

Forest School and Science for F2

How do things change over time? 5 th and 12 th Sept	<i>Plant Bingo Leaf Printing</i>
19 th and 26 th Sept	<i>Rubbings</i> Snap Science lesson 19 What is happening to the trees? (Autumn)
3 rd and 10 th October	<i>Den building</i> <i>Nature crowns</i> <i>Chemistry: objects and materials: lesson 7</i>
What can we learn about the world around us? 1 st and 7 th Nov	<i>Guy Fawkes. Talk about the Gunpowder plot and make bonfires and guys</i> <i>Chemistry: objects and materials: lesson 8</i>
14 th and 21 st Nov	Act the story of Rama and Sita and set a trail of Diva lights around the outdoor area <i>Chemistry: objects and materials: lesson 9</i> <i>Chemistry: objects and materials: lesson 10</i>
28 th and 5 th Dec	<i>Signs of Autumn. Adopt a tree activity</i> <i>Chemistry: objects and materials: lesson 11</i> <i>Chemistry: objects and materials: lesson 12</i>
12 th and 19 th Dec	<i>Create a manger for baby Jesus</i>
How has diversity improved life? 5 th and 9 th Jan	Sense linked to all the better to hear, smell.... you with. Blind folded food tasting. Listening walk , feely bag of natural materials.
16 th and 23 rd Jan	How does a dragon move? Dragon dance Snap Science lesson 22 What is the weather like today? (Winter)
30 th Jan and 6 th Feb	How do shadows move? <i>Shadows. Play shadow tick and draw around shadows</i>
13 th and 20 th Feb	<i>Make story wands</i>
What makes a good place to live? 27 th and 6 th March	Talk about signs of spring and go on a signs of Spring Walk Snap Science lesson 20 What is happening to the trees? (Spring) <i>Snap Science Biology: Animals and plants lesson 1</i> <i>Snap Science: Our changing world: lesson 24</i>
13 th and 20 th March	<i>Leprechaun houses. Show children how to make mini dens</i> <i>Snap Science Biology: Animals and plants lesson 2</i> <i>Snap Science Biology: Animals and plants lesson 3</i>

27 th March	<i>Easter egg hunt</i> <i>Snap Science Biology: Animals and plants lesson 4</i>
Where does the power come from? 17 th and 24 th April	<i>Earth Day 22nd April.</i> <i>Litter picking and poster making</i> <i>Plant Protectors – Ice</i> <i>Snap Science: Physics; Light, space, electricity and movement: lesson 1</i> <i>Snap Science: Physics; Light, space, electricity and movement: lesson 2</i>
2 nd and 8 th May	<i>Spring flowers hunt around school</i> <i>Planet Protectors – Eye,</i> <i>Snap Science: Physics; Light, space, electricity and movement: lesson 3</i>
15 th and 22 nd May	<i>Adopt a tree</i> <i>How has the American sycamore changed</i> <i>Snap Science lesson 20</i> <i>What is happening to the trees? (Summer)</i> <i>Planet Protectors –, Ace,</i> <i>Go on a minibeast hunt</i> <i>Snap Science: Physics; Light, space, electricity and movement: lesson 4</i>
Is everything what it first appears to be? 5 th and 12 th June	<i>Den building. Teach children how to make different types of dens</i> <i>Planet Protectors –, Ridge</i> <i>Snap Science: Physics; Light, space, electricity and movement: lesson 5</i> <i>Snap Science: Physics; Light, space, electricity and movement: lesson 6</i>
19 th and 26 th June	<i>Treasure maps to link in walk to school week</i> <i>Planet Protectors –, Reef</i>
3 rd July and 10 th July	<i>Make bug hotels</i>
17 th July	<i>Snap Science lesson 23</i> <i>What is the weather like today? (summer)</i>

WHAT DOES AN EARTHWORM DO?

Key words:

soil
segments
saddle

Key information:

An earthworm can be replaced with any other animal that the children are able to observe at first hand, for example, a bee, woodlouse, beetle or caterpillar. You should adapt the activities accordingly, with a focus on how the particular animal looks and behaves – see Science Photos 9–12 to help with this.

ACTIVITY SUMMARY:

Children learn about how earthworms move, what they eat and about their habitat through close up, first hand observation, asking their own questions and collecting evidence to answer them. The focus should be firmly on observable features and behaviour. Children explore the natural habitat of earthworms in the school grounds and also build or use a wormery where they can observe the earthworms above and below ground. It can take up to two weeks to see any changes in the wormery, and up to a year to see the soil created by the worms forming at the bottom of the wormery. The big biology ideas of classification based on observable features and interdependence, which are developed through KS1 and 2, are introduced here.

Learning intention:

Children can talk about what earthworms are like and what they do.

EYFS cross curricular links:

- Physical development: Moving and handling – Can you move like an earthworm?
- Expressive arts and design: Observational drawing – Can you use the magnifying glass to look carefully at an earthworm and draw what you see?

RESOURCES (FOR FOCUS ACTIVITY):

- Wormery. This can be made from a clip top bin or purchased specifically from a specialist provider, such as www.greenfingers.com or www.wiggos.com.
- Clear container in which to layer sand, soil and leaf litter
- Kitchen waste. A list of dos and don'ts for wormeries can be found on many websites, such as www.wormcity.co.uk.
- Earthworms. Earthworms are best sourced from your local area but can be purchased from several places, such as www.wormsdirectuk.co.uk.

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Magnifying glasses (plastic)
- Containers to view earthworms
- Science Photos 1–8
- Resource sheet (Word bank)
- Non-fiction books

EXPLORE:

Display the Story slideshow and play the story to the children. Play slide 4 again. Ask them to describe the earthworm Billy is holding. Do they notice the rings?

Ask: *Are there any clues to show where it might live?*

Ask them to talk to their friends about a time when they have seen an earthworm. Where did they find it? What did it look like? How did it move? Did it have eyes? Did it have a tail?

Ask: *Does anyone know what earthworms eat? Is it good to have earthworms in a vegetable patch? What or who would help us to find out?*

Take the children on an 'earthworm hunt' to look at earthworms in their natural habitat. Ask them where they think the best place will be to find earthworms. Were they right?

ENQUIRE (FOR FOCUS ACTIVITY):

As a class, spend time looking closely at an earthworm. Encourage children to touch it, hold it and observe it. Ask the children what they notice. Tell them that the 'rings' are the separate 'segments' of an earthworm and that the 'lump' in the middle is called a 'saddle'. Ask them if they can tell which end is which.

Set up a wormery that can be added to over time, somewhere in the outdoor area. This may be a part of the wider school garden. Visit the wormery regularly throughout the rest of the year to observe what is happening. Take photos that the children can use to retell the story of their wormery. Encourage them to notice how the earthworms are mixing the garden soil and kitchen waste together.

While building the wormery, and in the first few days afterwards, focus on observing what earthworms do.

Ask: *Where in the soil do earthworms live? What else lives there? How is the earthworm like other animals that live in the garden? How is it different? Can earthworms see in the dark? What animals might eat an earthworm? (You can introduce the term predator if appropriate.)*

Encourage children to think of their own questions about earthworms.

In the short term, layering sand, compost and leaf litter in a see-through tank and introducing some worms will enable the children to see the 'mixing' in action.

Encourage the children to return to the wormery regularly over the next months and to talk about what they observe happening. Can they answer their own questions now?

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Sand tray: What animals live in the soil? Use small toy animals that might live in the soil and add compost and leaves. Encourage children to move the animals through the soil and to talk about what else might live there.

Interactive display of the wormery: What is happening in the wormery? Place the clear-sided, layered wormery in an area that the children can access all the time. Make available a camera or tablet, drawing equipment, non-fiction books and magnifying glasses.

Malleable materials: Can you make an earthworm? Can you make the longest / shortest / fattest / thinnest earthworm? Can you make it wriggle?

Writing area: Can you write about the wormery? Cut out the word bank cards from the Resource sheet. Science Photos 1–8 can also be displayed. Encourage children to use them to write about how to make a wormery. Ask them to make labels for the wormery.

REFLECT AND REVIEW:

Spend time looking at the wormery over subsequent weeks with small groups of children. Talk about how the earthworms are moving. Show them a photo of what the wormery looked like at the start of the activity.

Ask: *What is different? What is the same? What have the earthworms been doing?*

EVIDENCE OF LEARNING:

Listen to children's descriptions of how an earthworm moves and what it does. In the short term, children should be able to talk about how an earthworm wriggles through the soil, that it eats leaf litter, that an earthworm feels soft, slimy or silky, and that some birds and moles like to eat them. In the longer term, children may also be able to talk about how worms are helpful to gardeners as they mix up the soil.

SCIENCE AT HOME:

Can they find an earthworm on their way home from school? Can they find an earthworm in their garden or in a local park? If they have a compost heap can they see any earthworms in it? Can they tell their parents or carers what earthworms do? Can they hold an earthworm charming championship with their family? Information on how to run one can be found in the 'free packs' section, under the 'muddy good fun' link at www.naturedetectives.org.uk.

Health and safety:

Be Safe!, page 14 (composting), pages 20–21 (safe animal handling).

Key information:

Charles Darwin described earthworms as 'nature's ploughs' because of the way that their activity causes soil layers and organic matter to mix. The mixing improves the fertility of the soil by allowing the organic matter to be dispersed through the soil and the nutrients held in it to become available to bacteria, fungi and plants.

WHO HAS STRIPES?

Key words:

camouflage

habitat

Key information:

The main focus of this activity is on stripes that help to camouflage animals; however, some stripes, e.g those on a badger or wasp, indicate their danger zones (teeth, sting) to warn off potential predators.

Key information:

Tropical fish suppliers are a good source of replica plants of more unusual plants that are suitable for water tray activities exploring a tropical water scene.

ACTIVITY SUMMARY:

This activity looks at stripes in nature, and in particular animals with stripes. Children will choose an animal to find out about and create a life-sized picture showing the stripes in detail. They will think about how an animal's stripes may help to keep them safe in their natural environment. This will introduce the big biology ideas of habitat and adaptation that they will meet in KS2. Children will use secondary sources of evidence, including photos, non-fiction texts and adult experts, but wherever possible this activity should be enhanced by a school visit from an animal handler or a class visit to a wildlife park or animal sanctuary so that striped animals can be observed at first hand.

Learning intention:

Children can talk about a range of familiar striped animals and start to suggest why the stripes may help to keep those animals safe.

EYFS cross curricular links:

Expressive arts and design: Exploring and using media and materials / Being imaginative – What will your stripy animal look like? Design and paint or draw an imaginary stripy creature of your own. What colour will it be? How many stripes will it have? What size will it be? Where will it live?

Expressive arts and design: Exploring and using media and materials / Being imaginative – Where does this stripy animal live? Paint or draw creatures with stripes in their natural habitats using the Science Photos or non-fiction books for reference.

Expressive arts and design: Exploring and using media and materials / Being imaginative – Can you paint a stripy fish? What colour will it be? How many stripes will it have? What size will it be? Can you paint a baby stripy fish to match? Cut out the painted fish and display as a class aquarium scene. (Ensure that children have knowledge or experience of tropical fish before doing this activity.)

Understanding the world / Literacy: Reading – What can you find out about stripy animals? Use a variety of non-fiction books to find out more about animals with stripes. Where do they live? What do they eat? How do they move?

RESOURCES (FOR FOCUS ACTIVITY):

- Large sheets of paper, joining and cutting materials, collage materials, including natural materials
- Free standing and hand held magnifying glasses
- Tweezers
- Digital camera or tablet
- Access to secondary sources such as an expert, books or the internet

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Resource sheet (Draw the habitat)
- Science Photos
- Colouring materials
- Small world stripy animals as suggested in the Science Photos, materials suitable to build a habitat for animals (real plant parts such as leaves and grasses where possible)

EXPLORE:

Display the Story slideshow to the children and play the story. Ask them to talk to a friend about the animals in the book that Billy and Rubina are looking at. Ask them about a time when they may have seen one of the animals featured in the story.

Ask: What did you notice about the animals that Billy and Rubina were looking at? What colours are the stripes on each animal? Are they all the same size?

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they are going to find out more about an animal with stripes. Ask them to talk to a friend about any other animals they know that have stripes.

Spend time looking at Science Photos 1–26, naming them, and comparing males, females and babies where appropriate.

Prompt the children's observations by asking them questions suitable for the particular animal they are looking at:

Ask: Are they born with stripes? Is every stripy fish the same? Is every tiger the same? What is the same about these animals? Can you find an animal with brown stripes? Or black stripes? Do they have stripes all over? Which direction do the stripes go? Up and down, along or around?

Ask the children to choose one animal and to find a photo of where it lives (Science Photos 27–33).

Encourage the children to find out how stripes are useful to their animal in its natural habitat.

Where does the animal live? How does it find its food? Do stripes make it harder or easier to see the animal? How is it camouflaged? Does the animal want to hide? Why? How do the stripes make it harder or easier to be seen? Why might that be useful?

Based on their initial observations and research some children may want to find out more about their animal. Help them to use books, the internet or contact an adult animal expert to find out more about their stripy animal.

Help the children to collect appropriate collage materials for their animal and to create a life size collage. This can be done by sticking large pieces of paper together for larger animals such as zebras and tigers or by using chalk on a hard surface outside. For smaller animals, such as caterpillars and bees, help may be needed to work on a very small scale for this activity. Provide table top magnifiers for the children to enlarge their collage as they are working on it.

Place the life size animals on a wall space and encourage the children to find collage materials to add the natural environment and to test if the stripes help the animals to hide. Invite other classes to visit the display to see if they can spot all the animals.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Creative area: Do their stripes work? Provide copies of the Resource sheet, Science Photos and colouring materials for children to draw surroundings for the animals and then see if the stripes help them to hide or make them easier to see.

Sand tray: Can you make a habitat for an animal to hide in? Rotate a range of small world stripy animals every few days in the sand tray with a range of natural materials.

Water tray: Can you make an underwater habitat for an animal to hide in? Provide a range of plastic toy stripy fish and plants and stones.

Small world area: Set up a variety of different habitats in tuff spot trays with small world animals, for example, jungle, farm, wildlife park. Which animals would live where? Which animals have stripes and which do not?

REFLECT AND REVIEW:

Remind the children of the animal that they chose to find out more about. Ask them to tell you what they know about that animal, including its natural habitat and how its stripes may help to keep it safe. Encourage children to name some other stripy animals. Do they use their stripes in the same way?

EVIDENCE OF LEARNING:

Listen carefully as children talk about their chosen animal. Do they describe the colour and pattern of stripes on the animal and suggest how these may help to camouflage it? Do they talk about its habitat?

SCIENCE AT HOME:

Can they bring an item of stripy clothing to school? Can they test out their stripy clothes against different backgrounds at home or at school? Can they tell an adult where the best place to hide would be if they were wearing their jumper? You may choose to do this first to launch this activity.

Key information:

The Science Photos do not provide an exhaustive list of animals with stripes but a wide selection as a starting point to encourage children's interest.

Key information:

It will be helpful to find out what the name of the female and the young of the species are called in preparation for Activity plan 6 'Who are my parents?'.

WHAT IS INSIDE AN EGG?

Key words:

Hatchling

Key information:

Close links can be made with Activity plan 6 'Who are my parents?', where some of the same animals can be looked at again in the context of parent and child of the same species.

Key information:

There are many specialist companies that can provide everything needed to do this activity safely in school, including incubators, heat lamps and the fertilised eggs, plus guidance on how to look after the equipment, eggs and chicks. The companies may provide resources for introducing the eggs to the class or an expert to talk to the class. They will also collect the hatched birds afterwards. For example, www.livingeggs.co.uk. The usual time frame for this type of activity is two weeks from the eggs arriving in school to the hatchlings being collected.

Health and safety:

Be Safe!, pages 20–21 (safe keeping of animals including hatching eggs).

ACTIVITY SUMMARY:

In this activity children observe the hatching of chicks or ducklings in the classroom. They build on this memorable first hand experience by using secondary sources of information to find out about other animals that lay eggs, including fish, birds, amphibians and reptiles. The children will explore where different animals lay their eggs and what their hatchlings are like. This introduces the big biology idea of life cycles and the scientific skill of observing change over time.

Learning intention:

Children can identify some animals that lay eggs and talk about the baby animals that hatch from them.

EYFS cross curricular links:

Understanding the world / Literacy: Reading – What can you find out about animals that hatch from eggs? Use a variety of non-fiction books to find out about a range of hatchlings. Where are they laid? Who looks after them?

Expressive arts and design: Exploring and using media and materials – Can you paint a hatchling? Use the Science Photos or non-fiction books for reference.

Expressive arts and design: Exploring and using media and materials – Which hatchling will be in your egg? Design and make an egg that opens using split pins, card, crayons, etc.

Expressive arts and design: Exploring and using media and materials – Can you make model turtles? Make clay turtles and their hatchlings.

Physical development: Moving and handling – Can you pretend to be a baby animal curled up tightly in an egg? What type of animal are you? Can you slowly start to grow and push your way out of the shell? How will you move when you get out?

RESOURCES (FOR FOCUS ACTIVITY):

- Fertilised eggs (chicken or duck), incubator, heat lamp, food and water for hatchlings, large area for the growing hatchlings
- Digital camera or tablet
- Access to large space such as school hall or playground
- Science Photos
- Sticky notes
- Access to secondary sources such as an expert, non-fiction books or the internet

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Resource sheet (Egg template)
- Science Photos
- Hoops for sorting images

EXPLORE:

Display the Story slideshow to the children and play the story. Ask them to talk to a friend about the animal that Rubina and Jamil are looking at in their book.

Show the children Science Photos 1–3 and establish that this is a sea turtle and that baby sea turtles hatch from eggs laid by their mother on the same beach that the mother was born on. Tell the children that the baby sea turtles are called hatchlings and help them to recognise how the hatchlings look like miniature versions of an adult sea turtle.

