



IGCSE Environmental Management Assignment

ASSIGNMENT ONE: ROCKS AND MINERALS

Introduction and Context

For your IGCSE, this topic will be assessed in Paper 1 and Paper 2. Paper 1 (Theory) will consist of Section A, short-answer and structured questions (20 marks), and Section B, short-answer and extended-response questions based on related source material (60 marks). The topic is also likely to be assessed in Paper 2 (Management in Context), which will consist of short-answer, data processing and analysis, and extended-response questions based on source material. Each paper is worth 50% of your final grade.

Assignment One

This assignment is based on Paper 1 and Paper 2 questions. Below are 4 questions. Q1–3 are based on Paper 1-style questions and are worth 22 marks. Q4 is based on a Paper 2-style question and is worth 28 marks. This assignment will be marked out of 50 and the mark then doubled to give you a mark out of 100.

Please write your answers on the question paper using black pen. Once your work is complete, scan the pages and upload to Canvas as a PDF.

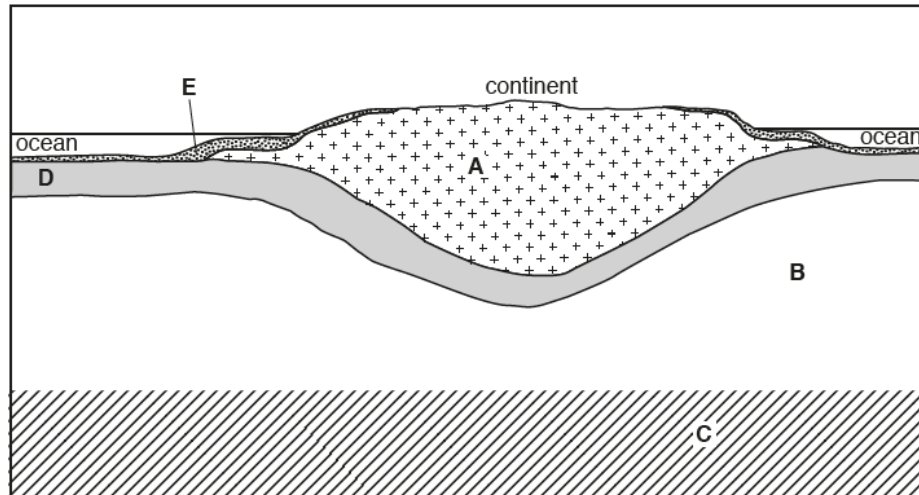
It is expected that you will usually complete your assignments under exam conditions (without referring to your textbook, notes or the internet, and within a maximum time limit of 1 hour). However, for Assignment 1 and 2 **only**, you may take as long as you like and look up answers if you feel it is necessary.

NB. Please note that your tutor will use exam marking guidance from the start. As you have no experience of IGCSE exams, this means that your marks for the first few assignment may be quite low. If this is the case, do not worry – the course is a learning curve, and your tutor will give you clear feedback on how to improve. Comparing your work to the mark scheme is an excellent way to learn how to achieve more marks.

PART 1: PAPER 1 PREPARATION

Questions 1–3 are in the style of Paper 1.

1. The diagram shows features of the Earth's crust.



not to scale

- a.
- i. Complete the table using letters A–E from the diagram.

Feature	Letter
Continental crust	
Core	
Mantle	
Oceanic crust	
Sediment	

(3 marks)

- ii. State the meaning of the terms:

Igneous rock

Metamorphic rock

Sedimentary rock

(3 marks)

- b. Most rocks are mined using opencast (open-pit) methods.

Describe four impacts of opencast mining on the environment.

1.

2.

