# Year 2 Science lessons pack

## Why should we reduce, reuse and recycle?

The Harmony Project

# Year 2

## Science lessons pack

ENQUIRY QUESTION

**Why should we reduce, reuse and recycle?**

LINKED HARMONY PRINCIPLE

**The principle of the Cycle**

The six lesson plans in this pack can be used to deliver the science content for the Year 2 enquiry of learning *Why should we reduce, reuse and recycle?*, linked to the principle of the Cycle. This science learning builds on the foundations of the National Curriculum statutory requirements relating to the uses of everyday materials.

**‘We need to use the things our world gives us carefully.’**

Each lesson plan includes opportunities to refer to the children’s prior learning, as well as questions to use to reflect on current learning and to assess the children’s developing knowledge and understanding. In addition, lessons feature key elements that are distinctive to the Harmony approach to teaching and learning, for example: opportunities to **learn about Nature,** to **learn in Nature** and to **learn from Nature.**

A summary of each of these elements in relation to the six lesson plans in this pack is set out on the next pages.

The Harmony Project

# 01 - Learning about Nature

The statutory requirements of the National Curriculum set out what children need to learn about Nature – although, of course, their wider learning about Nature will extend beyond this.

As children progress through their primary education, we can map the journey that their science learning about materials takes. By understanding their prior learning about materials in the EYFS and Year 1, and by looking ahead to the path their learning about materials will take in Years 3 to 6, we are better able to plan for progression.

The table below shows where the science learning about the uses of everyday materials covered in the lesson plans in this pack sits within this journey.

| | EYFS | Year 1 | Year 2 | Year 2 | Year 4 | Year 5 | Year 5 |
|---|---|---|---|---|---|---|---|
| ENQUIRY | **Understanding the world** | **What stories could our toys and games tell?** | **Why should we change the way we travel?** | **Why should we reduce, reuse and recycle?** | **What journey does our river take?** | **How can I be a sustainability champion?** | **How can we ensure our seas and oceans stay amazing?** |
| SUMMARY OF LEARNING | Children will be guided to increase their knowledge and sense of the ecologically diverse world around them. They will explore everyday objects through hands-on, engaging, multi-sensory experiences, learning more about the materials that objects are made from and their properties and uses. They will begin to recognise that some materials are natural and some are made by people | Children will distinguish between an object and the material from which it is made; identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. They will be able to describe, compare and group together a variety of everyday materials on the basis of their simple physical properties | Children will identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses | Children will continue to explore the suitability of a variety of everyday materials for particular purposes, with a specific focus on the sustainable use of materials.<br><br>Within this context, children will also find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching | Children will compare solids, liquids and gases; decide how mixtures might be separated; learn that some materials will dissolve to form a solution; describe how to recover a substance from a solution; observe how materials change state when heated or cooled; explain the part played by condensation and evaporation in the water cycle; and describe dissolving, mixing and changes of state as reversible changes | Children will consolidate their knowledge of everyday materials on the basis of their properties. They will explore that some changes result in the formation of new materials and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda | Children will compare and group together everyday materials on the basis of their properties and give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic |
| KEY VOCABULARY | object, material, natural, made by people, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card, cardboard, clay, rubber, wool, cotton | properties, hard, soft, stretchy, stiff, bendy, breakable, tearable, rough, smooth, shiny, dull, transparent, weak, strong, long-lasting, waterproof | absorbent, opaque, made by people, rigid, flexible, reflective, translucent, durable, reflective, (un)suitable, elastic, malleable, foam, leather, canvas, synthetic, bamboo | reduce, reuse, recycle, repurpose, source, extract, fell, gather, harvest, finite, renewable, single use, environmental impact, packaging, squash, bend, twist, stretch, expand, contract, compostable | solid, liquid, gas, change of state, melt, freeze, boil, condensation, evaporation, mixture, temperature, dissolve, solution, (in)soluble, filter, sieve, (ir)reversible, water cycle | thermal, electrical, insulator, conductor, (ir)reversible change, burning, rusting, new material | (non) biodegradable, pollution, lightweight, solubility, substance, buoyancy, flexibility |

The table below sets out what the children's learning about everyday materials looks like over the course of the six lessons.

| Week 1 | Week 2 | Week 3 |
|---|---|---|
| **Why do we need to use materials carefully?** | **Why do we use different materials to make different things?** | **What are stretchy materials useful for and how can we make better use of them?** |
| Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses; find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching |

| Week 4 | Week 5 | Week 6 |
|---|---|---|
| **How can we change the shape of materials and why is this useful?** | **What materials can we recycle where we live?** | **Why are scientists creating new materials?** |
| Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses; find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses |

# 02 - Learning in Nature

In addition to learning about Nature, a Harmony approach also provides suggestions for rich opportunities to learn in or alongside Nature, as the six science lessons in this pack demonstrate.

For example, the children will explore a range of materials and their sources, including those that originate from Nature, how we can find many examples of reusing and repurposing in the natural world (such as the hermit crab's reuse of abandoned shells and a robin gathering and repurposing nesting materials), the design inspiration that can be drawn from close observation of the silk in a spider's web and opportunities to observe Nature as our 'no waste' teacher.

As they learn in Nature, the children will also experience opportunities to develop their skills in working scientifically. Although these skills will be developed incrementally over time (as shown in Appendix A), the coverage of these skills within the sequence of these six lessons is set out below.

| Week 1 | Week 2 | Week 3 |
|---|---|---|
| **Why do we need to use materials carefully?** | **Why do we use different materials to make different things?** | **What are stretchy materials useful for and how can we make better use of them?** |
| Identifying and classifying; asking simple questions and recognising that they can be answered in different ways | Observing closely, using simple equipment | Performing simple tests |
| Scientific enquiry type: Identifying, classifying and grouping; research using secondary sources | Scientific enquiry type: Identifying, classifying and grouping | Scientific enquiry type: Comparative and fair testing |
| **Week 4** | **Week 5** | **Week 6** |
| **How can we change the shape of materials and why is this useful?** | **What materials can we recycle where we live?** | **Why are scientists creating new materials?** |
| Observing closely, using simple equipment; performing simple tests | Identifying and classifying | Performing simple tests |
| Scientific enquiry type: Comparative and fair testing | Scientific enquiry type: Identifying, classifying and grouping | Scientific enquiry type: Comparative and fair testing |

**Working scientifically vocabulary**

- method
- present
- compare
- fair test
- trends

# 03 - Learning from Nature

The third key element of a Harmony approach to learning is learning from Nature, which is linked to progression in understanding of Harmony principles. This aspect of learning supports the development of children's understanding of what it means to live sustainably.

The six lessons in this pack and the wider enquiry they are part of are underpinned by the principle of the Cycle; they build on children's prior learning in the EYFS and Year 1 and prepare them for further learning in Years 3 to 6.

