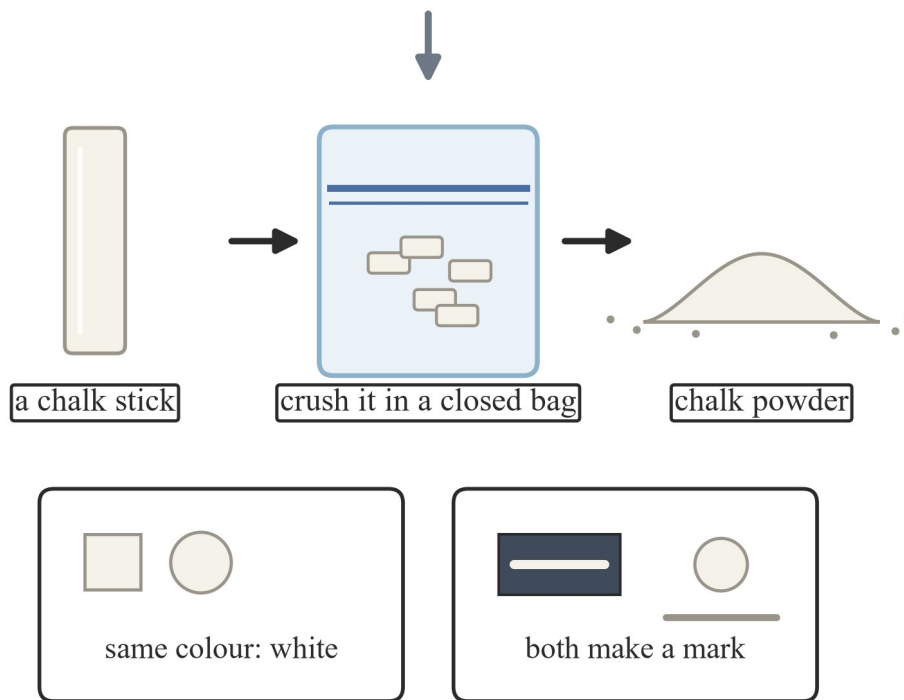
To **tear** means to pull a thing into pieces. Tear the paper. One piece becomes two. Tear again. Now four pieces. The pieces are smaller. They are still paper.

We can cut paper too. To **cut** means to make pieces with scissors. Scissors are sharp. Only the teacher handles the scissors.

Chalk: is the powder still chalk?

Chalk is a soft, white material. We draw with it on a board.

Chalk: from a stick to powder



Is the powder still chalk? Yes. It is the same material.

A chalk stick, then chalk pieces in a closed bag being pressed, then chalk powder. Two cards show: the stick and the powder are the same colour, and both make a mark.

We put the chalk stick in a bag. We close the bag. We crush the chalk in the bag. The chalk becomes **powder**. Powder is lots of very small bits, like dust.

Is the powder still chalk? We look:

- Same colour. The stick is white. The powder is white.
- Both make a **mark**. A mark is what chalk leaves when we rub it. The stick makes a mark. The powder makes a mark.

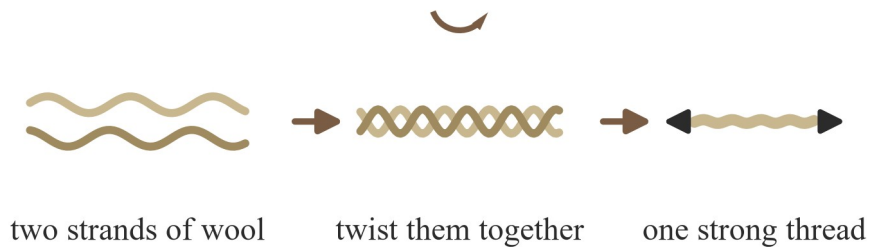
The powder is still chalk. It is the same material. Crushing changed the size of the bits. It did not change the material.

Do not open the bag. Do not breathe the powder. Never put materials in your mouth. Wash your hands after.

