



Living things & their habitats

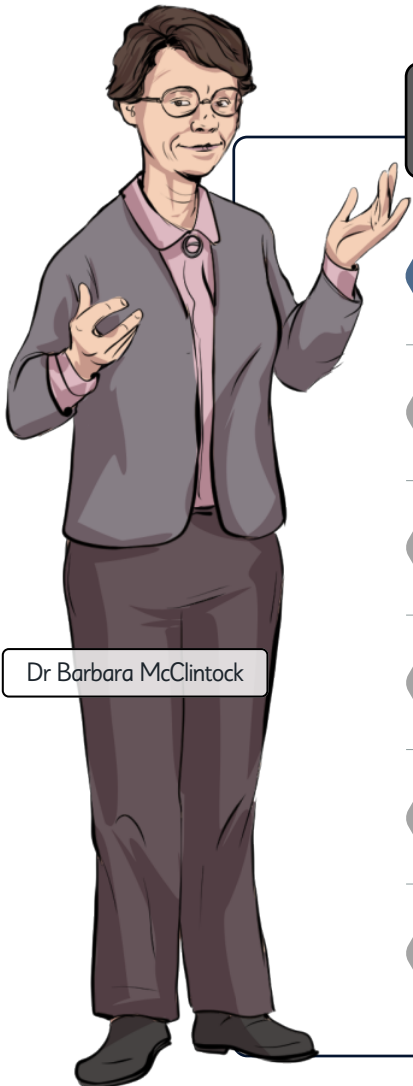
How do living things reproduce, and
why is this important in a life cycle?

Lesson 3: What are the stages in a life cycle of a plant?



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Scientific enquiry types and skills



Dr Barbara McClintock

Scientific enquiry types



Testing ✓



Researching



Observing



Pattern seeking



Identifying & classifying



Problem solving

Working scientifically skills



Asking questions



Making predictions ✓



Setting up tests ✓



Observing & measuring



Recording data



Interpreting & communicating results



Evaluating



How do living things reproduce, and why is this important in a life cycle?



Dr Rosalind Franklin

Lesson 1: How do plants reproduce?

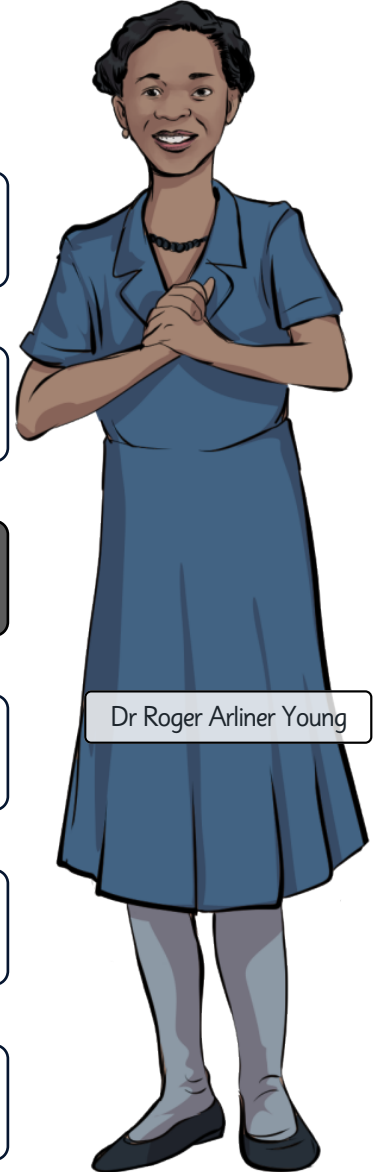
Lesson 2: How do flowering plants reproduce?

Lesson 3: What are the stages in a life cycle of a plant?

Lesson 4: How do animals grow and change?

Lesson 5: Does every egg have the same life cycle?

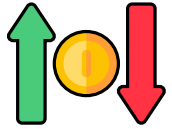
Lesson 6: What makes a mammal's life cycle special?



Dr Roger Arliner Young



Key vocabulary for this lesson



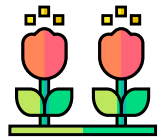
variable

– something that can change



disperse

– to spread out or to move away



pollination

– this is when the **pollen** is transferred from the **anther** to the **stigma**



fertilisation

– happens when the pollen reaches the **ovary** and seeds begin to develop

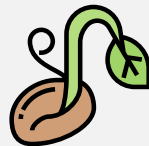


Testing



Hi! I'm Earle, and I work for the RHS. Part of my job is to create new types of plants. I need to learn about how plants grow and change over time. I focus on how seeds start to grow, which is called '**germination**'. By watching how different seeds grow in different conditions, I can find out which plants are the best. This helps us better understand plants and their life cycles. In my work, I look for ways to carry out tests on seeds, take measurements, and observe how plants grow and change over time.

