

Change: Science by Keith Kelly

AGE: Teenagers
LEVEL: Intermediate
TIME NEEDED: Approx. 90 minutes
OBJECTIVES: to learn about the different methods of fruit and seed dispersal; to do a prediction quiz and a reading; to take part in a group presentation; to complete exercises on words linked to change and interaction
KEY SKILLS: reading, speaking, writing, listening
MATERIALS: one copy of the worksheet per student; coloured pens; A3 paper; coconut and dandelion seeds (optional)

Content focus Fruit and seed dispersal

Warm-Up: 2-3 minutes
Activity 1: 15 minutes
Activity 2: 10 minutes
Activity 3: 5 minutes
Activity 4: 15-20 minutes
Activity 5: 15-20 minutes

WARM-UP

1. Show students a coconut and a dandelion seed and ask them to tell you what they are. Encourage students to describe how they think the fruit and the seed get from one place to another. Do not correct or expand on what students say, just allow them to touch on what they may already know about fruit and seed dispersal before the lesson begins.

Note: You can use other examples of a fruit and a seed depending on what is available. Or you can show students a picture of a fruit and a seed instead.

ACTIVITY 1

2. Hand out the worksheet and get students to answer the questions in pairs without looking at the text on fruit and seed dispersal in the second part of the activity. Encourage them to guess the answers if they are unsure.

Key _____
 1. *The seeds in a pod can be scattered away from the parent plant when a fruit dries and suddenly bursts*

open.; 2. Animals eat fruit and discard the seeds or eat fruit and excrete the seeds away from the parent plant.; 3. People disperse seeds both intentionally by moving them around, or accidentally by carrying them unawares.; 4. Some seeds are built with wings or parachutes to move in the wind by gliding, spinning or floating away from the parent plant.; 5. Some seeds are buoyant and can float on water, others can trap air in their fine hairs enabling them to float.

3. Now ask students to read the text on fruit and seed dispersal quickly to check their predictions. They shouldn't spend much time doing this, as it is to locate the answers to the questions only.

ACTIVITY 2

4. Get students to match the sentence beginnings in the left-hand column to the sentence endings in the right-hand column to make sentences about fruit and seed dispersal. Encourage students not to look back at the text in Activity 1 to help them do this. When they have finished, elicit answers from the whole class first and then let students read the text again, this time more slowly, to check their answers.

Key _____
 1. d; 2. c; 3. f; 4. e; 5. b; 6. a

ACTIVITY 3

5. Get students to match the pictures illustrating different types of fruit and seed dispersal with the correct descriptions.

Key _____
 1. c; 2. a; 3. d; 4. b

ACTIVITY 4

6. Put students into groups of three and ask them to prepare for a two-minute presentation. In their groups, they will research a fruit or seed and present it to the class. Either have a selection of different types of fruits and seeds available for students to choose from (these should cover the different types of dispersal), or ensure that there are plenty of reference resources available for students to do their research, such as encyclopaedias or internet access.

7. Go through the instructions for the presentation and give groups about 15-20 minutes to do their research. Hand out several sheets of A3 paper and

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coloured pens and ask them to prepare diagrams and illustrations and write a step-by-step process of the dispersal method of their chosen fruit or seed.

Stress that they should also give their opinions on how effective a mechanism their fruit or seed uses for dispersal. Encourage students to also use the phrases for change and interaction provided in preparing for their presentation.

Tip: Depending on time, it may be more suitable to allow students to finish their presentation preparation as homework for the next lesson.

ACTIVITY 5

8. Ask the first group to perform their presentation. Each presentation should take about two minutes. The other groups should listen carefully and make notes on the effectiveness of the dispersal methods of the fruits or seeds presented.

9. When all the groups have finished presenting, encourage each group to discuss their opinions amongst themselves. Tell them to collectively decide how effective the method of dispersal is for each of the fruits or seeds talked about.

10. Now discuss the presentations as a class and decide which fruit or seed has the most effective method of dispersal. This could be done by taking a class vote.

Language focus Change and interaction

Activity 1: 10 minutes
Activity 2: 10 minutes
Activity 3: 10-15 minutes

Get students practising language linked to change and interaction by reading the [Your CLIL: Change: Science](#) article.