The children's progression in their understanding of the principle of the Cycle, through enquiries of learning that help us to think and live more sustainably, is shown below.

| | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|---|---|
| ENQUIRY | Children are introduced to opportunities to explore and develop their initial knowledge and understanding about cycles (when leaves fall from trees, when day turns to night, what we notice around us in each season, life cycles) | **Which is my favourite wildflower and why?** | **Why should we reduce, reuse and recycle?** | **How can we identify native trees in autumn?** | **What journey does our river take?** | **What are the cycles of our solar system?** | **Where do migratory animals travel to and from and why?** |
| PROGRESSION: CONCEPT OF THE CYCLE | | Why is it important to have wildflowers? | What can we do to reduce the amount of waste we produce? | What is the life cycle of a tree? | How does the water cycle work and why is this cycle so important? | How many different cycles can you think of in the solar system? | Why are cycles of migration important to the survival of different species? |
| THINKING SUSTAINABLY | | How can we increase the number of wildflowers? | What happens if we don't recycle our packaging and waste? | What role do trees play in maintaining soil health and supporting other living things? | What can we do to keep our rivers healthy? | What are the benefits of solar energy? Are there any problems? | How could we reduce human threats to the cycles of migration? |
| THINKING SUSTAINABLY VOCABULARY | life cycle<br>season<br>pattern<br>rhythm<br>routine | growth<br>rest<br>cycle<br>seeds<br>habitat | waste<br>recycle<br>reuse<br>reduce<br>consume | abundance<br>decline<br>restore<br>regenerate<br>self-sustain<br>decay | responsibility<br>finite resources<br>solution<br>replicate<br>drought<br>flood | cyclical<br>sustainable<br>pollution<br>fuel<br>harness | agency<br>impact<br>circular economy<br>conserve<br>harness |

Lesson **01**

**Enquiry question:**
**Why should we reduce, reuse and recycle?**

**Harmony principle:**
**The principle of the Cycle**

# Why do we need to use materials carefully?

## NC Links

**Uses of everyday materials**
Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses

**Working scientifically:**
Identifying and classifying; asking simple questions and recognising that they can be answered in different ways

**Scientific enquiry type:**
Identifying, classifying and grouping; research using secondary sources

## Key vocabulary

Vocabulary relating to uses of everyday materials, working scientifically and thinking sustainably is highlighted within the unit introduction.

## You will need

Selection of objects made from materials including wood, metal, plastic, glass, paper/cardboard, rock and brick. Ensure the selection includes two or more examples that show how different materials can be used to make the same object e.g. plastic spoon, metal spoon, wooden spoon
(you will use these objects again in Lesson 3)

Whiteboards and pens

Clipboards

Copies of Resource 1A
(one per pair)

Skipping ropes

## Adapt the learning

Children requiring additional support may benefit from exploring the factsheet as a guided reading activity prior to the lesson.

Challenge the children to return to the objects that were explored at the start of the lesson and, using individual whiteboards, sort these objects into those that are made from finite materials and those that are made from renewable materials. Ask: *Do any belong in both groups?*

## Link the learning

**CLIMATE ACTION PLAN:**
Adaptation and resilience; Biodiversity and Nature

## What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by sharing with them a selection of objects made from wood, metal, plastic, glass, paper/cardboard, rock and brick.

Include several objects made from different materials, for example, a plastic fork, metal fork and wooden fork, and/or a paper bag, plastic bag and a fabric bag, alongside some objects made from more than one material, such as a pencil.

In pairs, children play a game of 'Link 3', choosing three objects to group together and explaining their reasoning.

Children may decide to group objects according to the material from which they are made e.g. *'These three objects are all made from plastic'*, the properties of materials e.g. *'These three objects are all made from materials that are hard'* or whether the objects are made from natural materials or from materials that were made by people. Questioning can be adapted to explore children's prior knowledge about each of these areas, depending on their initial responses.

Share ideas with the class and address any misconceptions.

## What are we learning today?

Begin the children's **learning about Nature** with reference to materials by taking the class outside to **learn in Nature** or in an open space.

Share with the class the selection of objects made from different materials (see 'You will need', left). In small groups, the children discuss what they think the different items are made from before sharing their ideas with the class. Address any misconceptions that might arise. Ask the children: *How could we sort these objects by the materials they are made from?* The children discuss their thinking in small groups and record their ideas on whiteboards.

Using suggestions from the children, sort the objects by the materials they are made from and discuss the outcomes by asking: *How many things are made from metal? Plastic? Wood? Why is this material suitable for making all these different things?* Establish that the same material can be used to make lots of different objects.

Ask: *Did any object appear in more than one group?* Establish that different materials can be used to make the same object (e.g. plastic, wooden or metal spoon; plastic or metal water bottle).

Challenge the children to find at least one other example of an object that they could add to each group.

Take a photo of the outcome of the sorting activity to refer to in Lessons 2 and 3.

With reference to the materials represented in the selection of objects, ask: *Where do these materials come from? What questions might we ask to find out?*

In pairs, the children discuss what questions they would like to ask to find out more about where the materials used to make these objects come from (e.g. Which of these materials are made by people? Are all materials natural materials? Is wood the only material that comes from a plant?). Record these as a class list.

## How are we learning today?

Introduce the factsheet on Resource 1A. Focusing either on the first section of the factsheet, or on one of the questions recorded on the class list, model how to highlight key information in the text.

Working in pairs, the children read and highlight information in the rest of the factsheet that would help them answer their questions about where materials from. You could give different children specific materials to research and report back to the class on.

As a class, discuss what the children have found out and how they could use this information to answer the questions they posed at the start of the lesson. In discussion, draw out the fact that some materials come straight from natural sources (e.g. wood, bamboo, cotton, rock) and that some materials are made by people using ingredients derived from natural sources (e.g. plastic from oil and gas, paper from wood from trees).

Ask the children: *Do you think some materials are more harmful to our planet than others? Which ones? Why?*

Use questioning to explore the environmental pros and cons of different materials. You might discuss how extracting oil and gas from underground

to make plastic, or extracting rocks from underground to make metal, can be harmful to the environment. You might also discuss how chopping down trees for wood can be harmful to the environment because it destroys forests but that forests can be looked after by limiting the number of trees that are felled and planting new ones. Bamboo can be harvested without chopping down the whole plant, but clearing land and destroying habitats to create new bamboo farms is environmentally damaging.

Ask the children: *Which materials might run out if we used too much of them?* (e.g. rocks, oil and gas). Establish that we describe these things as being finite. Ask: *Which materials won't run out if we use them carefully because they can grow again?* (e.g. wood, bamboo, rubber, wool). Establish that we describe these things as being renewable.