New word alert!



germination – when a seed starts to grow

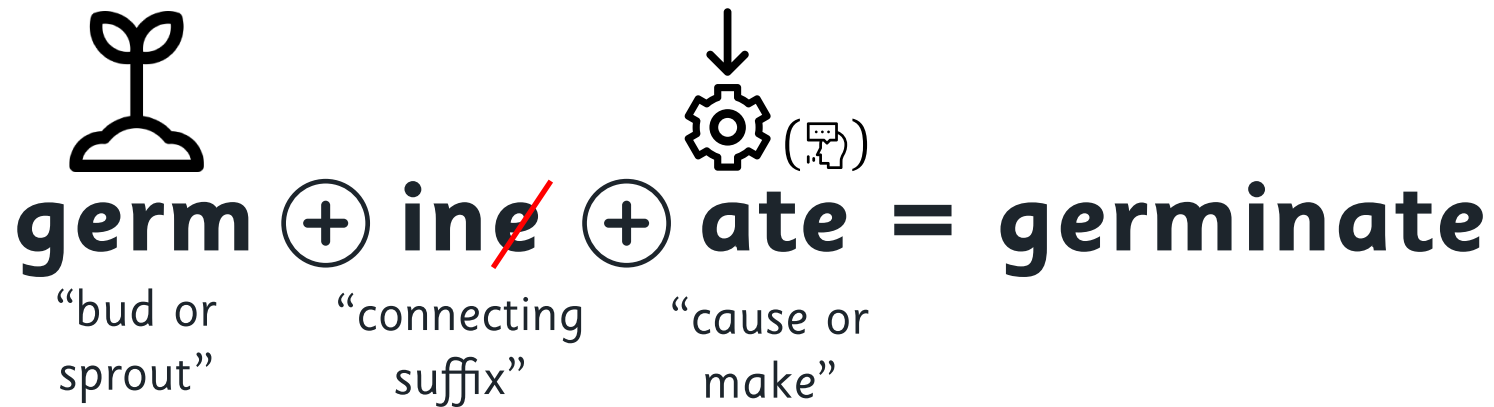


Word detective



germination – when a seed starts to grow

The word '**germinate**' comes from Latin, and it means '**cause to bud or sprout**'.



Together, these word parts form a word meaning “**to cause it to bud or sprout**”.

This makes sense because a **germinating** seed begins to sprout.



Let's discuss

Discuss the following question with your learning partner.

What is a life cycle?

Be ready to **share your feedback** with the class before the **answer is revealed**.

Use the following sentence starter to help you.

“A life cycle is ...”

Keywords you might need: stages, journey, adult, offspring, seed



Let's discuss

answers



A life cycle is the stages a living thing goes through from birth to being an adult and having offspring.

A life cycle is the journey from a seed to a mature plant that can make new seeds.