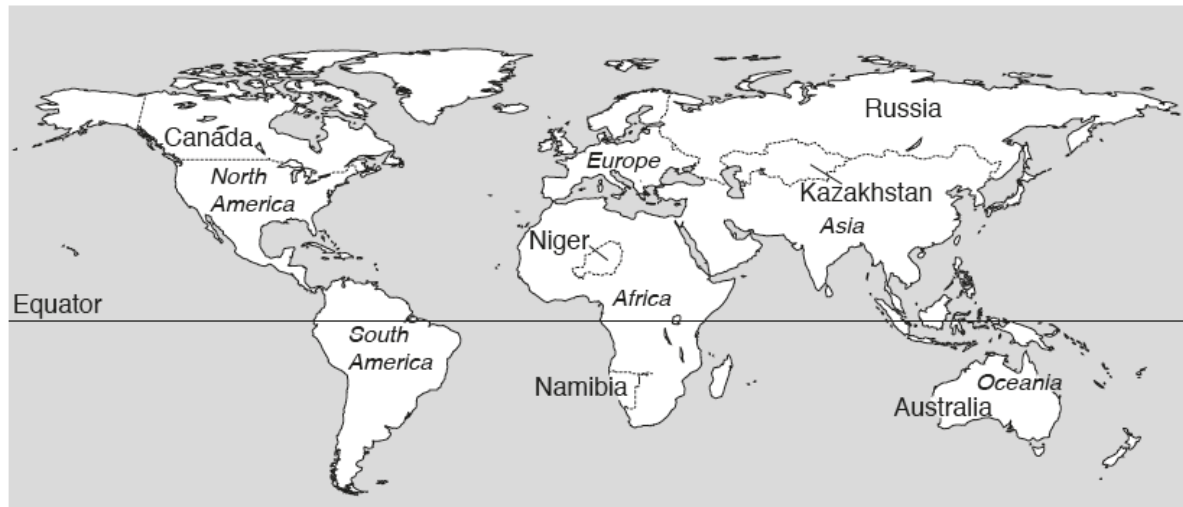
3.

4.

(4 marks)

(Total 10 marks)

2. The map and table show information about the ten biggest uranium mines in the world in 2014.



Key

----- international boundary

rank	country	type of mining used	percentage of world uranium production
1	Canada	underground mine	13
2	Kazakhstan	in-situ leaching	8
3	Australia	underground mine	6
4	Niger	open-pit mine	5
5	Kazakhstan	in-situ leaching	4
5	Kazakhstan	in-situ leaching	4
5	Russia	underground mine	4
5	Namibia	open-pit mine	4
9	Kazakhstan	in-situ leaching	3
9	Kazakhstan	in-situ leaching	3

Use the map and table to answer these questions.

- a. Name three countries with underground uranium mines.

1. _____
2. _____
3. _____

(1 mark)

- b. State the type of uranium mining in Africa.