**TEACHER TIP:**
The key vocabulary from the factsheet can be added to the class learning wall.

**TIME TO EXPLAIN:**
In small groups, the children use whiteboards and a skipping rope to create a simple scale with 'harmful for the planet' at one end and 'better for the planet' at the other. Focusing on one material from the factsheet at a time, they decide where on the scale they would place it, giving reasons for their thinking.

**STEM SENTENCES:**
_____ comes from _____
It is a useful material because
_____
It is harmful/better for the planet because
_____

To consolidate the children's understanding of renewable materials, watch the Maddie Moate short film How is cork made?, which explores how cork is harvested in a responsible way that allows cork oak trees to carry on growing. You might ask the children: *How often is the cork harvested from the tree?* (e.g. every nine years) *Why do the farmers have to be careful not to cut too deep into the tree?* (e.g. so they don't damage the tree)

**TEACHER TIP:**
Independent certification scheme logos can help us all make more informed choices about the things we buy based on the sustainability of the materials they are made from. Forest Stewardship Council (FSC) accreditation certifies that wood and paper products come from forests managed to defined environmental, social and economic standards.

## What have we learned today?

Reflect on the children's learning by returning to the selection of objects the children explored at the start of the lesson. Hold up one object at a time and invite the children to identify the material it is made from, say why the material is useful and explain where it comes from. Challenge them to comment on the environmental impact of growing, gathering or extracting this material, giving reasons for their thinking.

Draw out the **learning from Nature** and the link between this learning and the **principle of the Cycle** by asking: *Why do we need to use materials carefully?* (e.g. because most materials have an environmental impact of some sort so we need to make sure we only use what we need) *How can we make better use of the things we get from our world?* (e.g. by buying new things only when we need them, by using the things we have for as long as possible)

Resource 1A

# Where do our materials come from?

Everything around us is made from a material. Some materials come from living things, such as plants and animals. Other materials come from non-living things, such as rocks and sand. Let's find out more about where some materials come from.

## Materials from living things

We use **wood** to make buildings, furniture and small things like pencils. We get wood by cutting down trees, but this can mean that plants and animals lose their habitats. It's important that we don't cut down too many trees and that we plant new trees to replace them. **Paper** is a useful material that we make from wood from trees.

**Rubber** is another material that comes from trees, but we don't have to cut the trees down to get it. We get rubber by draining liquid from rubber trees and the trees make more. We use rubber to make elastic bands, tyres and wellies.

**Bamboo** is a strong material that comes from plants. We can harvest bamboo without chopping down the whole plant and it grows again quickly. If land is cleared to plant lots of bamboo or rubber trees, plants and animals can lose their habitats.

We use **cotton** to make lots of things, such as clothes, bed sheets and towels. Cotton comes from a plant. It's a useful material, but cotton plants need lots of water to grow, which can leave less water for animals and plants nearby. We use **wool** to make clothes, too. It comes from animals such as sheep. Sheep grow a new woolly coat every year.

## Materials from non-living things

**Rock** is strong, so we use it to build with. Rock has to be dug out of the ground. This can disturb animals and plants that live nearby. Some rocks have **metals** inside them, which we use to make lots of things, from cutlery to cars. Getting the metal out of rocks uses up lots of water and can pollute streams and rivers.

We use lots of **plastic** to make many different things. Plastic is made from oil, coal and gas from deep underground. Getting these things out of the ground damages our planet.

Believe it or not, **glass** is made from sand! To make glass, the sand has to be heated until it's very hot. This uses lots of energy and can be harmful for our planet. When we've finished with glass bottles and jars, they can be melted down so the glass can be reused again and again.

Lesson

# 02

**Enquiry question:**
**Why should we reduce, reuse and recycle?**

**Harmony principle:**
**The principle of the Cycle**

# Why do we use different materials to make different things?

NC Links

**Uses of everyday materials**
Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses

**Working scientifically:** Observing closely, using simple equipment

**Scientific enquiry type:**
Identifying, classifying and grouping

Key vocabulary

Vocabulary relating to uses of everyday materials, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

A selection of metal spoons, wooden spoons and plastic spoons (one set per group)

Copies of Resource 2A (for children requiring support)

Samples of cotton wool, rubber (a rubber band, snipped, would do) and paper or cardboard (one set per group)

Trays

Sets of objects that can be made from different materials – see main lesson content for examples (one set per group)

Adapt the learning

Children requiring additional support may benefit from exploring the vocabulary list on Resource 2A with an adult prior to the lesson and securing their understanding of the meanings of these words

Challenge the children to think of other single use things. Ask: *Could we replace these with reusable things?*

Link the learning

**CLIMATE ACTION PLAN:**
Adaptation and resilience; Biodiversity and Nature

## What do we already know?

Begin the lesson by recalling the children's prior **learning about Nature** with reference to materials by playing a game of 'What if?'.

Using the group of objects from Lesson 1, challenge the children to think about each of the objects in turn and what would happen if they were made from a different material. For example, ask: *What if our sketchbooks were made from wood? What if our trays were made from glass? What if boxes were made from rock?*

Encourage the children to suggest whether the alternative material would be suitable or not and to explain their reasoning.

Allow children time to pose their own 'What if?' questions, share as a class and address any misconceptions.

## What are we learning today?

Begin the children's **learning about Nature** with reference to materials by showing them a metal spoon, a wooden spoon and a plastic spoon. Display the photo of the outcomes of the sorting activity from Lesson 1 and ask: *Which groups did we/ would we put these items into?* Draw out in the discussion the materials from which these objects are made.

Extend the children's thinking by asking: *Why do we use these materials to make spoons? What are the properties of these materials that make them suitable for making spoons?* Explain that the children will be working like scientists to make observations that will help them to answer these questions.

In small groups, the children make lists of the properties of the plastic, metal and wood used to make each spoon that make them suitable for this use, using the vocabulary list on Resource 2A for support, as needed.

Discuss what they have found as a class and record their ideas before asking: *What properties do these materials have in common?* Draw out in discussion the fact that these materials are, for example, hard, rigid, smooth, strong. Ask: *Why are these properties useful in a spoon?* (e.g. won't break in your food, isn't rough in your mouth)

Share with the children samples of cotton wool, rubber (a rubber band, snipped, would do) and paper or cardboard and allow them some time to handle them and discuss their properties. Ask: *Would these materials be good materials to make a spoon from? Can you predict why or why not?* (e.g. the cotton wool is absorbent, the rubber is too bendy, the cardboard is strong and smooth but it isn't waterproof). Record the children's predictions as a class list.

