



2012 Geology

Intermediate 1

Finalised Marking Instructions

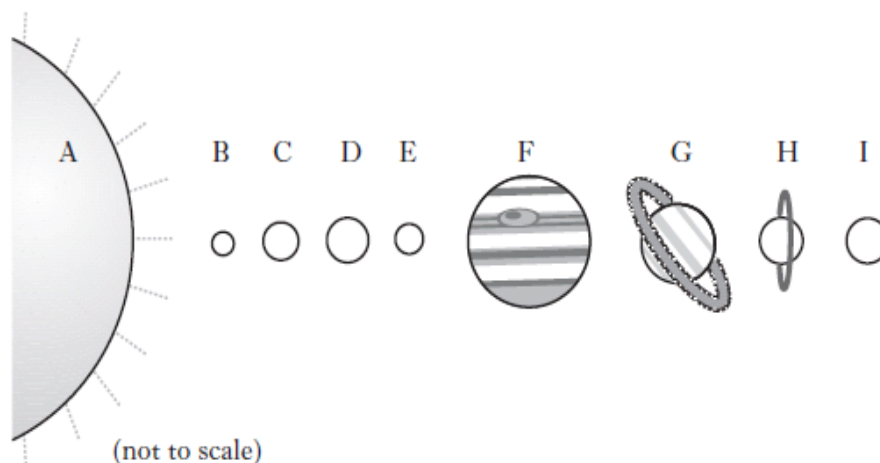
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1. Look at the diagram below showing the Solar System.



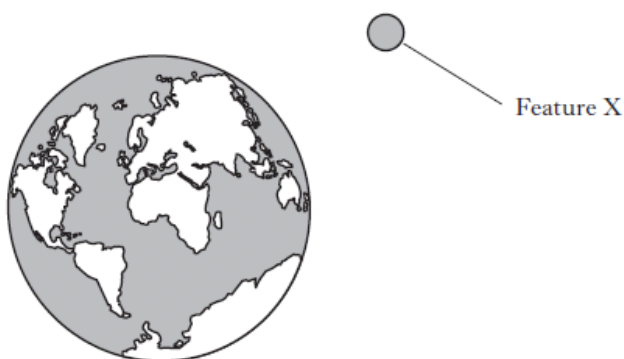
(a) Give **two** differences between objects A and E

- A is a star.
- A burns/is very hot.
- A does not orbit.
- A made up of gas.
- E is a planet.
- E is smaller than A OR A is larger than E.
- E orbits.

Any two correct, 1 mark each
Accept any detailed answer for 1 and 2

2

(b) Look at the diagram below showing a close up view of object D.



What is feature X?


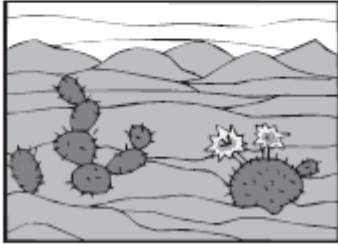
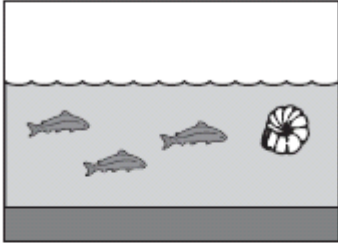
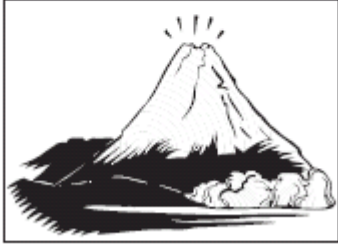
- Moon
- Satellite

1

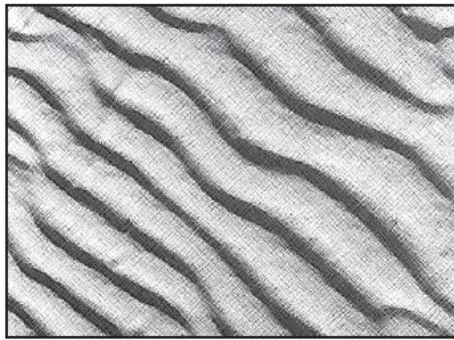
2. Look at the table below showing the conditions affecting Scotland in the past.