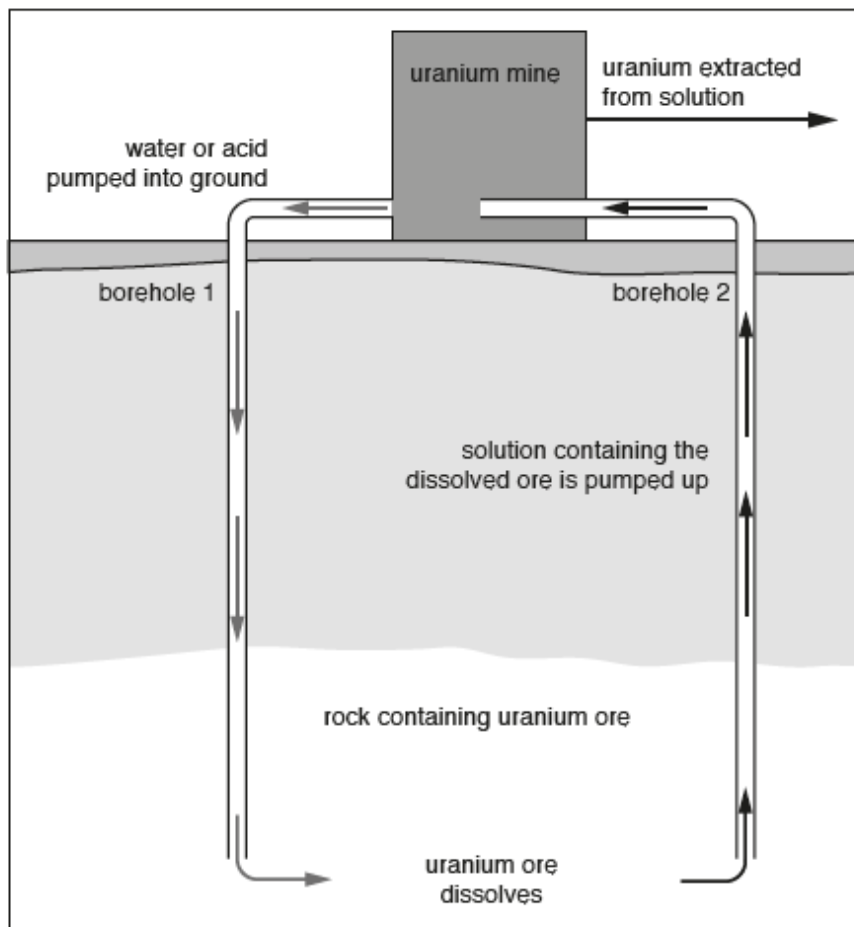
(1 mark)

- c. Calculate the percentage of world uranium production that comes from the mines in Kazakhstan.

_____ %

(1 mark)

- d. In 2014, over half of the world's uranium was mined using in-situ leaching. A borehole is drilled into the rock containing uranium ore. Water or an acid is pumped down to dissolve the uranium ore. Uranium ore in solution is pumped up as a liquid from a second borehole. The process is shown in the diagram.



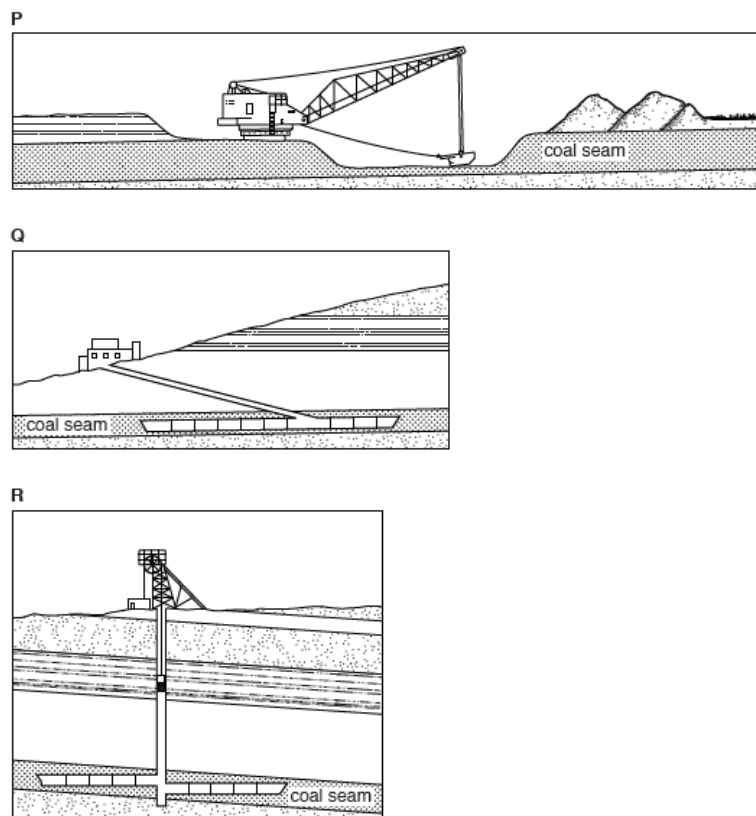
Suggest two advantages of the in-situ leaching method of mining.

