

Cambridge Primary

Ready to Go Lessons

Science

Stage 5

Second Edition



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with  **Boost** Subscription


Boost

 **HODDER**
EDUCATION

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How to use this book

Cambridge Primary Ready to Go Lessons for Science is a series of print and digital resources providing creative teaching strategies to support the delivery of the new Cambridge Primary Science at Stages 1–6. For each stage, there is a print book (like this one) and a suite of digital resources that you can access online at Boost. (boost-learning.com) The resources have been structured to reflect Hodder Education's other resources for the Cambridge Primary Science course, with units corresponding directly to those in the Learner's Books, Teacher's Guides and Workbooks; however you can use these independently to support your delivery of the curriculum. Each unit comprises:

- a set of lesson plans designed to target some of the most challenging aspects of the curriculum
- a set of PowerPoint slides containing starter activities or to support other activities for each lesson (Boost)
- photocopiable worksheets and flashcards to accompany each lesson (Boost)
- knowledge tests for Stages 4–6 (Boost)
- end-of-year tests for Stages 3–6 (Boost).

The lesson plans include the following features to help you structure your teaching.

Prior learning

A short outline of what the learners should be able to do and understand before attempting the unit.

Science in context

Science in context helps learners find out how science is used in everyday life. It helps them to find out how some of the things they use every day work. Jobs which require a scientific background are also introduced to show a range of possible careers. Ideas of how scientific thinking has changed over time help learners understand how scientific developments continue to make our lives better. Consideration is also given to how we can use scientific thinking to protect our world.

Resources

A list of resources, including Boost links for PowerPoints and worksheets for the lesson. Learners get to practise what they have learnt in the lesson.

Starter activity

A whole-class activity (sometimes available on PowerPoint) to prepare learners for the main activity.

Main activities

Activities that promote scientific enquiry and promote thinking and working scientifically.

Digging deeper

Provides opportunities for support or extension.

Wrapping up

Plenary session to draw the lesson to a close and recap the learning objectives.

Assessment for learning

Questions to ask in order to gauge the learners' level of understanding throughout the lesson.

We hope that using these resources will give you confidence and creative ideas in delivering the new Cambridge Primary Science curriculum framework.

Safety

The lessons in this book have been written with safety in mind. However, please ensure that you are aware of and conform to any national, regional or school regulations for safety as you conduct the activities in this book.

Always be aware of skin and food allergies/intolerances and obtain parental consent for learners to participate in tasting activities. If necessary, carry out a risk assessment of potential hazards before doing the activities. Ensure that learners are aware of safety considerations when carrying out practical activities.

Unit 1 Plant parts

Prior learning

Learners should be able to recall the simple structure of a flowering plant, with reference to roots, stem, leaves and flowers, and know the functions of each plant part. They may also be able to recall the importance of temperature, light and water for healthy plant growth. Learners should know the life processes common to plants: nutrition, growth, movement and reproduction.

Science in context

Lesson 1.1 provides an opportunity for learners to find out about the work of botanists.

1.1 Plant groups

Resources

PowerPoint 1.1; Worksheet 1.1 (Boost); extra copies of Worksheet 1.1 for the extension activity; samples of flowering plants, conifers, ferns and mosses (optional); digital cameras; internet access and/or reference books with information on flowering and non-flowering plants

Starter activity

- Use **PowerPoint 1.1**, slide 1, to show a typical flowering plant.
- With talk partners, ask learners to discuss the characteristics of the first main plant group: flowering plants. (Flowering plants have well-defined root systems, stems, leaves and easily identifiable flowers. They reproduce by producing seeds in their flowers.) This discussion also serves as a good way to discover their prior knowledge at the start of Stage 5.

Main activities

- Use **PowerPoint 1.1**, slides 2–4, to show images of non-flowering plants. These are conifers, ferns and mosses.
- Discuss and observe these in detail as a class and make comparisons.
 - Conifers: often grow into very tall trees with needles instead of leaves. They reproduce by producing seeds inside cones.
 - Ferns: these can also grow into huge tree ferns. Their leaves are called fronds. They reproduce using spores on the back of their fronds.
 - Mosses: these are very small and can be found in damp shade. They produce spores, not flowers, as their means of reproduction. They do not have roots.
- If possible, have samples available of each type of plant to be observed by learners.
- Give out **Worksheet 1.1** and explain to the learners that they need to find an image, take a digital photo or draw a sketch of one example of each type of plant. If real samples are available, the learners could use these as examples. They also need to write brief notes to describe the characteristics of each type of plant. Ask learners to describe the colour, shape, size and any other features of the plants they observe.
- Tell learners whether they should use reference books or the internet for their searches.

