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CAMBRIDGE PRIMARY Science

Learner's Book

5

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References to Activities contained in these resources are provided 'as is' and information provided is on the understanding that teachers and technicians shall undertake a thorough and appropriate risk assessment before undertaking any of the Activities listed. Cambridge University Press makes no warranties, representations or claims of any kind concerning the Activities. To the extent permitted by law, Cambridge University Press will not be liable for any loss, injury, claim, liability or damage of any kind resulting from the use of the Activities.

Introduction

The *Cambridge Primary Science* series has been developed to match the Cambridge International Examinations Primary Science curriculum framework. It is a fun, flexible and easy to use course that gives both learners and teachers the support they need. In keeping with the aims of the curriculum itself, it encourages learners to be actively engaged with the content, and develop enquiry skills as well as subject knowledge.

This Learner's Book for Stage 5 covers all the content from Stage 5 of the curriculum framework. The topics are covered in the order in which they are presented in the curriculum for easy navigation, but can be taught in any order that is appropriate to you.

Throughout the book you will find ideas for practical activities, which will help learners to develop their Scientific Enquiry skills as well as introduce them to the thrill of scientific discovery.

The 'Talk about it!' question in each topic can be used as a starting point for classroom discussion, encouraging learners to use the scientific vocabulary and develop their understanding.

'Check your progress' questions at the end of each unit can be used to assess learners' understanding. Learners who will be taking the Cambridge Primary Progression test for Stage 5 will find these questions useful preparation.

We strongly advise you to use the Teacher's Resource for Stage 5, ISBN 978-1-107-67673-2, alongside this book. This resource contains extensive guidance on all the topics, ideas for classroom activities, and guidance notes on all the activities presented in this Learners' Book. You will also find a large collection of worksheets, and answers to all the questions from the Stage 5 products.

Also available is the Activity Book for Stage 5, ISBN 978-1-107-65897-4. This book offers a variety of exercises to help learners consolidate understanding, practise vocabulary, apply knowledge to new situations and develop enquiry skills. Learners can complete the exercises in class or be given them as homework.

We hope you enjoy using this series.

With best wishes,
the Cambridge Primary Science team.

Contents

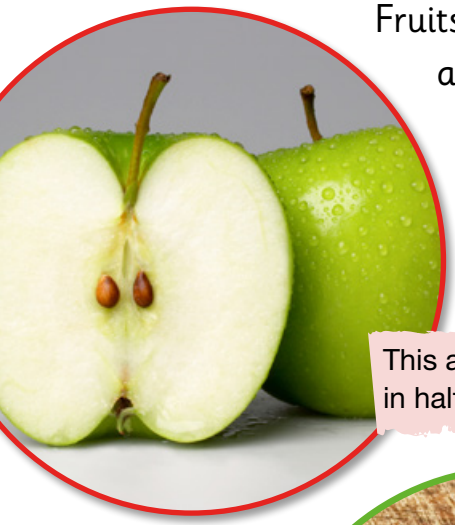
1 Investigating plant growth

1.1 Seeds

Words to learn
seed embryo
seed coat

Seeds and fruits

Have you ever swallowed a **seed** when you were eating an apple or an orange? We find seeds inside fruits. Fruits and seeds can be different sizes and shapes.



This apple has been cut in half to show the seeds.

An avocado pear has one large seed.

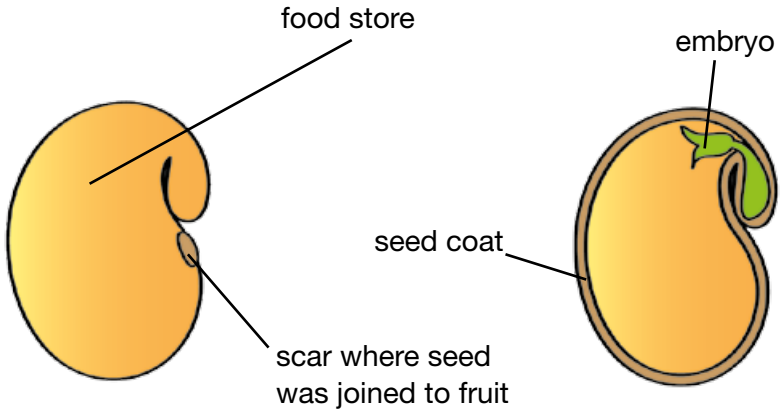
Bean seeds are found inside a pod.

A poppy's fruit contains the seeds.

What's inside a seed?

Are seeds alive? Seeds might look dead, but they are not. Seeds grow into new plants. There is a tiny plant inside the seed that starts to grow when it has all the things that it needs. The tiny plant inside the seed is called an **embryo**. The seed also has a food store.

Here is a bean seed with its parts labelled.