ACTIVITY 1

Get students to write the correct form of the noun into the table for each of the verbs used for describing growth and change. They can use a dictionary if needed.

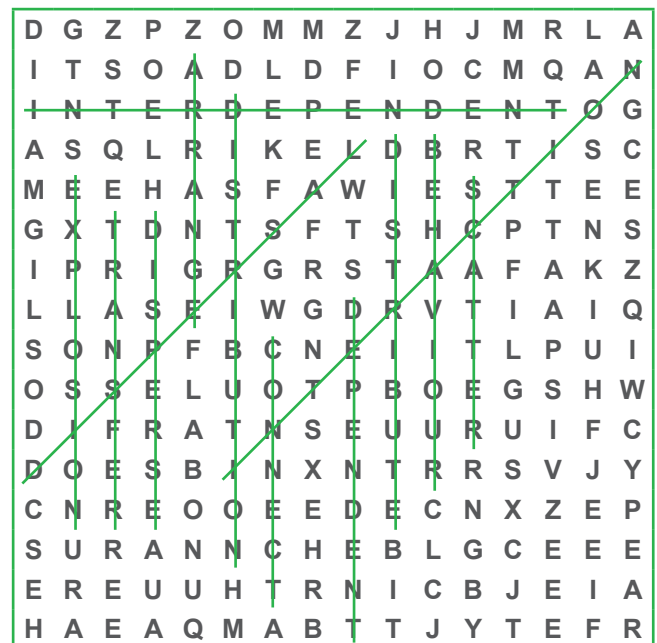
Tip: In cases where the verb and the noun are the same (for example, *decrease*), let students know that the stress is on the first syllable for the noun and on the second syllable for the verb.

Key

1. *adaptation*; 2. *change*; 3. *contraction*; 4. *decrease*; 5. *development*; 6. *enlargement*; 7. *evolution*; 8. *expansion*; 9. *explosion*; 10. *growth*; 11. *increase*; 12. *swell(ing)*

ACTIVITY 2

Get students to find and circle the words in the wordsearch used for describing patterns of interaction and distribution.



ACTIVITY 3

Get students to read the sentences and fill in the gaps with words used for describing circumstances and conditions for change. Students then complete the crossword with the words. All the words appear in the [Your CLIL: Change: Science](#) article, although some may be in a different form. The first letters are given as prompts.

Key

Across – 2. *provide*; 7. *inhibit*; 8. *allow*; 9. *preserve*; 10. *prevent*
Down – 1. *conditions*; 3. *regulate*; 4. *stimulate*; 5. *enable*; 6. *encourage*

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Content focus Fruit and seed dispersal

ACTIVITY 1

Predict the answers to the questions below.

1. How do fruit and seeds manage to disperse themselves?
2. How do animals help in the dispersal of fruit and seeds?
3. How do people help in the dispersal of fruit and seeds?
4. How does the wind help in the dispersal of fruit and seeds?
5. How does water help in the dispersal of fruit and seeds?

Now read the text about fruit and seed dispersal quickly and check your predictions.

Fruit and seed dispersal

The importance of fruits is in the dispersal of their seeds. If the seeds drop beside the parent plant and germinate there, they will be competing with the parent for water, light and nutrients. However, if the seeds are carried some distance, there is a better chance of having the conditions they need for germination and good growth. Seeds are dispersed by different methods, depending on the type of the fruit, and often with the assistance of external agents, such as animals, water and wind.

Dispersal by animals and people

Many fruits are tasty and colourful to attract animals. Large seeds inside the fruits may be discarded by the animal when eaten, and the smaller seeds may be swallowed during eating. These eventually pass out of the body undigested in the faeces of the animal because the coat (testa) on the seeds protects them from digestion. However, both large and small seeds are usually carried away from the parent plant before being discarded. There are some fruits dispersed by animals that are not edible. They have various structures, such as burrs or hooks, that enable them to catch on an animal's hair or fur as it brushes past. The seeds drop off later, usually when the animal is some distance from the parent plant. People play a major role in dispersing seeds around the world too. Sometimes it is intentional, as when they import plant materials from other countries. And sometimes it is by accident, such as seeds carried on the bottom of boats or accidentally caught in cargo.

