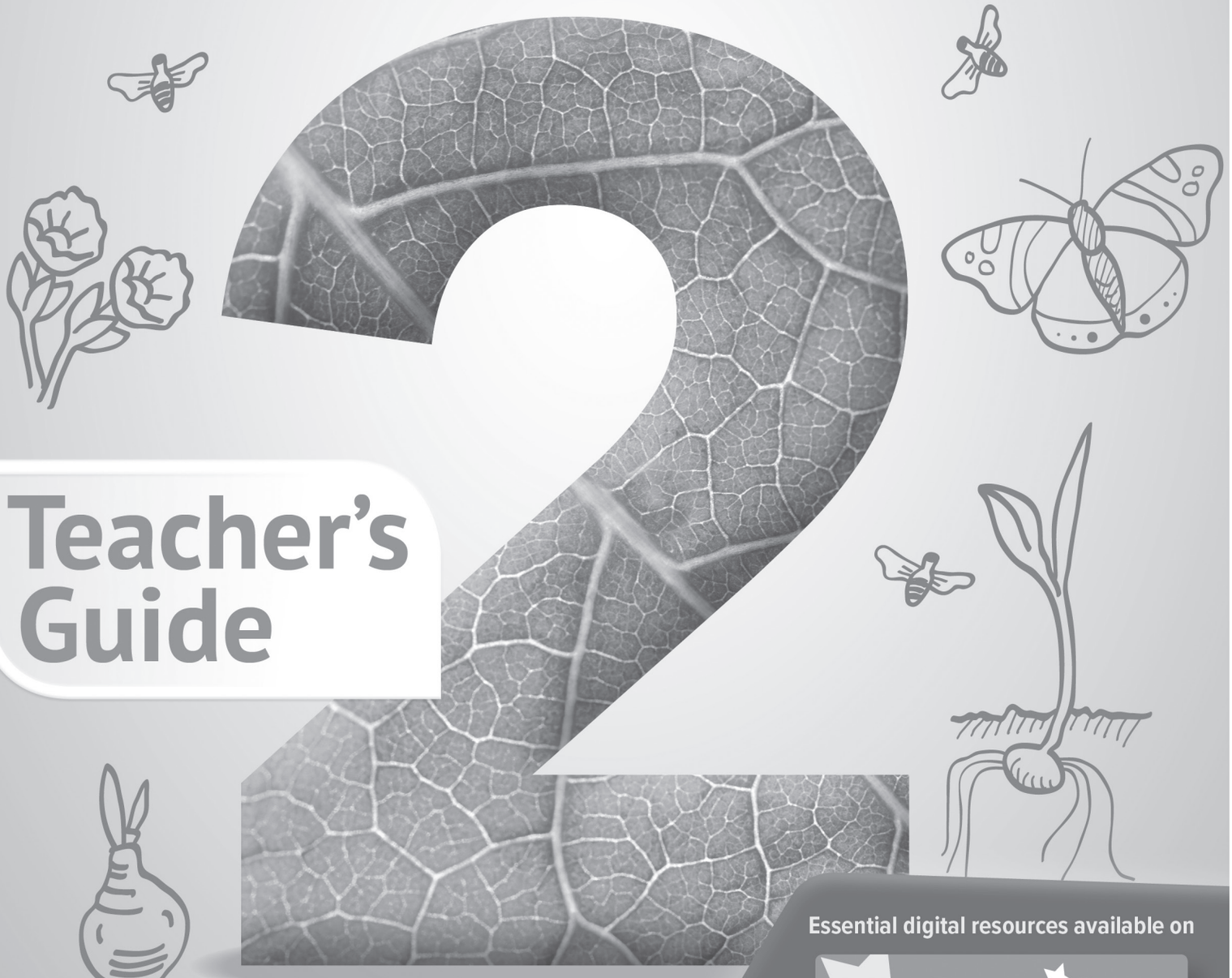
RISING STARS

SWITCHED ON Science

Second Edition



Teacher's Guide

Essential digital resources available on

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Contents

How to use Switched on Science, Second Edition

HOW THE YEAR 2 TOPICS FIT WITH THE NATIONAL CURRICULUM

In England, the primary science curriculum has been written to indicate the basic entitlement for children at Key Stage 1. *Switched on Science, Second Edition,* Year 2 ensures full coverage of the content for this year group with learning objectives at the beginning of each activity indicating the curriculum link. Children are given access to the Key Stage 1 curriculum in different contexts providing appropriate repetition and reinforcement. Units also provide contexts for learning in areas they experienced in EYFS and will meet in Key Stage 2 and are highlighted for the teacher.

What is included in the printed and online resources?

At the beginning of each topic learning outcomes for working scientifically are listed as well as subject knowledge concept statements.

The introduction for each topic also lists pupil videos which can be used to introduce new concepts and consolidate learning, and CPD videos which can be used to build confidence in teaching science. These can be accessed via the *My Rising Stars* website. Also online are editable versions of the Activity resources, teaching PowerPoints, interactive activities and visual resources to engage your pupils, as well as PDF versions of the Teacher's Guide.

Cross-curricular topic webs

We have taken a topic approach, which fits well with how most schools teach Key Stage1 science. Each year is organised into six topics, providing half a term's work. There is also a photocopiable section at the end of Year 1 and 2 Teacher's Guides that provides activities for developing the Seasonal change aspect of the curriculum over two years. The material is extensive and presents additional opportunities for children to develop and consolidate their understanding of plants, animals and the weather over the school year.

Topics have been organised in such a way that schools can either follow the suggested route or rearrange the topics to suit themselves.

At the beginning of each topic is a cross-curricular planning overview to indicate the potential of the topic across different curriculum areas.

Role play

For some topics there are suggestions for science role-play to encourage additional exploration.

Get started

There is an initial starter activity for all topics, which aims to elicit what children already know via interesting starting points.

Scientific vocabulary

As an important element of the science curriculum, and of course literacy, each topic has a list of words with which children should become familiar through listening, reading and writing on a regular basis.

To support children's understanding of key vocabulary and challenging ideas, some words have been defined so that they are more accessible.

Useful websites

You will find a list of useful websites with free resources or an interesting video that links to the topic on *My Rising Stars*. Put them in your favourites so that you can access them whenever needed.

Health and safety

Issues relating to health and safety are highlighted at the beginning of each topic and teachers are always advised to refer to their copy of:
ASE Be Safe! 4th Edition (9780863574269) available from www.ase.org.uk.

Reference is also made to **CLEAPSS** science, cleapss.org.uk, which also provides safety advice and suggestions for activities for primary schools.

You will need

Each activity includes a list of the key equipment and resources that are required to carry out the activities in each topic.

Assessment

Key Stage 1 material is written in such a way that opportunities for teacher assessment are an integral part of the activities.

At the beginning of each activity, learning objectives (L.O.) are listed and, at the end of each activity, there are suggested assessments for:

- Emerging (Em.)
- Expected (Exp.)
- Exceeded (Exc.)

In addition, there are interactive activities that can be used to assess children's understanding of each topic. These can be found on the *My Rising Stars* website.

Activity resources

The Activity resources section contains photocopiable resources for children to use. You will find diagrams for labelling, flashcards, tables, posters and instruction sheets.

Access to online resources

All teachers in your school can get access to the digital resources, which include CPD videos, pupil videos, editable resource sheets, word mats, interactive activities, planning and overview word docs on the *My Rising Stars* website. To get access, each teacher can simply register or login at www.risingstars-uk.com.

SEASONAL CHANGE

The Seasonal change section at the end of the book is an important element of the curriculum; its aim is to develop children's understanding of how their environment changes across the year, and how humans also change in what they wear, eat and do. It is appropriate that children develop their understanding of this across Key Stage 1 for the following reasons:

- Seasonal change repeats, children should have experience of comparing what happened when they were in Year 1 with Year 2. What were the similarities and differences? What is repeated?
- Placing learning about plants and animals in just one term means that children only learn about the living things in their environment during that time.
- Studying habitats regularly throughout the year allows children to observe and record change.
- Studying habitats regularly throughout the year means that they will learn about plants and animals that appear at different times of the year.
- Visiting the local environment across the year means that children get a 'second bite' at learning, e.g. observation, identifying and naming plants and animals so that by the end of Key Stage 1 children are confident and competent in naming living things.
- Recording observations of Seasonal change allows children to look back and compare similarities and differences between the season.
- Year 2 children can progress in deepening and broadening their understanding of local habitats and begin to use standard measurements in observations, e.g. temperature.

Many schools are adopting an approach where Seasonal change is developed over a year with teachers timetabling regular visits into the school grounds or local park, e.g. fortnightly for an hour. During each visit, the children carry out a range of activities including 'Adopt a tree' or habitat and record changes, e.g. photograph each visit.

Some teachers use a 'Big Book' approach where children record their observations of Seasonal change over a year in Year 1, and then the Big Book goes with the class to Year 2 so that they can look back and continue their work in Year 2.

For Year 2, the Seasonal change unit builds on and extends learning from Year 1.

TOPIC 1 Healthy Me

About this topic

Curriculum link: Year 1, Animals, including humans

SUMMARY:

In this topic, children explore the importance of exercise, diet and good hygiene, building on the Who am I? topic in Year 1.

UNITS:

1.1: Body and mind	1.2: Coughs and sneezes

ACTIVITY RESOURCES:

1.1: Healthy Me Certificate	1.2: How does it help?

ONLINE RESOURCES:

Teaching Slides (PowerPoint): Healthy Me
Interactive activity: Healthy Me
CPD video: Healthy Me
Pupil video: Healthy Me
Word mat: Healthy Me
Editable Planning: Healthy Me
Topic Test: Healthy Me

Learning objectives:

This topic covers the following learning objectives:

- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

Working scientifically:

This topic develops the following working scientifically skills:

- Observe closely.
- Perform simple tests. To Identify and classify.
- Use observations and ideas to suggest answers to questions.
- Gather and record data in answering questions.

CROSS CURRICULAR LINKS

This topic offers the following cross-curricular opportunities:

Numeracy and mathematics

- Classifying food.
- Weighing food.
- Shopping for food – handling weights and money.
- Counting for fitness.
- Amount of water children drink in a day.
- Pictographs.
- Bar graphs.

English

- Instructions for keeping healthy, e.g. cleaning teeth, washing hands.
- Pictures and sentences, e.g. 'My favourite things'.
- Creating menus, e.g. for a picnic, healthy lunch menu.
- Keeping a food and fitness diary.
- Writing a script for a video.
- Poetry, e.g. for cleaning teeth, washing hands etc.
- Give reasons for opinions about whether some foods are healthier than others.
- Listen to and read work from others and ask questions, make positive suggestions.
- Read
  - *What Makes You Cough, Sneeze, Burp, Hiccup, Blink, Yawn, Sweat, and Shiver?* by Jean Stangl
  - *The Whooping Cough Germ that Became a Hero* by Dr Richard G. Macdonald.

Geography

- Investigate playground games around the country.
- Design posters for keeping healthy.
- Make/use maps of places to visit locally for exercise, e.g. parks, swimming pools.

Computing / ICT

- Create a fitness or hygiene video. Watch and comment on hygiene videos created by other children.
- Photograph fitness poses.
- Use Paint and Draw programs to create images of different foods.
- Discuss how technology affects us, e.g. watch TV, play a video game or play outside?
- Discuss online safety and safe use of technology.
- Email link with another school doing the same topic.

Music

- Make a playlist of 'music to keep fit to'.
- Make a playlist of music that makes you relax, happy.
- Play rhythms for skipping and working out.
- Compose and perform rap style hygiene songs.

History

- Research diseases from the past, e.g. plague.
- Learn songs and rhymes, e.g. 'Ring a Ring a Roses', and discuss their origins and meaning. Others might include: 'Dr Foster went to Gloucester' and 'An Apple A Day Keeps the Doctor Away'.

Art

- Draw or paint self-portraits with the theme 'healthy happy me'.
- Create seed collages.
- Create fitness collages.

PE

- Plan fitness routines.
- Practise exercising different parts of the body, and developing different skills.
- Create fitness routines.
- Create an outdoor fitness and skills centre, with:
  - Skipping ropes.
  - Racing lanes.
  - Skills area, e.g. bean bags and baskets.
  - Hoops for hula hooping.
  - Tyres for jumping in and out of.
  - Balancing items.
  - Hopscotch.
- Play 'red light green light'.
- Play 'shadow tag' and 'freeze tag'.

Role Play

- **Science laboratory**
  - Lab coats (white shirts). Goggles.
  - Pictures of scientists.
  - Pictures of people at work who are scientists.
  - Digital microscope.
  - Hand lenses.
  - Resources relating to sound, light, seeing things, taste, touch and smell.
  - Wellcome 'In the Zone' kit.
  - Stethoscope.
  - Easi-Scope™ digital microscope .
  - Pedometers.

PSED

- **Discuss topics:**
  - What makes me happy?
  - How can I help myself to be safe and happy?
  - How can I help my friends to be happy?
  - How can keeping fit help me?
  - Being part of a community.
  - Looking after each other.
  - Understanding what makes us happy.
  - How actions and words can affect how people feel.

STEAM (SCIENCE TECHNOLOGY ENGINEERING ART AND MATHS) OPPORTUNITIES

Invite into class

- Nurse – this could be a parent or someone from the local surgery to talk to children about, e.g. keeping healthy, and their job.
- Sports person or trainer to talk about keeping fit and healthy.
- A chef or nutrition expert to talk about healthy food choices.

Visit

- Opticians to find out about eye and hearing tests.
- Local sports and fitness centre to work with a trainer on new activities.
- Local greengrocer or supermarket to look at and sample fruit and vegetables.
- A pizza restaurant to make nutritious pizza.
- Chemist to find out how to stop spreading germs.

HEALTH AND SAFETY

In this topic, some activities involve food and tasting. Check for children with specific allergies.

An activity also involves using a plant spray, so make sure that the one you use does not contain any harmful substances.

When using hair gel, check for children with skin allergies.

When exercising, make sure children wear appropriate clothing and footwear.

Check the ASE's *Be Safe!* book for further advice and CLEAPSS science.cleapss.org.uk

SUBJECT KNOWLEDGE: Healthy Choices

Children need to be helped to make healthy eating choices. We can do this by teaching children that eating too much sugar, fat and salt can affect out health. Children need a balanced diet, so that, when they get older they don't have problems with joints and hearts etc. Many foods have a lot of sugar in them, however it must be hard for children to understand how much sugar they can eat a day. You could show or give children sugar cubes, then show a snack such as a bowl of ice cream and sauce and put eight sugar cubes next to it, or eight teaspoons of sugar; and an apple, with no sugar cubes. Hands on and visual clues such as this will help children to understand how much sugar is in their food, and help them make decisions. One sugar cube = one teaspoon of sugar, = approximately four grams.

SCIENTIFIC VOCABULARY: Healthy Me

It is assumed that most children know, from their EYFS Stage experience, words for food, fruit and vegetables, although they might not know how to write and spell them. You can download a Word mat of essential vocabulary for this topic from *My Rising Stars*.

exercise: moving parts of the body to become stronger and healthier

healthy: feeling well and happy

hygiene: the things we do to keep our body clean and help stop the spread of germs

germ: tiny living things we cannot see with our eyes. They can live on our bodies, and can cause disease

Key words: calm / calves / cough / exercise / feed / fitness / food / fruit / germs / happiness / health / healthy / hygiene /hygienic / muscle / needs / sneeze / stomach / thighs / vegetables

PREPARE THE CLASSROOM

Area 1: I am a scientist – role play area

In this area, you could include:

- White laboratory coats (or white shirts) for children to wear. You could limit these to, e.g., four to regulate the number of children using the area.
- Children's goggles or protective glasses to wear, to help them take on the role of a scientist.
- Easi-Scope™ digital microscope.
- Wellcome 'In the Zone' kit.
- Stethoscopes.
- Pedometers.

Area 2: Keeping healthy club (in playground)

In this area, you could include:

- Keeping healthy club bibs.
- Keeping healthy club card with stamps (to show which activities were tried out and for how long).
- Timers.
- Small equipment, e.g. bean bags for throwing.
- Bats and balls.
- New game cards (photograph and instructions).
- Skipping ropes.
- Hula hoops.
- Hopscotch on ground.
- Cones for skills, e.g. dribbling ball around.

1.1 Body and mind

GET STARTED

This topic is set in the context of working towards Activity Resource 1.1: Healthy Me Certificate which states key understanding and could be given out at a school assembly where children celebrate and share what they have learned with the rest of the school.

Show the children a certificate and explain that everyone in the class is going to work towards achieving this award. This topic focuses on the four statements that are on the children's certificate, which are:

I know what I can do to be safe and happy. (Social and Emotional Health)

I know that exercise is good for me. (Physical Health)

I know what kind of foods help me to stay healthy. (Physical Health)

I know that personal hygiene is important to keep me healthy. (Personal Hygiene)

Begin by asking the children (working in small groups) to draw around someone in the group on a large piece of paper, or using chalk on the playground outside. Once complete, tell the children to talk with the children in their group about what they do to keep healthy and what else they could do to keep healthy.

Encourage children in their discussions to think beyond exercise and food, to areas such as emotional health. E.g., things that they do that make them feel confident and happy, such as playing with friends, reading or having quiet times. Let the children annotate the body shape they have created with the ideas that they have discussed.

Once completed, the rest of the class can visit each other and the groups to think about and discuss what children have done. You might ask children to:

- comment on the work, making sure that they are kind, helpful and specific (offering a comment that might improve their work);
- take one thing from another group to think about and add to their own outline.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- What do you think would happen if you never did any exercise?
- How could you help other people in your family be healthier?
- Why do you think sleep is good for your health?

ACTIVITIES

1 WHAT MAKES ME HAPPY?

L.O. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
Keeping healthy is not just working with children about fitness, diet and hygiene, but also about supporting children in developing their understanding that having positive relationships, being happy and

YOU WILL NEED

- PowerPoint Slides 5–8 are useful to support this set of activities.

free from worry (stress) is also important. We need to take care of our body *and* our minds. Hence you might wish to link this topic to your Personal, Social and Emotional Development (PSED) work.
This first activity aims to link PSED into this topic, so that a false impression of what it means to be healthy is not given to children. This area does of course require sensitivity from the adult, and other children, towards children's feelings and personal circumstances. The focus for this activity is encouraging children to share the things that make them happy and children could decide how to communicate in different ways, such as:
'Happiness' picture book
'Happy Me' video
'These things make me happy' scrap book.
Ask children to think about what makes people happy and list their ideas so that children can choose which aspects they want to share. E.g., family, homes, hobbies, places, holidays, friends, toys and pets. You could also encourage children to share responses:

- People who are important to me.
- Things that I like about myself.
- Things that I think I do well.
- Things that I would like to get better at doing.
- Things that I like to do to cheer myself up.
- How I help myself when I am sad, angry, nervous, frustrated.
- What I like to do with my friends.
- Who I can talk with if I am sad or worried.

ASSESSMENT

Subject Knowledge

- Em. Children can describe what makes them happy.
- Exp. Children know that being happy is important to how they feel.
- Exc. Children know that they need water, food etc. and that being happy is also important to being well.

2 HOW DO WE LIKE TO KEEP FIT?

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

- Discuss with children why they think that exercise is important. Children's responses could be scribed and recorded in a big book, floor book or on a working wall.
- Ask children to bring to school anything they have about keeping fit to share with each other. To help to make sure that this activity is as inclusive as possible, encourage children to bring anything; from photographs of themselves perhaps playing on a beach, to a football kit, dance shoes, skipping rope, scooter etc.
- Once children have had the opportunity to share with classmates, ask them to think about what they have learned, e.g.:
  - What are the different ways that we can keep fit?
  - What was a surprising way of keeping fit?
  - Is there something that they would like to try? Could a friend teach them?

Use the online resources and discuss how exercise can help different parts of the body. Ask children to think about how exercise helps

YOU WILL NEED

- Keep fit materials provided by children
- PowerPoint Slides 9–10 are useful to use at this point.
- Interactive activity

ASSESSMENT

Subject Knowledge

- Em. Children begin to link exercise with being healthy.
- Exp. Children link the idea of exercise with being healthy.
- Exc. Children can say how different things e.g. skipping, helps the body.
- Each of the statements above is a positive one and does not focus on weight, to avoid young children becoming concerned about body image.

their bodies. Collect their ideas. At the end of the discussion there are four key points to pull together with the children. Exercise:

1. Keeps our hearts healthy – when we exercise we 'give our hearts a work out'.
2. Strengthens our muscles in different parts of the body.
3. Helps to keep us flexible (supple).
4. Makes us feel good.

3 HOW DOES EXERCISE HELP ME?

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Gather and record data to help in answering questions.

- Arrange a carousel of activities as part of a PE lesson. As they complete each activity, ask children to complete the record sheet (Activity Resource 1.2). Ensure that a wide range of activities are included. E.g.: jumping, running (perhaps on the spot), rolling, throwing, dribbling balls around obstacles, climbing, to match the four points mentioned in the previous activity. It would help children to complete the record sheet if each activity was numbered and named.
- As children work, ask them to think about what happens to the body when they exercise, e.g. the heart beats faster, they breathe faster, the body feels warmer. Ask which parts of the body each activity exercises.
- At the end of the session, share the results for each activity. Encourage children to think about how each exercise helped different parts of the body, which muscles were being used, if the activity helped to keep the body flexible (supple) and which ones made them feel good and why.

YOU WILL NEED

- Activity Resource 1.2
- Materials e.g. balls, cones for a range of exercises

ASSESSMENT

Subject Knowledge

- Em. Children begin to link exercise with different parts of the body.
- Exp. Children can say how different activities help parts of the body.
- Exc. Children can say how the activities affect the body.

Working Scientifically

- Em. Children are supported in observing and recording changes in their body during exercise.
- Exp. Children record observations.
- Exc. Children use data to make links between exercise and changes in their body.

4 KEEPING FIT CHALLENGE

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

- Arrange for someone, such as the Head Teacher or a teacher with responsibility for PE, to set the children a challenge which could be, e.g., to design and create one or more of the following:
  - A 'Keeping Fit at Playtime Box' with equipment and perhaps photographs to show children how to use the items during play and lunchtimes.
  - A 'Healthy Buddy Day' where children, perhaps in pairs, design some fun 'keep fit' activities, which they use with children from a younger year group, with whom they become their 'Fitness Buddy' at playtimes and lunchtimes.
  - A fitness video that children from other year groups can use.
  - A new game using small PE equipment that they could teach someone else in their class to use.

YOU WILL NEED

- Range of PE equipment for different activities

ASSESSMENT

Subject Knowledge

- Em. With support children can describe their activity and say how it helps someone to stay healthy.
- Exp. Children can say how their activities help children to keep healthy.
- Exc. Children design and talk about the impact of their activities on someone's health using scientific vocabulary.

Explain to the children that whatever they do, they must make sure that the activity helps:

1. to keep the heart healthy (give the heart a workout)
2. to strengthen muscles in different parts of the body
3. to keep the body flexible (supple)
4. the person to feel good.

Before children share what they have created with other classes, give them the opportunity to peer review. Encourage children to talk about how their activity helps with one of the four main points (see above), which parts of the body it helped, what was good about the activity, as well as offer a helpful suggestion for improvement. Then, arrange for children from other classes to use the activities. The children can create a feedback form for them to fill in.