Tell the children that they are going to find out more about animals that hatch from eggs.

Ask: *Do you know of any other animals that lay eggs?* Collect the children's ideas. Play slide 1 if prompts are needed.

ENQUIRE (FOR FOCUS ACTIVITY):

Tell children that they are going to look after some eggs and that the eggs will hatch after a period of time. Show them the eggs.

Ask: *What do you think will come out of these eggs? What do you think we need to do to look after them? What do you think is inside the egg right now?*

Establish with the children that the eggs are chicken or duck eggs and that they need to be kept warm. There are baby animals growing inside them. Tell the children that the adult hen or duck would normally sit on top of the eggs to keep them warm until they are ready to hatch. Explain that, instead of the mother hen, the incubator will keep the eggs warm. The time frame between the eggs arriving in school and hatching is usually 3–4 days.

Place the incubator somewhere the children can look at it as often as they choose so that they will notice tiny changes. It will be very exciting to be the first to spot a crack in a shell!

Help children to take photos regularly and to add observational drawings and notes to make a scrapbook or timeline of the time that the eggs and hatchlings are in school. Encourage children to look for changes each time they look at the hatchlings.

Ask: *What is happening? What has changed? What do the eggs / hatchlings look like? How did you know that the chick was starting to hatch? Which bit of the chick did you see first? What happened to the shell after the chick hatched? What is the chick's skin like? What colour are they when they hatch? Are they all the same? What can they do today? What do they feel like? What do they sound like? What do they smell like?*

Once the eggs have hatched:

Spread out the Science Photos of the hatchling and the adult for each animal randomly face up on the floor in a large space with sticky notes covering the name of the animal. Ask the children in pairs to search for pairs of adult and baby and to bring them back to you. Let them check that they are correct by peeling off the sticky note to check the name. Return any incorrect ones to the open space for others to find. Continue until all matching pairs have been found.

Ask: *What is your animal called? What does the hatchling look like? Is it the same as the adult? How is it different?*

Spread out the Science Photos showing the eggs of each species in the same way and help the children to find the egg to match their other two photos by using clues from the hatchling photo: for example, colour, size, shape, etc.

Ask: *What shape is the egg? What size is the egg? What colour are the eggs? How many are there? Which animal do you think laid them? Where do you think they were laid?*

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Tabletop activity: What is inside an egg? Provide copies of the Resource sheet and appropriate Science Photos images. Change the animal every day and ask children to draw what they think is inside the egg.

Tabletop activity: Can you match the egg and the grown up? Use the Science Photos of the hatching infant and adult of the species.

Tabletop activity: Which are ... ? Sort the Science Photos of the hatching animals into groups using two hoops. For example, birds / not birds, fish / not fish.

Sand and water activity: Where will the turtle lay her eggs? Where will they hatch? Provide small world turtles, hatchlings and eggs. Can the children enact the process?

REFLECT AND REVIEW:

Look at the scrap book or time line about the eggs and hatchlings with the children and ask them to tell you what happened. Ask them to tell you about any other animals they know that hatch from eggs.

EVIDENCE OF LEARNING:

Listen carefully as the children describe what happened. Can they describe the events that they observed as the eggs hatched and the hatchlings grew? Can they identify some other animals that lay eggs? Can they talk about where the eggs are laid, how the parents look after the eggs and describe the hatchlings?

SCIENCE AT HOME:

Can they test egg shells to find out how strong they are? They should ask an adult to help them carefully crack two hen's eggs so that two complete domes are left. How hard were they to break? Is it good that eggs break easily? Can you balance a book on the two half egg shells? How many books can they hold? Why is it important for the eggs to be strong? Encourage children to take photographs and to share their results with the class.

Key information:

A female sea turtle lays her eggs by burying them in the sand on a nesting beach, usually in the tropics. She then returns to the sea. Six to eight weeks later the hatchlings emerge from the eggs and make their way to the sea. The hatchlings can spend up to a decade in open waters before returning to the coast. Depending on the species, it can be ten to fifty years before adult female sea turtles migrate to the area where they were born to lay their eggs. They lay several times during a nesting season and then every two to four years over their lifetime. Scientists think that sea turtles could have a life span of up to 100 years.

WHAT AM I MADE OF?

Key words:
human

Key information:

Ensure that you take into account cultural, social and physical differences between members of your class and handle these sensitively when exploring this activity. Children will inevitably want to identify what is the same about them and their friends and what is different. Maintain the focus on what 'I' am made of throughout using generic terms such as blood, hair and skin.

ACTIVITY SUMMARY:

In this activity children will learn about what different parts of their bodies are called, find out what they can do and think about what they are made of.

Children's interests may lead to further exploration and investigation, but no more than this is necessary at this stage. This activity introduces the big biology idea of the different human body systems. These are covered in detail in every year group of Snap Science from Year 1 to Year 6.

Learning intention:

Children can name the main parts of their bodies and describe their functions.

EYFS cross curricular links:

Understanding the world / Literacy: Reading – What can you find out about parts of your body?

Use a variety of non-fiction books to find out about the different parts of the body.

Physical development / Expressive arts and design: Moving and handling – Can you make different parts of your body move with the song? Sing and move to action songs, such as 'Heads shoulders knees and toes' and 'One finger one thumb keep moving'.

Physical development: Health and self-care – How do we look after our bodies, keep clean and eat healthily? Use a variety of non-fiction books to find out about health and self-care. Understanding the world / Physical development: Health and self-care – What questions would you ask about your body? Invite a school nurse, health visitor or doctor into school to talk to the children about their bodies and body parts.

Personal, social and emotional development: Making relationships / Role play – Can you care for patients who have hurt different parts of their bodies? Set up a hospital or medical centre using a range of equipment, including real bandages, plasters, stethoscopes, crutches, x-rays, scaled down uniforms, clip boards and posters.

Expressive arts and design: Exploring and using media and materials – Can you draw an x-ray picture? Use white chalk on black paper to make your own x-ray picture using the Science Photos and real x-rays.

Expressive arts and design: Exploring and using media and materials – What do you think you look like? Paint or draw self-portraits.

RESOURCES (FOR FOCUS ACTIVITY):

- Human x-rays. Sets of these are readily available from educational suppliers such as www.tts-group.co.uk.
- Science Photos 8-26
- Perspex mirrors (enough for everyone in the focus group to have one each)

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Play equipment for assault course, such as hoops, bean bags and obstacles to step over
- 'Movement dice' with the faces labelled run, walk, stand, sit, jump, hop
- Resource sheet 2 (Body plan and labels)
- Lifelike dolls
- Sticky notes

EXPLORE:

Display the Story slideshow to the children and play the story.

Play slides 2-5 again and ask the children to talk about a time when they have played a chasing game or have fallen over.

Ask: *What is Billy wriggling? What is Rubina using to run? Why is Billy bleeding?*

Use the 'move your body' cards from Resource sheet 1. Turn them over one at a time and ask the children to follow the instruction on each card. Encourage the children to suggest some silly things to do with their bodies, such as stand on their head, sit on their heels, walk on their hands, wiggle their ears.

Ask: *What are you made of?* Tell the children to talk to their friends about their ideas. Collect their ideas, accepting all answers at this point. Be sure to return to their suggestions after the Enquire activities. Do they want to make any changes? Accept all their answers at this point.

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they are going to find out more about their body parts.

Use Science Photos 16-26 to prompt examination of their smaller body parts, such as hair, nails, teeth, lips, tongue, eyes, ears, nose, mouth and fingers. Help children to use mirrors to look at these parts closely.

Ask: *What can you see? What shape is it? How many do you have? What does that part do?*

Use Science Photos 8-15 to talk about larger body parts, including head, chest, back, arms, legs and feet. Group the images linking the smaller parts to the larger parts and create sentences to describe the connections, for example, 'My head has two eyes, one nose, one mouth and two ears.'

Ask: *What is inside our bodies? Do you know the names of any parts of the inside of the body? What does that part do?* Some possible ideas include blood, bones, muscles, brain or heart.

Explore some human body x-rays.

Ask: *Which part of the body do you think this bone is in? Can you feel that bone in your body? Are there any parts of our bodies that don't have bones?* Help the children to identify some examples, such as ear lobes, tongue, eyeball.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Outdoor area: Can you make your heart beat faster? Provide equipment for the children to set up their own assault course or other vigorous activity, complete it and feel their hearts beating faster in their chests. What else happens to your body?

Outdoor area: Can you make your body move like this? In an open space, roll the 'movement dice' and make your body move in the way the dice shows. Provide the movement dice for pairs or small groups to challenge each other to make their bodies move.

Tabletop activity: Can you label the body? Use Resource sheet 2. Encourage the children to make their own extra labels, and to annotate the body parts to describe what the part does. Lifelike dolls can also be made available for the children to look at and use as they annotate the body parts.

Tabletop activity: Can you find the small body parts that are part of a larger body part? Provide larger copies of Science Photos 8-15 and smaller copies of Science Photos 16-26 for the children to group them together.

REFLECT AND REVIEW:

Ask children to point to a part of their body and to name it. Ask them to tell you what they use that part for. Ask them to tell you about any parts of their bodies that they can't see but that they know about.

EVIDENCE OF LEARNING:

Listen carefully to children's responses. Can they name several of the main body parts and describe what they do with them? Example answers for fingers could be 'can wriggle', 'hold food', 'help with buttons' and 'there are five on each hand'. Do children talk about blood, bones or their brain being a part of their body that cannot be seen?

SCIENCE AT HOME:

Can they make a newspaper person at home by laying down on sheets of newspaper joined together and asking someone to draw round them? Can they cut out the body outline and label it? Encourage children to bring in their newspaper person to share with the other children in the class.

IS ALL OF A PLANT GREEN?

Key words:

seed
root
leaf
flower
Stem

ACTIVITY SUMMARY:

In this activity children will learn about the different parts of plants and notice their colours. They will start to become familiar with the names of the main parts of a plant. They will plant and grow cress for sandwiches.

This introduces the big biology idea of plant structure and function. Children's interests in plants and growing them may lead to further exploration and investigation and this would link well with Activity plan 24 'What can I grow for my dinner?' Plants are also covered in detail in every year group of Snap Science from Year 1 to Year 6.

Learning intention:

Children can name the colours of different parts of a range of familiar plants, including flowering and non-flowering species.

EYFS cross curricular links:

Expressive arts and design / Understanding the world: Exploring and using media and materials – Can you draw different plants? Use a range of art materials to draw or paint a variety of different plants. Use both real plants and those in the Science Photos to demonstrate less familiar varieties.

Understanding the world / Literacy / Communication and language: The world / Writing – What food would you take on a picnic? Plan a picnic to eat your sandwiches. What else would you like to eat? Write invitations to the picnic.

Understanding the world / Literacy: The world / Reading – Where do different plants grow? Use a variety of non-fiction books to find out about plants that grow at the seaside, or up a mountain, or in the desert. How are they different from the plants near our school?

Physical development: Moving and handling – Can you move like a growing plant? Pretend to be a seed under the ground, curled up tightly, which gradually begins to grow roots and shoots. How tall can you stretch? How will you move in the wind?

RESOURCES (FOR FOCUS ACTIVITY):

- Access to outside area, or local park
- Cress seeds, approximately two teaspoons of seeds per child
- One container per child in which to grow cress, for example, inside one foot of a pair of tights filled with soil, a yoghurt pot with cotton wool in the bottom, or a cardboard egg box with cotton wool
- Soil or cotton wool
- Access to water
- Magnifying glasses, digital microscope or visualiser
- Digital camera or tablet
- Ingredients for making a sandwich (once the cress has grown)
- Resource sheet (Recording cress growth (print A3 size))

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Access to a wide range and number of real plants for close observation
- Seed catalogues or gardening magazines
- Magnifying glasses
- Scissors, cutting and sticking materials
- Drawing paper / large sheets of paper
- Drawing materials in a variety of media and colours

EXPLORE:

Display the Story slideshow to the children and play the story. Ask them to talk to a friend about a colour that they have seen on plants.

Play slides 2-5 again slowly, focusing on the colours of the plants in each slide.

Ask: *What colours can you see? Which parts are green? Which parts are not green?*

Ask children to find an object in the classroom, for example, a coloured pencil, that they think is the colour of a part of a plant. Take the objects outside. Can they find something growing that is the same colour? Record using a digital camera or tablet.

Key information:

Video and resources can be found on www.bbc.co.uk/cbeebies in their 'makes' section of the Mr Blooms Nursery page.

Health and safety:

Be Safe!, pages 18–19 (seeds and plant growing).

Health and safety:

Be Safe!, page 15 (food hygiene and food allergies).

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they are going to grow cress plants from seed, looking carefully at the colours all the time.

It will take between five and seven days to grow cress to eat. At each stage take photos to add to the Resource sheet or the children could draw what they notice at each stage.

Start by using a magnifying glass to look at the seeds.

Ask: *What colour are they? What do you notice about them?*

Plant the seeds. It is important that each child has their own plant to grow and check every day (see Independent activities).

When the seeds have started to germinate:

Ask: *What can you see? What colour is the plant now? What has changed?*

When the seedlings are a bit taller:

Ask: *What can you see? What colours are the different parts of the plant? What has changed?*

When the cress is ready to eat, take one single cress plant out of the container it has grown in and allow the children to look very carefully at all the parts of the plant, including the root. The seed case may still be attached. Use a digital microscope or visualiser to help them look closely.

Ask: *What can you see? What colours are the parts of the plant now? What has changed? How many colours are there on our plant?*

When the cress is ready to cut, help children to cut their own cress and add it to a sandwich. Their sandwich could be wrapped up to take home to share with their family or eaten as part of a class picnic. Talk about how it tastes.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Wherever there are plants: Can you find a plant that is ...? Add a different colour onto the end of the question each day. Ask the children to find the colour for that day.

Observation station: Can you draw and label this plant and colour it carefully? Place a different plant in the observation station each day with drawing materials and magnifying glasses.

Tabletop activity: Can you sort the plants? Provide pages from seed catalogues or gardening magazines, together with scissors and glue. Divide a large piece of paper into two and write 'Flowers' on one side and 'No flowers' on the other. Children cut out and sort pictures from the catalogues. Change the criteria daily: examples might include plants for food / plants not for food, trees / not trees, plants with one colour / plants with more than one colour.

In the cress-growing zone: What is happening to your cress today? Place question prompts where the cress seeds are growing and encourage each child to visit their cress plants every day. Do they need water? What has changed since yesterday? What do you think will happen tomorrow?

REFLECT AND REVIEW:

Show the children some cress seeds and their completed Resource sheets to remind them of what they have been doing. Ask them to tell you about the colours of the different parts of the plant. Ask them to tell you what else they noticed about other plants they have observed. Were they all green?

EVIDENCE OF LEARNING:

Listen carefully as children describe what they observed when they grew the cress and the plants they have seen in the local environment. Do they talk about a range of colours? Do they talk specifically about cress plants having brown seeds, yellow or white stems and green leaves? Do they refer to some plants having flowers that are many different colours, as well as stems or trunks of trees being a different colour to the rest of the plant? Do they realise that most plants have green leaves?

SCIENCE AT HOME:

Can they look for plants of different colours in their garden or on a walk in the park / woods? Can they choose their favourite plant and draw or paint it. Can they find out its name? Can they describe it – what colour, size, shape of leaves, flower, etc.? Encourage children to bring their drawing into school to share with the class.

WHO ARE MY PARENTS?

Key words:

animal
adult
parent
young
male
female

Key information:

This activity includes first hand observation, either in a farm, zoo or wildlife park setting, or by inviting an animal expert into school. Liaising with the visit location prior to the trip is important to ensure that the children have the chance to see both adult and young of several animals. The visit location will be able to recommend the best times of the year to visit and when the children may even see very new animals that have only just been born.

ACTIVITY SUMMARY:

In the activity children observe animals at first hand. They will name and identify the adult and young of the same animal. They will observe the differences and similarities between the adult and its young. This will introduce the big ideas about growth, reproduction and variation that children will meet in KS1 and KS2.

Most of the suggested animals are mammals but this is not an exhaustive list. Some animals looked at in Activity Plan 3 'What is inside an egg?' could be explored again here.

Learning intention:

Children can talk about and name several different animals, matching the young to the adult.

EYFS cross curricular links:

Expressive arts and design: Exploring and using media and materials – Can you match a parent and its young? Make collage pictures of adults and young, focusing on texture. Use a variety of different materials to create the effect of fur, feathers and skin.

Physical development / Expressive arts and design: Moving and handling – Does music describe an animal? Play 'The Carnival of the Animals' music. Can you identify the animal from the music? How do you know? Can you move like the various animals that feature in that piece of music?

Understanding the world / Communication and language / Physical development: The world / Listening and attention / Health and self-care – What do human babies need? Invite a parent with a young baby into school to talk about looking after a baby. Encourage the children to ask questions about the baby and how it is cared for.

Understanding the world / Literacy: The world / Reading – How are animal babies different from or similar to the adults? Use a variety of non-fiction books to find out about different animals and their young. What is the same / different about the adult and its young? Encourage children to look at all sorts of things, for example, size, shape, fur, wings, eyes, colour, etc.

RESOURCES (FOR FOCUS ACTIVITY):

- Class visit to a farm, zoo or wildlife park setting, or by inviting an animal expert into school
- Digital camera or tablet
- Science Photos
- Access to secondary sources of information such as an animal expert, books or the internet

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Resource sheet (Memory game)
- Small world animals, ideally adult (mother if possible) and young of the same animal. One larger than the other is sufficient for many animals that look like a smaller version of their parent when they are born.
- Soft toys animals such as the animals in Science photos 29–33

EXPLORE:

Display the Story slideshow to the children and play the story. Ask them to talk to a friend about a time when they may have seen a young animal.