Twist makes a strong thread

A **strand** is one long, thin bit of wool. A **thread** is a long, thin string.

Twisting makes a strong thread



A thread is a long, thin string.

The twist changed the strands. They are still wool. Now they are strong.

Two strands of wool, then the strands twisted together, then one strong thread with arrows pulling at each end.

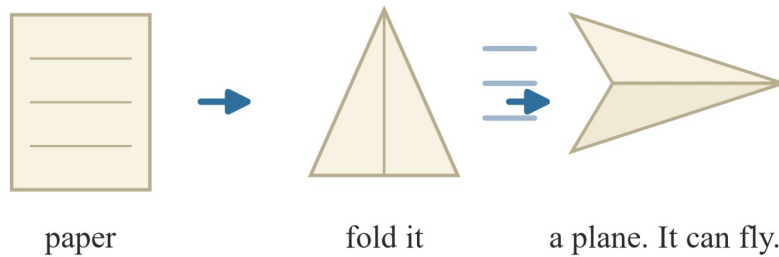
We take two strands of wool. We twist them together. They make one thread. The thread is **strong**. Strong means it does not break when we pull.

The twist changed the strands. They are still wool. Now they are strong. That is why we twist wool to make thread.

Fold paper to make it fly

To **fold** means to bend paper over on itself. A fold is a bend.

Fold paper to make it fly



A fold is a bend. Folding changed the shape of the paper.

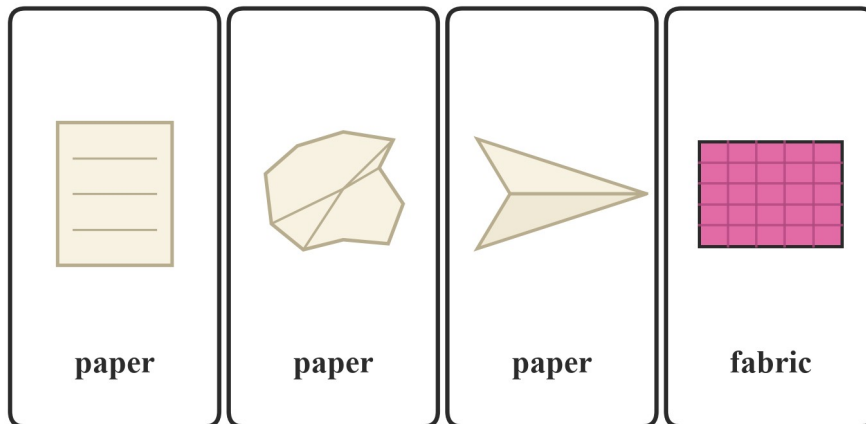
The plane is still paper.

Paper, then the paper folded into a triangle, then a paper plane with lines that show it can fly.

We fold the paper. We make a **plane**. A plane is a paper thing we fold, so it can fly.

The plane can fly. Folding changed the shape of the paper. The plane is still paper.

Odd one out



Three are the same material. One is different.

Which one is the odd one out? Point to it. Say why.

Four cards: three show paper and one shows fabric.

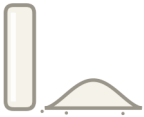
Three are the same material. One is different. The **odd one out** is the one that is different. Here it is the fabric.

Play the game with a partner. Put out three things of one material and one thing of another material. Your partner points to the odd one out and says why.

Record the changes

To **record** means to put it down, so we remember.

Record the changes

material	what we did	changed?	same material?
	fold	✓	✓
	squash	✓	✓
	crush	✓	✓

Every one changed. Every one is still the same material.

A table. It shows paper with fold, sponge with squash and chalk with crush. Each one changed, and each one is still the same material.

We do each one. We say: did it change? Is it still the same material? Then we record it in the table.

- Fold the paper. It changed. It is still paper.
- Squash the sponge. It changed. It is still sponge.
- Crush the chalk in the bag. It changed. It is still chalk.

Every one changed. Every one is still the same material.