5 SAFE CYCLISTS

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Ask children to discuss with their partners why cycling is good exercise.
- Children bring a cycling helmet to school and you could add to the collection yourself. Give children time to explore the helmets and find out as much as they can about them.
- Discuss with children what they could look for, e.g. shape, materials used, padding, whether materials are hard or soft. Ask children what they have learned about cycle helmets, e.g. shape, names of materials, why those materials are used why helmets are important to wear, and how they protect people.

YOU WILL NEED

- Selection of different cycle helmets

ASSESSMENT

Working Scientifically

- Em. Children name materials and need support to link materials with why they are used.
- Exp. Children name materials and say why they have been used.
- Exc. Children compare the different materials and why they have been used and may suggest alternatives.

6 DESIGN, MAKE AND TEST A HELMET

L.O. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Perform simple tests.

Observe closely, using simple equipment.

Use their observations and ideas to suggest answers to questions.

- Ask children to talk in pairs about falling off a bike. What do they think might happen if they did not wear a helmet whilst cycling and crashed, hitting their head? At this point you could take the opportunity to remind

YOU WILL NEED

- PowerPoint Slides 11–13
- A range of found materials to make an egg-sized bike helmet, including plastic containers, metal, cardboard, soft and padded materials such as textiles and cotton wool.

children how to make an emergency call by using PowerPoint Slide 12. Give children a hard-boiled egg to put on their bike seat and let it drop off onto the ground. What happened to the egg? What can we learn from using the egg about what might happen if we were not using helmets and fell off our bikes?

- Show children PowerPoint Slide 13 which challenges them to make a crash helmet for an 'egg cyclist' and test it on their egg.
- Children work in pairs using a range of materials to make and test their helmet.
- The children will be carrying out a comparative test, comparing the egg head before and after being dropped.
- Use the word 'test' with the children so they develop understanding of the word. Ask them to think about how they will know if their helmet design was successful. Give them the opportunity to take before and after photographs, which they can annotate and write sentences about, or video their test describing what they are doing and the result.

ASSESSMENT

Working Scientifically

- Em. Children make and test their helmet and need support to describe what happened and link to materials used.
- Exp. Children make and test their helmet and are able to link use of material to their result.
- Exc. Children make comparisons with the different materials used and suggest improvements on their test.

SWITCHED ON Science Second Edition

If someone needed an ambulance what would you do?

Make a play with your friend about ringing for an ambulance.

What would you say?

1.2 Healthy Choices

GET STARTED

Begin by asking children to think about how they feel when they are hungry. Collect their ideas and ask them why their brain makes them feel hungry? What is your brain trying to tell you? Why does your body need food and water?

You could use children's ideas as the starter for a Big Book, Working Wall or a display on Healthy Choices.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- Why do you think animals (including humans) need to eat food?
- What do you think would happen if we did not eat food?
- What do you think would happen if we only ate chocolate?

ACTIVITIES

1 WHY DO WE NEED FOOD?

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

- To start this activity put out a selection of foods for each group that they can explore using their senses, including to taste e.g. some fruits.
- Ask children to discuss the foods with their group, and talk about, e.g.:
  - Which of the foods they like / dislike?
  - Which of the foods they have never tried?
  - Which foods are very healthy and those that are less healthy?

Listen to the children's responses as you visit each group to find out what they know about food.

- Next ask children to think about why food is important to humans, give children time to discuss and then draw their ideas together.
- The aim is to focus on the idea that humans need food to:
  - live
  - grow
  - stay healthy
  - be active.
- Ask children to think about what it is like when they have not eaten for a while, e.g., at the end of the morning before lunch or when they get home from school. How do they feel? Some children might say: hungry, their stomach rumbles, tired, thirsty or they don't feel like working. Ask them to compare this with how they feel after they have had food.

YOU WILL NEED

- Selection of different foods for tasting

ASSESSMENT

Subject Knowledge

- Em. Children know that they need food to stay alive.
- Exp. Children can say that they need food to live, grow, be active and stay healthy.
- Exc. Children link the importance of choosing healthy food to live, grow, be active and stay healthy.

2 SORTING FOODS

L.O. Identify and classify. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

- In this activity use food rather than pictures, so that children can handle the food and some children could look at the labels to find out how much refined sugar there is in some foods. Create a collection of fruit, vegetables and processed food. Give children time to look at the food and talk about what they know about the food. Some children might look at the sugar content on foods, Alternatively you could place a sticker on to indicate sugar content.
- Ask children to sort the foods, in the first instance encourage them to use their own criteria which provide some insight to what they already know. They might sort food into packaged, fruit, vegetables, or packaged / not packaged.
- Take the opportunity to ask groups to share their criteria for sorting / classifying and then ask the children to sort the food into healthy / less healthy, then lots of sugar, not a lot of sugar.
- Once again share ideas between groups and help children to develop their understanding of foods that are healthier than others.
- Show children a can of cola, then put 12 sugar cubes or a pile of 12 teaspoons of sugar by the side of it. Ask children what they think and help them to compare one can of cola with the idea that children should have no more than four or five sugar cubes a day.

YOU WILL NEED

- Selection of foods, or pictures for sorting
- Sugar or sugar cubes

ASSESSMENT

Subject Knowledge

- Em. Children can say that they need food to live, grow, be active and stay healthy and sort foods using given criteria.
- Exp. Children can sort foods into their own criteria, and know that they need food to live, grow, be active and stay healthy.
- Exc. Children can identify and classify good into groups including those that are healthy food.

Working Scientifically

- Em. Children require support to name and sort foods.
- Exp. Children identify the names of different foods and sort them.
- Exc. Children identify and classify foods according to their own choices.

3 FAVOURITE SNACK

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Gather and record data to help in answering questions.

- You could use PowerPoint Slide 14 as a starting point for discussing healthy and less healthy foods. As part of developing children's understanding of healthy eating talk to children about eating between meals, or 'snacking'. What do children snack on? Which is their favourite snack?
- Leave out pictures of different snacks or the snacks themselves, and an outline of a pictograph. The children choose their favourite snack and colour or place a sticker on the pictograph.

YOU WILL NEED

- PowerPoint Slide 14
- Photos or examples of favourite snacks
- Sticky notes

ASSESSMENT

Subject Knowledge

- Em. Children require support to discuss whether snacks are healthy.
- Exp. Children can talk about which snacks are healthy.
- Exc. Children talk about the idea that they should have healthy snacks more often.

- They can do this at any time during the day but only two children at a time. Then, once complete, it can be used as a focal point for discussion about the least and most favourite snacks. This approach encourages independence and can be used as assessment of graphing skills.

Working Scientifically

- Em. With support children place their personal data on the pictograph.
- Exp. Children follow instructions on how to place their personal data on the pictograph.
- Exc. Children independently use the data use it to ask and answer their own questions.

4 SWAPPING SNACKS

L.O. Gathering and recording data to help in answering questions. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

- Use PowerPoint Slide 15 to find out which vegetables children can identify and name, which ones they eat with meals, and if they eat any as snacks.
- Show children a range of snacks. They could include those from the graph in Activity 3. You could return to the sugar activity, and place the equivalent sugar cubes next to sweets and biscuits, and salt next to crisps, to help remind them that children should only have a certain amount of sugar per day. Show children different foods and ask them to decide which ones would be a healthy swap. You could use PowerPoint Slides 15–18 at this point.
- Introduce children to alternative snacks to biscuits, crisps and sweets by making a fruit kebab. Prepare fruit by cutting it into chunks, e.g. melon, apple, pineapple, strawberries etc. If children are unsure of a fruit let them taste if first before putting it onto their wooden skewer. You could ask the school cook to come and teach them how to do this and also make sure that they follow basic hygiene rules.
- As children choose their fruit ask them to name each one and say why a fruit kebab is a better snack than sweets, crisps or biscuits.

YOU WILL NEED

- PowerPoint Slides 15–18
- A selection of snacks including healthy and less healthy
- Fruit and skewers for making fruit kebabs

ASSESSMENT

Subject Knowledge

- Em. With support children can say why a fruit kebab is a healthy snack.
- Exp. Children say why fruit kebabs are a healthy snack.
- Exc. Children can compare the effect of fruit kebab and ‘other snacks’ on their health.

Working Scientifically

- Em. Children require support to read a graph and talk about the data.
- Exp. Children read a bar graph and answer questions using the data.
- Exc. Children make draw conclusions using the data.

1.3 Coughs and sneezes

GET STARTED

The old saying 'Coughs and sneezes spread diseases' really is true, and children will have been told many times to put their hands in front of their mouths when they cough or sneeze. Cold and flu germs can survive outside the body on surfaces from a few minutes to up to two days! Worst are hard surfaces because germs last longer there than on, e.g., fabric. Sneezing, coughing and touching objects can spread the germs.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- Why do adults say 'put your hand in front of your mouth when you sneeze or cough?'
- What do you think is in a sneeze or a cough?
- What could you do to try not to catch a cold?

ACTIVITIES

1 SPRAYING GERMS

L.O. Perform simple tests. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

- Show children PowerPoint Slide 19 and use it a starter for this activity. Discuss the slide and the issues of being hygienic and also how germs are spread. You can also use Slides 20 and 21 to support this activity.
- Give the children a plant water spray (they are very cheap and one spray between three or four children is great – you can have a mass sneeze!) Working out in school grounds, let children observe what happens when they 'sneeze'. Use the word 'sneeze' rather than 'spray', since the spray is being used to model the sneeze.
- Be prepared to have buckets of water so children can refill. Encourage them to make appropriate noises (e.g. sneezes). Ask children to think about and share their observations. Ask them how they might prove how far a sneeze travels.
- Children might suggest:
  - Putting paint in the spray and 'sneezing' onto a wall or a piece of paper to show where the 'sneeze' goes.
  - One child wearing a waterproof tabard to be 'sneezed' on and children measure how far away a 'sneeze' travels and still can infect the person.
- At the end ask children to talk in their groups and decide what three important things they have learned from this activity about sneezing.

YOU WILL NEED

- Plant water sprays
- PowerPoint Slides 19–21

ASSESSMENT

Subject Knowledge

- Em. Children know that they should use a tissue when coughing or sneezing.
- Exp. Children can say why they need to use a tissue when coughing or sneezing.
- Exc. Children use the results from the activity to help explain how germs spread and what they can do to prevent germs being spread.

Working Scientifically

- Em. Children carry out a comparative test using plant sprays but require support to link to the idea of sneezing.
- Exp. Children link results of their tests to the idea of sneezes and germs.
- Exc. Children know that they are modelling 'sneezes' and make links with the idea of germs travelling and hygiene.

2 SNOT TRAIL

L.O. Perform simple tests. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

- This activity links to the one before. Children put their hands in front of their mouths to stop the sneeze spreading. But then germs are on their hands and transferred to anything they touch. This activity develops children's understanding of how germs are spread using hair gel.
- Use cheap green hair gel or glitter gel. Children love that the gel represents snot. Check for children with skin allergies. They may need gloves.
- One child pretends to sneeze and is given a handful of 'snot'. S/he then shakes hands with or touches as many things as possible in 10 seconds. Ask children – if putting your hand in front of your mouth does not stop the spread of germs, what would work? List ideas.
- Most children will suggest hand washing. Remind them of the best way to wash hands and give children opportunities to practise washing hands correctly. Use PowerPoint Slides 20–24

YOU WILL NEED

- PowerPoint Slides 20–24
- Green hair gel or similar
- Activity Resource 1.1

ASSESSMENT

Subject Knowledge

- Em. Children know that they should wash their hands; they might link this to keeping clean.
- Exp. Children can say why they need to wash their hands to stop germs spreading.
- Exc. Children use the results from the activity to help explain how germs spread and what they can do to prevent germs being spread.

Working Scientifically

- Em. Children carry out a simple test but require support to link to the idea hygiene.
- Exp. Children link results of their tests to the idea of sneezes and germs.
- Exc. Children know that they are modelling 'sneezes' and make links with the idea of germs travelling and hygiene.

HEALTHY ME CERTIFICATE CELEBRATION (ACTIVITY RESOURCE 1.1)

Ask children how they could communicate what they have learned to other children in the school. Perhaps they could share their learning in a school assembly. They might write and perform a short play, perform a fitness routine, perform a poem or talk about how to stay healthy and happy.

TOPIC 2 Materials Monster

About this topic

Curriculum link: Year 2, Uses of everyday materials

SUMMARY:

This topic explores the properties and uses of everyday materials, set in the context of meeting, talking to and feeding the Materials Monster.

UNITS:

2.1 Meet the Material Monster
2.2 Working with materials

ACTIVITY RESOURCES:

2.1: Monster Materials 2.2: Question Stems
2.3: Materials Monster Car
2.4: Materials Monster House

ONLINE RESOURCES:

Teaching Slides (PowerPoint): Materials Monster
Interactive activity: Materials Monster
CPD video: Materials Monster
Pupil video: Materials Monster
Word mat: Materials Monster
Editable Planning: Materials Monster
Topic Test: Materials Monster

Learning objectives:

This topic covers the following learning objectives:

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working scientifically skills:

This topic develops the following working scientifically skills:

- Observe closely.
- Perform simple tests.
- Identify and classify.
- Use observations and ideas to suggest answers to questions.
- Gather and record data to help in answering questions.

CROSS CURRICULAR LINKS

English

This topic offers the following cross-curricular opportunities:

- Learn names of materials.
- Create a monster vocabulary display, e.g. enormous, monstrous, massive, mammoth.
- Use non-fiction books to find information about different materials and recycling.
- Storytelling: How did Materials Monster arrive? Where did he come from? What does he eat? Where does he live?
- Create a play script about Materials Monster.
- Ask and find the answers to their own questions about different materials.
- Consider the opinions of others, e.g. should we recycle?
- Write poems about materials.
- Read:
  - *The Slimy Book* by Babette Cole
  - *Biscuit Bear* by Mini Grey
  - *Dinosaurs and all that Rubbish* by Michael Foreman.

Numeracy and mathematics

- Shape, e.g. packaging, brick patterns.
- Size and volume.
- Tessellations.

Music

- Use recyclable materials to create sound makers.
- Make Materials Monster sounds.

Drama and dance

- Meeting Materials Monster.
- Being Materials Monster, e.g. eating materials, adding materials to its body.

D & T

- Recycling materials to make useful objects, e.g. pen pots.

Art

- Create a Materials Monster collage.
- Patterns using objects such as plastic
- bottle tops.
- Weaving with different materials, e.g. plastic, paper, fabric.
- Learn about different craft, e.g. felting, weaving, pottery.
- Use a range of materials creatively to design and make products e.g. recycling materials.

Geography

- Origins of materials, e.g. paper from trees (forests), clay from quarries.

History

- History of materials, e.g. when glass was first used, when was plastic discovered, wool through the ages.
- Which materials do we use now that parents and grandparents did not have?
- Create a time line of when materials were first used, e.g. rubber, plastic.

Computing / ICT

- Use a tablet to take photographs.
- Use a tablet for QR codes to spot and name materials, to find materials and read information about them.
- Use a digital microscope to view different materials.
- Use a graphics programme to design a Materials Monster.
- Use the web to research how materials such as glass, pottery are made.

Role play

- Science Laboratory Recycling Centre.
- Recycling tubs.
- Collection of objects / materials to recycle.
- Recycling posters.
- Making new things from recycled materials.

STEAM (SCIENCE TECHNOLOGY ENGINEERING ART AND MATHS) OPPORTUNITIES

Invite into class

- Local builder to show children different materials used in building.
- Invite local artist or parent to make recycled paper.
- Invite local artist or parent to weave using recyclable materials, including a large weaving project in the school grounds.

Visit

- School grounds or local streets to see which materials and how they are used.
- Park, building site, housing estate, farm to look at how different materials are used.

HEALTH AND SAFETY

When using recyclable materials, make sure that they are clean and have no sharp edges.

Check safety documents on the safe handling of glass objects in the classroom.

For further advice please check the ASE's *Be Safe!* book and CLEAPSS science.cleapss.org.uk

SCIENTIFIC VOCABULARY: Materials

It is assumed that most children know, from their EYFS Stage experience, words such as wood, metal and glass, although they might not know how to write and spell them. You can download a Word Mat of essential vocabulary for this topic from *My Rising Stars*.

material: something that an object is or can be made from, e.g. a saucepan can be made from metal

properties: the characteristics of a material, e.g. glass can be transparent. transparent is the property

key words: absorbent / bend / brittle / bumpy / card / change / concrete / dull / elastic / fabric / flexible / glass / hard / man-made materials / metal / natural materials / opaque / paper / plastic / recycle / rough / rubber / shiny / smooth

PREPARE THE CLASSROOM

I am a Scientist

- White laboratory coats (or white shirts) for children to wear; you could limit these to, e.g., four to regulate the number of children using the area.
- Children's goggles or protective glasses to wear to help them take on the role of a scientist.
- Range of packaging
- Glues, sellotape etc. to make new objects from found materials.
- Range of objects made from different materials.
- Hand lenses
- Computer microscope

2.1 Meet the Materials Monster

GET STARTED

Set this topic in the context of the children meeting and befriending the Materials Monster. You could create a large display or a 3D monster both made from recycled materials, or have a Materials Monster puppet and introduce the children to the character. Tell the children that the Materials Monster lives on different kinds of materials, eats them, uses them and likes to know everything about materials.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- What materials do you wear?
- Where do you think the materials come from?
- Which is your favourite material? Why?

ACTIVITIES

1 FEEDING TIME

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

- The purpose of this activity is to find out what children already know about materials, such as can they sort them according to the name of each material and which properties of materials do children recognise. Use PowerPoint Slide 5 to start discussions.
- On each table, put out a wide range of objects made from different materials for the children to explore. Tell the children to explore the materials, to think about what they already know about different materials, and ask them what else they can find out. E.g., are they hard, soft, transparent and what are they used for?
- Provide children with a word mat or a working wall with vocabulary so that they have prompts and spellings. You could use PowerPoint Slide 3.
- Ask children to 'feed' the Materials Monster as many different words as they can about materials. The more the children feed the Materials Monster the happier it will be. You could give children blank cards to write words and name different materials, such as rock, pottery, wood, fabric, metal, plastic, glass. Then ask the children to write anything that they know about materials, such as some materials stretch, are flexible, are hard etc. Do make sure that the children sign their card, so that when you collect them you can track each child's responses.

YOU WILL NEED

- Wide range of objects made from different materials
- Word mat
- PowerPoint Slides 3–5

ASSESSMENT

Subject Knowledge

- Em. Children sort according to the object and not the material.
- Exp. Children identify and sort materials and say why some materials are used.
- Exc. Children identify each material and link properties with use.

Working Scientifically

- Em. Children can sort materials according to basic criteria e.g. touch, colour.
- Exp. Children identify and sort materials according to properties.
- Exc. Children identify and classify each material and link properties with use.

2 SORTING FOR MATERIALS MONSTER

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

- In this activity children sort a range of objects for the Materials Monster according to the materials that they are made from. Include in the collection:
  - cardboard
  - fabric
  - paper
  - pottery rocks wood glass plastic.
- Include the same kind of objects, e.g. mugs, rulers, spoons, that are made from different materials, to support children's understanding that the same object can be made from different materials.
- Give children labels such as plastic, brick, paper so that they can label their sets.
- When children have created their sets they could then be given postcards or sticky notes so that they can say why the object is made from that material e.g. cup is made from plastic because it can hold water or is waterproof.
- If children need to be reminded of properties that they learned in Year 1 you could use PowerPoint Slides 6–10.
- Children could then 'post' these into the mouth of the Materials Monster. Once again do make sure that the children sign their work, so that when you collect them you can track each child's responses.
- To help children to learn to spell words use PowerPoint Slide 18 and get children to collect, write and spell correctly the material and find words that rhyme.

YOU WILL NEED

- PowerPoint Slides 6–10
- Objects made from a range of different materials
- Cards or sticky notes

ASSESSMENT

Subject Knowledge

- Em. Children name some materials
- Exp. Children name materials and say why some materials are used.
- Exc. Children choose their own materials from around the classroom according to specific materials and /or properties

Working Scientifically

- Em. Children sort materials into given criteria.
- Exp. Children name and sort materials.
- Exc. Children make their own choices and sort according to properties

3 TALK TO MATERIALS MONSTER

L.O. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Observe closely, using simple equipment.

- Give different groups of children a specific set of materials, e.g. metal, ceramics, wood, plastic and ask them to use their senses (except taste) to find out about that material. Ask them to find out as much as they can using their senses:
  - Is it cold or warm to touch?
  - Is it flexible?
  - Is it hard or soft?
  - Does it make a ringing sound when tapped (e.g. metals and pottery)?
  - Is it rough or smooth?
  - Can it be squashed, stretched or twisted? Is it shiny or dull?
- Children could complete the record sheet (Activity Resource 2.1) to record their explorations.
- When children have completed this activity bring the class together to help the children draw some conclusions about what different materials are like.
- Ask children to make their own rules about how to tell one material from another. E.g.:
  - Metal is cold to the touch, hard, shiny and makes a ringing sound when tapped.
- Pottery is less cold to touch, hard, can be shiny or dull and also makes a ringing sound when touched.
- Plastic is less cold to touch, can be flexible or hard and does not make a ringing sound when tapped.
- Fabric is usually less cold to touch, flexible, does not make a ringing sound when touched and can be soft.
- Wood is less cold to touch, does not make a ringing sound when touched, is hard and is not shiny (unless it has been polished).
- Ask children to think about how they can tell the Materials Monster about each of the different materials. E.g. they could make a mini-Materials Monster book or create a display of the objects with captions about the materials.
- You could use PowerPoint Slides 11 and 12 as the starting point for a home school activity where children work with someone at home to find out about where the material wool comes from, its properties and what it is used for.

YOU WILL NEED

- Range of materials such as fabric, paper, plastic, wood, metal ceramics
- Activity Resource 2.1
- PowerPoint Slides 6–12

ASSESSMENT

Subject Knowledge

- Em. Children require support to observe and record.
- Exp. Children observe and complete the recording sheet.
- Exc. Children make comparisons between different materials.

Working Scientifically

- Em. Children sort materials into given criteria.
- Exp. Children name and sort materials.
- Exc. Children make their own choices and sort according to properties.

4 TAKING MATERIALS MONSTER OUTSIDE

L.O. Identify and classify. Observe closely, using simple equipment.

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- You and the children could take your Materials Monster puppet on a Materials Trail outside in the school grounds or the local environment. Explain to the children that Materials Monster wants to know what kind of materials are used outside the classroom and if there are any new materials.
- Prior to going out with the children, do make sure that if needed, they have word prompts to remind them what kind of materials they are looking for and also a list of properties. These could be in the form of a paper wristband. You could also give each child a photocopy of Activity Resource 2.2 (Question Stems) to prompt questioning.
- Before going out you could show children PowerPoint Slide 13 showing the different materials used in building a house.
- Challenge the children to think of a way that they could record the materials that they find so that they can share what they have found out with Materials Monster.
  - Children might suggest that they:
  - Take photographs using a digital camera, a smart phone or a tablet
  - Use a video camera
  - Use a grid
  - Use an Easi-Speak™ microphone.
- Back in the classroom, share what children have found, display any photographs etc. Ask the children to share what they have found out with another group and talk about the most common materials used, e.g. bricks, plastic, wood, etc. Discuss with children any common materials, particularly
- if they are specific to the local region, e.g. sandstone, slate.

