WJEC 2014 Online Exam Review

GCSE Science Unit 1 Foundation Tier 4781-01

All Candidates' performance across questions

Question Title	N	Mean	S D	Max Mark	F F	Attempt %
1	428	2.6	1.1	7	36.7	99.8
2	423	2.2	1.4	6	37.1	98.6
3	419	0.6	0.7	4	16.1	97.7
4	421	2.4	1.9	7	34.4	98.1
5	427	3.9	1.7	10	38.5	99.5
6	423	2	1.7	8	24.9	98.6
7	428	2.7	1	4	68.5	99.8
8	423	5.8	4	24	24.1	98.6

5

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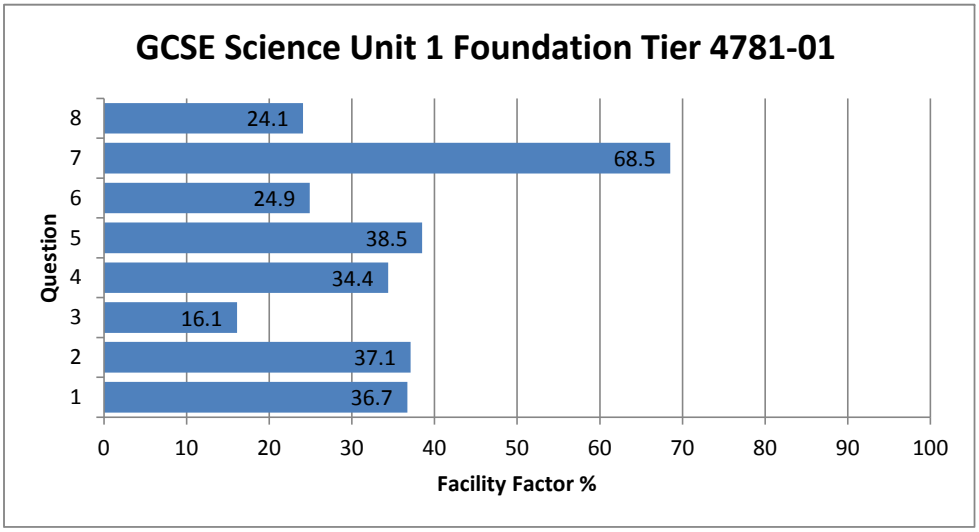


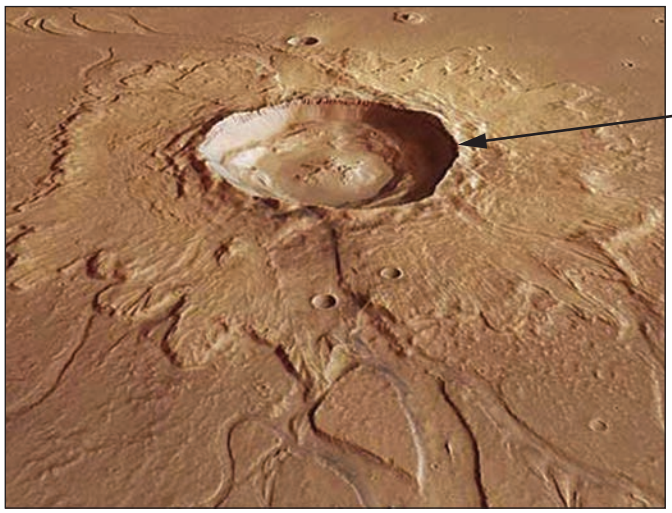
Examiner only

5. The photographs below show different features on Mars.

(a) Use words from the list below to complete the labels. [2]

volcano *ice cap* *crater*

Photograph 1



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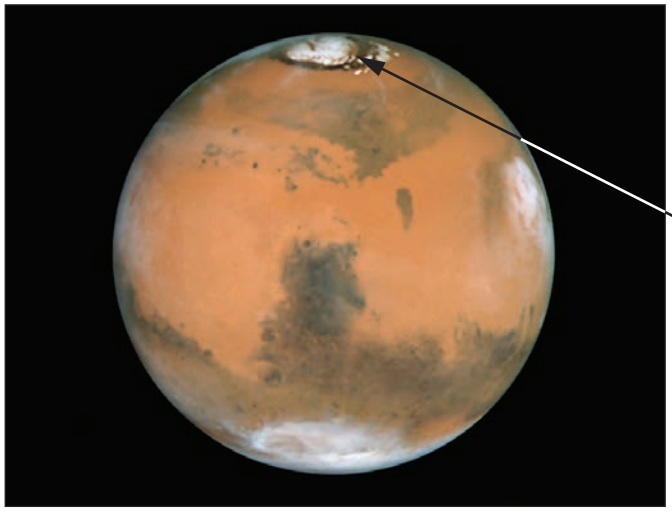
Photograph 2

.....

Photograph 3



.....

Examiner only

(b) (i) Name the substance that flows from a volcano when it erupts.

..... [1]

(ii) What does the presence of a volcano suggest about the early core of Mars? [1]

.....

.....

(iii) It has been suggested that the surface of Mars may be made from tectonic plates. Give **one** reason how the presence of volcanoes supports this idea. [1]

.....

(c) There are many more craters on the surface of Mars than on the surface of Earth.

(i) How were these craters formed? [1]

.....

(ii) Give **one** reason why this suggests there is a 'thinner' atmosphere on Mars. [1]

.....

.....

(d) (i) Only **frozen** water has been found on Mars, for example, at the ice cap. What does this tell us about the climate on Mars? [1]

.....

.....

(ii) Carbon dioxide makes up 95% of the atmosphere on Mars.
Explain how you would expect this to affect Mars' climate. [2]

.....

.....

.....

10

Turn over.

