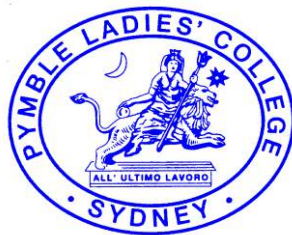


No. of Copies: 30

Name:

Miss K Gillies
Mr P Hare



SEMESTER II, 2003

Preliminary Course

EARTH AND ENVIRONMENTAL SCIENCE

2 UNIT

TIME ALLOWED: 2 HOURS

DIRECTIONS TO CANDIDATES:

- * Answer **ALL** questions. Total marks 75.
- * A *Geological Time Scale* is included on Page 24 on the reverse side of the multiple choice answer sheet
- * This paper is in **TWO PARTS**
- * **SECTION A - 20** one-mark multiple choice questions. Indicate all answers on the Answer Sheet provided. **Remove this page to answer the questions.**
 - **SECTION B** – Short Answer and Longer Response questions. All answers are to be written in the spaces provided.

Good luck

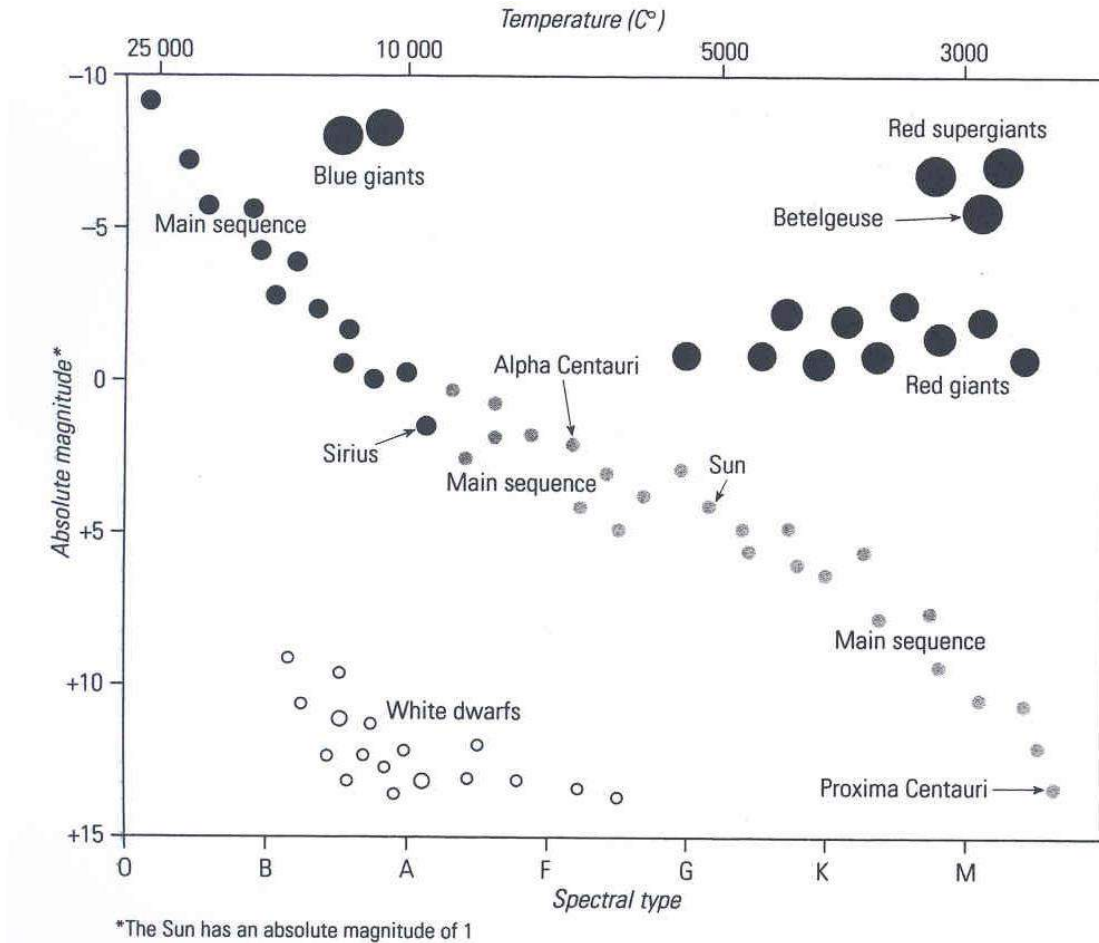
Section A

Questions 1 to 15 (1 mark each)

Multiple choice questions, choose the best answer.

Indicate all answers on the Answer Sheet provided on Page 24.

1. The diagram shows the magnitude of stars plotted against their surface temperature and spectral type in what has been termed a Hertzsprung-Russell diagram.



Which of the following stars is bigger and cooler than the Sun?

- A Sirius
- B Betelgeuse
- C Alpha Centauri
- D Proxima Centauri

2. Which piece of evidence, listed below, supports the idea that the universe is expanding?
- A the distance between Sydney and London is increasing
 - B all elements found on Earth are also found in the Universe
 - C light reaching Earth from distant stars is shifted toward the red end of the spectrum
 - D radio waves reach the Earth from distant parts of the galaxy at the same time