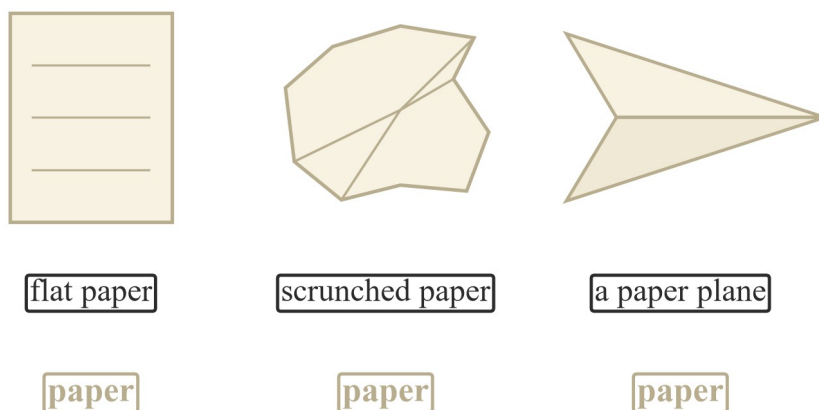
Worked examples

Do these with the teacher. Use what you can see here.

Worked example 1 — changed, but the same material

Look at the flat paper, the scrunched paper and the plane.

Changed — but still the same material



They look different. They are all paper. The material stayed the same.

Three pictures: flat paper, crumpled paper and a paper plane. They look different, but each one has the same word under it: paper.

Working

Say why

Point to the flat paper. It is paper.

Paper is the material.

Point to the crumpled paper. It looks different.

Crumpling changed how it looks.

It is still paper.

The material stayed the same.

Point to the plane. It is still paper.

Folding changed the shape, not the material.

∴ All three changed. All three are still paper. The material stayed the same.

Worked example 2 — which action is it?

I press the sponge. It changes shape. Which action is this?

Working

Say why

I press the sponge.

To press a thing to change its shape is to squash it.

The sponge changed shape.

Squash changes how a thing looks.

It is still sponge.

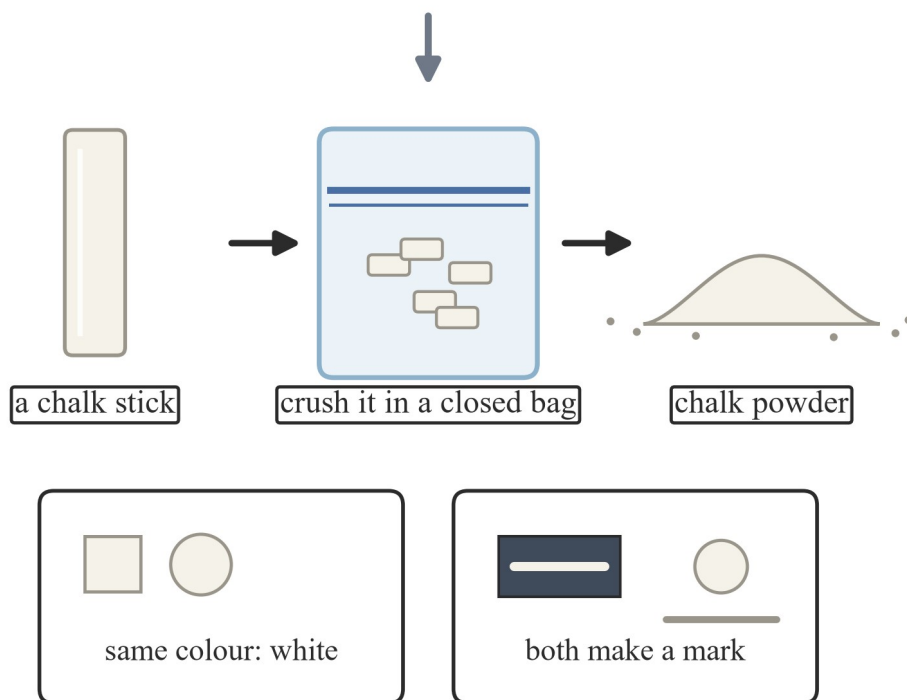
The material stayed the same.