In groups, the children test the properties of the cotton wool, rubber, paper or cardboard to see if they are right (e.g. by dripping water on to the samples or by manipulating the rubber to test for flexibility). Revisit the children's predictions and see whether they still agree with them. Ask: *What would happen if…?* questions to explore the unsuitability of these materials for making spoons. For example: *What would happen if a spoon were made from cotton?*

## How are we learning today?

Share with the children other groups of objects that can be made from a range of materials and discuss the materials they are made from. For example:

- a plastic carrier bag, a paper carrier bag and a fabric shopping bag
- a single-use plastic water bottle and a metal water bottle
- clingfilm and a waxed cotton sandwich wrapper
- a plastic clothes peg and a wooden one
- a paper drinking straw and a metal one

Working in small groups, the children choose one set of items to focus on. They identify the materials these things are made from and the properties that make them suitable for this use.

They go on to identify materials that would be unsuitable to make these objects from, giving reasons for their thinking.

**TIME TO EXPLAIN:**
The children draw and label the objects they have explored to show their ideas about the properties and suitability (or unsuitability) of different materials for different uses. They present what they have found out

about the choice of materials used to make these objects to another group.

**STEM SENTENCES:**
The properties of _____ are _____
It is a useful material to make _____ because _____
_____ would be unsuitable to make _____ because _____

Introduce the children to the term 'single use' and discuss its meaning (e.g. something that is designed to be used once then thrown away). Draw their attention to any single-use objects they have explored in this lesson. Ask: *What material are most of these objects made from?* Drawing on their learning from the first lesson, ask: *Where does this material come from? If we only use it once then throw it away, what is the problem?*

Explain that replacing single-use items with reusable things we can use over and over again makes better use of materials. This is better for the planet.

**TEACHER TIP:**
The children may not be aware of recent initiatives that have been introduced to help reduce the number of single-use plastic items used in the UK. You might share with them the introduction of the charge on single-use plastic carrier bags and the more recent bans of items including single-use plastic straws, plates, cutlery and some takeaway food containers. There's a good opportunity here for the children to take on a leadership role and apply their learning in science to help reduce the amount of single-use plastic items used in the school community and beyond (e.g. in packed lunches or at school events).

## What have we learned today?

Reflect on the children's **learning about Nature** with reference to materials and assess their understanding by using the scaling activity from Lesson 1 to explore the suitability of materials for different uses. This can be set up by placing a whiteboard with 'suitable' written on it at one end of a skipping role and another with 'unsuitable' written on it at the other.

Focusing on one of the materials the children have explored during the lesson at a time, discuss as a class where on the scale the children would place it, giving reasons for their thinking.

Draw out the **learning from Nature** by displaying the images on Resource 2B of a hermit crab, a robin gathering nesting materials and caddisfly larvae.

Discuss how each of the images exemplifies how many living things reuse items they find for different purposes (e.g. the hermit crab uses shells from dead sea snails, the robin uses grass and twigs to build its nest and caddisfly larvae – found in ponds – use tiny stones, old stems and other dead organic matter to create themselves a protective case).

We can learn from these examples in Nature how to make the best use of materials by reusing them. This helps us reduce the amount of waste we produce and the amount of new materials we use.

# The properties of materials

| | | | |
|---|---|---|---|
| soft | hard | waterproof | absorbent |
| light | heavy | translucent | opaque |
| flexible | rigid | rough | smooth |
| elastic | reflective | dull | strong |
| shiny | long-lasting | natural | made by people |

## Resource 2B

Lesson

# 03

**Enquiry question:**
**Why should we reduce, reuse and recycle?**

**Harmony principle:**
**The principle of the Cycle**

# What are stretchy materials useful for and how can we make better use of them?

NC Links

**Uses of everyday materials**
Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses

Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

**Working scientifically:**
Performing simple tests

**Scientific enquiry type:**
Comparative and fair testing

Key vocabulary

Vocabulary relating to the uses of everyday materials, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

A copy of Resource 2A

The same selection of objects used in the sorting activity in Lesson 1 (in a bag)

Selection of stretchy objects, e.g. rubber band, swimming cap, washing-up gloves, swimwear, sportswear or other garments with a high elastane content (also called Lycra or spandex – check the garment's care label for this information)

Materials to test: cotton thread, a length of rubber (a snipped rubber band is ideal), a strip of paper, a wooden lolly stick, a strip of plastic (this could be cut from used, clean plastic packaging such as a bread bag)

Rulers

Scissors

Copies of Resource 3B (one per group)

Adapt the learning

Children requiring additional support may benefit from exploring the selection of stretchy objects with an adult prior to the lesson to consolidate their understanding of stretchiness

Challenge the children to consider what would happen if they carried out their test on materials of different lengths

Link the learning

**CLIMATE ACTION PLAN:**
Adaptation and resilience; Biodiversity and Nature

## What do we already know?

Begin the lesson by retrieving the children's prior learning by playing a game of 'Guess the material'.

Display the photo of the outcomes of the sorting activity from Lesson 1. Invite one child to take an object from the bag containing a selection of items made from different materials (see 'You will need', left) without the rest of the class seeing. Using the word bank on Resource 2A for support, they describe the material the object they have chosen is made from. The rest of the children try to guess the object, drawing on the photo of the selection of objects to help them.

Share ideas with the class and address any misconceptions.

## What are we learning today?

Begin the children's **learning about Nature** with reference to materials by sharing with the children the image on Resource 3A of a spider's web. Ask: *Why doesn't a spiderweb break when the spider's prey gets caught in it?* Establish that spider silk is very strong but it is also very stretchy (or elastic).

Discuss with the children what they understand by the word 'stretchy' and share a simple definition e.g. a material that becomes longer or bigger when it's pulled. Establish that materials that are stretchy are very useful for people as well as spiders!

Challenge the children to work in pairs to think of three everyday things that are stretchy. Discuss their ideas as a class before sharing with them a selection of stretchy objects (see 'You will need', left). Establish that all of these things are made from stretchy materials – or, in the case of swimwear and sportswear, a mixture of stretchy materials and other materials. With reference to these objects, ask the children: *Why do these objects need to be made from a stretchy material?* (e.g. for comfort, to hold things together securely, because they need to be able to expand)

Draw the children's attention to the rubber band. With reference to their learning in the first lesson, discuss with the children how rubber is a natural, renewable material that can be harvested from rubber trees without damaging them. The properties of rubber are so useful that people have invented new stretchy materials made from other things, such as elastane, which is used in lots of clothes, and silicone, which is used to make swimming caps and lots of other things.

## How are we learning today?

The next part of the lesson could take place outside, giving the children the opportunity to **learn in Nature** or in an open space.

Explain to the children that in this part of the lesson they will be working like scientists to carry out a simple test to find out: *Which material would be suitable to make a hair band?* Establish that the most suitable material will need to be stretchy.

Share with the children the materials they will be testing (cotton thread, a length of rubber – a snipped rubber band is ideal, a strip of paper, a wooden lolly stick, a strip of plastic – this could be cut from used, clean plastic packaging such as a bread bag) and the equipment they can use to carry out their test (a ruler, scissors).

In pairs or small groups, the children discuss how they will carry out their test to find out how stretchy these materials are.