1. _____

2. _____

(2 marks)
(Total 5 marks)

3. The diagram shows three types of coal mine labelled P, Q and R.



a. Match the letters, P, Q and R, in the diagram to the types of coal mine.

Type of Coal Mine	Letter
Adit (drift) mine	
Open-pit (opencast) mine	
Shaft mine	

(2 marks)

- b. It is more dangerous to work in the type of mine labelled R than in the type of mine labelled P. Explain why.

(4 marks)

- c. Coal is a fossil fuel.

Name one other fossil fuel.

(1 mark)

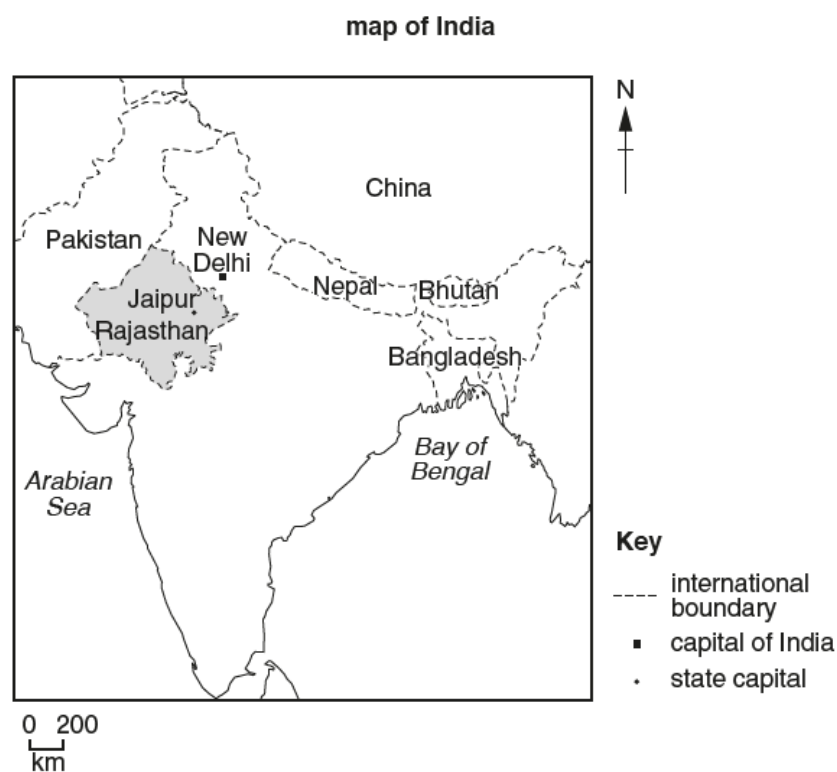
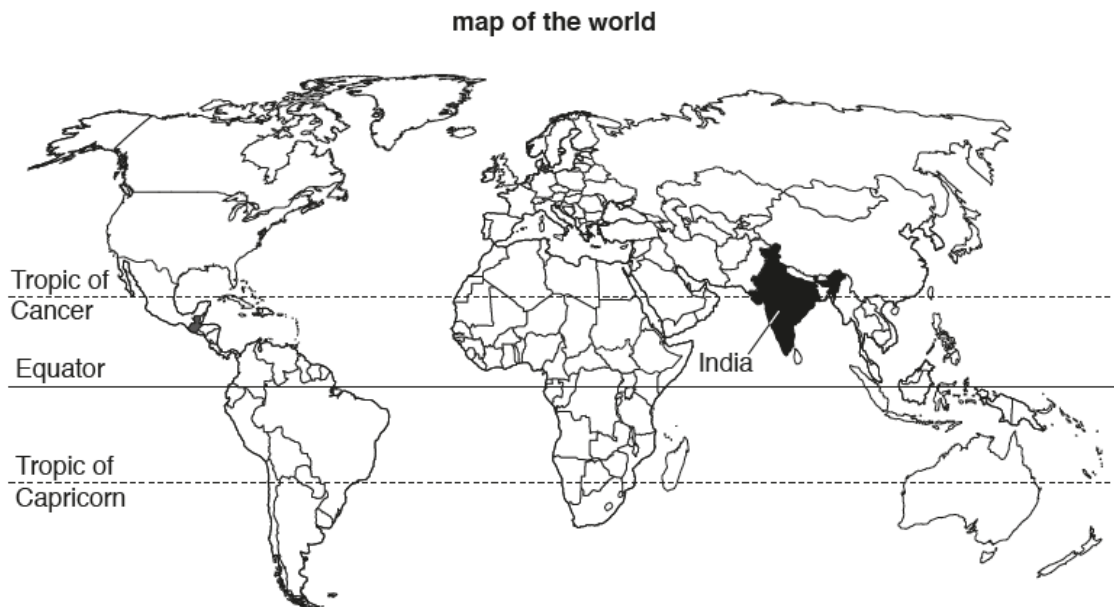
(Total 7 marks)

