Geo History Review Sheet

- **Earth Formation**
  - How old is the Earth?

    4.6 billion years

- **Relative Dating**
  - What is relative dating?

    Relative dating is used to place layers of rock in sequential order.

  - Describe the 6 principals of relative dating. I am listing them here. Make sure you can describe them!

1. Principle of Superposition
2. Principle of cross-cutting
3. Principle of Original Horizontality
4. Principle of Inclusions
5. Unconformities
6. Principle of folding

  - What must be true in order for a fossil to be considered an index fossil?

    The organism must have lived for only a short period of time.

  - What is the Law of Uniformitarianism?

    This Law states that the events that take place today that change Earth's land formations are the same as in the past.

- **Absolute Dating**
  - What is absolute dating?

    Absolute dating allows scientists to determine the age of a fossil or rock layer by using the ratio of radioactive isotopes to daughter product.
  - What is a half-life?

    The time it takes for a radioactive element to decay.

Identify the relative age of each rock layer, igneous dike, fault, and unconformity in Figure A. (Hint: start with the youngest first and label it with a "1")

Repeat the above procedure for Figure B.

In Figure A, answer the following question. Which is older? (Circle the correct answer)

A or E
G or J
A or I
E or J

G or A
I or B
E or B
J or H

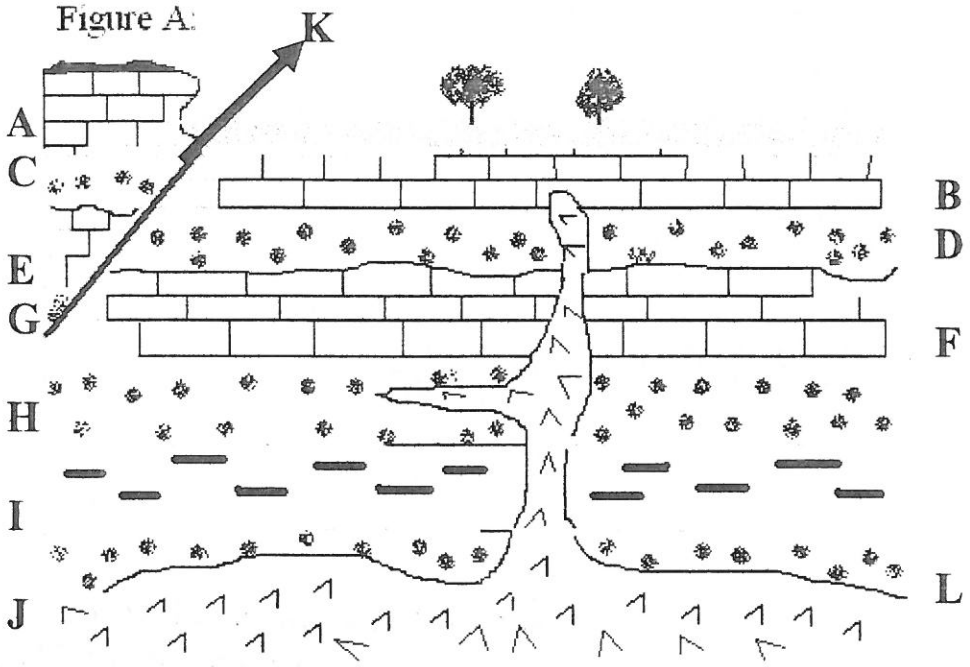
In figure B, answer the following question. Which is older? (Circle the correct answer)

