

Expected Student Responses - Worksheet 2.2 What are the ingredients for Life?

Please refer to the Teacher Resource document for information on how to use the worksheet for the activity.

Q1. a) Draw a **food chain** in the box below and explain how the energy is transferred from producer to consumer.

Expected Responses

Examples of food chains

- Grass → Rabbit → Fox
 - Grass → Grasshopper → Sparrow → Sparrow Hawk
- The grass gets energy from the Sun and then the rabbit eats the grass to get energy and then the fox eats the rabbit for its energy source.
- The grass is the producer and the rabbit and fox are consumers.

Q1. b) Using your food chain, **describe the ingredients** you think are needed for life.

Expected Responses

Example

- Grass → Rabbit → Fox
- In this food chain, the grass needs the Sun and water to grow. It uses the energy from the Sun and takes in carbon dioxide from the air to undergo photosynthesis, in order to generate energy. So that means carbon dioxide must also be an ingredient for life.
- The rabbit needs the grass as a food source, to give it energy and also water and oxygen to breathe.
- The fox needs the rabbit as its food source and water and oxygen to breathe.
- So the ingredients for life could be water, the Sun, carbon dioxide and oxygen.

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Q2. a) Imagine the Earth lost all of its Carbon. How would this affect your food chain? You may wish to use diagrams in your answer.

Expected Responses

- If the Earth lost all of its Carbon then there would be no carbon dioxide source. The grass needs carbon dioxide for photosynthesis - so the grass cannot undergo photosynthesis.
- If this is the case then the grass will die, and that means the rabbits have no grass to eat, so they will die.
- The foxes need the rabbits and so without their food source they will have no energy and die too.
- There would be no plant or animal life on an Earth without carbon.

Q2. b) The Earth is currently undergoing a climate crisis. Part of the reason for this is because of increasing levels of Carbon Dioxide (CO_2) in our atmosphere. How would an **increase** in CO_2 affect your food chain? You may wish to use diagrams in your answer.

Expected Responses

- Carbon dioxide is a greenhouse gas, meaning that it acts like a blanket keeping the heat trapped in the Earth's atmosphere.
- If carbon dioxide levels increase this means the Earth will get hotter and hotter and the grass will need more water. But the water will evaporate and dry up if the Earth is hotter.
- If the grass has no water source it will die, and this means the rabbits and foxes have no food source, so they will die out too.
- If the carbon dioxide levels increase then there will eventually be no life on Earth.

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Q2. c) Use the [Global Carbon Atlas website](#) to investigate how Carbon is produced on Earth and how the Earth absorbs Carbon. Record your findings in the table.

Carbon Sources	Carbon Sinks
Burning Coal	Oceans
Burning Oil	Forests and woodlands
Burning Natural Gas	Atmosphere
Changing forests to pastures or croplands	Soil (Peat/Bog)
Cement production	Plants
Gas flaring	

Q2. d) How can we, as citizens, reduce our Carbon emissions to help slow down global warming?

Expected Responses

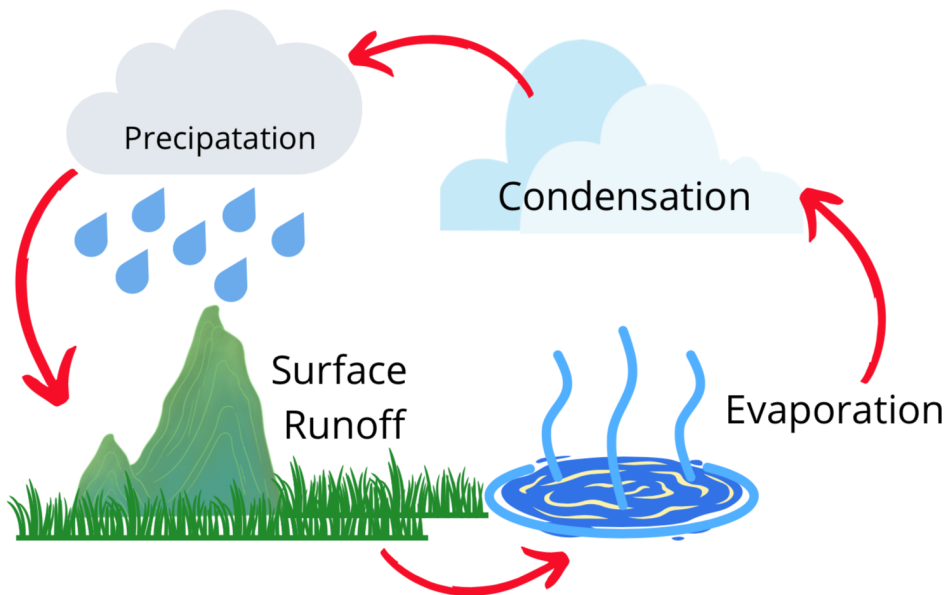
- We can reduce our carbon dioxide emissions by replacing our fossil fuels with renewable energy sources.
- We can travel by foot, bicycle or public transport rather than driving, where possible.
- We can protest and ask our government and other large corporations to stop funding the extraction of fossil fuels.
- We can have conversations with our families and friends and encourage them to reduce, reuse and recycle waste as much as possible.
- We can stop supporting fast fashion and instead buy from sustainable clothing brands or buy second-hand from Depop or charity shops.
- We can protest the excessive use of plastic wrapping in supermarkets and try to make swaps to plastic free alternatives such as using shampoo bars instead of plastic bottles of shampoo.
- We can buy second-hand phones or repair our phones when damaged rather than buying a new one.

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Q3. Water is another ingredient that is necessary for life. Imagine that you are a scientist who has discovered this fact. **Design a simple experiment** demonstrating the water cycle on Earth, to help you communicate your findings to others. Remember to include diagrams!

Expected Responses

Possible diagram students may include:



Example experiment:

Ziplock bag of water → Sun heats water and water evaporates → rises as steam to top of bag → steam condenses at top of bag → water vapour precipitates

1. Water evaporating

2. Water vapour precipitates