Dispersal by wind

Seeds dispersed in this way are specially shaped with wings or fine hairs to help them catch the air currents and glide, spin or float away from the parent plant. Dandelion fruits, for example, are shaped like parachutes and this makes it possible for them to float in the wind. And there are plants, like the poppy, that depend on the wind to shake the seeds out of its capsule and scatter them a short distance away from the parent plant. Seeds dispersed by the wind are very small and light so that they can be spread as far as possible.

Dispersal by water

Coconuts are the most commonly known fruits and seeds dispersed by water. They have a buoyant husk (mesocarp) that allows them to float for long distances by sea before they are washed up on the shore. Their waterproof skin (epicarp) prevents them from becoming waterlogged during their journey. Other seeds have fine hairs on them that can trap air and enable them to float on the surface of the water.

Self-dispersal

Some plants, such as the legumes, have a built-in mechanism that allows the seeds to be scattered when the fruits burst open. As the fruits dry, tension builds up in the coat of the seeds until they split. The sudden explosion causes the seeds to disperse a good distance from the parent plant.

Adapted from *CXC Integrated Science* by Tania Chung-Harris, pp.27-8 © Macmillan Caribbean 2005

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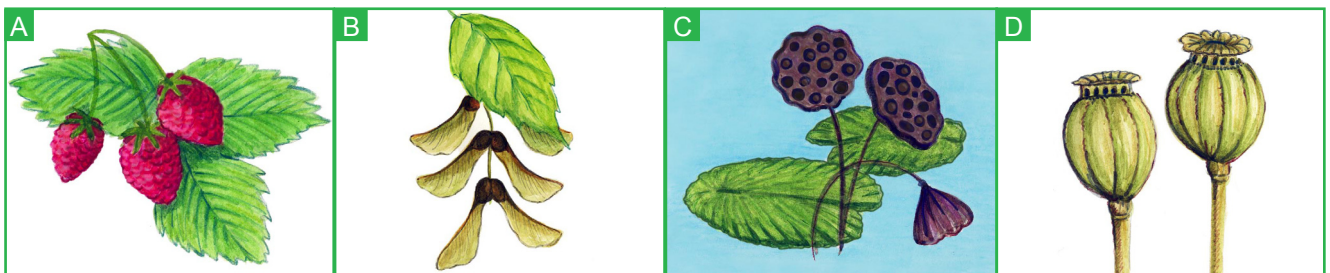
ACTIVITY 2

Read and match the sentence beginnings in the left-hand column with the correct sentence endings in the right-hand column. Then read the text in Activity 1 again, this time more slowly, to check the answers.

- | | |
|--|---|
| 1. Seeds carried some distance from the parent plant have a better chance of ... | a. ... that allows the seeds to be scattered when the fruits burst open. |
| 2. Many fruits are tasty and colourful to attract animals, and their seeds ... | b. ... prevents them from becoming waterlogged during their journey. |
| 3. Some fruits have burrs or hooks on them ... | c. ... are usually carried away from the parent plant before being discarded. |
| 4. Dandelion fruits are shaped like parachutes ... | d. ... having the conditions they need for germination and good growth. |
| 5. Coconuts have a waterproof skin or epicarp that ... | e. ... making it possible for them to float in the wind. |
| 6. Some plants, such as the legumes, have a built-in mechanism ... | f. ... enabling them to catch on an animal's hair or fur as it brushes past. |

ACTIVITY 3

Read the texts and match the pictures with the correct descriptions.



1 Some seeds are so small that they don't break the surface tension of the river or lake they grow by and when they fall into the water, they simply float away from the parent plant. Larger seeds may have a thick woody coating to protect them and can use buoyancy to enable them to float.

2 Some plants have rich, juicy, fleshy fruits to attract animals. When an animal eats the fruit, the seeds pass through its digestive system and are dispersed in the droppings, or the seeds may simply be discarded during eating. Other seeds have hooks or burrs that attach them to an animal's hair or fur and carry the seeds away from the parent plant.