∴ The action is squash. The sponge is still sponge.

Worked example 3 — is the powder still chalk?

We crush a chalk stick in a closed bag. It becomes powder.

Chalk: from a stick to powder



Is the powder still chalk? Yes. It is the same material.

A chalk stick, then chalk pieces in a closed bag being pressed, then chalk powder. Two cards show: the stick and the powder are the same colour, and both make a mark.

Working

Say why

The stick is white. The powder is white.

Same colour.

The stick makes a mark. The powder makes a mark.

Same mark.

Same colour and same mark.

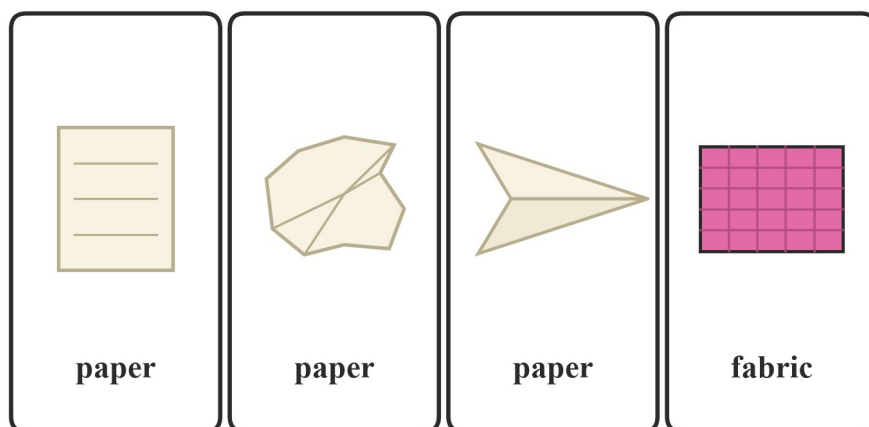
It is the same material.

∴ Yes. The powder is still chalk. Crushing changed the size of the bits. It did not change the material.

Worked example 4 — odd one out

Look at the four cards.

Odd one out



Three are the same material. One is different.

Which one is the odd one out? Point to it. Say why.

Four cards: three show paper and one shows fabric.

Working

Say why

Three cards show paper.

Three are the same material.

One card shows fabric.

One is different.

Point to the fabric.

It is the odd one out.

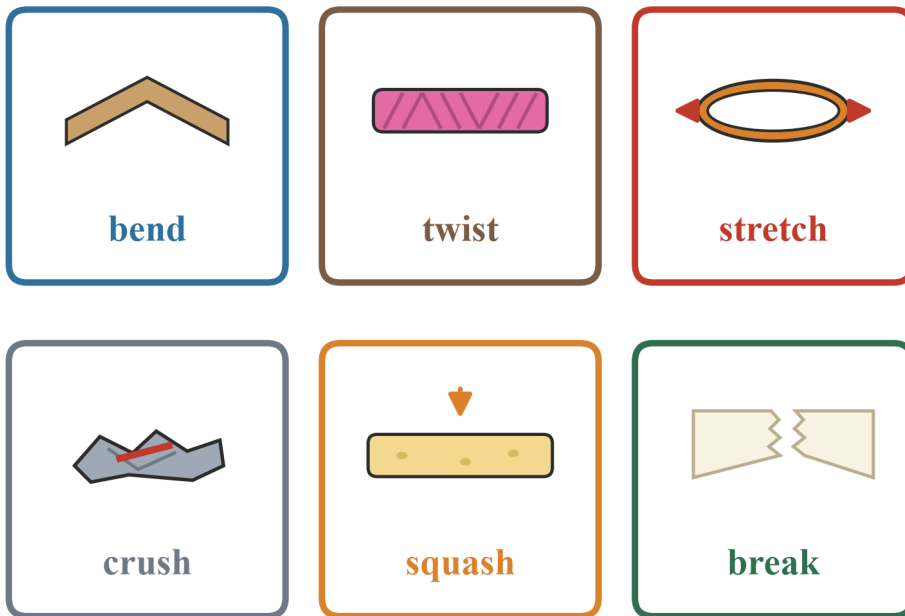
$\therefore$ The fabric is the odd one out. The other three are paper.