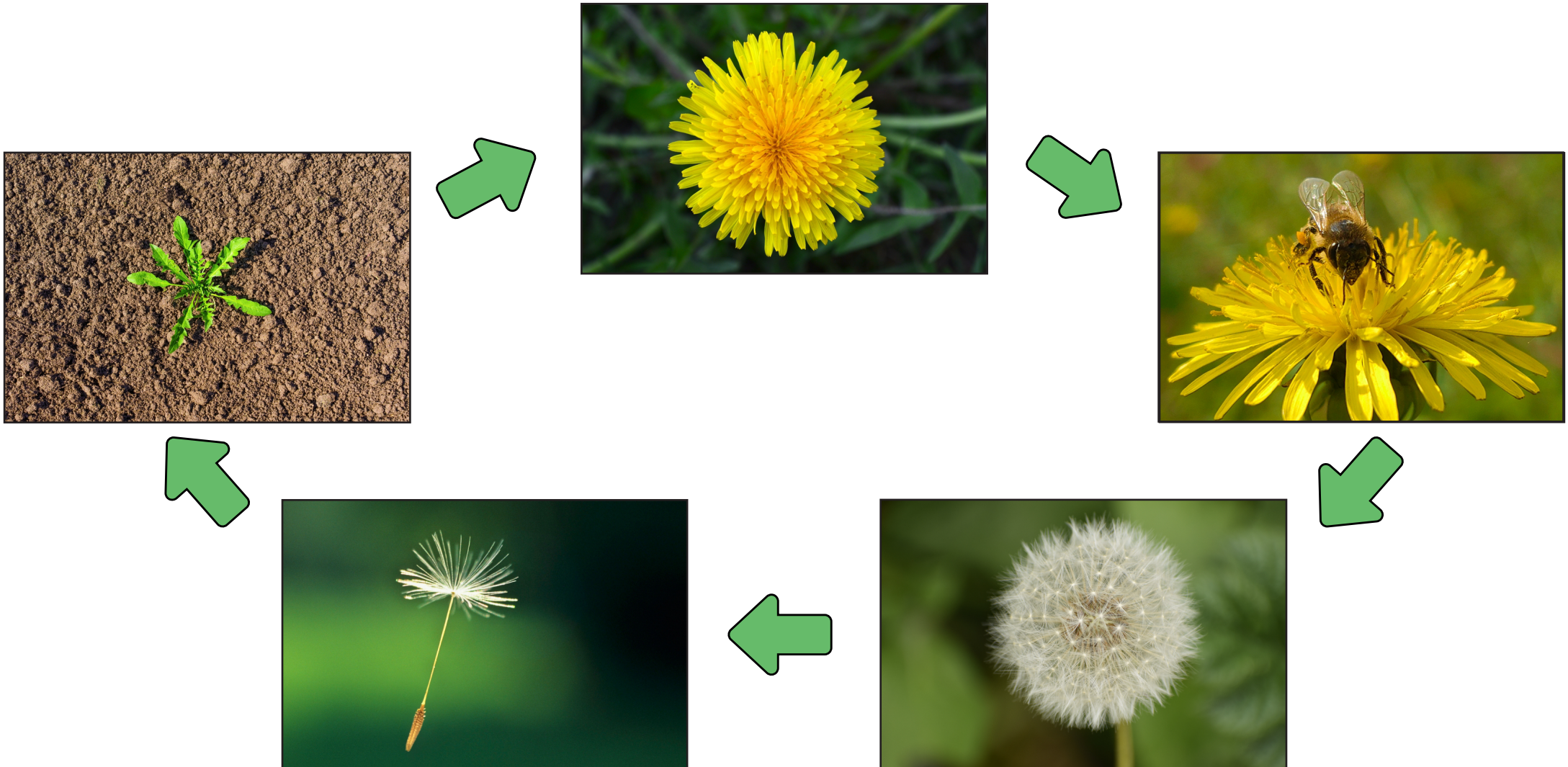
The life cycle of a dandelion

Use the photo cards on your table. Sequence the photos to show the life cycle of a dandelion plant with your learning partner. Be ready to share your feedback with the class before the answers are revealed.