3. What were the first organisms to produce oxygen?

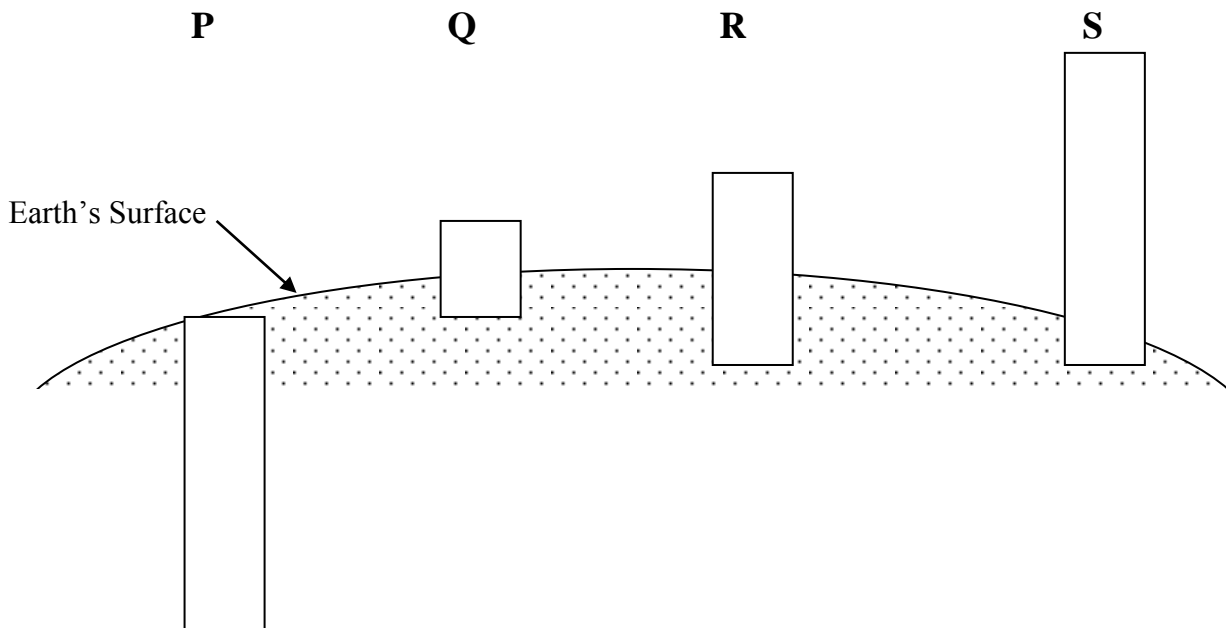
- A archaeobacteria with aerobic respiration
- B Bacteria similar to those found near fumeroles
- C Bacteria which carried out photosynthesis
- D Archhaeobacteria with anerobic respiration

4. The Mt Narrayer zircons have provided evidence for the Earth's early history.

What is the significance of the Mt Narrayer zircons.

- A They indicate that Australia and Greenland were once joined
- B They indicate that Australia is the oldest continent.
- C They contain the first evidence of life on Earth.
- D They formed during the Hadean eon

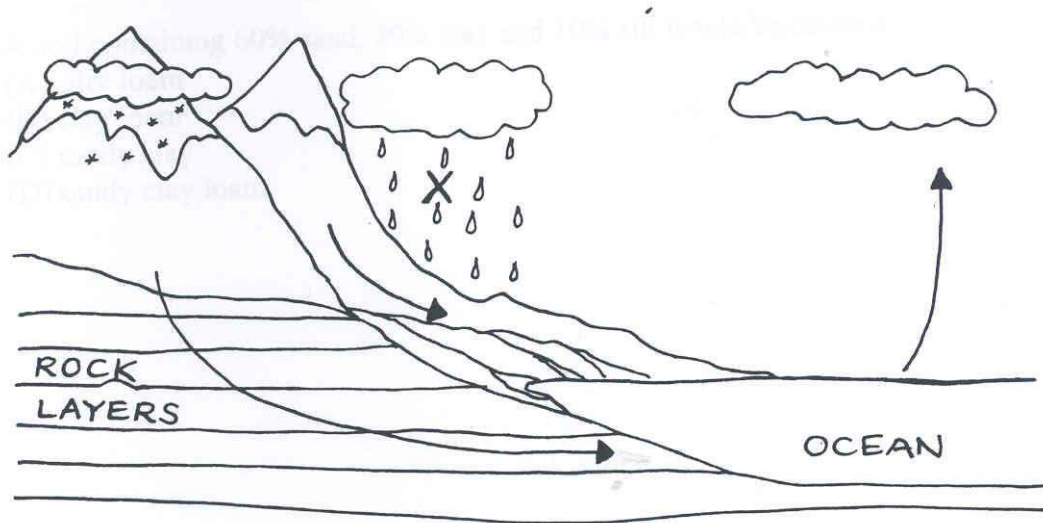
5. The diagram below shows the distribution of four zones of the Earth.



The distribution of the atmosphere, biosphere, lithosphere and hydrosphere are represented respectively by –

- A S, R, P, Q
- B S, Q, P, R
- C R, Q, P, R
- D S, P, Q, R

6. The diagram below shows the water cycle



What is the name of the process occurring at **X**?

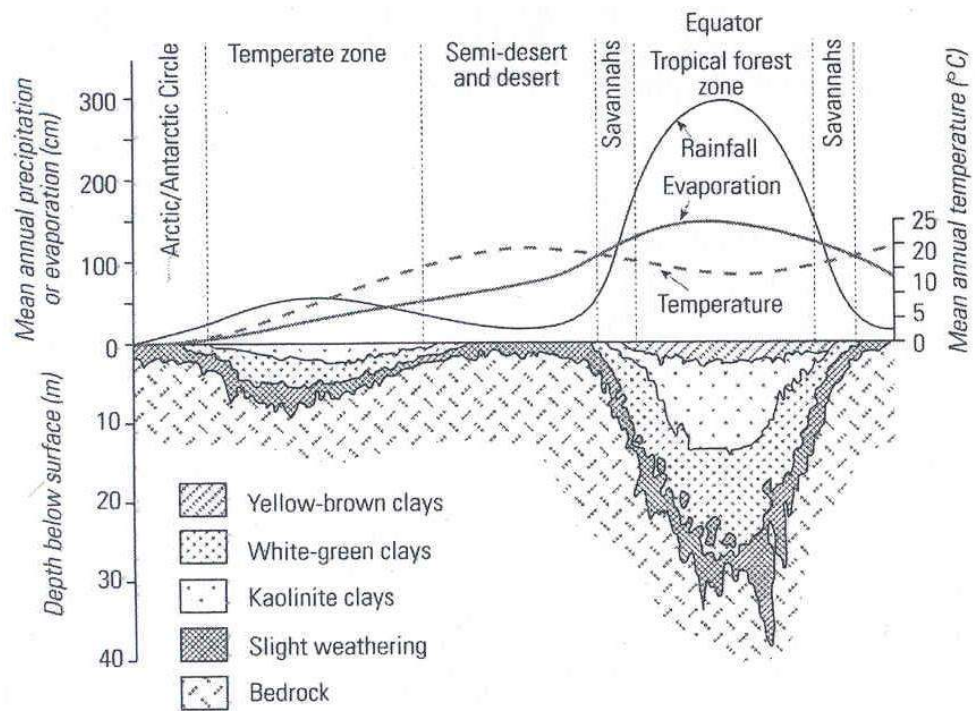
- A run off
 - B infiltration
 - C precipitation
 - D transpiration
7. A student examined a sample of rock in class and wrote the following description in her note book.