YOU WILL NEED

- Activity Resource 2.2
- Cameras or other technology to record materials
- PowerPoint Slide 13

ASSESSMENT

Subject Knowledge

- Em. Children require support to identify different materials they may need help to say why they are used.
- Exp. Children identify and name different materials and can say why they are used.
- Exc. Children can suggest alternative materials to replace those being used e.g. wooden fence changed to a metal fence, paper cup for a plastic cup.

Working Scientifically

- Em. Children have help at home to identify what objects are made from.
- Exp. Children identify and classify materials and record their observations.
- Exc. Children might use the internet to find out additional materials used in the home e.g. Velcro, Teflon.

5 TAKE THE MATERIALS MONSTER HOME

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

- Use PowerPoint Slide 14 to introduce the Materials Monster again.
- Tell the children that they are going to take the Materials Monster home and feed it lots of different materials. Children could use Activity Resources 2.3 and 2.4 for this activity. When children bring this sheet back from their home, ask them to share what they have found with the rest of their group. What have they learned about materials that are used in the home?
- E.g.:
  - What kind of materials are used in the kitchen? Why? What properties do they have?
  - Which materials did you find in your bedroom? Why do you think those materials are used?
  - What are the materials like in your bedroom? How many different materials did you find? Why do you think those materials are used in your bedroom?

YOU WILL NEED

- PowerPoint Slide 14
- Activity resources 2.3 and 2.4

ASSESSMENT

Subject Knowledge

- Em. Children are given help at home to complete the activity.
- Exp Children complete the activity independently.
- Exc. Children choose other parts of their home to apply their understanding and create their own materials picture.

Working Scientifically

- Em. Children have help at home to identify what objects are made from.
- Exp. Children identify and classify materials and record their observations.
- Exc. Children identify materials and link to subject knowledge about properties of materials.

2.2 Working with materials

GET STARTED

Show children a range of objects made from material with special properties (e.g. Teflon frying pan, leggings made with Lycra), and show why they are special (e.g. crack an egg into the frying pan and show how it slides over the surface).
Tell children that they are going to design a new material for the Materials Monster: material that does not already exist.

- What would be special about their material?
- What would it look like?
- What kind of properties would it have?
- What could it be used for?

When they have thought about their material they could design a poster that will tell the Materials Monster and children from their own class, as well as others in the school, all about their new invention.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- Which material do you think is the most useful?
- What do you think would happen if all the hard materials became soft materials?
- What if you could invent a new material, what would you make and why?

1 SILLY MATERIALS MONSTER BOOK

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

- In this activity children make a book of pictures or drawings where the objects are made from silly materials, such as a chocolate tea pot, or newspaper wellington boots.
- Show children PowerPoint Slide 15, which has a picture of a chocolate teapot. Ask children why it is silly to make the teapot out of chocolate and which materials would have been more suitable.
- You could ask them to suggest silly materials for, a football, pillow, duvet, umbrella, car etc.
- Using this approach children have to think about the original material, understand its properties and then replace that material with something that is totally inappropriate.

Children will have great fun doing this. Create a book or display that children can add to at any time. This is a fun assessment point because, if the child can explain why the material is inappropriate they understand the properties required for the original object.

YOU WILL NEED

- PowerPoint Slide 15

ASSESSMENT

Subject Knowledge

- Em. Children require support in suggesting 'silly' alternatives.
- Exp. Children identify and say why the materials they have chosen are unsuitable.
- Exc. Children apply their understanding of materials to explain why the materials they have chosen are unsuitable and suggest suitable alternatives.

2 SQUASH, BEND, TWIST, STRETCH

Perform a simple test. L.O Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

- Offer children a collection of objects made from materials that can be squashed, squeezed, twisted and bent, such as,
  - cotton wool pipe cleaners dough socks paper card sponges tights fabric wire wool plastic
- Discuss with children what they already know about materials, e.g. the names of materials, the properties e.g. transparent, translucent, waterproof and introduce the idea that some materials can be squashed, bent, twisted and stretched. Explain that they are going to find out which materials on their table can be squashed etc. The key learning here is for children to:
  - know what the words mean
  - be able to say which materials (not the object) can be squashed etc.
  - to know that some materials can be both bent and twisted
  - to know that some materials e.g. metal can be bent and sometimes be rigid and not be able to be bent.
- You could place the key words on each table so that children could use them for identifying and classifying materials according to these properties. Children could identify the material the object is made from and then say whether it can be squashed etc. Ask children to think about how they could record this e.g. take a photograph of or draw the object, then annotate with the name of the material and whether it can be squashed etc.
- Topic 4 contains more activities around changing materials by squashing, bending, twisting and stretching.

YOU WILL NEED

- Selection of materials or objects that can squashed, twisted etc.

ASSESSMENT

Subject Knowledge

- Em. Children require support in differentiating between the object being, e.g., bent and the material.
- Exp. Children know that it is the material that they can squash etc.
- Exc. Children find objects to prove their own ideas e.g. plastic can be squashed and rigid depending on the kind of plastic.

Working Scientifically

- Em. Children require help to carry out their test and link to key words.
- Exp. Children test objects according to bend, squash etc.
- Exc. Children use their tests to make comparison between different materials.

Elastic materials are able to stretch then go back to their original shape.

SWITCHED ON Science Second Edition

Elastic bands

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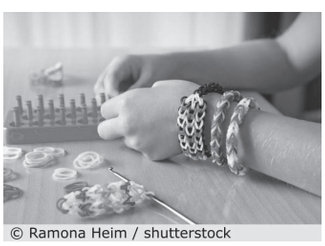
What can you find in your classroom that is elastic?

Loom bands



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3 MAKE YOUR OWN MATERIALS MONSTER

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

- Finally, children make their own Materials Monster using recycled materials. Explain to the children that they should use as many different materials as possible to make their Materials Monster.
- They should also think about the properties of the materials. E.g., where, would they want to use materials that are transparent, opaque, translucent? Where would you use materials that are soft, rough or flexible? You could use PowerPoint Slide 15 as a starting point for discussion.
- Give children the opportunity to design their Materials Monster first and annotate their design with labels and captions as well as samples of the materials stuck onto their design.
- When children have constructed their Materials Monster, ask them to compare it with their design. What was different from their original design and why did they change their idea?
- Give children the opportunity to look at each other's model and make comments, about, e.g.:
  - What did you like about the Materials Monster?
  - How many different kinds of materials did your friend use?
  - Could they have improved anything? How?
- Allow each child to take a photograph of their Materials Monster to go alongside their design work. The children then think about what they could have improved and how.

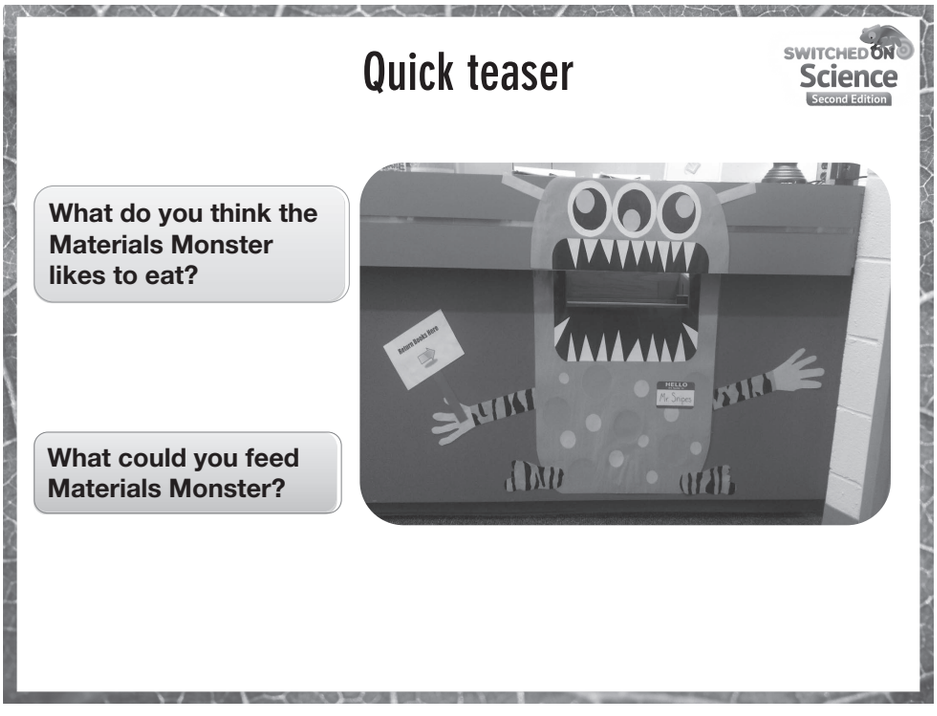
YOU WILL NEED

- Wide range of materials with different properties

ASSESSMENT

Working Scientifically

- Em. Children require help to use appropriate scientific language to explain choices of materials.
- Exp. Children are able to say why the materials used for their own materials monster and their friends.
- Exc. Children apply their knowledge and understanding to offer alternatives to the materials used.



TOPIC 3 Squash, Bend, Twist and Stretch

About this topic

SUMMARY:

In this unit, children explore how the shapes of objects can be changed by squashing, bending, twisting and stretching. In doing this they raise questions, perform simple tests, and gather and record data.

UNITS

3.1: Squash, squeeze, bend and twist!

ACTIVITY RESOURCES:

3.1: Flying Mouse 3.2: Straw Rocket

ONLINE RESOURCES:

Teaching Slides (PowerPoint): Squash, Bend, Twist and Stretch
Interactive activity: Squash, Bend, Twist and Stretch
CPD video: Squash, Bend, Twist and Stretch
Pupil video: Squash, Bend, Twist and Stretch
Word mat: Squash, Bend, Twist and Stretch
Editable Planning: Squash, Bend, Twist and Stretch
Topic Test: Squash, Bend, Twist and Stretch

Learning objectives:

This topic covers the following learning objectives:

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

Working scientifically skills:

This topic develops the following working scientifically skills:

- Observe closely.
- Perform simple tests.
- Identify and classify.
- Use observations and ideas to suggest answers to questions.
- Gather and record data to help in answering questions.

CROSS CURRICULAR LINKS

This topic offers the following cross-curricular opportunities:

English

- New words: Tenses, squash, squashing, squashed
- Following and/or writing instructions to make a mouse rocket.
- Predict what will happen next in a science activity.
- Write up a real event, e.g. testing rocket mice
- Reading non-fiction to research information about objects that can be squashed etc..
- Read: *Duck on a Bike by David Shannon.*

Numeracy and Mathematics

- Estimating and comparing how much something can be stretched.
- Measuring distance that something has been stretched using standard measures.
- 2D and 3D shapes, e.g. rocket mice

Art

- Make collages using materials that can be squashed, twisted, bent and stretched.
- Use dough or clay to make a sculpture using squash, twist, bend and stretch.

PE

- Different kinds of movement.
- Moving different parts of the body.
- Improving movement skills, from gross motor to fine motor movements.

Role Play

- Science laboratory – sorting, testing,
- Sort and test different cars or moving toys.

- How does a scooter work? Look at a bicycle – name the different parts, find different kinds of materials.
- Take apart a moving toy – which parts help to make it move?

D & T

- Design different rocket mice and test them.
- Design and make something that uses different materials that can be bent, squashed, stretched or twisted.
- Follow a bread recipe to make a mini loaf twist.

Computing / ICT

- Use a tablet to take photographs.
- Use a tablet for QR codes to find object that are squashed, twisted, bent or stretched.
- Use a digital microscope to view materials.

STEAM (SCIENCE TECHNOLOGY ENGINEERING ART AND MATHS) OPPORTUNITIES

Invite into class

- Primary Engineers or a STEM ambassador
- Baker to make bread or pizza dough with class
- Gymnast (maybe child from another class, to perform and show how body moves and bends)

Visit

- A local car mechanic and garage
- A local park to use swings, slides etc.
- Local bakery where bread is baked on site

SCIENTIFIC VOCABULARY: Move It

It is assumed that most children know, from their EYFS Stage experience, words such as squash, squeeze and direction, although they might not know how to write and spell them. You can download a Word Mat of essential vocabulary for this topic from *My Rising Stars*.

bend: to force something that is straight into a curve or an angle

squash: to push something together so that it changes shape, e.g., becomes flat

stretch: to pull something and make it longer

twist – to turn something that is still or standing

Key words: bend / dough / elastic / f / pull / push / squash / squeeze / stretch

PREPARE THE CLASSROOM

I am a scientist

- White laboratory coats (white shirts) for children to wear. You could limit these to, e.g., four to regulate the number of children using the area.
- Children's goggles or protective glasses to wear to help them take on the role of a scientist.
- Collection of wind-up toys
- Collection of toys that move
- Objects that can have their shape changed, e.g. sponges
- Materials that can have their shape changed, e.g. dough, silly putty
- Paper, card and scissors
- Camera

3.1 Squash, squeeze, bend and twist!

GET STARTED

In this first set of activities, one of the main aims is to focus on supporting children to:

- raise their own questions
- perform simple tests to answer those questions gather and record data to help answer the questions.

Children will also need support in observing, describing and explaining what happens, in order to answer their original question. Supporting children to observe and describe step-by-step what they did and make links between cause and effect in their thinking, will help them in the quality of their descriptions and to move towards beginning to explain what happened.

Then, using this new knowledge they can ask further questions and explore their new ideas.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- What do you think would happen if everything was rigid and nothing could be bent, squashed or squeezed?
- What would your school be like if everything in it was flexible?

ACTIVITIES

1 FLEXIBLE ME

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

- A PE lesson would be an excellent starter to find out how confident children are with the words, squash, bend, twist and stretch. In using their bodies children have to think about what they are doing and therefore experience the words, which should make it easier for all children. Begin by asking children to squash themselves into a small ball, then to stretch, e.g., into a star shape or as tall as they can make themselves. Follow by asking children to twist their bodies and to bend, e.g. their knees, their elbows etc. and their whole body.
- Children could work in pairs to create a sequence and show other children who, as the children change their body shape, call out squash, stretch, bend or twist.
- Children will also enjoy putting these movements to music.

ASSESSMENT

Subject Knowledge

- Em. Children will require some support in knowing how the words link to moving their body.
- Exp. Children know the words and create body movements to match.
- Exc. Children are creative in the ways they use squash, stretch, bend and twist.

2 SQUASH ME, BEND ME, TWIST ME, STRETCH ME

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

This could be offered as a carousel of activities, where the children visit different areas or tables with a range of resources and one of these commands:

- Squash me: Half-filled balloons, Blu Tac, bath sponges, cushions, Flump sweets, playdough
- Bend me: Pipe cleaners, florist wire
- Twist me: Fabric, rope, playdough
- Stretch me: Elastic, fabric, playdough, socks, tights

Children visit each of the areas and carry out the command on the table, e.g. Squash me, Bend me, Twist me, Stretch me.
Ask children to think about what they have to do in order to squash, bend, twist or stretch something. Do they have to use a push or a pull (force)? So with squashing, children may say they need to use a push (force), whereas when they stretch something they need to use a pull (force).
Ask children to think about the material that the shape is made from, is it a material, like playdough that can be easily squashed where wood is hard to squash?

YOU WILL NEED

- See list of possible materials in activity instructions

ASSESSMENT

Subject Knowledge

- Em. Children find it hard to differentiate between stretch, bend, twist, and squash
- Exp. Children can say what they have to do to stretch, twist, bend and squash something.
- Exc. Children can relate the ability to change the shape of an object to the material it is made from.

3 SORT ME

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

- Give children assortment of objects that can be squashed, bent, twisted and stretched for children to sort. You could use PowerPoint Slide 6 as a focal point for discussion on how to sort the objects into different boxes or hoops.
- This activity provides a good assessment of whether the children understand these terms and can classify them into the appropriate groups. Do make sure that there are opportunities for children to place an object in overlapping sets, since e.g., a balloon could be squashed, stretched and twisted.
- Ask the children to discuss with their partner or group what kind of material the object is made from. So, is it soft, flexible, rigid, elastic? This means that the children are not only thinking about changing the shape of the object but also how the material it is made from allows it to be squashed, bent etc.

YOU WILL NEED

- Collection of objects from activity 2
- PowerPoint Slides 6 and 7

ASSESSMENT

Subject Knowledge

- Em. Children find it hard to differentiate between stretch, bend, twist, and squash
- Exp. Children can say what they have to do to stretch, twist, bend and squash something.
- Exc. Children can relate the ability to change the shape of an object to the material it is made from.

Working Scientifically

- Em. Children sort into groups but find overlapping areas difficult.
- Exp. Children sort objects into different sets.

- At the end of this activity use PowerPoint Slide 7 to find out what children know and if they can explain how the material something is made from is important, e.g. if it is soft it can be easily squashed.

- Exc. Children sort objects and relate the ability to change their shape to the material it is made from.

4 AT HOME

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

- Show children PowerPoint Slide 8 which shows pictures of everyday things that squash, stretch, bend and twist. Ask children to look around at home for things that can be bent, squashed, twisted and stretched. Tell children that they can draw things, make a list, take photographs or bring objects to school. The children could use the school internet site to post pictures, or write a blog. Make time for children to share what they have found out at home and ask them what they notice about the materials that the objects are made from that can be changed by bending, squashing, twisting and stretching.

YOU WILL NEED

- PowerPoint Slide 8

ASSESSMENT

Subject Knowledge

- Em. Children find it hard to differentiate between stretch, bend, twist, and squash
- Exp. Children can say what they have to do to stretch, twist, bend and squash something.
- Exc. Children can relate the ability to change the shape of an object to the material it is made from.

Working Scientifically

- Em. Children sort into groups but find overlapping areas difficult.
- Exp. Children sort objects into different sets.
- Exc. Children sort objects and relate the ability to change their shape to the material they are made from.

5 BALLOON SHAPES

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

- Show children PowerPoint Slide 9 and discuss the questions.
- Whilst it does take some time to blow up balloons for all children (unless this is done over a week, group by group) most children will find this a fun activity.
- The best shape to use are long ones, which are not fully inflated so that they can be squashed, stretched, twisted and bent. Give children the opportunity to work in pairs and explore a balloon, changing its shape in different ways. If you have enough balloons some children working in pairs could try to create an animal. If they do this then suggest that they use a camera or tablet to take photographs which could be printed out and placed in their books or a class Big Book (Floor book) with annotations / sentences to describe how they change the shapes using correct scientific vocabulary.

YOU WILL NEED

- PowerPoint Slide 9

ASSESSMENT

Subject Knowledge

- Em. Children can say how they changed the shape of the balloon with support to use correct vocabulary.
- Exp. Children use scientific vocabulary to describe how they changed the shape of the balloon and can say that the material can be changed.
- Exc. Children recognise that the material allows the shape of the balloon to be changed and also that the air inside can be squashed.

6 STRETCHY SOCKS

L.O. Find out how the shapes of solids objects made from some materials can be changed by squashing, bending, twisting and stretching.
Perform simple tests.

- Gather and record data to help in answering questions.
- As a starter for this activity you might like to read the book *Socks* by Nick Sharratt and Elizabeth Lindsay which shows lots of different socks and is great for 'word play' on socks.
- Give children a selection of socks from babies, to adults, thin to thick, hiking socks and ask them to sort in as many different ways as they can, which might include, size, shape, colour, length, fabric, thick, thin.
- Ask children to think about a question that they could test, support this by suggesting that their question could begin with 'Which..?' This might lead to children asking:
  - Which sock is the warmest?
  - Which sock is the biggest?
  - Which sock is the stretchiest?
- Use PowerPoint Slide 10.
- Ask children to think about what they could do to find the answer to their question, and working in pairs or small groups no more than four children, ask them to share their ideas with the rest of the class or with another group. Encourage children to listen and offer suggestions to help improve their ideas. As you visit each group ask them to look at and feel the socks, and think about why some socks are more stretchy than others?
- E.g., 'Which sock is the stretchiest?' could be answered by children testing say 4 or 5 different socks. The children might take roles e.g. two children to stretch the sock, one to measure and one to record their data in a table.
- The challenge then is for children to work out what they are measuring, e.g. the total length of the two socks (the easier route) or the difference between how far one sock stretched and the other sock (more challenging). Encourage children to think about and make decisions about what to use to measure and how they will record their activity and how far the sock stretched.
- Children should be using the maths related to their ability, so most children should be using standard measurements. Ask children to draw a table and think about the headings, so that data is recorded appropriately.
- Each group could complete a bar graph or the teacher could have a whole class session where children place their data on a bar chart. Finally children should use the data to answer their original question.

YOU WILL NEED

- Selection of socks
- Rulers for measuring
- PowerPoint Slide 10

ASSESSMENT

Subject Knowledge

- Em. Children require support to carry out their test, take measurements and record data.
- Exp. Children carry out their test and use numerical data to answer their question.
- Exc. Children use their data to answer the question and their observations to talk about the material the stretchiest sock is made from.

Working Scientifically

- Em. Children can say how they changed the shape of the socks with support using the correct vocabulary.
- Exp. Children use scientific vocabulary to describe how they changed the shape of the sock and can say that the material can be changed.
- Exc. Children recognise that the material allows the shape of the socks to be changed and that the material is stretchy and returns to its original shape.

7 STRETCH AND SQUASH

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

- This is a problem-solving challenge where children to make a model from dough by stretching and squashing the material, stretching and squashing.
- Ask children to think about their favourite book and character from that book. Many children of this age will choose, e.g., *The Gruffalo* by Julia Donaldson or *The Very Hungry Caterpillar* by Eric Carle, or the troll from the traditional story *Billy Goats Gruff*.
- You might like to leave a range of familiar story books out to remind children of what they have read and the characters in them. The children choose their favourite character and then make the character out of playdough, Plasticine™ or clay.

YOU WILL NEED

- Selection of favourite books and characters
- Playdough, Plasticine or clay for modelling

ASSESSMENT

Subject Knowledge

- Em. Children make the model but confuse stretch and squash.
- Exp. Children can say when they are stretching and squashing the dough.
- Exc. Children can say whether they are using a push or a pull when stretching or squashing the dough.

8 FLYING MOUSE

L.O. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.
Performing simple tests.