A or C
E or J
D or G
I or J

G or H
B or E
C or I
H or B

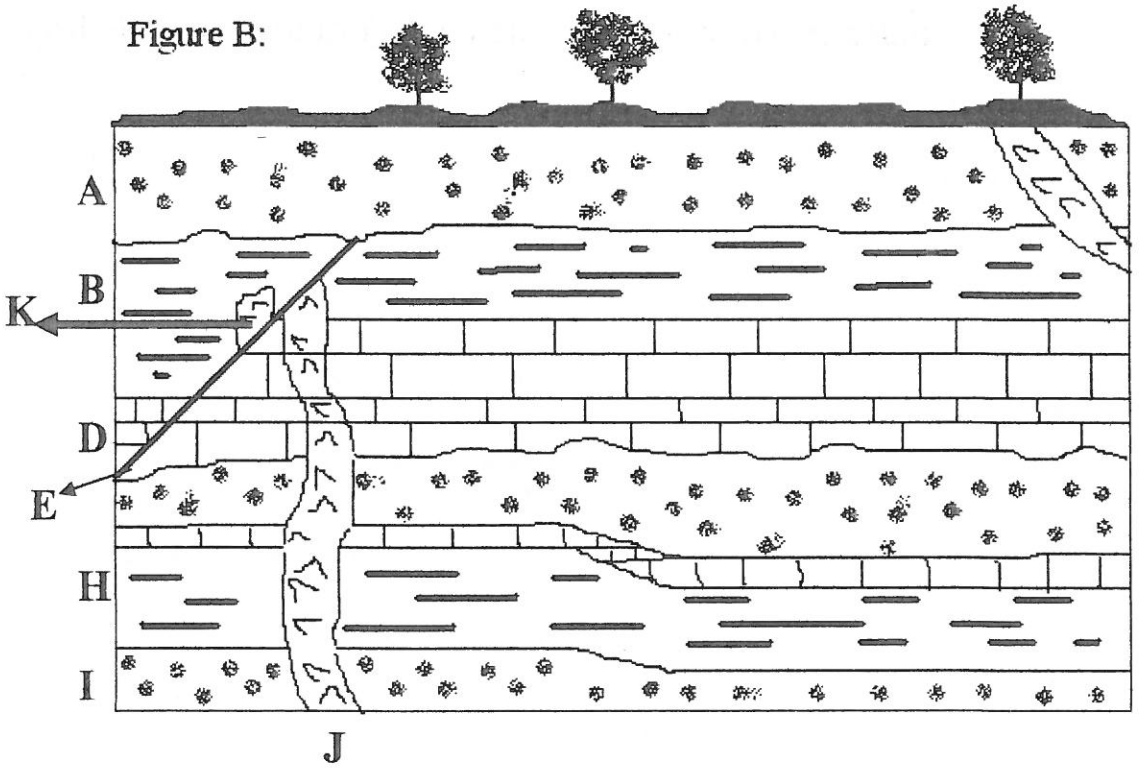
Name: _____

Figure A:



A
K
Youngest
C
L
B
D
E
G
F
H
I
J
Oldest

Figure B:



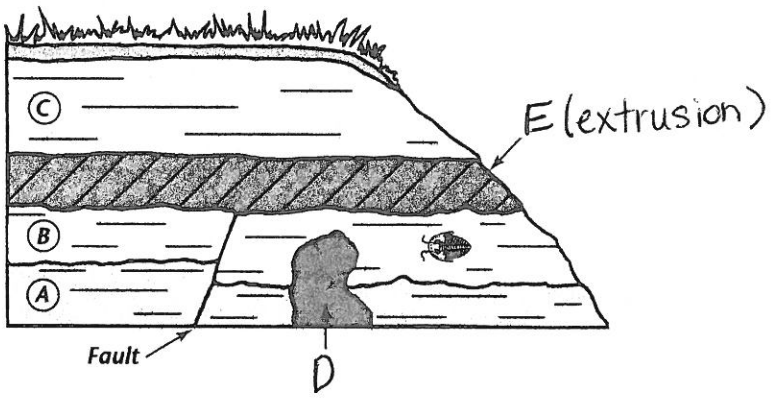
C
Youngest A
E
B
M
K
L
D
F
G
H
Oldest I

Name _____ Date _____ Class _____

The Relative Age of Rocks

Understanding Main Ideas

Use the figure below to answer questions 1–4. Write your answers on a separate sheet of paper.



1. What is the youngest rock layer? Explain. C - law of superposition
2. Is the extrusion older or younger than rock layer B? Explain. younger - law of superposition
3. Is the fault older or younger than rock layer A? Explain. younger - Law of crosscutting
4. How could a geologist use the fossil in rock layer B to date a rock layer in another location? Index fossil could be dated using radioactive dating

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line next to the term.