The rock contained interlocking crystals which were large enough to see without a hand lens. The teacher said the rock had a lot of ~~quarts~~ quartz. There was no evidence of any layers or mineral alteration. It was decided that the rock had formed from a magma in the Earth.

Based on her information, how is the rock best classified?

- A igneous and volcanic
- B igneous and plutonic
- C sedimentary
- D metamorphic

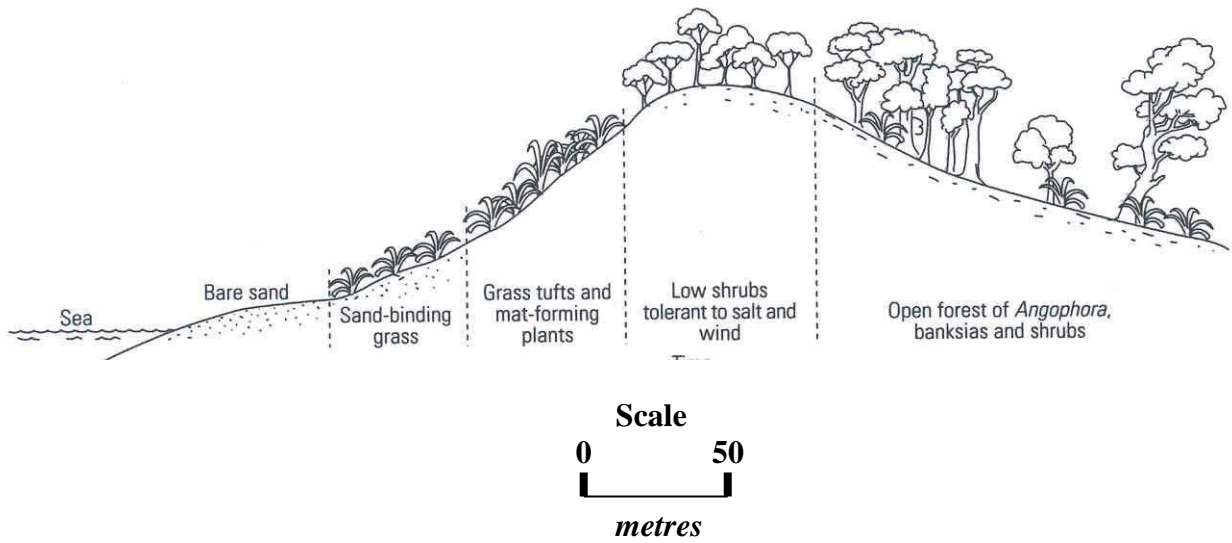
8. The diagram below shows how latitude, climate and soil formation are related.



What factor would contribute most to the poor development of soil in a desert?

- A temperature
- B evaporation
- C rainfall
- D depth

9. The diagram below shows the changes in vegetation across a sand dune.

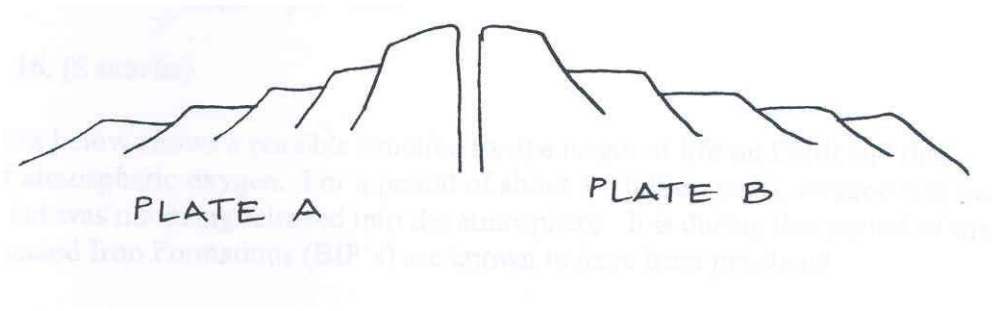


What factor could result in the succession of plants on the dune?





- A altitude
- B fencing the area
- C increased rainfall away from the coast
- D increased soil nutrients and carbon content away from the sea
10. What happens to the capacity of water to hold carbon dioxide as the water temperature increases?
- A remains constant
- B increases
- C decreases
- D fluctuates
11. Which common pollutant could be increased in rivers as a result of using some detergents?
- A nitrates
- B potassium
- C phosphorus
- D carbon dioxide

12. What evidence suggests that warm shallow seas existed in the past?
- A Palaeozoic limestone deposits
 - B dinosaur fossils in Jurassic rocks
 - C Permian and Triassic coal deposits
 - D volcanic activity in Tonga, Hawaii and Japan
13. The percentage of the Earth's total water budget which is available to humans as fresh water is closest to?
- A 25%
 - B 15%
 - C 10%
 - D 1%
14. What is the asthenosphere?
- A a rigid layer beneath the Earth's crust
 - B a partially molten zone above the mantle
 - C a mobile zone which allows plates to move
 - D the molten layer between the crust and the mantle