- Gathering and recording data to help in answering questions.
- The 'flying mouse' offers another experience of a different way that something can move using the force applied by the children. This is a very good activity for developing children's ability to think through cause and effect. That is, 'If I do something...this happens'. The template for the flying mouse can be found on Activity Resource 3.1.
- Use either 500ml or 1l plastic milk bottles, the children make the cone mouse an put it over the opening to the bottle, then they 'clap' their hands either side of the plastic bottle and the mouse shoots up into the air. To return the bottle back to its original shape children blow into the bottle, then they can send the mouse into the air again.
- The children will be excited to use the flying mouse, so give them time to explore and then ask them to think very carefully about exactly how they made the mouse fly.
- Children should be thinking and talking about what they do in order to make something happen. In this instance, what happens to the milk carton and what did they do to it? Once happy with their descriptions, they can relay them to the group. They should use phrases such as: 'When I do this … the mouse … then it … because …'

YOU WILL NEED

- Activity Resources 3.1 and 3.2
- Plastic milk cartons – 1 and 2 litre
- Card for making mouse
- PowerPoint Slide 5

ASSESSMENT

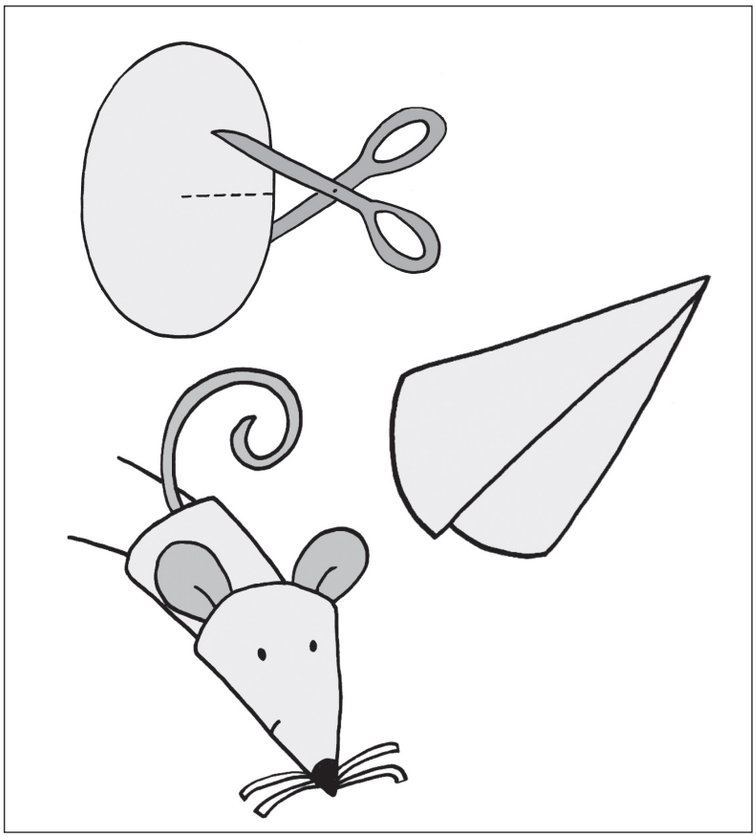
Subject Knowledge

- Em. Children require support in describing how they made the rocket mouse move.
- Ex. Children can explain that they squash the bottle, then the air and make the rocket mouse move.
- Exp. Children are able to suggest how they can use forces to make the mouse move certain distances or heights.

- The movement of the flying mouse is caused by a force being exerted on the milk carton.
- The aim is for children to realise that when they squash the carton (change its shape), the carton squashes the air inside the carton and the air is pushed out of the carton. This then pushes the mouse into the air.
- Finally you might want to ask if anyone knows why the mouse does not stay in the air and what makes the mouse fall down to the ground. Whilst it is not taught at this level, some children might be able to talk about gravity.
- At this level children can be expected to use standard measurements to find out how far the mouse travelled and use a table to record their results.
- Now ask children what other ideas they have about how to make the mouse travel further or higher. Use the question stems on PowerPoint Slide 5, to scaffold children's questions, e.g.:
  - Do bigger milk containers make the mouse go further?
  - What if I change the size of my mouse?
  - What if I made the mouse mice from different materials?
  - Which material is the best for my mouse?
  - Do all kinds of containers work, e.g. plastic lemonade bottles, small water bottles?
- Challenge children to find out who can make their flying mouse go the furthest which then makes the demand on children to measure and record measurements using a two column table. The data from the table can then be used to create a bar graph showing the distance the different mice travelled in each group. Children can repeat the activity using Activity Resource 3.2 (The Straw Rocket) and see how far they can make theirs fly.

Working Scientifically

- Em. Children explore how they can make the Rocket Mouse move.
- Exp. Children test their ideas and measure distance using standard measurements and record in a table.
- Exp. Children test their ideas, use measurement and record data, which they then use to answer their questions.



TOPIC 4 Our Local Environment

About this topic

Curriculum link: Year 2, Living Things and their Habitats, Plants

SUMMARY:

This topic brings together study of living things, habitats and growing plants and is strongly focussed on outdoor learning and investigations.

UNITS

4.1: Living things
4.2: Habitats 4.3: Food chains

ONLINE RESOURCES:

Teaching Slides (PowerPoint): Our Local Environment
Interactive activity: Our Local Environment
CPD video: Our Local Environment
Pupil video:Our Local Environment
Word mat: Our Local Environment
Editable Planning: Our Local Environment
Topic Test: Our Local Environment

Learning objectives:

This topic covers the following learning objectives:

- Explore and compare the differences between things that are living, dead, and things that have never been alive
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- Identify and name a variety of plants and animals in their habitats, including micro-habitats
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

Working scientifically skills:

This topic develops the following working scientifically skills:

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use observations and ideas to suggest answers to questions.
- Gather and record data to help in answering questions.

CROSS CURRICULAR LINKS

This topic offers the following cross-curricular opportunities

Numeracy and mathematics

- Choose and use appropriate standard units to estimate and measure height of plants.
- Compare plant heights, using standard measures
- Create block graphs to show plant growth.
- Use graphs to compare data and answer questions.
- Look at patterns in plants.
- Classify plants and seeds.
- Handle money and give change.

English

- Learn plant names.
- Compose instructions for growing plants – orally and then write sentences.
- Find information on plants and gardening.
- Favourite words, e.g. flowers such as geraniums, chocolate cosmos.
- Personalise nursery rhymes, e.g. make them about their own garden –

- Consider the opinions of others – e.g. best way to get rid of snails and slugs.
- Write poems about flowers.
- Create plant labels for the garden.
- Read:
  - *Oliver's Vegetables* by Vivian French and Alison Bartlett
  - *Plant* (*Eye Know*) by Penelope Arlon
  - *Eddie's Garden and How to Make Things Grow* by Sarah Garland
  - *Ten Seeds* by Ruth Brown.

Geography

- Identify seasonal and daily weather patterns to inform planting and growing.
- Know key physical features around school grounds and decide if they are suitable for growing plants, e.g. steep, shady, damp, sunny.
- Know what the school soil is like.
- Know where some plants come from, e.g. cacti.

D & T

- Grow plants for a healthy diet.
- Know where plants come from.
- Cook garden produce.
- Think about making salads visually appealing.

Art

- Look at paintings of flowers from different artists,
- Create clay flowers and Flower collages using different materials for texture and colour.
- Use plants to dye cloth, e.g. onions, beetroot.

Music

- Compose gardening songs.
- Change the words to 'Mary Mary Quite Contrary'.
- Use plants as musical instruments, e.g. wood, ornamental gourds, make seed shakers.
- Discuss what kind of music might make plants grow, e.g. pop or classical?
- Choose and compose music to help plants grow.

Role play

- Science laboratory / botanical garden.
- Information about plants.
- Activities where plants are grown in different conditions.
- Conserving plants. Looking after plants.
- Plants for different senses.

Computing / ICT

- Use a time-lapse camera to record plant growth.
- Create a flower calendar using photographs of plants grown.
- Design and make seed packets using graphics programs and add text.

Drama

Role play discovering a new plant.

Role play plant life cycle 'seed to seed'.

Create a gardening play.

Create a play from Ruth Brown's book *Ten Seeds*.

STEAM (SCIENCE TECHNOLOGY ENGINEERING ART AND MATHS) OPPORTUNITIES

Invite into class

- Local gardener to give a masterclass session on planting and caring for seeds and plants
- Artist to create clay models, vegetable printing,
- Work with school cook to use school produce

Visit

- Local park or botanic gardens
- Local greengrocer
- A garden centre –
- An allotment to interview and get advice from people who grow flowers and vegetables.

HEALTH AND SAFETY

These activities include children:

- Tasting different foods – check for food allergies.
- Handling seeds – check there is no fungicide.
- Handling plants – make sure plants are safe to use with children, some are irritants, others poisonous.

Make sure that children understand that they:

- Wash hands after handling seeds, plants and soil.
- Never eat plants unless they are safe.
- Know how to use garden tools correctly.

SCIENTIFIC VOCABULARY: Environment

It is assumed that most children know, from their EYFS Stage experience, words such as, plant, soil, vegetables, although they might not know how to write and spell them. You can download a Word Mat of essential vocabulary for this topic from *My Rising Stars.*

Alive: something move, grows, breathes, reacts and reproduces

Dead: was once alive

Food chain: a food chain is a way of recording who eats what. It begins with plants (they make their own food), plants are eaten by animals and these animals are the food for other animals

Habitat: where an animal or plant lives

Micro-habitat: where very small animals live

Predator: an animal that preys on other animals

Prey: an animal that is eaten by another animal

key words: live/ carnivore, dead/ food chain/ habitat/ herbivore/ micro-habitat/ never alive/ omnivore/ predator/ prey

PREPARE THE CLASSROOM

I am a botanist

- Activities where plants are grown in different conditions
- Mini gardens botanist badges
- Conserving plants – looking after plants in need of care
- Information about plants
- labelling plants
- plant books
- plants for different senses
- visitor guides
- microscope to look at flowers, leaves etc.
- *The Great Plant Hunt* box from the Wellcome Trust given to every maintained school in England.

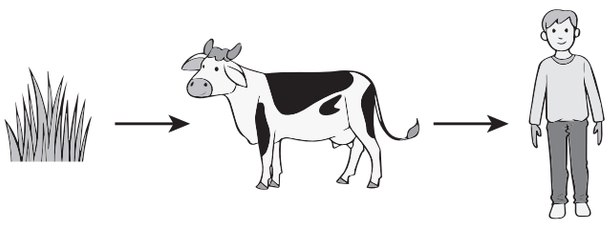
SUBJECT KNOWLEDGE: LIVING THINGS

Our environments are full of things that are living, dead and things that have never been alive. In order for something to be classified as alive, there are certain things that it needs to do. At Year 2 this must be communicated in simple terms, as it can be a difficult concept to grasp. Basically, living things are able to move, breathe, grow, reproduce (in humans, babies), get rid of waste (in humans, 'wee' and 'poo') and eat. They also need to be able to know when something changes, e.g. gets colder, warmer (sensitivity). These ideas are more difficult to understand with plants, because we cannot see them move, breathe, get rid of waste or make their own food. It is much easier for children to recognise these things in themselves, their pets and animals in the locality.

SUBJECT KNOWLEDGE: Food Chains

Simple rules for food chains are:

- A food chain tells us who eats who.
- Food chains do this by using arrows.
- The arrows means 'is eaten by', so (below) the plant is eaten by an animal, which is eaten by another animal.



4.1 Living Things

GET STARTED

Take children outdoors with cameras and tablets and working in pairs or small groups they have to choose 3 things to photograph: something that is living, something that has never been alive and dead. The children should only take a photograph when they are all agreed that the object is living, never been alive or dead. Listen to children's discussions to identify misconceptions. Back in the classroom, retrieve their photographs and place them (with blu tac or Velcro on the back) onto a working wall where they can be move, classified and re-classified.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- How could you prove to someone that you were alive?
- Is a snail alive or dead? How do you know?
- How do we know that dinosaurs were once alive?

ACTIVITIES

1 PROVE IT!

L.O. Explore and compare the differences between things that are living, dead and things that have never been alive.

- Ask children to prove that they are alive and dead, or have never been alive. They could draw around each other on the playground and annotate their outline with reasons which prove that they are alive. Children could then visit each other's outlines, read and comment in pairs on what other children have written.
- Now ask them to talk with their partner and think about what it means if something is dead and never alive.

ASSESSMENT

Subject Knowledge

- Em. Children need support with the idea of things that have never been alive.
- Exp. Children can sort into groups of alive, dead and never been alive to a given group.
- Exc. Children apply their understanding to a wide range of things.

2 LIVING OR NOT?

L.O. Explore and compare the differences between things that are living, dead and things that have never been alive.

- To help children understand the idea of 'never alive' bring in, e.g., a battery-operated toy dog that walks and yaps. Ask children to think about whether the battery-operated dog is living, dead or has never been alive, and collect ideas.
- Ask children to vote on one of the answers. Of course, the battery-operated dog can move, it gets energy from the battery, it might flip over if it hits an obstacle (sensitive); but it does not breathe, it does not go to the toilet and it can't have babies. It is not alive, and has never been alive, which therefore means it cannot be dead.

YOU WILL NEED

- Moving toy such as battery-operated toy dog

ASSESSMENT

Subject Knowledge

- Em. Children need support with the idea of things that have never been alive.
- Exp. Children can say why the battery operated dog has never been alive.
- Exc. Children apply their understanding to a wide range of things.

3 SORT IT

L.O. Explore and compare the differences between things that are living, dead and things that have never been alive.

- Ask children to sort items into those that are living, dead or have never been alive. Ask children the reason for their choices.
- Next, in pairs or small groups, sort items into hoops labelled 'living', 'dead', 'never alive'. Let them discuss and work together to decide the best hoop for the object.
- Move around the groups listening to their reasoning and, where appropriate, asking questions such as 'Why do you think that? How do you know? Why do you dis/agree?'

YOU WILL NEED

- Collection of things that are living, dead or never alive, e.g.
- Living: cacti, herb plants in pots, pictures of animals, snails
- Dead: dried herbs, fallen leaves, shells, wooden spoon, tinned fruit, twig, paper
- Never alive: ball, elastic band, hairbrush, paper clip, lollipop, stones

ASSESSMENT

Subject Knowledge

- Em. Children need support with sorting objects into different categories.
- Exp. Children can say why objects are living, dead or never been alive.
- Exc. Children apply their understanding to a wide range of things inside and outside the classroom.

4 EXPLORE!

L.O. Explore and compare the differences between things that are living, dead and things that have never been alive.

- Take children out into the school grounds to find items that are living, dead and never alive. Depending on what is in your school grounds, you might need to prepare some objects worthy of discussion beforehand.
- Working in small groups, children collect items and place them in chalk circles on the playground, sorting into 'living, dead or never lived'. Each time they place an object in a hoop, or circle drawn on the playground. Insist that they need to agree with the others in their group. Listening to children's ideas will help to identify any misconceptions and assess learning.
- Finally, challenge children to create their own set of rules which explain why things are living, never alive and dead. This offers a good assessment point.

YOU WILL NEED

- Objects to discuss alongside those in the environment e.g. flowers in pots, toys, a bicycle

ASSESSMENT

Subject Knowledge

- Em. Children need support with applying their ideas in the context of outdoors.
- Exp. Children can apply their understanding in the context of outdoors.
- Exc. Children apply their understanding and are able to justify through discussion their choices, using scientific language.

4.2 Habitats

GET STARTED

A habitat is a place where a plant or animal lives. Plants and animals have basic needs in order to live, called life processes. They need to be able to breathe, move, grow, eat, go to the toilet and have babies. For an animal or plant to survive in a habitat, the habitat has to support those needs e.g. providing food. If children understand the scientific term 'habitat', it becomes easier to understand 'micro-habitat'. A micro-habitat is simply a very small habitat (a small area of a larger habitat). E.g., a leaf could be a micro-habitat of a hedgerow.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- What is your habitat like?
- If you could choose a different habitat to live in, where would you like to live? Why?
- Why do you think people should look after different habitats and not destroy them?

ACTIVITIES

1 MY HABITAT

L.O. identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

- It is always useful to begin with children's own world. Use the analogy (albeit a limited one scientifically) of their own house as a habitat, where lots of people (who are also animals) live. Ask children what their habitat has that helps to keep them alive. They might suggest food, water, warmth, shelter and air.
- If children can think of their home as a habitat, then an example of a micro-habitat (discuss with children the words micro and habitat) would be where their hamster lives in its cage, or where a spider lives in the corner of the bathroom, or a plant lives in a plant pot on the window sill.
- Develop understanding that plants and animals live in the micro-habitats because they provide what the living thing needs to stay alive. So the hamster cage provides shelter, water, food, air, safety (from things that might eat it – the cat which is a predator) and warmth. The plant has air, warmth, water and sunlight to make food.
- Ask the children to think about a habitat that would not suit e.g. themselves, or a plant, or their pet, and ask them to explain why, encourage them to use vocabulary such as habitat, needs, air, warmth, water, food, shelter.

ASSESSMENT

Subject Knowledge

- Em. Children understand that a house is where they live but are unable to relate this to the word habitat.
- Exp. Children know that a habitat is where plants and animals live because it provides for basic needs.
- Exc. Children apply the idea of habitat and micro-habitat locally and globally e.g. desert, rainforest.

2 FIND A MICRO-HABITAT

L.O. identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

- Cue the children into this concept by talking to the children about the word habitat referring to Activity 1. Then ask children to think about the word 'micro-habitat'. They know what a habitat is but what does the word 'micro' mean?

YOU WILL NEED

- PowerPoint Slide 5

- Take the children outside and ask them to find micro-habitats in the school grounds and to think about why it is a micro-habitat. Children might find any of the following; a tree trunk, leaves, fence, grass, under a log, around a drain pipe, a crack in a paving stone, plants growing on a drain cover. What is then important is that the children can say why it is a micro-habitat (i.e. because it is a very small habitat with plants and animals living there).
- The next step is to discuss why the plants and animals are there – what does the micro- habitat have that enables the living things to live there? Challenge children to refer back to discussions in the classroom relating to the needs of living things, what does each habitat have that means a plant or animal could live there.

ASSESSMENT

Subject Knowledge

- Em. Children recognise where plants and animals live.
- Exp. Children can identify micro-habitats and know that plants and animals live there.
- Exc. Children know that micro-habitats provide food, shelter etc. that things need to live there.

3 MICRO-HABITAT SURVEY

L.O. Identify and name a variety of plants and animals in their habitats, including micro-habitats.

- Give the children a map of the school grounds and help them find their current position and key places on the map, e.g. playground, field, buildings. There are different ways to use this map depending on the ability and interest of the children, e.g.:

1. Working in pairs the children could go around the school and, using a simple key, draw on the map micro-habitats such as: grass, log, stone, leaf, soil, wall, drainpipe, crack in the ground. It would be helpful to carry out a reconnaissance first, to find out what is in the area the children will be working in. A simple identification sheet can be given to them so that they can identify and name the common plants and animals that they find.
2. Give children a digital camera to go around the school and photograph or video different habitats. Print them out or view them on a computer, and annotate the images with information about the kind of habitat, conditions and what lives there and why.
3. As a home–school activity you could give the children sheets of 1 cm graph paper and ask them to draw a map of, e.g., their garden and house at home and to show where there are micro-habitats around their home and garden. If they want to, they could also take photographs. Ask them to find out the names of the plants and the animals they see.

YOU WILL NEED

- Map of school grounds
- Graph paper
- Camera or tablet for recording habitats

ASSESSMENT

Subject Knowledge

- Em. Children are able to recognise plants and animals and require help using identification sheet.
- Exp. Children are able to identify common plants and animals using an identification sheet.
- Exc. Children can apply their understanding and to use identification sheets in a range of habitats.

4 ANIMALS AND PLANTS IN DIFFERENT HABITATS

L.O. Identify and name a variety of plants and animals in their habitats, including microhabitats. Gather and record data to help in answering questions.

- Now that children know what habitats and micro-habitats are they can re-visit different habitats to find out which plants and animals live there and importantly why they live there. There is no need to

YOU WILL NEED

- Plant and animal identification sheets
- Research materials on different plants and animals

collect animals or plants because the children are exploring habitats to find out what lives there.

- Once again identification sheets should be used to that children can attempt to identify, e.g., plants such as dandelions, shepherd's purse, daisies, dock. Children are most likely to find invertebrates, birds and mammals will not stay where the children are, so children are unlikely to see any but should be encouraged to look for clues e.g. feathers, bird or animal droppings.
- Children could mark on their identification sheets which plants and animals they find (you can easily put sheets together related to your school grounds or locality). As children work visit groups and help them to link what is living there to the idea of a habitat, why are plants there, what do they think the animals eat etc.?
- Once children are back in the classroom they could choose their favourite or the most interesting plant or animal to research and create a fact file, post it notes to go on a working wall etc.
- Alternatively pairs or small groups can be sent to different locations to do a plant and animal count and record their data using a tally chart.
- Back in the classroom this data can be converted to a bar chart to show how many plants or animals live in specific habitats e.g. hedge, soil, tree, wall, and the information used by children to answer a range of questions.

ASSESSMENT

Subject Knowledge

- Em. Children can recognise plants and animals and require help using identification sheets.
- Exp. Children can identify common plants and animals using identification sheets.
- Exc. Children know common plants and animals and check using an identification sheet.

Working Scientifically

- Em. Children require support to gather and record their observations.
- Exp. Children can gather and record their observations using e.g. a tally chart.
- Exc. Children can apply their understanding and draw conclusions from their data about their habitat.

5 MAKE A MICRO-HABITAT

L.O. identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

- Challenge children to choose a micro-habitat and make it, before placing in it the plants and animals that are found there. They could use either plastic, stuffed animals or make their own from clay or dough.
- Ensure that children have a good understanding of the habitat, e.g. for woodlice, stones, dead leaves, twigs, soil and moisture (food, water, air).
- Challenge children to ensure that the habitat has what the animal and plants needs to survive there. Children could communicate this by showing and explaining their habitat to others, or by creating labels to be placed around the habitat, a mini video clip or using talk buttons / cards.
- Children could create their habitat in a box, making a diorama, they could return to their diorama after the next section to add a food chain to the habitat.

YOU WILL NEED

Cardboard boxes e.g. shoe boxes

Materials to create habitats e.g. stones, fallen leaves, twigs, soil, sand

ASSESSMENT

Subject Knowledge

- Em. Children make a habitat for animals, they require support to link the habitat to basic needs of animals.
- Exp. Children make a habitat and include some plants and can say how the habitat meets the needs of those living things.
- Exc. Children talk about terms of how the plants and animals are suited to the habitat and know what might happen to the plants and animals if something changed.

4.3 Food chains

GET STARTED

All living things need energy to live. Humans and other animals get their energy from the food they eat. Children will find this idea easy to understand, even for snails, slugs and worms; but what they find more difficult is how plants make their own food. Plants are producers, meaning that they produce their own food. In the case of plants, they use sunlight (photosynthesis) to create energy. Telling children that plants make their own food using the sun is the easiest approach, rather than trying to explain photosynthesis, which is not tackled until end of Key Stage 2 and beginning of Key Stage 3.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- Which animals do you know that eat other animals?
- Which animals do you know that only eat plants?
- What do you eat, -animals, plants or both?

ACTIVITIES

1 FOOD CHAIN PAIRS

L.O. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.

- Help children to understand food chains by starting with simple pairs. Ask 'who is eaten by whom?' (e.g., a nettle is eaten by a snail, lettuce is eaten by a slug, a hazelnut is eaten by a mouse, slugs are eaten by hedgehogs, a rabbit is eaten by a fox, grass is eaten by a rabbit).
- Give each child the name of a plant or animal, a paper plate and some string. Children paint or draw (and colour) the plant or animal onto the paper plate and make sure that the name can be clearly seen. They then hang a length of string from it (in a loop) so that they can wear the paper plate roughly at chest level.
- Take the children outside or into the hall. Each child wears their part of the food chain. The children scatter and then have to find what they eat or who eats them within a set time.
- Use words such as 'predator' and 'prey' and ask children which they think they are, remembering that predator and prey is an animal to animal relationship.