Examiner only

5. The photographs below show different features on Mars.

(a) Use words from the list below to complete the labels. [2]

volcano *ice cap* *crater*

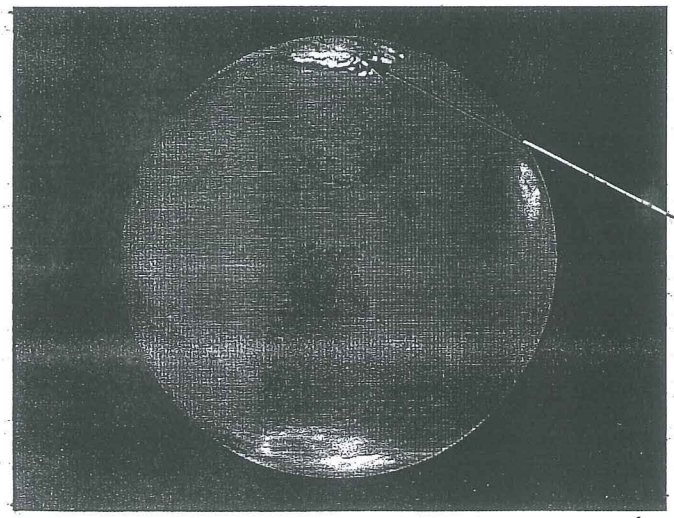
Photograph 1

crater

Photograph 2

volcano

Photograph 3



ice cap

Examiner only

(b) (i) Name the substance that flows from a volcano when it erupts.

Lavas [1]

(ii) What does the presence of a volcano suggest about the early core of Mars? [1]

~~Lava is Magma under the surface.~~ It also might mean that there are tectonic plates.

(iii) It has been suggested that the surface of Mars may be made from tectonic plates. Give **one** reason how the presence of volcanoes supports this idea. [1]

Because sometimes when tectonic plates bump the form a volcano

(c) There are many more craters on the surface of Mars than on the surface of Earth.

(i) How were these craters formed? [1]

Asteroids hit Mars.

(ii) Give **one** reason why this suggests there is a 'thinner' atmosphere on Mars. [1]

because the asteroids get to the surface faster either get sucked in by gravity and it ses meteors

(d) (i) Only **frozen** water has been found on Mars, for example, at the ice cap. What does this tell us about the climate on Mars? [1]

It is cold.

(ii) Carbon dioxide makes up 95% of the atmosphere on Mars.
Explain how you would expect this to affect Mars' climate. [2]

It should trap in more heat making mars very hot.

10

Examiner only

5. The photographs below show different features on Mars.

(a) Use words from the list below to complete the labels. [2] 2

volcano *ice cap* *crater*

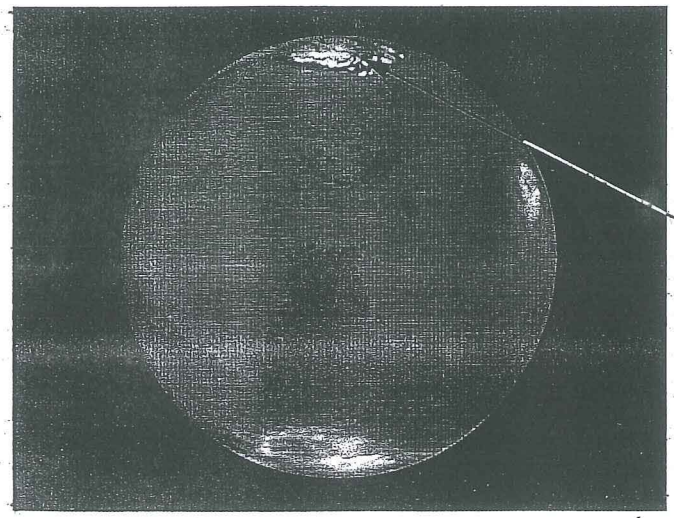
Photograph 1

crater

Photograph 2

volcano

Photograph 3



ice cap

Examiner only

(b) (i) Name the substance that flows from a volcano when it erupts.

Lavas [1] 1

(ii) What does the presence of a volcano suggest about the early core of Mars? [1] 0

~~Lava is found under the surface.~~ It also might mean that there are tectonic plates.

(iii) It has been suggested that the surface of Mars may be made from tectonic plates. Give **one** reason how the presence of volcanoes supports this idea. [1] 1

Because sometimes when tectonic plates ~~blow~~ the form a volcano

(c) There are many more craters on the surface of Mars than on the surface of Earth.

(i) How were these craters formed? [1] 1

Asteroids hit Mars.

(ii) Give **one** reason why this suggests there is a 'thinner' atmosphere on Mars. [1] 0

because the asteroids get to the ~~Mars~~ faster either get sucked in by gravity and it uses energy

(d) (i) Only **frozen** water has been found on Mars, for example, at the ice cap. What does this tell us about the climate on Mars? [1] 1

It is cold.

(ii) Carbon dioxide makes up 95% of the atmosphere on Mars. **Explain** how you would expect this to affect Mars' climate. [2] 1

It should trap in more heat making mars very hot.

7
10

Examiner only

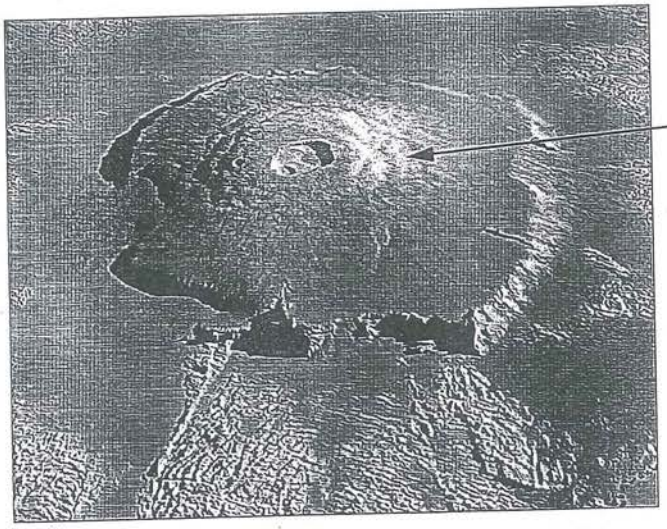
5. The photographs below show different features on Mars.