Misconceptions

Some learners might think all plants have flowers. Explain that this is not true (as they will discover in this lesson) and that most plants only flower for a short time during their life cycle. Tell learners they will find out a lot more about this in Unit 2.

Some learners might think trees do not flower. Explain that tree blossom is the flowers produced by some trees seasonally.

Digging deeper

Support: Before giving out the worksheet, write the names of plants of each type on the worksheet or give the learners specific names of plants to research, choosing familiar plants according to your location in the world. Alternatively, allow these learners to work in mixed-ability pairs or groups to carry out this research.

Extension: Challenge these learners to find as many different examples of each plant type as time allows and write them down on extra copies of **Worksheet 1.1**.

Wrapping up

- Explain how these non-flowering and flowering plants are the four main groups that scientists use to classify and identify plants.
- Ask different learners to share their findings and to show their examples.
- If any learners have carried out the extension activity, ask them also to share their findings and examples.
- Explain how some people make a career by becoming a botanist. Use **PowerPoint 1.1**, slide 5, to show a video of what botanists do. Start from 1:10.

Assessment for learning

Ask the learners:

- *What are the four main groups of plants?*
- *Describe and name an example of a conifer, moss, fern or flowering plant.*
- *How is a conifer different from moss? (Repeat for different pairs of plant types.)*

1.2 Classifying flowering and non-flowering plants

Resources

PowerPoint 1.2; Worksheet 1.2 (Boost); extra copies of Worksheet 1.2 for the extension activity; samples of flowering plants, conifers, ferns and mosses (optional); internet access and/or reference books on flowering and non-flowering plants

Starter activity

- Use **PowerPoint 1.1** from the previous lesson (Lesson 1.1) to remind learners about the four main groups of plants: flowering plants, conifers, ferns and mosses.
- Look together at **PowerPoint 1.2**, slide 1, which shows images of plants. The learners will be expected to identify these plants using the key on **Worksheet 1.2** as the Main activity for this lesson.
- Ask the question on the slide: *How do you think some of these plants have been named?* The plants are A, giant fern; B, spoon-leaved moss; C, Scots pine; D, hibiscus; E, corkscrew hazel; F, centipede grass. Often, plants are named based on their external appearance. Ask learners to look closely! For example, corkscrew hazel is twisted, like a corkscrew twist; spoon-leaved moss has leaves shaped like small spoons; centipede grass looks like centipedes.
- Talk about the external observable features of each plant. Tell the learners they will need to use the key on the worksheet to name each plant A–F.

Main activities

- Remind learners that identification keys can be used to find out the names of different plants or animals. Explain how one type of sorting key involves answering a series of questions that will lead you to identify a plant from its external appearance. Each stage either identifies the plant name or directs you to another question. By answering the questions, you can name all the listed plants.

- Give out **Worksheet 1.2** to each learner and show them how to use the key to answer the questions.
 - Explain that, by the end, they should have been able to identify each plant on **PowerPoint 1.2**, slide 1, correctly. Explain that trees, such as the corkscrew hazel, are very large flowering plants that produce seeds and then flowers or fruits. Grasses, such as centipede grass, are also flowering plants because they produce grass seeds. Their flowers are not big and bright, however, so they may be less obvious.
- Misconceptions**
- Some learners might not think of trees as flowering plants, due to their size. This lesson helps to address this misconception. Also, some learners might not recognise grasses as flowering plants because they do not produce pretty, coloured flowers. Again, this is addressed in this lesson.
- Digging deeper**
- Support:** Work in a small group with these learners, perhaps completing the worksheet as a group. Refer to **PowerPoint 1.2**, slide 1, to help with easier identification.
- Extension:** Ask these learners to use the internet or reference books to find other plants that would fulfil the criteria of the questions in the key. Ask them to write an answer key and then test their friends! Give them another copy of Worksheet 1.2 to work from.
- Answers:**
- **A – Giant fern:** this is a fern which reproduces using spores. It has roots, stems and leaves.
 - **B – Spoon-leaved moss:** mosses reproduce using spores. They have no true roots and mainly grow in damp shade.
 - **C – Scots pine tree:** does not produce flowers; its seeds are contained inside cones.
 - **D – Hibiscus flower:** the brightly coloured flowers attract insects to pollinate them.
 - **E – Corkscrew hazel:** this tree produces catkins as flowers which droop down, and this makes it easier for pollen to be carried on the wind. The flowers are not brightly coloured because they do not need to attract insects.
 - **F – Centipede grass:** grasses usually have brown or green flowers or stems and easily sway or bend in the wind. Grasses are also pollinated by the wind and so do not need colourful flowers.
 - Explain how keys can help you to identify and name things. Although it is relatively easy to identify a grass, fern or flowering plant, there are actually millions of different types around the world.