YOU WILL NEED

- Paper plates
- String

ASSESSMENT

Subject Knowledge

- Em. Children need support from others to find the other part of their food chain.
- Exp. Children are able to complete their paired food chain.
- Exc. Children apply what they know by suggesting linking other food chains to their own.

2 EXTENDING THE FOOD CHAIN

L.O. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.

- Scaffold the children to the next stage, moving from two parts of a food chain to three.

YOU WILL NEED

- As Activity 1

ASSESSMENT

Subject Knowledge

- Em. Children need support from others to find the other parts of their food chain.

- Explain that food chains begin with a plant, which an animal eats and then another animal (predator) eats the animal (prey).
- Ask children to discuss with their partner if they know of any food chains, e.g. plant – deer – lion.
- Repeat Activity 1 but this time add some more animals and plants and ask children to create a food chain with more than two parts to it.

- Exp. Children are able to complete their food chain.
- Exc. Children apply what they know by suggesting extending their food chain.

3 FOOD CHAIN MOBILE

L.O. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.

- Give the children lots of different animals and plants and challenge them to use as many as they can to make a food chain mobile. e.g. blackberry, mouse, owl, hedgehog, plant, slug, cabbage, caterpillar, blue-tit, tadpole, frog, pond weed, heron, stickleback, shrew, owl, worm, dead leaves, badger, beetle, dead wood, woodlice, frog.
- If children are unsure what some animals eat ,encourage them to use books, posters, leaflets or a website to find out.
- The correct food chains could be placed onto paper plates and hung vertically as a classroom mobile.

YOU WILL NEED

- Paper plates or cards
- Research books and websites

ASSESSMENT

Subject Knowledge

- Em. Children are able to make a food chain with 2 or 3 animals and plants with help.
- Exp. Children are able to complete their food chain.
- Exc. Children research food chains.

4 FOOD CHAIN HUNT

L.O. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.

- This activity links back to previous work on habitats, where children identified animals and plants in local micro-habitats. Returning to those habitats children use their new subject knowledge about food chains.
- Children could take photographs of different parts of food chains that they find in a micro-habitat. As they work encourage them to think about what eats what, which is a predator and which is prey. Help the children to recognise that some food chains might be incomplete, so they might want to write down or remember what is missing. E.g., they might see a caterpillar eating a nettle but not a bird because the humans have frightened them away.
- Once back in the classroom, they could choose how to recreate the food chains they could draw pictures, make new paper plate mobiles or use dough. If children are working in groups of three, each of them could roleplay part of their found food chain.
- This activity also provides an opportunity for children to identify and name the local plants and animals that are part of their food chains.

YOU WILL NEED

- Camera or tablet for recording

ASSESSMENT

Subject Knowledge

- Em. Children require help to apply their knowledge of a food chain to a micro-habitat.
- Exp. Children recognise food chains in a habitat and can identify and name plants and animals using an identification sheet.
- Exc. Children identify and name plants and animals and make more complex food chains often with animals that are not currently there e.g. owl, fox.

TOPIC 5 Young Gardeners

About this topic

Curriculum links:

Year 1 Topic 4 Plants and animals where we live
Year 3 Topic 4 How does your garden grow
Year 5 Topic 3 Circle of Life
Year 6 Topic 1 Classifying Living Things

SUMMARY:

This topic brings together study of living things and habitats and is strongly focussed on outdoor learning and investigations.

UNITS

5.1 Young Gardeners

ACTIVITY RESOURCES:

5.1: Our Seeds 5.2: Plant Pots
5.3: Quirky Containers

ONLINE RESOURCES:

Teaching slides (Powerpoint): Young Gardeners
Interactive activity: Young Gardeners
CPD video: Young Gardeners
Pupil video: Young Gardeners
Word mat: Young Gardeners
Editable Planning: Young Gardeners
Topic Test: Young Gardeners

Learning objectives

This topic covers the following learning objectives:

- Observe and describe how seeds and bulbs grow into mature plants.
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Working scientifically skills

This topic develops the following working scientifically skills:

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use observations and ideas to suggest answers to questions.
- Gather and record data to help in answering questions.

CROSS CURRICULAR LINKS

Numeracy and Mathematics

- Choose and use appropriate standard units to estimate and measure height of plants.
- Compare plant heights, using standard measures
- Create block graphs to show plant growth.
- Use graphs to compare data and answer questions.
- Look at patterns in plants.
- Classify plants and seeds.
- Handle money and give change when selling plants.

English

- Learn plant names.
- Compose instructions for growing plants – orally and then write sentences.
- Use non-fiction books to find information on plants and gardening.
- Favourite words, e.g. flowers such as geraniums, chocolate cosmos.
- Change nursery rhymes, e.g. make them about their own garden – *Mary Mary Quite Contrary.*
- Ask and find the answers to their own questions about gardening.
- Consider the opinions of others – e.g. best way to get rid of snails and slugs.

- Write poems about flowers.
- Create plant labels for the garden.

Read

- Oliver's Vegetables – Vivian French & Alison Bartlett.
- Plant (Eye Know) – Penelope Arlon.
- Eddie's Garden and How to Make Things Grow – Sarah Garland.
- Ten Seeds – Ruth Brown.

Geography

- Identify seasonal and daily weather patterns to inform planting and growing.
- Know key physical features around school grounds and decide if they are suitable for growing plants, e.g. steep, shady, damp, sunny.
- Know what the school soil is like.
- Know where some plants come from, e.g. cacti.
- Fruit and vegetables from around the world.

D & T

- Grow plants for a healthy diet.
- Know where plants come from.
- Cook garden produce.
- Think about making salads visually appealing.
- Design, make and test a cloche.
- Design, make and test bird scarers.

ART

- Look at paintings of flowers from different artists, e.g. Japanese, van Gogh's flowers, Georgia O'Keeffe, Monet. Consider similarities and differences.
- Create clay flowers.
- Flower collages using different materials for texture and colour.
- Using plants to dye cloth, e.g. onions, beetroot, carrots.

Music

- Compose their own gardening songs.
- Change the words to *Mary Mary Quite Contrary* and sing to audience.
- Use plants as musical instruments, e.g. wood, ornamental gourds, make seed shakers.
- Choose music to help plants grow. Pop or classical?
- Compose music to help plants grow.

Role Play Areas

- Science laboratory / botanical garden.
- Wide range of plants.
- Labelled plants.
- Botanist badges.
- Visitor guides.
- Information about plants.
- Plant books.
- Activities where plants are grown in different conditions.
- Conserving plants. Looking after plants in need of care.
- Plants for different senses.

Computing / ICT

- Use time-lapse camera to record plant growth.
- Create a flower calendar using photographs of plants grown.
- Design and make seed packets using Draw, Paint programs and add text.

Drama

- Role play discovering a new plant.
- Role play plant life cycle 'seed to seed'.
- Create a gardening play.
- Create a play from Ruth Brown's book Ten Seeds.

Health and safety – these activities include children:

- Tasting different foods – check for food allergies amongst children.
- Handling seeds – check they are not coated with fungicide.
- Handling plants – make sure plants are safe to use with children, some are irritants, others poisonous.

Make sure that children understand that they:

- Wash hands after handling seeds, plants and soil.
- Never eat plants unless told by an adult that they are safe.
- Know how to use garden tools correctly.

STEAM (SCIENCE TECHNOLOGY ENGINEERING ART AND MATHS) OPPORTUNITIES

Invite into class

- Local gardener to give a masterclass session on planting and caring for seeds and plants
- Artist to create clay models, vegetable printing, tie dyeing
- Work with school cook or a chef to use school produce

Visit

- Local park or botanic gardens
- Local greengrocer
- A garden centre – children could be taught how to plant seeds etc.
- An allotment to interview and get advice from people who grow flowers and vegetables.

PREPARE THE CLASSROOM

Botanist role play area

- Activities where plants are grown in different conditions
- Mini gardens botanist badges
- Conserving plants – looking after plants in need of care
- Information about plants
- labelling plants
- plant books
- plants for different senses
- visitor guides
- microscope to look at flowers, leaves etc.
- *The Great Plant Hunt* box from the Wellcome Trust given to every maintained school in England.

SCIENTIFIC LANGUAGE

It is assumed that most children know, from their EYFS Stage experience, words such as, plant, soil, vegetables, although they might not know how to write and spell them. You can download a Word Mat of essential vocabulary for this topic from *My Rising Stars*.

Bulb: The round underground part of a plant that contains food for the plant, for example, an onion bulb, daffodil bulb, a tulip bulb.

Corms: Corms are not made up of scales, they do not have the fleshy leaves you would find on a bulb and the bud is on top of the corm. Examples of plants grown from corms are gladiolus and crocus.

Germinate: This is when a seed begins to grow, using its stored food, and put out roots and shoots**.**

Properties: A special quality or characteristic of something that makes it different from another material, e.g. transparent, flexible.

Root: The part of a plant that grows downwards, it gets water from the ground, and holds the plant in place.

Stem: The stem is usually the upper part of the plant and it can have branches, leaves and flowers.

Tuber: Tubers, such as potatoes, are thickened underground stems, unlike bulbs they don't have a covering of layers.

Key words: annual / compost / flower /fruit / germinate / germination / fruit / health / healthy / leaf / plant / root / seed / seedling / soil / stem / vegetable / properties / materials / bulb / leavest

5.1 Young gardeners

GET STARTED

The aim of this section is for children to develop an understanding of plants though gardening, which gives a purpose to their science. The topic could be taught in several different contexts, e.g.:

- children growing plants so that they can use the ingredients in the 'Little masterchefs' topic, which is the final topic in Year 2
- children working towards a 'Flower and Vegetable Show' where children exhibit their produce. You could have 'expert gardeners' visit and judge the show
- children taking on the role of botanists, learning about different plants.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- What do you think the difference is between a fruit and a vegetable?
- Do you think that big seeds grow into bigger plants than small seeds?
- Which is the biggest seed in the world?

ACTIVITIES

1 WHAT IS GROWING IN OUR SCHOOL GROUNDS?

L.O. Identify and name a variety of plants and animals in their habitats, including microhabitats Identify and classify using simple equipment

- This activity is carried out in your school grounds, allotment or nearest park or green space. Challenge children to go on a plant hunt and to find and name as many plants as they can.
- Children could use a tablet to take photographs or to use an app or identification sheet to identify common flowers.
- If you have access to a vegetable plot, do include these plants for identification.
- You could use PowerPoint Slide 5 to talk about how to identify plants e.g. colour, leaves, petals.

YOU WILL NEED

- PowerPoint Slide 5
- Camera or tablet for recording plants in the environment

ASSESSMENT

Subject Knowledge

- Em. Children require support to name plants.
- Exp. Children name common plants in the school grounds.
- Exc. Children name common plants and choose to use ID sheet or book to identify less well known.

Working Scientifically

- Em. Children require support to identify plants and flowers.
- Exp. Children name common plants and flowers using identification resources.
- Exc. Children choose to observe plants in detail and apply existing personal knowledge of plants and flowers.

2 WHAT SHALL WE GROW?

L.O. Observe and describe how seeds and bulbs grow into mature plants. Ask simple questions and recognise that they can be answered in different ways

- In the previous activity children explored the school grounds or local area to find out which plants were growing. You could use this as a starting point to think about what children would like to grow in the school grounds, using PowerPoint Slide 6.
- A mix of flowering plants and vegetables would be great, even if the school has limited growing areas, hanging baskets and pots can be used. So do try to carry out most planting outdoors rather than in the classroom.
- You could show children PowerPoint Slide 7 and ask them to name the different garden tools.
- Rather than start this work by asking children what plants need to grow etc. gain children's interest by growing seeds that are quick to germinate e.g. salad crops, which means that they can pick and eat quite soon. This way all children will have some experience of seeds and planting to draw upon in future activities.
- Give each group a selection of seed packets (children's or beginners' seeds will be easier for children to read) that they will be using, and ask them to look at and read the packets. What kind of information is on the seed packet?
- Ask children to make a list of words on the seed packets that they don't know, and share these so that they can become a focal point for future learning (e.g. words such as germinate, germination, propagator, succession, sow, sowing, drills, intervals). Encourage children to see if they can find out what the word means from perhaps family members who garden.
- Bring the children together to share what they have found out about seed packets and what they think that they have to do to plant their seeds.
- At this point children could complete the Activity Resource 5.1 which helps children to summarise information from their seed packets.
- Different groups could have different kinds of lettuce e.g. cos, lambs lettuce, rocket, Little Gem, so that when they grow children can develop their understanding that they are all lettuce but different kinds. The same can be done with radishes, and help to show the variety.
- Show children PowerPoint Slide 8 and collect questions for your working wall and ask the topic progresses see if children can add answers to their questions.
- At this stage children might have limited experience of growing seeds, so when children go to plant their seeds outdoors do demonstrate how to plant them before children plant their own. You could show them the following video which shows children how to plan nasturtium seeds: www.dailymotion.com/video/xrria5

YOU WILL NEED

- Selection of seeds in packets e.g. salad crops
- Area / pots, in which to plant seeds
- PowerPoint Slides 6–8
- Activity Resource 5.1

ASSESSMENT

Subject Knowledge

- Em. Children are able to plant their seeds with help.
- Exp. Children follow instructions to plant their seeds and know what they have to do to help them grow into mature plants.
- Exc. Children apply existing and new subject knowledge on growing plants to make decisions about how they grow their own plants.

Working Scientifically

- Em. Children require support e.g. question stems to ask their own questions.
- Exp. Children ask questions about the seeds they are growing.
- Exc. Children ask questions for the working wall on a range of plants.

- Set up a rota for water regularly helps to teach them about planting and caring as well as ensuring that they will have success fairly quickly. It helps to make sure that children do not over water to agree an amount, and for children to use a measuring, which also ensures they apply maths in science.
- This way children will have experience of seeds growing into mature plants as they learn other things about what plants need to stay healthy.
- Do get children to record their first planting experience, using tablets to create video diaries would be great so that they can film reading seed packets, planting seeds, watering and seeds growing. Use their videos on the school website and to share with each other to support learning about plants and discuss.

3 WHAT DO SEEDS NEED FOR GERMINATION?

L.O. Perform simple tests Observe closely, using simple equipment Perform simple tests and use observations and ideas to suggest answers to questions
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

- Seeds are dormant until the conditions are right (for germination). Seeds need water, oxygen, and the right temperature to germinate. Most seeds do not need light. Use the video clip (on *My Rising Stars*) showing a market garden and how plants grow at this point.
- Give each group six seeds and ask them to think about what would make them germinate. In this case, the answer is water, so agree that all seeds will need to be watered. Next, ask each group how they would find out if their seeds need air, light and warmth to germinate. Give each group one of the conditions to think about.
- Get the children to make a simple plan and share it with others. They could demonstrate and explain what they plan to do to the rest of the class. Remind children that, as scientists, they need to listen to each other, think about what is being said and offer helpful comments. Then, let the children carry out their plan and tell them that they will have to record what they are doing, perhaps through video clips, photographs or drawings.
- Each group should record when their seeds begin to germinate, and then measure their growth for the next few days. The best way to plant seeds so that children can observe germination is to use cut down plastic bottles (1 or 2 litre bottles), and plant the seed between the soil and the edge of the bottle, so it acts as a window for observation.
- At the end of the activity ask each group to report back and discuss what they have found out and what they have learned about seeds.
- At this point refer back to the questions that children asked at the beginning of this topic. Has their work helped to answer any of their questions? Which new questions could they answer about growing seeds?

YOU WILL NEED

- Seeds
- Plastic drink bottles, cut down to make plant pots

ASSESSMENT

Subject Knowledge

- Em. Children recognise that each seed has germinated, they require support in recognising that the seeds are a sequence of growth.
- Exp. Children are able to describe how the seed grows and use scientific language.
- Exc. Children predict what the next set of plants will look like in the sequence.

Working Scientifically

- Em. Children are supported to grow and observe seeds.
- Exp. Children plan, carry out their test and use standard measures to record growth.
- Exc. Children use their results to draw simple conclusions.

4 WHAT DO PLANTS NEED TO GROW?

L.O Observe closely, using simple equipment
Perform simple tests Use observations and ideas to suggest answers to questions
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

- You could begin this activity by showing the children PowerPoint Slide 9 and discuss the question 'What do you think plants need to grow? In this activity the focus is on plants not seeds, because seeds do not need light to grow. You will need plants (they can be young plants) for this activity, so that children develop their understanding that:
  - too much or too little water can affect how a plant grows,
  - plants need light to grow,
- if the temperature is too high or low it can affect how the plant grows.
  - You could use Slides 10,11 and 12 as starting points for discussion on each idea about what plants need to grow. On each slide, children are only offered two options to test. This enables children to carry out a comparative test at this point, where they only need to use two plants (which is more manageable for the children and reduces the number of plants need to be grown).
  - Usually children carry out these activities in the classroom but they could carry out comparative tests outdoors, using plants that they have grown. E.g., they could give three plants different amounts of water, or they could place an opaque container over a plant and not over others when comparing light. This means that children are working in a more relevant context.
  - The aim of these comparative tests is for children to compare the two plants, e.g. light, no light. This is also observation over time, with children making comparisons over a week or perhaps two. Children could keep a diary which might include comparative photographs which they annotate. The important elements of the learning outcome is the word 'healthy'. Children should notice that plants that receive sunlight have green leaves, strong stems etc. The plants grown without light (but which are still watered) do still grow but they are less healthy, have yellowing leaves, and are spindly without strong stems.
  - Children's conclusion should be that plants can grow without light but the plant is not strong and will eventually die.
  - The plants without water will wilt and die, so the comparisons between plants that are watered and not will be marked.
  - It is more difficult to control temperature outside, so this one which is better to do in the classroom, and perhaps as a whole class activity if the classroom is too small for lots of plants. Do support children in using a thermometer, taking the temperature and recording it, perhaps choosing a very warm place, warm and cold place in the classroom or school.

YOU WILL NEED

- Plants
- PowerPoint Slides 9–12
- Thermometer
- Opaque container to cover plants
- Measuring tools

ASSESSMENT

Subject Knowledge

- Em. Children can describe each plant, they require support to link cause and effect.
- Exp. Children are able to describe that plants need water, light and right temperature to grow.
- Exc. Children apply their understanding to plan and carry out new activities e.g. putting plants in a freezer, using translucent containers.

Working Scientifically

- Em. Children require support to carry out their test, and make observations.
- Exp. Children plan, carry out their test and use standard measures to record growth and use data to draw a conclusion.
- Exc. Children use their knowledge about plant growth to explain the data.

5 NEWSPAPER PLANT POTS

L.O. Compare the suitability of a variety of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

- Explain that some gardeners make their own plant pots out of recycled newspaper. Use Activity Resource 5.2 with children to show them an alternative way of recycling, and use their newspaper pots to plant. These are great to grow, e.g. bean seeds – when they have germinated and the young plant is large enough, the newspaper pots can be placed directly into the ground. As their plants grow, use PowerPoint Slide 13 to check that they can name different parts of the plant. Some children will understand that the newspaper rots in the ground, and if children are still in school when the old bean plants are taken out they will be able to observe this has happened.

YOU WILL NEED

- Newspaper
- Seeds and soil for planting
- Activity Resource 5.2
- PowerPoint Slide 13

ASSESSMENT

Subject Knowledge

- Em. Children following instructions with support, and need help to understand recycling.
- Exp. Children make their newspaper pots and understand they are recycling newspaper.
- Exc. Children suggest other suitable materials for recyclable plant pots.

6 GROW A SALAD

L.O. Observe closely, using simple equipment
Gathering and recording data to help in answering questions
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

- You could use PowerPoint Slides 14 and 15 to find out how many children can name some every day salad plants. Alternatively, you could grow a wild flower seed mix, so that children can learn the names of common wildflowers such as, poppies, cornflowers, meadow buttercup etc. These can be sown in a corner of the school grounds or in pots.
- Children not only enjoy planting vegetables but also flowers. There are many flowers that will mature quickly, e.g.:
  - Candy tuft
  - Nasturtiums
  - Love in the mist
  - Cosmos (especially Chocolate Cosmos, which does smell like chocolate)
  - Sunflowers
  - Calendula (Marigolds)
- Once again begin with seed packets and ask children to look at what the plants need to grow and stay healthy. E.g., does it say what the best temperature is, how much water, do they need to be planted in shade, bright light or a mix of shade and light?
- As with other planting activities ensure that children record planting and growth.

YOU WILL NEED

- PowerPoint Slides 14–16
- Seeds for salad vegetables or wild flowers

ASSESSMENT

Subject Knowledge

- Em. Children plant their seeds, they need help to understand the needs of the plant to grow and stay healthy.
- Exp. Children understand the instructions and successfully sow and grow healthy plants.
- Exc. Children consider alternative places in the school grounds for their plants to grow and make their own decisions according to the instructions.

Working Scientifically

- Em. Children are supported in recording the growth of their plant.
- Exp. Children observe, measure and record plant growth.
- Exc. Children use their data and subject knowledge about plant growth to explain results.

- Children could sketch one of their flowers, or pick and press a wildflower and annotate to show parts of the plant (you could use the interactive activity to revise plant parts with the class) and what it needs to grow and stay healthy.
- You could also extend what children grow to herbs, use PowerPoint Slide 16 and bring some in for children to explore using their senses especially smell and taste.

7 GROWING BULBS

L.O. Observe and describe how seeds and bulbs grow into mature plants Observe closely, using simple equipment.

- So far the activities have related to plants grown from seeds. In this activity children are introduced to plant bulbs. A bulb is next year's plant inside the bulb with scale leaves on the outside, it can have some immature leaves and flower stems, and sometimes even flower buds.
- Give children some onions, and explain that they are bulbs, even better would be if you can find some onion bulbs that are beginning to sprout so that children can see this. The bulb itself is actually a store of food for the shoot inside to grow into the plant above ground.
- Talk about which way up they think that an onion should be planted, which is the base and which is the top of the bulb. Do make sure that children plant any kind of bulb that they think about which way it needs to be planted.
- Whilst we usually grow bulbs in soil they can be grown in, e.g. in jars or cut down plastic water bottles so that children can see the roots and shoot forming. Or you could grow them in a transparent plastic container filled with water and stones or pebbles. Children will be able to observe the bulb roots growing round the stones.
- This activity is gives children to the opportunity to observe over time. So do encourage children to observe and sketch / draw their observations, take photographs and use them to make comparisons. Do think about growing different kinds of bulbs so that children can observe and discuss similarities and differences between them.
- Do make sure that children wash their hands after handling bulbs. Show children PowerPoint Slide 17 and talk about the sequence of growth of the tulip bulb. Children could plant bulbs to create a spring garden area or plant them in tubs in the school grounds, and watch out for signs of growth then create a photograph diary of the bulbs growing into flowers. When the plant flowers do dig up some so that children can see the whole plant and identify and label the different parts
- Whilst carrying out these activities do make links with the needs of plants and if children also want to find out if bulbs need water, light and warmth to grow provide opportunities for them to test their ideas.