(a) Use words from the list below to complete the labels. [2]

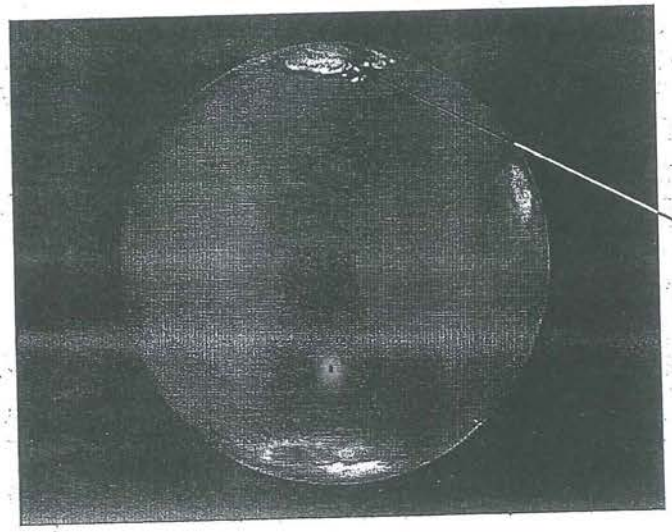
volcano *ice cap* *crater*

Photograph 1

Photograph 2



Photograph 3



Examiner only

(b) (i) Name the substance that flows from a volcano when it erupts. [1]

Lava

(ii) What does the presence of a volcano suggest about the early core of Mars? [1]

It was hot

(iii) It has been suggested that the surface of Mars may be made from tectonic plates. Give **one** reason how the presence of volcanoes supports this idea. [1]

Volcanos are caused by the movement of tectonic plates

(c) There are many more craters on the surface of Mars than on the surface of Earth.

(i) How were these craters formed? [1]

hard molten rock

(ii) Give **one** reason why this suggests there is a 'thinner' atmosphere on Mars. [1]

Because there is no heat to be trapped in because of the atmosphere the lava has hardened because it's of the temperature.

(d) (i) Only **frozen** water has been found on Mars, for example, at the ice cap. What does this tell us about the climate on Mars? [1]

It's cold

(ii) Carbon dioxide makes up 95% of the atmosphere on Mars. **Explain** how you would expect this to affect Mars' climate. [2]

because carbon dioxide ~~traps~~ traps heat

10

Examiner only

5. The photographs below show different features on Mars.

(a) Use words from the list below to complete the labels. [2] 1

volcano *ice cap* *crater*

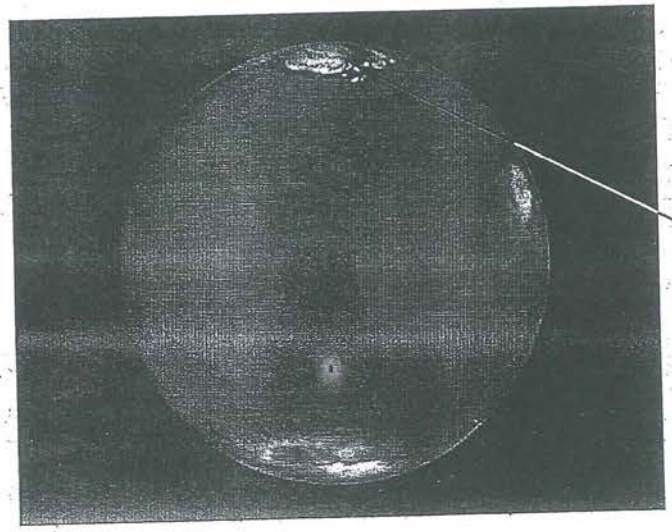
Photograph 1

volcano

Photograph 2

crater

Photograph 3



ice cap

Examiner only

(b) (i) Name the substance that flows from a volcano when it erupts.

Lava [1] 1

(ii) What does the presence of a volcano suggest about the early core of Mars? [1] 1

It was hot

(iii) It has been suggested that the surface of Mars may be made from tectonic plates. Give **one** reason how the presence of volcanoes supports this idea. [1] 0

Volcanos are caused by the movement of tectonic plates

(c) There are many more craters on the surface of Mars than on the surface of Earth.

(i) How were these craters formed? [1] 0

hard molten rock

(ii) Give **one** reason why this suggests there is a 'thinner' atmosphere on Mars. [1] 0

Because there is no heat to be trapped in because of the atmosphere the land has hardened because it's of the temperature.