Assessment for learning

Ask the learners:

- *What is an identification key used for in science?*
- *What features tell you that a tree is a flowering plant?*
- *How do ferns reproduce?*
- *What do mosses **not** have?*
- *How do you think [name of plant] got its name?*

Wrapping up

- Talk through the answers to the key on the worksheet. Work through each question systematically, asking learners to justify their choice of response each time.

1.3 Parts of a flower

Resources

PowerPoint 1.3; Worksheet 1.3; flashcards (Boost); a collection of real or synthetic flowers, or pictures from the internet or books; hand lenses or magnifying glasses

Starter activity

- If there is time and specimens are available to be picked (always check local laws: in the UK it is illegal to pick wild flowers), organise the learners to go outside and choose a flower for their group or pair to look at. Emphasise that they should only pick flowers where they have been given permission to do so.
- Alternatively, provide a selection of fresh flowers. (Synthetic flowers or photos of different flowers from the internet can be used if fresh specimens are not readily available.)
- Be aware of any plant allergies in the group or learners who might suffer from hay fever.
- Look at some examples of real or synthetic flowers. If there are sufficient samples available, give the learners a flower to examine with their talk partner.
- With talk partners, ask learners to identify the different parts of a flower.
- Share and discuss their responses and find out what vocabulary they might already be familiar with.

Main activities

- Use **PowerPoint 1.3** to show the structure of a flower. Encourage learners to use the correct vocabulary for the parts of a flower.
- Give out **Worksheet 1.3** to use as a reference for the names of different parts of a flower. Ask learners to draw a diagram of the flower they have been observing. Suggest they might like to draw an aerial (looking down) view and a side view to illustrate their observations. Give them a magnifying glass or hand lens to look closely at the flower.

Misconceptions

Some learners might think the function of the petals is merely to make the flower appear attractive, with no idea about the role of petals in plant reproduction. This will be addressed in Unit 2, The life cycle of a flowering plant.

Digging deeper

Support: For these learners, choose a simple flower (perhaps a familiar flower). Write the name of the flower on the worksheet for them in preparation. Ask them to count the numbers of sepals and petals on their flower. Choose a flower that will enable them to count the numbers of petals and sepals easily.

Extension: Give each of these learners, or each pair of learners, a different flower and ask them to compare the numbers of petals, sepals and so on, on each separate flower.

Wrapping up

- Look at the completed diagrams on **Worksheet 1.3**.
- Compare the flowers studied using some similarities and differences observed by the learners; for example: bright, colourful petals, attractive scent.
- Use the flashcards on Boost to test the learners' knowledge of vocabulary for the parts of a flower.

Assessment for learning

Ask the learners:

- *What is the name of the flower you looked at?*
- *What is the function of the petals?*
- *How many sepals did you find?*
- *Do all flowers have the same number of petals?*

1.4 Male and female parts of a flowering plant

Resources

PowerPoint 1.4; Worksheet 1.4 (Boost); tweezers; selection of different flowers suitable for dissection and easy counting of flower parts (this will depend on your location); magnifying glasses or hand lenses; internet access or reference books about flowering plants

Starter activity

- With talk partners, ask learners to talk about the flowers observed in the previous lesson. Ask them to name the different plant parts. Can learners give any functions of petals?
- Use **PowerPoint 1.4**, slide 1, to revise the male parts of a flower and slide 2 to revise the female parts of a flower. Check for correct use of vocabulary: petal, sepal, stamen, anther, filament, carpel, stigma, style, ovary. Explain to learners that they will be looking at the functions of each part in Unit 2, The life cycle of a flowering plant.