YOU WILL NEED

- Bulbs, such as daffodils, tulips, hyacinth, crocus bulbs
- PowerPoint Slide 17

ASSESSMENT

Subject Knowledge

- Em. Children can observe and describe a bulbs grow into a plant.
- Exp. Children describe how bulbs grow into mature plants using examples e.g. hyacinth bulb.
- Exc. Children apply their knowledge of how to grow a seed into a healthy plant to bulbs.

Working Scientifically

- Em. Children are supported in observing and recording bulb growth.
- Exp. Children observe, record and talk about how bulbs grow.
- Exc. Children describe the similarities and differences between observations of seeds growing and bulbs

! HEALTH AND SAFETY

Make sure that children wash their hands after handling bulbs the sap can irritate the skin, protective gloves should be used with hyacinths.

8 QUIRKY CONTAINER CONTEST

L.O. Observe closely, using simple equipment. Use their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions

Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

- This is a final assessment challenge where children apply what they have learned about growing plants. In this activity, children choose an unusual container, either one bought from home or supplied by the teacher to grow a seed in e.g. old teapots, wellington boots, cut-down milk containers, empty egg shells, cups and saucers, tin cans (no sharp edges). Show children the examples on PowerPoint Slide 18 and encourage them to make their own suggestions for containers. By using different containers for planting, children are being offered a new context for applying their subject knowledge which provides an opportunity to assess them.
- Point out that it is no good planting a courgette seed in an empty egg shell as the seed is big and the plant will be too big for the container. The children need to think about what size their plant will grow to in the container they have chosen as well as reading the seed packet instructions, planting the seeds and looking after them.
- The children could take a photograph of their planter and write an explanation about the seeds and what they need to grow, also how they will record the growth of their plant. Give them Activity Resource 5.3 to record their activity and provide assessment evidence.
- The children could display their 'Quirky Containers' in an area of the school grounds for everyone to enjoy.

YOU WILL NEED

- PowerPoint Slide 18
- Activity Resource 5.3
- Range of quirky containers, or ask children to find their own

ASSESSMENT

Subject Knowledge

- Em. Children are able to plant seeds, they need support to decide the conditions for growth.
- Exp. Children plant and decide conditions for growth, e.g. amount of light, warmth and water.
- Exc. Children apply their knowledge of plant growth and seek additional information for planting in an unusual container.

Working Scientifically

- Em. Children require support to decide what to observe and how to record.
- Exp. Children decide what to observe and use standard measures, how to record and use data to explain the plant growth.
- Exc. Children observe and record plant growth and use the information to make changes to improve growth.

TOPIC 6 Little Masterchefs

About this topic

Curriculum link: Year 2, Animals, including humans

SUMMARY:

This topic explores food, including making healthy food choices, and cooking various different foods.

UNITS:

6.1: Become a masterchef
6.2: Let's get cooking
6.3: Tasting Breads
6.4: Sandwich Book
6.5: Make Fresh Lemonade

ACTIVITY RESOURCES:

6.1: Chef's Hat
6.2: Carrot and Courgette Muffins

ONLINE RESOURCES:

Teaching Slides (PowerPoint): Little Masterchefs
Interactive activity: Little Masterchefs
CPD video: Little Masterchefs
Pupil video: Little Masterchefs
Word mat: Little Masterchefs
Editable Planning: Little Masterchefs
Topic Test: Little Masterchefs

Learning objectives:

This topic covers the following learning objectives:

- Find out about and describe the basic needs of humans for survival (water, food and air).
- Describe the importance for humans of eating the right amounts of different types of food, and hygiene.
- Observe and describe how seeds and bulbs grow into mature plants.
- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

Working scientifically skills:

This topic develops the following working scientifically skills:

- Observe closely.
- Perform simple tests.
- Identify and classify.
- Use observations and ideas to suggest answers to questions.
- Gather and record data to help in answering questions.

CROSS CURRICULAR LINKS

This topic offers the following cross-curricular opportunities:

English

- Learn vegetable and flower names.
- Use recipe instructions.
- Use non-fiction books, e.g. cookery books.
- Powerful smell and taste adjectives, e.g. delicious, tasty, appetizing, scrumptious, mouth-watering.
- Think about what will happen in the cooking process.
- Listen to instructions.
- Discussing the sequence of events in the cooking process.
- Structure descriptions and explanations for how and why food is changing when cooked.
- Writing their own recipe.
- Use appropriate technical words, e.g. chop, sieve.
- Re-tell stories, e.g. Oliver's Vegetables could be made into 'Class 1's Vegetables'.
- Check each other's writing.
- Read:
  - *Oliver's Vegetables* by Vivian French and Alison Bartlett
  - *Oliver's Milkshake* by Vivian French and Alison Bartlett
  - *Mr. Wolf's Pancakes* by Jan Fearnley
  - *Biscuit Bear* by Mini Grey
- Use children's recipe books, e.g.
  - *Children's First Cookbook* by Annabel Karmel
  - *CBeebies: I Can Cook* by Sally Brown and Kate Morris
  - *The Children's Step-by-Step Cook Book* by Angela Wilkes

Numeracy and mathematics

- Using standard measures to weigh food.
- Using standard measures for liquids.
- Comparing amounts.
- Cutting food into ½, ¼, etc.
- Portion sizes.
- Shapes, e.g. pizza, cutting vegetables.

Drama

- Gathering food from the garden.
- Working in restaurant.
- Chef cooking.
- Different actions, e.g. chopping, whisking, kneading, rolling.

Art

- Printing with fruit and vegetables, e.g. potatoes, apples.
- Paper plate meals.
- Clay model meals,
- Fruit and vegetable models.
- Creating pictures using pulses.
- Consider food pictures and food sculptures.
- Repeat patterns, e.g. making a fruit kebab.

Music

- Learn, sing and play famous songs, e.g. 'Food, Glorious Food' from Oliver, or 'Do You Know the Muffin Man?'
- Learn and re-write the 'On top of spaghetti' song.
- Use dried pasta to make musical shakers. Use empty food containers as sound makers / musical instruments.

D & T

- Be able to create and follow health and safety rules for working with food.
- Design, make and evaluate a pizza, sandwich, kebab, drink.
- Design, make and evaluate menus.
- Design, make and evaluate table cloths.
- Understand and apply the principles of nutrition and apply when learning how to cook.
- Select from a range of utensils and ingredients according to their properties.
- Design and make a chef's hat, cookery apron.

Geography

- Use maps to identify where food is grown locally, to locate supermarkets, greengrocers, bakeries etc.
- Use world maps, atlases and globes to identify which foods are eaten around the world, and origins of food, e.g. spaghetti.

Computing / ICT

- Search for recipes online.
- Looking at ingredients using computer microscope.
- Describe and explain changes using Easi-Speak™ mic and video.
- Use graphics packages to make repeat patterns using food shapes.

Role play

- Healthy Food Lab – taste and test food and classify foods.
- Classify vegetables according to parts of a plant.
- Identification posters for vegetables and fruits.
- Matching pictures, vegetable and fruit to plant.
- Tasting sessions.

STEAM (SCIENCE TECHNOLOGY ENGINEERING ART AND MATHS) OPPORTUNITIES

Invite into class

- School cook, parent or friends of school who can cook different dishes with children.
- A local greengrocer who can bring different fruit and vegetables for children to handle and taste.
- A chef from a local restaurant to cook with children and to teach them hygiene when cooking.
- Artist to print using fruit and vegetables
- Musician to make e.g. shakers using dried gourds.

Visit

- Local businesses e.g. café, restaurant.
- Local shops e.g. bakers, greengrocers.
- Arrange to visit local supermarket, food to fork session.
- Visit local allotment to see how fruit and vegetables are grown.

HEALTH AND SAFETY

These activities include children:

- cooking foods – hygiene rules should be followed.
- tasting different foods – check for food allergies amongst children.
- Wash hands after harvesting plants.
- Adult supervision required when cooking food that requires an oven.
- For advice on cooking in school please check the ASE Be Safe! book and for further advice see CLEAPSS science.cleapss.org.uk

SCIENTIFIC VOCABULARY: Food

It is assumed that most children know, from their EYFS Stage experience, words such as food, fruit and vegetables, although they might not know how to write and spell them. You can download a Word Mat of essential vocabulary for this topic from *My Rising Stars*.

hygiene: the things we do to keep our body clean and help stop the spread of germs.

key words: bones / bread / change / chopping board / cook / dehydrate / digest / energy / fork fruit / frying pan / grow / heat / hot / hygiene / ingredients / knife / oven / rainbow / saucepan / spoon / strong / temperature / utensils / vegetables / whisk

PREPARE THE CLASSROOM

I am a scientist

- White laboratory coats (white shirts) for children to wear. You could limit these to, e.g., four to regulate the number of children using the area.
- Children's goggles or protective glasses to wear to help them take on the role of a scientist.
- Food packets
- Food group wheels
- Books on food, health and hygiene
- Food tasting sessions
- Recording sheets

6.1 Become a masterchef

GET STARTED

A 'masterchef', as the name suggests, is someone who is very good at their job, is able to run a kitchen and a team of chefs. A masterchef has in depth understanding of different kinds of food, knows about ingredients, can present food so that it looks appetising and understands the science of food (what happens to cause changes).

Importantly, a masterchef knows about and is in charge of safety in the kitchen (preventing cuts, scalds, burns, slips) and makes sure that hygiene is of the highest standard.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- What if a chef had dirty hands when he/she was cooking?
- What would happen to some food if you did not have a fridge?
- What do you think would happen if you only ate pizzas?

ACTIVITIES

1 WHAT DO WE NEED TO SURVIVE?

L.O. Find out about, and describe the basic needs of animals, including humans, for survival (water, food and air).

- Using a working wall children could work in pairs or groups to contribute to answering the question 'What do humans need to survive?
- Children will probably come to water and food quite quickly but might not appreciate that we need air to survive and without it we would die. Help children link their statement to the idea that they are animals, and other animals like reptiles, birds, fish, amphibians, invertebrates and mammals all need water, food and air to live.
- Children might suggest things like friends, family etc. and whilst biologically these are not essentials for life, they are very important, help children to discuss the difference.

ASSESSMENT

Subject Knowledge

- Em. Children can say that they need food and water to survive but might require help with the idea of air.
- Exp. Children can say that they need food, water and air to survive.
- Exc. Children know that humans (and therefore themselves) are animals and share the same basic needs for survival.

2 WHAT IS A MASTERCHEF?

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- Ask children to share what they know about chefs, and then ask them to think about what 'masterchef' means. Show children PowerPoint Slides 5–6 and talk about the kitchen utensils that cooks use. Encourage children to think of not only cooking but health, healthy foods, hygiene, leading and working in a team.
- For this activity, children's ideas could be written onto large chef hats.

YOU WILL NEED

- PowerPoint Slides 5–6
- Examples of kitchen utensils
- Chef's hats (see activity 4)

ASSESSMENT

Subject Knowledge

- Em. Children can say that a chef cooks and needs support with linking a chef to healthy food and washing hands etc.

- Explain to children that they are going to become 'little masterchefs' and learn about food, how to present food and how to be safe and hygienic, so that they can prepare food for their own special masterchef picnic.

- Exp. Children know that a cook needs to think about healthy foods and be hygienic.
- Exc. Children can explain what might happen if a chef does not follow hygiene rules.

3 HEALTH AND SAFETY

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- For this activity the class are going to think about a set of rules for working with food in the kitchen. Use PowerPoint Slide 7 to support discussion and remind them of their cooking rules from Year 1 (see Year 1 Activity Resources). Ask children if they can think of any others to add. You could also remind them of the hand washing rules they created in Topic 1: Healthy Me. Are they happy with these rules or do they think that there is something else they need to add or something that they need to change? The children then adopt these rules in their roles as 'masterchefs'.

YOU WILL NEED

- PowerPoint Slide 7

ASSESSMENT

Subject Knowledge

- Em. Children needs support to describe what they would do to stay safe and be hygienic when cooking.
- Exp. Children can create a set of basic rules for working with food in the kitchen.
- Exc. Children use personal knowledge of, e.g. germs, burns, cuts to explain why hygiene and working safely is important.

4 MAKE AND WEAR A CHEF'S HAT

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

- Activity Resource 6.1 helps children to design and make their chef's hat.
- Ask children to think about why chefs wear hats while preparing food (to prevent hair falling into food). Originally, the height of the hat represented the rank of the chef. The taller the hat, the more important the chef.
- Show children PowerPoint Slide 6 and talk about the materials children could use to make a hat e.g. white card and paper or crepe. Encourage the children to think about what the chef's hat looks like and how they think it has been made. If children need support then there are online videos that could support this activity. Once made, children should use them when preparing and cooking food along with their cookery aprons, and so follow their own health and safety guidelines for making sure they work safely and hygienically.

YOU WILL NEED

- Activity Resource 6.1
- Paper and card
- Glue
- PowerPoint Slide 6

ASSESSMENT

Subject Knowledge

- Em. Children can say that a chef wears a hat.
- Exp. Children know that a chef wears a hat to keep hair out of food.
- Exc. Children can explain wearing a hat to prevent hair falling into food and spreading germs.

5 WHAT ARE KITCHEN UTENSILS MADE FROM?

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

- This is a good opportunity for children to revise and apply previous knowledge about materials and find out how secure children are in their ideas. Use PowerPoint Slide 8 as a starting point and then give children a wide range of utensils and ask them how many different ways they can sort them.
- Suggestions for utensils may include: biscuit cutters, chopping boards, colanders, forks, graters, mashers, measuring jugs, measuring spoons, mixing bowls, rolling pins, sieves, spoons, tea towels, trays, whisks, oven gloves, pastry brushes.
- Encourage children to make their own choices. E.g., they might think about, material, forces used, job they do, size, shape, colour. You could add some categories if children do not include them, e.g. wood, metal, plastic or chop, whisk, pour, and squash, twist.

YOU WILL NEED

- Wide range of kitchen utensils
- PowerPoint Slide 8

ASSESSMENT

Subject Knowledge

- Em. Children can sort objects e.g. colour, materials. They require support explaining how they have sorted items.
- Exp. Children sort according to a variety of criteria.
- Exc. Children sort according to multiple criteria e.g. wooden and spoon.

Working Scientifically

- Em. Children have help to identify what objects are made from.
- Exp. Children identify and classify materials and record their observations.
- Exc. Children identify materials and link to subject knowledge about properties of materials.

6 SORT THE SHOPPING – KEEPING FOOD FRESH AND SAFE

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- Explain to children that you have had food delivered from the supermarket and it needs putting away in the right place. Where possible use real food, although obviously some will have to be empty containers or fake food.

The selection could include a range of food which represents the local community, e.g.: apples, noodles, okra, pasta, broccoli, cheese, rice, tomato sauce.

- You could create a 'pretend' freezer, fridge and cupboard for children to put the food into, or sort and place on large pictures of each. Use PowerPoint Slide 9 as a starting point for discussion.
- Ask children why different foods are place in different places, especially the fridge or freezer. The focus should be to develop children's understanding that some food needs to be kept cool or frozen to keep the food fresh and so that it does not begin to 'go off' which if eaten could make someone ill. Ask children if they have seen food that has started to 'go off' or rot, e.g. mouldy cheese, meat where the colour has changed or it smells bad. You could also use the interactive activity at his point.

YOU WILL NEED

- Range of different foods and food containers to represent typical regular shop
- PowerPoint Slide 9

ASSESSMENT

Subject Knowledge

- Em. Children can put food in different places but need help in say why.
- Exp. Children can say why they have put items in different places.
- Ex. Children can suggest new foods that could be put in the different areas and explain why relating to how the food might change and their health.

Working Scientifically

- Em. Children have help to identify what objects are made from.
- Exp. Children identify and classify materials and record their observations.
- Exc. Children identify materials and link to subject knowledge about properties of materials.

- Depending on what is in the shopping bags, you might need to include items such as a bread bin, banana tree or fruit bowl, since not all fresh food benefits from being placed in a cupboard, fridge or freezer.
- Discuss with children their choices, asking them to explain their reasons and helping them to think about whether a food has been put in the wrong place.

7 SORT THE SHOPPING – EATING AND DRINKING WELL

L.O. Identify and classify. Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- In this activity the term 'balanced diet' is replaced by 'eating and drinking well'. This term helps children to understand that we all need to eat foods that help us to grow and stay healthy. They are foods that:
  - give us energy. We can eat lots of bread, rice, pasta, cereals and potatoes, but not so much of chocolate, cakes and crisps.
  - help the body to grow and mend itself, such as meat, fish, nuts and eggs
  - help the body to grow and keep bones strong. Examples are milk, cheese and yoghurt
  - are good for our eyes, blood and helps us to digest food and go to the toilet. Examples are fruit and vegetables.
- Ask children why they need to drink water. It will be interesting to know what they think and if they understand that, like all animals, we need water to stay alive. This is because:
  - our blood is mainly water
  - water gets rid of waste products out of our kidneys and livers
  - it lubricates (oils) our joints
  - it keeps our eyes, mouths and nose tissues moist
  - it helps to keep our temperature the same.
- What children should know is that as soon as they feel thirsty, it means that they are already beginning to dehydrate (dry out) and they should have a drink as soon as possible.
- This activity uses the shopping again from the previous activity. Working in pairs ask the children to sort the shopping but this time into food groups, using the following labels (see above for definitions and examples) – 'Give us energy', 'Help the body to grow and mend itself', 'Help the body to grow and keep bones strong', 'Good for eyes, blood and helps us digest food and go to the toilet'.
- Discuss with children how they have classified the different items from the shopping bags and ask them to think about which types of food they eat a lot of and which foods they should eat more to help them stay healthy.
- In the following activities refer children back to different food groups in relation to the food that they cook.

ASSESSMENT

Subject Knowledge

- Em. Children can put food in different groups but need help in say why.
- Exp. Children can say why they have put items in different groups.
- Ex. Children can suggest new foods that could be put in the different areas and explain why relating to how the food might change and their health.

Working Scientifically

- Em. Children have help sorting foods.
- Exp. Children classify foods according to given criteria.
- Exc. Children classify foods and add to given criteria.

6.2 Let's get cooking!

GET STARTED

The role of the adult is to support children by asking questions, encouraging discussion and prompting children to:

- Choose – encourage children to discuss with their partner which ingredients and utensils they need to use so that they are working independently. Challenge them to explain their choices.
- Use senses – to smell, taste, look at, listen to and touch different ingredients, discussing, e.g., sweet, sour or bitter tastes.
- Measure – where appropriate use standard measures with increasing accuracy and check each other's results.
- Compare – encourage children to observe similarities and differences between ingredients and utensils using their senses. They might be the material they are made from (spoons) or what they do and look like (whisks).
- Predict – what will happen when ingredients are mixed, changes that take place, how using utensils changes mixtures, dough etc. Encourage children to think about changes that will happen when mixtures are heated.
- Explore – using different utensils, changing the recipe, changing the oven temperature (adult supervised) length of time, and noting effect of what they do.

LET'S THINK LIKE SCIENTISTS

Use these questions to develop research skills and speaking and listening:

- What do you think you should do before you begin cooking? Why?
- Which is your favourite healthy food?
- Which healthy food have you never tasted but would like to try?

ACTIVITIES

1 DESIGN, PREPARE AND COOK A VEGETABLE 'PIZZA-LICIOUS!'

L.O. Observe closely, using simple equipment.

Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- Start this section by using the video clip which shows a class designing and making pizzas (see *My Rising Stars*). Children will make their own pizza, using the ingredients either from the herbs and vegetables they have grown from Topic 5: Young gardeners, or provided by the adult. The pizza base could either be pre-packed or dough that the children make themselves. Use PowerPoint Slides 10 and 11 as a focus for discussion about making pizzas.
- The main science ideas to develop during this activity are, for children to be able to talk about:
  - why vegetables are good for people where different foods come from
  - how they can change the dough using forces such as squashing, twisting, stretching
  - which ingredients changed the most because of the heat.

YOU WILL NEED

- Pizza ingredients including: pizza base (or ingredients for dough), cheese, vegetables, herbs
- Access to kitchen
- PowerPoint Slides 10–11

ASSESSMENT

Subject Knowledge

- Em. Children follow hygiene rules.
- Exp. Children follow hygiene rules to make their own pizzas making healthy food choices.
- Exc. Children design a healthy pizza and can explain their choices.

- Most children will have eaten pizza, so you should be able to draw upon their experiences. Ask them to discuss what they know about pizzas with their partner or in their group and then share one thing from their group with the rest of the class.
- The adult could scribe children's comments on a large pizza on a display or interactive whiteboard. At this stage you could share a pizza recipe with them to compare with the ideas they have shared.
- Engage children in discussing where the different ingredients come from, e.g., the pizza dough is flour which comes from wheat, cheese from cow's milk, herbs from plants, carrots are a root, bell peppers a fruit, onions a bulb. If you have your own school vegetable patch, take the children out so that they can think about which of the vegetables and herbs they could use from their garden to make a pizza. This could include handling the herbs to see which ones they recognise from smelling pizza. Then, give each child a paper plate or large circle of paper and ask them to design their own vegetable 'Pizza-licious!' using either ingredients from the garden, or provided by the adult.
- When children have planned their pizza and discussed where the ingredients come from and their nutritional value, then give children an amount of pre-prepared pizza dough. If children are making their own dough, then make sure that children talk about personal hygiene and follow their own hygiene rules.
- Discuss with children how they can change the shape of the dough, using forces such as squashing, twisting and stretching. Then explain that they are going to follow their own design to make their pizza using the ingredients that they have chosen. Cooking is usually around 200–220°C for 10–15 minutes, after which they can share and eat.

Before and after children have eaten the pizza, they could:

- take photographs
- write comments on a 'Pizza Poster'. What did they think of their pizza? Did they grow their own vegetables and herbs? What do they think of it and how did it make them feel?
- compare the pizza before and after. What are the similarities and differences?
- talk about which ingredient has changed the most.

Working Scientifically

- Em. Children are directed towards observing changes.
- Exp. Children observe a range of changes using their senses.
- Exc. Children link changes to subject knowledge e.g. stretching, changes due to heat.

2 DESIGN YOUR OWN SALAD

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- There are many recipes for salad, leave some out for children to look at, some might follow a recipe, others might choose their own ingredients to make their salad. They could, e.g., create a salad that has mixed lettuce leaves, using those leaves they like the best.
- You could also refer children back to Topic 1: Healthy Me and ask them what they remember about rainbow colours in food. The children could then think about creating a 'Rainbow Salad' using crops they have grown and some that the adult might provide. Use PowerPoint Slide 12.

YOU WILL NEED

- Different recipes for salad
- Salad ingredients including anything grown as part of Topic 5: e.g. tomatoes, bell peppers, broccoli, grated carrots, raisins, show children
- PowerPoint Slide 12

- Children could create their own written or pictorial recipe and write a sentence to say why it is a healthy salad. Some children could make a short video – their own cookery programme where they demonstrate and explain how to make their salad.
- Talk about how just eating salad might not be balanced, and extend children's understanding of different food groups by introducing, e.g., cheese which is good for bones, the memory and the heart.
- Finally the children should decide how to keep their salad fresh for their picnic.