(d) (i) Only **frozen** water has been found on Mars, for example, at the ice cap. What does this tell us about the climate on Mars? [1] 1

It's cold

(ii) Carbon dioxide makes up 95% of the atmosphere on Mars. **Explain** how you would expect this to affect Mars' climate. [2] 1

because carbon dioxide ~~traps~~ trapps heat

5

10

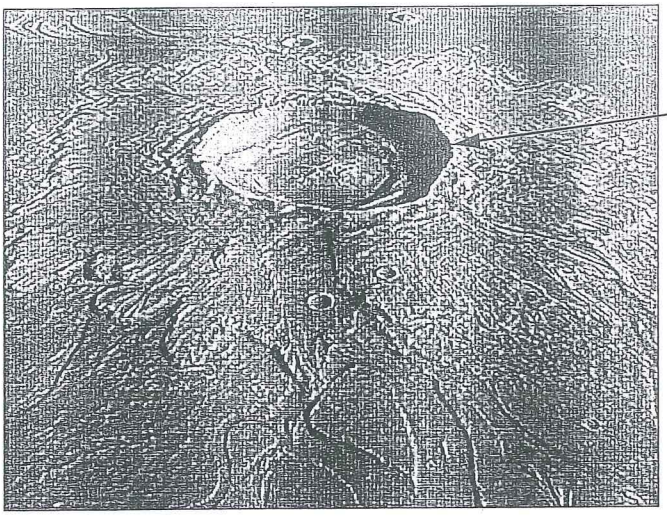
Examiner only

5. The photographs below show different features on Mars.

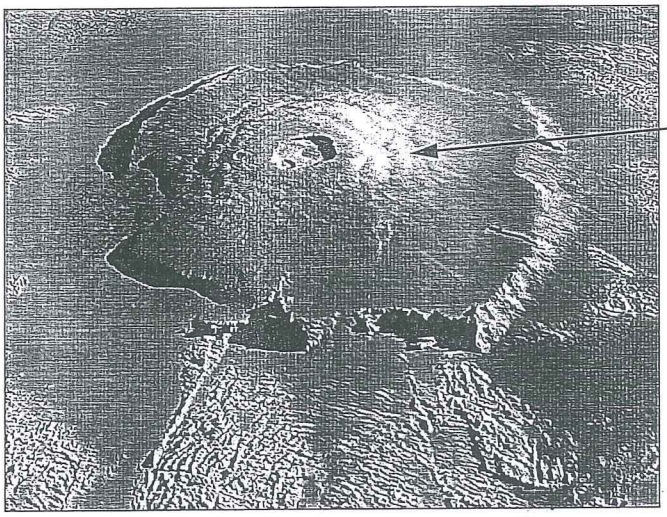
(a) Use words from the list below to complete the labels [2]

volcano *ice cap* *crater*

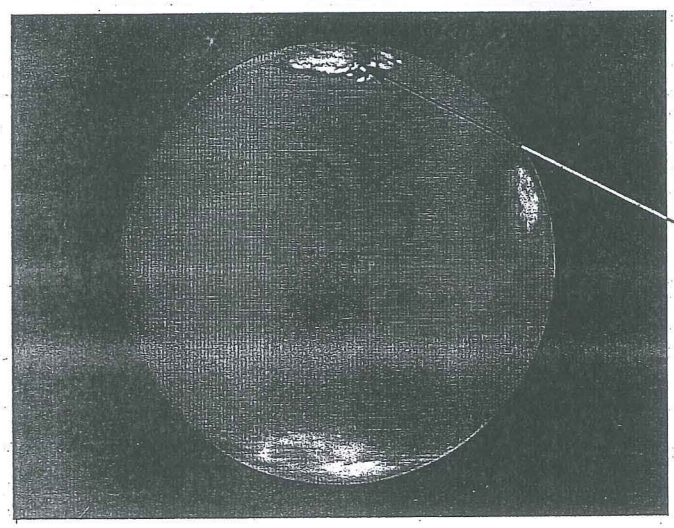
Photograph 1



Photograph 2



Photograph 3



Examiner only

(b) (i) Name the substance that flows from a volcano when it erupts.

lava [1]

(ii) What does the presence of a volcano suggest about the early core of Mars? [1]

It used to not have as much CO^2 in the air

(iii) It has been suggested that the surface of Mars may be made from tectonic plates. Give **one** reason how the presence of volcanoes supports this idea. [1]

when techtonic plates move it causes volcano

(c) There are many more craters on the surface of Mars than on the surface of Earth.

(i) How were these craters formed? [1]

Astroids.

(ii) Give **one** reason why this suggests there is a 'thinner' atmosphere on Mars. [1]

The land is very dry, more sun can get through.

(d) (i) Only **frozen** water has been found on Mars, for example, at the ice cap. What does this tell us about the climate on Mars? [1]

It's cold

(ii) Carbon dioxide makes up 95% of the atmosphere on Mars.
Explain how you would expect this to affect Mars' climate. [2]

nothing can grow or live because most of it is Carbon dioxide.

