



# Year 1 Science lessons pack

What will we find at the seaside?



# Year 1

## Science lessons pack

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### ENQUIRY QUESTION

**What will we find at the seaside?**

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### LINKED HARMONY PRINCIPLE

**The principle of Interdependence**

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The six lesson plans in this pack can be used to deliver the science content for the Year 1 enquiry of learning *What will we find at the seaside?*, linked to the principle of Interdependence.

This science learning builds on children's understanding of seasonal changes, everyday materials and animals, including humans, and the foundations of science learning that will have been explored through the area of Understanding the World in the EYFS and their prior learning in Year 1.

**‘Looking after the seaside allows living things to thrive there.’**

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.



# 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 seasonal changes and animals, including humans, takes. By understanding their prior learning in the EYFS, and by looking ahead to the path that their learning about seasonal changes and living things and their habitats will take in Years 2 to 6, we are better able to plan for progression.

The table below shows where the science learning about seasonal changes and animals, including humans, covered in the lesson plans in this pack, sits within this journey.

## Lessons 1-4

|                     | EYFS                                                                                                                                                                                                                                                                                                                                                                       | Year 1                                                                                                                                                                                                                                           | Year 2                                                                                                                                                                                                                                            | Year 3                                                                                                                                                                                                                                       | Year 4                                                                                                                                                                                                                                                                                                                                                               | Year 5                                                                                                                                                                                                                                                      | Year 6                                                                                                                                                                                                                                   |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENQUIRY             | Understanding the world                                                                                                                                                                                                                                                                                                                                                    | What will we find at the seaside?                                                                                                                                                                                                                | Why are bees so brilliant?                                                                                                                                                                                                                        | How can we identify native trees in autumn?                                                                                                                                                                                                  | Why should we protect the biodiversity of the rainforest?                                                                                                                                                                                                                                                                                                            | How can we restore our UK habitats back to health?                                                                                                                                                                                                          | Where do migratory animals travel to and from and why?                                                                                                                                                                                   |
| SUMMARY OF LEARNING | Children will be guided to increase their knowledge and sense of the ecologically diverse world around them. They will begin to recognise and name different habitats and the animals that live within them. They will discover how habitats provide for the needs of different animals and plants, and that different animals and plants are suited to different habitats | Children learn about living species that live in ecosystems within a beach habitat. They will consider particular characteristics that help animals to survive within this particular habitat and the changes that occur across the four seasons | Children explore the life of bees. They will learn how bees are suited to particular habitats and describe how these habitats provide for their basic needs<br><br>They will learn how plants and bees depend on each other to survive and thrive | Children develop their knowledge of the needs of plants to include healthy soil and nutrients. They recap the structure of a plant and learn the function of each part of the plant. Children investigate how water travels within the plant | Children explore living things within different food chains, identifying producers, predators and prey.<br><br>They learn how to use classification keys to help group, identify and name a variety of plants and animals within local and wider environments. They learn about the potential dangers to living things that can be caused by changes in environments | Children learn to describe the differences in life cycles of different living species within a variety of UK habitats. They will build on their knowledge of how plants reproduce, including seed dispersal and pollination, and learn about photosynthesis | Children explore how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, and give reasons for classifying animals based on specific characteristics |
| KEY VOCABULARY      | home, habitat, food, water, shelter, woodland, pond, sea, ocean, rainforest, land, desert, polar, river                                                                                                                                                                                                                                                                    | seaside, tide, sea snail, mussel, topshell, limpet, (hermit) crab, spiny starfish, rockpool, anemone, blenny, seaweed, algae, whelk, shrimp, sunrise, sunset                                                                                     | microhabitat, bee species, bee-friendly habitats, solitary, social, colony, hive, honeycomb, queen, worker, drone, threats                                                                                                                        | flowering plant, nutrients, bark, twig, trunk, seed dispersal                                                                                                                                                                                | tropical, temperate, rainforest, food chain, producer, predator, prey, environment, habitat, microhabitat, classification key                                                                                                                                                                                                                                        | moorland, heathland, wetland, reproduction, carpel, stamen, anther, filament, stigma, style, ovary, ovule, indicator species, endangered, photosynthesis                                                                                                    | resident, migrate, (non) migratory, classification, taxonomy, observable characteristics, Linnaean, kingdom, phylum, class, order, family, genus, species                                                                                |

# Lessons 3, 5 and 6

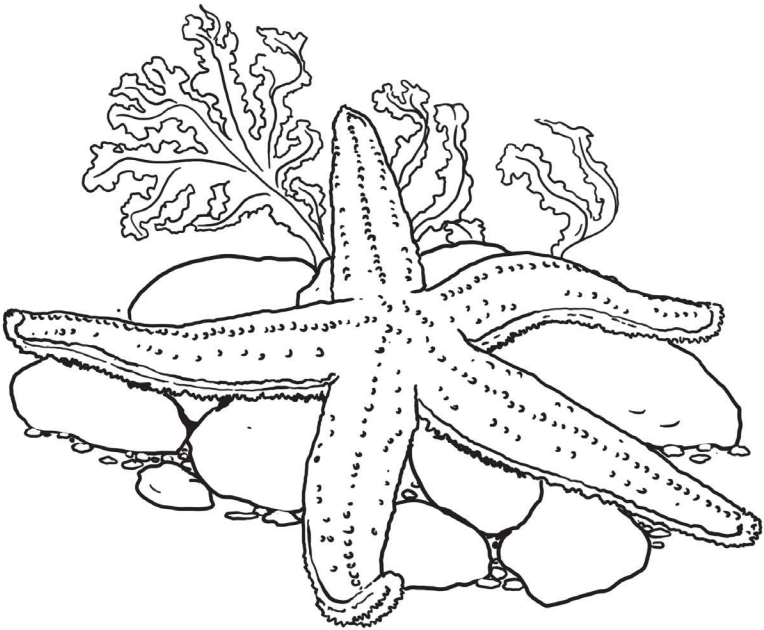
We can also map the journey that their science learning relating to materials takes.

The table below shows where the science learning about materials is covered within this journey in the plans for lessons 3, 5 and 6 in this pack.

|                     | EYFS                                                                                                                                                                                                                                                                                                                                                                                     | Year 1                                                                                                                                                                                                                                                                                                                                   | Year 1                                                                                                                                                                                                                                                            | Year 2                                                                                                                                                                              | Year 2                                                                                                                                        | Year 4                                                                                                                                                                                                                                                                                                                                                                                                                     | Year 5                                                                                                                                                                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENQUIRY             | Understanding the world                                                                                                                                                                                                                                                                                                                                                                  | What stories could our toys and games tell?                                                                                                                                                                                                                                                                                              | What will we find at the seaside?                                                                                                                                                                                                                                 | Why should we change the way we travel?                                                                                                                                             | Why should we reduce, reuse and recycle?                                                                                                      | What journey does our river take?                                                                                                                                                                                                                                                                                                                                                                                          | 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, 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 learn about living species that live in ecosystems within a beach habitat. Alongside this they will think about the materials that we find on our beaches, which are natural, which belong there and how the materials that don't belong there got there | 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 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 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                                                                                                                                                                                     | packaging, rubbish, litter, float, sink, reusable, beach clean                                                                                                                                                                                                    | absorbent, opaque, human-made, rigid, flexible, reflective, translucent, durable, reflective, (un)suitable, elastic, malleable, foam, leather, canvas, synthetic, bamboo            | reuse, reduce, recycle, squashing, bending, twisting, stretching                                                                              | solid, liquid, gas, change of state, melt, freeze, boil, condensation, evaporation, mixture, temperature, dissolve, solution, (in)soluble, filter, sieve, (ir)reversible, water cycle                                                                                                                                                                                                                                      | (non) biodegradable, pollution, lightweight, solubility, substance, buoyancy, flexibility                                                                                                                                                           |

The table below sets out what the children’s learning about seasonal changes, animals, including humans, and everyday materials, looks like over the course of the six lessons.

| Week 1                                                                                                                                                                                             | Week 2                                                                                                                                                                         | Week 3                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When would I like to visit the seaside?</b>                                                                                                                                                     | <b>How would I spend a day at the seaside?</b>                                                                                                                                 | <b>Why do some living things have shells?</b>                                                                                                                                                                                              |
| Observe changes across the four seasons; observe and describe weather associated with the seasons and how day length varies.                                                                       | Observe changes across the four seasons; observe and describe weather associated with the seasons and how day length varies.                                                   | Describe the simple physical properties of a variety of everyday materials. Describe and compare the structure of a variety of common animals; identify and name a variety of common animals that are carnivores, herbivores and omnivores |
| Week 4                                                                                                                                                                                             | Week 5                                                                                                                                                                         | Week 6                                                                                                                                                                                                                                     |
| <b>How do the living things in a rockpool depend on one other?</b>                                                                                                                                 | <b>What materials do we find on our beaches?</b>                                                                                                                               | <b>Which materials don’t belong on our beaches?</b>                                                                                                                                                                                        |
| Identify and name a variety of common animals that are carnivores, herbivores and omnivores; identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals | 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 | 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                                                             |



# 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 observe and record changes in the weather, explore examples of seasonal changes, reenact the feeding relationships that occur between the living things in a rockpool and investigate the natural materials and materials made by people, that can be found in Nature.