Play slides 3–5 again.

Ask: *What animals can you see? What are their young called? What are they doing? How are they the same as the adult animal? How are they different from the adult animal?*

Ask children to talk to a friend about the names of any other young animals that they know.

ENQUIRE (FOR FOCUS ACTIVITY):

During a visit to see animals at first hand, use questions to prompt children's observations of adults and young of the same animals.

Ask: *Which animal is this? What is the same about the adult and the young? What is different? How is the parent looking after their young?*

When looking at mammals, it may be possible to watch the females feeding their young.

Ask: Is this the male or female? How do you know? How are they feeding their young? Have you seen any other animals that do this?

During the visit take lots of photos of all the adults and their young that were seen by the children for use during further exploration back in the classroom.

After the visit:

In a large outside space, tell the children that they are going to find out about more animals and their young. Print out Science Photos 1-28 (these are the ones showing just an adult or a young animal) and hide the photos of the adult animals around the outside space. Give each pair of children the young of one animal and send them on a hunt to find the adult.

Ask: What will you look for? What colour will it be?

When the children have returned, check that the photos match the young with the adult of the same animal.

Ask: what is the same about the adult and its young? How do you know you have the right one?

Give each pair of children time to look closely at the photos. Ask them to circle parts of the young animal that are different to the adult. Ask them to use another colour to circle things that are the same as the adult.

This activity can be added to the Independent activities afterwards for the children to explore some other animals that interest them.

Some children may wish to find out more about some of these animals. Help them to use secondary sources such as books, experts or the internet.

Key information:

Laminating the Science Photos will mean that they can be drawn on with a whiteboard pen, wiped clean and used for another activity or by another group.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Role play: Who carries their young? Can you carry the young animal like its parent does? Display Science Photos 29-33 to help.

Tabletop activity: Can you play match the parent and young? Use the Resource sheet to play a matching memory game.

Tuff spot, sand or water tray: Can you look after the young animals? Provide suitable habitat materials and at least two of each animal for the children to role play caring for the young. Change the animals daily.

Small world: Which animals and their young might you find on the farm / at the zoo? Set up a farm / zoo in a tuff spot tray. Include lots of different farm / zoo animals and their young.

REFLECT AND REVIEW:

Using the cards from the Resource sheet (or alternatively photos taken during the class visit), put the shuffled baby animal cards face down in a pile and spread the adult cards face up. Tell the children to pick up a baby card. Ask them to tell you what the baby animal is called and to find and name its parent from the other set of cards.

EVIDENCE OF LEARNING:

Listen and observe carefully as children match up the cards. Are they able to name the young of more than one animal and can they find the adult? Do they describe differences and similarities between the adult and young? Do they refer to specific characteristics of that particular animal?

SCIENCE AT HOME:

Can they talk to a grown up at home about when they were a baby. What were they like? How were they the same as they are now? How were they different? How have they changed since then? Can they bring a photo into school of themselves as a baby to share with the class?

Or do they have a pet? Do they know what it was like when it was young? How has it changed? Do they have photos that they could bring in of their pet when it was young and as an adult?

WHO LIVES HERE?

Key words:

home
materials

Key information:

It is not necessary for children to use the word 'properties' to describe the different features of a material, but it is important for them to recognise that materials differ, and to use their first hand observation and prior knowledge to describe these differences.

ACTIVITY SUMMARY:

This activity introduces the big chemistry idea that there is an enormous range of materials in the world, all with different properties that make them suitable for different purposes. The focus for the children's investigation will be homes. Children will find out how the structure of different homes and the materials used make them suitable for their different inhabitants. Children will have the opportunity to make their own model homes for different types of animals. A visit to an open farm or wildlife centre where children can compare the homes of a range of animals will ensure essential first hand experience for this activity.

Learning intention:

Children can describe a range of homes and give reasons why different homes are suitable for their inhabitants.

EYFS cross curricular links:

Expressive arts and design: Exploring and using media and materials – How many windows does your clay house have? Design and make a house from clay. Use clay tools to add details such as doors, windows or a brick pattern.

Communication and language / Understanding the world: Understanding / The world – What do you need to build a house? Create an outdoor building site (role play area) for the children to build houses. Use plastic or wooden building bricks, wheelbarrows, high visibility vests, cement mixer and spade.

Understanding the world / Expressive arts and design: The world / Exploring and using media and materials – What makes the strongest house? Use a variety of large and small construction kits, for example, large building bricks, small building bricks, wooden blocks, plastic tiles, to investigate which construction equipment makes the strongest house.

Mathematics: Shape, space and measures – What shapes can fit together? Look at a bee hive and the way that the hexagon-shaped wax cells fit together. What other shapes tessellate like a hexagon? **Communication and Language / Literacy:** Reading – Read a selection of stories about houses, for example, 'The House that Jack Built', 'The Wise Man and the Foolish Man'.

RESOURCES (FOR FOCUS ACTIVITY):

- Science Photos
- Variety of materials suitable for making a model of an animal's home, including sticks, leaves, soil, water, bricks, wooden planks, ice cubes, wool, string, Perspex sheets
- Access to a digging area to build setts, burrows, dens
- Digging tools, such as rakes and trowels
- Range of small world or stuffed animals
- Digital camera or tablet

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Range of cutting and joining materials
- Resource sheet (Card match)
- Science Photos
- Paper or plastic cups, shoeboxes
- Doll's house with furniture and small world people
- Tweezers
- Natural building materials (as for Focus activity)

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about where Rubina and her family are staying on their holiday. Play slide 2 again.

Ask: *Who put this tent up? Who is staying in it? Why do they need it?* Establish with children that Rubina and her family are on a camping holiday and this is their home for their stay. It is required for shelter from the weather, as somewhere quiet and warm to sleep and to store their belongings.

Play slides 3-5, again and ask the children to spot the other homes in the story.

Ask: *Who lives in this home? Why do they need their home? What do they do in their home? Who built this home? What is it made from? What is the same about all four of these homes? Is anything different? Can you think of any other homes? Who built them?*

Key information:

Spiders make their temporary homes by producing silk threads from special glands on their abdomen. The webs help to trap the prey that the spiders eat.

Wild birds make their own nests in trees, hedges or in buildings, using twigs, leaves, grass and other materials that they find. They build a nest as a safe place to lay and incubate their eggs and nurture their young. (Links can be made to Activity plan 3 'What is inside an egg?'.)

Humans live in houses that are usually built by someone else, such as a builder. Houses are designed to be warm, dry, safe places in which families can live. In the UK they are often made from bricks, wood and glass.

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they are going to find out about some different homes. Give each pair of children a photo from the Science Photos. Ensure that you provide a mix of homes, including those that are made by humans for others and those that are made by the homeowner.

Ask: *Who lives there? What do they use their home for? What is it made of? Who made the home?* Repeat this activity at least twice to enable children to consider more than one home.

Tell the children that they are going to make a model of a home for an animal of their choice, including humans. Allow them time to consider their choice of animal. Explain that they should think about what the home will be made of, where it will be built and what it will look like.

Depending on the animal chosen and the availability of the necessary materials, facilitate the collection of materials for the children and let them build their home.

Ask: *What materials did you use? Why? How is this home the same as the photo? How is it different? Is there anything you want to change?*

Take photos of the models and encourage children to draw and write about their homes.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Tabletop activity: Who lives here? Use the cut out cards from the Resource sheet. Match the home to the home owner and to the materials from which it is made.

Outdoor area: Where do these animals live? Use a variety of animals, for example, owl, fox, badger, rabbit, hedgehog (either stuffed toys, photographs or small world figures). Can you find a suitable habitat for these animals to build their home, for example, owl in a tree, hedgehog under a pile of leaves?

Small world tray: What is in your house? Provide a doll's house with furniture and small world people for making human homes.

Tabletop activity: Can you make a model of a dovecot? Provide plastic cups, boxes, cutting and joining materials to make a multi-space dovecot.

Tabletop activity: Can you make a model of a hutch or a stable? Provide a range of cardboard boxes, joining and cutting materials to make a home for a horse, donkey, rabbit or guinea pig. Ensure that the model features key aspects of the home for that animal.

Outdoor area: Can you make a home for this bird in the wild? Place a range of leaves, sticks and mud in various locations so that, like a bird, children have to go and collect small items one at a time. Tell them that they can only use tweezers to collect everything, to act like a beak.

REFLECT AND REVIEW:

Ask the children to pick a photo of a home that they have found out about and to tell you who made it, who lives in it and why it is a good home for them. The children should do this several times, giving them the opportunity to refer to a range of homes built by humans and animals.

EVIDENCE OF LEARNING:

Listen carefully as children describe the homes. Do they tell you who lives there? Can they tell you what materials the home is made of? Do they refer to the properties of that material and why it is a good material for the home?

SCIENCE AT HOME:

Can they draw or find a picture of an animal in its home in a wild or domestic setting? Can they take a photo of a family pet asleep in its favourite place? Can children bring their photos to school to show an adult? Can they talk about why they think the animal sleeps there and what it likes about the home?

WHICH HAT IS BEST TO WEAR TODAY?

Key words:

material
suitable

Key information:

Links can also be made with Activity plan 22 'What is the weather like today? (Winter)' and Activity plan 23 'What is the weather like today? (Summer)'.

Key information:

Before starting this activity it will be helpful to gather as many examples of hats as possible, particularly those that are appropriate for specific weather conditions. Ideas for these can be taken from the hats in the Science Photos.

ACTIVITY SUMMARY:

In this activity, children investigate hats, the materials they are made from and their different shapes, and make decisions about their suitability for wearing in different weather conditions. This activity can be adapted for use at any time of year based on the current weather. This activity links to Activity plan 7 'Who lives here?', building on the big chemistry idea that materials have different properties and that choices about how they are used are based on these properties.

Learning intention:

Children can give reasons why a particular hat is suitable for a particular type of weather, based on the observable properties of the material from which it is made.

EYFS cross curricular links:

Understanding the world: The world – Have you seen the weather forecaster on television? Create a weather map so that you can present the weather to your friends. What symbols do they use? Can you make your own weather symbols? Can you present the weather wearing hats suitable for the weather?

Understanding the world / Literacy: The world / People and communities / Reading – Which hat would you wear here? Use a variety of non-fiction books to find out which hats people might wear in other countries with different climates to ours. For example, rice growers, tea pickers and Arctic fishermen.

Communication and language / Mathematics: Speaking / Listening and attention / Numbers – How much for this hat? Set up a hat shop in the classroom. Use a variety of different hats, a till, money and price tags.

Understanding the world / Communication and language: Show children pictures of a range of professionals and their hats, for example, builders, firefighters and chefs. Who would wear a hat like this, and why?

RESOURCES (FOR FOCUS ACTIVITY):

- A Hat hamper – basket or box full of hats
- Science Photos 14–17 (weather photos)

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Resource sheet (Hat template)
- Range of waterproof and non-waterproof materials for making hats
- Range of cutting tools and joining materials
- Hats of all shapes and sizes
- Magazines, clothing catalogues or holiday brochures
- Purchased or school-made weather chart
- Role play dress up items, suitable for different weathers

EXPLORE:

Display the Story slideshow title slide. Ask the children to describe the hats on the title slide.

Play the story, and after each slide use questions to prompt the children's observations.

Ask: What is the weather like? What type of hat are they wearing? Why do they need that hat?

Establish that the hats are suitable for different weathers because they are made from different materials and are different shapes.

Ask: Can you think of a time when you have worn a hat? Why did you wear it? Can you think of a time when you have seen someone else wearing a hat? Why were they wearing it?

Establish that hats are not just worn for protection from the weather; some hats might be worn for protection from accidents, or to look smart.

Key information:

It is not necessary for children to use the word 'properties' to describe the different features of a material, but it is important for them to recognise that materials differ, and to use their first hand observation and prior knowledge to describe these differences.

ENQUIRE (FOR FOCUS ACTIVITY):

Explain to the children that they are going to decide which hats to wear for the weather today. Start by going outside and talking about what type of weather it is today.

Ask the children to choose from the hat hamper a hat that they think would be suitable for the weather and to tell a friend why they have chosen it. Encourage them to think about the properties of the material that the hat is made from, for example, whether or not it is thick, soft, waterproof, stiff or strong. Encourage them to comment on its shape.

Using Science Photos 14–17, ask the children to select hats for different types of weather and give reasons for their choices.

Show one of the photos and ask the children to choose a hat that would not be suitable for the weather shown. Ask them to explain to a friend why they think it would not be suitable.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Creative area: Can you make and test a hat for teddy to wear in the rain? Provide different materials and the Resource sheet to use as a template. Does the hat keep teddy's head dry in a rain shower? How can you find out?

Creative area: Can you make and test a hat for you to wear outside today? Is it suitable? Why? Ideally this will involve real hats that they can add to appropriately. If real hats are not available, provide larger copies of the Resource sheet (print at A3) and cutting and joining materials to add to the hat.

Creative area: Can you find hats for different weathers? Provide magazines, catalogues or brochures and ask children to find pictures of hats and to cut them out. They could stick them in groups according to the weather they are worn for.

Role play: Can you dress for the weather today? Place a weather chart on the wall in the role play area to allow children to change the weather and to dress up appropriately, including putting on suitable hats.

REFLECT AND REVIEW:

On a day when a hat would be required to play outside, ask the children to look at the weather and to choose a hat from the hat hamper that would be suitable for the day. Ask them to tell you why they have chosen it.

EVIDENCE OF LEARNING:

Listen carefully to children's explanations. Do they give reasons for their choice of a particular hat? Do they link the weather conditions with the properties of the material from which the hat is made, and its shape? For example, can they explain that they chose a peaked hat for a sunny day as it offers shade from the Sun, or that they would choose a woolly hat on a cold, frosty day as it will keep them warm.

SCIENCE AT HOME:

Can they bring in a photo from home that shows themselves or someone else wearing a hat? These photos could be added to a weather wall in the classroom. Why did they wear that hat on that day?

WHAT MELTS?

Key words:

heat
melt

Key information:

it is not necessary for children to use the words 'solid' and 'liquid' to describe the different states of materials, but it is important for them to recognise that they are different.

Health and safety:

Be Safe!, page 9
(food tasting).

ACTIVITY SUMMARY:

This activity explores melting in a range of contexts. Children will observe first hand materials that melt in everyday situations and compare these to materials that do not melt. They will learn about the role of heat in the melting process. Scientific language related to the changes that occur should be encouraged, including descriptive and comparative vocabulary about how something looks, feels and smells.

This activity introduces the big chemistry idea that some materials undergo a reversible change from solid to liquid when heated. This big idea of change of state is developed in Snap Science Year 4 Module 1 'In a State'.

Learning intention:

Children can name some materials that melt and describe what they observe during the melting process.

EYFS cross curricular links:

Mathematics: Data handling – What is your favourite ice lolly flavour? Collect data from the children and use to create a class pictogram.

Physical development / Expressive arts and design: Moving and handling / Being imaginative – Can you pretend to be an icicle? Can you show me what shape you are? Can you show me what happens to the icicle when the Sun shines on it?

Expressive arts and design: Exploring and using media and materials – What happens when you heat it? Place broken wax crayons in a bun tray and bake in the oven. What happens to the crayons and what different colours can you see?

RESOURCES (FOR FOCUS ACTIVITY):

- Take-away coffee cups with lids (ideally plastic-lined paper type)
- Chocolate buttons
- Access to hand hot water
- Digital camera or tablet
- Wet wipes for cleaning up

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Variety of ice cubes that are made differently, for example, using food colouring to colour the ice cubes; layering different colours by freezing a layer, then adding another layer and freezing again; making different shaped and sized ice cubes, including big blocks made in washing up bowl-sized containers; freezing objects inside ice cubes, such as animals, numbers, letters and small world people; freezing glitter inside ice cubes.
- Resource sheet (Melt or not?)
- Digital camera or tablet
- Numerous empty yoghurt pots

EXPLORE:

Display the Story slideshow to the children and play the story. Ask them to talk to a friend about what Billy is doing in each picture and where he is.

Play each slide again and prompt children to think about what is happening when something melts.

Ask: *What is happening to the lolly / chocolate / cheese / snow as it is changing? How has it changed? What do we call it when something changes like this? Why did it melt?*

Establish that heat is helping the lolly, chocolate, cheese and snow to melt. Play the slides again, this time looking for the heat source.

Ask: *What is making it melt? What does it look like when it has melted?* Establish that melted materials behave like a liquid. They drip, flow and spread over a surface or the bottom of a container.

Key information:

During this activity, children will melt chocolate buttons. They should be reminded that food used for science should not be eaten unless they are told to do so.

ENQUIRE (FOR FOCUS ACTIVITY):

Explain to the children that they are going to make something melt. Show them a bowl of chocolate buttons and ask them to talk to a friend about how they could melt one. Share some of their ideas, for example, hold the chocolate button in their hands, put it on the radiator or put it on their tongue. Help them to understand that they need to add heat to the chocolate button to make it melt.

Give them each one chocolate button and ask them to test their idea if it is safe to do so. Give each child a take-away coffee cup and lid. Fill with hand hot water, put on the lid and place the chocolate button on the lid.

Ask: What do you notice is happening? What does the chocolate look like when it is melted? How does it move? What does it feel like? What does it taste like?

Take off the lids with the buttons still in place and leave them for half an hour somewhere away from a heat source. Encourage children to observe what happens without touching them.

Ask: What has happened to the chocolate now? What can you see? What does it feel like? Why do you think this has happened?

Establish that the chocolate has solidified because it has cooled down again after being taken away from the heat source.