Discuss their ideas and agree on a simple methodology (e.g. using the ruler to measure each material then see how far they can stretch it and measure its new length, then compare the 'before and after' lengths to identify the material that changed length the most).

Establish that they will need to ensure all the materials are the same length so that this is a fair test and model how to cut all the materials to the same length as the wooden lolly stick using the scissors.

The children carry out the test, recording their results on Resource 3B.

**TIME TO EXPLAIN:**
The children present and compare their results with another group and identify any trends in their data.

**STEM SENTENCES:**
_____ was the stretchiest material.
I know this because _____
It would be a good material to make
_____

Discuss what they found as a class and establish what their results reveal the most stretchy material to be. Ask: *Did all of the materials return to their original length? Did any of the materials break when you stretched them?*

Draw the children's attention to the selection of stretchy objects from the start of lesson.

Ask them: *To avoid using more materials than we need to make new things, how can we make sure these things are used for as long as possible?* (e.g. take care of clothes, pass them on to someone else when we've finished with them or repair them, make a rubber band ball to reuse rubber bands). To reduce, we can reuse!

**TEACHER TIP:**
There's a good opportunity here for the children to take on a leadership role and apply their learning in science to help promote the reuse of clothes by arranging a clothes swap or helping to run a preloved uniform sale, for example.

## What have we learned today?

Reflect on the children's **learning about Nature** and assess their understanding by showing the children the rubber band, swimming cap, sportswear and washing-up gloves one at a time. In pairs, the children discuss what makes the materials used to make these things suitable for these uses (e.g. they are stretchy – this property can be used to make clothes more comfortable, to make things fit better, to hold things securely).

Draw out the **learning from Nature** by returning to the image of the spider web on Resource 3A. Discuss with the children how things in Nature – in this case, a material – can inspire things that humans make (e.g. stretchy materials that are useful in many different ways).

## Resource 3A

Resource 3B

| material | starting length | stretched length |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Lesson

# 04

**Enquiry question:**
**Why should we reduce, reuse and recycle?**

**Harmony principle:**
**The principle of the Cycle**

# How can we change the shape of materials and why is this useful?

NC Links

**Uses of everyday materials**
Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses

**Working scientifically:** Observing closely, using simple equipment; performing simple tests

**Scientific enquiry type:**
Comparative and fair testing

## What do we already know?

Retrieve the children's learning so far about how the shape of materials can be changed by sharing with them one of the rubber bands, or a section of rubber band, that they explored and tested in Lesson 3. Ask: *How did we change the shape of this material?* Establish that they changed its shape by stretching it and recap what this means (e.g. a material that becomes longer or bigger when it's pulled).

Share ideas as a class and address any misconceptions.

## What are we learning today?

Move the children's **learning about Nature** with reference to materials on by giving each child or pair of children a blob of clay and asking: *Do you think we could stretch the clay by pulling it?* Discuss their predictions and invite them to try this for themselves before inviting them to share what they have found.

Ask the children: *How else might we change the shape of the clay?* In pairs, they discuss their ideas before sharing them with the class. Draw out in discussion that they might squash it, twist it or bend it and let the children try this out for themselves. Record these words then draw the children's attention to the word 'squash'.

Ask: *What are you doing when you squash something?* (e.g. pressing or pushing on something to make it change shape) *When you twist something?* (e.g. turning or winding the two ends of something in opposite directions) *When you bend something?* (e.g. pushing or pulling something so that it curves) In pairs or small groups, the children devise their own definition. Share and compare these as a class.

Challenge the children to think of other solid objects that can be squashed, twisted or bent to change their shape and discuss what these objects are made from. To support this discussion, share the selection of objects listed in the 'You will need' section, left, and discuss what they are made from.

Working in small groups, the children test whether one of the objects can be squashed, twisted or bent, before presenting what they have found out with the class and comparing their results.

Extend their thinking by asking: *Did all the objects return to their original shape? Why is it useful that we can squash, bend and twist objects?* (e.g. twisting a sponge means we can wring water out of it, bending foil means we can cover dishes when we cook, squashing clay means we can make models, pots and other things)

Key vocabulary

Vocabulary relating to uses of everyday materials, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Clay

Objects to explore (foam swimming aids, sponges, wooden lolly sticks or twigs, strip of foils, empty plastic bottles)

Lengths of cotton, jute or hemp twine

2.5cm-wide strips of newspaper (two strips per pair)

Adapt the learning

Children requiring additional support may benefit from a visual reminder to aid their recall of the vocabulary used when changing the shape of objects made from different materials (squashing, bending, twisting and stretching)

Challenge children to think of a way that they could test whether the repurposed newspaper is as strong as the original twine

## How are we learning?

Share with the children the lengths of twine. Once they have had a chance to observe and handle them, ask: *Do you think this twine was made by twisting, squashing or bending a material? Why?* Establish that it was made by twisting cotton/hemp/jute (depending on the type of twine shared).

Ask: *How could we work like scientists to find out how this material has been twisted to make twine?* (e.g. by untwisting or deconstructing it and observing it)

In pairs, the children untwist and deconstruct the twine, using a handheld magnifier to make careful observations as they work. Using a visualiser, you could display the twine at various stages of deconstruction, ending with a collection of fibres. Relate the fibres to the material the twine is made from.

Ask the children: *Why is this material suitable for making twine?* (e.g. because it is flexible) *What might we use twine for?* (e.g. to tie things to stakes in the growing area, for junk modelling, to wrap presents or parcels)

Discuss with the children that instead of buying new twine, we can make twine by changing the shape of old newspaper by twisting it. This means the old newspaper has a new use. Finding a new use for something in this way is called repurposing. Repurposing helps us to reduce the amount of new materials we use to make new things. Explain that the children will be using their science knowledge of twisting (and squashing!) to make twine from old newspaper.

Demonstrate how to do this by lightly scrunching then unscrunching a strip of

Link the learning

**CLIMATE ACTION PLAN:**
Adaptation and resilience; Biodiversity and Nature

newspaper (roughly 2.5cm wide). Asking a partner to hold the end of the strip you are starting from, model how to gently twist the newspaper strip, squashing it along its length as you go. If you twist a second newspaper strip, this can then be twisted with the first to make two-ply paper twine.

In pairs, the children use strips of old newspaper to make their own paper twine.

**TIME TO EXPLAIN:**
The children talk through the methodology used to make their paper twine, using words such as 'first', 'then' and 'finally'. Challenge them why being able to change the shape of the newspaper by twisting and squashing it in this way is useful (e.g. because it has allowed them to make something new from the same material).