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                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------|
| <b>When would I like to visit the seaside?</b>                                                                                                   | <b>How would I spend a day at the seaside?</b>                     | <b>Why do some living things have shells?</b>                  |
| Asking simple questions and recognising that they can be answered in different ways; gathering and recording data to help in answering questions | Using their observations and ideas to suggest answers to questions | Observing closely, using simple equipment                      |
| Scientific enquiry type: Pattern seeking; observing over time                                                                                    | Scientific enquiry type: Research using secondary sources          | Scientific enquiry type: Identifying, classifying and grouping |
| Week 4                                                                                                                                           | Week 5                                                             | Week 6                                                         |
| <b>How do the living things in a rockpool depend on one other?</b>                                                                               | <b>What materials do we find on our beaches?</b>                   | <b>Which materials don't belong on our beaches?</b>            |
| Identifying and classifying                                                                                                                      | Performing simple tests                                            | Gathering and recording data to help in answering questions    |
| Scientific enquiry type: Identifying, classifying and grouping                                                                                   | Scientific enquiry type: Comparative and fair testing              | Scientific enquiry type: Identifying, classifying and grouping |

**Working scientifically vocabulary**

- question
- recognise
- gather
- record
- compare

# 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 Interdependence; they build on children’s prior learning in the EYFS and prepare them for their learning in Years 2 to 6.

The children’s progression in their understanding of the principle of Interdependence 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 interdependence (observing bees, butterflies or wasps pollinating plants, when we work as a team) | What will we find at the seaside?                                      | Why are bees so brilliant?                                                  | What is the story of our food?                       | How did the Anglo-Saxons farm and how was it different from today?  | How can we ensure our seas and oceans stay amazing?                      | How are we connected to Antarctica?                                                         |
| PROGRESSION: CONCEPT OF INTERDEPENDENCE |                                                                                                                                                                                                                   | How do the living things we find at the seaside depend on one another? | Why do we need bees and other pollinators?                                  | Where does our food come from?                       | How did the Anglo-Saxons build community and work together?         | What makes our seas and oceans amazing?                                  | What is the link between temperature change in Antarctica and our school's electricity use? |
| THINKING SUSTAINABLY                    |                                                                                                                                                                                                                   | What can we do to look after the seaside?                              | What can we do to help bees?                                                | How can we eat more seasonal food?                   | How can we support our UK farmers through the food choices we make? | Why is plastic pollution a problem and what can we do about it?          | How can we monitor data, analyse it and reduce the energy we use in school?                 |
| THINKING SUSTAINABLY VOCABULARY         |                                                                                                                                                                                                                   | team<br>together<br>look after<br>care                                 | ecosystem<br>role<br>value<br>relationship<br>individual<br>whole<br>litter | connection<br>community<br>part<br>species<br>colony | action<br>reaction<br>consequence<br>impact<br>seasonal             | group<br>holistic<br>collective<br>cooperation<br>reciprocate<br>organic | support<br>depend<br>wellbeing<br>ecology<br>biodegradable                                  |

**Seasonal changes**

Observe changes across the four seasons; observe and describe weather associated with the seasons and how day length varies

**Working scientifically:**

Asking simple questions and recognising that they can be answered in different ways; gathering and recording data to help in answering questions

**Scientific enquiry type:**

Pattern seeking; observing over time

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

Nature journals

Flipchart and marker pen

Equipment to help make observations and take measurements about the weather e.g. bubble mixture and wands or streamers, thermometer

Children requiring additional support may benefit from revisiting vocabulary relating to the weather and the seasons prior to the lesson.

Challenge the children to consider whether all the trees that they have seen in their chosen space will look different in different seasons and to explain their reasoning.

**TEACHER TIP:**

This is an ideal opportunity to consolidate their learning about evergreen and deciduous trees from the enquiry *Which is my favourite wildflower and why?*

**CLIMATE ACTION PLAN:**

Adaptation and resilience;  
Climate education and green skills

# When would I like to visit the seaside?

## What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by sharing with the children the image of the seasons wheel on Resource 1A. Allow the children time to explain what this is and what they have learned about the seasons so far.

Play a game of 'Before and After' with each of the seasons in turn, exploring their understanding of the cyclical nature of

seasonal changes. Ask questions such as: *Which season comes before summer? Which season comes after winter? Which season are we in now? Which season came before/after?*

Share ideas as a class and address any misconceptions.

## What are we learning today?

Begin the children's **learning about Nature** with reference to weather and the seasons by sharing with them the image on Resource 1B of the seaside in summer in the UK and ask: *Which season do you think this photo was taken in? Why?*

In pairs, the children discuss their ideas before sharing them with the class. Establish that the photo was taken in the summer. Ask: *If we visited the seaside in summer, what might it feel like? What would we wear? What might we do there?* (e.g. paddle, swim, make sandcastles – all of which are visible in the image) *How would we keep ourselves safe in the summer?* (e.g. use sunscreen, make sure we don't stay out in the sun too long, drink lots of water)

Ask the children: *What do you think the weather where we live is like in the summer? What questions could we ask that would help us to find out?* Once the children

have discussed this in pairs, invite them to share their ideas and create a class list of questions on a large sheet of paper (e.g. *What does it feel like outside today? Is it hot? Is it windy? Is it sunny?*) You will need to take the class list with you when the learning moves outside in the next part of the lesson.

Ask the children: *How could we work like scientists to answer these questions?* (e.g. gather data and make observations) Encourage them to draw on their learning in science and geography throughout Year 1 to help them suggest ideas and agree on methodologies (e.g. measuring the temperature, blowing bubbles or using streamers to see how windy it is; making observations about how cloudy or sunny it is; looking for puddles to see if it has been raining)

## How are we learning today?

Take the children outdoors to **learn in Nature** or in an open space. In pairs, in small groups or as a class, they make observations about the weather, using the agreed methodologies and recording their data in their Nature journals. If you have set up and maintained a class weather station throughout the year, there is a great opportunity to make use of it to support the learning in this lesson.

Encourage the children to stop and observe the space around them. Ask: *What can you see that tells you it is summer?* (e.g. the trees have leaves, there are flowers on some of the plants, the growing area has fruit or vegetables growing in it, the soil is dry) Give them time to record any signs of summer they notice in their Nature journals.

Revisit the class list of questions about the weather. Discuss which of them they can now answer and how they would answer them.

Extend their thinking by asking: *How would it feel to be here in winter? In spring? In autumn? What would we see in different*

*seasons?* Focusing on the signs of summer the children have identified, discuss what would be the same and what would be different in different seasons. To support this discussion, share the images on Resource 1C and ask the children to work in pairs or small groups to discuss which season they think each photo was taken in and why.

Challenge the children to use their knowledge of weather to give reasons for their thinking (e.g. ponds freeze when it gets very cold in winter; we see blossom on trees in spring when the weather starts to get warmer; we see more plants in the growing area when it is warmer and sunnier in summer).

In their Nature journals, the children predict and record what they might see or what the weather might be like if they were to spend time in the area they visited in this lesson in another season. Using the information recorded in their Nature journals and the stem sentences for support, they present their ideas to another child.

**STEM SENTENCES:**

In summer/autumn/winter/spring we see \_\_\_\_\_

In summer/autumn/winter/spring the weather is \_\_\_\_\_

**TEACHER TIP:**

If you have collected class temperature and weather data through the seasons as part of your learning in geography and science, you could use this in this lesson to explore changes to the weather in your school's grounds through the seasons.