(Total for Part 1: 22 marks)

PART 2: PAPER 2 PREPARATION

Question 4 is in the style of Paper 2.

4.



area of India: 3.3 million km²

population: 1252 million

children per woman: 2.48

life expectancy: 68 years

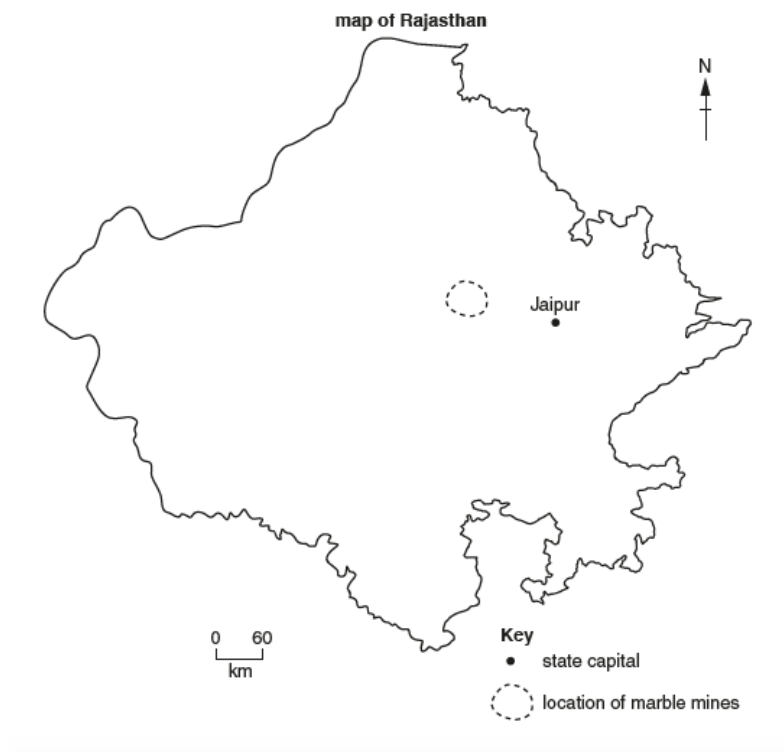
currency: Indian Rupee (60 INR = 1 USD)

languages: Hindi, many other languages

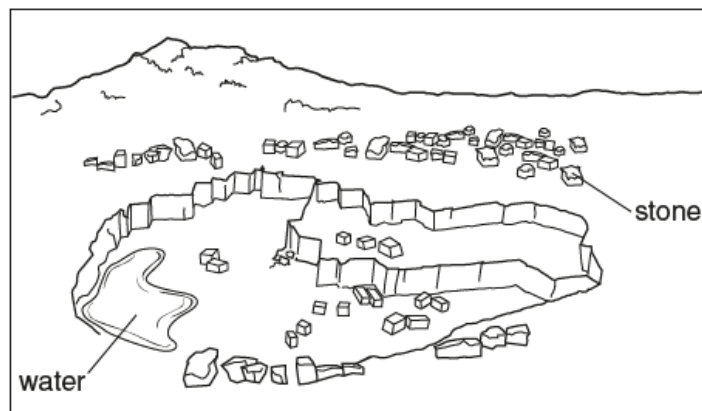
climate: tropical monsoon, arid in north west

terrain: mountains in the north, Ganges valley, plateau in south

main exports: petroleum products, precious stones, machinery, iron and steel, chemicals, vehicles, clothing