10

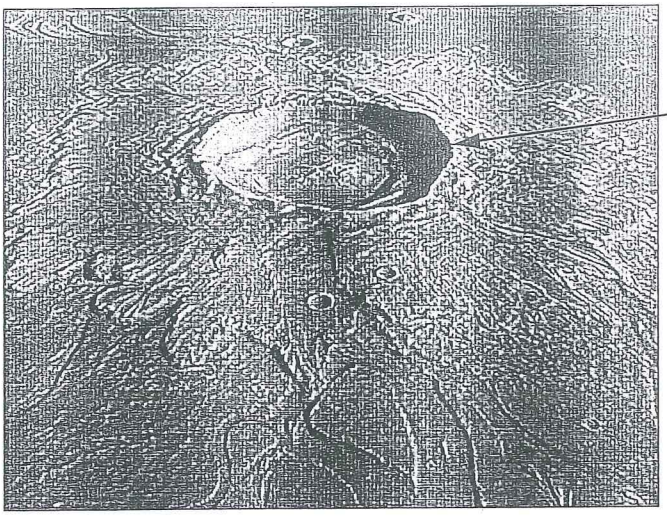
Examiner only

5. The photographs below show different features on Mars.

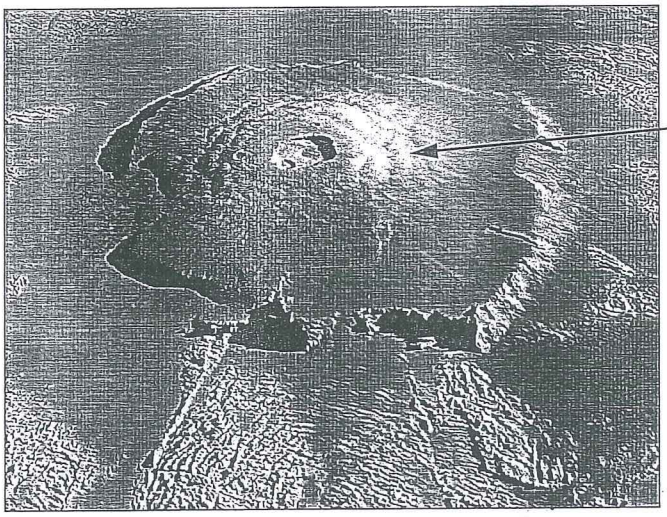
(a) Use words from the list below to complete the labels [2] 2

volcano *ice cap* *crater*

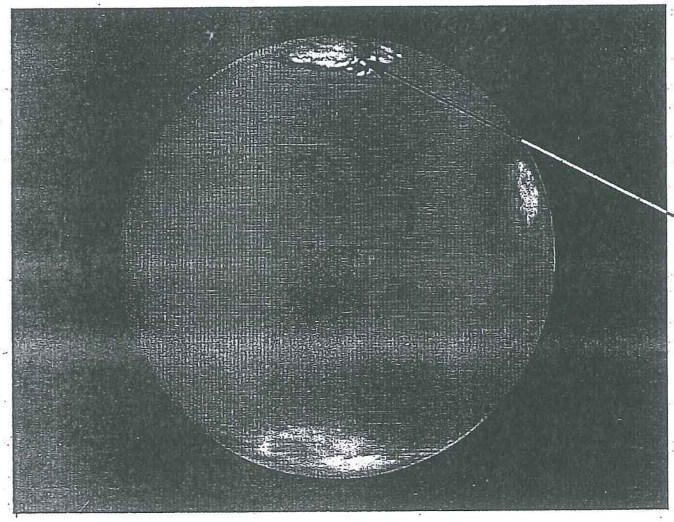
Photograph 1



Photograph 2



Photograph 3



Examiner only

(b) (i) Name the substance that flows from a volcano when it erupts.

lava [1] 1

(ii) What does the presence of a volcano suggest about the early core of Mars? [1] 0

It used to not have as much CO^2 in the air

(iii) It has been suggested that the surface of Mars may be made from tectonic plates. Give **one** reason how the presence of volcanoes supports this idea. [1] 1

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(c) There are many more craters on the surface of Mars than on the surface of Earth.

(i) How were these craters formed? [1] 1

Astroids.

(ii) Give **one** reason why this suggests there is a 'thinner' atmosphere on Mars. [1] 0

The land is very dry more sun can get through.

(d) (i) Only **frozen** water has been found on Mars, for example, at the ice cap. What does this tell us about the climate on Mars? [1] 1

It's cold

(ii) Carbon dioxide makes up 95% of the atmosphere on Mars. **Explain** how you would expect this to affect Mars' climate. [2] 0

nothing can grow or live because most of it is Carbon dioxide.

5
10

Examiner only

6. Large areas of land are used to grow trees that will be cut up to make wood chips. The wood chips are used instead of gas, coal or oil, as fuel in boilers.

(a) Explain why the supply of wood chips is renewable. [2]

.....

.....

.....

(b) (i) Name **one** gas given out when wood chips are burned. [1]

.....

(ii) Name the gas **used by** trees during photosynthesis. [1]

.....

(iii) Give **one** reason why using wood chips as a fuel is carbon neutral. [1]

.....

(c) Some coal power stations have been converted to run on wood chips.
They also act as combined heat and power (CHP) stations.
These make use of the heat in water to provide central heating for the power station and houses nearby.

One CHP station receives 500 MW of power from burning wood chips. Of this, 220 MW is distributed for district heating and 180 MW is transferred to the National Grid.

(i) Calculate the total useful output power. [1]

Useful output power = ... MW

(ii) Calculate the efficiency of the power station using the equation: [2]

$$\% \text{ efficiency} = \frac{\text{useful output power}}{\text{total input power}} \times 100$$

Efficiency = ... %

8

Examiner only

6. Large areas of land are used to grow trees that will be cut up to make wood chips. The wood chips are used instead of gas, coal or oil, as fuel in boilers.

(a) Explain why the supply of wood chips is renewable. [2]

Because we can plant more trees and keep cutting the down for eating chips and then plant more trees.

(b) (i) Name **one** gas given out when wood chips are burned. [1]

Carbon dioxide.

(ii) Name the gas **used by** trees during photosynthesis. [1]

carbon dioxide

(iii) Give **one** reason why using wood chips as a fuel is carbon neutral. [1]

Because wood doesn't contain it.

(c) Some coal power stations have been converted to run on wood chips.
They also act as combined heat and power (CHP) stations.
These make use of the heat in water to provide central heating for the power station and houses nearby.

One CHP station receives 500 MW of power from burning wood chips. Of this, 220 MW is distributed for district heating and 180 MW is transferred to the National Grid.

(i) Calculate the total useful output power. [1]

Useful output power = 400 MW

(ii) Calculate the efficiency of the power station using the equation: [2]

$$\% \text{ efficiency} = \frac{\text{useful output power}}{\text{total input power}} \times 100$$

Efficiency = 80 %

8

Examiner only

6. Large areas of land are used to grow trees that will be cut up to make wood chips. The wood chips are used instead of gas, coal or oil, as fuel in boilers.