Activity 1.1

You will need:
a large fresh seed • a hand lens

Draw and label a seed

Look carefully at the seed with the hand lens.
Find the **seed coat** and the scar where the seed was joined to the fruit.
Make a neat drawing of the outside of the seed. Label your drawing.
Use your fingernails to pull off the outer covering of the seed.
Pull the two halves of the seed apart.
Find the embryo inside the seed.
Find the seed's food store.
Draw and label the inside parts of the seed.

Questions

1. Why does the seed need a food store?
2. Why does the seed need a seed coat?
3. What do you think the seed needs to make it start to grow?

Talk about it!
What is the biggest seed in the world?

What you have learnt

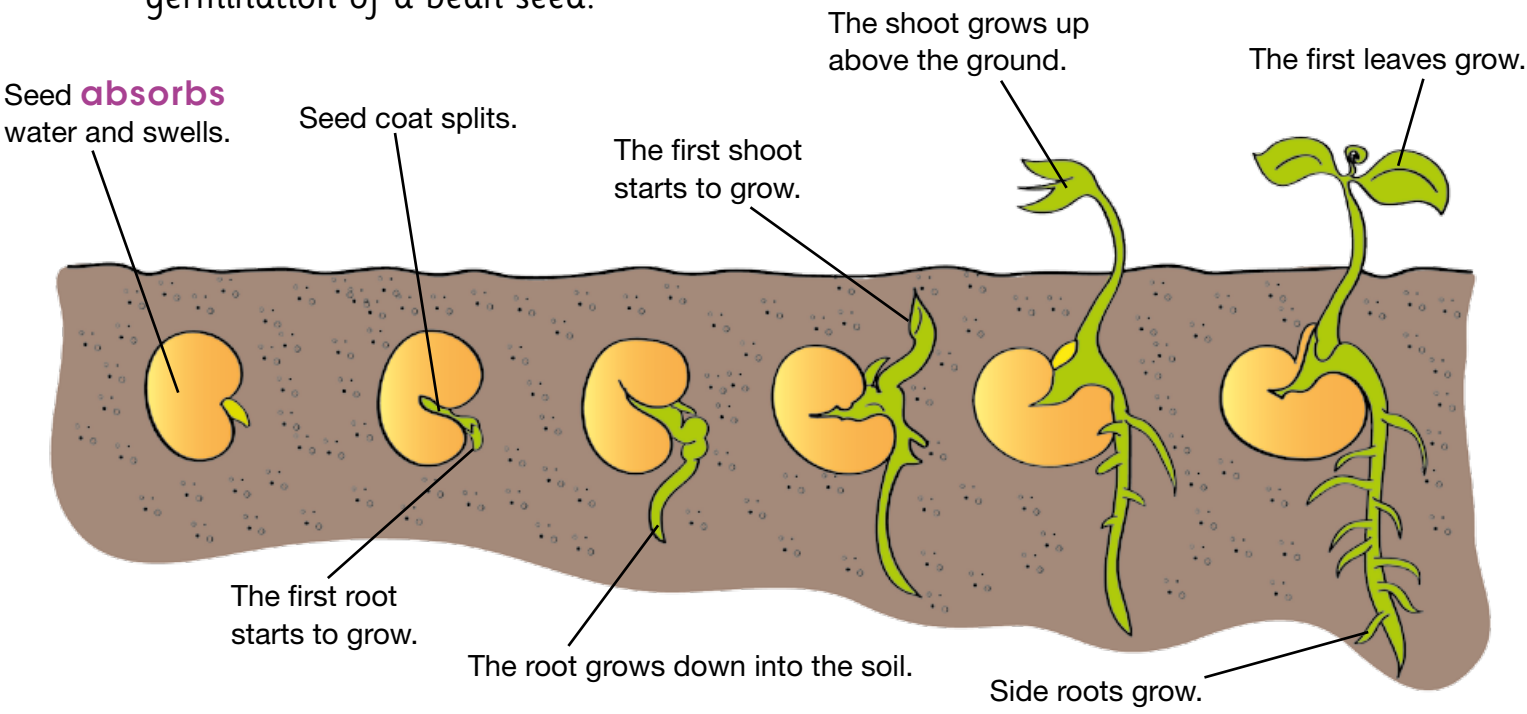
- Seeds are found in fruits.
- The embryo inside a seed grows into a new plant.
- Seeds are covered by a seed coat.
- Seeds contain a food store.

1.2 How seeds grow

Words to learn
germination shrivels
absorbs

Germination

If a seed is given the right conditions, and the embryo is alive, it will grow. When a seed starts to grow, we say it germinates. This process is called **germination**. The seed uses its food store to give it the energy to grow. The seed **shrivels** and becomes small after germination. Here are the stages in germination of a bean seed.



A lotus plant growing in water.

Seeds can live without germinating for years until the conditions become suitable. The oldest seed known to germinate was a 1300-year-old lotus seed found at the bottom of a lake in China.

Activity 1.2

You will need:
a bean seed • a saucer of water

Observe a seed

Soak the bean seed in water overnight. Predict how the seed will change overnight.
Observe the seed the next day and write down any changes that you see.
How did the seed change overnight? Was your prediction correct? Explain why the changes happen.
Where do you think the water entered the seed?
Give a reason for your answer.