(a) Use the word box to complete the diagram to show the rock type which would have formed under each set of conditions.

Limestone Sandstone Basalt Schist Coal

<i>Conditions affecting Scotland</i>	<i>Rock type</i>
 <p>Tropical rainforest</p>	Coal
 <p>Desert dunes</p>	Sandstone
 <p>Shallow sea</p>	Limestone
 <p>Volcano</p>	Basalt

(b) Look at the diagram below showing structures which have formed in sedimentary rocks.



Structure P 5 cm



Structure Q 50 cm

Name structures P and Q.

Structure P – Ripple marks or sand ripples

Structure Q – Footprints/trace fossil

2

(c) Explain how **one** of these structures was formed.

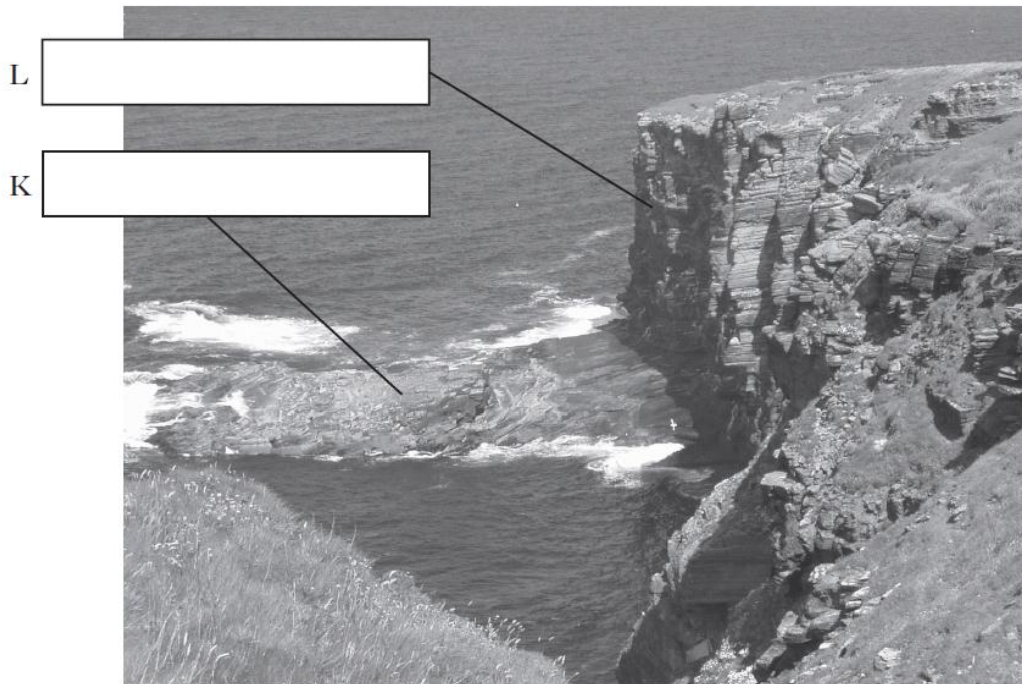
**P – Rain falling/ (1) on soft mud (1) dries out (1)
water flowing**

Q – Animal walks (1) on soft mud (1) dries out (1) (dried not hardened)

Accept covered by other sediment and later exposed by erosion

2

3. Look at the photograph below.



(a) Label landforms K and L on the photograph.

K – wavecut platform

L – cliff/headland

(b) Describe what might happen to landforms K and L in the future.

