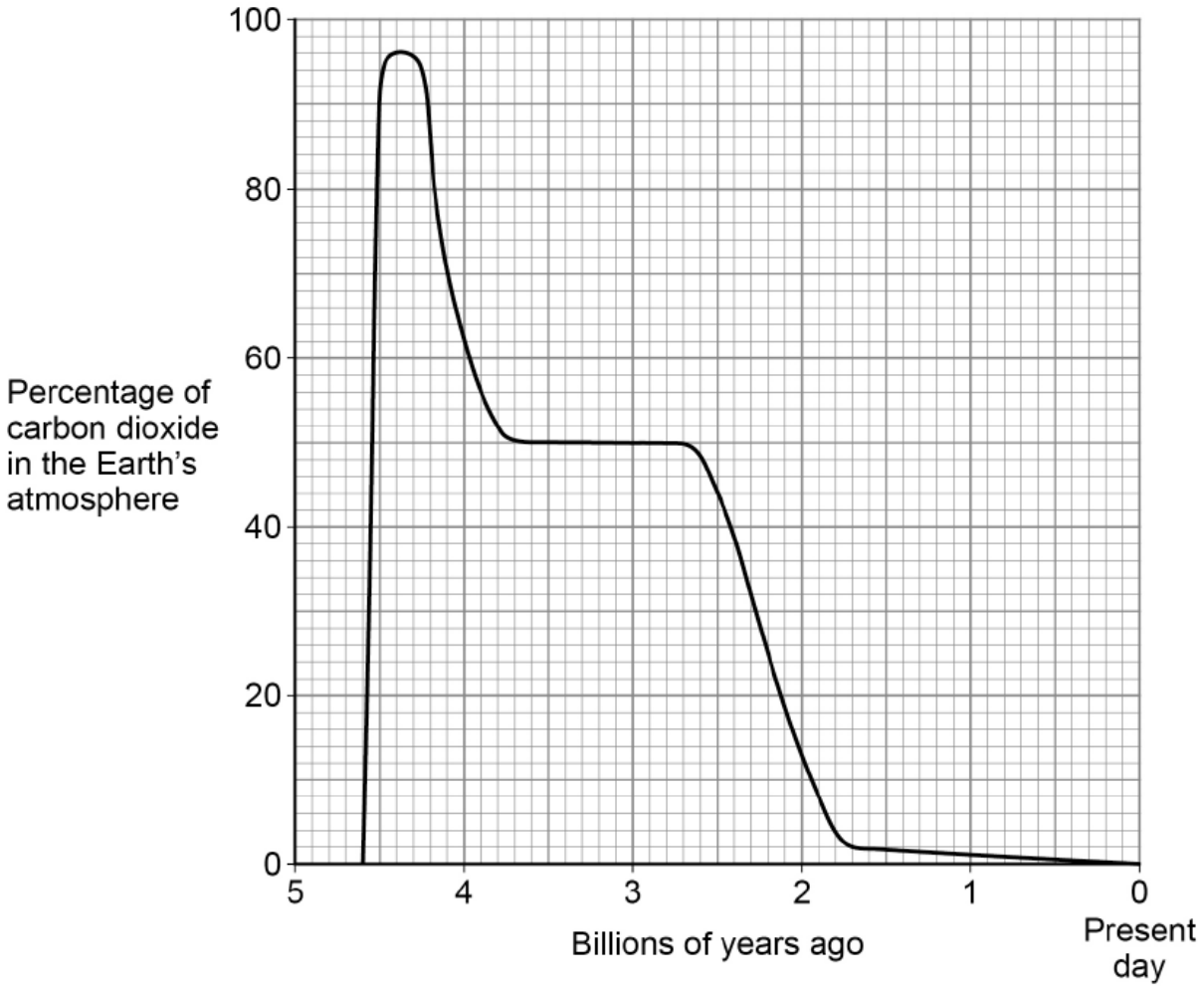
AQA - The composition and evolution of Earth's atmosphere – GCSE Combine Science Chemistry

1. May/2020/Paper_8464/2F/No.2

This question is about carbon dioxide in the Earth's atmosphere.