(a) Explain why the supply of wood chips is renewable. [2] 2

Because we can plant more trees and keep cutting the down for eating chips and then plant more trees.

(b) (i) Name **one** gas given out when wood chips are burned. [1] 1

Carbon dioxide.

(ii) Name the gas **used by** trees during photosynthesis. [1] 1

carbon dioxide

(iii) Give **one** reason why using wood chips as a fuel is carbon neutral. [1] 0

Because wood doesn't contain it.

(c) Some coal power stations have been converted to run on wood chips.
They also act as combined heat and power (CHP) stations.
These make use of the heat in water to provide central heating for the power station and houses nearby.

One CHP station receives 500 MW of power from burning wood chips. Of this, 220 MW is distributed for district heating and 180 MW is transferred to the National Grid.

(i) Calculate the total useful output power. [1] 1

Useful output power = 400 MW

(ii) Calculate the efficiency of the power station using the equation: [2] 2

$$\% \text{ efficiency} = \frac{\text{useful output power}}{\text{total input power}} \times 100$$

Efficiency = 80 %

7
8

Examiner only

6. Large areas of land are used to grow trees that will be cut up to make wood chips. The wood chips are used instead of gas, coal or oil, as fuel in boilers.

(a) Explain why the supply of wood chips is renewable [2]

because you can plant trees

(b) (i) Name **one** gas given out when wood chips are burned. [1]

carbon dioxide

(ii) Name the gas **used by** trees during photosynthesis. [1]

carbon dioxide

(iii) Give **one** reason why using wood chips as a fuel is carbon neutral. [1]

because it neutralises the carbon

(c) Some coal power stations have been converted to run on wood chips.
They also act as combined heat and power (CHP) stations.
These make use of the heat in water to provide central heating for the power station and houses nearby.

One CHP station receives 500 MW of power from burning wood chips. Of this, 220 MW is distributed for district heating and 180 MW is transferred to the National Grid.

(i) Calculate the total useful output power. [1]

Useful output power = 400 MW

(ii) Calculate the efficiency of the power station using the equation: [2]

$$\% \text{ efficiency} = \frac{\text{useful output power}}{\text{total input power}} \times 100$$

Efficiency = 80 %

8

Examiner only

6. Large areas of land are used to grow trees that will be cut up to make wood chips. The wood chips are used instead of gas, coal or oil, as fuel in boilers.

(a) Explain why the supply of wood chips is renewable [2] 1

because you can plant trees

(b) (i) Name **one** gas given out when wood chips are burned. [1] 1

carbon dioxide

(ii) Name the gas **used by** trees during photosynthesis. [1] 1

carbon dioxide

(iii) Give **one** reason why using wood chips as a fuel is carbon neutral. [1] 0

because it neutralises the carbon

(c) Some coal power stations have been converted to run on wood chips.
They also act as combined heat and power (CHP) stations.
These make use of the heat in water to provide central heating for the power station and houses nearby.

One CHP station receives 500 MW of power from burning wood chips. Of this, 220 MW is distributed for district heating and 180 MW is transferred to the National Grid.

(i) Calculate the total useful output power. [1] 1

Useful output power = 400 MW

(ii) Calculate the efficiency of the power station using the equation: [2] 2

$$\% \text{ efficiency} = \frac{\text{useful output power}}{\text{total input power}} \times 100$$

Efficiency = 80 %

6
8

Examiner only

6. Large areas of land are used to grow trees that will be cut up to make wood chips. The wood chips are used instead of gas, coal or oil, as fuel in boilers.

(a) Explain why the supply of wood chips is renewable. [2]

because they can be renewed.

(b) (i) Name **one** gas given out when wood chips are burned. [1]

carbon dioxide (CO^2)

(ii) Name the gas **used by** trees during photosynthesis. [1]

Oxygen

(iii) Give **one** reason why using wood chips as a fuel is carbon neutral. [1]

(c) Some coal power stations have been converted to run on wood chips.
They also act as combined heat and power (CHP) stations.
These make use of the heat in water to provide central heating for the power station and houses nearby.

One CHP station receives 500 MW of power from burning wood chips. Of this, 220 MW is distributed for district heating and 180 MW is transferred to the National Grid.

(i) Calculate the total useful output power. [1]

Useful output power = 180 MW

(ii) Calculate the efficiency of the power station using the equation: [2]

$$\% \text{ efficiency} = \frac{\text{useful output power}}{\text{total input power}} \times 100$$

500
180
220
900

900 x 100

Efficiency = 90 %

8

Examiner only

6. Large areas of land are used to grow trees that will be cut up to make wood chips. The wood chips are used instead of gas, coal or oil, as fuel in boilers.

(a) Explain why the supply of wood chips is renewable. [2] 0

because they can be renewed.

(b) (i) Name **one** gas given out when wood chips are burned. [1] 1

carbon dioxide (CO^2)

(ii) Name the gas **used by** trees during photosynthesis. [1] 0

Oxygen

(iii) Give **one** reason why using wood chips as a fuel is carbon neutral. [1] 0

(c) Some coal power stations have been converted to run on wood chips.
They also act as combined heat and power (CHP) stations.
These make use of the heat in water to provide central heating for the power station and houses nearby.

One CHP station receives 500 MW of power from burning wood chips. Of this, 220 MW is distributed for district heating and 180 MW is transferred to the National Grid.

(i) Calculate the total useful output power. [1] 0

Useful output power = 180 MW

(ii) Calculate the efficiency of the power station using the equation: [2] 0

$$\% \text{ efficiency} = \frac{\text{useful output power}}{\text{total input power}} \times 100$$

500
180
220
900

900 x 100

Efficiency = 90 %

1

8

Examiner only

SECTION B

Answer **all** *questions in the spaces provided.*

Use the information in the separate Resource Folder to answer the following questions.