## What have we learned today?

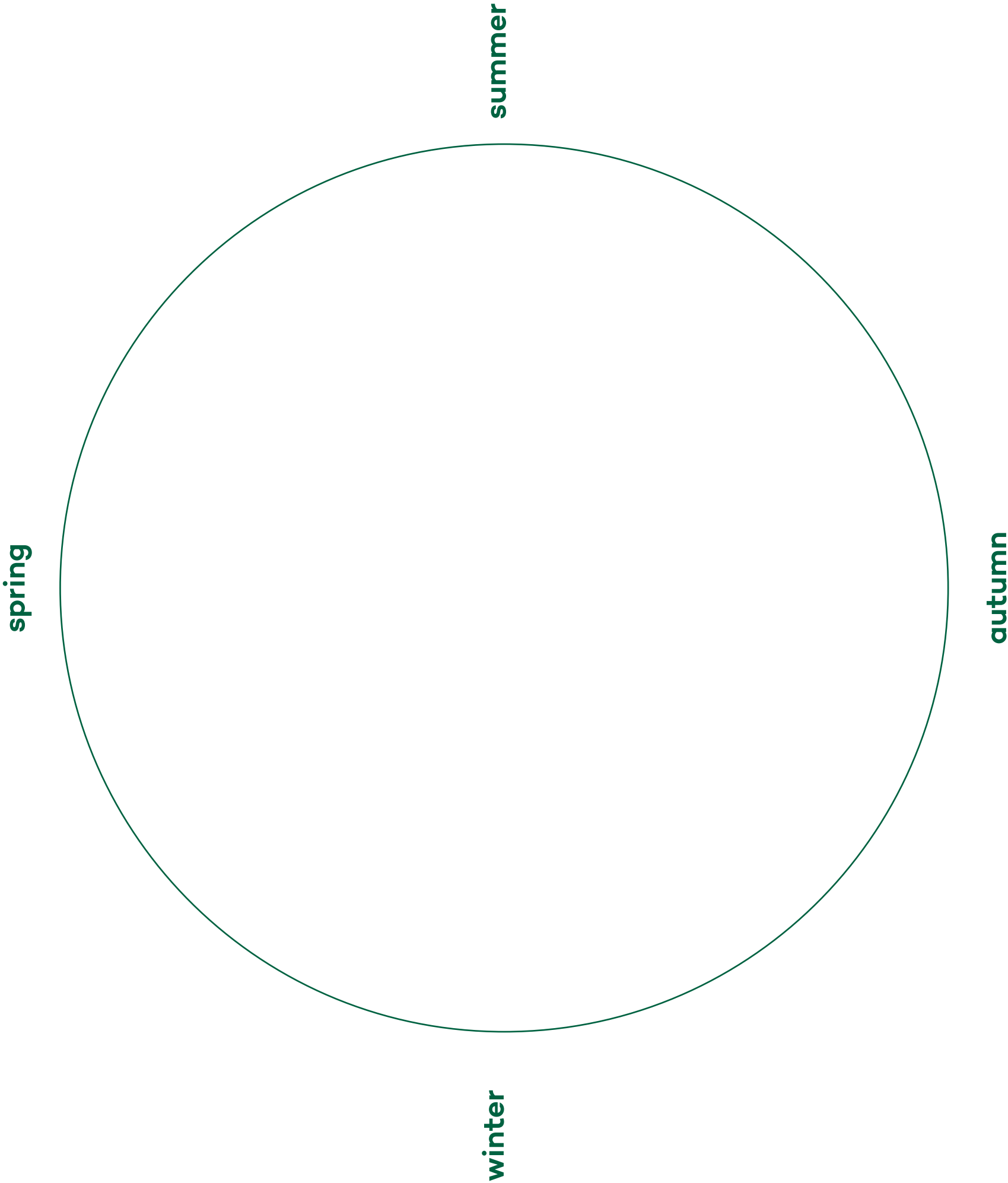
Reflect on the children's **learning about Nature** and assess their understanding by displaying the image of the seaside in winter on Resource 1D. Ask the children to use their learning about the weather in different seasons to decide in pairs which season this photo was taken in, giving reasons for their thinking (e.g. the people are wearing warmer clothes so it must be colder).

Discuss their ideas as a class before displaying the image of the seaside in summer on Resource 1B alongside the image of the seaside in winter. Ask: *When would you like to visit the seaside?* The children decide which season they would like to visit the seaside in and explain why.

Draw out the link between this learning and the **principle of Interdependence** by asking the children: *How does the weather affect what we like to do? What we wear? How we feel?*

Draw out in discussion the fact that what we like to do, what we wear and how we feel can depend on the weather and that this may be different for each of them.

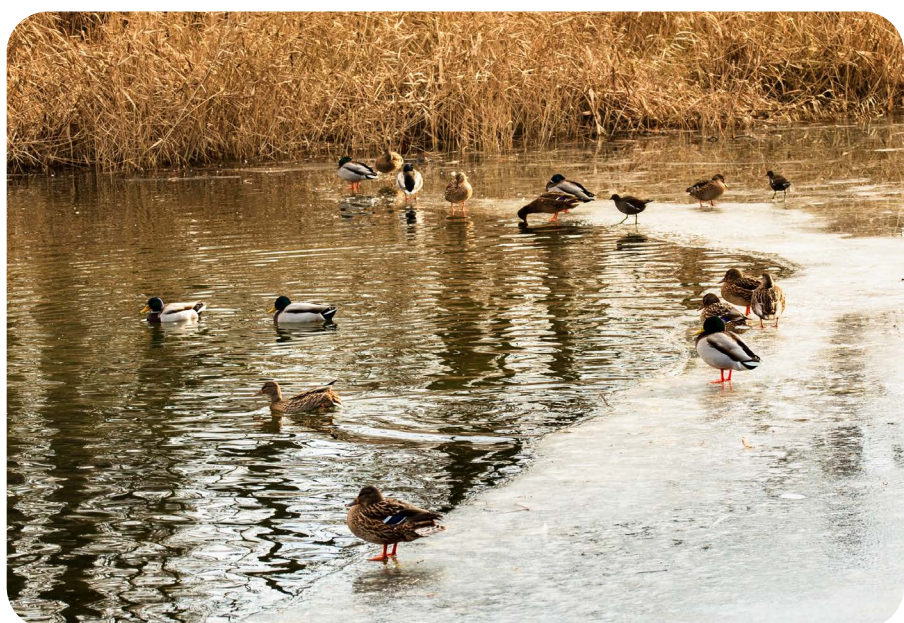
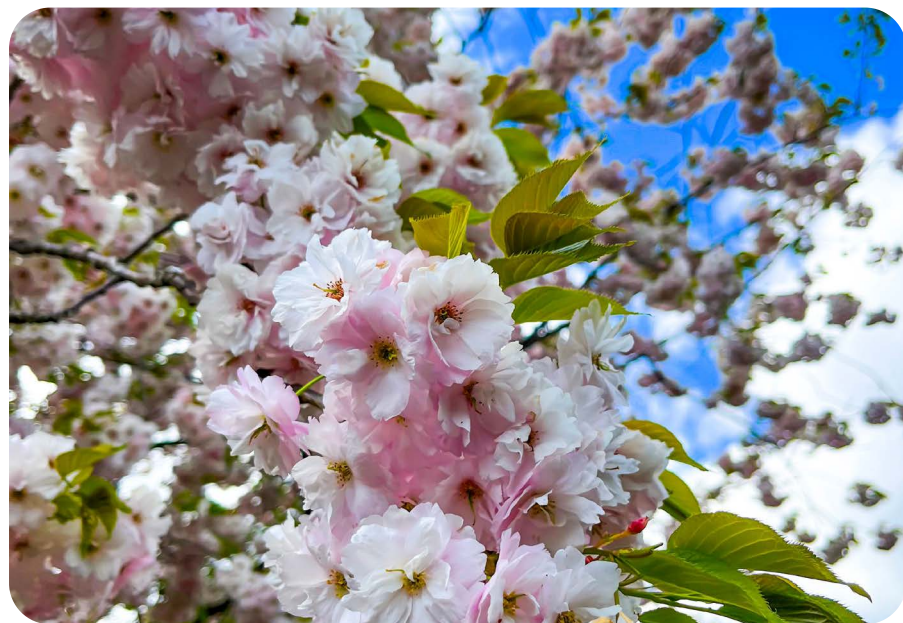




Resource 1B



## Resource 1C



Resource 1D



**Seasonal changes**

Observe changes across the four seasons; observe and describe weather associated with the seasons and how day length varies.

**Working scientifically:**

Using their observations and ideas to suggest answers to questions

**Scientific enquiry type:**

Research using secondary sources

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

Copies of Resource 2A (one per group)

17 yellow cones

16 black or blue cones

2 whiteboards and pens

Copies of Resource 2B (one per child)

Clipboards

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

Challenge the children to consider what they might change on their circle to represent a winter's day.

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

# How would I spend a day at the seaside?

## What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by sharing with the children the images on Resource 1B and 1D.

In pairs, play a game of 'What's different?' where children take turns to choose something that is different in each image and their partner then asks them a 'why' question, to extend their reasoning.

For example, Child A: '*The people are wearing coats*', Child B: '*Why?*', Child A: '*Because the weather is colder.*' Take turns to share and question other examples of differences.

Share ideas as a class and address any misconceptions.

## What are we learning today?

Move the children's **learning about Nature** with reference to the seasons on by drawing their attention to the images on Resources 1B and 1D and asking: *What are the people in the photos doing by the seaside? What activities would you like to do by the seaside?*

Introduce the fact cards on Resource 2A with 'I like...' statements about what the

children might enjoy doing by the seaside. In pairs or small groups, the children sort them into things they would like to do in summer, in winter or both, giving reasons for their thinking linked to the weather (e.g. I would like to swim in the sea in the summer because it is warmer; I would like to fly a kite on the beach in the winter when it's windier). Discuss their ideas as a class.