Figure 2 shows how the percentage of carbon dioxide in the Earth's atmosphere has changed over 4.6 billion years.

Figure 2



What was the highest percentage of carbon dioxide in the Earth's atmosphere?

Use **Figure 2**.

[1 mark]

Highest percentage = _____ %

The percentage of carbon dioxide in the atmosphere has decreased since Earth's early atmosphere.

Which **two** processes have decreased the percentage of carbon dioxide in the Earth's atmosphere?

[2 marks]

Tick (✓) **two** boxes.

Combustion of fuels ☐

Formation of sedimentary rocks ☐

Photosynthesis ☐

Volcanic activity ☐

The total amount of carbon dioxide emitted over the life cycle of a product can be measured.

What name is given to the total amount of carbon dioxide emitted during the life cycle of a product?

[1 mark]

Tick (✓) **one** box.

Carbon footprint ☐

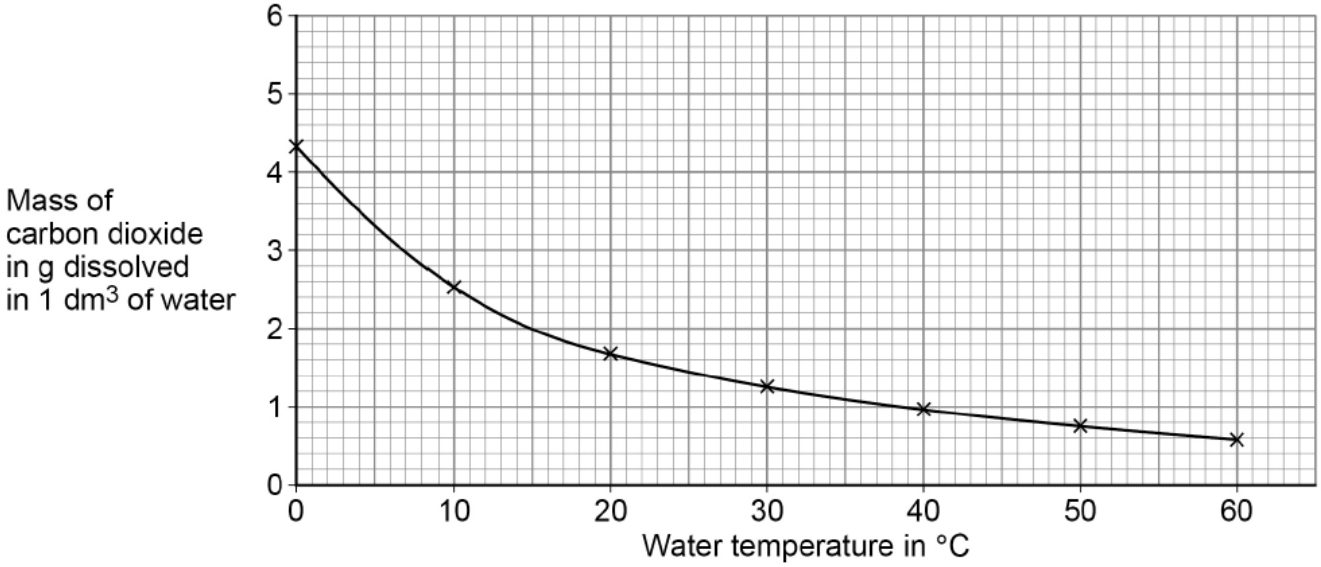
Global dimming ☐

Greenhouse effect ☐

Carbon dioxide dissolves in water.

Figure 3 shows the mass of carbon dioxide dissolved in water at different temperatures.

Figure 3



Complete **Table 1**.

Use **Figure 3**.

[2 marks]

Table 1

Water temperature in °C	**Mass of carbon dioxide in g dissolved in 1 dm^3 of water**
5	
15	

Calculate the difference in the mass of carbon dioxide dissolved in 1 dm^3 of water at 5 °C and at 15 °C

Use **Table 1**.

[1 mark]

Mass = _____ g

Carbon dioxide is a greenhouse gas.

The greenhouse effect happens in four stages.