Main activities

- Tell learners that, in this lesson, they will be looking at and counting the different parts of a flower. They might have a flower that is the same as or different to those given to other learners.
- Explain to all the learners that they need to pull their flower apart (gently!), using the tweezers provided, and count the different numbers of plant parts in their flower. They should record their observations on **Worksheet 1.4**.

Digging deeper

Support: Work in a small group with these learners or allow them to work in mixed-ability groups to carry out the Main activity.

Extension: Ask these learners to find a flower they like the appearance of on the internet or in a reference book. They should find out about the numbers of sepals, petals, stamens and carpels (stigma, style and ovaries) it has.

Wrapping up

- Talk through the responses for **Worksheet 1.4**. These will be open-ended responses, according to the different flowers that have been observed.
- Ask any learners who have completed the extension activity to share their findings; again, responses will be open ended.
- Explain the following functions of the parts of a flower:
 - the anther – produces and disperses pollen
 - the filament – supports the anther
 - the stigma – the top of the female part of a flower, which receives or collects pollen grains
 - the style – joins the stigma to the ovary
 - the ovary – contains ovules, which eventually turn into seeds.

Assessment for learning

Ask the learners:

- *What are the names of the female parts of a flower?*
- *What are the names of the male parts of a flower?*

1 Unit assessment

Questions to ask

- Name the two main groups of plants.
- Give an example of each group of plant.
- Name any type of non-flowering plant.
- What is a question key used for in science?
- Name two groups of plants which reproduce using spores.
- Describe conifer leaves and say where a conifer stores its seeds.

Summative assessment activity

Observe the learners while they complete this activity. You will be able to quickly identify those who appear to be confident and those who might need additional support.

Sorting flowering and non-flowering plants

This activity reveals the learners' understanding of the different characteristics of flowering plants and different types of non-flowering plants: conifers, ferns and mosses.

You will need:

A set of images of flowering and non-flowering plants from the internet or reference books. Alternatively, re-use the PowerPoints from this unit.

What to do

- Give each learner (if there are sufficient resources), pair or small group a set of images to sort. Ask them to group them in as many different ways as possible and to record and explain their groupings each time (for example, flowering/non-flowering; reproduce using seeds/reproduce using spores; grow in damp, shady places/bright places).
- Talk with the learners about their choices. Record their individual responses on a checklist to keep track of their understanding of the main concepts in this unit.

Written assessment

Give learners time to complete **Worksheet 1.5**. The learners should work independently or with their usual in-class support.

Unit 2

The life cycle of a flowering plant

Prior learning

Learners should be able to recall that plants need water and light to survive, and the right conditions of temperature, light and water to grow well. They should also know about different habitats and environments, and examples of some plants that can be found in different growing conditions. They might also be able to recall how plants get their energy.

Science in context

Lesson 2.1 enables learners to find out about the effect of the use of pesticides and the impact of this on food production.

2.1 Stages in the life cycle of a flowering plant

Resources

PowerPoint 2.1; Worksheet 2.1 (Boost); sets of labelled cards with the words or phrases describing each stage in the life cycle of a flowering plant: pollination, fertilisation, seed production, seed dispersal, germination. There should be enough sets for the number of groups you choose.

Starter activity

- Arrange the class into pairs or small groups and give each group a set of cards. Ask them to arrange them in order (as a cycle) of what happens in the life cycle of a flowering plant.
- Ask the learners to tell you what happens at the stage written on each card.

Main activities

- Use **PowerPoint 2.1** to introduce the life cycle of a flowering plant. Ask questions such as: *What does this diagram show?* Ask learners to describe

what is happening in any stage in the diagram. *Does anyone know any special scientific words for what is happening at each stage in the cycle?*

- Discuss as a whole class, compare the learners' answers and address any questions.
- Confirm the order of the stages in the cycle.
 - Germination: seed begins to grow and develops roots and shoots.
 - Growth: shoots get bigger.
 - Flowering: the plant produces one or more flowers.
 - Pollination: pollen is brought to the flower from male anthers and is transferred to the female stigma (usually by insects).
 - Fertilisation: the male pollen grain fertilises the female ovule in the ovary.
 - Seed dispersal: the plant produces seeds, which will grow into new plants. The seeds are scattered to new sites, to take them away from the parent plant.
 - The cycle begins again ...
- Give out **Worksheet 2.1** and explain to learners that they should label the correct stages on the diagram. Explain that this differs slightly from the PowerPoint slide image. Challenge them to work out the correct labels together!