Practice questions

The teacher reads all the words. The child says or does the answer. The teacher puts the answer down.

Q1. (Foundation) Look at the six action cards.

Six actions that change materials



Each action changes how a material looks. The material stays the same.

Six cards, one for each action: bend, twist, stretch, crush, squash and break.

- Point to the card for stretch.
- Point to the card for twist.
- Say two actions.

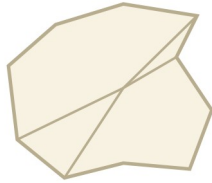
Q2. *(Foundation)* Look at the paper that changed.

Changed — but still the same material



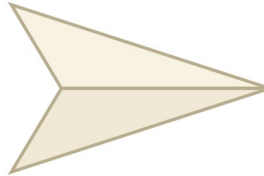
flat paper

paper



scrunched paper

paper



a paper plane

paper

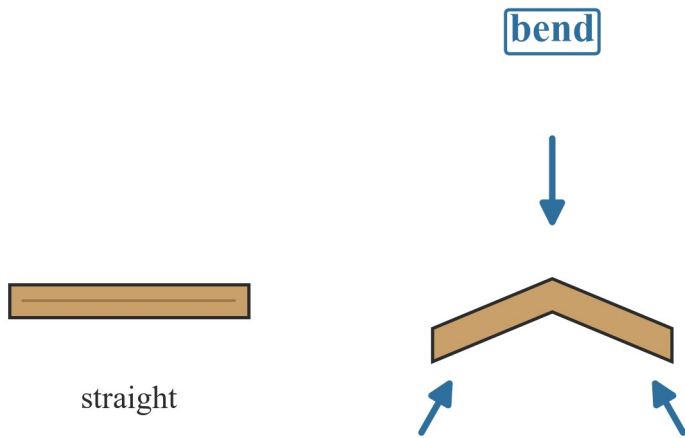
They look different. They are all paper. The material stayed the same.

Three pictures: flat paper, scrunched paper and a paper plane. They look different, but each one has the same word under it: paper.

- Point to the scrunched paper.
- Say the material of all three.

Q3. (Foundation) Look at the bend picture.

Bend



This strip is straight.

Bend it. Now it has a corner.

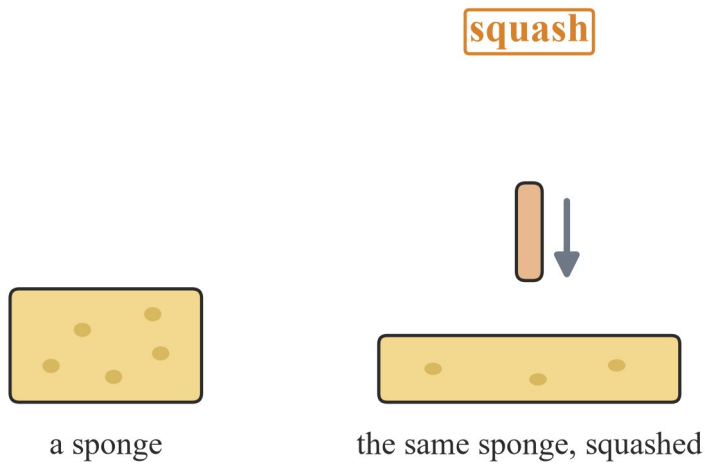
Bend: push one way to make it not straight. It is still cardboard.

A cardboard strip that is straight, and the same strip after a bend, with a corner.

- Point to the strip that is straight.
- Point to the strip with a corner.
- Say the material of the strip.

Q4. (Foundation) Look at the sponge.

Squash



Squash: press it to change its shape.

The sponge changed shape. It is still sponge.

A sponge, and the same sponge pressed flat.

- Point to the squashed sponge.
- Is it still sponge? Say yes or no.