## How are we learning today?

Take the children outside to **learn in Nature** or in an open space. Use yellow and black (or blue) cones to mark out a large circle showing hours of daytime and hours of nighttime in the winter. (At roughly the time of the winter solstice, the sun rises at around 8am and sets at around 4pm in the south of England). Use eight yellow cones representing hours of daytime and 16 black cones representing hours of nighttime.

You could write or draw symbols to represent sunrise and sunset on whiteboards and add these to the circle to support the children's understanding.

Ask the children: *Is the daytime longer or shorter in winter?* Discuss their ideas, drawing on their existing knowledge and experiences (e.g. in the summer, it's already light when I wake up; in the winter, it's dark by the time I leave after-school club).

In pairs or small groups, the children use the class model to plan a day at the seaside in the winter. Moving around the circle, they act out the activities they would like to do on a winter day. Discuss as a class what they have planned, drawing out the fact that they would have time to do fewer things outdoors and that they might have chosen different activities based on what the weather is likely to be like in the winter.

Adjust the cones marking out the large circle so that there are now 17 yellow cones to represent the hours of daytime and 7 black cones to represent the hours

of nighttime. (At roughly the time of the summer solstice in the UK, the sun rises at around 4.45am and sets at around 9.30pm in the south of England, so there are approximately 17 hours of daytime and 7 hours of nighttime). Establish that this now shows the hours of daytime and nighttime in the summer in the UK and ask the children to help decide where the whiteboards showing sunrise and sunset should now be placed.

Ask the children: *Is the daytime longer in summer or winter? Would we be able to do more things or fewer things if we spent a day at the seaside in the summer? Would we do the same things or different things? Why?*

Using their knowledge of the activities they might do at the seaside from the fact card activity, the children work in pairs or small groups to plan a day at the seaside in the summer. Moving around the circle, they act out all the activities they could fit into a long summer day. Discuss as a class what they have planned and draw the children's attention to all the activities they would have time to fit in between sunrise and sunset.

**TEACHER TIP:**

Watching a time-lapse film of the transition from daytime to nighttime and vice versa like [this one](#) can help to consolidate the children's understanding of sunrise and sunset. If you are able to create a 24-hour time-lapse in the school grounds or in

another location the children are familiar with, even better.

**TIME TO EXPLAIN:**

The children draw the activities they would like to do during a day at the seaside in summer around the circle on Resource 2B. Using this for support, they present their day at the seaside to another child, using their understanding of the weather and day length in summer to explain their choices.

**STEM SENTENCES:**

I would like to \_\_\_\_\_ because the weather in summer is \_\_\_\_\_  
In summer, I could do more things in a day because \_\_\_\_\_

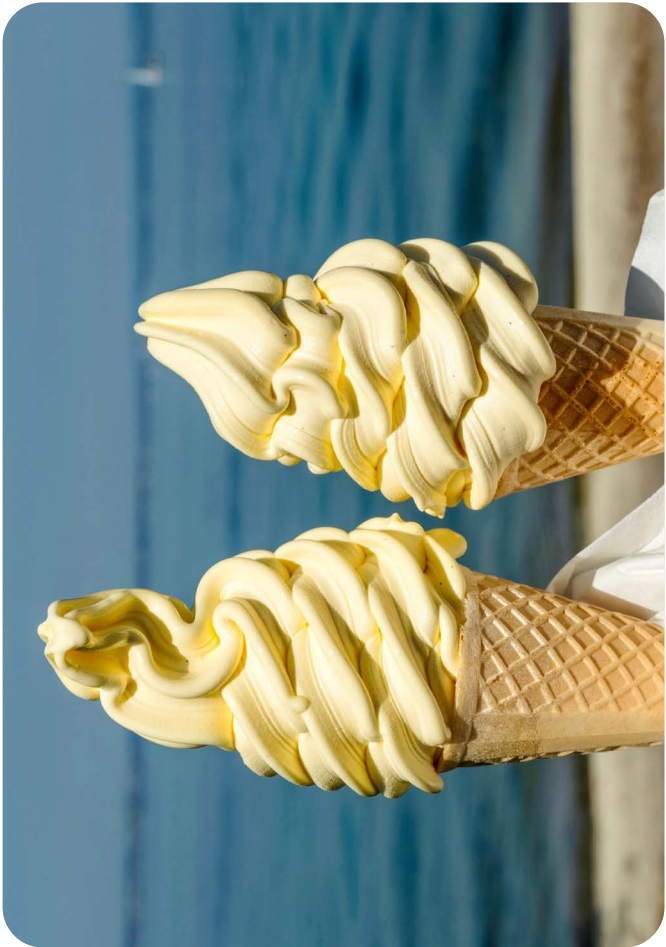
## What have we learned today?

Reflect on the children's **learning about Nature** and assess their understanding by sharing with them the concept cartoon on Resource 2C. In pairs, the children decide whether they agree with the children's statements or not, giving reasons for their thinking.

Draw out the link between this learning and the **principle of Interdependence** by discussing with the children how they might do more outdoors in the summer when the days are longer and the weather is warmer, and that the natural world depends on sunlight and warmth for growth and activity. You could link this to the signs of summer the children observed in the previous lesson.



Resource 2A



I like eating ice cream.



I like going to the pier.



I like eating fish and chips.



I like flying a kite.

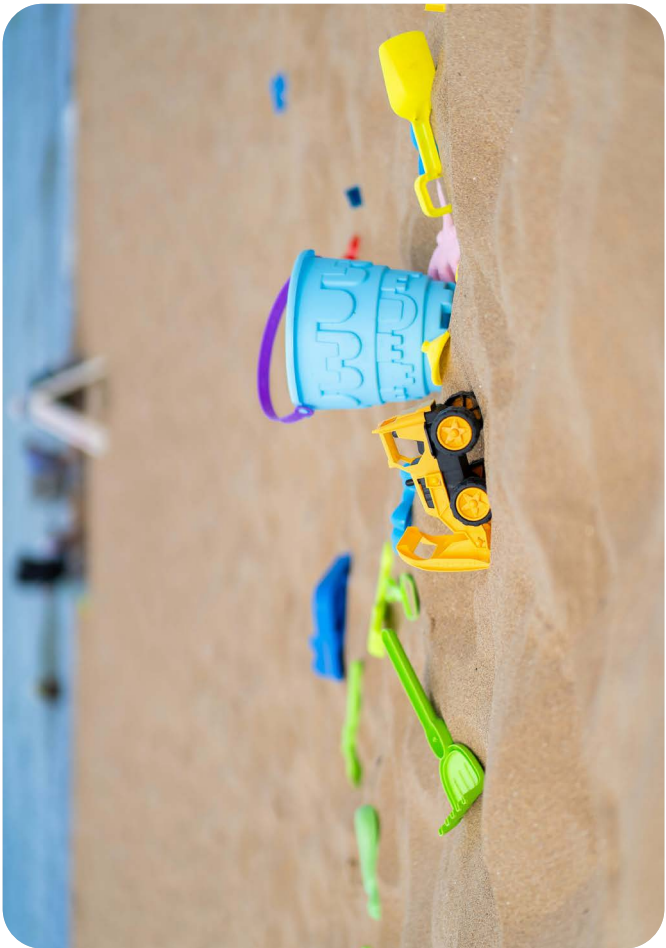
Resource 2A



I like playing in the water.



I like making sandcastles.



I like playing in the sand.



I like rock pooling.