15. The diagram below shows a cross section through a part of the Earth above a plate boundary.



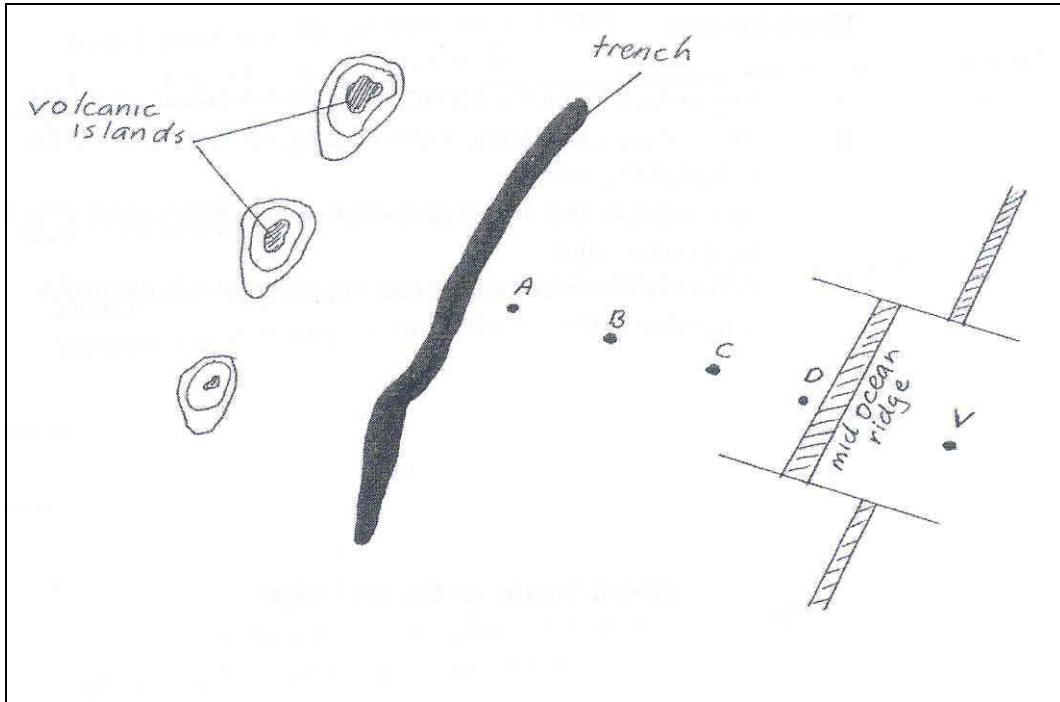
Which of the arrows indicate the relative movement of these two plates?

- A 
- B 
- C 
- D 

16. What method can be used to determine the age of the ocean crust.

- A fossils in the basalt crust
- B radioisotopes in the ocean crust
- C magnetic anomaly patterns on the sea floor
- D the rate at which new crust is formed at a spreading centre

17. The diagram below is an aerial view of a part of the Earth.



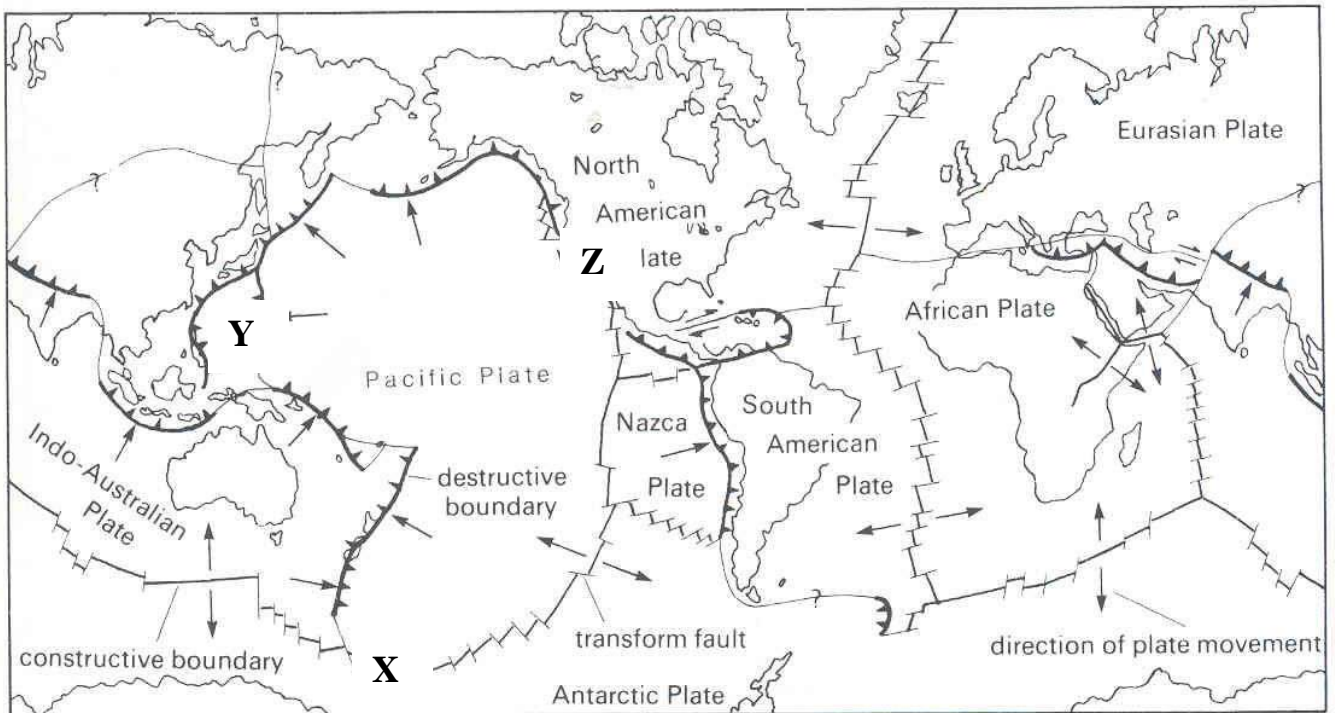
Which location on the diagram will be closest in age to the crust at point V?

- A A
- B B
- C C
- D D
18. Following World War II, improved technology became available which provided evidence that suggested that the sea floor was spreading.

What was the new evidence?

- A Finding similar fossils in India and Western Australia
- B Fit of the continents on either side of the Atlantic Ocean
- C Matching patterns of rocks on South America and Africa
- D Topography of the sea floor between Europe and North America

19. Refer to the map below



What type of plate boundary is at X, Y and Z?