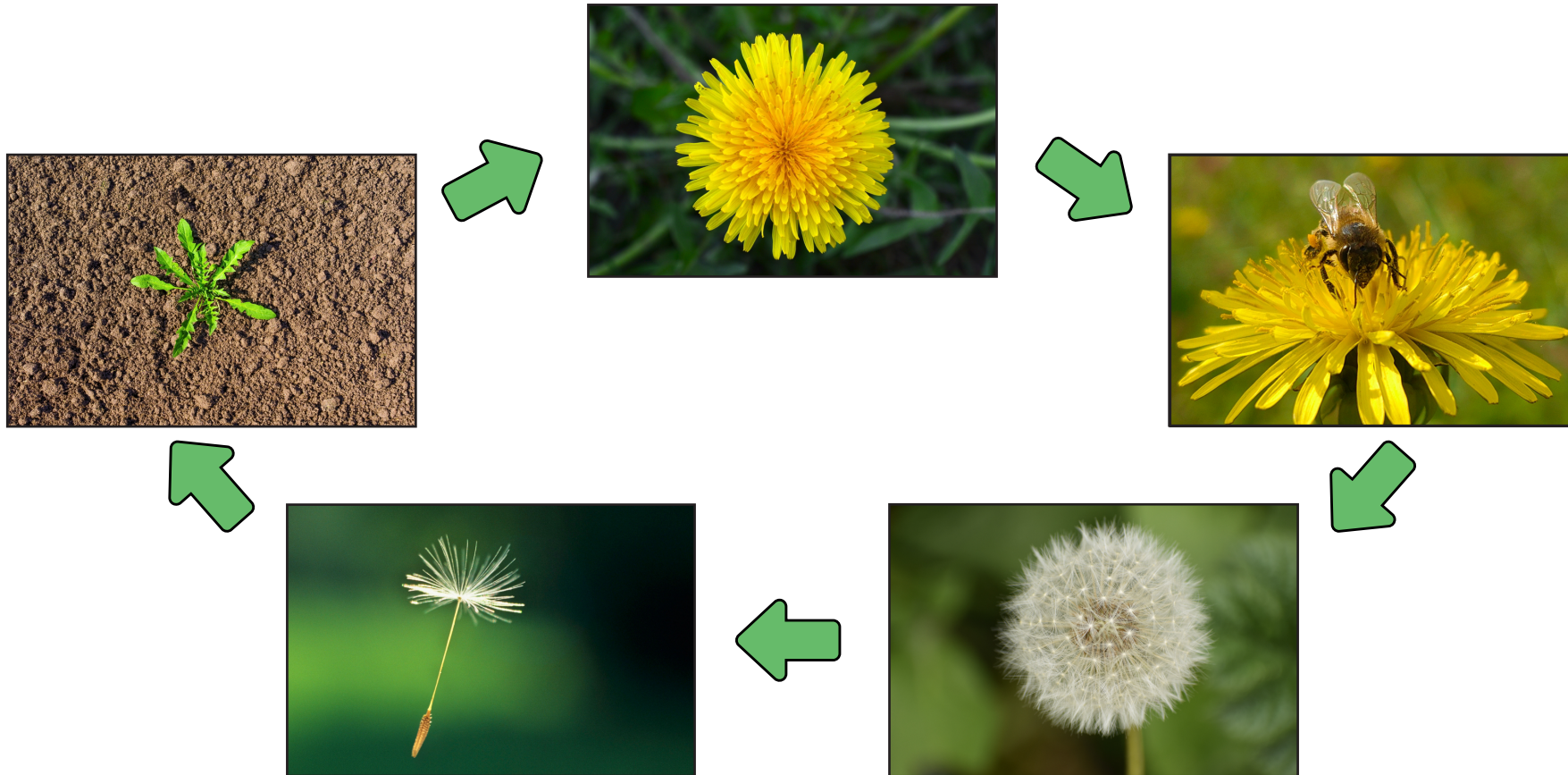
The life cycle of a dandelion

answers



The stages of a life cycle

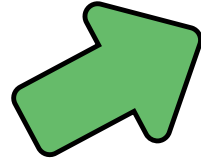
What is happening at each stage in this life cycle? Discuss this question with your learning partner.
Be ready to share your feedback with the class before the answers are revealed.



The stages of a life cycle

answers

The **seedling** grows into a mature plant.




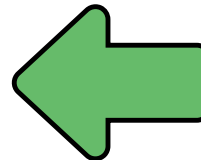
The mature plant produces flowers that attract pollinators.





The seed settles and begins to **germinate**.



The seeds are **dispersed** .

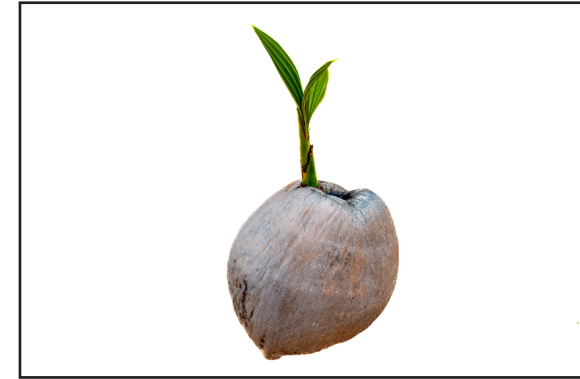


Once **pollination**  and **fertilisation**  have occurred, seeds form.