**STEM SENTENCES:**
We changed the shape of the _____ by _____
Changing the shape of objects is useful because _____
Repurposing things means we can _____

## What have we learned today?

Reflect on the children's **learning about Nature** with reference to materials and assess their understanding by showing the children some of the objects they explored in the lesson (e.g. a blob of clay, foam swimming aids, sponges, wooden lolly sticks or twigs, strip of foil or newspaper, empty plastic bottles, twine) one at a time.

In pairs, the children discuss what they know about changing the shape of these objects by squashing, bending and twisting them.

Draw out the **learning from Nature** by sharing the image of a goldfinch and its nest on Resource 4A. Ask the children: *What do you think this bird has used to build its nest? Where did these things come from?*

Discuss how goldfinches often use soft materials like feathers, wool and even the fluff from thistle seeds to line their nests. The nests themselves aren't only made from twigs – these birds also use moss, grasses and spider silk to construct them.

Discuss how this exemplifies how many living things don't just reuse objects and materials, they find new uses for them by repurposing them. We can learn from this example in Nature how to make the best use of materials by repurposing things. This helps us reduce the amount of waste we produce and the amount of new materials we use.

## Resource 4A

Lesson **05**

**Enquiry question:**
**Why should we reduce, reuse and recycle?**

**Harmony principle:**
**The principle of the Cycle**

# What materials can we recycle where we live?

**NC Links**

**Uses of everyday materials**
Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses

**Working scientifically:**
Identifying and classifying

**Scientific enquiry type:**
Identifying, classifying and grouping

**Key vocabulary**

Vocabulary relating to uses of everyday materials, working scientifically and thinking sustainably is highlighted within the unit introduction.

**You will need**

A bin

A selection of commonly thrown-away objects, rinsed or cleaned (e.g. plastic pots, bottles, punnets, film lids, bread bags and crisp packets; foil lids and trays and clean, used kitchen foil; cardboard trays, boxes and kitchen roll tubes; used wrapping paper, flyers and newspaper; glass jars and bottles; tins and drink cans)

A camera

Access to laptops or tablets

Optional: *What A Waste: Rubbish, Recycling, And Protecting Our Planet* by Jess French

**Adapt the learning**

Children requiring additional support could be provided with samples of the recyclable materials so they can explore their properties again

Challenge children to engage in a 'packaging hunt', listing as many items of packaging that they can find in the classroom, the materials they are made from and why

**Link the learning**

**CLIMATE ACTION PLAN:**
Adaptation and resilience;
Biodiversity and Nature;
Climate education and green skills

## What do we already know?

Begin the lesson by retrieving the children's prior learning, sharing the image of the recycling bins on Resource 5A, or you may wish to share an image of a recycling bin that can be found on your school site.

Invite the children to simply describe what they can see and what they understand about how the bin should be used.

Create a class mind map, recording the children's ideas around the image and address any misconceptions.

## What are we learning today?

Begin the children's **learning about Nature** with reference to materials by taking them outside to **learn in Nature** or in an open space and asking them to sit in pairs in a circle. Share with them a bin full of commonly thrown-away objects (see 'You will need', left). Give each pair of children one item to handle, keeping back any tins or drink cans with sharp edges and any glass items.

Ask them to identify what the item is, the material they think it is made from and why they think it is a suitable material to use to make this object. Pass the items around the circle so each pair can handle several different objects.

As a class, discuss the children's thinking and ask: *Why do we use these materials to make these things? Why are they suitable for these uses?* Introduce the tins, drink cans and glass jars and bottles, discuss as a class the materials they are made from and why the children think they are suitable materials to make these items. You might draw out in discussion the fact that foil and plastic film is flexible, so these materials are often used to make peel-off lids; some plastic and glass is transparent, so you can see what's inside before you buy something; plastic and cardboard is lightweight, so it can be transported easily; the metal used in drink cans or the plastic used in drink bottles is waterproof and airtight; the cardboard in the middle of kitchen roll is rigid, so it provides support.

Ask the children: *What job does most of this waste do?* Discuss how a lot of the things we throw away in our homes are packaging, particularly food and drink packaging.

Remind the children of the ideas about recycling that they explored in the retrieval activity. Establish that recycling means reusing the material an object is made from to make a new object. Ask: *Which of the things in our waste pile do you think we can recycle where we live?* As a class, use the children's thinking to sort the items into things they think can be recycled where they live and things that can't.

Take a photo of the outcomes of this sorting activity to use in the next part of the lesson and at the start of Lesson 6.

**TEACHER TIP:**
Either in this lesson, or at another point in the school day, you could share with the children the book *What A Waste: Rubbish, Recycling, And Protecting Our Planet* by Jess French, which works well to support this learning.

## How are we learning today?

Back in the classroom, display the photo of the outcomes of the sorting activity and introduce the 'Check what items you can rescue from the rubbish' search tool on the RecycleNow website. Model how to use it to find out whether one of the waste items can be recycled at home or at another location in the local area.

In pairs, the children use the search tool to find out which other waste items in the photo can be recycled where they live.

With reference to the photo of the outcomes of the sorting activity, invite the children to share what they have found out about the waste items that can be recycled locally.

Remind the children of their learning in Lesson 4 about how the shape of solid objects made from some materials can be changed by squashing them. Ask: *What does squashing mean? Do all objects return to their original shape when we squash them?* Explain that this science learning can help us to recycle and introduce these tips:

1. Used, clean kitchen foil, foil lids and foil packaging should be squashed into a ball – the bigger the better – to make it easier to recycle.

2. Some shiny, metallic packaging looks like foil (cut open a crisp packet for an example), but is actually plastic film in disguise. A quick way to tell the

difference is to squash it into a ball in your hands. If it stays squashed, it's foil. If it springs open again, it's plastic film and can't be recycled.

3. Not all wrapping paper can be recycled. If you squash it in your hand, and it stays squashed, it can be recycled. If you squash it and it springs open again (or if it has glitter or foil decoration on it), it can't be recycled.

Give the children time to test these tips out using the selection of waste items.

Ask the children: *Why is it important that we recycle correctly?* Establish that adding the items that can't be recycled to your recycling bin can stop other things that *can* be recycled from being recycled.

**TEACHER TIP:**
Many, but not all, local authorities advise squashing plastic bottles once they have been rinsed, then putting the lid back on before recycling. This helps save space in recycling bins and recycling collection lorries. However, squashing plastic bottles before adding them to your recycling bin can make it harder for some sorting machinery at recycling centres to identify them correctly. Check the guidance from your local authority first if you plan on sharing this with the children as a fourth tip.

**TIME TO EXPLAIN:**
Focusing on one of the waste items in the selection they have explored and researched during the lesson, the children write a page for a recycling guide. They draw the item and add information about the material it is made from, why this material is suitable to make the item and what to do with the item once you've finished with it to ensure it is either recycled or disposed of correctly. The children present their page to another child and trade facts.

These pages can then be collated to create a class recycling guide that can be shared with others in the school community.