Misconceptions

Some learners might think a flower on a flowering plant is not part of the life cycle. Explain that these plants only flower when they are ready to reproduce. This is a specific stage in the life cycle of a flowering plant.

Digging deeper

Support: Work with these learners in completing the rest of **Worksheet 2.1**. Alternatively, allow them to work in pairs or small groups to complete this activity.

Extension: Ask these learners to write a sentence to explain what happens at each stage of the life cycle on the back of **Worksheet 2.1**.

Wrapping up

- Talk through the answers to **Worksheet 2.1** (clockwise from the top): seed production (given), **seed dispersal**, **germination**, **growth**, **pollination**, fertilisation (given).
- Explain that the life process is a cycle, which keeps going round and round. Seeds produce new plants which, in turn, make new seeds and so the plant survives. Compare this to the human life cycle: baby – child – adolescent – adult.
- Make sure the learners know the name of each stage in the life cycle and can remember the correct spelling of each.
- Explain that each stage will be studied in greater depth in the rest of this unit.
- Discuss how the use of pesticides could affect food production (for example, more food could be produced, but chemicals could damage the crops; depending on conditions, there could be more or less food produced).

Assessment for learning

Ask the learners:

- *How can you tell when a seed has germinated?*
- *When a plant grows, what does it produce?*
- *How does pollination usually occur?*
- *What is the process when pollen and ova combine?*
- *What do all green plants need to grow well?*

2.2 Plant parts in pollination

Resources

PowerPoint 2.2; Worksheets 2.2a and 2.2b (Boost); real flowers with lots of pollen on the stamens; sticky tape; hand-washing facilities; internet access or reference books

Starter activity

- Use **PowerPoint 2.2**, which shows a talk about pollination. Watch from 3:19 to the end with the class (although you might like to watch it all on your own first).
- As the class watches the video, stop it at various points and ask the learners, *Which part of the flower does this happen in?* This will prompt discussion about the role of each plant part.
- Explain that, in this lesson, they will be thinking in more detail about what each plant part does in the process of pollination.
- Tell learners that insect pollination is not the only method of pollination; they will find out about other methods in the following lessons in this unit.
- Ask learners: *Have you ever been covered in pollen?* Some of them might have had pollen on their clothes or hands. Invite them to share their experiences if this has ever happened to them. Lilies have lots of deep yellow pollen, which spreads easily. It can also stain quite badly, so some florists remove the stamens so that the pollen cannot stain clothes and soft furnishings.
- Give the learners a real flower and ask them to try to collect pollen from the stamens using sticky tape. Ensure hands are washed carefully afterwards!

Main activities

- Ask the learners to tell you again how insects are attracted to flowers. (Flowers attract insects by being large, colourful and having a pleasant scent/smell.)
- Remind the learners that insect pollination is when insects carry pollen from a plant's anthers (the male part) to their stigmas (the female part), or to the stigmas of other flowers. When an insect visits a flower to feed, the pollen gets shaken off the anthers and some pollen grains may stick to its hairy body or legs. When the insect flies off, the pollen is carried off with it to the next flower it visits. The pollen lands on the stigma of the next flower, which has a sticky surface, and so attaches there. (Bright, perfumed petals also attract birds and bats, as seen the video.)
- Give out **Worksheet 2.2a** to learners who need support. They should cut out the statements and match them with the appropriate image.
- Give out **Worksheet 2.2b** to all other learners and explain that they will use the information on the worksheet to help them complete the facts about the stigma, stamen and ovary.

Misconceptions

Some learners might believe that bees are the only pollinators of flowering plants. Tell them there are many other animal pollinators, including other insects, some small birds, reptiles and mammals.

Digging deeper

Support: Give these learners **Worksheet 2.2a**.

Extension: Ask these learners: *Do different colours of flowers and shapes of petals attract different insects?* Give them internet access or provide reference books with information about insect pollination for them to use for their research. (Responses will be open-ended, depending on the flowers they find.)