Wider/longer wavecut platform

Lower wavecut platform

Cliff retreat

Cave/arches/stacks etc

Wavecut notch

Any 3 correct, 1 mark each

2

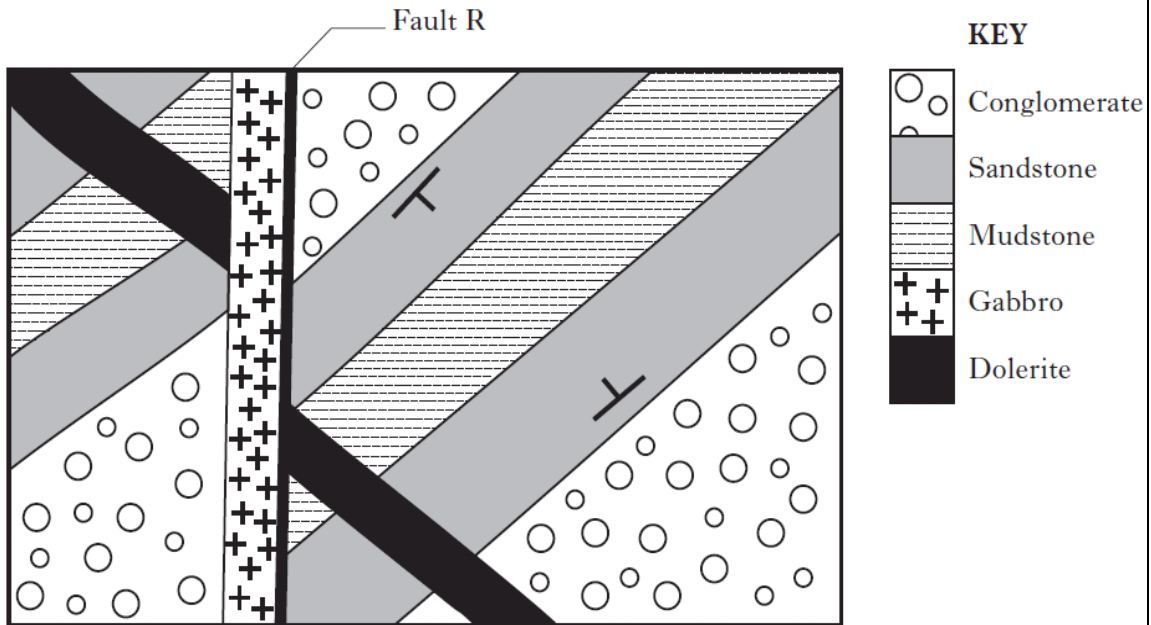
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(c) Complete the table below to name the processes which form landscapes.

<i>Description</i>	<i>Process</i>
The process by which land is worn away by moving wind, water and ice.	Erosion
The process by which materials such as pebbles, sand and mud are laid down by wind, water and ice.	Deposition
The process by which rocks are broken up in the place where they are sitting.	Weathering (accept freeze-thaw action and frost shattering) Exfoliation Root action

3

4. Look at the geological map below.



(a) Which type of structure is shown by the strike and dip symbols?

Syncline (downfold)