B 5. fault

H 6. extrusion

g 7. unconformity

e 8. relative age

C 9. law of superposition

D 10. intrusion

A 11. absolute age

f 12. index fossil

a. the number of years since a rock has formed

b. a break in Earth's crust

c. the way to determine relative ages of rocks

d. a hardened layer of magma beneath Earth's surface

e. the age of a rock compared with the age of other rocks

f. fossils used to help geologists match rock layers

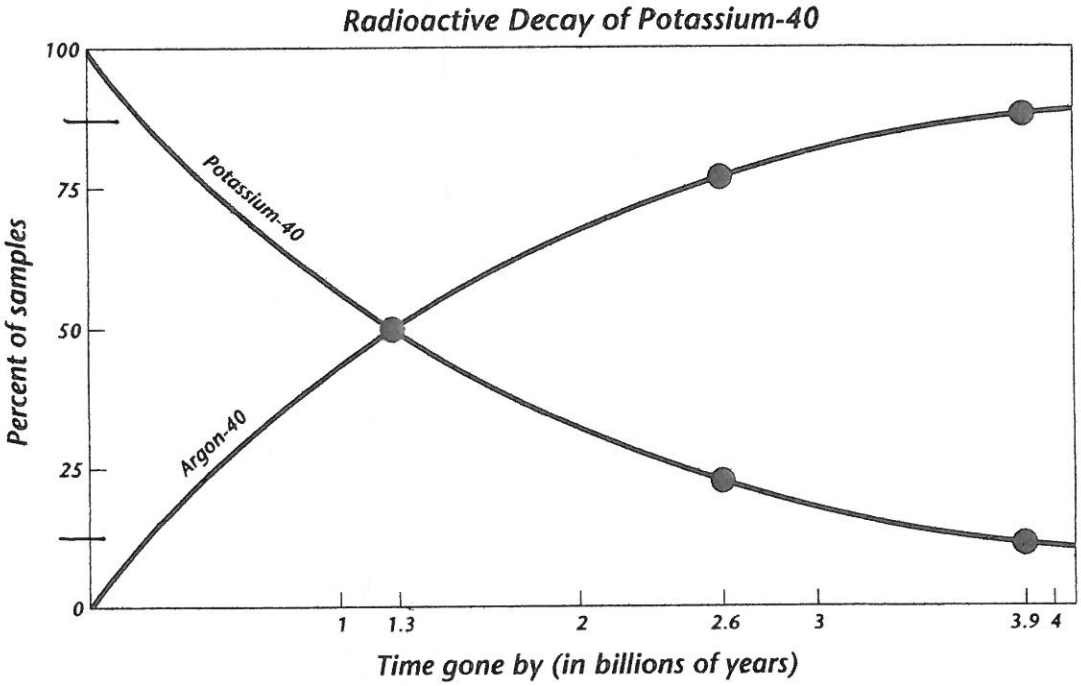
g. the surface where new rock layers meet a much older rock surface beneath them

h. a hardened layer of lava on Earth's surface

Name _____ Date _____ Class _____

A Continuous Process

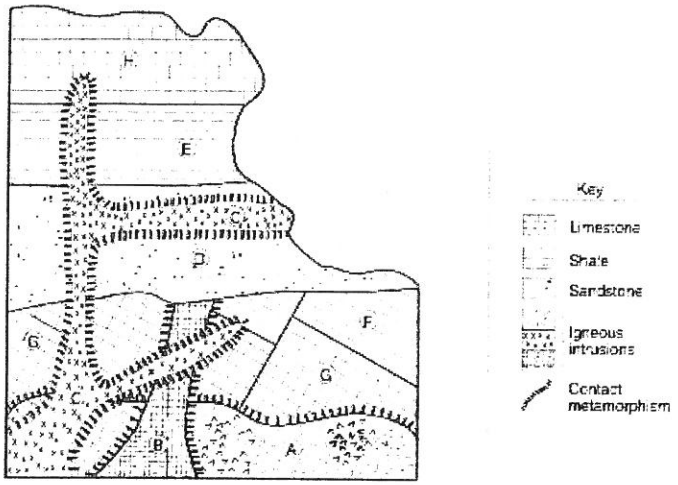
In potassium-argon dating, geologists measure the amount of radioactive potassium-40 in igneous rock and compare that amount with the amount of stable argon-40. The stable argon-40 forms as a result of the radioactive decay of the potassium-40. From this comparison, geologists can tell the absolute age of the rock. The graph below shows this radioactive decay over time.



Answer the following questions below on a separate sheet of paper.