Wrapping up

- Invite learners to show their work and discuss it, for both worksheets.
- Ask for contributions from those who might have carried out the extension activity.

Assessment for learning

Ask the learners:

- *What are ova?*
- *What do ova need to be able to grow into seeds?*
- *Where is pollen found?*
- *How does pollen get to the ova?*
- *What happens when the pollen meets the ova?*

2.3 Flowers and fruits

Resources

PowerPoint 2.3; Worksheet 2.3 (Boost); internet access or reference books; examples (real or imitation) of plants with fruits or flowers on them and/or pictures of many different types of fruits, including cucumbers, peppers, tomatoes, nuts in their shells, grains; magnifying glasses or hand lenses; a range of art materials: pencils, paint, paper, collage materials, fabrics and threads

Starter activity

- Ask the learners to work in pairs to identify as many of the fruits and flowers available as they can within a given time limit (pictures and/or samples). Alternatively, present a series of pictures and organise this as a quiz, awarding a small prize for the winning individual, table or team (if this approach is permitted within the rewards system in your school).
- In small groups or as a class, discuss the question, *What is the difference between fruits and flowers?* (Flowers contain the plant's reproductive organs, fruits contain seeds.) Use **PowerPoint 2.3** and talk about the pictures of the fruits and flowers on it: sunflower, jasmine and rice flower, grapefruit, date and rambutan. Ask if learners have seen any of these flowers or eaten any of the fruits.
- Ask the learners to think about the purposes of each and to share their thoughts with the rest of the class.
- This will give you an insight into how much detail regarding flowering plants the learners have remembered from previous work on plants in other stages.

Main activities

- Explain that flowers and fruits are the produce of flowering plants and that it is from these that new plants grow. Flowers contain the plant's reproductive organs; fruits contain seeds.
- Give out **Worksheet 2.3** and ask the learners to draw a storyboard to describe how they think new plants grow from a flower or fruit. Explain that a storyboard is a series of pictures showing the stages of plant growth (seed, small plant, growing plant, plant with fruit or flowers). Start from when the seed is planted.
- Give the learners the opportunity to observe some actual flowers and fruits closely. Use magnifying glasses or hand lenses, if preferred (or available).
- Ask them to make a representation of the flower or fruit they have chosen or been given. Explain that this could be a drawing, painting, collage or textile work, depending on the range of art materials and time available.
- Ask them to make the piece an insect's view (i.e. viewed from close-up) to give a sense of enlarged perspective. The work could be 2D or 3D. It may take more than one lesson to complete.

Misconceptions

Learners might not understand that the term 'fruit' includes any structure that contains a seed. Show learners pictures of a wide range of fruits (e.g. cucumbers, nuts in their shells, grains, tomatoes, peppers) to explain that, biologically, a fruit is a structure which contains a seed or seeds.

Digging deeper

Support: Support these learners to describe and draw the process in three pictures. Suggest ideas for their artwork or give them fewer alternatives to select from.

Extension: Ask these learners to choose and research the life cycle of a particular flowering plant: one that is native to their country.

Wrapping up

- Ask some of the learners to share their storyboards on **Worksheet 2.3** with the rest of the class. Discuss their pictures to check the learners' understanding.
- Remind the learners that flowers grow from seeds, fruits contain seeds and seeds are the basis of reproduction in flowering plants.

Assessment for learning

Ask the learners:

- *Why do flowering plants have flowers or fruits?*
- *Where do flowers and fruits grow from?*
- *What happens to fruit when it grows?*
- *Why are fruits important for plants?*

2.4 Seeds

Resources

PowerPoint 2.4; Worksheet 2.4 (Boost); selection of fruits with seeds (for example, melon, lemon, orange, kiwi, pomegranate); plastic knives; paper plates or napkins; hand-washing facilities; whiteboard or flipchart and markers; card; paint, paint rollers; scissors; ribbon; glue; gift tags or calendar tabs (if being given as a choice of activity)

Starter activity

- Arrange the learners into pairs and give each pair a piece of fruit. Ensure good hygiene and hand washing before learners handle the fruit. Ask them to find the seed or seeds in the fruit; tell them that they may need to cut the fruit to find the seeds.
- Ask the learners to show the rest of the class their fruit and to describe where the seeds can be found, how many seeds there are (if there are under about 20, they can give specific numbers; where there are a lot of seeds they can estimate whether it is 20–50, over 50 or over 100), their colour and texture, and whether they make a pattern inside or on the fruit. This encourages good observational skills.
- Use **PowerPoint 2.4** to talk about the names of different fruit seeds, such as apple pips, cherry stones, etc. Identify some of the less familiar fruits. Have learners tasted any of these?
- If there are no known allergies or intolerances to the fruit, invite the learners to taste them. Encourage them to try a new fruit if they can. Discuss their personal preferences.