Resource 2A

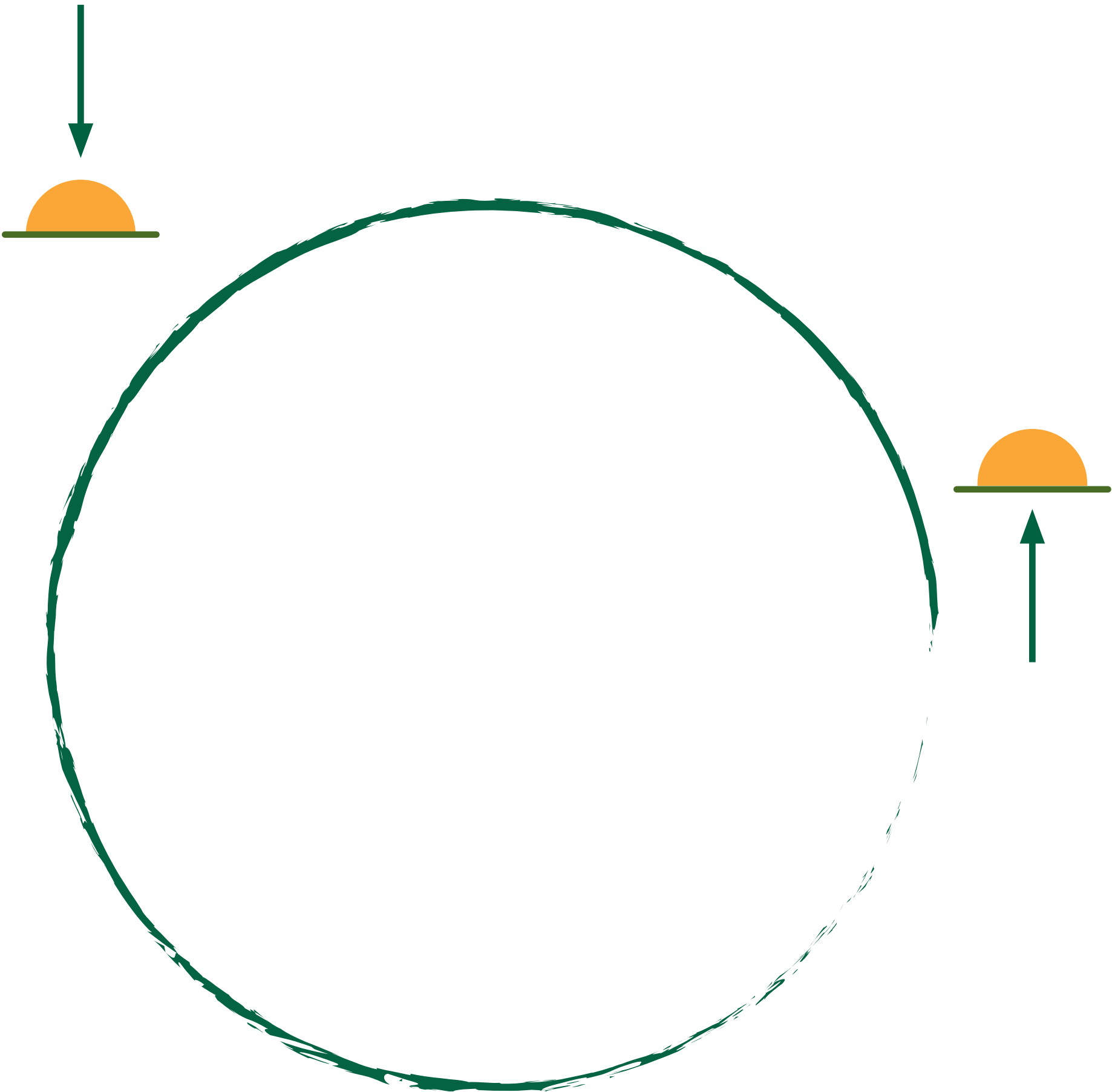


I like swimming in the sea.



I like looking for seashells.

Resource 2B



## Resource 2C



We can spend longer on the beach in the summer when the daytime is longer.

The sun always rises and sets at the same time.



Beaches are always busier in the summer.



**Everyday materials**

Describe the simple physical properties of a variety of everyday materials

**Animals, including humans**

Describe and compare the structure of a variety of common animals

Identify and name a variety of common animals that are carnivores, herbivores and omnivores

**Working scientifically:**

Observing closely, using simple equipment

**Scientific enquiry type:**

Identifying, classifying and grouping

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

A selection of seashells

Handheld magnifiers

Nature journals

Optional: A copy of *Shells... And What They Hide Inside* and *What A Shell Can Tell* by Helen Scales and Sonia Pulido

Children requiring additional support may benefit from having access to a simple word bank of vocabulary they could use to describe the shells they are handling in the first part of the lesson.

Challenge the children to compare the shells of the invertebrates they have learned about in this lesson with other animals with shells they know about (e.g. snails, turtles, tortoises)

**CLIMATE ACTION PLAN:**

Adaptation and resilience;  
Biodiversity and Nature

# Why do some living things have shells?

## What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by sharing with the children the images on Resource 3A of a common frog and a frog skeleton. The children previously encountered these images in their science learning linked to the learning enquiry *Where do we live and what makes it special?*

Ask the children: *What is this animal? What do you know about it?* In pairs, the children take turns 'talking like an expert' to explain what they already know about the structure

of frogs, before sharing their ideas with the class.

Depending on the children's responses, you may wish to use questioning to elicit from the children what they have remembered about a frog's structure (e.g. it has a backbone; its skeleton is inside its body; its body is covered with skin).

Ask: *What do we call an animal with a backbone?* (vertebrate)

## What are we learning today?

Move the children's **learning about Nature** on by sharing with them the images on Resource 3B. Introduce the term invertebrate as the word that describes animals without a backbone and establish that these animals are examples of invertebrates we might see at the seaside.

Ask the children: *What is the same about all these animals? What is different?* Establish that although they are all different shapes, sizes and colours, and although the crab has limbs, they all have a shell. Discuss the fact that the topshell and limpet have a shell in one piece with a soft body inside, the mussel has a shell in two pieces with a soft body inside and the crab's shell is made up of many pieces that cover its soft body.

Share with the children a selection of shells and explain that they were all once part of an animal (an invertebrate). As a class, you could use the shells to identify different invertebrates using the [British Seashell Guide](#) on the Countryfile website.

Ask the children to choose one shell to observe and describe to their partner using the prompts: *What does it look like? What does it feel like?*

Share their ideas as a class and model how to use vocabulary about the shells' properties that will help the children talk like scientists e.g. smooth, ridged, rigid, hard, stiff, strong.

Using handheld magnifiers, the children work in pairs or small groups to observe and describe different shells, drawing them in their Nature journals and adding labels about their properties if they can. They could also explore different ways to group them according to their properties as they explore them.

Discuss their observations as a class and draw the children's attention to the fact that all the shells are hard and rigid. Establish that although these animals don't have a hard skeleton inside their bodies, they do have a hard shell on the outside of their bodies.

**TEACHER TIP:**

Either in this lesson, or at another point in the school day, you could share with the children the book *Shells... And What They Hide Inside* by Helen Scales and Sonia Pulido, which works well to support this learning.

## How are we learning today?

Move the children's **learning about Nature** on by asking: *Why do you think some living things need a hard shell on the outside of their bodies?*

In pairs, the children discuss their ideas before sharing them with the class. Introduce the image of the spiny starfish on Resource 3C. Establish that the spiny starfish is another animal found at the seaside and that it is a carnivore. Invite the children to share their understanding of this word and tackle any misconceptions, as necessary.

Explain that spiny starfish feed on mussels and limpets. With reference to the blue

mussel and the limpet image on Resource 3B, revisit the question *Why do you think some living things need a hard shell on the outside of their bodies?* Establish that some living things need shells for protection against predators. The limpet also uses its shell for defence, as explored in [this clip](#) from the BBC documentary *The Secret Life Of Rockpools*.

If they have drawn a limpet or mussel shell in their Nature journals, the children could add this new information about them.

Share with the children the image of a hermit crab on Resource 3D. Ask them: *What is unusual about this crab?* (e.g. its

shell doesn't look like a crab's shell). Explain that hermit crabs can't grow shells on the main part of their bodies so they use the shells of sea snails that have died (usually whelks or periwinkles) for protection and shelter. When a hermit crab grows too big for its shell, it has to find a new, slightly larger one.

Watch the BBC Earth Kids film clip [Hermit crabs line up to swap shells](#) and draw out in discussion how these crabs need shells for protection from predators but also for shelter. The children might like to draw and label a hermit crab in their Nature journals, too.

**TIME TO EXPLAIN:**  
The children choose to play the role of either the limpet or the hermit crab. They draw on their learning about the properties and function of shells to introduce themselves to their partner, drawing on the stem sentences for support.