1

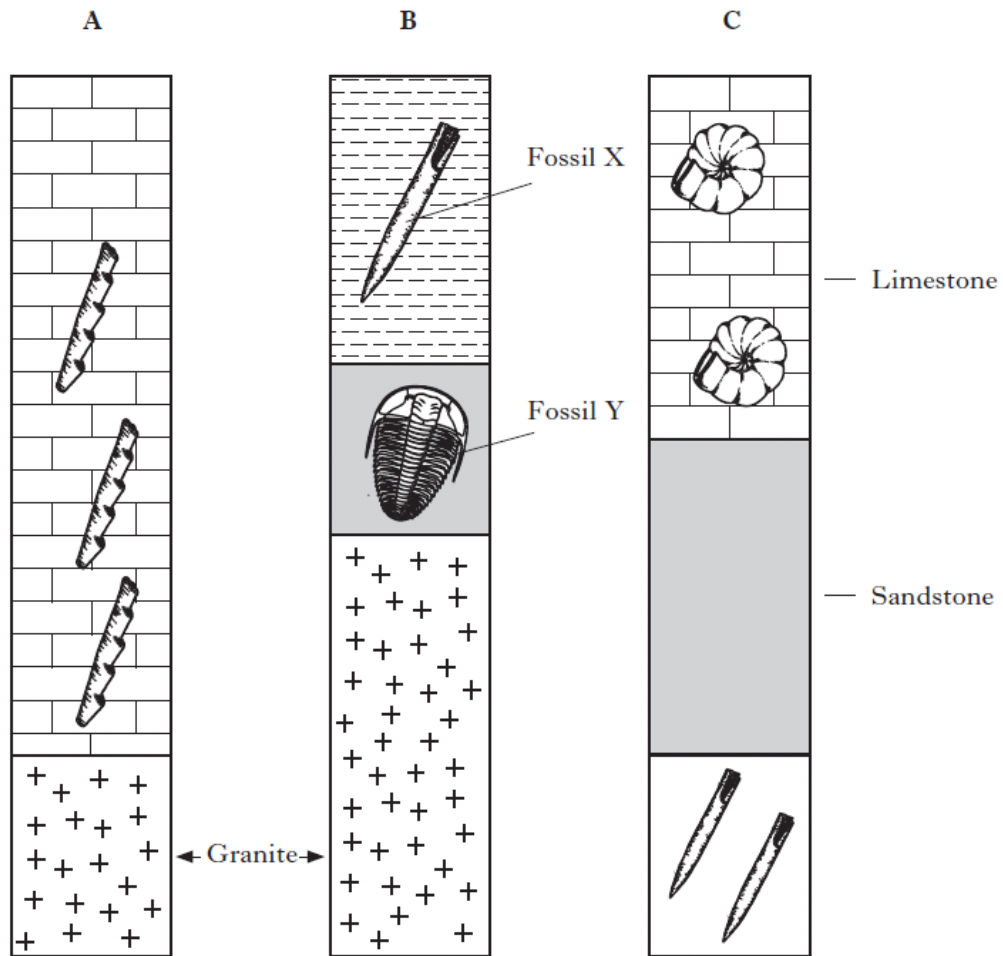
(b) Using the geological map, place the following events in the right order

- A **Faulting of rock**
- B **Intrusion of dolerite**
- C **Deposition of conglomerate**
- D **Folding of rocks**

Give only the letters: **C** → **D** → **B** → **A**
oldest youngest

4

5. Look at the diagrams below showing rock sequences in boreholes.



(a) Name fossils X and Y.

Fossil X: Belemnite

Fossil Y: Trilobite

(b) Which fossil, X or Y, is the older?

Fossil Y

Give a reason for your answer.

Lower down in the borehole/sequence

Lower rocks laid down first/buried deeper

Trilobites found from Cambrian – Permian

Belemnites found mostly Jurassic/Cretaceous

(Do NOT accept trilobites are older!)

2

1

1

(c) Rocks containing ammonites may contain oil, whereas rocks containing graptolites are unlikely to contain oil.

Which borehole would be the best choice for an oil company trying to find oil?

Give only the letter. C

Explain your answer.

**Ammonites are only found in C
Ammonites are not found in A and B**

(d) Apart from helping to find oil, how else can fossils be of use to geologists?

- **Tell us about the conditions in which rocks were laid down.**
- **Help date rocks.**

1

1

1

6. Look at the list of minerals below.

Mica	Calcite	Pyrite	Malachite	Talc
Galena	Haematite	Quartz	Pyroxene	Feldspar

- (a) Name the softest mineral. **Talc** 1
- (b) Name the hardest mineral. **Quartz** 1
- (c) Which mineral is a source of copper? **Malachite** 1
- (d) Which mineral is a source of lead? **Galena** 1
- (e) Which **one** of the following statements is correct? 1
 - A. Mica is a good source of iron.
 - B. Copper can be extracted from Pyrite.
 - C. Calcite is a mineral found in marble.
 - D. Haematite and pyroxene are both sources of metals.