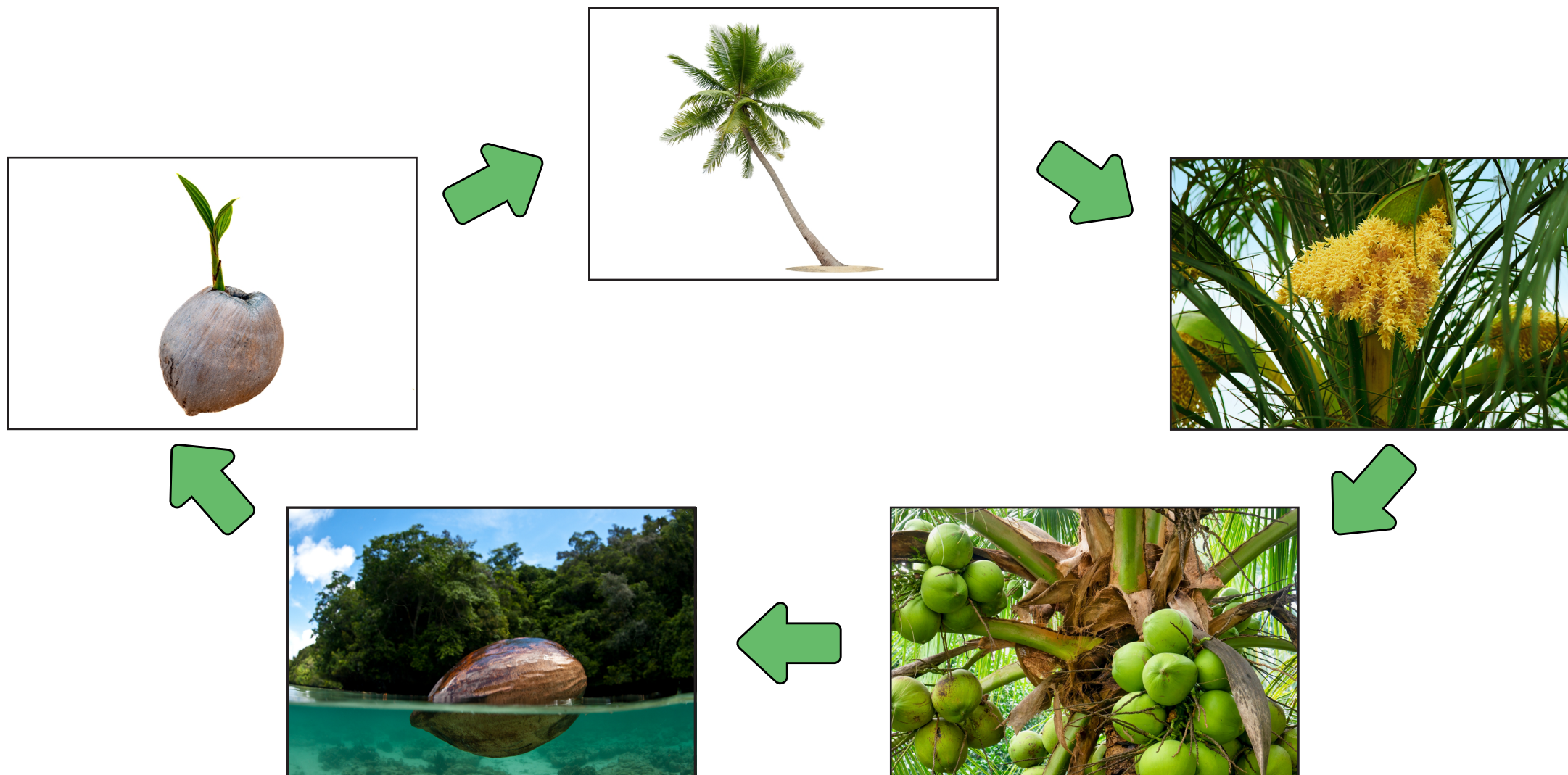
The life cycle of a coconut

Use the photo cards on your table. Sequence the photos to show the life cycle of a coconut with your learning partner. Be ready to share your feedback with the class before the answers are revealed.



The life cycle of a coconut

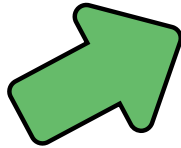
answers



The stages of a life cycle


These are the stages of a coconut's life cycle.

The **seedling** grows into a mature plant.




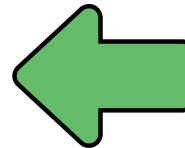
The mature plant produces flowers that attract pollinators.



Once **pollination and fertilisation**  have occurred, seeds form.



The seeds are **dispersed** 

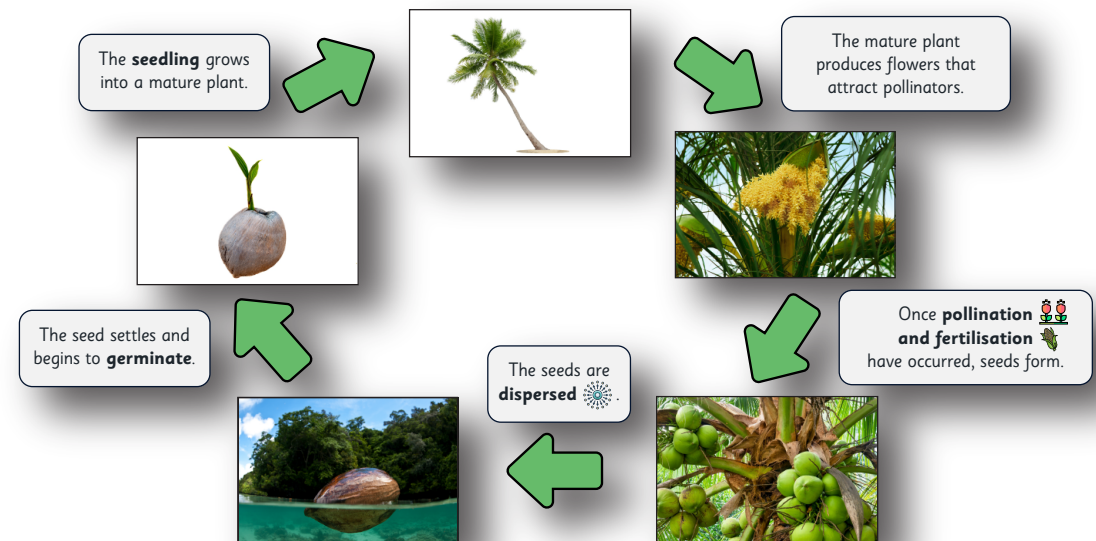
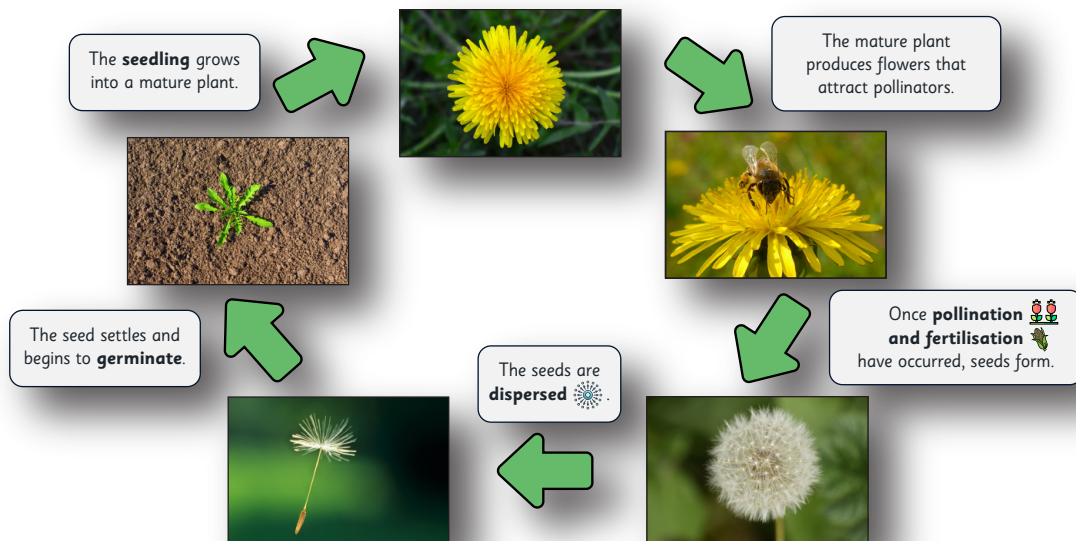