This idea can be repeated with butter, a wax crayon or candle wax on a radiator or sunny windowsill. Be cautious using an ice cube as it will not become an ice cube again unless put back in the freezer and this may cause some confusion. This can be explored further when talking to the children about the Independent activities that involve ice.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Water tray: Can you get me out of here? Provide various different ice cubes with small world characters and animals frozen inside into an empty water tray for children to explore how to get them out.

Outdoor area: What size ice cube melts fastest? Provide a range of sizes of ice cubes and let the children explore how the size of an ice cube affects melting time.

Investigation time: Where does the ice melt fastest? Provide a source of ice cubes that are all the same size and lots of yoghurt pots in which to transport them. Allow the children to investigate indoor and outdoor locations in their setting to find where the ice melts fastest and where it takes the longest time to melt. Repeat this activity on different days in different weathers and at different times of the day. Help them to look for any patterns in what they notice.

With all these Independent activities, help the children to take photos over the period of time that they are exploring the melting process. The photos can then be looked at when the children are describing what they noticed.

Melt or not? Cut out the cards from the Resource sheet and ask children to sort the cards into objects that melt and those that don't. Once they have sorted the cards, ask children to tell you what material each object is made of.

REFLECT AND REVIEW:

Show the children some chocolate buttons and remind them of the activity that you did together to make the chocolate melt. Ask them to tell you what they did to make it melt, to describe how the chocolate changed and what happened to it when they left it to cool.

EVIDENCE OF LEARNING:

Listen carefully as children describe their observations. Do they use the word 'melting' to describe the process by which the solid chocolate button became liquid chocolate? Can they explain that heat is needed for the chocolate to melt? Do they use words like 'soft' and 'runny' to describe the melted chocolate? Can they describe how the chocolate become hard (solid) again when left in a cool place for a while? Can they list and describe other materials that melt when heated?

SCIENCE AT HOME:

Can they make chocolate crispies with a family member? Can they ask an adult to help them melt chocolate (safely) and mix this with a breakfast cereal, then spoon the mixture into cupcake cases to set? Can they tell their teacher what happened after they left their crispies for a while? Can they make a milky chocolate drink by asking an adult to help them melt some chocolate and add it to some warm milk? Can they tell their teacher what happened and what it tasted like?

WHAT HAPPENS WHEN YOU MIX IT?

Key words:

mix
wet
dry
materials

ACTIVITY SUMMARY:

This activity provides a wide range of opportunities for children to observe and talk about what happens when they mix different dry and wet materials together. This introduces the big chemistry idea that some materials can be mixed together. The act of mixing and the changes that occur during the mixing process are the focus of this activity rather than the achievement of a particular final mixture. Scientific language related to the changes that occur should be encouraged, including descriptive and comparative vocabulary about how something looks, feels and smells.

Learning intention:

Children can use comparative and descriptive language to talk about what they notice when they mix two or more materials together.

EYFS cross curricular links:

- Expressive arts and design: Painting – Can you mix different colours? What happens when you add white? What happens when you add black? What happens when you add water?
- Mathematics: Capacity – How many smaller containers does it take to fill a larger container? Investigate with containers of various sizes in the sand or water tray.

RESOURCES (FOR FOCUS ACTIVITY):

- Range of dry and wet materials, for example, poster paint, powder paint, flour, mud, sand, salt, glitter, cooking oil, sugar, water, pebbles, sawdust, cooked pasta, dry pasta, washing-up liquid, porridge oats. Children should be encouraged to add their own ideas to this list and may wish to include leaves, twigs, grass, etc. if working outside.
- Mixing containers of different sizes and shapes, for example, plastic bowls, plates, buckets
- Range of mixing implements, for example, wooden spoons, sticks, metal spoons, hand whisks, forks
- Range of measuring tools, for example, scales, spoons and scoops
- Aprons, coveralls, table coverings as appropriate

RESOURCES (FOR INDEPENDENT ACTIVITIES):

Several of the materials, mixing containers and tools used for the Focus activity can be reused for the Independent activities.

- Sieves, measuring cylinders, plastic tweezers, trays
- Magnifying glasses
- Writing materials
- Resource sheet 1 (Mix or miss game)

Health and safety:

Be Safe!, pages 8, 9 and 34 (avoiding putting substances or small objects in the mouth).

EXPLORE:

Display the Story slideshow and play the story to the children. Show slides 2 and 3 again and ask the children to describe what is happening in Billy and Rubina's bowl.

Ask: *What do you think will happen next?*

Show slide 5.

Ask: *What will happen when they mix it?*

Demonstrate mixing water and washing-up liquid with a whisk.

Ask: *What can you see? What is happening?*

Add some oil.

Ask: *What is happening now? What happens when we mix it? What happens when we stop mixing?*

Ask them to talk to their friends about a time when they have mixed two materials. Why did they mix them? Did they use a spoon, or a fork? Or something else? What did they mix them in? Was it suitable? Why not? How did the mixture feel? Was it hard or stiff? Was it soft or sloppy? What happened to the materials?

ENQUIRE (FOR FOCUS ACTIVITY):

Share the range of materials with the children and explain to them that some materials are wet and some are dry. Do they know which is which? Ask them to think of words to describe the difference between wet and dry materials. Ask the children to help you sort the materials into wet and dry groups.

Tell the children to choose two materials they want to mix together. Encourage them to select their own equipment and materials. Allow them to measure the materials if they wish to do so and to mix with their hands rather than with a mixing tool if they prefer.

Encourage the children to describe what they notice.

Ask: *What is happening? What does the mixture feel like? What does it smell like? What does it look like?*

Tell them to pick a third material to add to their mixture. What do they think will happen now? If they have used only dry or only wet materials until this point, suggest that they try adding a material from the other group.

Encourage the children to look closely each time a new material is added and to notice how their mixture changes. Ask them what might happen if they add more of the same material. What if they had added less? What if they stirred less or more? What happens when they stop stirring?

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Mud kitchen: Can you make a mix to make a mud pie? Can you make a mix to make a mud milkshake?

Writing area: Can you write or draw a list of what you need for your mix?

Role play, Chemistry lab testing station: Can you mix like a chemist? (Remind the children that they may have seen the CBeebies TV programme *Nina and the Neurons*.) Make available a range of mixing equipment for the children to use independently. Include measuring cylinders, jugs, plastic tweezers and mainly dry materials. Also, a range of sieves and trays to allow them to start to separate mixes that they make.

Sand tray: What happens when you mix? Keep the focus on mixing materials together, but change the materials, utensils and containers available each day for a week. Include, for example, pebbles, shavings, shredded paper or marbles to be mixed with sand.

Water tray: What happens when you mix? Keep the focus on practising mixing and looking at the consistency of materials, but change the materials, utensils and containers available each day for a week. Include, for example, Gelli Baff, fake snow, shaving foam or bubbles to be mixed with water.

Mix or miss game: Children play this game in pairs using the cards cut from Resource sheet 1.

REFLECT AND REVIEW:

Ask the children to describe what happened when they made their mixture.

EVIDENCE OF LEARNING:

Notice the language that children use to talk about their mixtures. Do they refer to materials mixing, being wet or dry and changing? How do they describe what happens when they mix materials together? Do they talk about changes in texture, stiffness, consistency? Observe the children's use and manipulation of tools. Are they able to handle tools with confidence and accuracy?

SCIENCE AT HOME:

What can they mix at home? Can they invent a new mixture with their family? Can they make a yummy mixture to eat? Can they tell you one way that they have seen a grown up make a mixture at home? Can they make a milkshake for their family? Give the children the simple recipe (Resource sheet 2) to take home, and encourage them to investigate what happens with different fruit and other ingredients.

WHAT GOES THROUGH?

Key words:

sieve

separate

grains

ACTIVITY SUMMARY:

In this activity children investigate how to separate mixtures of different materials and different sized objects. This introduces the big chemistry idea of separating materials. They use sieves to separate sand, pebbles, stones and other materials and objects. Links can be made to Activity plan 10 'What happens when you mix it?', where the terms wet and dry are introduced.

Learning intention:

Children can talk about the size of an object, how it goes through a sieve and therefore how the sieve can be used to separate objects.

EYFS cross curricular links:

Mathematics / Understanding the world: Shape, space and measures – What can you do while the sand runs through? Can you sort the timers? In which one does the sand finish coming through first? Provide a range of sand timers, making sure that they are different sizes, styles and times. Invite the children to try different activities while the sand runs through, for example, writing their name, counting, hopping on the spot.

Understanding the world / Mathematics: Baking / Shape, space and measures – Do all your baking ingredients go through the holes in your sieve? Sieve a variety of baking ingredients, for example, flour, icing sugar and baking powder, when baking buns or cakes.

Understanding the world / Mathematics: The world / Shape, space and measures – Can you find big stones and small stones? What size are they? Which are the biggest? Which are the smallest?

Understanding the world / Physical development: Moving and handling – Using your sense of touch, can you sort with your fingers? Fill a bucket with sand and put some other small items in, such as coins, buttons, shells and beads. Put on a blindfold (adult supervision required) and feel in the bucket. What do the objects feel like? Which are the easiest to find? Can you use your hand like a sieve and let the sand fall through your fingers while keeping the object in your hand?

Expressive arts and design: Exploring and using media and materials / Being imaginative – What will you add to your seaside picture? Add sand to paint and glue to create textured seaside pictures.

RESOURCES (FOR FOCUS ACTIVITY):

- Bowls of flour, sugar, salt, icing sugar
- A range of sieves, for example, plastic, metal, mesh, garden sieve, tea strainers, sink drainer, colander, fine sieves, seaside sieves
- Plastic spades or shovels
- Materials and objects such as dry play sand, stones of various sizes, including gravel and pea pebble, soil, buttons, shells, beads, pasta of different shapes and sizes, gemstones, perspex pebbles
- A large flexi garden bucket containing a mixture of sand, smaller and larger stones
- Empty buckets, water

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Sand tray, sieves and objects from Focus activity
- Resource sheet (Sand recipes; additional resources listed on sheet)
- Dried pasta of varying shapes and sizes
- Magnifying glasses
- Paper plates, shallow trays, cardboard
- Range of cutting and joining materials

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about where Billy and his mum are and if they have ever visited somewhere like this.

Return to slide 4.

Ask: *What is Billy doing? What is he using?*

Ask the children to bury their hands in the sand tray and to tell a friend what it feels like. Share some responses, talking about temperature and what it feels like when the sand is running through their fingers.

Health and safety:

Be Safe!, page 9
(play food should not be eaten).

Ask them to tell a friend about another material that is like sand. They may refer to liquids, such as water, that also run through your fingers. Establish that sand is made of tiny, separate grains.

Provide bowls of flour, sugar, salt and icing sugar and give the children plenty of time to explore these with their hands.

Ask: *What does it feel like? What is the same as the sand? What is different?* These materials can be explored further with sieves as an independent enquiry activity.

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children they are going to help sort out a mixture. Show them a bucket full of sand and different sized stones. Explain that the stones have got mixed up with the sand and that you need their help to separate them.

Ask: *What can we use to get the sand back?*

Establish that a sieve will help with this as it can let small things through and keep bigger things in, like Billy's shell in the Story slideshow. Remind them that sand is made of lots of very small grains. Tell the children to select a sieve and to try it out by sieving some of the mixture into an empty bucket.

Ask: *What is in the bucket? What is left in the sieve? What went through the sieve? Have we got the sand back yet?*

Help the children to discover through trial and error which materials or objects go through each sieve and which are the best to use to separate the sand and stones. They may use sieves to sort out the stones into different sizes too.

Ask the children to bury some treasure in the bucket for a friend to find. They should choose their treasure from a range of gemstones, shells, coins, buttons and beads and make a mixture to hide it in. Their friend should try to find the treasure using only sieves.

Ask: *Is it easier to find a smaller piece of treasure or a larger one? Which sieve is best for finding the buried treasure?*

Add some water to the remaining sand and stone mixture.

Ask: *How has the mixture changed now that we have added water? Which sieve should we use to separate the sand now? Why? What does it feel like to sieve a wet mixture? Is it easier or harder?*

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Sand tray: Can you find it? Change the contents of the sand tray and the range of sieves available, for example, wet sand, moon sand, clean mud, sand mousse (see the Resource sheet for instructions on how to make different wet mixtures), soil, sawdust, polystyrene packing pieces. Bury tiny objects to be found in a buried treasure contest each day, such as beads, gemstones, coins or pieces of pasta. Which objects are easiest to find? Which are hardest?

Creative area: Can you make your own sieve? Provide cardboard, hole punches and cutting and joining materials next to a shallow tray of dry sand mixed with other slightly larger objects.

Tabletop activity: What is sand made of? Provide tiny amounts of sand, paper plates and magnifying glasses to look closely at the grains of sand.

Tuff spot or water tray: Can you sort it? Provide a variety of shapes and sizes of dried pasta and sieves. Can you sort the pasta into the different types using only the sieves?

REFLECT AND REVIEW:

Place some 'buried treasure' such as tiny beads in the sand tray and ask the children to choose a sieve that they think will help them find the treasure and see if it works. Ask them to find a sieve that will not be useful to find the treasure. Encourage them to explain their choices of sieve.

EVIDENCE OF LEARNING:

Observe and listen carefully to the children as they choose their sieves and explain their choices. Do they compare the size of the objects and the size of the holes in the sieves? Do they identify that smaller holes will let the grains of sand through but not the treasure?

SCIENCE AT HOME:

Can they make a sieve at home to help find the smallest toys in their toybox? Can they bring it in to share with an adult in school? Can they help make a cake and sieve the flour? Can they play with sieves in the bath to help collect up the bath toys?

Health and safety:

Be Safe!, page 8–9
(safe playing with sand and putting small objects in mouths).

Key information:

Different wet mixtures can be made with a group of children and are great for developing fine motor skills when mixing and kneading.

Health and safety:

Be Safe!, page 8–9
(safe playing with sand and putting small objects in mouths).

Health and safety:

Be Safe!, page 9
(play food should not be eaten).

HOW DO YOU MAKE A GOOD BUBBLE?

Key words:

mixture
materials

Key information:

A bubble is a thin film of soapy water filled with air. Water molecules, the smallest unit of water, are attracted to each other by surface tension. Adding washing-up liquid lowers the surface tension, making the surface stretchy and more suitable for blowing bubbles. Adding glycerine makes stronger, longer-lasting bubbles. Longer-lasting bubbles will be formed if the mixture is left overnight. Returning to the activity the following day may produce some interesting results. No matter what shape a bubble has initially, it will always become a sphere.

Health and safety:

Glycerine (or glycerol) is used in this activity. It is safe to use in primary classrooms and can be purchased from chemists. Further information on using glycerine safely in the primary classroom can be found in G5P Using Chemicals Safely, at www.cleapss.org.uk.

Health and safety:

Be Safe!, page 36 (using chemicals safely, not putting them in the mouth, washing hands carefully afterwards).

ACTIVITY SUMMARY:

In this activity children will investigate soap bubbles, finding out how to make them and how they behave. Based on their observations they will compare bubbles, deciding whether the best bubbles are the biggest, last the longest, float highest or are easiest to catch. Children will need plenty of opportunities to make and play with bubbles using different equipment. This further develops the big chemistry idea about materials mixing together and links to Activity plan 10 'What happens when you mix it?'.

Learning intention:

Children can describe how they made bubbles and how their bubbles compared with others.

EYFS cross curricular links:

Expressive arts and design: Bubble printing – Can you print bubbles? Use a shallow tray of bubble mixture and food colouring (different colours) and with a straw blow a big pile of bubbles. Gently press a piece of paper onto the bubbles until they pop to leave a bubble image on the paper. Try this with two or more colours.

Expressive arts and design: Bubble pictures – Can you draw a picture of bubbles? On black paper draw bubble shapes with white chalk. Then add the rainbow colours that you see in a bubble with coloured chalk.

Physical development: Moving and handling – Can you move like a bubble? Can you float around the space like a bubble? What happens when the bubble pops?

Mathematics: Numbers / Shape, space and measures – Can you follow instructions to make a bubble mixture? Can you measure the right amounts to make the bubble mixture?

Literacy / Communication and language: Reading / Writing / Understanding – How can you describe a bubble? As a class can you think of some words to describe the bubbles and what they do, for example, pop, explode or float? Write a class poem about bubbles.

Understanding the world / Physical development: The world / Moving and handling – Can you catch a bubble? Can you catch more than one bubble? Switch on a bubble machine outdoors for the children to catch the bubbles. Try this in different weather conditions and with wet and dry hands.

Understanding the world: The world – Can you make a huge bubble? Use a tuff spot, a hula hoop covered in a crepe bandage and a box to stand on. Fill the tuff spot with a layer of bubble mixture, agitate the hoop in the mixture and swiftly pull it over a child stood on the box. Can they make a bubble big enough for the head teacher?

RESOURCES (FOR FOCUS ACTIVITY):

- Ready-made bubble mixture, access to water, washing-up liquid, glycerine or glycerol (available from chemists, pharmacies or from online soap manufacturers)
- Wands for blowing bubbles, plastic containers, funnels to decant bubble mixture into smaller pots
- Resource sheet (Bubble mixture instructions). Use information on the Resource sheet to make two batches of different bubble mixtures.

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Variety of shop bought bubble mixtures in a range of pots
- Individual whiteboards and pens
- Variety of bubble wands

EXPLORE:

Start by going outside and blowing lots of bubbles for the children to play with. Let them catch, chase, watch and enjoy the bubbles first before displaying the Story slideshow.

Health and safety:

Bubble machines can make smooth surfaces dangerously slippery.

Key information:

Resourcing suggestion – reuse old bubble mixture containers or use a hot glue gun to glue the wand into the lids of small water bottles from the supermarket (do this before the lesson) so that children can have their own sealable bottle of bubble mixture to test.

Key information:

Optimum bubble mixture will contain 95% water, 3% washing-up liquid and 2% glycerine.