The four stages are:

Stage **A** Carbon dioxide stops longer wavelength radiation escaping

Stage **B** Radiation is absorbed by the Earth

Stage **C** Longer wavelength radiation is emitted

Stage **D** Shorter wavelength radiation enters the atmosphere.

What is the correct order of stages **A**, **B**, **C** and **D**?

[1 mark]

Tick (✓) **one** box.

C, **A**, **B**, **D** ☐

C, **D**, **B**, **A** ☐

D, **B**, **C**, **A** ☐

D, **C**, **B**, **A** ☐

Changes in the percentage of carbon dioxide in the Earth's atmosphere cause climate change.

Give **two** effects of climate change.

[2 marks]

1 _____

_____

2 _____

_____

2. Jun/2019/Paper_8464/2F/No.2

Concrete contains cement, water, sand and small stones.

Concrete is a mixture designed as a useful product.

What do we call a mixture which has been designed as a useful product?

[1 mark]

Tick (✓) **one** box.

Finite ☐

Formula ☐

Formulation ☐

Fraction ☐

Concrete contains cement.

Cement is made by heating a mixture containing silicon dioxide (SiO_2).

Why does silicon dioxide have a very high melting point?

[2 marks]

Tick (✓) **two** boxes.

It has a giant structure ☐

It has a simple molecular structure ☐

It has strong covalent bonds ☐

It has strong ionic bonds ☐

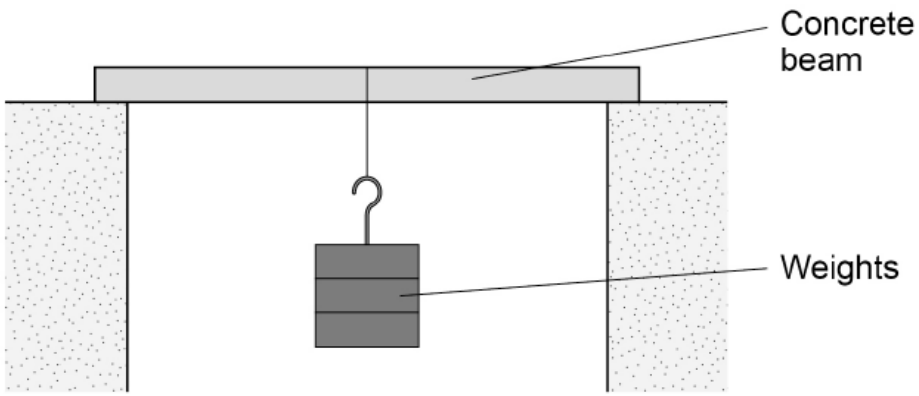
It has weak intermolecular forces ☐

Student **A** investigated how the mass of the small stones in concrete affects the strength of a concrete beam. All other variables were kept the same.

The student added weights until the concrete beam broke.

Figure 1 shows the apparatus Student **A** used.

Figure 1



Draw **one** line from each type of variable to the correct example of the variable.

[2 marks]

Type of variable	Example of variable
	Length of concrete beam
Control	Mass of small stones in concrete
Independent	Time taken to add weights
	Weight needed to break concrete beam

Table 1 shows Student **A**'s results.

Table 1

Mass of small stones in grams (g)	Weight needed to break concrete beam in newtons (N)
500	70
1000	100
1500	110
2000	100
2250	85
2500	65
2750	35