3 Some seeds have pods that dry out and eventually burst open to scatter the seeds at some distance from the parent plant.

4 Some seeds use wings or feathery threads that enable them to float on air currents away from the parent plant.

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ACTIVITY 4

In groups of three, choose a fruit or a seed. Research how it disperses, the plant it comes from and the habitat in which it grows.

Present your chosen fruit or seed to the class.

Your presentation should include the following:

- Choose an illustration for your fruit or seed.
- Describe the process of dispersal step-by-step using diagrams and / or pictures.
- Give your opinion of the method of dispersal for your fruit or seed. Does it have an effective method of dispersal? Can you suggest any improvements?

Use the phrases for change and interaction in the table below to help you with your presentation.

If ... there is a better chance that ...
... with the assistance of ...
... enable it / them to ...
... play a major role in ...
... are specially shaped with ... to help it / them ...
... make it possible for it / them to ...
... make it easy for it / them to ...
... depend on ... to ...
... that allows it / them to ...
... prevents it / them from ...
... are able to ...
... enabling the ... to ...
... have a built-in mechanism that allows ... to ...

ACTIVITY 5

Discuss the presentations as a class and decide which fruit or seed has the most effective method of dispersal.

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**Language focus
Change and interaction**

ACTIVITY 1

Read the verbs used for describing growth and change in the tables and write the correct noun form in the right-hand columns.

	verb	noun
1	adapt	
2	change	
3	contract	
4	decrease	
5	develop	
7	enlarge	

	verb	noun
8	evolve	
9	expand	
10	explode	
11	grow	
12	increase	
13	swell	

ACTIVITY 2

Find and circle the words used for describing patterns of interaction and distribution. They can be found horizontally, vertically and diagonally.

- arrange
- behaviour
- connect
- dependent
- dispersal
- disperse
- distribute
- distribution
- explosion
- interaction
- interdependent
- scatter
- transfer

D	G	Z	P	Z	O	M	M	Z	J	H	J	M	R	L	A
I	T	S	O	A	D	L	D	F	I	O	C	M	Q	A	N
I	N	T	E	R	D	E	P	E	N	D	E	N	T	O	G
A	S	Q	L	R	I	K	E	L	D	B	R	T	I	S	C
M	E	E	H	A	S	F	A	W	I	E	S	T	T	E	E
G	X	T	D	N	T	S	F	T	S	H	C	P	T	N	S
I	P	R	I	G	R	G	R	S	T	A	A	F	A	K	Z
L	L	A	S	E	I	W	G	D	R	V	T	I	A	I	Q
S	O	N	P	F	B	C	N	E	I	I	T	L	P	U	I
O	S	S	E	L	U	O	T	P	B	O	E	G	S	H	W
D	I	F	R	A	T	N	S	E	U	U	R	U	I	F	C
D	O	E	S	B	I	N	X	N	T	R	R	S	V	J	Y
C	N	R	E	O	O	E	E	D	E	C	N	X	Z	E	P
S	U	R	A	N	N	C	H	E	B	L	G	C	E	E	E
E	R	E	U	U	H	T	R	N	I	C	B	J	E	I	A
H	A	E	A	Q	M	A	B	T	T	J	Y	T	E	F	R

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ACTIVITY 3

Complete the sentences with the missing words describing circumstances and conditions for change. Then complete the crossword with the words. The first letters have been given for you.

Across

2. Carbohydrates are required to p_____ energy both for the mother and the developing foetus.
7. Hormones in the blood from target glands i_____ the production of the hormone from the pituitary gland that stimulated them.
8. Which materials a_____ the transfer of heat by convection?
9. Techniques developed to prepare and p_____ foods include pickling, salting and smoking.
10. Brushing your teeth to remove plaque helps p_____ tooth decay and gum disease.

Down

1. Sexual reproduction is best in changing c_____, as there will be a variation between the offspring.
3. The diaphragm is adjusted to r_____ the light passing through the camera lens.
4. Diuretics s_____ the body to get rid of water and salts by urinating.
5. Cotton seeds have fine hairs that trap air and e_____ them to float.
6. Plant hormones can e_____ root growth.