The seed settles and begins to **germinate**.



Similarities and differences


Compare the life cycles of a dandelion and a coconut. Discuss with your learning partner what is the same and what is different. Be ready to share your feedback with the class before the answers are revealed.



Similarities and differences

answers



1. Both seeds are dispersed  and find a good place to germinate.



2. The coconut takes longer to grow and produce flowers.



3. Both flowers are pollinated by either insects or the wind.



4. The seeds develop in the ovary. The dandelion has small, light seeds. The coconut seeds are large and heavy.



5. The seeds look different and are dispersed in different ways.



Let's watch

Seed dispersal plays an important part in a plant's life cycle. Let's watch the video below to remind you of all the different ways seeds can be **dispersed**.



<https://www.youtube.com/watch?v=-KIYVGXT1IA>



True or false activity

Read the statements below with your learning partner and decide whether they are **true** or **false**.
Be ready to **share your feedback** with the class before the **answers are revealed**.

True**False**

Dandelion seeds are dispersed by water.....

☐☐

Coconut seeds can be transported across the sea.....

☐☐

Animals can only disperse seeds if they eat the fruit.....

☐☐

True or false activity

answers

True**False**

Dandelion seeds are dispersed by water.

☐

FALSE. They are dispersed by the wind.

Coconut seeds can be transported across the sea.

☐

Animals can only disperse seeds if they eat the fruit.

☐

FALSE. They can carry sticky seeds in their fur.

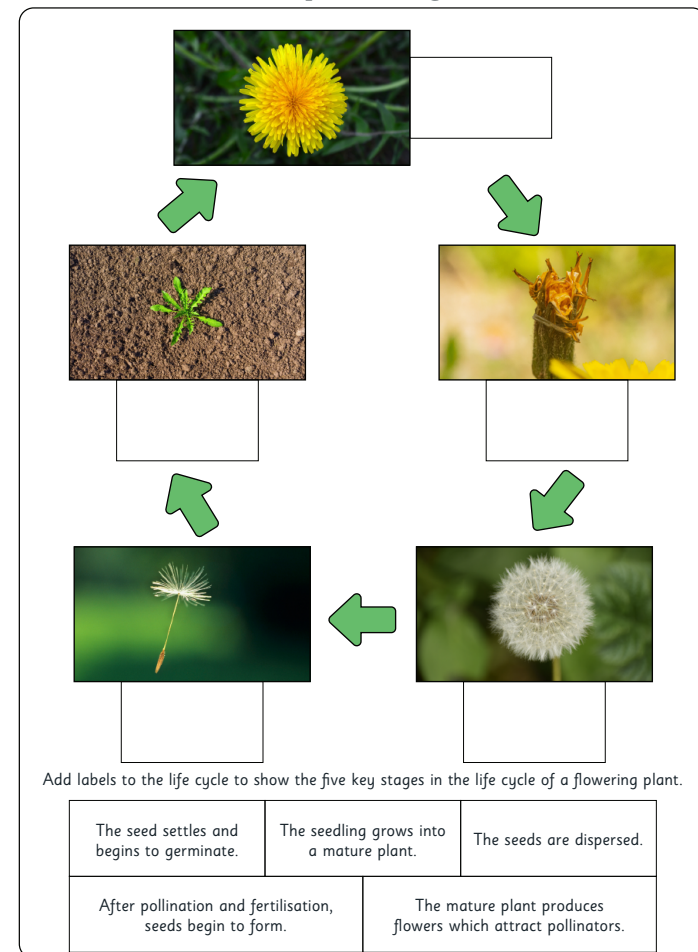


Stop and jot



Complete the labels on your **stop and jot worksheet** to show the **five key stages** in the **life cycle of a flowering plant**.