Rajasthan has the largest area of any state in India and a population of 85 million. Most of the population are farmers and live in small villages. Natural resources include marble, granite, sandstone, copper, zinc and oil. There are thousands of small quarries and mines from which stone is extracted. An example is shown in the diagram below.



- a. The eight largest cities in the state are shown in the table.

City	Population/Millions
Jaipur	3.1
Jodhpur	1.2
Kota	1.0
Bikaner	0.7
Ajmer	0.6
Bhilwara	0.4
Alwar	0.4
Bharatpur	0.3
Total	

- i. Complete the table.

(1 mark)

- ii. Calculate the percentage of the 85 million people of Rajasthan that live in these cities.

_____ %

(1 mark)

- b. Some businesses in the cities trade in stone to supply other states in India and to export to other countries. White marble is a valuable form of stone. Labourers migrate from farming villages to work in the mines. Most of the work is done by hand. When the mines flood, work stops for at least three months.

Look at the rainfall data for a location near a mine.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Average rainfall/mm	5	3	4	3	11	93	239	232	105	18	16	2

- i. State in which three months work is most likely to stop in the mine.

(1 mark)

- ii. Suggest the impact on labourers when mining has to stop.

(1 mark)

- iii. People living near a mine suffer more disease when the mine is flooded than when it is not flooded. Suggest why.

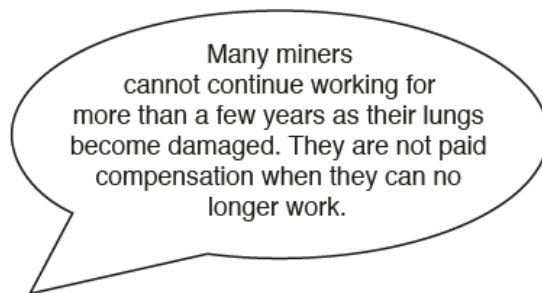
(3 marks)

- iv. This mining of marble causes noise and dust pollution.

Suggest how noise and dust pollution can affect the environment near the mine.

(4 marks)

- c. Read these quotes from two miners.



- i. Suggest three other items employers should give to miners.

(3 marks)

- ii. Suggest why the miners are not paid compensation.