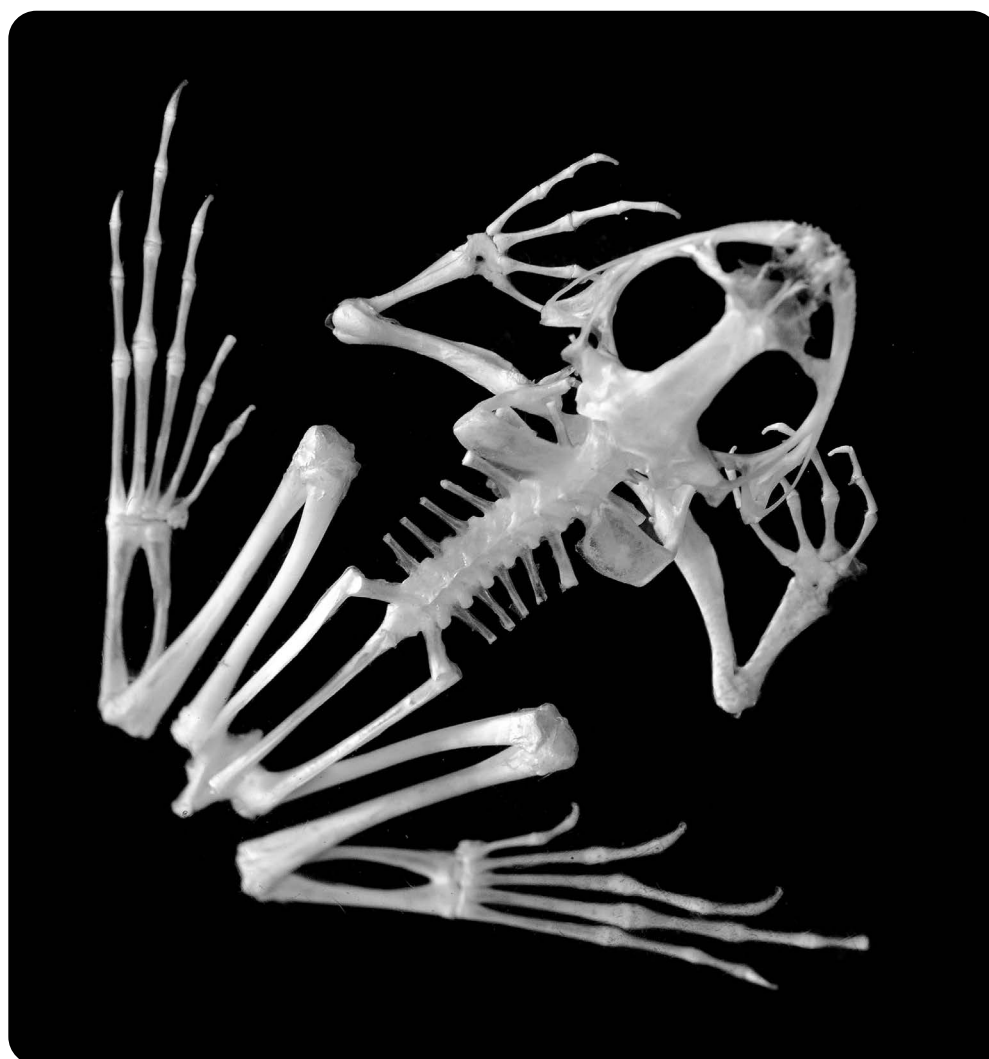
**STEM SENTENCES:**  
My shell is/I need a shell that is \_\_\_\_\_ (hard, rigid, strong)  
I need a hard shell because \_\_\_\_\_

## What have we learned today?

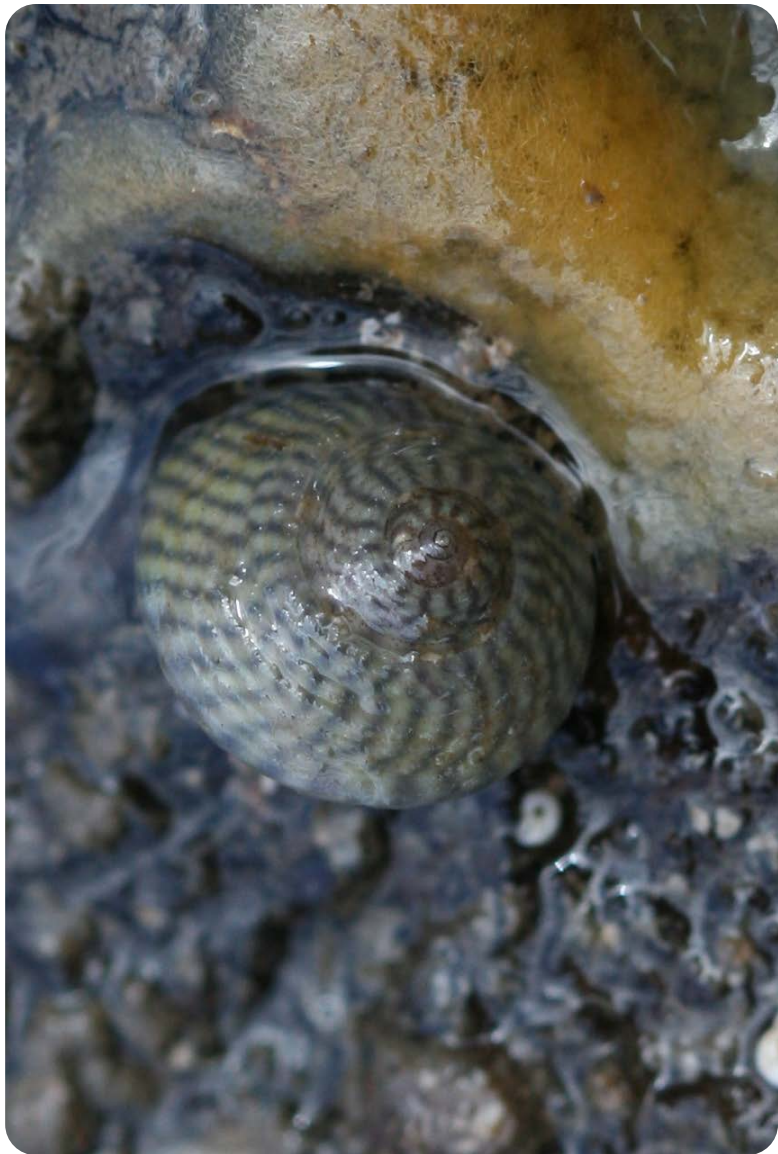
Reflect on the children's **learning about Nature** and assess their understanding by asking: *How would you describe a shell? Which living things by the seaside have shells? Why do living things need shells?*

Draw out the **learning from Nature** and the link to the **principle of Interdependence** by asking: *Why should we leave shells on the beach?* Discuss the fact that in Nature, everything has a use. Hermit crabs, for example, need old shells to protect them. Every living thing in Nature has a role to play.

## Resource 3A



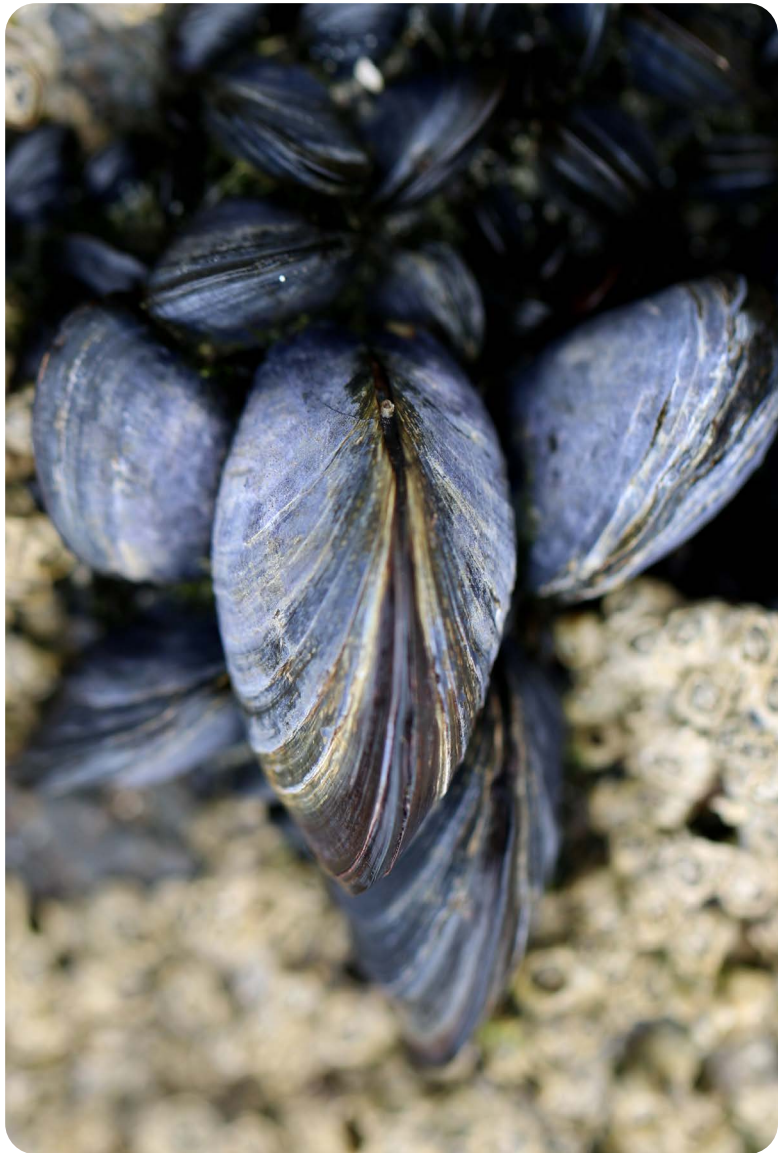
Resource 3B



grey topshell



shore crab



blue mussels



limpets

## Resource 3C



spiny starfish

## Resource 3D



hermit crab

**Animals, including humans**  
Identify and name a variety of common animals that are carnivores, herbivores and omnivores

Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals

**Working scientifically:**  
Identifying and classifying

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

Vocabulary relating to animals, including humans, working scientifically and thinking sustainably is highlighted within the unit introduction.