Questions

1 Why do seeds need to absorb water?
2 a Which part of the new bean plant grows first?
  b Suggest a reason why this part grows downwards.
3 In which direction does the first shoot grow and why?
4 Why do you think the new leaves start to grow above the ground?
5 Why do you think the seed shrivels and becomes small after germination?

Talk about it!
Can new plants only grow from seeds?

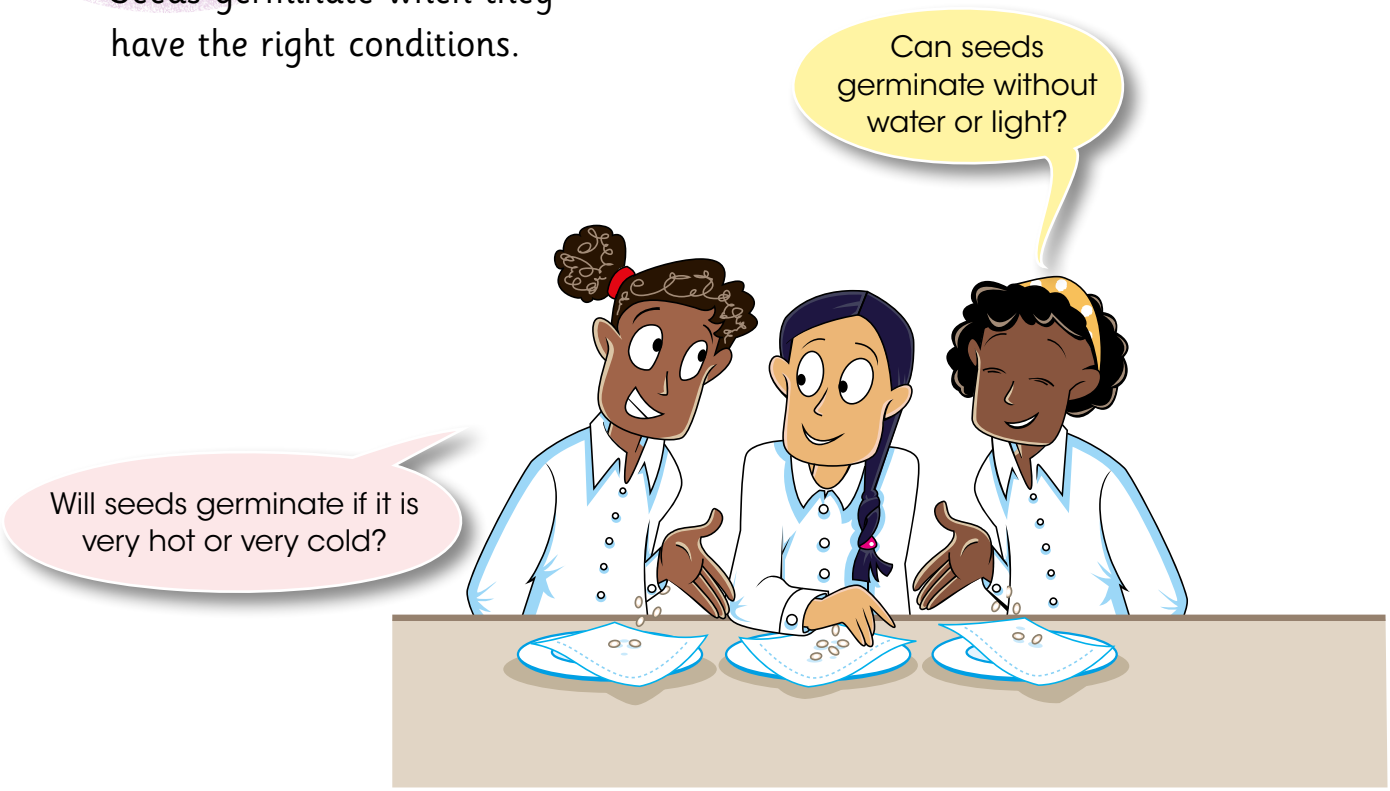
What you have learnt

- Seeds start to germinate if the conditions are right and the embryo is alive.
- The food store gives seeds the energy they need for germination.
- Seeds absorb water to start germination.
- The new root grows downwards first, followed by the new shoot which grows upwards.

1.3 Investigating germination

What do germinating seeds need?

Seeds germinate when they have the right conditions.



Activity 1.3a

Do seeds need air to germinate?

You will need:
20 small seeds • four paper towels • some water
two saucers • two small plastic bags • two bag ties
a drinking straw

Place 10 seeds on a moist paper towel on each saucer.
Cover both saucers with moist paper towels. Place one saucer in each bag.
Use the straw to suck all the air out of one bag. Quickly close it with a bag tie.
Close the other bag, leaving air inside it.
Leave both bags in a warm place for two days, then remove the seeds from the bags and observe them.
Which seeds germinated?
Suggest a reason for this.