Review 2
Worksheet

Combined Science - Chemistry - Key Stage 4

C9 - Chemistry of the Atmosphere

Miss Fenner

What's wrong with this statement?

The greenhouse layer of the atmosphere is also known as the ozone layer.

What should it say?

The greenhouse layer of the atmosphere is different to the ozone layer.

What’s wrong with this statement?

The most abundant gas in our current atmosphere is oxygen.

What should it say?

The most abundant gas in our current atmosphere is nitrogen.

What's wrong with this statement?

Lots of nitrogen was released by volcanic activity.

What should it say?

A little nitrogen was released by volcanic activity, but as it is an unreactive gas, it built up to high levels.

What’s wrong with this statement?

Photosynthesis increased the level of carbon dioxide in the atmosphere.

What should it say?

Photosynthesis increased the level of oxygen in the atmosphere.

What's wrong with this statement?

Greenhouse gases are the process by which the Earth warms up.

What should it say?

The greenhouse effect is the process by which the Earth warms up.

What's wrong with this statement?

High levels of methane are produced by growing vegetables.

What should it say?

High levels of methane are produced by farming cattle / growing rice.

What's wrong with this statement?

The definition of climate change is "an increase to the average global temperature".

What should it say?

The definition of climate change is "a change to the average global temperature".

What’s wrong with this statement?

Carbon footprint is the total amount of carbon dioxide emitted.

What should it say?

Carbon footprint is the total amount of carbon dioxide (and other greenhouse gases) emitted.

What's wrong with this statement?

The pollutant carbon monoxide can form acid rain.

What should it say?

The pollutants sulfur dioxide and nitrogen oxides can form acid rain.

Quick Quiz!

1. State 3 fossil fuels.
2. What caused the high levels of water vapour in the early atmosphere?
3. The development of algae and plants caused levels of which gas to decrease?
4. Approximately how long does it take for limestone and fossil fuels to form?
5. Why are fossil fuels described as finite?
6. What is a greenhouse gas?
7. Why is it thought that climate change could lead to a rise in sea levels?
8. Why is it thought that climate change could lead to food shortages?
9. How could walking to school help reduce your carbon footprint?
10. What problem can carbon monoxide cause to humans?

Review

1. **Coal, oil and natural gas** are the 3 fossil fuels.
2. **Volcanic activity** caused high levels of water vapour in the early atmosphere.
3. The development of algae and plants caused levels of **carbon dioxide** to decrease.
4. It takes approximately **millions of years** for limestone and fossil fuels to form.
5. Fossil fuels are described as finite because there is a **limited supply** of them.
6. A greenhouse gas is a gas that **absorbs infrared radiation** in the atmosphere e.g. **carbon dioxide, water vapour and methane.**

Review

7. Climate change could lead to a rise in sea levels because an increase in temperature could cause **ice caps to melt and additional water to enter the sea.**

8. Climate change could lead to food shortages **because some crops will be unable to grow in the heat and with less water available.**

9. Walking to school can help reduce your carbon footprint because it means you are **not using a car which burns fossil fuels and releases greenhouse gases.**

10. Carbon monoxide can **bind to our red blood cells** preventing oxygen from reaching our cells and respiration occuring.

Match each command word to its meaning

State	Make something clear, or state the reasons for something happening
Describe	Describe the similarities and differences between things
Explain	Consider evidence for and against and make a judgement
Compare	Give a simple answer. No explanation needed.
Evaluate	Recall some facts, events or process in an accurate way

Self-assess

State	Make something clear, or state the reasons for something happening
Describe	Describe the similarities and differences between things
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Independent Practice

1. **State** an example of a pollutant.

2. **Describe** what an atmospheric pollutant is.

3. **Explain** the problems caused by sulfur dioxide.

4. **Compare** how the pollutants sulfur dioxide and carbon monoxide are formed.

Review

1. An example of a pollutant is **carbon monoxide/ soot / sulfur dioxide/ nitrogen oxides.**

2. An atmospheric pollutant is a substance which **negatively affects the atmosphere.**

3. Sulfur dioxide causes problems **because** it can dissolve in rain water to form sulfuric acid (acid rain). This can damage plants, buildings and statues.

4. Sulfur dioxide is formed when a fossil fuel containing sulfur impurities combusts **whereas** carbon monoxide is formed from the incomplete combustion of a fossil fuel.

Describe the process of the greenhouse effect. (6 marks)

Model answer

Long wavelength infrared radiation passes through the Earth's atmosphere. The Earth absorbs most of the radiation and warms up. The Earth **radiates** short wavelength infrared radiation. Some of the infrared radiation **goes into space.** Some of the infrared radiation is **absorbed** by greenhouse gases in the atmosphere. The atmosphere **warms up.** This is called the greenhouse effect.

Explain two ways a person can reduce their carbon footprint. (4 marks)

Cycle or walk to school instead of driving
This reduces their carbon footprint **because** cars combust petrol to run which releases greenhouse gases.

Eat less beef/ rice
This reduces their carbon footprint **because** farming beef and growing rice releases lots of methane, a greenhouse gas.

Use less electricity
This reduces their carbon footprint **because** fossil fuels are combusted to generate electricity. This process releases greenhouse gases.

See you next time.