- A X is a convergent boundary, Y is a divergent boundary and Z is conservative plate boundary
- B X is a conservative boundary, Y is a divergent boundary and Z is convergent plate boundary
- C X is a divergent boundary, Y is a convergent boundary and Z is conservative plate boundary
- D X is a convergent boundary, Y is a conservative boundary and Z is divergent plate boundary

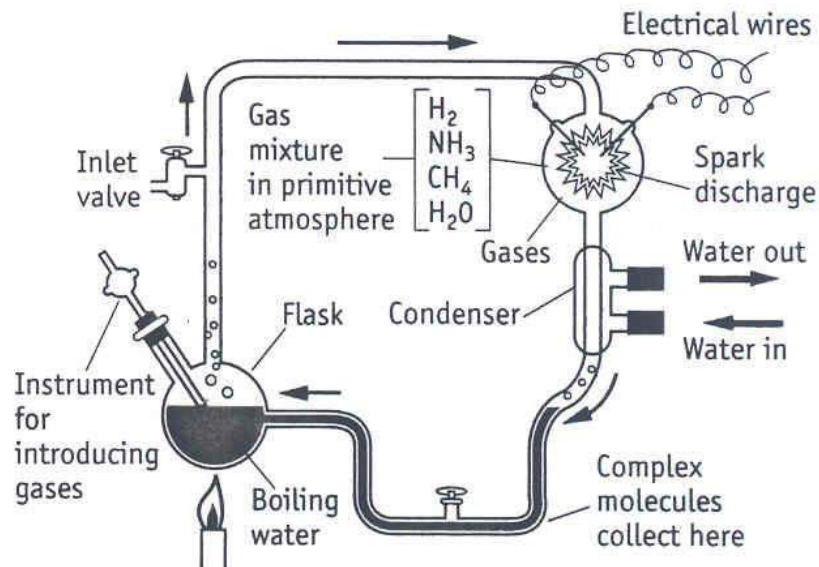
20. What type of volcanic activity occurs at a continent – continent collision boundary

- A Explosive
- B Effusive
- C Quiet
- D None

Name:

Section B*Questions 15 to 29 (Total 60 Marks)***Write your answers in the appropriate space on this paper.**

21. The diagram below shows the apparatus Stanley Miller and Harold Urey used to reproduce conditions of the early Earth.



Assess the importance of the findings of Urey and Miller to our understanding of how life may have originated on Earth.

4 Marks

.....

.....

.....

.....

.....

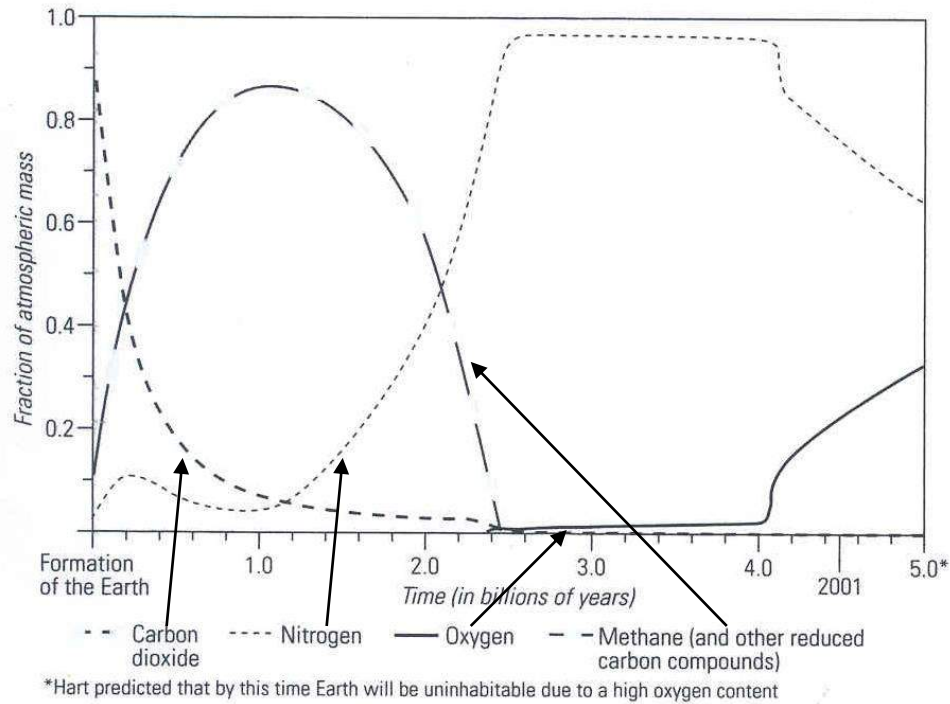
.....

.....

.....

22. The diagram below shows Hart's estimates of atmospheric gases throughout Earth history

For a period of about 1.5 billion years, oxygen was being produced but was not released into the atmosphere. During this time Banded Iron Formations (BIFs) are known to have formed.



A Briefly describe Banded Iron Formations 2 Marks

.....

.....

B Identify the process responsible for the introduction of large amounts of oxygen into the atmosphere. 1 Mark

.....

.....

C Explain why atmospheric oxygen did not become a major component of the atmosphere during the time that Banded Iron Formations were being produced. 3 Marks

.....

.....

.....

.....

23. List the sequence of events used by scientists to explain the formation of the solar system.

4 marks

.....

.....

.....

.....

.....

.....

.....

.....

24. Outline one implication of the global loss of biodiversity.

2 marks

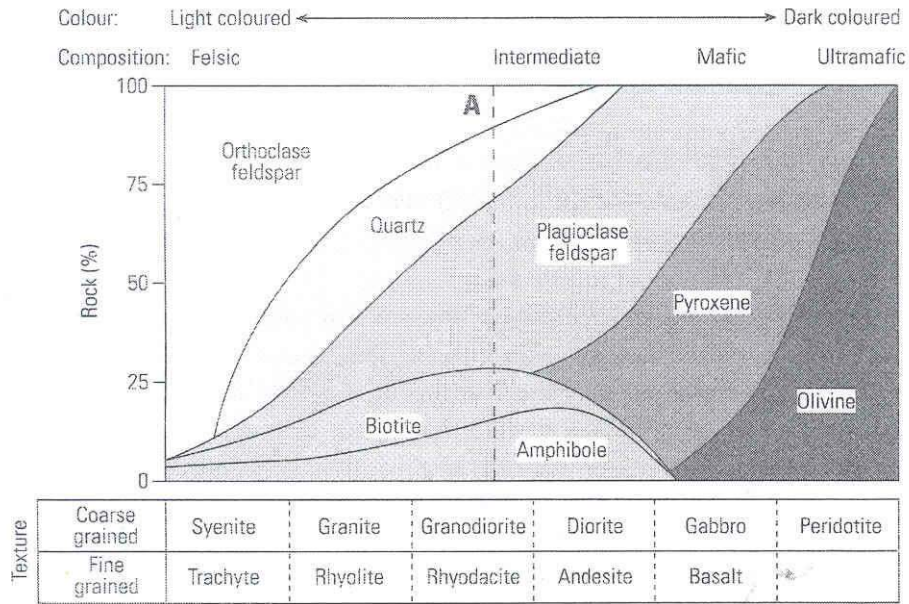
.....