Q5. (Level 1) Say the action.

- A rubber band gets long. Which action?
- A can is pressed very hard. Which action?
- Paper is in two pieces after a tear. Which action?

Q6. (Level 1) Circle the action.

I hold the ends of a strip of fabric. I turn them different ways.

bend · twist · stretch

Q7. (Level 1) Circle the action.

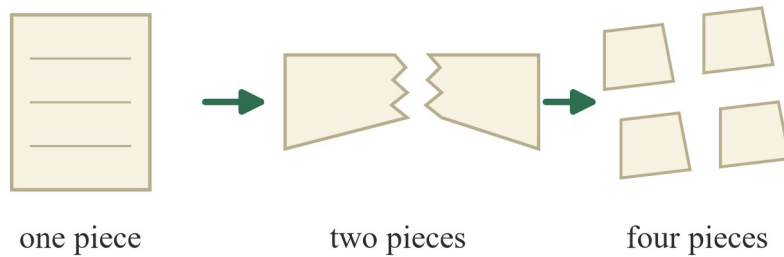
I press the sponge. It changes shape.

squash · stretch · break

Q8. (Level 1) Look at the paper in pieces.

Break into smaller pieces

break



Break: tear it into smaller pieces.

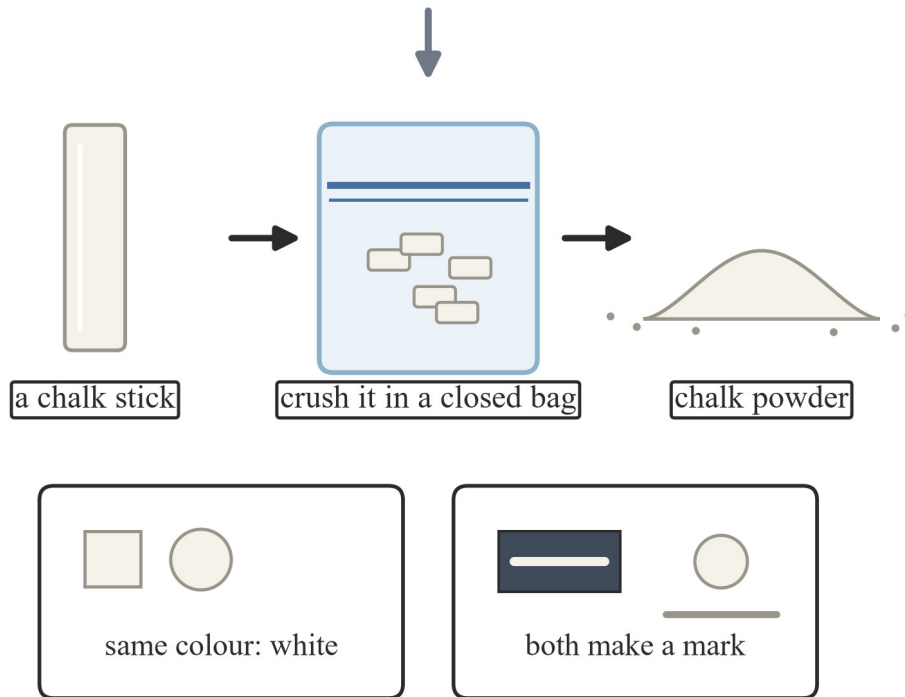
The pieces are smaller. They are still paper.

One piece of paper, then the paper in two pieces, then in four pieces.

- Say how many pieces at the end.
- Are the pieces still paper? Say yes or no.

Q9. *(Level 2)* Look at the chalk.

Chalk: from a stick to powder



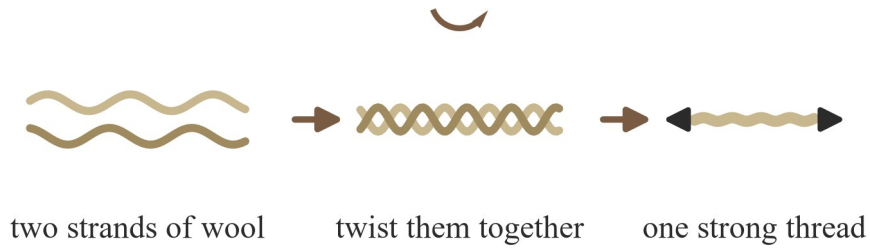
Is the powder still chalk? Yes. It is the same material.