**STEM SENTENCES:**
_____ is made from _____ because it is _____ .
When you have finished with it, _____

Ask the children: *Why is it important to recycle things when we have finished with them?* As a class, watch the Maddie Moat Do You Know? episode How is glass made? and discuss their understanding of the role of recycled glass in making new glass. Ask: *How can we reduce the amount of sand we need to make glass?* (e.g. use some recycled glass) *Where does the recycled glass come from?* (e.g. the glass we put in our recycling bins)

**TEACHER TIP**
Some waste is harder to recycle than others. TerraCycle's The Green School Project helps schools start collecting these items and supports school fundraising by rewarding them for the recycling they collect and send in.

## What have we learned today?

Reflect on the children's **learning about Nature** by sharing the photo of the outcomes of the waste-sorting activity from the start of the lesson. In pairs, the children match two pieces of waste that are made from the same material and explain why this material is suitable for these uses. Invite them to share their thinking with the class and address any misconceptions. Ask the children: *How can we recycle these things where we live? Why is it important to recycle?*

Draw out the **learning from Nature** by sharing with them image of the dung beetle on Resource 5B. Ask the children: *How are things recycled in Nature? Is anything not recycled in Nature?* Using the dung beetle as an example, discuss how everything in the natural world is recycled and has a use – even poo, which living things like dung beetles help to break down so the nutrients in it can be used to support life.

**Enquiry question:**
**Why should we reduce, reuse and recycle?**

**Harmony principle:**
**The principle of the Cycle**

## Resource 5A

## Resource 5B

Lesson **06**

**Enquiry question:**
**Why should we reduce, reuse and recycle?**

**Harmony principle:**
**The principle of the Cycle**

# Why are scientists creating new materials?

NC Links

**Uses of everyday materials**
Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses

**Working scientifically:**
Performing simple tests

**Scientific enquiry type:**
Comparative or fair testing

Key vocabulary

Vocabulary relating to everyday materials, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Optional: cardboard sandwich box, foam packing chips

Plastic kitchen bin bags

Compostable kitchen bin bags

Copies of Resource 6A (one per pair)

Copies of Resource 6B (one per group)

Equipment to carry out a simple test, depending on the methodology agreed (see 'How are we learning today?')

Optional: *A Planet Full Of Plastic* by Neal Layton,

Adapt the learning

Children requiring additional support may benefit from exploring the factsheet as a guided reading activity prior to the lesson

Challenge children to think of another packaging material that they would like to design an alternative for. Ask: *What is the packaging used for? What are the properties of your new material that will make this a better alternative?*

Link the learning

**CLIMATE ACTION PLAN:**
Adaptation and resilience;
Biodiversity and Nature;
Climate education and green skills

## What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** with reference to materials by sharing with them the photo of the outcomes of the sorting activity from Lesson 5.

Revisit the children's responses to the question they were asked in Lesson 5: *What job does most of this waste do?* Draw out in the discussion the fact that a lot of the things we throw away in our homes are packaging.

Ask them: *Can everything we throw away be recycled?* Allow time for children to share their ideas and their understanding so far and address any misconceptions. Establish that much of our waste can't be recycled and that this is harmful to our planet.

## What are we learning today?

Continue the children's **learning about Nature** with reference to materials by drawing their attention to the group of plastic items in the photo. Discuss why finding ways to use less plastic is good for our planet.

Introduce the idea that scientists are working to create new materials that we can use instead of plastic to reduce the amount of plastic we use.

Share with the children the factsheet on Resource 6A about some of the new materials scientists have created to help us reduce the amount of plastic we use. Read the first sections as a class and model how to highlight key information about the new materials being developed and their benefits, and any information about their properties.

In pairs, the children continue reading the factsheet and highlighting information.

As a class, discuss what the children have found out. If you have been able to source a cardboard sandwich box, you may be able to demonstrate the presence of the thin layer of plastic by showing it to the children or peeling this off. Use this to support a discussion about the properties that make this material suitable for this use.

If you have been able to source foam packing chips, the children could handle them before discussing as a class the properties that make this material suitable for this use. You can test whether the foam is plant-based by putting it in water – it will disintegrate if it is.

**TEACHER TIP:**
The seaweed-based material referenced in the factsheet has been developed by Notpla, which won the Earthshot Prize in the 'Build a waste-free world' category in 2022.

## How are we learning today?

Move the children's **learning about Nature** with reference to materials on by sharing with them a plastic kitchen bin bag and a compostable kitchen bin bag. With reference to the children's research using the factsheet, establish that these two bin bags are made from different materials. One is made from standard plastic and one is made from a plant-based plastic replacement.

Ask them: *What are the properties of these materials that make them suitable to make a bin bag?* Allow the children some time to discuss their ideas in small groups before feeding back to the class. Elicit in conversation that these materials might need to be flexible, waterproof and strong, and record these properties in the first column of a table (see Resource 6B for an example).

In small groups, the children discuss how they will test the materials that these two bin bags are made of for these properties. Discuss this as a class and agree on a suitable methodology before the children carry out this simple test, recording their results on Resource 6B.

**TIME TO EXPLAIN:**
The children present and compare their results with another group and identify any similarities or differences in their results.

**STEM SENTENCES:**
The properties of _____ are _____
The _____ is more/less _____ than the _____
These materials are suitable for making a bin bag because _____

Discuss what they found as a class.

Extend the children's thinking about materials by asking them: *If a material is better for the planet than another material, do we still need to think carefully about how much of it we use? Why?*

Draw out in the discussion the fact that avoiding single-use items as much as possible will always be a more planet-friendly approach, but that using new materials developed to have less of an environmental impact may be a better option for making things it's hard to avoid using.

**TEACHER TIP:**
There is a distinction to be made between compostable bin bags and certified home-compostable bin bags. Only the latter have been tested to ensure they will break down in the conditions typically found in a home compost bin (as opposed to being compostable in an industrial composting facility). Either in this lesson, or at another point in the school day, you could share with the children the book *A Planet Full Of Plastic* by Neal Layton, which works well to support this learning.

## What have we learned today?

Reflect on the children's **learning about Nature** and assess their understanding by sharing with the children the images on Resource 6C and asking: *What new materials are scientists developing? Why are they developing them? What are their properties? How are they being used?*

Display these questions so the children can use them as prompts to 'Talk like an expert' with a partner about their learning. With reference to the overarching enquiry question for the half term, encourage the children to explain why we should reduce, reuse and recycle.

Draw out the **learning from Nature** by displaying the image of fallen leaves on Resource 6D. Ask the children: *What happens to leaves when they fall from trees in autumn? Where do they go?*

Establish that fallen leaves and other things made from organic material break down when they die. They release nutrients that other living things rely on to thrive. In this way, there is no waste in Nature.