ASSESSMENT

Subject Knowledge

- Em. Children choose items to put in their salad, they need support to say why they are using them.
- Exp. Children design and make their own salad and explain their choices.
- Exc. Children choose foods and link them to how they help people to keep healthy e.g. carrots for healthy eyes.

3 CARROT AND COURGETTE MUFFINS

L.O. Observe closely, using simple equipment.

Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- Muffins are often seen as unhealthy because they can be made with lots of sugar. Carrot and courgette muffins are a healthy and very tasty alternatives and it is important that children have the opportunity to taste healthy options.
- The aim of the recipes is to show how many different ways food from the garden can be cooked. So far we have had pizza and salad.
- In this recipe the children cook muffins, which are usually seen as a sweet cake. Here, they are savoury, but just as tasty.

As children use Activity Resource 6.2: Carrot and Courgette Muffins, ask them to think about the different ingredients, e.g.:

- How does it help the body?
- Where does the food come from? Which part of a plant? Is it from an animal?
- As children prepare and cook the muffins encourage them to talk with their partner about the changes that take place.
- How do foods change? E.g. grating carrots and courgettes, whisking an egg, adding milk and oil.
- What are the differences between uncooked and cooked carrots and courgettes?
- Which ingredient do you think causes the mixture to rise so the muffins are big?
- What do you think would happen if we did not include baking powder?
- How could we find out how the different ingredients help to keep us healthy, e.g. carrots, courgettes, egg, milk?

The children should decide how to keep their courgette muffins for their picnic, so that they stay fresh and do not get squashed.

YOU WILL NEED

- See Activity Resource 6.2 for detailed ingredients
- Access to kitchen

ASSESSMENT

Subject Knowledge

- Em. Children make muffins, they can talk about the process and taste.
- Exp. Children can say what they have used to make their muffins healthy food.
- Exc. Children can explain how different ingredients help to keep them healthy.

Working Scientifically

- Em. Children are directed towards observing changes.
- Exp. Children observe a range of changes using their senses.
- Exc. Children link changes to subject knowledge e.g. changes due to mixing ingredients, heat.

4 BREAD TASTING

L.O. Identify and classify. Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- Discuss with children why bread is a good thing to eat (as with all foods in moderation), how does it help to keep our body healthy? You could offer children books, website or leaflets so that they can research information to help them answer the question.
- Use PowerPoint Slides 13,14 and 15 to support discussion about different breads and to scaffold language and questions. Arrange a bread tasting session, offering children 1cm – 2 cm cubes of bread to try.
- As children try each type of bread, they complete Activity Resource 6.3: Tasting Breads, where children use their senses to explore each bread and record their observations.
- Which bread do children already know? What have children found out about bread? Which is their favourite new bread? What do they like about that bread?
- What kind of food do they think would go well with different kinds of bread?
- Which bread will they choose for their sandwich? What would they use to make a healthy sandwich?

YOU WILL NEED

- Range of common breads to be found in food stores, that represent as well as introduce children to bread from different countries and cultures: bagels, ciabatta, focaccia, granary, naan, pitta
- PowerPoint Slides 13–15
- Activity resource 6.3

ASSESSMENT

Subject Knowledge

- Em. Children can talk about the different breads they have tasted.
- Exp. Children can say what they have found out about bread and why it is a healthy food.
- Exc. Children can talk about the importance of not eating too much bread.

Working Scientifically

- Em. Children have help sorting and naming breads.
- Exp. Children classify breads according to given criteria.
- Exc. Children classify breads and add to given criteria.

5 HOW CAN WE KEEP OUR MUFFINS AND BREAD FRESH?

L.O. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
Perform simple tests.
Using their observations and ideas to suggest answers to questions.
Gather and record data to help answering questions.

- Use the idea of children making food to go on a picnic and the need to keep their muffins and bread fresh. Children could work in pairs or small groups and share their ideas about what happens to bread if it is left out and how they could keep their bread fresh for the picnic.
- Give children a choice of wrappings and challenge them to plan a simple test to find out which one keeps the bread and muffins fresh the longest. You could use a paper bag, plastic bag, greaseproof paper and aluminium foil and no wrapping at all.

YOU WILL NEED

- Bread and muffins from previous activities
- Range of different wrappings

ASSESSMENT

Subject Knowledge

- Exp. Children link the properties of the materials used for wrappers to the results.
- Exp. Children use their results and knowledge of properties of materials to support their choices for the best wrapper.

- Encourage children to think about:
  - What do we want to find out?
  - What do we think we will do?
  - What will we need?
  - How will we keep it fair? (if children are at this stage?)
  - What should we measure?
  - How will we record what happens?
- What is the answer to our question?
- How will we tell other people what we did and what we found out?

Working Scientifically

- Em. Children need support to carry out a comparative test between two types of wrappers.
- Exp. Children plan, carry out a test and use their observations to answer the question.
- Exc. Children are able to carry out their test and suggest reasons why one wrapper is better than another.

6 FRUIT CHOICE

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- Give children a small pot and allow them to taste and choose a five-piece rainbow fruit salad to take on their picnic.
- Use PowerPoint Slide 16 to show how they could make a Rainbow Fruit Kebab Children could also make lemonade to take on the picnic (Activity Resource 6.5).
- Discuss the foods they have tasted and talk about how different fruits help them e.g. kiwis help us to fight infection so do strawberries which also help to keep our hearts healthy.

YOU WILL NEED

- Ingredients for fruit salad e.g. apple, grapes, kiwi, mango, melon, orange, pear, pineapple, raisins, strawberries
- PowerPoint Slide 16
- Activity Resource 6.4

ASSESSMENT

Subject Knowledge

- Em. Children can talk about the different fruits they have tasted.
- Exp. Children can say what they have found out about different fruits and why fruit is healthy food.
- Exc. Children can talk about health benefits of specific fruits.

7 DESIGN AND MAKE A SANDWICH

L.O. Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.

- Children design and make a sandwich using the bread that they have chosen from the bread tasting activity. You could use PowerPoint Slide 17 as a starter for discussion. Aim to offer children a range of fillings that represent the different food groups. Ask children to make a sandwich that will keep them healthy. They can include boiled eggs and produce from their garden, such as chives, cress, lettuce, tomatoes, and spring onions.
- Prompt children to think about and act on being hygienic when they make their sandwiches.
- Children explain how they made their sandwich and what makes it healthy. Create a sandwich book using Activity Resource 6.5. Once made, they wrap their sandwich in the material they found to be best for keeping it fresh, ready to take to the picnic.

YOU WILL NEED

- Activity Resource 6.5
- PowerPoint Slide 17

ASSESSMENT

Subject Knowledge

- Em. Children make a sandwich and are able to work hygienically.
- Exp. Children say how they have healthy food choices and worked hygienically.
- Exc. Children can explain their choices help to keep them healthy and why working hygienically is important.

September and October

Do these photocopiable activities with your class throughout the year.

HOW WILL WE REMEMBER?

Look back on what you found out last year, compare what you did and what you found out? Is it the same as last year? How will you record the changes in September and October? You could use:

- Photographs
- Collect and stick in a book
- Journey sticks
- Weather records
- Easi-Speak™ mics, Talk Buttons, Talk Cards.
- Monthly calendar or PowerPoint
- Diaries

COLLECTING SEASONAL WORDS

Autumn Change Collect Daylight Dispersal Fruit Photograph Sunrise Sunset Weather

WEATHER

- Keep a weather chart
- Have a class rota, a group in charge each week.
- Take measurements, e.g. temperature, how much rainfall, how much sunshine during the day.
- Put the temperature on graph or put rainfall or sunshine hours on a bar chart.
- How does the weather change over September and October?
- Compare it to weather the same time last year.

AUTUMN PHOTOGRAPHER

- Take some photographs of autumn around your school grounds, walking to and from school and around your home.
- Look at your photographs, what is it in your photographs that tell you it is autumn?
- Make a mini photographs album using your pictures.
- Write a sentence next to your photograph saying what the signs of autumn are.
- Which is your favourite photograph? Why?

SEED COLLECTOR

- What kind of seeds can you find in your school grounds, local park or even in your garden home?
- Make a collection.
- Find out which plant the seeds belong to.
- Do your seeds have a seed case?
- What is the seed case like? Prickly? Hard?

ADOPT A PLANT?

- Adopt a plant. Become an expert in the plant.
- Follow the plant through the year and record the changes, e.g. sketches, photos, video diary.
- What would you like to know about your plant?
- What questions can you ask? Use the questions stem cards (Activity Resource 2.2).
- Find the answers to your questions.
- You are the expert in the plant you have chosen, how will you share what you know with others.

WHERE ARE THE ANIMALS?

- Where are the animals in your school grounds?
- Look for animals.
- Sketch animals that you see.
- Take a photograph of where you found or saw the animal.
- What have you found:
  - A bird
  - An invertebrate
  - A mammal
  - An amphibian
- Back in the classroom find out more about the animals that you saw.

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SPIDER MAP

- As the days get cooler it is easier to see spiders' webs particularly in the mornings.
- Where do spiders live in your school ground, local park, garden at home?
- How can you record where spiders are found in your school grounds, local park, garden at home?
- How many different types of spider can you find? What are they called?
- What else would you like to find out about spiders?
- Jot down your questions.
- See how many questions you can find the answers to.

SEED DISPERSAL

- How many different seeds (fruits) can you find in September and October? Collect the seeds (fruits) and take photographs of them.
- Find out which trees the seeds (fruits) belong to?
- What is each seed like? Big, small, round, oval, shiny?
- What could you do so that the seed germinates and grows into a plant.
- Which part of the seed helps it to move away from the parent tree?
- Which animals eat the seed?
- Which is your favourite seed? Why?

STICKY SOCKS

- Go for a walk in a wood or through some grass.
- Put a pair of socks on over your shoes.
- Walk through the wood or grass area with your sticky socks.
- When you have finished take the socks off and see if you have collected any seeds on your socks.
- Take the seeds off the socks, what are they like? How did they stick to your socks? What else could stick to your sticky socks in the wood or grass?
- This is a type of seed dispersal, what other ways do plants disperse their seeds?
- Why is this a good way to disperse seeds?
- How many other kinds of seeds can you find in September and October?

COLOUR CHANGES STRIP

- What are the main colours in each month of the year? Is it green, brown, grey, white, yellow?
- Make a colour strip for each month and compare months. You could use paint colour cards, or make an artist's palette with the colours of that month.
- What are the main colours for September and October?

WEATHER SAYINGS

- How could you find out if this saying is true?

Cats scratch a post before wind; Wash their faces before a rain; and sit with backs to the fire before snow.

- In your school grounds which is North, South, East, West?

WINDSOCK

- Do you know what a windsock is and what it is used for?
- Find out all about windsocks?
- Now design, make and test your wind sock?
- Where could you put it in the school grounds?
- Use your windsock each month, compare your information each month.
- Which is the windiest month?
- Which is the calmest month?

NOVEMBER AND DECEMBER

- Look at the temperatures for September, October, November and December last year,
- What do you think that the temperatures will be like in September, October, November and December this year?
- In an Easi-Speak mic, say what you think the temperature will be like.

November and December

HEALTH AND SAFETY

When growing bulbs please note that hyacinth bulbs are harmful if eaten or handled. Handling hyacinth bulbs can cause mild skin irritation. Please see ASE's *Be Safe!* or visit CLEAPSS *www.cleapss.org.uk*

COMPARE THE CHANGES

- Think back to September and October, look at what you found out.
- What do you think is the biggest difference between then and now? Take photographs to show what is different.
- What do you think has stayed the same? Make a list. Take photographs to show what has stayed the same.

If you could call the months November and December different names, what would you call them? Why have you chosen those names?

- Don't forget to use your windsock and record your results. Were November and December windier than September and October?

Don't forget to use your colour chart or palette. What are the colours of November and December?

SILHOUETTES

- Look for deciduous trees which are bare and have no leaves, are there any in your school grounds, local park, on your way or in your garden at home?
- What shape is the silhouette (outline)? Is it a triangle, oval, bell shape?
- Take a photograph of the tree or make a sketch of its shape.
- Look at paintings of tree silhouettes, how have the artists painted them?
- What colours have the artists used?
- Which one do you like best? Why?
- How can you use what you have learned from the artists to paint the silhouette of your tree?
- What will you call your painting?
- You could put your painting in a class art exhibition.
- Look at the paintings by other children in your class. What do you like about them?

Leave a post it next to someone else's painting with a comment about what you like.

YOUR ADOPTED PLANT

- What is your plant like during November and December?
- Has it changed?
- How has it changed? Is it still the same size, shape, colour, does it still have leaves, flowers, stem?
- What is the biggest change in your plant since September and October?

COLLECTING SEASONAL WORDS

Bulb Coniferous Deciduous Dormant Fog Freezing Frost Hibernate Hibernation Torrential

GROWING BULBS INDOORS

- What does your bulb look like? Draw your bulb.
- What kind of plant will your bulb grow into? A hyacinth, daffodil, crocus, snowdrop, daffodil?
- What will you have to do to help your bulb grow and flower indoors?
- Take photographs of your bulb.
- Write or draw a 'How to look after your bulb' leaflet.
- Design and make a container for you bulb and its pot?
- What materials will you use? Why?
- How will you decorate your pot?
- Perhaps you could take your bulb home as a gift?

TWIG PICTURES AND TWIG SCULPTURES

- Collect twigs of different shapes and sizes.
- Use your twigs to make a picture.
- Use your twigs to make a sculpture.
- Look at pictures and sculptures made by other people in your class.
- What do you like about their work?

KEEPING LEAVES

- How do you think you could keep leaves?
- How could you stop them from drying out and going wrinkly?
- What ideas have you got?
- Which ones could you try?
- Which one worked best?

KEEPING WARM

- Humans need to keep warm in winter and so do some animals, for example, a woodmouse.
- Find a picture of a woodmouse.
- What would you like to find out about woodmice?
- Make a list of your questions.
- Find out the answers to your questions.
- You could make a mini book about woodmice.
- Design and make a home for a woodmouse.
- What will it look like?
- What kind of materials will you use?
- Which natural materials could you use?

FEEDING THE BIRDS

- Which birds visit your school grounds, do you see on the way to and from school, in your local park or at home?
- Are there any birds that you saw last summer or in the autumn that you do not see now?
- Where have they gone?
- What problems do you think the birds that you see have during the winter months?
- What do you think you could do to help them?
- Where could you find out information about birds in winter?
- Find out about the RSPB. Share what you find out with other people in your class.

HOW IS THE WEATHER AFFECTING WHAT WE WEAR AND DO?

- What kind of materials do we wear in winter?
- Which materials are gloves and scarves made from?
- What kind of materials keep you warm and which materials do not?
- What is different about them?
- What do they look like under a computer microscope or a hand lens?

MOON WATCH

- Choose a clear night when there are no clouds. Look at the sky at night.
- What does the Moon look like?
- Does the shape of the Moon stay the same?
- Look at the Moon on different nights keep a Moon diary. What do you notice?
- Can you see craters on the Moon?
- You could borrow some binoculars to look at the Moon.
- Have humans ever walked on the Moon? Find out.
- What would you want to find out if you could visit the Moon?

January and February

COMPARING THE CHANGES

- Look at the pictures and photographs from September to December.
- How are January and February the same as the other months?
- How are January and February different to the other months?
- Which season are we in?
- How are our school grounds the same and different?
- How has the temperature changed? Are January and February colder or warmer than September to December?
- Don't forget to use your windsock and colour palette this month.

GROWING POTATOES

- 'Seed' potatoes begin to appear for sale in garden centres in January for example, early croppers such as Arran Pilot.
- Have a planting potato competition: who can grow the heaviest crop of potatoes?
- Find out all about potatoes and growing them.
- Become a 'Potato Expert'.

BUILDING SNOWMEN

- How can we stop our snowman from melting?
- How can we find out?
- Do smaller snowmen last longer than larger snowmen?
- Does it matter where we build our snowmen, in shade or sun?
- What kind of snow sculptures can we make?
- Have a snow sculpture exhibition in the school grounds.

SEARCHING FOR SIGNS OF LIFE

- What is happening in our school grounds?
- When did you see the first shoots pushing through?
- Which bulbs that we planted are beginning to push through?
- Where are they?
- Which plants do we think they are?
- Photograph the plants.
- You could search online for a time lapse of a daffodil bulb

COLLECTING SEASONAL WORDS

Blizzard Change Clear Cold Coldest Freezing point Gritting Icy Liquid Melt Perishing Scrape Sledge Sleet Slide Slip Snowballs Snowman Solid

WEATHER PICTURES

- Take photographs of frost and snow.
- What are people wearing?
- What are trees like with snow on?
- What do other plants look like in the snow and ice?
- What is the sky like on frosty and snowy days?

ICE BLOCKS

- How can we make ice blocks?
- Where will we put them in the school grounds?
- Where in the school grounds do we think they would stay frozen the longest?
- Where do we think they would melt the quickest?
- Why do they melt and stay frozen in different parts of the school grounds?
- What is the temperature like in those places?

ICE SPOTS AROUND SCHOOL

- Which parts of the school have the most ice?
- Where does the ice last all day?
- Where does the ice melt first in the school grounds?
- Why do some places have ice all day and others the ice melts quickly?
- What is the temperature like in those places?
- Make a map of icy places in the school grounds.

THE SUN

Important: We must never stare straight at the Sun, it can damage our eyes.

- What is the sun like during January and February?
- Is it low in the sky?
- On what kind of days do we have a lot of sunshine?

What time does the sun start to go down? E.g. whilst we are still at school?

- How much sunshine do we get each day?
- How could we work out how much sunshine there is each day?

SLIPPING AND SLIDING

- Why is ice dangerous on the roads and pavements?
- What kind of shoes are best for walking to school when it is icy?
- How can we find out and also stay safe?

HOW IS THE WEATHER AFFECTING WHAT WE WEAR AND DO?

- How do we keep warm?
- What kind of clothes do we wear?
- What are the materials like?
- How do animals keep warm?
- Where have some of the animals gone?
- Which animals hibernate?
- Why do they hibernate?

WEATHER SAYINGS

- Are these really true?
- Open crocus, warm weather. Closed crocus, cold weather
- Clear moon, frost soon.
- What other weather sayings do you know? Ask people at home if they know any.

STARRY NIGHTS

- What does an astronomer do?
- Choose a clear night when there are no clouds. Look at the sky at night.
- What do you notice?
- What patterns can you see in the stars?
- Draw a pattern that you can see.
- Give it a name.
- Share it with people in your class.
- Find out what the Moon looks like

March and April

COMPARING THE CHANGES

- What is happening in your school grounds, local park, on the way to school and in your garden that is different to November and December?
- What are the signs that spring has arrived?
- What is the biggest change outdoors?
- What has stayed the same?

BIRD NESTS

- Which birds visit your school grounds, local park, your garden?
- Find out what kinds of nests the different birds build.
- How do birds use their beaks when nest building?
- Choose one of those birds and try to build a nest in the same way that the bird does.
- Take photographs of your nest and the materials you have used.
- Annotate your photograph to explain how the nest is built.

HELPING BIRDS NEST

- Find out how you can help birds when they are nesting.
- For example leave out natural fibres and pieces of plant materials for birds to collect. Where do you think is the best place to put them?
- House martins, song thrushes and blackbirds use mud in the construction of their nests. How could you help these birds?

WHAT IS HAPPENING TO INVERTEBRATES?

- Which invertebrates have you seen about?
- How many different kinds can you spot?
- Find out the name of the invertebrates.
- You could use
- www.uksafari.com/news1

BIRD WATCH

- Where is the best place in your school grounds to bird watch?
- Organise a rota in your class to bird watch to find out what birds are doing this time of year.
- How will you recognise each type of bird?
- Make a grid to record your observations that everyone can use.
- Look at the data you collect and think about what you are finding out about what birds do this time of year.

COLLECTING SEASONAL WORDS

Bird watch Build Construct Data Direction East West Fibres Information Materials Nests North Showers South Wind

WEATHER SAYINGS

- Do you think these sayings are true or false? How could you find out?
- *A sunny shower won't last an hour.*
- *A wind from the south has rain in its mouth*
- People talk about 'April showers'. Keep a tally chart of how many rain showers there were in April.

SUNRISE AND SUNSET

- When does the sunrise and when does the sun set?
- Look back over the months, did the sun always rise and set at this time?

SPRING FLOWERS

- Which plants are flowering in March and April? Do any of the trees have blossom on them?
- How many different flowers and tree blossoms can you find?
- How many can you find out the names of?
- How have the colours in the school grounds, local park and your garden changed?
- Have you made your new colour palette for March and April? How have the colours changed?

MAKE A 'SPRING WATCH' VIDEO

- Make a Spring watch video.
- What will you show people?
- What will you tell people?
- Which important changes will you talk about?
- Who will you show the video to?

WEATHER WATCH

- How does the weather change in March and April?
- Find out how the temperature has changed since January and February?
- Is it wetter or dryer in March and April than it was in January and February?
- Does the wind come from the North, South, East or West?
- Is it a different direction than during January and February?
- Is the wind stronger in March and April than January and February? Use your windsock.

CONTINUE YOUR SPRING WATCH DIARY

- Continue your Spring watch diary that you started in February.
- What will you photograph?
- What will you sketch?
- What are the animals doing?
- What is happening to plants?
- What are you doing that is different?
- How does the weather change what you do?

LOOKING BACK

- Look at your photographs, diaries, charts for September through to now.
- How have the seasons changed?
- Which month has been your favourite so far? Why?
- Which month was not your favourite, why?
- What do you think May and June will be like?

May and June

SUMMER IS HERE

- How do we know that summer is here?
- How are May and June different to the other months?
- What is the biggest change in the school grounds?
- What is the biggest change in the weather?
- How do these months feel?
- What do you like best about them?

ON THE GROUND

- Get a hoop. Lay it on the grass. How many different plants can you spot in the grass? Can you find more than five?
- Pick a leaf from each plant and stick it to a piece of paper. Find out which plant the leaf belongs to?
- What else can you find in your patch of grass? Are there any flowers, animals or evidence of humans?

MAKE A HANGING GARDEN

- What will you use as a container?
- Where will you hang it?
- What plants will you put inside your container?
- Can you plant strawberries or tomatoes in your hanging container?

WHERE DOES THE WATER GO?

- Where do you think water goes?
- Make a puddle on the school playground. What happens to it over a day, two days etc.?
- Where does the water go?
- Which is the best kind of day to hang washing out to dry, cloudy, sunny, windy, calm? How can you find out?
- Where do you think the water goes from the clothes as they dry?

SHADOW STICK

- How do shadows in the school grounds change during the day?
- Put up a Shadow Stick, what happens to the stick's shadow during the day?
- Would the same happen to your shadow? How could you find out?
- How could you tell the time using the Shadow Stick or your shadow?

THE GARDEN

- What is happening in your school garden or your garden at home?
- Which plants are weeds?
  Why don't gardeners like weeds?
- How can you stop weeds from growing in a garden?
- Be a weed spotter, get to know your weeds, identify weeds.
- How do weeds spread?