A chalk stick, then chalk pieces in a closed bag being pressed, then chalk powder. Two cards show: the stick and the powder are the same colour, and both make a mark.

- Say what we did to the chalk stick.
- Is the powder still chalk? Say one way we know.

Q10. (Level 2) Look at the wool.

Twisting makes a strong thread



A thread is a long, thin string.

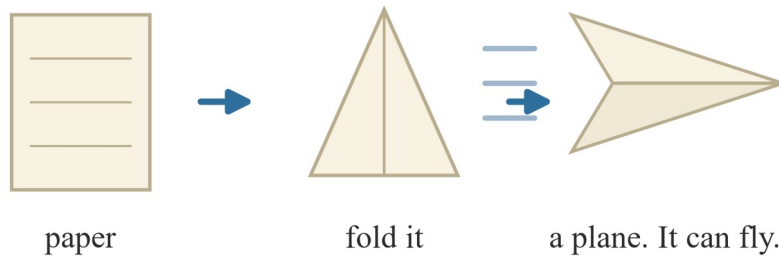
The twist changed the strands. They are still wool. Now they are strong.

Two strands of wool, then the strands twisted together, then one strong thread with arrows pulling at each end.

- Say what the strands are at the start.
- Say why we twist the strands.

Q11. *(Level 2)* Look at the plane.

Fold paper to make it fly



A fold is a bend. Folding changed the shape of the paper.

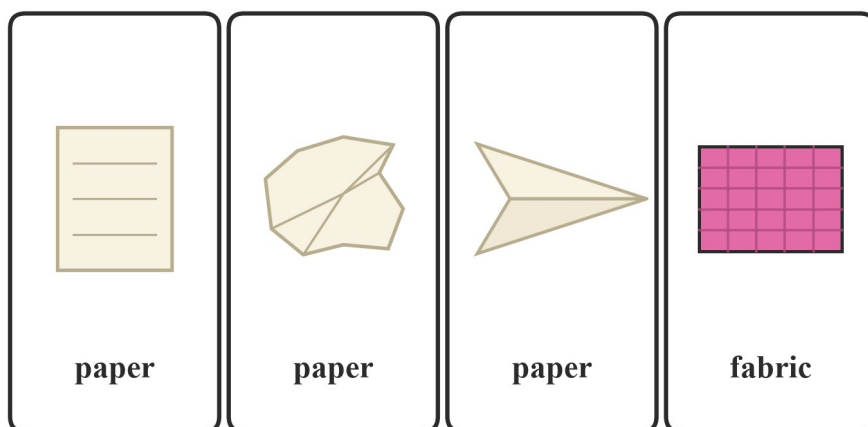
The plane is still paper.

Paper, then the paper folded into a triangle, then a paper plane with lines that show it can fly.

- A fold is which other action?
- Is the plane still paper? Say yes or no.

Q12. (Level 2) Play odd one out with the cards.

Odd one out



Three are the same material. One is different.

Which one is the odd one out? Point to it. Say why.

Four cards: three show paper and one shows fabric.

- Point to the odd one out.
- Say why it is the odd one out.

Answers

Q1. a. the card with the rubber band b. the card with the fabric strip c. any two of: bend, twist, stretch, crush, squash, break.

Q2. a. the middle one b. paper.

Q3. a. the first strip b. the one with a corner c. cardboard.

Q4. a. the flat, pressed one b. yes.

Q5. a. stretch b. crush c. break.

Q6. twist.

Q7. squash.

Q8. a. four b. yes.

Q9. a. crush (we crushed it in a closed bag) b. yes — it is the same colour (white), or it makes a mark. (any one)

Q10. a. wool b. to make one strong thread.