.....

.....

.....

26. The diagram below shows the classification of igneous rocks by texture and composition.



A Give the percentage composition of granodiorite represented by the line 'A'. 2 marks

Mineral	% present in Granodiorite
Orthoclase	
Quartz	
Plagioclase	
Biotite	
Amphibole	

B Describe the conditions in which granodiorite forms giving a reason for your answer. 2 marks

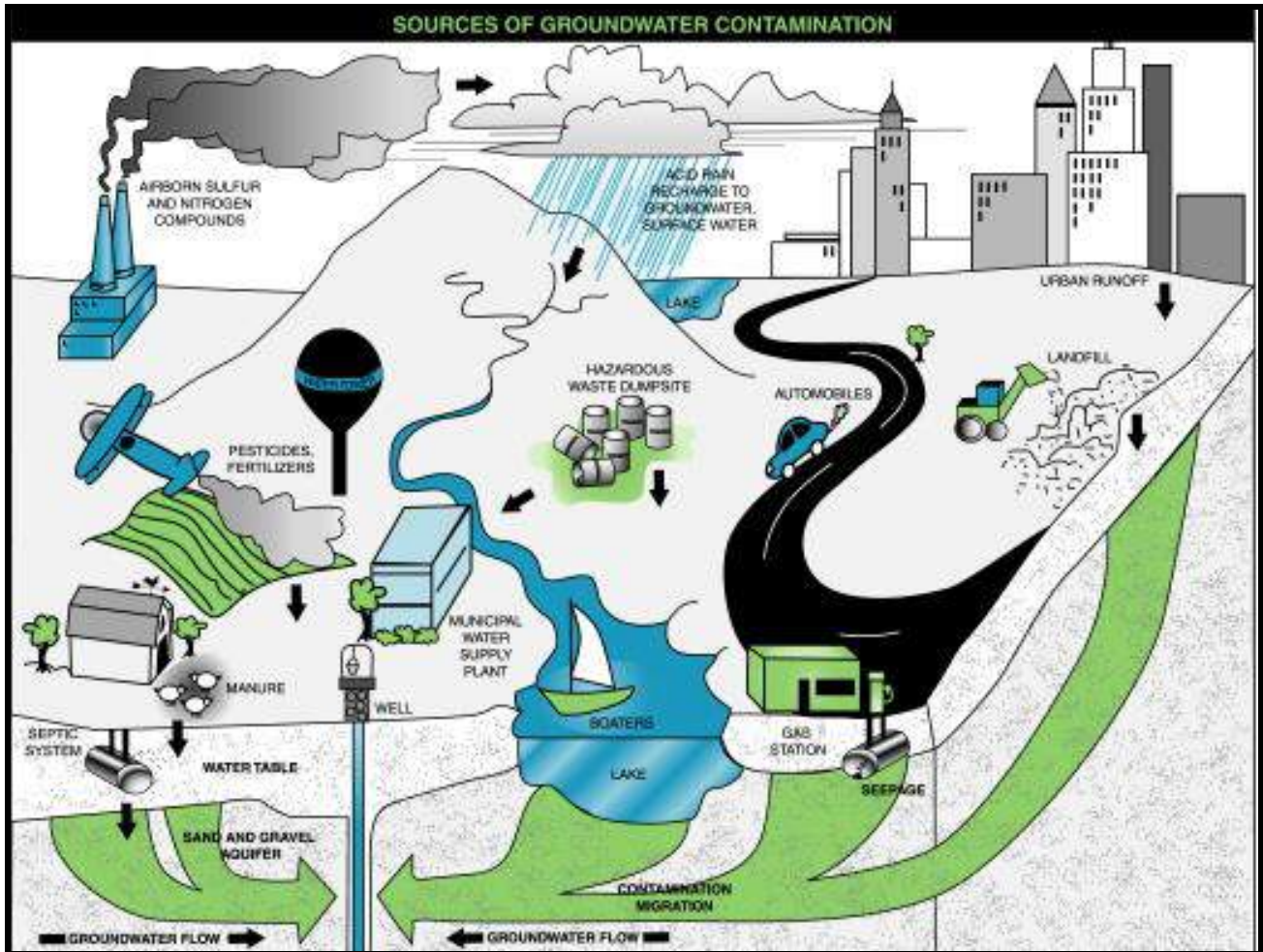
.....

.....

.....

.....

27. Refer to the diagram below which shows sources of pollution in a groundwater system.



A Identify one specific source of pollution from the diagram.

1 mark

B Explain the effect of the source of pollution you have identified on the groundwater system.