Play the story but stop after slide 2 and ask children to talk to a friend about what Rubina and Eliza are doing. Ask them about another time when they might have seen bubbles.

Play the rest of the Story slideshow.

Ask: *What are bubbles like?* Encourage the children to talk to a friend about their ideas.

Blow some more bubbles for the children to look at.

Ask: *Are bubbles wet or dry? What is inside them? What shape are they? How do they move?*

ENQUIRE (FOR FOCUS ACTIVITY):

This activity will work best on a humid, still day. Tell the children that they are going to make some bubble mixture to make bubbles. Remind them of when they played with the bubbles during the Explore part of the activity and talk about what a bubble is like.

Explain that you have two different bubble mixtures for them to try out. Ask the children to choose a bubble wand and to use each mixture in turn to blow some bubbles. Encourage them to talk to each other about what they notice about their bubbles.

Ask: *How long do they last? Can you catch them? Are they good bubbles? Why?*

It is likely that the bubble mixture with glycerine will produce longer lasting bubbles, which may mean the children decide that these make good bubbles. Encourage them also to compare the bubbles' relative sizes and how they travel. Tell the children that one batch of bubble mixture has a special ingredient that bubble manufacturers add to their bubbles. You may wish to help them to read the Resource sheet and recognise the word glycerine.

Following this initial Focus activity allow children time to investigate making their own bubble mixture using different quantities of water, washing-up liquid and glycerine. Help children to recognise that they need lots of water and very small amounts of washing-up liquid and glycerine in their mixture. Allow them to explore this in their own way. Can they make good bubbles?

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Outdoor area: Can you blow bubbles for your friends to catch? How many can you blow? Provide a range of bubble mixtures with wands for the children to blow bubbles for each other.

Outdoor area: Can you blow bubbles that last longer? Can you count how long they last? Provide individual whiteboards and pens for recording results.

Outdoor area: Which wand makes good bubbles? Provide a wide variety of different sized and shaped wands, but keep the bubble mixture the same. How are the bubbles different? What happens when two bubbles touch? Do they join together? What shape do they make?

Water tray: Can you mix a big bubbly mixture? Add some washing-up liquid to lukewarm water and provide mixing tools for the children to explore.

REFLECT AND REVIEW:

Ask the children to describe a 'good bubble' and how to make one.

EVIDENCE OF LEARNING:

Listen carefully as children talk about how to make a good bubble. Do they refer to the different materials when they are explaining how they made their bubble mixture? Can they describe the features of a 'good bubble'? Do they compare the size of the bubbles and how long before they pop?

SCIENCE AT HOME:

Can they share the bubbles at home? Give each child a party bag-sized pot of bubbles to take home and explore with their family. They could tell their families what they know about what makes good bubbles. Can they tell their teacher what they did, who they shared it with and where they chose to use their bubbles?

WHAT HAPPENS AT NIGHT?

Key words:

dark
light
the Sun
the Moon
stars

Key information:

We only see objects when light from a light source is reflected off the object and into our eyes. If there is no light source, it is completely dark and we cannot see. At night, even though it may be 'dark', there are still some sources of light in most places where children will be and therefore they often think that they can see in the dark. Light sources include the Sun, a flame, a lamp or other electrical devices such as computers and TVs. The Moon, our eyes or shiny objects are not light sources, but are good reflectors of light.

ACTIVITY SUMMARY:

This activity provides a starting point for developing the big physics ideas about light, dark, night and how we see, which are explored in more detail in Snap Science Year 3 Module 3 'Can You See Me?'. It builds on children's own experiences of night time, including their bedtime routines and their knowledge of what and who come out at night. It also includes an opportunity to test ideas about the relationship between light and sight. It is assumed for this activity that night is when the Sun goes down and it is therefore dark. Opportunities to consider seasonal change of daylight hours could be explored and linked to this activity.

Learning intention:

Children can use appropriate language to talk about what happens at night, including dark, light, the Sun, the Moon and stars.

EYFS cross curricular links:

Literacy: Reading – What happens at night? Read non-fiction books relating to nocturnal animals, sky, space, light, darkness, and fiction about night time adventures, dreams and routines.

Understanding the world / Expressive arts and design: The world / Exploring and using media and materials – What animal is awake at night? Make an observational drawing of a nocturnal animal, from photographs.

Expressive arts and design: Exploring and using media and materials – Can you make a night-time scene? Make night scenes on black paper with chalks / pastels and glitter, or make a clay nocturnal animal, for example, a hedgehog with twigs for spines collected from the outdoor area.

RESOURCES (FOR FOCUS ACTIVITY):

- Resource sheet (Night or not)
- Dark tent. These can be purchased from specialist providers such as www.tts-group.co.uk, or made from opaque fabric such as blackout material.
- Small objects such as counters, buttons and coins, including some that are shiny, white, black and different colours
- A range of battery-powered small light sources

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Items for role play using a child doll and a baby doll, such as pyjamas, dressing gowns, slippers, books, brushes, toothbrushes, sink and bath
- Glow in the dark items such as glo-bands and sticks, a range of torches and reflective items such as snap bands and reflective clothing
- Magnifiers, torches
- Small world nocturnal animals, for example, hedgehogs, owls, foxes and materials to make a woodland habitat

EXPLORE:

Display the Story slideshow and play the story to the children.

Ask: *What time of day is it? How do you know?*

Establish that it is night time and Rubina is going to bed.

Ask children to talk to their friends about what they think happens at night. What happens in their home at night time? What do they do to get ready for bed? Ask them to compare what they do with what Rubina does in the story.

Ask: *What comes out at night?*

Explore what the children know about animals that are nocturnal and are active at night. There are ideas in the story that Rubina's dad reads to her.

Ask: *Have you ever seen or heard animals out at night? Do you know any stories about animals that come out at night?*

Key information:

Be aware that some children may be anxious about being in a dark space.

Key information:

If it is truly dark, children will not be able to see the items in their hand. However, it is likely that there will be a small amount of light that allows them to see objects that reflect light well, such as shiny or white objects, without the light source.

ENQUIRE (FOR FOCUS ACTIVITY):

Working with a small group of children, show them the cards cut from the Resource sheet. Ask them to look at the pictures in front of them and to choose one that they think happens at night. Tell the children to share with a friend the card they have chosen.

Ask: *What is happening and why is it happening at night?* Encourage realistic answers and support children to explain their reasons if they are able to. For example, if choosing the 'bed' card, they could say, 'I sleep in my bed at night when I am tired'.

Ask children to choose a card that shows something they can see at night.

Ask: *How can you see this at night?* Encourage them to explain that they can see the object at night for reasons such as 'I sleep with a nightlight on' or 'it glows in the dark'.

Give the children a set of small objects, such as counters, buttons and coins, including some that are shiny, white, black and different colours.

Ask: *Which objects do you think you will be able to see in the dark tent?*

Help them to find out if they are right, by taking the objects into the tent. Encourage them to talk about what it is like in the dark tent and which objects they can see.

Let the children choose a light source to take into the dark tent and then talk about what they can see. They may notice that they can only see an object when the light is shining towards it. Establish that when it is dark at night time we need a light source to see things.

Some children may compare dark night time with light daytime and recognise that we don't need a torch to see things during the daytime. This is an opportunity to talk about the Sun being our biggest source of light and that this helps us to see objects easily during the day.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Role play: Can you get the child doll ready for bed? Can you get the baby doll ready for bed?

Dark tent: Can you see things in the dark? What helps you to see things?

Writing area: Can you draw or write about which animals come out at night? Can you write about something you remember that happened at night?

Tabletop activity: Can you play 'Night or not' with a friend? Use the Resource sheet.

Outdoor area: Can you find some creatures (for example, woodlice, earthworms) living in dark places (under stones or pots or in the soil). Use a torch if you need to.

Small world tray: Can you find the animals that come out at night? Add nocturnal animals, such as hedgehogs, owls, or a fox in a woodland habitat.

REFLECT AND REVIEW:

Ask the children to choose and talk about three objects or pictures that happen at night. For example, brush their teeth, see the stars, hear the fox.

EVIDENCE OF LEARNING:

Notice the language that children use when talking about night. Do they talk with confidence using language appropriate and relevant to night? Do they use darkness as a way to describe night? Do they refer to the Moon and stars? Do they refer to the absence of light at night time, not being able to see if there are no lights, and the Sun not being visible at night?

SCIENCE AT HOME:

Ask children to talk about what happens at night at home. Can they draw a picture of themselves ready for bed? Can they tell a member of their family about a nocturnal animal or find out more about a particular one? Ask them to share what they find out with you and the rest of the class.

WHAT IS IN THE SKY?

Key words:

fly
fall
sky

ACTIVITY SUMMARY:

This activity explores things that children might see in the sky and introduces the big physics ideas about flight and falling. Children will share ideas and find out about planes, helicopters, hot air balloons, the Sun, the Moon, stars, rainbows and clouds, weather such as rain and snow, and flying animals, including birds and insects. Children will have opportunities to talk about, observe and record what they see and hear in the sky.

This activity may prompt ideas correctly linked to outer space, including rockets, astronauts, comets and planets. These can be explored in Activity plan 15 'What is the Moon?'.

Learning intention:

Children can name and describe a range of living and non-living things that are in the sky.

EYFS cross curricular links:

Literacy: Writing – What's it like in the sky? Write a story about being up in the sky, for example, flying like a bird, travelling in a machine, being on the Moon.

Expressive arts and design: Exploring and using media and materials – What can you see from up high? Draw a bird's eye view of the outdoor area or school, or the view from a climbing frame. Design and make something that travels in the sky.

RESOURCES (FOR FOCUS ACTIVITY):

- Resource sheet (Sky or ground?) and sticky tack

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Items for role play, such as aeroplane, cockpit and cabin, uniforms, chairs, dials and screens, headphones, speakers, (sky) maps
- Clipboard, paper and pencils
- Digital cameras or tablets
- Paper (including tissue paper, card), scissors, paper clips, glue sticks
- Large blank table

EXPLORE:

Display the Story slideshow to the children, pausing it at slide 2. Ask them to tell a friend what they can see in the picture. Accept anything that can be seen or reasonably inferred from the picture at this stage. Then, play the remainder of the story.

Ask: *What have you seen in the sky?*

Encourage the children to share their ideas with their friends. Take the group outside and ask them to look carefully at the sky immediately above the area they are in. Encourage them to lie down if possible, to be peaceful and observant. Gather together their ideas, perhaps as words in a list or quick sketches. This list can be added to through both the Enquire activities and the Science at home section.

Ask: *Did you see something no one else did? Did you see anything that surprised you? Did you see anything that should not be in the sky? Did you see anything on the ground that could be in the sky? Did you hear anything that was in the sky? Did you see anything falling? Which things were flying?*

Explore and share their ideas, adding prompts or ideas if necessary.

Health and safety:

Be Safe!, page 13
(not looking directly
at the Sun).

ENQUIRE (FOR FOCUS ACTIVITY):

Working with small groups of no more than six children, show the cards and the background scene (enlarged to A3) from the Resource sheet. Shuffle the pictures and put them face down around the base board. Ask each child in turn to choose a picture and to say if they think it belongs in the sky or on the ground. Tell them to place their picture on the base board where they think it should be. Take care to add one picture at a time and ask the rest of the group if they are happy with the position of each one.

Continue choosing, talking and placing the pictures until they are all gone. Encourage children to listen to each other's ideas. For example, they may decide to place Billy in the sky bouncing off the trampoline. They may decide the seat part of the swing is in the sky in this instance. The focus of the activity should remain on the typicality of the image being in the sky.

Leave out the cards from the Resource sheet, with sticky tack on the back of each image, so that children can explore different options for the scene.

Remove the background scene and focus in on just the images that the children agree are usually in the sky.

Ask: What can you tell me about them? What else do you want to know about them? They may refer to wings that help a lot of the items, such as a plane or a bird, to stay in the sky.

Ask: Have you ever been in the sky? What did you do? What did it feel like? Would you like to do it again? They may refer to big wheels, fairground rides, plane trips, bouncy castles or simply jumping.

Ask: Could you stay in the sky by yourself? What did you need to keep you there? Could you stay there without it?

Encourage the children to continue to add ideas to the class list made in the Explore part of the activity, over subsequent days.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Maths area outdoors: Can you go on a sky hunt? Record findings in a pictorial table with pictures of things in the sky that the children tick off over the course of an outdoor play session. Leave blanks for children to add their own findings. Can you count the number of things you saw in the sky? Who saw the most?

Art: Can you take photos of things in the sky? Use digital equipment to take photos of things in the sky. Children can then draw what they see.

Role play: What do pilots do? What do other people who work on planes do? What do passengers do on planes?

Construction: Can you make something that moves through the air? Use available resources to make a paper plane, helicopter or parachute, for example. Which model flies furthest or straightest? How do you make them fly? Why do they stop flying?

REFLECT AND REVIEW:

Ask the children to name and describe living and non-living things that they have either seen in the sky, or know that move through the sky.

EVIDENCE OF LEARNING:

As children describe things that can be seen in the sky, notice whether they are confident naming them. Do they notice living and non-living things? Do they include things that they have seen outside of the focus Enquire activity? Do they include animals, types of weather, permanent objects in the sky and man-made flying objects? Do they talk about why they are there, making connections to their own observations of things flying and falling.

SCIENCE AT HOME:

Can they make a model of something that travels in the sky? For example, a paper plane, parachute, balloon, space rocket, etc. Encourage children to bring their finished product into school.

WHAT IS THE MOON?

Key words:

the Moon
space
astronaut
rocket

Key information:

The Moon is approximately 238,855 miles (384,400 kilometres) away from Earth. The Apollo space programme ran between 1963 and 1972. There were six successful Moon landings. The first was Apollo 11 in 1969. The Apollo missions took about 3 days to reach the Moon. Only 12 astronauts have ever landed on the Moon. The Moon is made of rock and its surface is covered in extinct volcanoes, craters and lava flows. The Moon is the closest orbital neighbour to the Earth and is always present in the sky, although it is not always visible to the naked eye during daylight hours. The Moon is not a light source; we see it because it reflects light from the Sun. The Moon appears to change shape over the course of a month because, as the Moon orbits Earth, we see different amounts of the part reflecting the Sun's light. When the Moon is between Earth and the Sun, the side reflecting sunlight is hidden from us. As it moves around Earth, more and more of the lit side comes into view. Then it begins to disappear again.

ACTIVITY SUMMARY:

This activity focuses on the Moon in particular and could follow on from Activity plan 13 'What happens at night?' and Activity plan 14 'What is in the sky?'. Children will observe the Moon in real life and, using photographs, notice that its shape appears to change, think about its surface and find out about people and machines that have travelled to the Moon.

They will have the opportunity to explore their own questions about the Moon and this may lead on to a broader space-related topic, depending on the interests of the children. This activity introduces the big physics ideas about Earth and space that are covered in Snap Science Year 5 Module 8 'The Earth and Beyond'.

Learning intention:

Children can describe the Moon's appearance and what an astronaut does.

EYFS cross curricular links:

Understanding the World: People and Communities – What would it be like to land on the Moon? Watch a film of the Apollo Moon landing. Find out if any of your relatives remember when it happened.

Literacy: Writing – What would a journey to the Moon be like? Create a 'mission control' writing area in your classroom and resource it with writing frames to encourage independent writing about a journey to the Moon.

Understanding the world: The world / Technology – How high can it fly? Play with a stomp rocket. Make the rocket fly.

Expressive arts and design: Exploring and using media and materials / Make 3D Moon pictures – Can you make a moonscape? Use a variety of resources, including egg boxes, rice, pasta, to create the Moon's surface and craters. These could be painted afterwards to reflect the colours of the Moon.

Physical development: Moving and handling – Can you move like an astronaut? Try to move as if you were an astronaut in a space suit on the Moon.

RESOURCES (FOR FOCUS ACTIVITY):

- 2 hoops
- Resource sheet (True / False)
- Video footage of astronauts in space rockets, Apollo 11 Moon landing, or walking on the Moon
- Space food (can be purchased by searching for Astronaut Food in the grocery store department of www.amazon.co.uk)

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- A space rocket role play area, and items for role play, for example, astronaut outfits and space food packets
- Science Photos
- Rock and stone samples

EXPLORE:

Display the Story slideshow and play the first two slides from the story. Encourage the children to notice what is in the pictures.

Ask: *What time of day is it? What season is it? What can Rubina and Jamil see? What shape is the Moon?*

Share the rest of the story and ask the children to talk to their friends about a time when they have seen the Moon.

Ask: *What colour is it? Where have you seen it? When? What shape is it? Has anyone ever seen the Moon when it looked a different shape? What shape was it? Have you ever been able to see the surface of the Moon?*

Ask them to think and talk to a friend about what they have noticed when they have looked at the Moon. Share their ideas.

Ask the children to think and talk to a friend about Rubina's question on slide 5.

Ask: *Do you think anyone from Earth has ever been to the Moon? How far away is it? How long does it take to get there?*

Collect their ideas together at this stage and explain that you will explore them further in the Enquire part of the activity.

ENQUIRE (FOR FOCUS ACTIVITY):

Remind the children of their ideas about whether anyone has ever been to the Moon. Children may well know that an astronaut is the job title of someone who travels in space. Ask them to think on their own about how the astronaut might get to the Moon or into space.

Place the True / False labels cut out from the Resource sheet in the two hoops on the ground and give the children the 'How' set of cards. Read the question: How will we travel to the Moon? Help the children to sort the 'How' cards into the 'True' or 'False' hoops. Establish that astronauts need a space rocket to travel as far as the Moon.

Now ask the children to think about what you might need to pack to take to the Moon. Repeat the hoop activity with the 'What' set of cards, by asking the question: What should we take to the Moon? Ask children to give a reason for their answers. Prompt them to think about how long it would take to get to the Moon and what it is like in space and on the Moon.