Main activities

- Draw up a tally chart – with assistance from the class – of the learners' favourite fruit from the available fruits. Record the tally chart as shown at the top of **Worksheet 2.4**.
- Demonstrate how to use this information to construct a bar chart. Emphasise the need for a title, labelled axes, appropriate scale and clear presentation.
- Give out **Worksheet 2.4** for the learners to make a tally of the favourite fruits in their small group and also to draw their own bar chart.
- Ask learners who need support to use the data you have already obtained (or give them a selection of data to use).
- Allow the learners to use more cut fruit (where appropriate) to make some prints to decorate a greetings card, a calendar or a gift tag. Place the cut side of the fruit into some paint and press it on a piece of paper. Alternatively, they could design and make their own gift wrap by printing a repeating pattern on a piece of paper.

Misconceptions

Explain that a tomato is a fruit because it has seeds inside it, although most people think of it as a salad vegetable.

Digging deeper

Support: Encourage these learners to work together in a small group and help them to collect their data and use it to draw their bar chart.

Extension: Ask these learners to write three questions about the fruit to accompany their bar chart (for instance, which fruits have the smallest number of seeds, which fruit has more seeds than any other, which fruit has the largest seeds). They will ask other learners to answer these questions. Make sure the learners know the answers to their own questions!

Wrapping up

- Interrogate the learners to elicit information about the bar charts drawn. For example, *What is the favourite fruit in your group? Are there any fruits that only one person liked best? How many more people liked [name of fruit] rather than [name of fruit]?*
- Invite the learners to show each other the products they made with the fruit prints.
- Remind them that seeds are necessary for reproduction to produce new flowers or fruits.

Assessment for learning

Ask the learners:

- *Which fruit do we like best as a class?*
- *How many more people prefer [name of fruit] to [name of fruit]?*
- *Why do plants have seeds?*
- Invite the learners who completed the extension activity to ask their questions about the bar chart that they have constructed if they have not already done so. If they have obtained answers from other learners already, discuss their responses.

2.5 Seed dispersal

Resources

PowerPoint 2.5; Worksheet 2.5 (Boost); whiteboard or flipchart and markers; large space such as a sports hall or gym; gym mats; source of pre-selected music (a familiar or contemporary piece of music); internet access or reference books

Starter activity

- Take the class into the school hall or gym. Ensure that the learners are wearing appropriate footwear or have bare feet (in line with your school rules). Place the gym mats randomly around the space. When the music plays, the learners can move freely around the hall. When the music stops, they must stand on a mat. Repeat this activity several times until they understand what they have to do.
- When everyone is clear on the rules, start removing a mat each time the music stops. This means that learners will need to crowd on to the remaining mats. Make a rule that if they are not standing with both feet on a mat after the music stops, or if they are the last person to stand on a mat, then they are 'out' and have to miss the rest of the game. The winners are those remaining in the game when only one mat is left.
- In pairs, ask the learners to decide what things green plants need to be able to grow.
- Discuss their answers and clarify that all green plants need air, light, minerals and water.

Main activities

- Discuss the idea of seed dispersal, either in the hall/gym or back in the classroom. Following the Starter activity, introduce the idea that seeds from any plant are in competition with each other to find the best growing conditions. In the game they played, learners were competing for space. Do seeds need to compete for space in the same way?
- Introduce the word 'dispersal', meaning the way that seeds are scattered or spread out away from the parent plant. (The term 'parent

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Author

Judith's career in primary and lower secondary education spans more than 30 years of teaching, Headship and education consultancy in the UK and worldwide. She currently works as a freelance education consultant for Cambridge Assessment International Education. She is an author and a series editor of Hodder Education's *Cambridge Primary Ready to Go Lessons for Science* and *Cambridge Primary Science* series.

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ISBN 978-1-3983-4671-0