1. When the rock first forms, what is the percent of potassium-40 compared with the percent of argon-40? potassium-40 = 100%., Argon = 0%
2. What is the half-life of potassium-40? 1.3 billion years
3. What are the percentages of the two elements at 1.3 billion years? 50/50
4. After the first 1.3 billion years, does the rock contain more potassium-40 or argon-40? Argon-40
5. What are the percentages of the two elements after three half-lives of potassium-40? Potassium-40 = 20%. ; Argon-40 = 80%
6. Does a geologist have to wait 1.3 billion years before seeing a difference in the amounts of these two elements? Explain.
   No. The potassium breaks down immediately.

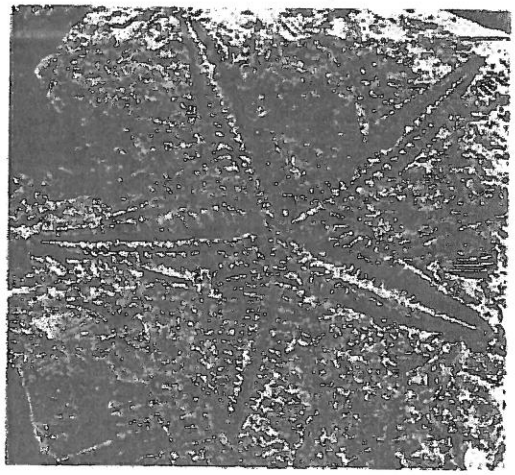
Use this diagram to answer the next two questions.



4. Which statement gives an accurate age relationship for the bedrock in the cross section?

A Intrusion A is younger than intrusion C.
→ (B) Intrusion C is younger than intrusion B.
C Intrusion B is older than intrusion A.
D Intrusion C is older than layer E.

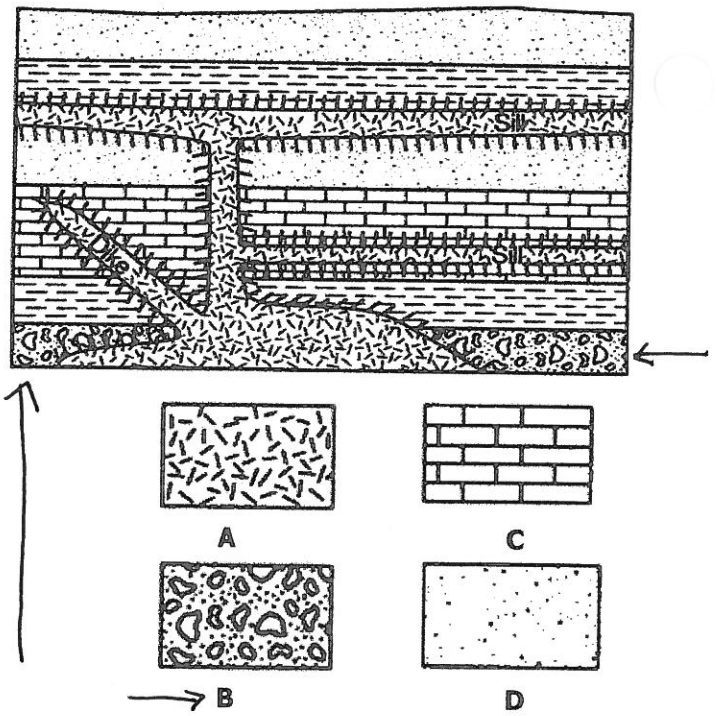
6. What does the presence of this fossil suggest about the area during the Devonian?



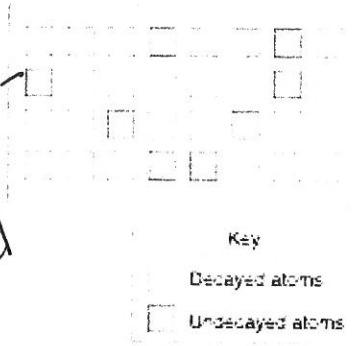
A swamp
B desert
→ (C) marine
D polar

(starfish)

7. Which rock type is the oldest?



8. The diagram below represents the current number of decayed and undecayed atoms in a sample that was originally 100% radioactive material.



ignore → cannot read

If the half-life of the radioactive material is 1,000 years, what is the age of the sample?

A 1,000 yr
B 2,000 yr
C 3,000 yr
D 4,000 yr

omit. Cannot read diagram

10. What is the estimated age of the Earth?

A 4.5 billion years
→ (B) 4.6 billion years
C 4.5 million years
D 4.6 million years