



KS3 Science

Geological Changes

Mark Scheme

Time available: 38 minutes

Marks available: 50 marks

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Mark schemes

1.

- (a) • C
D
C
A
C

accept 'metamorphic'
accept 'igneous'
accept 'metamorphic'
accept 'sand and mud'
accept 'metamorphic'

*for all **five** correct answers, award three marks*
*for any **four** correct answers, award two marks*
*for any **two** or **three** correct answers, award one mark*
*if only **one** correct answer, award no marks*

3 (L6)

(b) (i) **physical weathering name**

- freeze-thaw

accept 'erosion'

a name can be awarded a mark in either the process or name cell if
it is not contradicted elsewhere
the process named must match the description given

1 (L7)

description of process

- it can freeze and crack the rock

accept a description of erosion for physical weathering where
'erosion' has been named

e.g. 'rain hits the rocks and bits break off'

'the rain wears away or erodes rock' is insufficient

1 (L7)

(ii) **chemical weathering name**

- acid rain

a name can be awarded a mark in either the process or name cell if
it is not contradicted elsewhere
the process named must match the description given

1 (L7)

description of process

- reacts with rock

accept 'the rock corrodes'

'it changes the rock' is insufficient

'the rock changes colour' is insufficient

*do **not** accept 'it erodes the rock'*

1 (L7)

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- 2.** (a) (i) any **two** from
- smoother **or** rounder
accept 'it was more like a pebble'
 - broken **or** crumbled **or** crushed **or** it was smaller pieces
*accept 'it eroded' **or** 'it weathered'*
 - powder **or** dust formed
- 2 (L3)
- (ii) • it was harder than the chalk
*accept 'it was hard **or** strong'*
*'it did not erode **or** weather' is insufficient*
'it is solid' is insufficient
- 1 (L4)
- (b) • *chalk: B granite: A*
both answers are required for the mark
answers must be in the correct order
- 1 (L4)
- (c) (i) fossils
- 1
- (ii) starfish
*accept 'it looks like a star **or** starfish'*
accept 'it has five legs'
*if more than one box is ticked, award no mark **both** the answer and the correct explanation are required for the mark*
- 1
- (d) (i) any **one** from
- it is too hot for animals to live (in molten rock)
accept 'animals would be burnt'
accept 'it is too hot'
accept 'fossils are destroyed'
accept 'they would melt'
 - there are no animals in magma **or** melted rock
'animals do not live underground' is insufficient
- 1 (L4)
- (ii) • magma ✓
if more than one box is ticked, award no mark
- 1 (L4)
- 3.** (a) (i) weathering ✓
if more than one box is ticked, award no mark
- 1 (L3)

[8]

(ii) any **one** from

- it is hard **or** harder
accept 'limestone is softer'
*'granite **or** it is solid' is insufficient*
- it is resistant to acid rain
accept 'it is resistant'
accept 'limestone is affected by acid rain'
- it is less permeable or porous
*accept 'limestone is more permeable **or** porous'*
accept 'granite is stronger'
- it is less easily weathered
*accept 'granite does not weather **or** erode'*

1 (L4)

(b) (i) any **one** from

- coal
- gas
accept 'methane'
- oil
accept 'petrol' or 'diesel' or 'kerosene'
- peat
accept 'turf'

1 (L3)

(ii) All fossil fuels are a source of energy ✓

if more than one box is ticked, award no mark

1 (L3)

(iii) corrosion ✓

if more than one box is ticked, award no mark

1 (L4)

(iv) paint

*accept 'grease' **or** 'oil'*
*accept 'plastic' **or** 'wax' **or** 'polish'*
accept 'varnish'
*accept 'zinc' **or** 'galvanise it'*
'waterproof coating' is insufficient
'something to stop them reacting' is insufficient

1 (L4)

[6]

4.

- (a) any **one** from
- it cools more slowly
accept 'it cools slowly' or 'it is cooler above ground'
 - large volume of magma
accept 'there is a lot of it'
 - magma is insulated by rock
accept 'magma is surrounded by rock'
 - heat is transferred more slowly to rock than to air
accept 'it is hotter underground'
 - lava cools more quickly
- 1 (L7)

- (b) (i) crystals formed underground will be larger
accept the converse
accept 'they will be larger'
- 1 (L7)

- (ii) any **one** from
- magma cools more slowly than lava
accept 'magma cools slowly'
do not accept 'bigger crystals cool more slowly'
 - lava cools more quickly than magma
accept 'lava cools quickly'
accept 'there is no rock above the lava'
- 1 (L7)

- (c) (i) any **one** from
- high temperatures
accept 'heat' or 'hot'
 - high pressure
accept 'pressure'
- 1 (L7)

- (ii) marble
- 1 (L7)

[5]

5.