Individual whiteboards and pens

Optional: A copy of *Rockpool Secrets* by Narelle Oliver

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

Challenge the children to find 'three in a row' when they are exploring the feeding relationships of living things in a rockpool (e.g. algae – limpet – starfish)

**CLIMATE ACTION PLAN:**  
Biodiversity and Nature

# How do the living things in a rockpool depend on one other?

## What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by writing the words herbivore, carnivore and omnivore on the whiteboard. Ask children to use their individual whiteboards to draw their answers as you ask: *What does a herbivore eat? What does a carnivore eat? What does an omnivore eat?*

Share with the children the image on Resource 4A of a sea turtle grazing on

sea grass.

Allow children time to describe what they can see and to share any prior knowledge relating to sea turtles. Ask: *Is a sea turtle a carnivore, herbivore or omnivore? Can we tell just by looking at this image?*

Share children's ideas and address any misconceptions.

## What are we learning today?

Begin the children's **learning about Nature** by displaying the image on Resource 4B and asking them: *What can you see?* Draw their attention to the rockpool in the image and ask: *What is a rockpool?* Watch the first 45 seconds of the BBC Bitesize film clip [Rockpools are full of life and drama](#) and discuss how rockpools are formed when the tide goes out, cutting off the living things in them from the rest of the sea until the tide comes in again.

Ask the children: *What living things do you think might live in a rockpool?* Encourage them to draw on their learning from the previous lesson to discuss their ideas with a partner before sharing them as a class. Watch the rest of the film clip, pausing when the children spot a new living thing to discuss what it is (e.g. mussel, limpet, anemone, blenny, seaweed, algae, whelk, topshell, spiny starfish, crab, shrimp).

With reference to the clip, ask the children: *How does the blenny depend on the sea snail in the rockpool?* Establish that it depends on it for food and that other living things in the rockpool depend on one other for food, too.

The next part of the learning could take place outside so children have the

opportunity to **learn in Nature** if there is access to a natural space.

Introduce the living things on the fact cards on Resource 4C that explain what some of the living things found in a rockpool eat. Discuss with the children which are animals and which aren't (the seaweed and algae – strictly speaking, these are not classified as plants, although they behave like them). Give each pair of children one of the fact cards to read before inviting pairs of children to read out the information on their fact card. Challenge the other children to listen carefully to see if their living thing is mentioned. Draw out different feeding relationships as they present themselves (e.g. the blenny eats the sea snail).

In small groups, the children use a full set of fact cards to find other pairs of living things with a feeding relationship. Discuss what they have discovered as a class and address any misconceptions.

### TEACHER TIP:

Either in this lesson, or at another point in the school day, you could share with the children the book *Rockpool Secrets* by Narelle Oliver, which works well to support this learning.

## How are we learning today?

Extend the children's **learning about Nature** by revisiting the words herbivore, carnivore (explored in the previous lesson) and omnivore, and discuss their meanings. In small groups, the children revisit the statements on the fact cards and decide if each animal is a herbivore, a carnivore or an omnivore, giving reasons for their thinking and sorting the cards into these groups.

Discuss their thinking and reveal that the limpet and topshell are herbivores, the anemone and starfish are carnivores and the mussel, crab and shrimp are omnivores.

Ask the children: *How else might living things in a rockpool depend on one other?* Once they have shared their ideas in pairs, discuss them as a class. To support the

discussion, or to extend their thinking, share the statements on Resource 4D.

### TIME TO EXPLAIN:

Take the children outdoors to **learn in Nature**. Drawing on their learning from the rest of the lesson, create a class model of a rockpool with each child choosing a living thing to represent and acting out how it interacts with other living things in the rockpool. Freeze the class model from time to time and ask individual children to guess what another child is doing, highlighting the interdependence between the living things.

### STEM SENTENCES:

I am a \_\_\_\_\_  
I depend on \_\_\_\_\_ for/because \_\_\_\_\_.

## What have we learned today?

Reflect on the children's **learning about Nature** and assess their understanding, by asking: *What living things might we find in a rockpool? How do the creatures in a rockpool depend on each other for food? Which are herbivores? Carnivores? Omnivores? How else do the living things in a rockpool depend on each other?*

Draw out the **learning from Nature** and the link to the **principle of Interdependence**

by asking the children: *Why shouldn't we disturb the living things in a rockpool?* Discuss how, because the living things in a rockpool depend on each other in different ways, we need to be careful that we don't disturb or disrupt these relationships.

Resource 4A



green sea turtle

## Resource 4B



Resource 4C



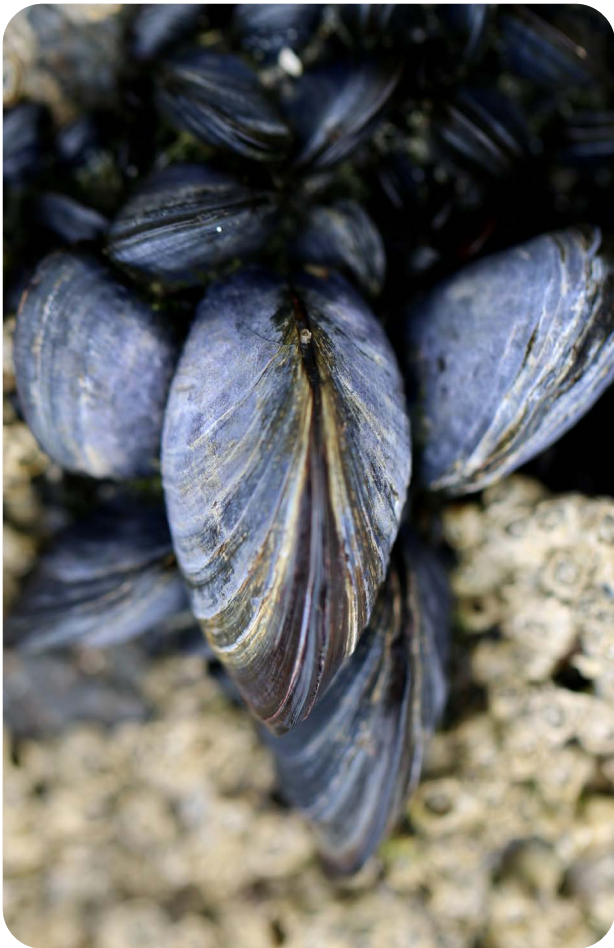
**limpet**  
I eat algae that grows on rocks.



**crab**  
I eat seaweed and small animals.



**blenny**  
I eat sea snails, seaweed and tiny shrimp.



**mussel**  
I eat tiny plants and animals that float in the water.

Resource 4C



**shrimp**  
I eat dead plants and animals.



**anemone**  
I eat small crabs, shrimp and fish.



**starfish**  
I eat mussels and limpets.



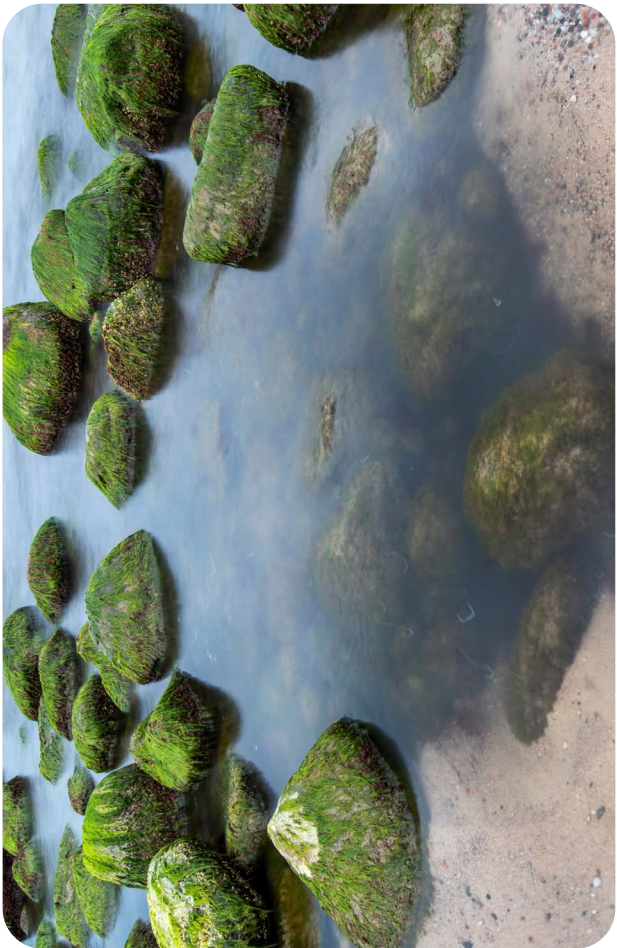
**topshell**  
I eat seaweed, algae and tiny plants.