2 marks

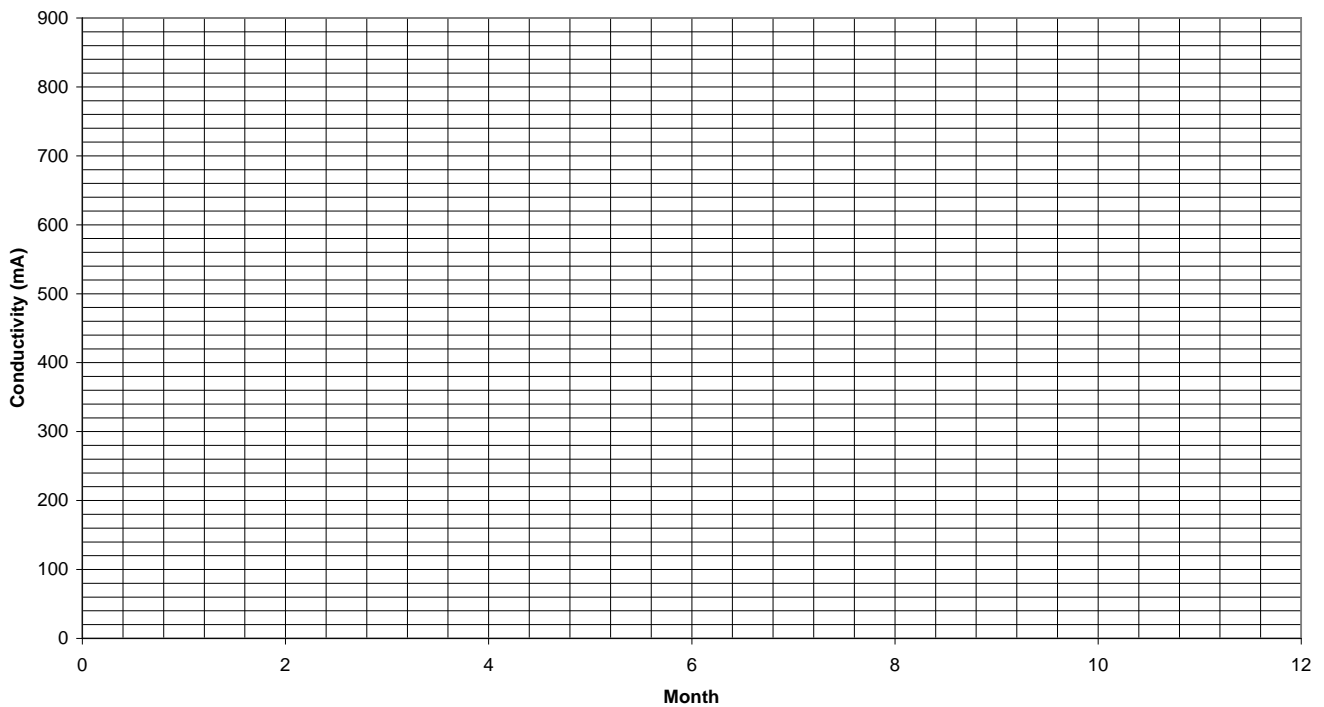
29. The table below shows the electrical conductivity of water at one location along the Lachlan River in NSW over a number of months. Conductivity measures the dissolved ions present in the water.

Month	Month Number	Electrical Conductivity (mA)
February	2	620
April	4	760
June	6	800
August	8	180
October	10	380

A Draw a line graph using this data.

2 marks

Electrical Conductivity of River Water



B Describe the trend shown by the data in the table.

2 marks

.....

.....

.....

.....

C Give a possible reason for the low value in August.

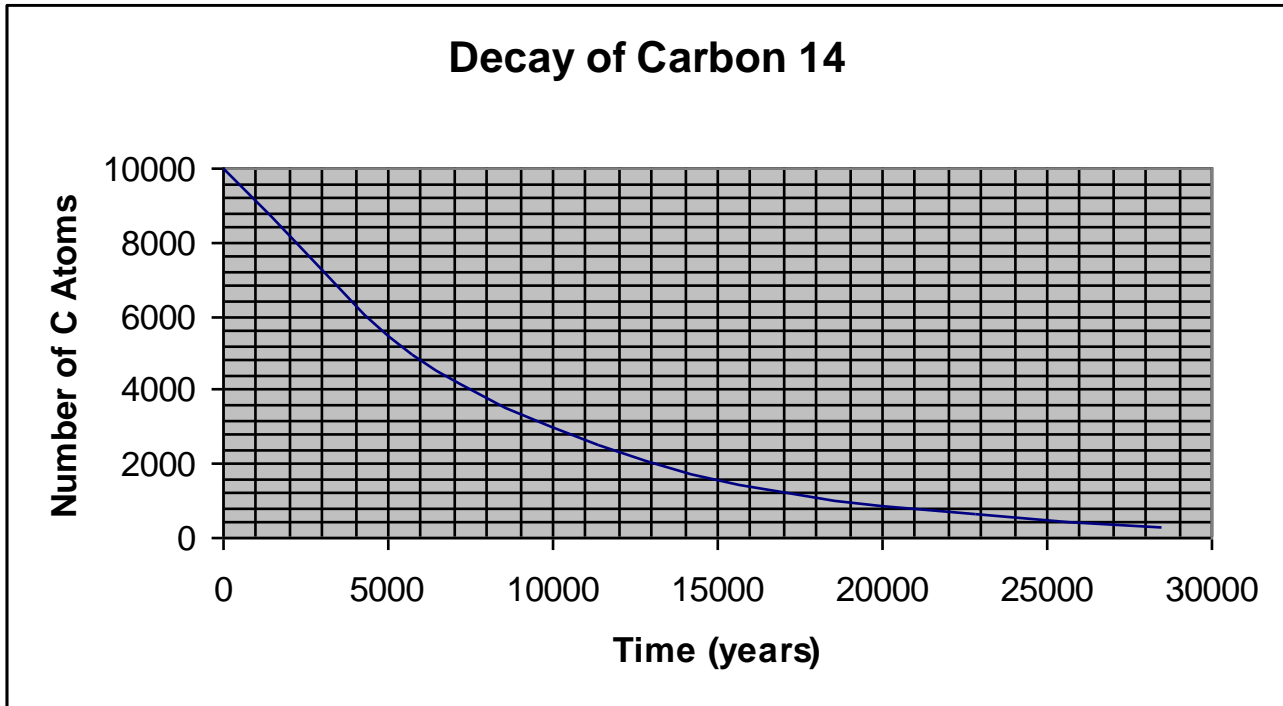
1 mark

.....

.....

30. The body of a man wearing the traditional clothes of the snow plains nomads was found at the bottom of one of the many peat bogs that remain from the last glacial retreat. He had a stone axe buried in the back of his skull.

A C^{14} radio-active dating test done on the victim's body and clothes. The following graph shows the decay of radioactive Carbon 14 atoms into stable Nitrogen 14 atoms.



- A Identify the term used to describe the stable product.

1 Mark

- B Using the graph, identify the half life of C^{14} .

1 Mark

The test found that for every 100,000,000 C^{12} atoms present in the man's body and clothes only 3,000 radio-active C^{14} atoms were present.