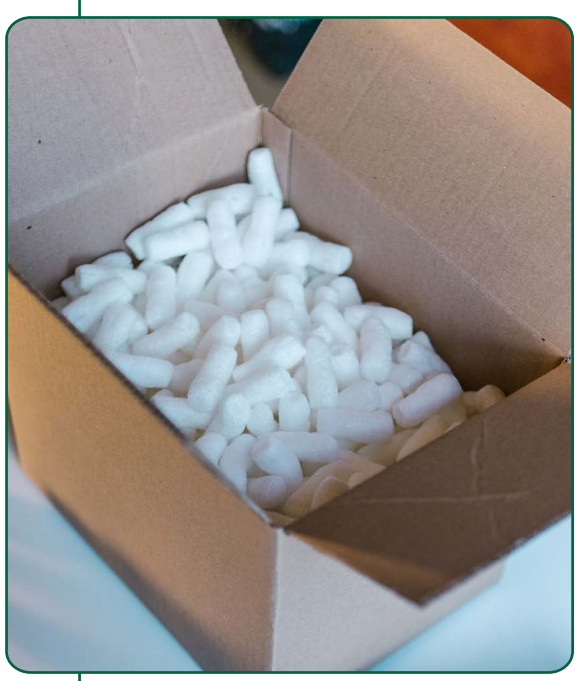
Resource 6A

# Clever new materials

Our world is full of useful materials. We need them to make the things we use every day, but they aren't always good for the planet. That's why scientists are working to make new materials.

**No one wants a soggy sandwich!**
Have you ever wondered why cardboard sandwich boxes or takeaway boxes don't go soggy? It's because they are covered with a layer of waterproof plastic. It is so thin you can hardly see it. The plastic protects the food and stops it from leaking, but it can't be recycled. This plastic stays in the environment for hundreds of years when you throw the box away.
That creates plastic pollution.

Now, scientists have made a new waterproof material using seaweed. We can use it instead of plastic. It breaks down when we've finished using it. This new material helps reduce plastic waste.



**Plants not plastic**
When a parcel arrives in the post, it might be packed with plastic foam chips to protect whatever is inside. These foam chips can't be recycled easily. They can cause plastic pollution.

Scientists have made a new material using plants such as corn and potatoes. It can be used instead of plastic to make squishy foam chips and to make bin bags. It breaks down when we've finished using it instead of staying in the environment for hundreds of years like plastic does.

You can even add some of these materials to your compost bin!

Scientists have even found a way to grow packaging from mushroom roots to reduce the amount of plastic we use. You can add this mushroom packaging to your compost bin when you've finished with it.

Enquiry question:
Why should we reduce, reuse and recycle?

Harmony principle:
The principle of the Cycle

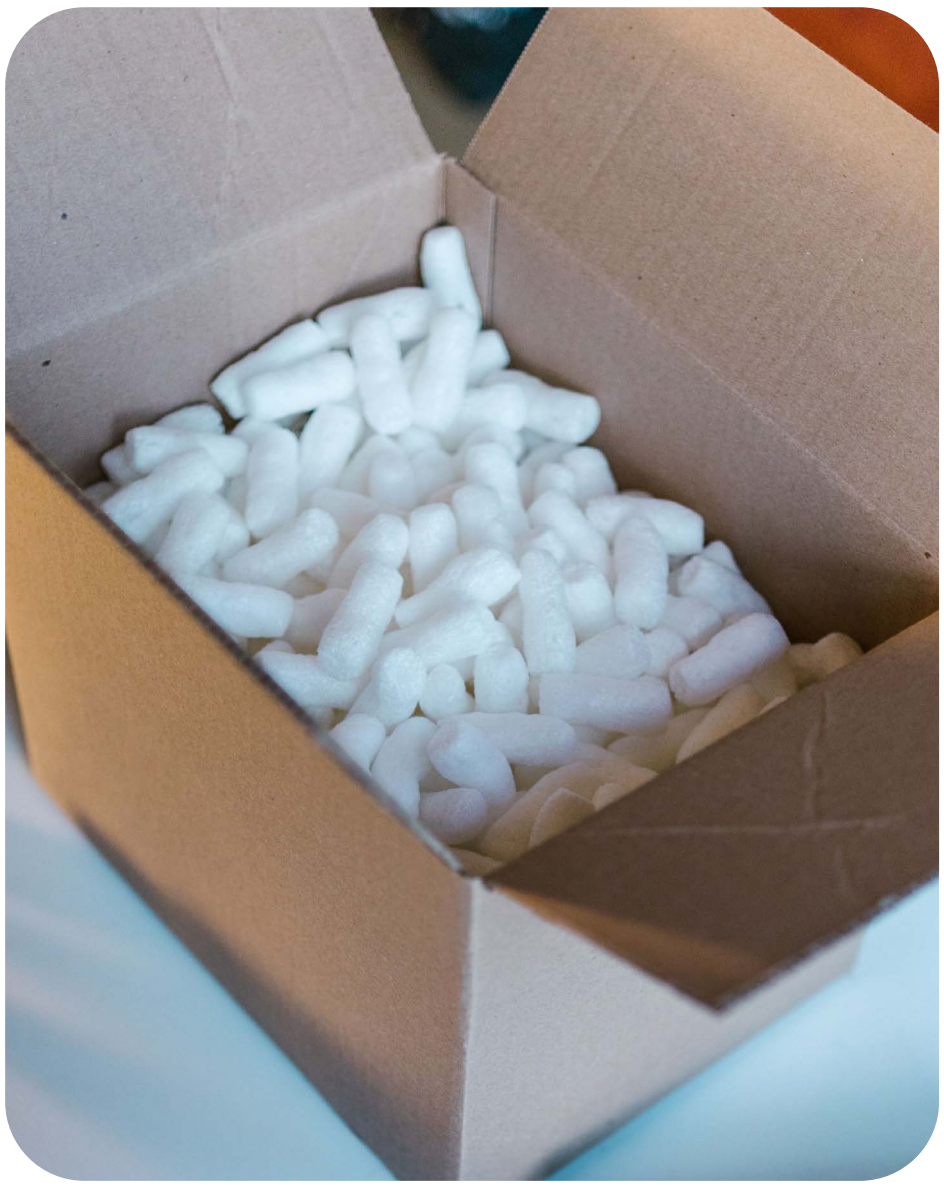
Resource 6B

| property | plastic bin bag | compostable bin bag |
|---|---|---|
| flexible | | |
| waterproof | | |
| strong | | |

**Enquiry question:**
**Why should we reduce, reuse and recycle?**

**Harmony principle:**
**The principle of the Cycle**

## Resource 6C




## Resource 6D

# Additional image credits

*Hermit crab* by Gail Hampshire © 2014 Gail Hampshire, licensed under CC BY 2.0 (creativecommons.org/licenses/by/2.0/) Source: www.flickr.com/photos/gails_pictures/16604482948/