Resource 4C



seaweed

I grow on rocks. I don't eat anything.



algae

I grow on rocks. I don't eat anything.

## Resource 4D

I need old shells  
to live in.



I keep the rockpool  
cool and shady.



I hide under seaweed.



I eat dead things to keep  
the rockpool clean.



Everyday materials

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

Working scientifically:  
Performing simple tests

Scientific enquiry type:  
Comparative and fair testing

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

A bowl of water

A selection of items commonly found on beaches e.g. pebbles, shells, driftwood or sticks, empty plastic drinks bottles, plastic bags, plastic bottle tops, plastic beach toys, empty crisp packets, plastic sweet wrappers, metal bottle tops

A glass bottle

An empty drink can

A selection of small items made from different materials to test e.g. coins or paperclips, glass marbles, twigs, pebbles, plastic bottle tops, shells (one set per group)

Plastic containers

Children requiring additional support may benefit from a reduced selection of materials to explore.

Challenge the children to explain whether this statement is true or false and to explain how they know or could find out: 'All natural materials float'

CLIMATE ACTION PLAN:  
Biodiversity and Nature

# What materials do we find on our beaches?

## What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by sharing a collection of objects and words (a bowl of water, a pebble, a stick, the word 'float' and the word 'sink') and inviting the children to play a game of 'Connect 3'.

Ask the children to find three things that they can connect and to explain why, for example, '*If you put a pebble in a bowl of water, it will sink*', '*We can find out if an object will float or sink using a bowl of water*'. Share ideas and address any misconceptions.

## What are we learning today?

Begin the children's **learning about Nature** by taking them outside to **learn in Nature** or in an open space and asking them to sit in pairs in a circle. Show the children the selection of items commonly found on beaches in the UK (see 'You will need', left). Give each pair of children one item to handle. Ask them to identify what the item is and to discuss what material they think it is made from. Pass the items around the circle until each pair has handled and discussed all of them.

As a class, discuss the children's thinking about each of the items and address any misconceptions. Show them the empty drink can and explain that this is another item commonly found on beaches in the UK. Ask the children to identify it and the

material it is made from. Repeat for the glass bottle. Ask the children: '*Why weren't you given these things to pass around the circle?*' Establish that these items are made from materials that can be sharp and that if you see them on the beach or elsewhere, you shouldn't touch them.

As a class, sort the items into groups according to the materials they are made from (e.g. rock, wood, shell, plastic, metal, glass). Draw the children's attention to the items in the plastic, metal and glass groups and discuss how these are all types of packaging for food or drink that have been used once and then discarded. Take a photograph of the grouped items for use in Lesson 6.

## How are we learning today?

Remind the children of their learning about the tides in relation to the formation of rockpools in Lesson 5. With reference to the term 'float' and 'sink' from the retrieval activity, ask the children: '*Do you think items that float or items that sink would be more likely to wash out to sea when the tide goes out? Which items do you think would float away on the tide? What are these items made from?*'

Explain to the children that in this part of the lesson they will be working like scientists to find out which materials found on our beaches float and which ones sink. Share the small items that they will use to carry out this simple test (see 'You will need', left) and ask the children to predict in pairs which ones will float and which ones will sink. Discuss their ideas and record their predictions as a class.

In pairs, the children discuss how they will test whether these materials sink or float before sharing their ideas.

Agree on a simple methodology (see 'Teacher tip'). Model how the children can use Resource 5A to draw the item that matches the material in the first column, record their prediction in the second column, then use the third and fourth

columns to record their results. In small groups, the children carry out the test.

**TEACHER TIP:**  
Instead of using plastic containers filled with water to carry out this simple test, the children could work in their own 'rockpools'. These can be created by draping reused plastic sheeting over old tyres, if your school has these in its loose parts play provision. Thanks to the staff at Boyton Primary School, Launceston, for this brilliant idea!

**TIME TO EXPLAIN:**  
The children present their results to another group and compare them.

**STEM SENTENCES:**  
The \_\_\_\_\_ is made from \_\_\_\_\_ .  
We found that \_\_\_\_\_ sinks.  
We found that \_\_\_\_\_ floats.

As a class, discuss the children's results. Ask: '*Which materials floated? Which materials sank? Do the materials that floated have anything in common? What about the materials that sank?*' (e.g. the children might suggest that the materials that sank are heavier than the materials that floated)

## What have we learned today?

Reflect on the children's **learning about Nature** and assess their understanding by asking: *What items might we find on our beaches? What materials are they made from? Which materials float and which materials sink? Which items might float out to sea on the tide?*

Draw out the **learning from Nature** and the link to the **principle of Interdependence** by asking the children: *Which of these materials belong on the beach? Which don't? How do you think the materials that don't belong on the beach got there?*

Revisit the idea of natural materials and materials made by people, which the children will explore further in Lesson 6.

### TEACHER TIP:

The data collected by the Marine Conservation Society as part of its annual [Great British Beach Clean](#) provides insight into the items found on British beaches and the impact of initiatives that seek to address this.

Resource 5A

| material | sinks | floats |
|----------|-------|--------|
| rock     |       |        |
| wood     |       |        |
| shell    |       |        |
| metal    |       |        |
| glass    |       |        |

**Everyday materials**  
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

**Working scientifically:**  
Gathering and recording data to help in answering questions.

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

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

The same selection of items commonly found on beaches that the children explored in Lesson 5

Litter-picking equipment

Copies of Resource 6A (enough for one per pair)

Clipboards

Optional: A copy of *Clem And Crab* by Fiona Lumbers

Children requiring additional support may benefit from exploring the items they will be using in the simple test and identifying the materials they are made from prior to the lesson.

Challenge the children to extend their lists of litter, including further objects and the materials that they are made from. Ask: *Is most litter made from the same material?*

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

# Which materials don't belong on our beaches?

## What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by sharing with them the photo from Lesson 5 of the items found on UK beaches sorted by material.

Recap the sorting activity by asking: *What items can you see? What materials are they made from? How did we sort them?*

Ask: *Which of these materials are natural materials? Which are made by people?*

The children discuss their ideas in pairs before sharing them with the class. Address any misconceptions.

## What are we learning today?

Begin the children's **learning about Nature** by asking: *What would we call the items we find on our beaches that are made from materials made by people?* Introduce the term 'litter' and discuss its meaning. *Why is litter on our beaches a problem?* As a class, watch the CBBC film clip [Radzi cleans up a beach](#) to help answer this question.

Ask the children to discuss in pairs: *Where does the litter on our beaches come from?* Discuss their ideas and explain that some of the litter found on beaches is left there by people visiting the beach but most of it comes from places far away from the seaside. Emphasise how important it is that we dispose of our rubbish correctly to prevent it becoming litter.

**TEACHER TIP**  
The majority of litter that ends up on our beaches ( 80%) comes from inland sources, recent data from the Marine Conservation

Society shows. Wet wipes and other rubbish that is incorrectly flushed down the toilet instead of being binned can also end up on our beaches when drains overflow or leak. Many wet wipes are made from synthetic (plastic) fibres.

Explain to the children that they will be carrying out a local area litter pick or beach clean to see what materials most of the litter they find is made from. Ask the children: *What litter do you think we'll find? What materials are these things made from? Which material will we find most of? Record the children's predictions.* Model how to use the recording sheet on Resource 6A to record the items of litter they find and how many items made by each material they find on their litter pick.

## How are we learning today?

Take the children outside to **learn in Nature** or in an open space. In pairs, the children use litter-picking equipment to carry out a litter pick, drawing the items they find next to the corresponding material and using a tally to record how many items of litter they find that are made from each of the materials listed.

**TIME TO EXPLAIN:**  
In pairs, the children compare the results of their litter pick with another pair.

**STEM SENTENCES:**  
The \_\_\_\_\_ is made from \_\_\_\_\_.  
The material that most of the litter is made from is \_\_\_\_\_.

**TEACHER TIP:**  
Either in this lesson, or at another point in the school day, you could share with the children the book *Clem And Crab* by Fiona Lumbers, which works well to support this learning.

## What have we learned today?

Reflect on the children's **learning about Nature** by asking: *What items of litter did we find? What materials were they made from? What material was most of the litter made from?*

Draw out the link between this learning and the **principle of Interdependence** by asking: *What do we find at the seaside? Why is it a problem that we find so many items made from materials made by people at the seaside? What would we want to find at the seaside in the future?* (e.g. less litter, fewer items made from materials made by people)

Discuss the actions that we can all take to help protect the seaside (e.g. take our rubbish home with us when we visit the beach; use reusable water bottles and containers for picnics so we create less rubbish; always dispose of our rubbish correctly wherever we are; take part in beach cleans and litter picks). The children each make a pledge of one thing they will do to help.

Resource 6A

| material | items | tally |
|----------|-------|-------|
| plastic  |       |       |
| glass    |       |       |
| metal    |       |       |
| wood     |       |       |
| paper    |       |       |

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