Stop and jot



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Germinating seeds



Testing

Making
predictionsSetting
up tests

It can sometimes take years for the conditions to be right for a seed to germinate. In 2005, scientists managed to get a date palm seed to germinate that was around **2000 years old!** WOW!

We are going to investigate how long it takes seeds to germinate!



Seeds



You can select any **four types of seeds**.

You could even choose some from the **school grounds**!

cress



mustard



basil



lettuce



Let's get ready



You will need **four different types of seed**. We only need these seeds to begin **germinating**, so we will use damp kitchen paper rather than soil. We will keep the seeds covered, as most don't need light to germinate, which will prevent them from **drying out**. Get what you need for the experiment ready.

You will need:

- individual trays or a paint palette
- kitchen roll paper
- water
- four different types of seeds
- black paper to cover



Let's get ready



Testing

Making
predictionsSetting
up tests

Now, **let's read through the steps** of the experiment, so you know what to expect when you start.

Method:

1. Use a paint palette with four or six wells.
2. Cut two or three layers of kitchen paper to fit the bottom of each well.
3. Soak the kitchen paper in water and drain off excess water.
4. Sprinkle ten to twenty seeds on the paper in each well and make sure you label them.
5. Cover the paint palette with a sheet of black card.
6. Keep in a warm place and spray lightly with water if the seeds begin to dry out.
7. Check the seeds to see if there are signs of germination at the beginning and end of each school day.



Let's discuss



Testing

Making
predictionsSetting
up tests

Will this be a fair test or a comparative test?

Discuss this question with your learning partner. Be ready to share your feedback with the class.

In a fair test:

one variable would be changed:
temperature, light or water
the **seed** would **stay the same**

In a comparative test:

one variable would change
this time it would be the **seed**.

(This would not be a fair test because there are other variables that we cannot control, like the size of the seed or the thickness of the seed covering.)

Remember!



A variable is something that can be changed in an investigation.



Predictions



We will **compare** how quickly different seeds germinate.

Discuss the following questions with your learning partner.

Which of the seeds do you think will germinate first?

Look at each seed. Is there anything in the appearance that might suggest they will germinate quickly?

Can you use any knowledge about seeds to help you?

Be ready to share your feedback with the class.

Use the following sentence starter to help you.

“I predict that the...will germinate first because...”



Remember!

A prediction is a statement saying what we think will happen.

Things to consider:

What is germination?

How will you measure this?

Will all the seeds need to germinate or just some of them?



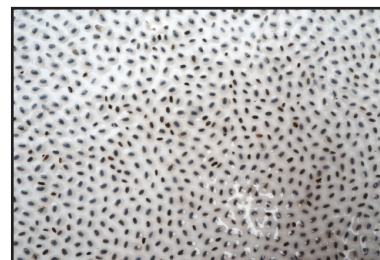
Recording your results



Think about how to record your results.

You could take photos or make careful observations.

You might like to **record the results in a table** or count the number of seeds that germinate each day. It's up to you.



Activity



It's time to **investigate!** Follow the instructions and record your results on your **activity worksheet**.

Germination investigation



You will need:

- individual trays or a paint palette
- kitchen roll paper
- water
- four different types of seeds
- black paper to cover

Investigate: which seeds will germinate first.

- make predictions
- set up tests
- record results

Method:

1. Use a paint palette with four or six wells.
2. Cut two or three layers of kitchen paper to fit the bottom of each well.
3. Soak the kitchen paper in water and drain off excess water.
4. Sprinkle 10 to 20 seeds on the paper in each well and make sure you label them.
5. Cover the paint palette with a sheet of black card.
6. Keep in a warm place and spray lightly with water if the seeds begin to dry out.
7. Check the seeds to see if there are signs of germination at the beginning and end of each school day.

What seeds are you including in your investigation?

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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Prediction:

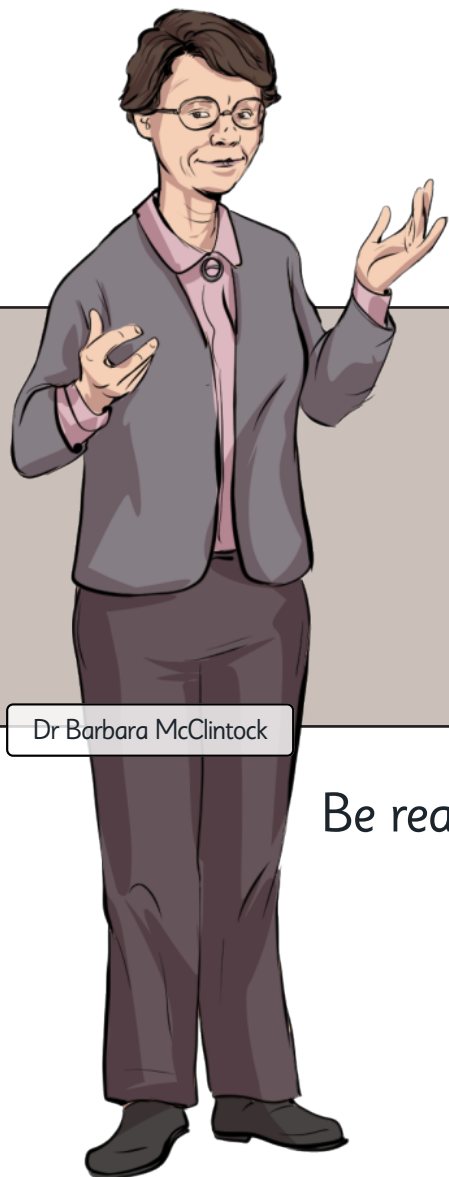
- I predict that the _____ will germinate first because _____