BEING OUTSIDE

- What do you like to do outside?
- Take a book outside and find a space to sit and read it. Which was better reading inside or outside? Why?
- How do you think being outside can help you to learn?
- What kind of things would you like to do outside? Make a plan of what you will do with your time outside at playtime or dinner time.
- What could teachers do to make playtime and dinner time outside more fun and interesting?
- Design a special seat for reading outside.

BLINDFOLD TRAIL

- Blindfold a partner and take them on a blindfold trail around your school grounds.
- Stop at different places, ask your friend what they can hear, smell and feel.
- Can they guess what the things are?
- What clues can you give them?
- Ask your friend to blindfold you so that they take you on a blindfold trail.
- What was it like? How did you feel being blindfolded?
- Did you get better at working out what you were hearing, feeling and smelling?

SOIL

- Collect some soil from your school grounds.
- Put it on a paper plate or a large piece of paper.
- Use tweezers.
- Find out what the soil is made up of?
- Sort the things that you find in your soil into groups.
- How many different groups did you make?
- What have you learned about what makes up soil?
- Take some of your soil, what does it feel like?
- Is it sticky, crumbly, warm, cold?
- Can it be made into a ball?
- Is all the soil in your school grounds the same?
- Is the soil that you have at home the same as in the school grounds? How is it the same and how is it different?

MICROSCOPES AND HAND LENSES

- Look closely at lots of things from the school grounds, invertebrates, blossom, leaves, stones, soil, feathers.
- What do they look like under a microscope or hand lens?
- Sketch what you see.
- Take digital microscope pictures.
- Which object is the most interesting, why?
- Which object is the most surprising when you look at it closely? Why?
- Which object is the most beautiful, why?

July and August

LOOKING BACK

- Look back at your pictures on the seasons since last September.
- What is the same in the pictures?
- What has changed in the pictures?
- What do you think July and August will be like?
- What will the weather be like?
- What will you wear?
- What will you do?
- What do you think is good about summer? Why?
- Is there anything that you don't like about summer? Why?

OUTSIDE WITH BOATS

- What kind of things float and sink?
- Make a boat, what will you use? Make your boat out of materials that can be recycled.
- How much can your boat carry? How can you find out?
- How can you make your boat move without touching it?
- Could your boat carry a Gingerbread Man across a pretend stream, without getting the Gingerbread Man wet?

MAKE A SUMMER POSTCARD

- Draw a picture of your favourite summer picture on a postcard. What will you draw? Animals, plants, a holiday scene, a sporting scene, you with friends or family.
- Send it to someone you know, make sure you put their address on, make sure you write a sentence telling them something about the summer.

FLOWER HUNT

- Go on a flower hunt. Take a camera, and photograph different flowers. Make a flower photo album and find out the names of each flower.
- How could you find out what they care called? Could you look in a book, ask someone in your family?
- Which is your favourite flower? Why?
- Paint a picture or make a collage of your favourite flower.

SUMMER WORDS

Bees Birds Butterflies Caterpillars Colours Cool Flowers Heat Insects Shadows Sun Sunburn Temperature

SHADOW PLAYTIME

- What kind of shadows can you make outside at playtime?
- How can you make a really big shadow?
- How can you make a really small shadow?
- Make a monster shadow?
- Make an animal shadow? Which animal can you make?
- Join with a friend. What kind of shadows can you make together?
- Join with lots of friends. What kind of shadows can you make together?
- Play shadow chase. Catch someone else's shadow by jumping on the shadow.
- What can you find in the school grounds or at home to make an unusual shadow? Show everyone.

SEED EGG

- If you have clay or heavy soil, use this.
- Make a hollow egg shape with hole in it from the clay, let it dry.
- Fill the clay with seeds, e.g. grass seeds, wildflower seeds, salad crop seeds.
- Where will you throw your Seed Egg so that the seeds will grow?
- Throw it, leave it for several weeks. What happens?

BINOCULAR WATCH

- Take a pair of binoculars outside, what can you see with them?
- What can you see more clearly than without the binoculars?
- Which birds can you spot with them?
- Look back at your Seasonal Change book, are the birds different or the same as those that you saw in September, January, March?

MAKE A NEW OUTDOORS SUMMER GAME TO KEEP YOU FIT.

- With a friend make up a game to play outdoors during the summer to help to keep you fit.
- What will you use? Hoops, balls, bean bags, skipping ropes?
- How will you game keep you fit? Which part of the body does it use?
- Share your game with other people in your class?
- Teach your game to children from Foundation Stage.
- Teach your family to play your outdoors game.

HOW WILL IT CHANGE?

- Choose a plant with a flower.
- Draw a picture of it, as it is now.
- Draw a picture of what you think it will look like tomorrow, the same day next week and the same day next month.
- Keep your drawings and then look at them – does the plant look the same as in your picture? How is it different?
- How good do you think your predictions were? Good, very good or not good. Why do you think that?

HAVE A PICNIC

- Where is the best place in your school grounds to have a picnic even if you don't have much grass?
- Where is the best place to have a picnic near your school?
- Design a menu for your picnic? What could you make at school? What kind of healthy foods can you use?
- How will you make sure that you are 'sun safe' on your picnic?
- What games could you play whilst on your picnic?
- How will you keep your food cool and make sure it does not get squashed?

BIRDWATCH

- Which birds visit your school grounds?
- How many different birds can you spot?
- Look out for birds on the way to and from school?
- Which birds did you see?
- What did they look like? Find out their names.
- Which is the biggest? Which is the smallest?
- Which birds do you see at home, add those to your list?
- Can you reach five different birds as your target? Make a new target – can you reach your target?

MEASURE UP

- With a friend take a tape measure outside and measure whatever you like.
- Which is the largest thing that you can measure?
- Which is the smallest thing you can measure?
- How will you record your measurements?
- What else can you measure outside, for example, temperature, light and sound?
- What have you found out using your measurements? For example, lightest, darkest place, quietest and noisiest, biggest and smallest.

END OF YEAR ASSESSMENT

- Em. Children use the Big Book as support to talk about changes across the four seasons. They can talk about the weather pictures and with support say that days are long in the summer and short in the winter.
- Exp. Children talk about changes in the plants and animals in the school grounds or local environment across the year. They know that days get longer and shorter and link certain weather to different seasons.
- Exc. Children link different aspects of seasonal change, such as, weather getting warmer with birds nesting, bees appearing, identify plants, e.g. snowdrops, daffodils. They know that day length varies and humans also change what they do during the year.

1.1 Healthy Me Certificate

Healthy Me Award

Physical health

Healthy eating

Healthy relationships

To _____

- **I know what I can do to be safe and happy.**
- **I know that exercise is good for me.**
- **I know what kinds of foods help me to stay healthy.**
- **I know that personal hygiene is important to keep me healthy.**

Signed _____ **Date** _____

1.2 How Does It Help?

	Activity name	Keeps our hearts healthy	Strengthens our muscles	Helps to keep us flexible	Makes us feel good
1					
2					
3					
4					
5					
6					
7					

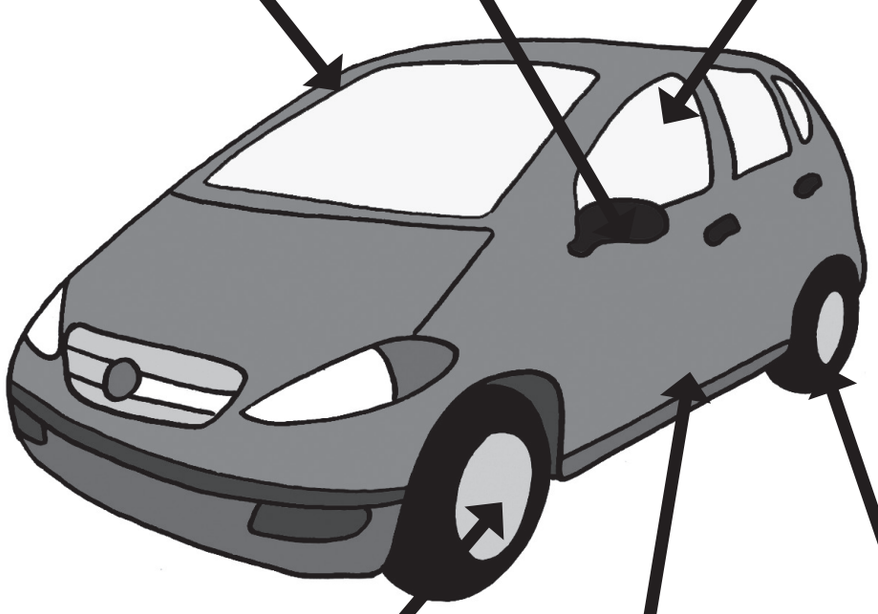
2.1 Monster Materials

Material	Is it cold or warm to touch?	Is it flexible?	Hard or soft?	Does it make a ringing sound when tapped?	Can it be squashed or stretched?	Is it shiny or dull?
Fabric						
Metal						
Paper						
Plastic						
Wood						
Wool						

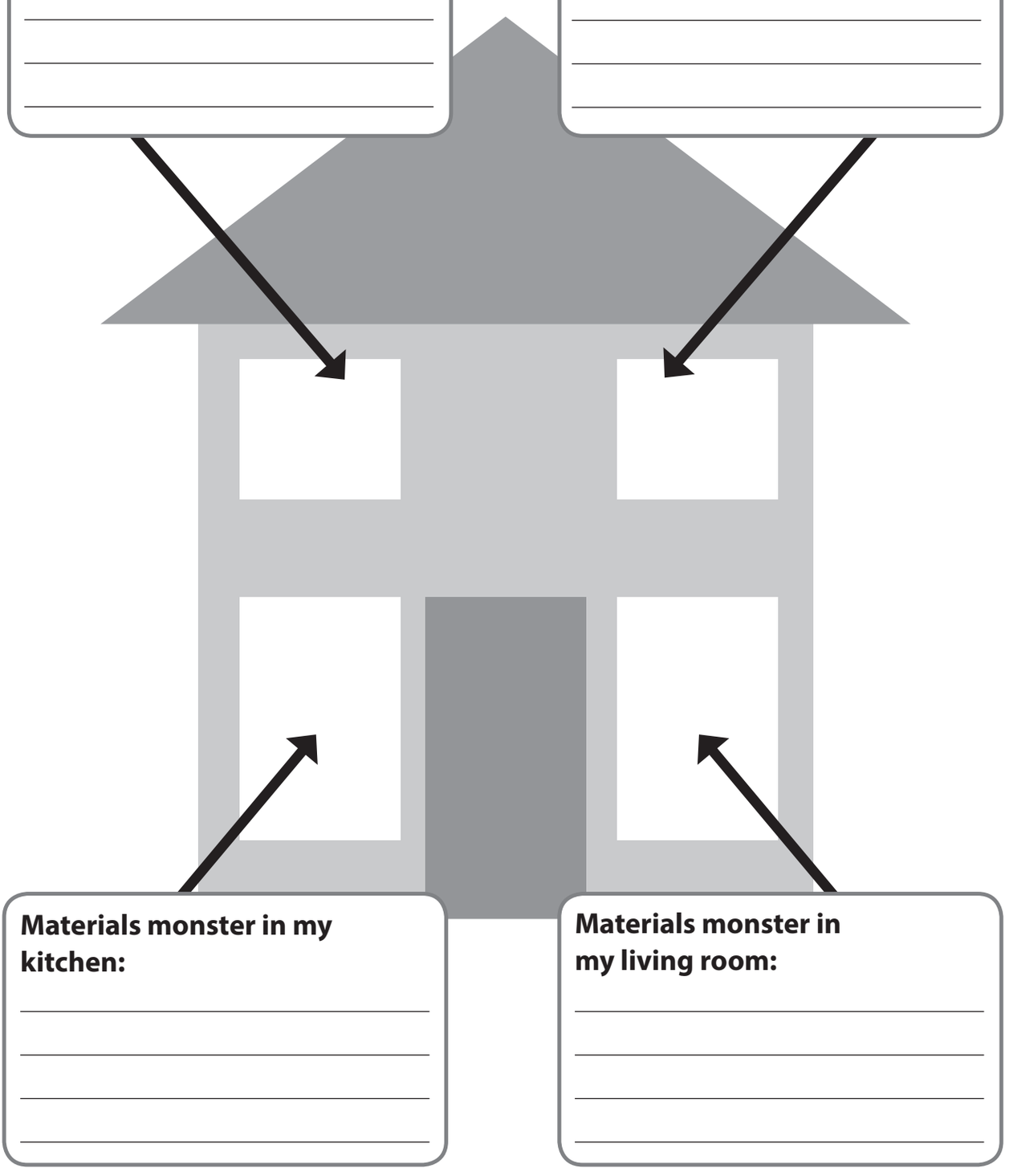
2.2 Question Stems

What . . .	**Where . . .**
How . . .	**When . . .**
Why . . .	**What if . . .**
Which . . .	**Do . . .**
If . . .	**Would . . .**
Can . . .	**Should . . .**

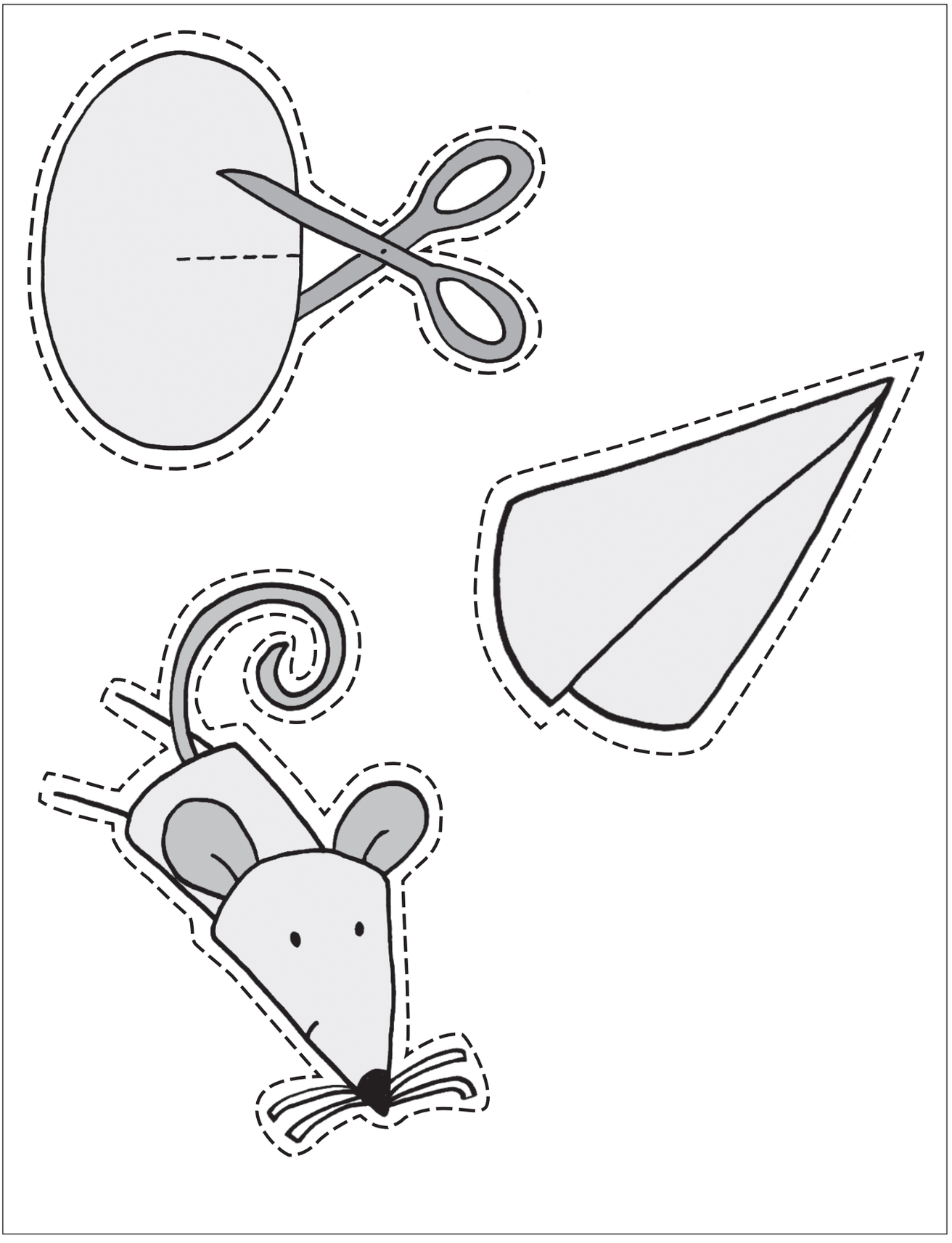
2.3 Materials Monster Car



2.4 Materials Monster House



3.1 Flying Mouse



3.2 Straw Rocket

1. Get a plastic drinking straw.

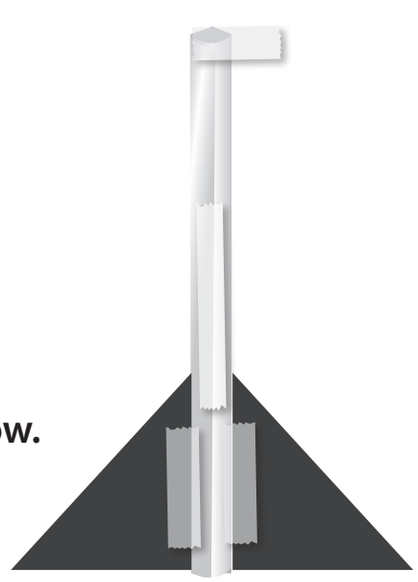
2. Cut a piece of paper and wrap it round the straw.
Leave room between the straw and the paper.

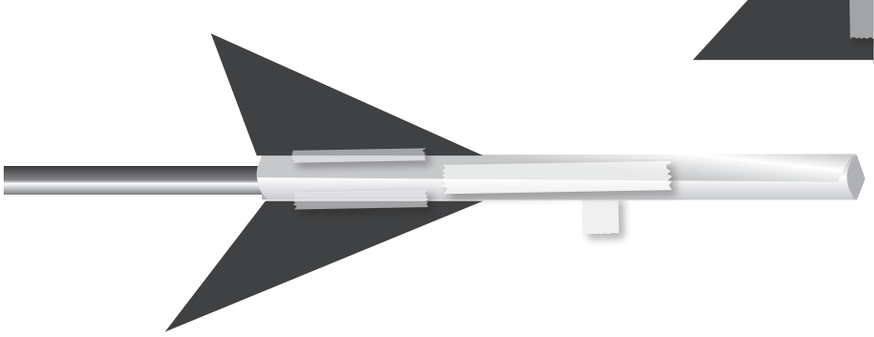
3. Sellotape the paper.

4. Make three rocket fins and put them onto your paper rocket.

5. Sellotape one end of the rocket together (this is the nose).

6. Make sure that you will not hit anyone.
Put the straw inside your rocket and blow.
How far did it go?





5.1 Our Seeds

How deep should you sow the seeds?

We are sowing

..... **seeds**

How far apart should you sow your seeds?

When the plant has grown it will look like this.

How tall will the plant grow?

What does it need to grow?

- ☐ **Sunny place**
- ☐ **Shady place**
- ☐ **Partly sunny and partly shady**

How many days will it take for the seeds to germinate?

5.2 Plant Pots

5.3 Quirky Containers

SWITCHED ON Science Second Edition

What will you grow your plants in?

Quirky plant pots

© unpict / shutterstock

© Imfoto / shutterstock

Day	Height

What will your plant need to grow?

What is the name of your plant?

Are you growing a seed or a bulb?

Will your plant grow into a flower, vegetable or a fruit?

6.1 Chef's Hat

Design and make your own chef's hat to wear when you are cooking.

Which is best, paper or card?

What will you need to make the hat?

How many different parts do you think the hat has?

How will you know how big to make the hat?

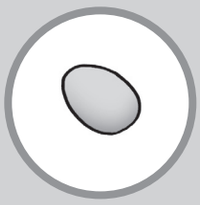
How will you make sure the hat stays on your head?

6.2 Carrot and Courgette Muffins

You will need:


1 courgette 20g


1 carrot 20g


1 egg

2 tablespoons milk

1 heaped tablespoon raisins


1 tablespoon sunflower oil

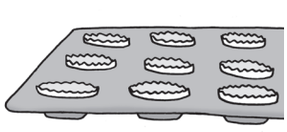
75g plain flour

4 teaspoons light soft brown sugar

1 teaspoon baking powder

How to cook:

1

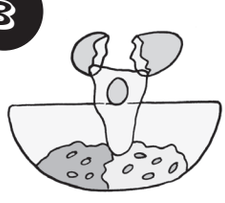


Put your muffin cases ready for the mixture.

2

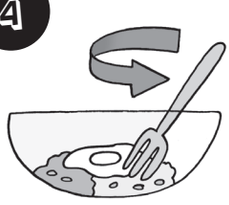
Grate the carrot and the courgette into a bowl.

3



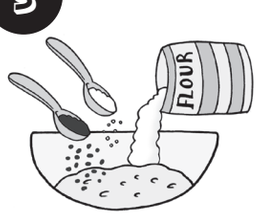
Break the egg into the bowl.

4



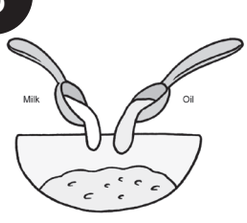
Whisk the egg with a fork.

5



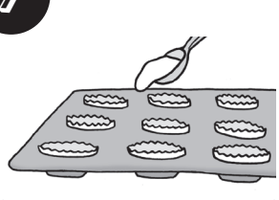
Add the grated courgette, grated carrot, raisins to the egg mix.

6



Now add the milk and sunflower oil. Mix.

7



Put a tea spoonful into each muffin case.

8

Give the muffin tray to an adult to put in the oven 200°c fan/400°f for 12–15 minutes.

Adapted from CBeebies – I can cook - Sally Brown, Kate Morris

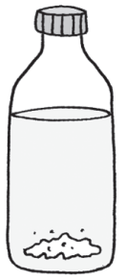
6.3 Tasting Breads

Name of the bread	Colour outside	Colour inside	Smell	Texture	Taste	Like / dislike	What would you eat with it?
Bagel	Shiny brown	white	Creamy	Smooth	chewy		Cream cheese

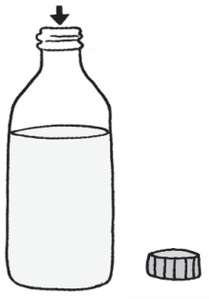
6.4 Make Fresh Lemonade

1. 4 cups of water
   1 cup or caster sugar

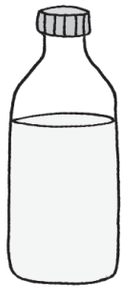
2. Shake the bottle for 1 minute.



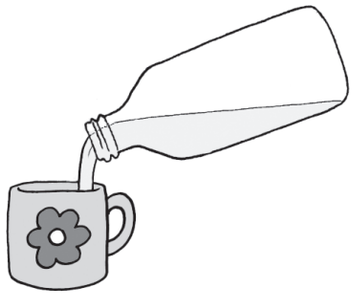
3. Add juice of 4 lemons.



4. Shake for 30 seconds.



5. Taste your lemonade.



6.5 Sandwich Book