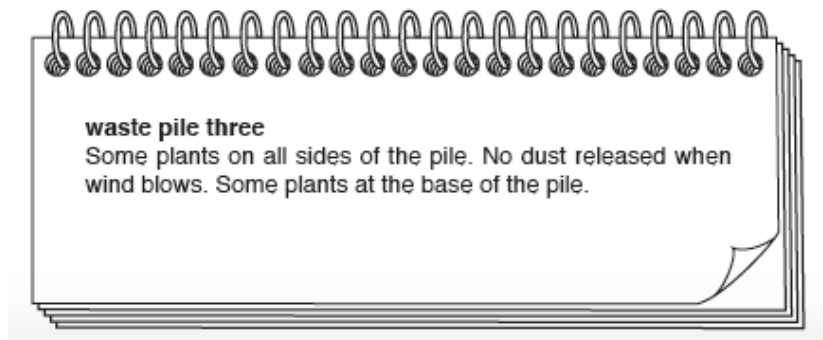
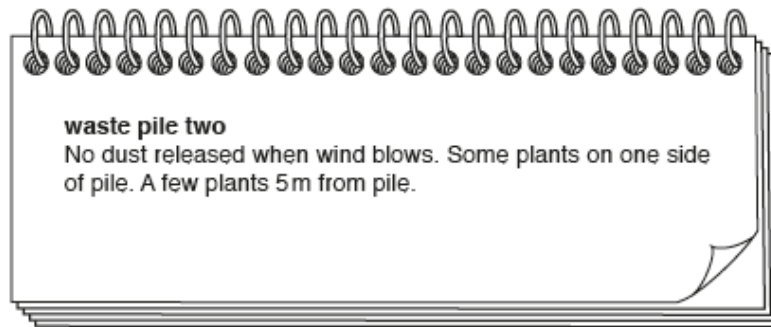
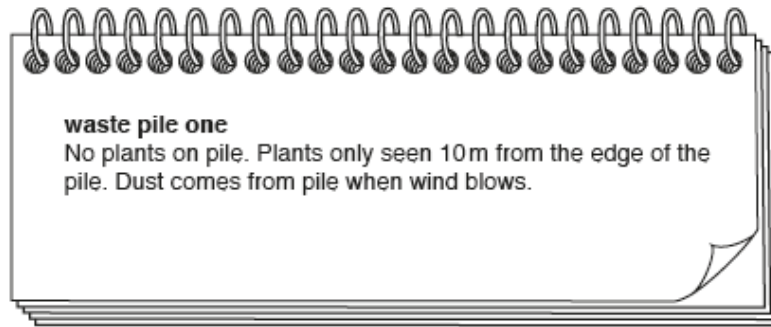
(2 marks)

- d. Mines are abandoned when all the marble has been removed.

Describe what can be done to restore the land when a mine reaches the end of its working life.

(4 marks)

- e. A student carried out a visual survey of three piles of waste from a marble mine.



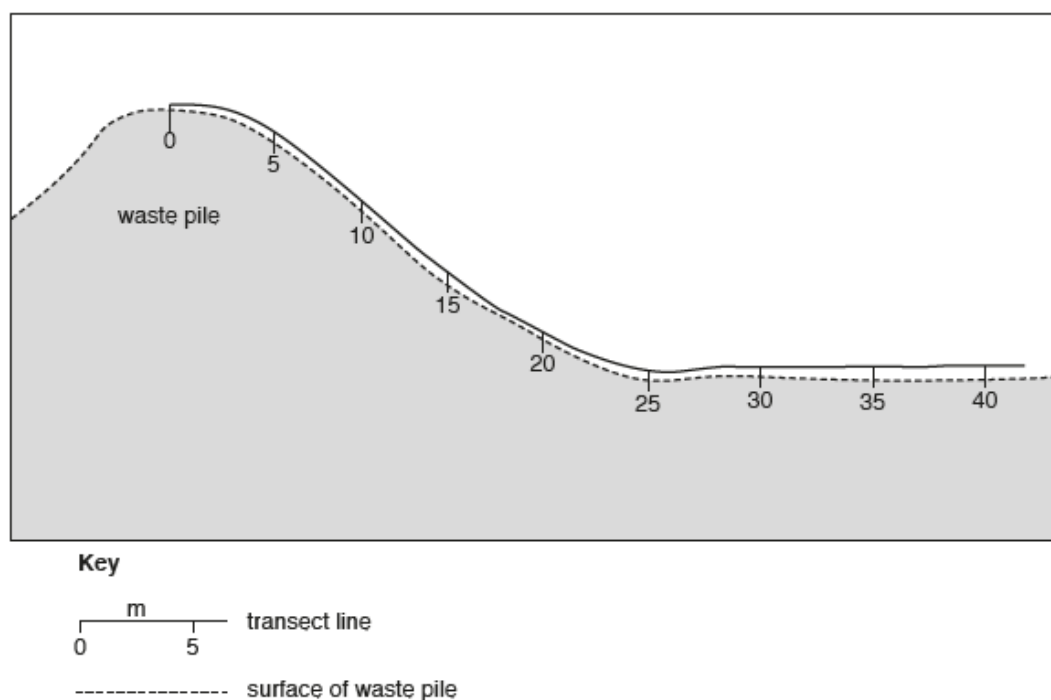
Using this information, state which is the newest and which is the oldest pile.