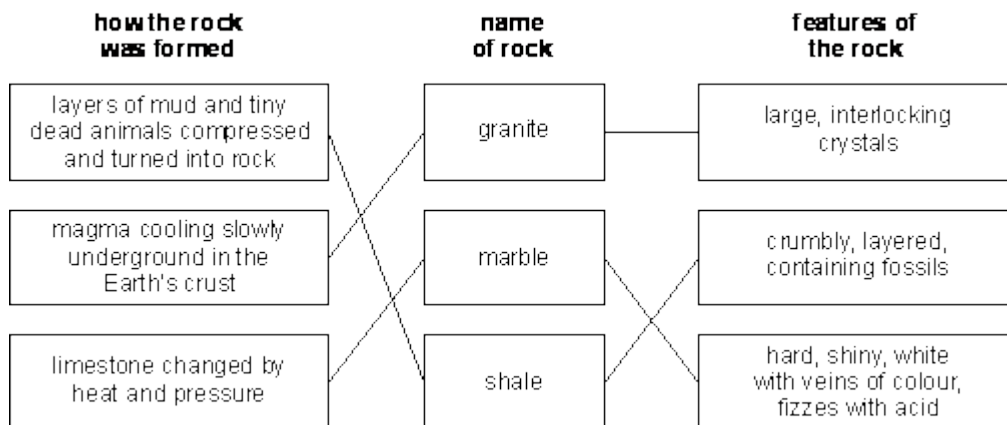
- (a) (i) C
- 1 (L3)
- (ii) A
- 1 (L3)
- (iii) D
- 1 (L3)

- (b) igneous rock ✓
if more than one box is ticked, award no mark 1 (L4)
- (c) water is heated to form water vapour ✓
if more than one box is ticked, award no mark 1 (L4)
- (d) (i) skeleton **or** bones
accept 'spine' or 'backbone' or 'ribs' or 'skull'
accept 'scales' 1 (L3)
- (ii) fossils 1 (L4)

[7]

6.

- (a) Both the line from the name of the rock to the method of formation and to the features of the rock must be correct for the mark.



3 (L6)

- (b) (i) acidic water drains through cracks
accept 'rain is acidic' 1 (L7)
- water reacts with limestone **or** calcium carbonate
accept 'limestone dissolves' 1 (L7)
- (ii) any **two** from
- low temperatures make water freeze in cracks
accept 'water freezes in cracks'
 - water expands as it freezes
 - ice expanding breaks up the limestone
accept 'ice forces the rock apart'
- 2 (L7)

[7]

7. (a) (i) sedimentary
accept 'conglomerate' 1
- (ii) igneous 1
- (b) The temperature falls below freezing point. ✓ 1
- Expansion forces the cracks in the rock to open. ✓
*if more than two boxes are ticked, deduct one mark for each incorrect tick
minimum mark zero* 1

[4]

8. (a) magma at B cooled more quickly
*accept 'magma at A cooled more slowly'
do **not** accept 'they cooled at different rates'* 1
- (b) the rock at C has formed from limestone and the rock at E has formed from sandstone
*accept 'they have formed from sandstone and limestone'
or 'two types of sedimentary rock have been metamorphosed
or baked' **or** 'they have been made from two different kinds of rock'* 1
- (c) **the answer should refer to the proximity of A to C**
any **one** from
- more energy has been transferred to it from A
accept 'more heat was passed to it'
 - it is next to the larger volume of cooling magma **or** igneous rock
*accept 'heat was passed to it from more magma'
or 'it is closer to the main amount of magma'
or 'only a small amount of magma got near to D'
do **not** accept 'it cooled more slowly'
or 'the magma was hotter close to C'* 1

- (d) (i) 1. deposition of sandstone
accept 'sandstone'
2. deposition of limestone
accept 'limestone'
3. intrusion of magma
accept 'intrusion'
4. formation of metamorphic rocks
accept 'metamorphism' all four events in the correct order are required for the mark
- 1
- (ii) tilting occurred sometime after the deposition of the limestone because both sandstone and limestone are tilted
accept 'it was after the sedimentary rocks formed because they are all tilted'
- 1
- there is no evidence to show whether tilting occurred before or after the intrusion
accept 'you can not tell whether it was before the igneous rocks formed'
- 1

[6]