8. *(a)* Use the information in **Diagram 1** and **Table 1** to answer the following questions.

(i) Arrange the houses **A, B** and **C** in order of amount of energy loss starting with the house that loses least energy. [2]

House ..... House ..... House .....

Loses least energy ⟶ Loses most energy

(ii) Compare the cost effectiveness of loft insulation, double-glazing and cavity wall insulation. [6 QWC]

In your answer you should compare:

- the energy saved by each type of insulation
- the value for money of each type of insulation.

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Examiner only

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(b) Refer to the information about **double-glazing** and **Graph 1** to answer the following questions.

(i) I. Describe how the rate of loss of energy is related to the size of the air gap. [1]

.....

.....

.....

II. Give **one** reason why makers of double-glazing are unlikely to use an air gap larger than 20 mm. [1]

.....

.....

(ii) A house has a window area of 24 m^2. The air gap used in the windows is 15 mm. There is a 20 °C temperature difference between the inside and outside of the house.

Calculate the rate of loss of energy through the windows of the house. [2]

Rate of loss of energy = ... W

Turn over.

Examiner only

SECTION B

*Answer **all** questions in the spaces provided*

Use the information in the separate Resource Folder to answer the following questions.

8. *(a)* Use the information in **Diagram 1** and **Table 1** to answer the following questions.

(i) Arrange the houses **A, B** and **C** in order of amount of energy loss starting with the house that loses least energy. [2]

House A House C House B

Loses least energy ⟶ Loses most energy

(ii) Compare the cost effectiveness of loft insulation, double-glazing and cavity wall insulation. [6 QWC]

In your answer you should compare:

- the energy saved by each type of insulation
- the value for money of each type of insulation.

Dubble glazing windows you lose 1200J compared to 2000J for single glazing. So you lose and extra 800J for the single glazing and dubble glazing costs £4000. Per For loft insulation you lose 400J compared to the 1600J without it and it only costs £250 so it is very good value for money. The dubble glazing windows ie not worth it so much. for foam filled cavity wall insulation you only lose 700J and for air filled cavity wall you lose 2000J and without either you lose 3400J. So at the price of £1200 it is good value for money specially formed filled cavity walls.

Examiner only

So the best value for money is loft insulation 2nd is foam filled cavity walls then 3rd is double glazing windows.

(b) Refer to the information about **double-glazing** and **Graph 1** to answer the following questions.

(i) I. Describe how the rate of loss of energy is related to the size of the air gap. [1]

The bigger the gap the less rate of loss energy is less.

II. Give **one** reason why makers of double-glazing are unlikely to use an air gap larger than 20 mm. [1]

Because it don't make much of a difference then no difference paid 3D.

(ii) A house has a window area of 24 m^2. The air gap used in the windows is 15 mm. There is a 20 °C temperature difference between the inside and outside of the house.

Calculate the rate of loss of energy through the windows of the house. [2]

Rate of loss of energy = 60 W

Examiner only

SECTION B

*Answer **all** questions in the spaces provided*

Use the information in the separate Resource Folder to answer the following questions.

8. *(a)* Use the information in **Diagram 1** and **Table 1** to answer the following questions.

(i) Arrange the houses **A, B** and **C** in order of amount of energy loss starting with the house that loses least energy. [2] 0

House A House C House B

Loses least energy ⟶ Loses most energy

(ii) Compare the cost effectiveness of loft insulation, double-glazing and cavity wall insulation. [6 QWC] 4

In your answer you should compare:

- the energy saved by each type of insulation
- the value for money of each type of insulation.

Dubble glazing windows you lose 1200J compared to 2000J for single glazing. So you lose and extra 800J for the single glazing and dubble glazing costs £4000. Per For loft insulation you lose 400J compared to the 1600J without it and it only costs £250 so it is very good value for money. The dubble glazing windows ie not worth it so much. for foam filled cavity wall insulation you only lose 700J and for air filled cavity wall you lose 2000J and without either you lose 3400J. So at the price of £1700 it is good value for money specially formed filled cavity walls.

So the best value for money is loft insulation 2nd is foam filled cavity walls then 3rd is double glazing windows.

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(b) Refer to the information about **double-glazing** and **Graph 1** to answer the following questions.

(i) I. Describe how the rate of loss of energy is related to the size of the air gap. [1]

The bigger the gap the less rate of loss energy is less. 1

II. Give **one** reason why makers of double-glazing are unlikely to use an air gap larger than 20 mm. [1]

Because it don't make much of a difference then no difference paid 30. 0

(ii) A house has a window area of 24 m^2. The air gap used in the windows is 15 mm. There is a 20 °C temperature difference between the inside and outside of the house.

Calculate the rate of loss of energy through the windows of the house. [2] 1

Rate of loss of energy = 60 W

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SECTION B

~~*Answer all questions in the spaces provided.*~~

Use the information in the separate Resource Folder to answer the following questions.

8. *(a)* Use the information in **Diagram 1** and **Table 1** to answer the following questions.

(i) Arrange the houses **A**, **B** and **C** in order of amount of energy loss starting with the house that loses least energy. [2]

House C House b House a

Loses least energy ⟶ Loses most energy

(ii) Compare the cost effectiveness of loft insulation, double-glazing and cavity wall insulation. [6 QWC]

In your answer you should compare:

- the energy saved by each type of insulation
- the value for money of each type of insulation.

The most effective is the cavity wall foam filled, because it traps air in the foam which makes it a good heat insulator. The foam filled ~~EST~~ also isn't the most expensive either, as its £1200.
The Double-glazing is the most expensive option, it's also not the best, as the ~~Double~~ foam filled cavity wall.