Watch a film of astronauts in space or on the Moon, and talk about how they are moving. Talk about how no humans live on the Moon. Some children may know that there is no air for humans to breathe in space, and that no food grows there.

The chance to taste some of the space food an astronaut may eat will allow the children to experience some of the delights of space travel first hand. Talk about how space food is different from the food they usually eat.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Sand tray: What does the Moon feel like? Fill with rocks and stones for the children to explore the textures of different surfaces.

Outside area: What else is made from rock? Explore the outdoor area looking for other things made of rock like the Moon.

Writing area: Can you write a list of what to take to the Moon? Display the Science Photos to help children think about a journey to the Moon.

Role play: What do astronauts do? What do they wear? Can you prepare the rocket for take off? Display the Science Photos to help the children think about being an astronaut.

REFLECT AND REVIEW:

Ask the children to tell you what the Moon looks like, and to describe things that astronauts do.

EVIDENCE OF LEARNING:

Notice whether children use appropriate language when describing the Moon's appearance, referring to where and when they see it, and the Moon's apparent changing shape and its surface. They may have further questions about planets, stars or the Sun. Children may refer to the distance of the Moon from Earth and of the environmental differences when talking about space travel and astronauts.

SCIENCE AT HOME:

Can they keep a Moon diary? Encourage children to look at the Moon every day for a month and to record what shape it is. They can bring what they record into school to share. Is there a pattern in how the Moon appears to change shape? Were there some days when you couldn't see it? Why do you think that was?

WHAT MAKES IT MOVE?

Key words:

move
push
pull

ACTIVITY SUMMARY:

In this activity children will investigate how to make things move. They will be encouraged to ask questions from their observations and to carry out their own investigations.

This launches the big physics idea that nothing moves without a force acting upon it. The force will always be a push or a pull. These ideas are built on in Snap Science Year 3 Module 4 'The Power of Forces' and Year 5 Module 7 'Feel the Force'. Children do not need to use the term 'force'.

This activity is a good starting point for further learning in Activity plan 17 'How does my toy work?' and Activity plan 18 'What floats?' in the Foundation series.

Learning intention:

Children can demonstrate how a push or a pull is needed to make an object move.

EYFS cross curricular links:

Mathematics: Numbers / Shape, space and measures – Which toy goes the furthest? Conduct an outdoor investigation using a selection of wheeled toys. Mark a starting line with chalk and compare how far the toys travel when pushed. Measure the distance travelled.

Expressive arts and design: Painting / Being imaginative – What marks can you make when you push or pull the roller or brush? Investigate paint with a variety of rollers and brushes. Use patterned rollers (for example, tie string round a paint roller) to make a picture.

Communication and language / Literacy: Understanding / Writing – How does it move? Record the different ways that an object moves when it is pushed or pulled. Use descriptive words to describe how it moves, for example, fast, slow, smoothly, zoom, etc.

RESOURCES (FOR FOCUS ACTIVITY):

- Resource sheet (Push or pull word bank)
- Digital cameras or tablets

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Science Photos
- Items for role play, including replica builders' tools, cement mixer and workbench
- Range of balls
- Sand tray and toys, such as a sand wheel and hand mixer
- Water tray and water toys, such as plastic ducks and boats
- Toy cars and other wheeled vehicles
- Road mat

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about the objects in the slides.

Ask: Have you made a swing move? Or a toy car? Or anything like them? What did you do to start it moving?

Show children the push and pull cards from the Resource sheet and read the words aloud. Discuss what they understand by the two words and go back through the story again, spotting pushes and pulls.

Give each child a toy car. Ensure that the cars are on a flat surface. Flip the coin or counter to land on push or pull. Children should carry out the action on their car. Repeat this four or five times or until you are satisfied that there is a good understanding of both push and pull before starting the focus Enquire activity. Ensure that children are clear that the car will not move unless they push or pull it. There is further opportunity to explore this activity as one of the independent tasks.

Health and safety:

Be safe!, page 8–9 (putting small things in mouth).

ENQUIRE (FOR FOCUS ACTIVITY):

Working with small groups of no more than six children, take the children on a trail to explore their local environment, focusing on how things move. Depending on your location and environment, you may want to visit an area beyond the school gates, such as a park.

Give each child a push or a pull card cut from the Resource sheet. Ask them to search the vicinity for somewhere that they think their force is needed to make an object move. The children should test their idea, take a photo or have a photo taken, with the card clearly visible and continue on their search within the directed area.

Ask: *What have you found? What do you need to do to make it move? Could you use the other card as well?*

It is likely that the children will have lots of questions and some uncertainty may arise during this activity. It is important to make a note of more challenging questions, such as: How does a leaf move? How does a car move? How does a cloud move? This will allow you to explore them in more detail back in the classroom at a suitable time.

Collate the photos, and help the children to group them into things that need a push to make them move and things that need a pull. Encourage them to think of more questions to explore, such as: can you pull and push at the same time? Is pushing harder than pulling? How can things move when no one touches them? Help children to follow lines of enquiry that interest them, while remaining focused on the key question: what makes it move?

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Construction / Builders yard role play: Can you build it? Provide children with appropriate builders' tools (hammer, nails, screwdrivers, trowels, etc.), replica cement mixer and workbench to practise pushing and pulling.

Investigation table: Can you make the ball move? Provide a range of balls for children to select from to make them move. Change the surface; how does this change how the ball moves?

Tabletop activities: What makes it move? Print off the Science Photos as small cards and cut out the images. The children should take a card and decide if the object needs a push or a pull to make it move.

Sand tray: What makes the toys move? Investigate a range of sand toys, such as a sand wheel, hand mixer and vehicles. Do the toys move differently in the sand from the way they do on the table?

Water tray: What makes the toys move? Investigate a variety of water toys, such as boats, fish, ducks, etc. Do the toys move differently in the water from the way they do on the table or in sand?

Small world: Road mat and vehicles – What makes the vehicles move? Investigate how different vehicles can be moved.

REFLECT AND REVIEW:

Ask the children to select either a photo they have taken or an object of their choosing and to demonstrate how to make it move.

EVIDENCE OF LEARNING:

Can children describe what they do to make an object move using the words 'push' and 'pull' or a combination of the two? (They may refer to experiences beyond the classroom.)

SCIENCE AT HOME:

Ask children to look for toys and objects in their home that need to be pushed or pulled to make them move. Encourage the children to share what they have found. They could also spot things on their way to and from school in their local environment that need pushing and pulling to make them move.

Health and safety:

Prior to the trail, appropriate risk assessments should be carried out based on your school's policy and the intended route.

HOW DOES MY TOY WORK?

Key words:

move
push
pull
twist

Key information:

Before the activity begins, ensure that parents are aware of the risks of sending a precious toy to school.

ACTIVITY SUMMARY:

In this activity children compare the different ways that they can make a range of simple mechanical toys move. This builds on Activity plan 16 'What makes it move?' where children explored the big physics idea that a push or a pull is required to make something move. In this activity they will also use the word 'twist' to describe a particular type of rotational push.

They will explore at first hand simple push and pull wheeled toys, pedal toys, rocking toys, spring-powered toys, string-pull toys, wind-up toys, rotational toys, pop-up toys and spinning toys. They will think about the different ways that they can push, pull or twist the toys to make them move, and group them accordingly. Links with home are encouraged throughout the activity and it may be appropriate to ask the children to bring a toy to share to launch the activity in advance of the Explore session.

Learning intention:

Children can demonstrate and describe, using the words 'push', 'pull' and 'twist', what they need to do to make a toy move.

EYFS cross curricular links:

Expressive arts and design: Exploring and using media and materials / Being imaginative – Can you make a moving toy? Use a variety of junk modelling materials to design and make a moving toy.

Expressive arts and design: Exploring and using media and materials / Being imaginative – Can you make a moving toy? Use a variety of construction kits (big building bricks, small building bricks, etc.) to design and make a moving toy.

Physical development: Moving and handling – How do these toys move? In the outdoor area investigate how outdoor toys move, for example, bike pedals, wheels, etc.

RESOURCES (FOR FOCUS ACTIVITY):

- Range of toys that can move, for example, simple push and pull wheeled toys such as a car, train, dog, trolley or scooter; pedal toys such as a bike, car or trike; rotational toys such as windmills or waterwheels; rocking toys such as a seesaw or rocking horse; spring-powered toys such as a jack-in-the-box or pogo stick; string-pull toys, such as a traditional string puppet or toys where the legs and arms move up when a string between the legs is pulled; pop-up toys (simple stick on a cone type); wind-up toys; spinning tops. If necessary, use the Science Photos to supplement any types of toy of which you have limited examples.
- Three hoops
- Resource sheet (Push, pull and twist word bank)
- Digital camera or tablet
- Science Photos (if needed to supplement toys)

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Range of toys as suggested for Focus activity, together with objects such as wheels, axles, split pins, paper and card
- Plastic tubs, foil, modelling tack and straws
- Science Photos (if needed to supplement toys)
- Resource sheet (Push, pull and twist word bank)

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about a time when they played with a toy like any of those in the story.

Ask: *What was your toy called? What did you do to make the toy move?*

Collect some of their ideas together. Remind the children of Activity plan 16 where they identified how things move with a push or pull and introduce the word 'twist' to describe a rotational push or pull. Demonstrate these actions using exaggerated movements and ask the children to copy you.

Look at each slide again in turn and ask the children to look carefully at the pictures to see if they can tell what the child is doing to make the toy move.

Ask: *How is Eliza making her puppet jump? Is she pulling or pushing the string? Is Rubina pushing or pulling the pedals to make the car's wheels turn?*

Use examples of different toys to prompt discussion with the children about the different ways toys move, including push and pull wheeled toys, pedal toys, rocking toys, spring-powered toys, string-pull toys, pop-up toys, wind-up toys and spinning toys. Help them to identify which ones are in the story and which are not. Talk about whether a push, a pull or a twist is needed to make each type of toy move. Can they think of any other pedal toys or wind-up toys that are not shown in the story? Ask them to talk to their friends to share ideas.

ENQUIRE (FOR FOCUS ACTIVITY):

If the children have brought their own toys to share, ensure that they have time to play with their own toy for a while first before introducing it to the rest of the group, demonstrating and explaining in their own words how to make it move.

Provide a selection of toys that work in a variety of ways as suggested in the resources list. If these are toys that the children haven't seen before, allow plenty of time to explore them.

Place three hoops on the floor where all the children can see them. Label each hoop with either the word 'push', 'pull' and 'twist'. Tell them to select a toy and to investigate whether they need to push, pull or twist it to make it move.

Ask: *Which hoop does your toy belong in?*

Children should spend more time working together in pairs or small groups, deciding where the rest of the toys should go and placing them in the hoops. Do this until all the toys are sorted.

Ask: *Are there any toys that need a push and a pull? Where should we put them?*

Take photos of the finished hoops to record the children's way of grouping. Encourage them to explore other aspects of the toys, such as which direction the toys move following the push, pull or twist action, for example, forwards, backwards, round and round, up and down, fast or slow.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Writing area: Can you label, with push, pull or twist, what you do to make your toy move?

Role play toy shop: Can you sort the toys for sale based on what you do to make them move? Provide the word cards from the Resource sheet.

Investigation table: Can you make a moving toy and describe what you do to make it move? Provide a range of resources, for example, wheels, axles, split pins, paper and card.

Water tray: Can you make a boat? What will you do to make it move? Provide a range of resources, for example, plastic tubs, foil, modelling tack, straws, paper, and card.

REFLECT AND REVIEW:

Ask the children to select two different toys. Ask them to demonstrate to you what they need to do to make each toy move and to describe their actions and the movement that the toy makes.

EVIDENCE OF LEARNING:

Can children demonstrate how to make a range of simple mechanical toys move using push, pull or twist actions, or a combination of these? Can they describe their actions accurately, using the words 'push', 'pull' and 'twist'? Do they recognise that different toys need different actions to make them move, for example, rocking toys move with a push then a pull, string-pull toys operate with a pull? Can children talk about other toys they have at home or have seen elsewhere in terms of the actions needed to make them move?

SCIENCE AT HOME:

Can children bring a toy from home to share at school and talk about how they make it move? This should ideally be done to launch the activity and used during the Explore part of the activity.

Health and safety:

Be Safe!, pages 8–9
(small objects and
safe playing with
toys).

WHAT FLOATS?

Key words:

float
sink

ACTIVITY SUMMARY:

In this activity children will explore, through first hand experience, the big physics idea that some objects float on the surface of water and that some objects sink. They will be encouraged to investigate the questions that their observations raise.

The focus for this activity is the idea that some objects float, and for the children to notice the relative shape, size and mass of the objects and the materials that they are made from.

Learning intention:

Children can talk about objects that float and sink, referring to the size, shape and mass of the object, and what it is made from, and link this to their first hand experience.

EYFS cross curricular links:

Expressive arts and design: Exploring and using media and materials – What will float? Design and make something that floats and will carry a small world character or small world animal across the water.

Mathematics / Understanding the world: Shape, space and measures / Technology – How much will this boat carry? Using a selection of toy boats investigate which float well. How many small world characters / cubes / teddies will they hold before they sink?

RESOURCES (FOR FOCUS ACTIVITY):

- Box 1: A wide range of objects, including some that will float and some that will sink, for example, objects made from wood, plastic and metal and natural objects such as pebbles, leaves, twigs and grass. Select a range of objects that are made from the same material but that are a different size, shape and weight.
- Box 2: A range of malleable materials, such as modelling clay, paper, foil and cardboard
- Box 3: A range of objects that will challenge the children, such as metal paperclips, ice cubes, blown up balloons, large heavy log, metal coins, fruit, full bottles and cans of fizzy drink
- Science Photos 9–26 (if needed to supplement objects)
- Range of plastic containers for water, including large buckets, a water tray and fish tank-type containers. These should be clear sided where possible to aid observation.
- Resource sheet (Float or sink template (add photos and drawings))
- Digital camera or tablet

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Objects and materials collected for the Focus activity, additional materials for making boats, plenty of plastic cubes or similar small items for testing
- Resource sheet (Float or sink template (add photos and drawings))
- Water container in outside area for testing natural objects

EXPLORE:

Display the Story slideshow and play the story to the children.

Ask them to describe to a friend what they noticed about all the objects.

Play the slides again and help the children to notice that all the objects are floating on the surface of the water.

Ask: *What is the object made from? What shape is it?* Repeat these questions for each slide.

Tell the children to talk to a friend about anything else they can think of that they have seen float on water, perhaps in the classroom, outside or at home. Establish that a floating object sits on or near the surface of the water. Objects that sink go to the bottom of the container and remain there.

Health and safety:

Be Safe!, pages 8–9 (water, small objects in mouth, blowing up balloons and lifting things).

ENQUIRE (FOR FOCUS ACTIVITY):

Working with a small group of children, gather them around a full water tray. Give the children time to look closely at the objects in box 1. Then, ask them to choose an object that they think will float in the water tray and to tell a friend which one they have chosen.

Allow time for the children to explore what happens when they put the object in the water tray. Take photos of the process to remind children what they did and as a prompt to help them to talk about it later.

Ask: What happens when you put your object in the water? Did it float straight away? What do you notice? Was it what you expected?

Repeat this with different objects.

Ask: What sort of objects float? What shape are they? Are they heavy or light? Big or small? What are they made of?

Share box 2, which contains the malleable materials, and ask the children to choose something that will float and to explore it in the same way.

Ask: What can you do to make it float? How does that help? Can you work with a friend to make a small object that floats? Who can make the biggest floating object?

Share the objects from box 3. Tell the children that this is the mystery box and that some things in here may surprise them. Give them time to talk about whether items will float or sink, and then to explore whether items sink or float.

Ask: What do you think will happen? What did you notice? Why do you think that happened? What else do you want to find out?

Children may wish to explore further objects of their own choosing. The Resource sheet is provided to allow them to record what they have found out, if appropriate.

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Writing area: Can you draw and label objects that float? Provide copies of the Resource sheet as a template for children to record their observations on.

Creative area: Can you make a boat to carry a plastic cube? How many cubes can your boat hold and still float? Provide a range of materials to make a boat, such as plastic bags, paper, card and foil. Make sure that there is water nearby for frequent testing.

Outside area: Can you find objects outside that float? Provide a water tank and ask children to test objects they find in the natural environment to see if they float or sink.

REFLECT AND REVIEW:

From the Science Photos, ask the children to choose a picture of an object that floats, and referring to their first hand experience, to describe it and what happened.

EVIDENCE OF LEARNING:

Listen carefully to what the children say. Do they describe what they noticed when they tested different objects? They may describe something sinking first and then bobbing back to the surface, or sitting on the surface straight away. Can they talk about how they know that the object floats and do they explain how they tried it more than once to be sure? Children may refer to what material it is made from and talk about whether other objects that are made of the same material also floated. They may talk about the shape of objects that float and compare the size and mass of objects that sink and float. Do the children talk about some of the more challenging objects, such as fruit or cans of fizzy drink, and how these objects behaved? They may also refer to objects that didn't float or sink as they expected.

SCIENCE AT HOME:

Can they find objects at home that float (in the bath, paddling pool, kitchen sink)? Can they sort objects into things that floated and things that didn't? Can they write or draw a picture about what they found out and bring it in to share with the teacher / class? Copies of the Resource sheet could be sent home to accompany these ideas.

WHAT IS HAPPENING TO THE TREES? (AUTUMN)

Key words:

autumn
season
winter
deciduous
leaves
fruit

Key information:

For the purpose of this activity autumn is considered to take place in September, October and November.

Health and safety:

Be Safe!, page 13 (study out of the classroom).