Give only the letter: C

7. A deposit of copper ore was discovered.

% of copper in ore	% of copper extracted	Price in \$ per tonne
0.5%	86%	\$5000

(a) What percentage of copper cannot be extracted?

$$100 - 86 = 14\%$$

1

(b) (i) How much copper is found in 200 000 tonnes of ore deposit?

$$200,000 \times \frac{0.5}{100} = 1,000 \text{ tonnes}$$

2

(ii) How many tonnes of copper can be extracted from this ore deposit?

$$1,000 \times \frac{86}{100} = 860 \text{ tonnes}$$

2

(iii) What is the value of the copper extracted?

$$860 \times 5,000 = \$4,300,000$$

2

(c) The price of copper is predicted to rise over the next few years. How will this affect rates of extraction?

**More will be extracted
Lower grade deposits would be extracted
Rate of extraction will increase**

Accept any reasonable answer

2

8. Look at the photograph below.



(a) Name landform A in the photograph

A = Hanging valley/“U” shaped valley/glaciated valley

1

(b) Draw labelled diagrams to show how this feature was formed.

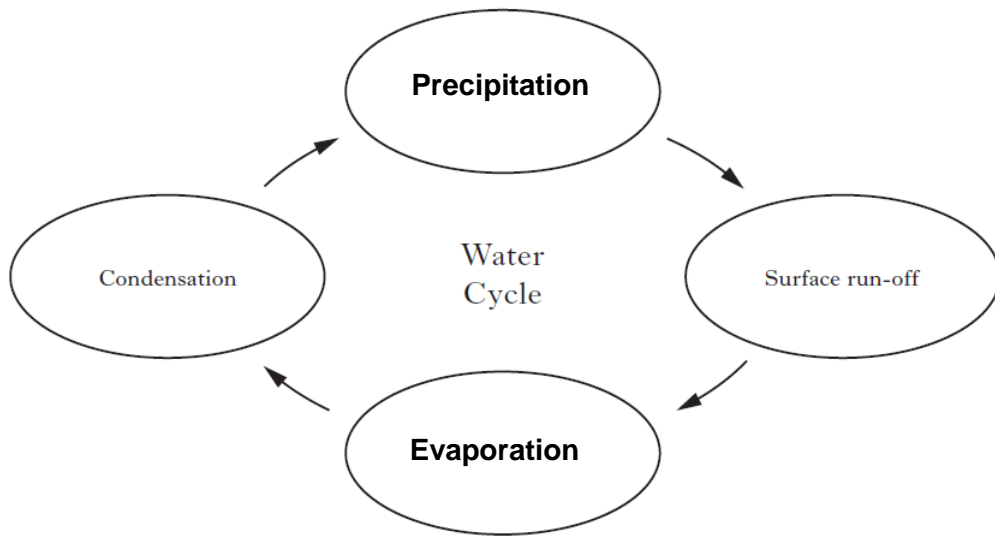
Mark out of 2 if no diagram

- **Glacier/ice moving**
- **Erosion by ice and rocks frozen in ice (including plucking/abrasion)**
- **Widening/deepening**
- **Gravitational pull**

Credit details of processes.