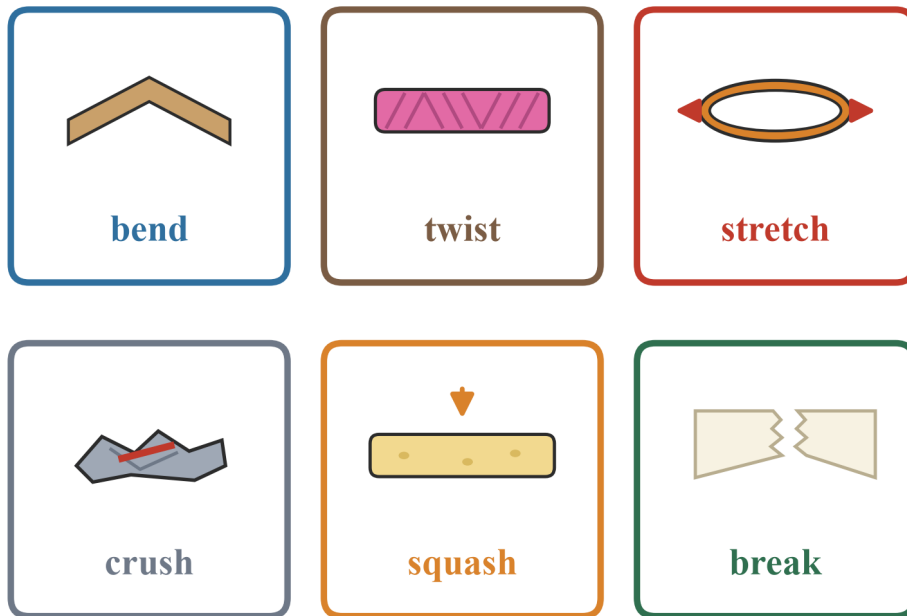
Q11. a. bend b. yes.

Q12. a. the fabric b. the other three are paper, and the fabric is a different material.

Fully-worked solutions

Q1.

Six actions that change materials



Each action changes how a material looks. The material stays the same.

Six cards, one for each action: bend, twist, stretch, crush, squash and break.

- Stretch is the card with the rubber band. The arrows pull out.
- Twist is the card with the fabric strip. The ends turn different ways.
- Say any two: bend, twist, stretch, crush, squash, break.

∴ Each card shows one action.

Q2.

- The scrunched paper is the middle one. Point to it.
- All three are paper.

∴ They look different. They are all paper.

Q3.

- The first strip is straight. Point to it.
- The strip with a corner is after the bend. Point to it.
- The strip is cardboard.

∴ Straight first, a corner after the bend. Still cardboard.

Q4.

- The squashed sponge is the flat one. Point to it.
- Yes. It is still sponge.

∴ Squashing changed the shape. The material stayed the same.

Q5.

- a. The band gets long, so the action is stretch.
- b. The can is pressed very hard, so the action is crush.
- c. The paper is in pieces after a tear, so the action is break.

∴ a. stretch b. crush c. break.

Q6.

I hold the ends and turn them different ways. That is twist.

∴ Circle twist.

Q7.

I press the sponge to change its shape. That is squash.

∴ Circle squash.

Q8.

- a. At the end there are four pieces.
- b. Yes. The pieces are still paper.

∴ Four pieces, all paper.

Q9.

- a. We crushed the chalk stick in a closed bag.
- b. Yes. The powder is the same colour as the stick (white), and the powder makes a mark like the stick. (any one)

∴ The powder is still chalk.

Q10.

- a. The strands are wool at the start.
- b. We twist them to make one strong thread.

∴ Wool strands, twisted into one strong thread.

Q11.

- a. A fold is a bend.
- b. Yes. The plane is still paper.

∴ A fold is a bend. The plane is still paper.

Q12.

- a. The fabric is the odd one out. Point to it.
- b. The other three are paper. The fabric is a different material.

∴ The fabric is the odd one out. The other three are paper.