ACTIVITY SUMMARY:

This activity takes place during the autumn term and introduces the big biology idea of seasonal change. Children will look closely at the colour and texture of leaves, a tree's shape and notice how a tree changes during the season of autumn. The activity is linked to Activity plan 20 'What is happening to the trees? (Spring)' and Activity plan 21 'What is happening to the trees? (Summer)'.

Select a deciduous tree nearby – ideally visible from the classroom base – which can 'belong' to the class for the year. Children should visit it formally 4–6 times over the autumn season, but more frequent visits in less structured sessions would enable more familiarity with the tree and its changing form.

Learning intention:

Children can describe the physical changes they notice on and around a tree during the season of autumn.

EYFS cross curricular links:

Expressive arts and design: Colour mixing – How do you make the colours of different leaves (green, brown, orange, gold)? How do you make the colour darker or lighter? Experiment making different autumnal colours with paint.

Expressive arts and design / Physical development: Moving and handling – Can you move to the music? How does the music make you feel? Listen to 'Autumn' from Vivaldi's *The Four Seasons*.

Physical development: Moving and handling – Can you move like a falling leaf (whirling, twirling, falling, still)? Observe leaves as they fall from the tree.

Understanding the world: The world – What can you find in autumn? Use the outdoor learning area to collect a variety of leaves, twigs, branches or nuts and place on a 'nature table' with books about the seasons, magnifying glasses, clipboards and paper.

Expressive arts and design: Exploring and using media and materials – Can you draw a leaf? Try some leaf rubbings using wax crayons.

Understanding the world: People and communities / The world – What do you know about harvest? Discuss the importance of harvest and celebrate harvest festivals, such as Sukkot, in school.

RESOURCES (FOR FOCUS ACTIVITY):

- Tree – native, deciduous, local and observable
- Digital camera or tablet
- Scrapbook or wall frieze
- Drawing materials and paper

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Science Photos
- Resource sheet (Question cards)
- Seeds, sticks, leaves and fruit (collected from local walks, school grounds or by children)
- Paint colour sample strips from a DIY shop
- Strips of paper and a range of fastening materials
- Magnifying glasses
- Edible fruit from native trees such as apples and pears

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about what Billy has noticed.

Ask: *What type of tree can Billy see? How do you know? Have you seen an apple tree before? What is Billy wearing? What is the weather like?*

Establish that this story about Billy takes place at the beginning of autumn. Some fruit is still on the trees and leaves are starting to change colour as they fall off the trees.

Ask: *What else happens in autumn?* Some examples might include: going back to school, harvest, bonfire night, darker nights and colder weather.

Ask: *What do you think will happen to the apple tree by the end of autumn?*

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they will be visiting a tree nearby throughout the year and noticing what happens in each season.

Visit your chosen tree at least every two weeks during autumn. Ask the children to talk to a friend about what they see.

Ask: *Where are the leaves? What colour are the leaves? Can you see any fruit? Can you see any evidence of anything living in the tree?*

Take photos and ask the children to draw the tree during each visit.

Back in the classroom, make a class book or timeline wall frieze that includes: photos of the children each time you visit; a list of what they were wearing, for example, wellies and waterproofs or jumpers and shoes; photos and drawings of the tree; leaves that have fallen from the tree and anything else that the children think is relevant. Add to this display each time you visit the tree.

In November, after having visited the tree at least four times, ask the children to look at the evidence they have collected.

Ask: *What do you notice? What has changed? What has stayed the same? What has happened to the tree? What do you think might happen to the tree over winter?*

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Sand tray: What do autumn leaves feel like and sound like? Fill the tray with fallen leaves for the children to feel. Keep the leaves for a couple of weeks so that the children can notice changes in them.

Outdoors: Can you find a leaf for each shade of red? Give the children paint colour sample strips from a DIY shop – browns, reds, oranges, yellows, greens – so that they can find or collect leaves that match the colours.

Outdoors: How many leaves can you catch? Take the children outside on a windy day when the leaves are falling from the trees.

Art table: Can you make a leaf crown? Provide leaves, strips of paper and a range of fastening materials.

Nature table: Which tree is it from? Use magnifying glasses to look carefully at leaves, seeds and fruits from other trees in the area and use identification guides to help identify and name them.

Nature table: Can you use all your senses to tell someone about a leaf or something displayed on the nature table? Use the Resource sheet cards to prompt investigation and discussion. Ensure that children only taste items that are safe to eat.

Sequencing: Using the Science Photos can you find five pictures of the same tree? Can you put the photos in order for each tree? Can you tell someone about the order you have put them in? For this activity, cut out the images in order to hide the headings.

Health and safety:

Be safe!, pages 9, 18 and 19 (when using the sense of taste, refer to safe foods and plants to taste).

Key information:

Activity plan 20
'What is happening to the trees?' (Spring) revisits this tree in spring. During the winter months it is a good idea to take more photos of the tree once it has lost all its leaves.

REFLECT AND REVIEW:

As a prompt, show the children two photos of their tree, one from September and another from November. Ask the children to describe the changes that they have noticed during autumn.

EVIDENCE OF LEARNING:

Listen carefully to the children's descriptions. Do they talk about changing colours of leaves from green to reds, oranges, browns and yellows? Do they refer to leaves falling or being blown off trees? Do they refer to the fruits being ready for picking or falling? They may also talk about what they think will happen to their tree during the following season of winter. Children may compare the autumnal changes that they observed in their tree with changes in other trees.

SCIENCE AT HOME:

Can they find some leaves on the way to school, in their garden, or in a nearby park or wood? Can they find out the names of any trees they see? Can they take photos of a tree at home or nearby and bring them to share with the class? Can they draw pictures of a tree in September, October and November?

WHAT IS HAPPENING TO THE TREES? (SPRING)

Key words:

spring
season
deciduous
buds
blossom
winter
insect

Key information:

For the purpose of this activity, spring is considered to take place in March, April and May.

Health and safety:

Be Safe!, page 13 (study out of the classroom).

Key information:

Bees are important to the pollination process and help trees to produce fruit. It is sufficient at this stage simply to observe that bees are near and on flowers in late spring and summer and to know that bees are needed to help the fruit grow later in the year.

ACTIVITY SUMMARY:

This activity takes place during the spring term and develops the big biology idea of seasonal change. Children will look closely at the colour and shape of the blossom and notice how the tree changes during spring. This activity is linked to Activity plan 19 'What is happening to the trees? (Autumn)' and Activity plan 21 'What is happening to the trees? (Summer)'.

Use the same deciduous tree selected for Activity plan 19. Children should visit it formally 4–6 times over the course of spring but more frequently in less structured sessions to enable more familiarity with the tree and its changing form.

Learning intention:

Children can describe the physical changes they notice on and around a tree during the season of spring.

EYFS cross curricular links:

Expressive arts and design / Physical development: Moving and handling – Can you move to the music? How does the music make you feel? Listen to 'Spring' from Vivaldi's *The Four Seasons*.

How is the music different from Vivaldi's 'Autumn'?

Understanding the world: The world – Use the outdoor learning area to search for signs of spring (blossom on trees, bulbs growing, etc.). Record these pictorially or use a camera.

Understanding the world: The world – How do seeds and bulbs change as they grow? Plant seeds in the outdoor area or in trays in the classroom and observe their growth over time.

Understanding the world: The world – What can you find in spring? Use the outdoor learning area and go on a nature walk to collect a variety of things associated with spring and place them on a 'nature table' with books about the seasons, magnifying glasses, clipboards and paper.

RESOURCES (FOR FOCUS ACTIVITY):

- Tree – native, deciduous, local and observable
- Digital camera or tablet
- Scrapbook or wall frieze – continued from autumn (Activity plan 19)
- Drawing materials and paper

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Science Photos
- Resource sheet (Tree template)
- Blossom collected from local walks
- Craft materials for blossom trees
- Magnifying glasses

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about what Rubina has noticed.

Ask: *What type of tree do you think Rubina can see? What clues are there? Have we seen an apple tree before?*

Ask: *What is Rubina wearing? What is the weather like? How do you know this?*

Remind children of the Story slideshow in Activity plan 19 where Billy was looking at an apple tree in autumn, when the leaves were falling off the trees.

Establish that this story about Rubina takes place in the middle of spring. The blossom is on the trees and bees are starting to collect pollen from flowers.

Ask: *What else happens in spring?* Some examples might include: plants start to grow again, warmer weather, lots of animals have babies at this time of year, such as lambs.

Ask: *What do you think will happen to the apple tree by the end of spring?*

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they will be visiting the same tree they looked at in autumn. Using the analogy of sleeping to imply dormant, explain that they will be looking for signs that the tree is waking up from the winter and getting ready to produce more fruit.

Look back at photos, your scrapbook or wall frieze from Activity plan 19 to remind children what the tree looked like in autumn and winter.

Ask: *What do you think you will see when you look at it now that it is spring?*

Visit your chosen tree at least every two weeks during spring. Ask the children to talk to a friend about what they see.

Ask: *Can you see any buds or leaves? What colour are they? How big are they? Where are they growing?*

Prompt the children with questions during subsequent visits.

Ask: *Is there any blossom? Have the leaves changed shape, size or colour? Are there any signs of animals living in the tree?*

Take photos and ask the children to draw the tree during each visit.

Back in the classroom, continue to add to your class book or timeline wall frieze that you started in autumn (photos of the children each time you visit, a list of what they were wearing, photos and drawings of the tree, and anything else the children think is relevant). Add to this display each time you visit the tree.

In May, after having visited the tree at least four times, ask the children to look at the evidence they have collected.

Ask: *What do you notice? What has changed? What has stayed the same? What has happened to the tree? What has changed since your last autumn visit to the tree? What do you think might happen to the tree during the summer months?*

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Art table: Can you create a spring tree? Provide copies of the Resource sheet and ask the children to collect or suggest materials that they could use to make the tree look spring like.

Art table: Can you paint / draw a spring scene? Provide Science Photos 1–11 of spring images as a stimulus.

Observation station: What can you see? Provide magnifying glasses and a range of parts of spring trees, including small branches with buds or small leaves and blossom, to observe at first hand carefully.

REFLECT AND REVIEW:

As a prompt, show the children two photos of their tree, one from early spring and one from later in the season. Ask the children to describe the changes they have noticed in spring.

EVIDENCE OF LEARNING:

Listen carefully to children's descriptions. Can they describe the changes to the tree that they have seen? Do they mention the buds or small leaves that are visible, the leaves changing to green, the visible blossom, or the blossom falling off the trees? Do they describe the bees visiting the tree's flowers, and the leaves growing bigger and greener? They may also refer to other changes that start to happen in spring, such as lambing, spring flowers, warmer weather and longer days.

SCIENCE AT HOME:

Can they notice any trees in blossom on their journey to school or in their garden? Can they talk to an adult about what else happens in spring?

Can they record how many different signs of spring they can find in their garden or on a family walk in the local park or woods? Can they draw, write about or photograph what they have found and bring it in to share with their class. Did they find anything for the nature table?

WHAT IS HAPPENING TO THE TREES? (SUMMER)

Key words:

summer
season
deciduous
buds
flowers
fruit

Key information:

For the purpose of this activity summer is considered to take place in June, July and August.

Health and safety:

Be Safe!, page 13 (study out of the classroom).

Key information:

Mammals such as foxes, badgers, mice or voles will eat fruit on the lower branches or those that have fallen onto the ground.

ACTIVITY SUMMARY:

This activity takes place during the summer term and develops the big biology idea of seasonal change. Children will look closely at a tree, focusing on colours, textures, leaves, buds, flowers and fruit, tree shape and how the tree changes during the season of summer. The activity is linked to Activity plan 19 'What is happening to the trees? (Autumn)' and Activity plan 20 'What is happening to the trees? (Spring)'.

Select the same deciduous tree used in Activity plans 19 and 20. Children should visit it formally 4–6 times over the course of the summer season but more frequently in less structured sessions to enable more familiarity with the tree and its changing form.

Learning intention:

Children can describe the physical changes they notice on and around a tree during the season of summer.

EYFS cross curricular links:

Expressive arts and design / Physical development: Moving and handling – Can you move to the music? How does the music make you feel? Listen to 'Summer' from Vivaldi's *The Four Seasons*. How is the music different Vivaldi's 'Autumn' and 'Spring'?

Expressive arts and design: Exploring and using media and materials – What can you print with? Provide apple halves or other pieces of fruit for printing.

Understanding the world: The world – How do you know it is summer? Use the outdoor learning area to search for signs of summer (leaves on the trees, fruit, etc.). Record these pictorially or use a camera.

Understanding the world: The world – What can you find in summer? Use the outdoor learning area and go on a nature walk to collect a variety of things associated with summer. Place the items on a 'nature table' with books about the seasons, magnifying glasses, clipboards and paper.

RESOURCES (FOR FOCUS ACTIVITY):

- Tree – native, deciduous, local and observable
- Digital camera or tablet
- Scrapbook or wall frieze – continued from autumn and spring (Activity plans 19 and 20)
- Drawing materials and paper

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Resource sheet (Fruit salad template)
- Paper and craft materials
- Access to range of leaves and tree trunks ideally in the area accessible by the children
- Chunky wax crayons and chalks

EXPLORE:

Display the first three slides of the Story slideshow and play the story to the children.

Ask: *What type of tree is this? Have we seen it before?* Remind them of the Story slideshows in Activity plans 19 and 20 where Billy and Rubina looked at an apple tree in autumn and spring.

Show slide 4 and ask children to talk to a friend about what Billy has noticed and what they can see. Play on to slide 5 and discuss what might have made the holes in the apple. Share children's ideas and then show the final slide.

Display slide 4 again and ask what other animals might have eaten the apple. Share the children's ideas and establish that it is likely to be birds or insects that eat the apples of the higher branches.

Ask: *What is the weather like? How do you know this?* Establish this is summer. Fruit is on the tree and animals may be using the tree as a food source, a home or a shelter.

Ask: *What else happens in summer?* Some examples might include holidays, warm weather, seaside visits, paddling pools and longer days.

Ask: *What do you think will happen to the apple tree by the end of summer?*

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they will be visiting the same tree they looked at in autumn and spring. Look back at photos, your scrapbook or wall frieze to remind children what the tree looked like previously.

Ask: *What do you think you will see when you look at it now it is summer?*

Visit your chosen tree at least every two weeks during summer. Ask the children to talk to a friend about what they see.

Ask: *What has happened to the leaves since spring? What has happened to the shape of the tree? What has happened to the size of the tree? Can you see any flowers? Can you see any fruit? How many colours can you see on the tree?*

On this and subsequent visits, encourage children to spend time quietly near to the tree listening for sounds of the tree.

Ask: *Can you hear the leaves moving? Can you hear anything else moving?*

Let them feel the tree, smell it and look really closely at it.

Ask: *Can you see any signs that animals are living here or eating the fruit?*

Take photos and ask the children to draw the tree during each visit. Continue to add to the class book or timeline wall frieze.

In July, after having visited the tree at least four times, ask the children to look at the evidence they have collected.

Ask: *What do you notice? What has changed? What has stayed the same? What has happened to the tree? What has changed over the three seasons that we have visited the tree?*

Remind children what they noticed happening to the tree in autumn.

Ask: *What do you think will happen to the tree next?*

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Outdoors: Can you compare bark rubbings from different trees? Provide children with chunky wax crayons. In the outdoor learning environment encourage children to make and compare bark rubbings from a variety of trees.

Outdoors / Creative: Can you draw the trees? In the outdoor area make observational drawings of trees. Provide a variety of different media (drawing pencils, wax crayons, chalks and pastels).

Outdoors / Creative: Can you notice how the shadows change? Provide chunky chalks for drawing around the shadows that the trees cast upon the ground. Encourage the children to do this at different times of the day. Ask them to tell an adult what they notice.

REFLECT AND REVIEW:

As a prompt, show the children two photos of their tree, one from early summer and one from later in the season, alongside one that was taken in the spring. Ask the children to describe the changes they have noticed in summer.

EVIDENCE OF LEARNING:

Listen carefully to children's descriptions. Do they talk about the physical features they have seen on the tree? Do they refer to the colour of leaves, flowers and fruit? Can they talk about the changes compared with spring or make references to the whole year that they have been visiting the tree? Do they describe animals they have seen near the tree? Can they identify changes that happened specifically in the summer?

SCIENCE AT HOME:

Can they cut up a selection of fruits that grow on trees? Can they talk to an adult at home about what they can see inside? Can they talk about how the fruit seeds can be planted to grow fruit trees? Can they taste the different fruits, make a fruit salad and talk about the importance of eating fruit as part of a healthy diet. Give children copies of the Resource sheet to complete and then invite them to share how they made their fruit salad.

WHAT IS THE WEATHER LIKE TODAY? (WINTER)

Key words:

winter
season
weather
temperature

Key information:

For the purpose of this activity winter is considered to take place in December, January and February.

Health and safety:

Be Safe!, page 8
(clothing for cold weather and putting small things in mouths).

ACTIVITY SUMMARY:

This activity takes place in the winter and develops the big biology idea of seasonal change. It is linked to Activity plan 23 'What is the weather like today? (Summer)'. When opportunities arise to investigate winter weather, including low temperatures, snow, ice, frost, hailstones, sleet and fog, children will use their senses to explore and record what they can feel, see and hear.

This activity is designed to be repeated on several occasions during the winter months, either every day for a week or two, or at regular intervals over a longer period of time.

Learning intention:

Children can describe the observations of the weather they have made on a winter day.

EYFS cross curricular links:

Expressive arts and design: Exploring and using media and materials – How do you see winter? Create a winter scene picture using black paper and chalk.

Expressive arts and design: Exploring and using media and materials – Can you make it snow? Make a 'snow globe' in a jar using water, glitter, glycerine and small world characters, trees, etc.