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is much better (it saves 2700) more than the ~~DA~~ standard brick wall.

(b) Refer to the information about **double-glazing** and **Graph 1** to answer the following questions.

(i) I. Describe how the rate of loss of energy is related to the size of the air gap. [1]

until the air gap is 25 mm wide the bigger the gap the more air will be trapped between which is a good insulation.

II. Give **one** reason why makers of double-glazing are unlikely to use an air gap larger than 20 mm. [1]

because after 20mm it starts to keep the loss of energy at the same rate.

(ii) A house has a window area of 24 m^2. The air gap used in the windows is 15 mm. There is a 20 °C temperature difference between the inside and outside of the house.

Calculate the rate of loss of energy through the windows of the house. [2]

Rate of loss of energy = 960 W

Examiner only

SECTION B

~~*Answer all questions in the spaces provided.*~~

Use the information in the separate Resource Folder to answer the following questions.

8. *(a)* Use the information in **Diagram 1** and **Table 1** to answer the following questions.

(i) Arrange the houses **A**, **B** and **C** in order of amount of energy loss starting with the house that loses least energy. [2] 2

House C House b House a

Loses least energy ⟶ Loses most energy

(ii) Compare the cost effectiveness of loft insulation, double-glazing and cavity wall insulation. [6 QWC] 1

In your answer you should compare:

- the energy saved by each type of insulation
- the value for money of each type of insulation.

The most effective is the cavity wall foam filled, because it traps air in the foam which makes it a good heat insulator. The foam filled ~~EST~~ also isn't the most expensive either, as its £1200.
The Double-glazing is the most expensive option, it's also not the best, as the ~~Double~~ foam filled cavity wall.

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is much better (it saves 2700) more than the ~~DA~~ standard brick wall.

(b) Refer to the information about **double-glazing** and **Graph 1** to answer the following questions.

(i) I. Describe how the rate of loss of energy is related to the size of the air gap. [1] 0

until the air gap is 25 mm wide the bigger the gap the more air will be trapped between which is a good insulation.

II. Give **one** reason why makers of double-glazing are unlikely to use an air gap larger than 20 mm. [1] 1

because after 20mm it starts to keep the loss of energy at the same rate.

(ii) A house has a window area of 24 m^2. The air gap used in the windows is 15 mm. There is a 20 °C temperature difference between the inside and outside of the house.

Calculate the rate of loss of energy through the windows of the house. [2] 0

Rate of loss of energy = 960 W

Examine only

SECTION B

Answer **all** *questions in the spaces provided.*

Use the information in the separate Resource Folder to answer the following questions.

8. *(a)* Use the information in **Diagram 1** and **Table 1** to answer the following questions.

(i) Arrange the houses **A, B** and **C** in order of amount of energy loss starting with the house that loses least energy. [2]

House C House A House B

Loses least energy ⟶ Loses most energy

(ii) Compare the cost effectiveness of loft insulation, double-glazing and cavity wall insulation. [6 QWC]

In your answer you should compare:

- the energy saved by each type of insulation
- the value for money of each type of insulation.

By ~~not~~ having loft insulation it saves ~~£1,200~~ loft insulation costs £250 but ~~you save £1,200.~~ By not having Loft Insulation costs £250 but it saves 1200 J. If you had not loft insulation you are wasting 1600 J per second. But, If you do have loft insulation you ~~are~~ saves ~~losing~~ 100 J per second. Double glazing costs £4000. It saves 800 J per second. It

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looses 1200 J
Cavity wall insulation

(b) Refer to the information about **double-glazing** and **Graph 1** to answer the following questions.

(i) I. Describe how the rate of loss of energy is related to the size of the air gap. [1]

The bigger the air gap the more energy is lost

II. Give **one** reason why makers of double-glazing are unlikely to use an air gap larger than 20 mm. [1]

It would let more through

(ii) A house has a window area of 24 m^2. The air gap used in the windows is 15 mm. There is a 20 °C temperature difference between the inside and outside of the house.

Calculate the rate of loss of energy through the windows of the house. [2]

50

Rate of loss of energy = 412 W

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SECTION B

Answer **all** *questions in the spaces provided.*

Use the information in the separate Resource Folder to answer the following questions.

8. *(a)* Use the information in **Diagram 1** and **Table 1** to answer the following questions.

(i) Arrange the houses **A, B** and **C** in order of amount of energy loss starting with the house that loses least energy. [2] 1

House C House A House B

Loses least energy → Loses most energy

(ii) Compare the cost effectiveness of loft insulation, double-glazing and cavity wall insulation. [6 QWC] 2

In your answer you should compare:

- the energy saved by each type of insulation
- the value for money of each type of insulation.

By ~~not~~ having loft insulation it saves ~~£1,200~~ loft insulation costs ~~£250~~ but ~~you save £1,200.~~ By not having Loft Insulation costs £250 but it saves 1200 J. If you had not loft insulation you are wasting 1600 J per second. But, If you do have loft insulation you ~~are~~ saves ~~wasting~~ 100 J per second. Double glazing costs £4000. ~~It~~ saves 800 J per second. It

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looses 1200 J
Cavity wall insulation

(b) Refer to the information about **double-glazing** and **Graph 1** to answer the following questions.

(i) I. Describe how the rate of loss of energy is related to the size of the air gap. [1] 0

The bigger the air gap the more energy is lost

II. Give **one** reason why makers of double-glazing are unlikely to use an air gap larger than 20 mm. [1] 0

It would let more thorugh

(ii) A house has a window area of 24 m^2. The air gap used in the windows is 15 mm. There is a 20 °C temperature difference between the inside and outside of the house.

Calculate the rate of loss of energy through the windows of the house. [2] 1

50

Rate of loss of energy = 480 W