Using the graph deduce how long ago the man died (show working)

2 Marks

31. A Define the term Subduction Zone

2 Marks

.....

.....

.....

.....

B Identify the features that are characteristic of a subduction zone

3 Marks

.....

.....

.....

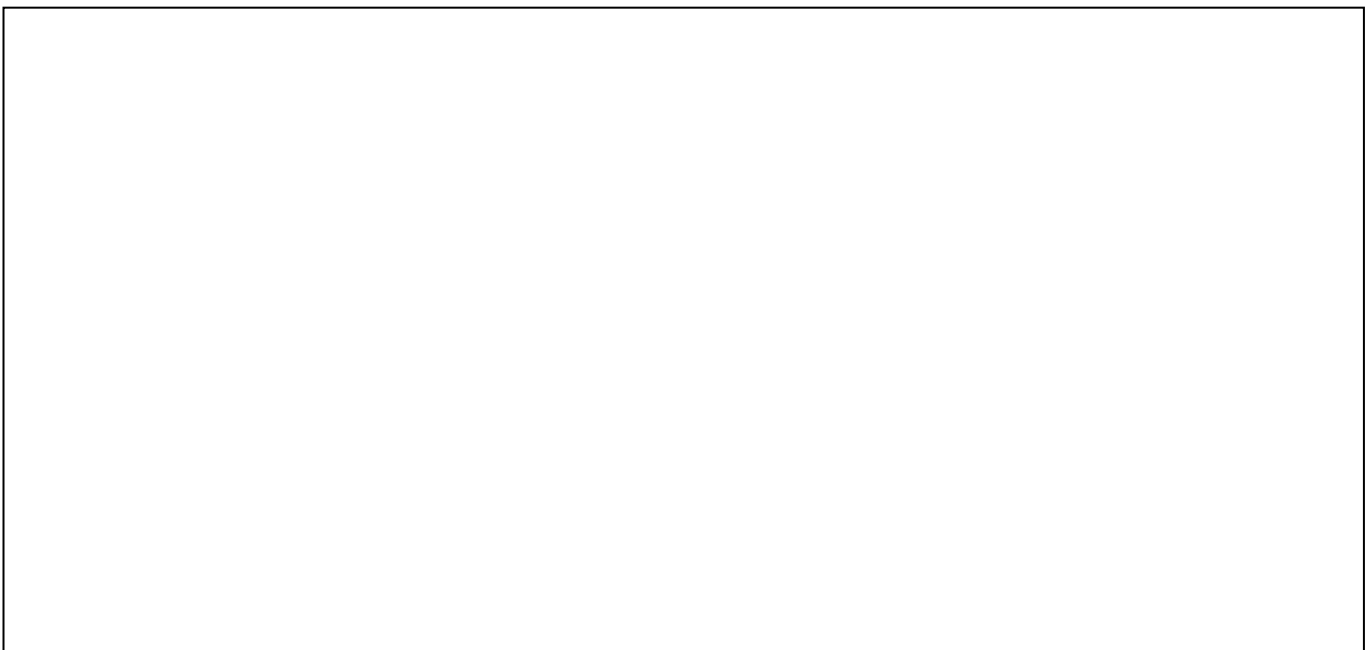
.....

.....

.....

C In the space below draw a diagram to illustrate a transform fault

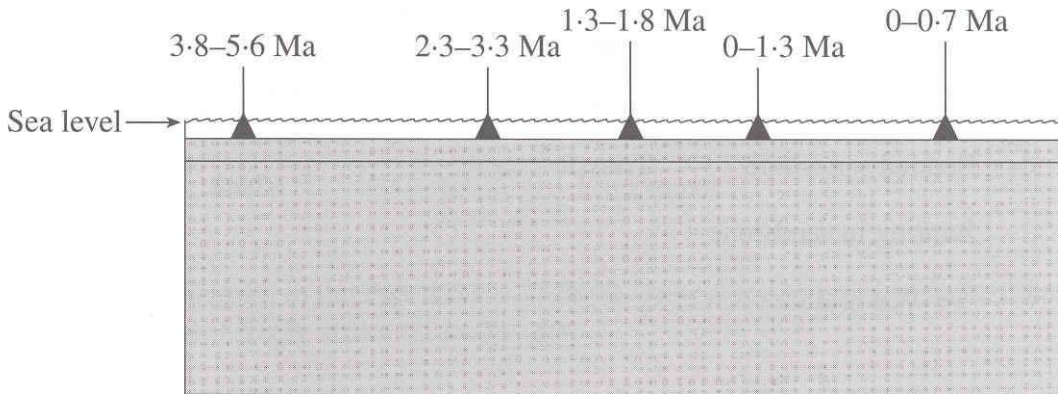
1 Marks



D Indicate on your diagram, using the letter **X**, a place where earthquakes would be most likely.

1 Mark

32 The diagram shows a cross section through an oceanic plate, the position of five volcanic islands and their ages.



A on the diagram, indicate the direction of plate movement with an arrow. **1 Mark**

B Identify the composition of lava erupted for this type of volcanic island chain **1 Mark**

.....

.....

C Sketch the shape of a typical volcano formed in this setting and relate the Shape to the characteristics of the eruptions that produced it. **2 Marks**

.....

.....

.....

.....

.....

.....

Name:



YEAR 11

EARTH AND ENVIRONMENTAL SCIENCE

Select the alternative A, B, C or D that best answers the question.

Fill in the response space completely. If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

If you change your mind and have crossed out what you consider to be the correct answer, then indicate this by writing the word **correct** and drawing an arrow.

Question				
1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D

Question				
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D
16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
20	A	B	C	D

Geological Time Scale

	EON	ERA	PERIOD	EPOCH	
0	Phanerozoic	Cenozoic	Quaternary	Holocene	
2				Pleistocene	
5					Pliocene
10					Miocene
20				Tertiary	
30					Oligocene
40				Eocene	
50				Palaeocene	
60			Mesozoic		
70				Cretaceous	
100					
200				Jurassic	
300				Triassic	
400	Palaeozoic		Permian		
500			Carboniferous		
600			Devonian		
1000			Silurian		
2000			Ordovician		
3000			Cambrian		
4000	Proterozoic				
6000			Archaean		
4000			Hadean		