Expressive arts and design: Exploring and using media and materials – Are all snowflakes different? Design and make a snowflake from folded paper, using scissors to cut out a pattern. Compare all the different snowflakes that are created by the children.

Communication and language / Literacy: Speaking / Writing – Which words describe winter? Make a list of all the winter words that the children can think of (cold, icy, glistening, flurry, fluttering, snowy, etc.). Use some of the words to create a winter poem either individually or as a class.

Physical development: Moving and handling – Can you move like a snowflake fluttering to the ground? Play some 'wintery' music, for example, 'Winter' from Vivaldi's *The Four Seasons*, or an extract from *The Snowman*.

Understanding the world: The world – What's the weather today? Create a weather station in the classroom by the window so that the children can independently record their observations of the weather using clipboards, paper, etc.

RESOURCES (FOR FOCUS ACTIVITY):

- Resource sheet 2 (Weather record template (make multiple A3 copies as required))
- Thermometer – ideally a large outdoor one with a scale that children can read
- Digital camera or tablet

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Resource sheet 1 (Dressing for the weather)
- Resources from Focus activity
- Weather boxes, each containing items to explore different types of winter weather conditions: ice, fog, snow, rain, sleet, hail. Items could include torches, high visibility objects, noisy toys such as horns, glow sticks, seaside buckets and spades, shaped moulds, magnifying glasses, wind chime, empty ice cream tubs, rock salt, table salt, paintbrushes of differing sizes, perspex mirrors, umbrellas, containers to catch the rain in, plastic sheeting such as a shower curtain.

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about what the weather is like in the story.

Ask: *What season do you think it is?*

Look again at slide 6.

Ask: *What are Billy and Eliza wearing? Why are they wearing these clothes?* Establish that while the Sun may be shining on a winter day, it does not mean it is warm. They need to wear warm clothes to explore winter weather.

Ask the children to talk to a friend about a time when they have been outside on a cold winter day. Ask them to talk about what they did, what they wore and what they could see and feel.

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they are going to look at the weather today. Ask them to look out of the window and to talk to a friend about what they can see, what clothes they should wear to go outside, and if they think the weather today has a name.

Dress appropriately and go outdoors to explore:

What does the weather feel like today? Tell the children to close their eyes.

Ask: *What does your face feel like? Hands? Toes? Eyes?*

What can you see today? Tell the children to look around.

Ask: *What is different today? What can you see? What has changed? What does the sky look like? What does the ground look like?*

What can you hear today? Tell the children to find a quiet spot, close their eyes and listen.

Ask: *What can you hear? Do you usually hear these noises? What is different today?*

Each time you observe the weather, repeat the above questions and invite the children to use Resource sheet 2 to record the main features of the weather, including the weather type, temperature, what they wore and what they did outside. Show the children how to read the thermometer and how to measure and record the temperature in °C.

After the children have observed the weather on at least three occasions, compare the information recorded on each day.

Ask: *Is there anything on the chart that is the same as another day? What is different?*

Help the children to notice patterns between the temperature and weather features, for example, did it snow on the coldest days? Were there icicles on snowy days? Was there ever a frost when it was foggy?

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Use the weather box that is suited to the weather observed that day.

Outdoor area: Foggy weather – Can you see me? Explore with or without glow sticks or high visibility items. Can you find me? Hide and seek with and without high visibility items. Does the torch help you see? Can you make it easier to see a bike or trike in foggy weather? Can you make a safe place to stop in foggy weather? Can you hear me? Use noisy toys to explore hearing your friends even if you can't see them.

Outdoor area: Snowy weather – Can you build a snow brick wall? Use ice cream tubs to shape bricks and stack them. Can you build a snow-castle? Can you make snow animals? How big can you make your snowball? Can you spot a snowflake? Use magnifying glasses to look at snowflakes carefully.

Outdoor area: Icy weather – Can you make it melt? Can you make it freeze again? Use salt and ice to explore melting and refreezing together to build larger objects. Can you see your breath? Use Perspex mirrors. Can you paint an icy picture? Use warm water and paintbrushes to paint on an icy surface.

Outdoor area: Hail, sleet or rainy weather – Can you hear it? Shelter under an umbrella and listen to the rain. Can you make a waterproof shelter? Use a shower curtain over a climbing frame or table and listen to the rain. Can you catch it? Use pots, buckets and tubs to collect the water from the rain, hail or sleet. Explore how much you caught and watch what happens to it over time.

Tabletop activity: What should they wear? Use Resource sheet 1 to dress Billy, Rubina, Jamil or Eliza for the weather today. Tell an adult what you have chosen and why.

REFLECT AND REVIEW:

Show the children photos taken outside on two different days in winter, or two photos of your choice from the Science Photos. Ask the children to tell you about what the weather was like on each day.

EVIDENCE OF LEARNING:

Listen to the children's descriptions carefully. Do they refer to things they did in that type of weather? Can they describe what they could see, what they heard and felt. Do they tell you about taking the temperature? Can they compare features of the weather on two different days and see patterns between weather features.

SCIENCE AT HOME:

Can they make a snowman with their family? Encourage them to take a photo and bring it in to show the class.

WHAT IS THE WEATHER LIKE TODAY? (SUMMER)

Key words:

summer
season
weather
shadow

Key information:

For the purpose of this activity summer is considered to take place in June, July and August.

Health and safety:

Be Safe!, page 8 (safety when working outside in very warm weather). Check for allergies to sun cream and school policy on its use.

ACTIVITY SUMMARY:

This activity takes place in the summer and develops the big biology idea of seasonal change. It is linked to Activity plan 22 'What is the weather like today? (Winter)'. When opportunities arise to investigate summer weather, children will use their senses to explore and record what they can feel, see and hear.

This activity is designed to be repeated on several occasions during the summer months, either every day for a week or two, or at regular intervals over a longer period of time.

Learning intention:

Children can describe the observations of the weather they have made on a summer day.

EYFS cross curricular links:

Expressive arts and design: Exploring and using media and materials – What can you use to make a summer picture? Create a summer scene picture (such as a beach, seaside or park). What could you use to make it look more authentic, for example, sprinkle real sand on it?

Communication and language / Literacy: Descriptive or creative writing – What do you like about summer? Write about your favourite summer day.

Mathematics: Data handling – What is your favourite flavour of ice cream? Taste a variety of different flavours of ice cream. Which is your favourite? Create a pictogram using the data.

Mathematics: Shape, space and measures / Role play – Can you sell ice creams? Create an ice cream shop / van role play area with money, pretend cornets, ice lollies, ice cream, till, price lists, etc.

Physical development: Moving and handling – Can you show how a summer day feels? Create the story of a summer day using dance / drama as a class or a small group. The children could act out rolling out the towel, unpacking the beach bag, putting on sunglasses, applying sun cream, building a sandcastle and splashing in the sea. (Music suggestion – 'Here Comes the Sun' by The Beatles).

Understanding the world: The world – What is the weather like today? Create a weather station in the classroom by the window so that the children can independently record their observations of the weather using clipboards, paper, etc.

RESOURCES (FOR FOCUS ACTIVITY):

- Resource sheet (Weather record template (make multiple A3 copies as required))
- Thermometer – ideally a large outdoor one with a scale that children can read
- Digital camera or tablet

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Range of building materials and coverings (for example, white cotton sheets and lightweight coloured fabric scarves)
- Dolls and other plastic people, clothing
- Items for role play, such as buckets, spades, empty sun cream bottles, sunglasses, hats
- Tuff spot full of sand
- Chalk

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about what the weather is like in the story.

Ask: *What season do you think it is?*

Look again at slide 6.

Ask: *What are Rubina and Jamil wearing? Why are they wearing these clothes? Why are they having a drink?*

Establish that the Sun can be dangerous and that we all need to protect our skin from burning and our heads from the sunshine. Talk about the need to drink extra water on a hot day and how this helps to keep us cool.

Ask children to talk to a friend about a time when they have been outside on a hot summer day. Ask them to talk about what they did, what they wore and what they could see and feel.

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they are going to look at the weather today. Ask them to look out of the window and talk to a friend about what they can see, what clothes they should wear to go outside and if they think the weather today has a name.

Dress appropriately and go outdoors to explore:

What does the weather feel like today? Tell the children to close their eyes.

Ask: *What does your face feel like? Hands? Toes? Eyes?* If appropriate, take off shoes and socks and feel the heat on the grass, the path and the shaded area, and talk about the differences between these areas.

Tell the children to look around. What can you see today?

Ask: *What is different today? What can you see? What has changed? What does the sky look like? What does the ground look like? What does the pond look like?*

What can you hear today? Tell the children to find a quiet spot, close their eyes and listen.

Ask: *Can you hear the weather? What does it sound like? Does it normally sound like this here? What is different today?*

Each time you observe the weather, repeat the above questions and ideas and use the Resource sheet to record the key elements of the weather, including the weather type, temperature, what they wore and what they did. Show the children how to read the thermometer and how to record using °C.

After you have observed the weather on at least three occasions, compare the information recorded on each day. If possible record night-time thunderstorms.

Ask: *Is there anything on the chart that is the same as another day? What is different?*

Help the children to notice patterns between the temperature and weather features, for example, were there clouds in the skies on the hottest days? Did it rain in the summer? How hot was it when we had the thunderstorm? Did the pond get deeper or shallower as the weather got hotter?

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Outdoor area: Den building – can you build a sun shade for you and a friend? Use a range of materials to create a shady space outside.

Role play: Can you get ready for a day at the beach? Dress the doll for a day at the beach, pack a beach bag, including something to provide shade and anything else the children think is important.

Role play: What do people use on the beach? Create an 'at the beach' role play area with towels, deck chairs, tuff spot full of sand, buckets, spades, etc.

Outdoor area: Shadow activities – Does your shadow change? Provide chalks to draw around a friend's shadow, and repeat at other times of the day. Talk about what they notice.

Health and safety:

Be Safe!, page 13
(avoid looking
directly at the Sun).

REFLECT AND REVIEW:

Show the children photos of them outside on two different days in summer, or two photos of your choice from the Science Photos. Ask the children to tell you about what the weather was like on each day.

EVIDENCE OF LEARNING:

Listen carefully to the children's descriptions. Do they refer to things that they did in the summer weather, what they could see, what they heard and felt? Do they describe taking the temperature and comparing the weather features on different days? Can they see patterns between weather features?

SCIENCE AT HOME:

Can they make up a 'Safety in the Sun' song to the tune of 'Twinkle Twinkle Little Star,' 'Wheels on the Bus' or another familiar tune?

WHAT CAN I GROW FOR MY DINNER?

Key words:

plant
seed
stem
leaf
root
flower
vegetable

Key information:

Detailed information for growing edible crops can be found on many gardening websites, such as www.rhs.org.uk.

Key information:

Potatoes: First earlies need to be planted in February or March to be ready for harvesting in June or July. Second earlies will be ready in July and August, while maincrop will be ready in October to December. Potatoes can be grown in pots, bin bags, special potato bags or in the ground. Carrots grow all year round and are usually ready for harvesting 12–16 weeks after sowing. Ideally grown in open ground but can be planted in grow bags for shorter varieties. Early Nantes are a good variety for this activity. Broad beans can be planted from January to May and will be ready about 4 months after planting. Can be planted in pots or open ground and taller varieties will need canes. Aquadulce is a good variety for this activity.

Health and safety:

Be Safe!, page 8 (gardening with under 5s), page 14 (safety code for gardening) and pages 18–19 (safety with plants).

ACTIVITY SUMMARY:

This activity can take up to a year, enabling children to observe the food-growing cycle at first hand. It introduces the big biology idea of plant life cycles. Broad beans, carrots and early potatoes are suggested as suitable crops for this activity as they can be planted and harvested within a school year. Other suitable fruit and vegetables include strawberries, courgettes, peas, runner beans and lettuce.

The plants should be visited repeatedly throughout the growing season so that children can notice changes and investigate factors that help the plants to grow well.

Learning intention:

Children can name the fruit and vegetables that they have grown, describe how they cared for the plants and the changes they noticed.

EYFS cross curricular links:

Literacy: Writing – How do your plants grow? Create a growth diary to record the growth of your crop. Write and illustrate the diary to show how you planted the crop and how it grew over time.

Expressive arts and design: Exploring and using media and materials – What can you print? Provide vegetable halves and different coloured paints for vegetable printing.

Understanding the world / Literacy: The world / Writing – Do you know the different parts of a potato plant? Draw and label the parts of a potato plant (seed, stem, leaf and root).

Understanding the world / Literacy: The world / Writing – How many plants do you recognise? In the outdoor learning environment use plant labels and pens to label crops, plants or trees.

Understanding the world: The world – How do you like your potatoes? Taste potatoes in a variety of different forms: raw, boiled, chipped, mashed, roasted, etc. Which is your favourite type?

RESOURCES (FOR FOCUS ACTIVITY):

- An area suitable for growing crops, such as a raised bed, local allotment society plot, plastic buckets or potato sacks
- Soil (ideally enhanced by the compost created by the worms in the wormery in Activity plan 1 'What does an Earthworm do?')
- Bamboo canes
- Seeds and/or seed potatoes
- Range of fully grown potatoes

RESOURCES (FOR INDEPENDENT ACTIVITIES):

- Items for a role play garden centre, including small usable tools (not plastic toys), small bags of soil, seed packets, buckets and watering cans
- Resource sheet (Growing vegetables)
- Books about growing food

EXPLORE:

Display the Story slideshow and play the story to the children. Ask them to talk to a friend about what Billy is doing in the story.

Ask them to identify the vegetable that Billy and his mum are growing and to tell a friend about a time when they may have eaten potatoes. Establish that potatoes can be cooked in lots of ways, such as roasted, baked, boiled, mashed or fried. Pass some potatoes of different varieties around so that the children can feel them, smell them and look closely at them.

Ask: *How long does it take to grow potatoes? Where do they grow? What helps them to grow?*

Establish that potatoes grow in the soil and that it takes four months until they are ready to eat. Talk about how long that is.

Go back to the title slide 1 and encourage the children to notice which vegetables they recognise.

Ask: *What other vegetables can you see? Which ones have you tried before? What other things that we eat are grown in fields and gardens?*

Ask if anyone in the group has experience of growing fruit and vegetables.

Key information:

Other suitable fruit and vegetables include strawberries, courgettes, peas, runner beans and lettuce. Alternatively, children in Reception classes can plant and cultivate crops that take longer to mature, such as sweetcorn, pumpkins and main crop potatoes, which can be harvested in September by the new arrivals in Reception class.

Health and safety:

Be Safe!, page 19 (hazardous edible plants).

Key information:

It may be helpful to mark on a calendar the date that you planted the crop along with other anticipated events such as leaves, flowers and fruit appearing.

Key information:

During the growing process, some things may not go according to plan. It is important to discuss with the children what has happened and why. Information about possible pests and problems linked with each type of plant can be easily found, for example, at www.rhs.org.uk.

ENQUIRE (FOR FOCUS ACTIVITY):

Tell the children that they are going to grow some vegetables to eat. Use the photocopier to enlarge any instructions on seed packets so that the children can recognise numbers, months and other key words. Help children to recognise that there will be a sequence of events for them to notice before they can harvest and eat their crop.

Take photos at least once a week, even if nothing is happening. Keep a scrapbook to show the progress of your crop.

When preparing the ground:

Ask: *Where will the crop grow best? Can we find an area that is suitable? What do we need to do to prepare the ground? What tools do we need? How do we use them safely?*

When planting the seeds:

Ask: *How deep do they need to be planted? How close together? Is there a right way up? What do we have to do to look after them now? What do you think will happen to them?*

When tending the crop:

Ask: *What has happened to the plant? Are there any leaves? What are they like? Are there flowers? What are they like? What do you think is happening under the ground? How often do we need to water the crop? Do we need to do anything else while it is growing? What do you think will happen next?*

When harvesting the crop:

Ask: *How do we know our crop is ready? What does it look like? Where is it, for example, under the ground, on the surface, higher on the plant? How many have grown on each plant? What do we need to do to pick it?*

Ensure that the crop is thoroughly washed and, if suitable, the children have the chance to eat the crop, both raw and cooked.

When preparing the crop to eat, ask further questions to prompt discussion:

Ask: *Why do we need to wash our fruit and vegetables before we eat them? Do we need to cook them? Can we eat the whole fruit or vegetable or just part of it? What is inside our fruit or vegetable?*

Show children the photographs of the seeds or seed potatoes they planted. Can they find any new seeds in their fruit or vegetables? What could they do with these?

ENQUIRE (FOR INDEPENDENT ACTIVITIES):

Role play: What do you need to buy to plant and grow your crop? Set up a garden centre using a range of gardening equipment (seed packets, trowels, spades, gardening gloves), a till and money. Can you serve the customer everything that they need to grow their own dinner?

Creative area: Can you draw or paint a picture of what your crop looks like today? This activity could be repeated over several weeks to create a growth timeline.

Tabletop activity: Can you sequence the crop from sowing to eating? Use the Resource sheet to sort the three different plants out and then sequence. There are four steps for each plant.

REFLECT AND REVIEW:

Share with the children some key images from the scrapbook you have created to show the growth of your plants. Ask the children to describe the sequence of events, naming the different parts of the plant.

EVIDENCE OF LEARNING:

Listen carefully as children describe the crop and what has happened over the growing period. Do children use vocabulary associated with the different parts of plants and the process of growing crops for food? Can they describe the growing sequence, from planting the seeds to harvesting, and what they did to help the plants grow? Was there anything that was not as they expected? Do they tell you what they did with the harvested crops to make them ready to eat?

SCIENCE AT HOME:

Can they grow a plant at home? Give each child a seed, a small plant pot and some soil in a bag. Provide some simple planting and growing instructions that are suitable for the variety you have provided. Something that grows quickly is best, for example, a bean is ideal.