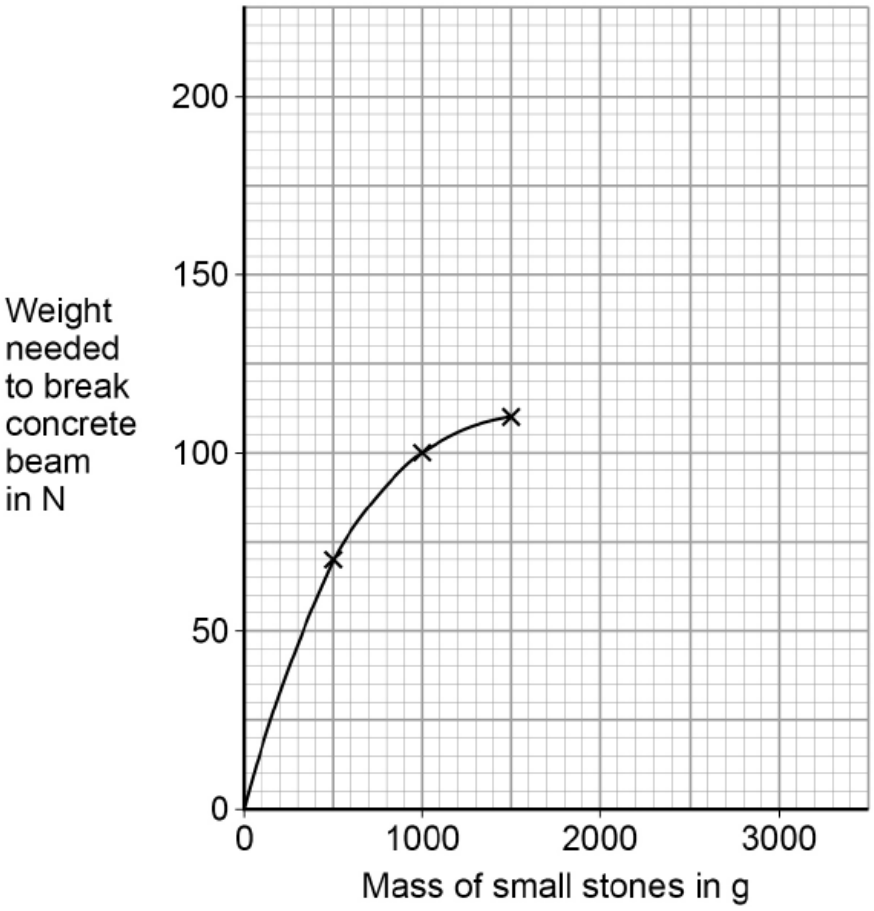
Plot the data from **Table 1** on **Figure 2**.

The first three points are plotted for you.

Draw the line of best fit.

[3 marks]

Figure 2



What mass of small stones would be needed to make the strongest concrete?

Give a reason for your answer.

Use **Figure 2**.

[2 marks]

Mass = _____ g

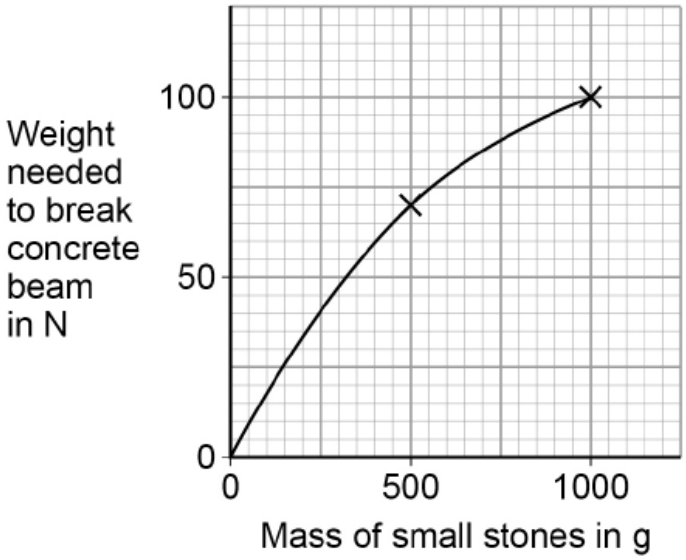
Reason _____

_____

Student **B** did a similar investigation.

Figure 3 shows Student **B**'s results.

Figure 3



How could Student **B** improve their investigation?

Use **Figure 2** and **Figure 3**.

[1 mark]

_____

_____

3. Jun/2019/Paper_8464/2F/No.5.1-5.2

What is the percentage by mass of calcium in the Earth's crust?

[1 mark]

Tick (✓) **one** box.

3.25%	☐	3.50%	☐	4.50%	☐	5.00%	☐

The percentage by mass of magnesium in the Earth's crust is 2.1%

Draw the bar for magnesium on **Figure 6**.

[1 mark]