How have you controlled variables in the investigation?

How will you record your results?



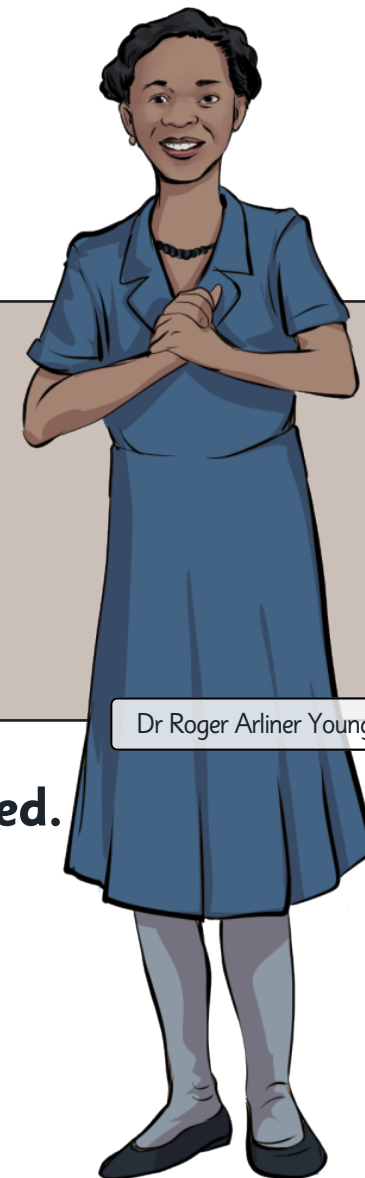
Challenge



Dr Barbara McClintock

Discuss the following question with your learning partner.

Why do seeds need to be **dispersed away** from the parent plant before they **germinate?**



Dr Roger Arliner Young

Be ready to **share your feedback** with the class before the **answer is revealed.**

Use the following sentence starters to help you.

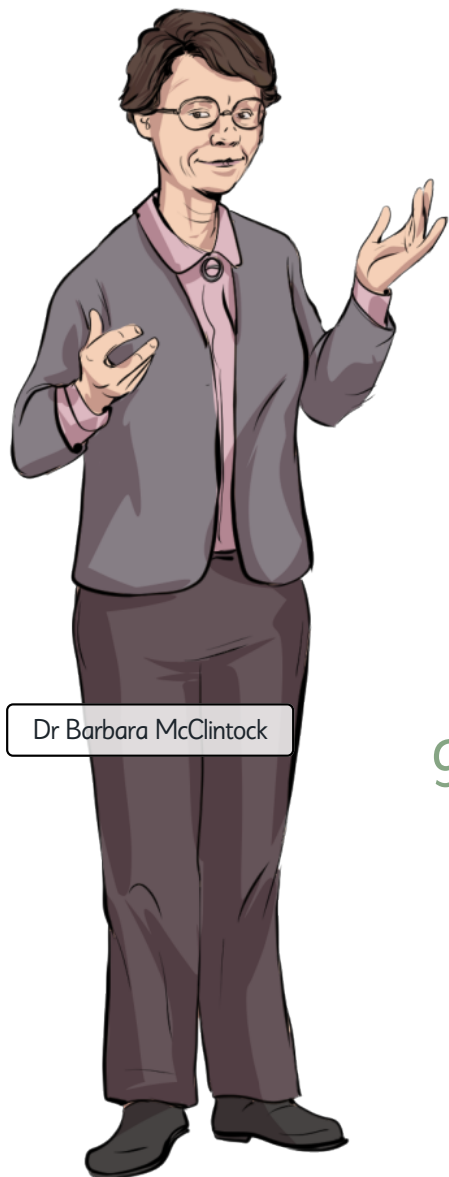
“Seed dispersal moves seeds away from the parent plant so...”

“If seeds stay near the parent plant...”



Challenge

answers



Dr Barbara McClintock

Seed dispersal moves seeds away from the parent plant so they have enough space to grow.

If seeds stay near the parent plant, they might all try to grow in the same spot, making it hard for them to survive.



Dr Rosalind Franklin