Newest: _____

Oldest: _____

(2 marks)

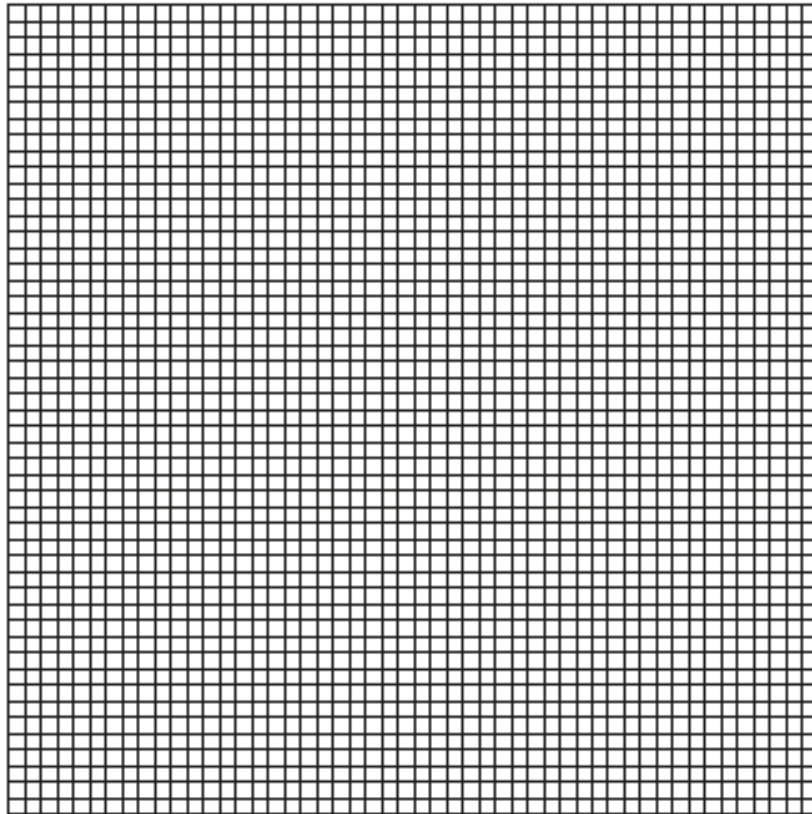
- f. The student decided to carry out a more detailed survey to record the plants found along a transect starting at the top of a waste pile. They surveyed at 5 m intervals using a 0.25 m² quadrat. The student also measured pH and surface temperature at 5 m intervals.



The results are shown in the table.

Distance from top of waste pile/m	0	5	10	15	20	25	30	35	40
Number of plants	1	2	5	8	12	13	18	17	18
Number of plant species	1	1	1	2	3	3	5	4	5
pH	8.7	8.6	8.5	8.2	7.7	7.4	7.2	7.2	7.2
Surface temperature/°C	25	25	26	26	25	24	23	23	24

- i. Plot a graph of the number of plants along the transect on the grid below.



(4 marks)

- g. About half the rock from marble mines becomes waste. When cutting and polishing machines are used, large amounts of marble powder mix with water to form slurry. This is pumped onto nearby land.

A machine has been made that can produce building blocks. The following raw materials can be used to make up to 750 000 blocks in one year.

Raw Material	Mass/Tonnes
Cement	11
Sand	32
Slurry	272
Total	315

Calculate the percentage by mass of slurry in each block.

_____ %

(2 marks)

(Total 28 marks)

(Total for Part 2: 28 marks)

TOTAL FOR ASSIGNMENT 50 MARKS