3

9. Look at the diagram below showing part of the water cycle.

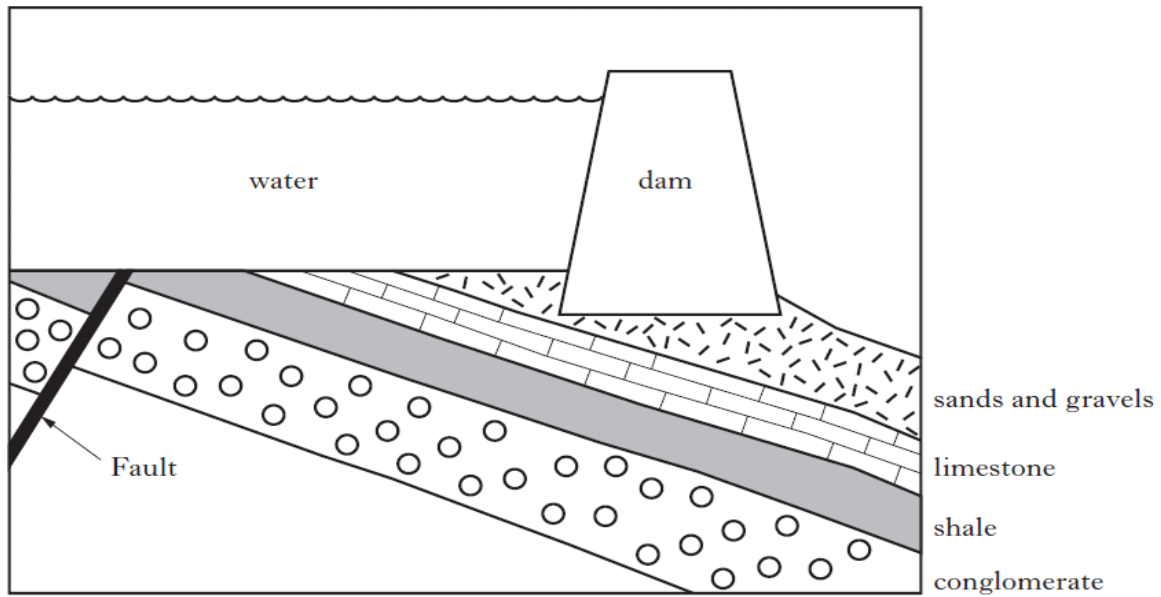


(a) Using the word box, complete the diagram above.

Groundwater	Evaporation	Precipitation	Aquifer
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2

(b) Look at the diagram below showing the proposed site for a reservoir.



(i) Give **two** reasons why reservoirs are built.

**Supply water Leisure – Fishing/Boating
H.E.P
Control river flow
Prevent flooding, irrigation, industrial use**

2

(ii) Explain why this is a poor site for a reservoir.

Fault – unstable, could cause tsunami, water leaking out of reservoir

Sands and gravels – porous

Limestone – soluble or water can pass through cracks etc

Dam liable to slide – sloping beds

2

10. Look at the table below which shows the percentage of total world oil reserves and consumption.

<i>Area</i>	<i>Oil reserves</i>	<i>Oil consumption</i>
North America	4%	28%
South America	12%	8%
Europe	8%	32%
Middle East	66%	6%
Africa	6%	2%
Asia and Australasia	4%	24%

(a) On the graph paper below, draw a **bar** graph to show the percentages of oil **consumption** for each area.

1 mark – scales
2 marks – accuracy

1
2

(b) Explain why North America has high oil consumption.

- **Developed country/rich country**
- **More industry**
- **More cars/vehicles**
- **More air conditioning/heating**
- **Higher population if developed explanation**

2

Accept any reasonable answer, 2 for well developed answer

(c) Give **one** problem caused by high oil consumption. Explain your answer.

Problem: **Greenhouse effect/global warming, price rise of oil in world market, oil running out.**

Acid rain/smoke, increased oil pollution/spillages

1

Explanation – **credit any correct answer, oil reserves could run out faster**

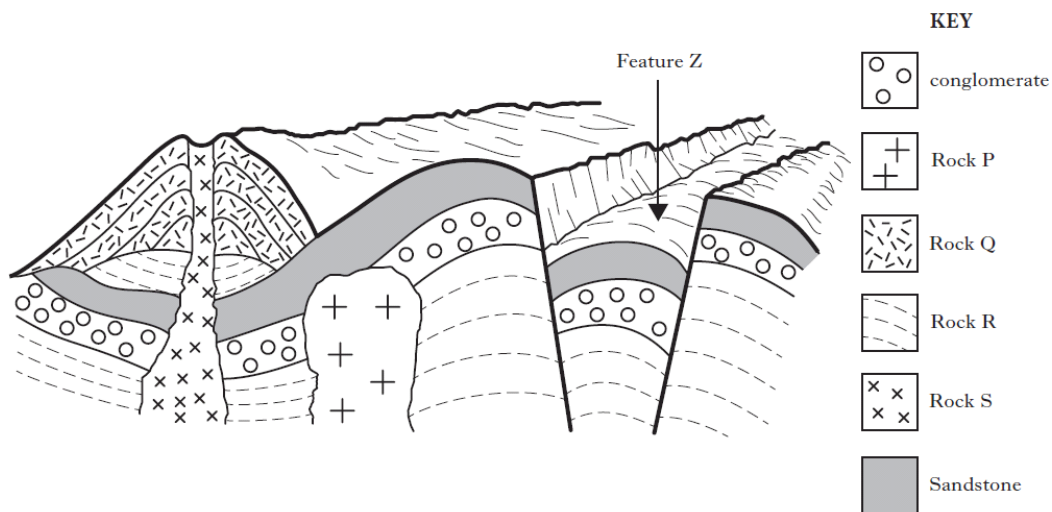
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(d) If North American cut oil consumption, give **three** other methods of producing energy it could use.

- Wind**
- Wave**
- Tidal**
- Solar**
- Geothermal**
- Nuclear**
- Coal**
- Natural Gas**
- Hydro**

3

11. Look at the diagram below showing how rocks are formed.



(a) Which rock is extrusive?

Give only the letter. **Rock S or Rock Q**

1

(b) Explain how igneous rock P has affected rock R

Heated, melted, metamorphosed, changed

2

(c) (i) Name feature Z

Rift Valley

1

(ii) Explain how feature Z was formed

2 faults (must be mentioned)

Land between drops

2

(d) (i) After erosion, the landscape will change. Name **two** features which would be left as higher ground.

**Volcanic plug/dyke (do not accept volcano)
Igneous rock
Intrusion**

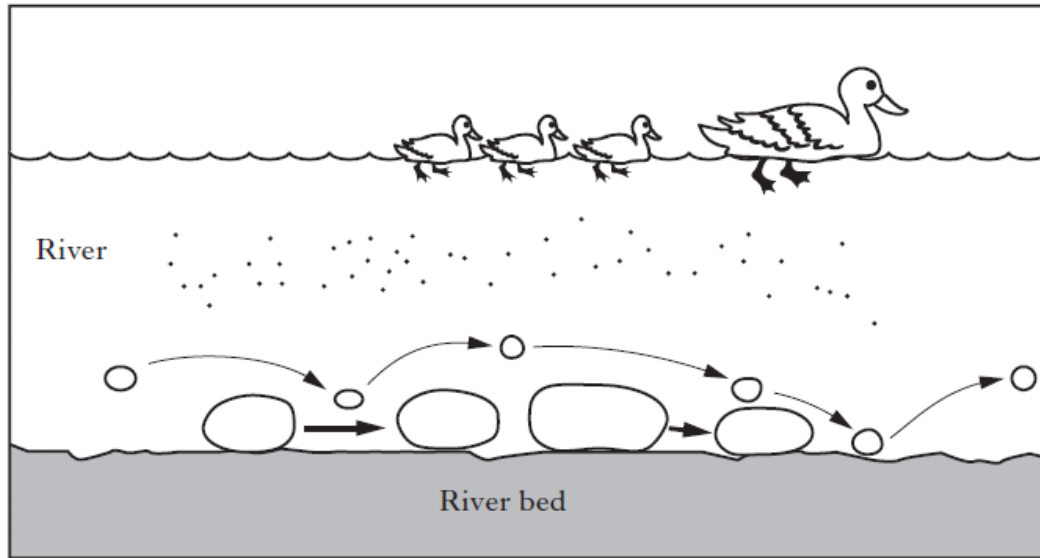
2

(ii) Explain why these features are left as higher ground.

**Explanation – igneous rocks harder (1)
Therefore erode more slowly (1)**

2

12. Look at the diagram below showing material being transported by a river.



(a) Explain how the largest material is moved.

Rolling/sliding (1)
Pushed along (1)

2

(b) How would very wet weather affect the transportation of material?

Heavier material would be moved

Material moved more quickly
More material would be moved
Credit link between wet weather and increased discharge

2

[END OF MARKING INSTRUCTIONS]