SI Geology - Full Discipline Demo

Relative Dating

Final Report - Answer Guide

Institution	Science Interactive University
Session	SI Geology - Full Discipline Demo
Course	SI Geology - Full Discipline Demo
Instructor	Sales SI Demo

Test Your Knowledge

Categorize each statement as true or false.

Absolute dating is the process of determining when geologic events occurred in relation to one another.

The geologic record is a history of the earth consisting of layers upon layers of rocks stacked over time.

The Principle of Catastrophism is based on the idea that the Earth continues to be affected by sudden, violent events that shape the planets.

Uniformitarianism states that geologic processes change over time.

True	False
1	2

Correct answers:

1

The geologic record is a history of the earth consisting of layers upon layers of rocks stacked over time.

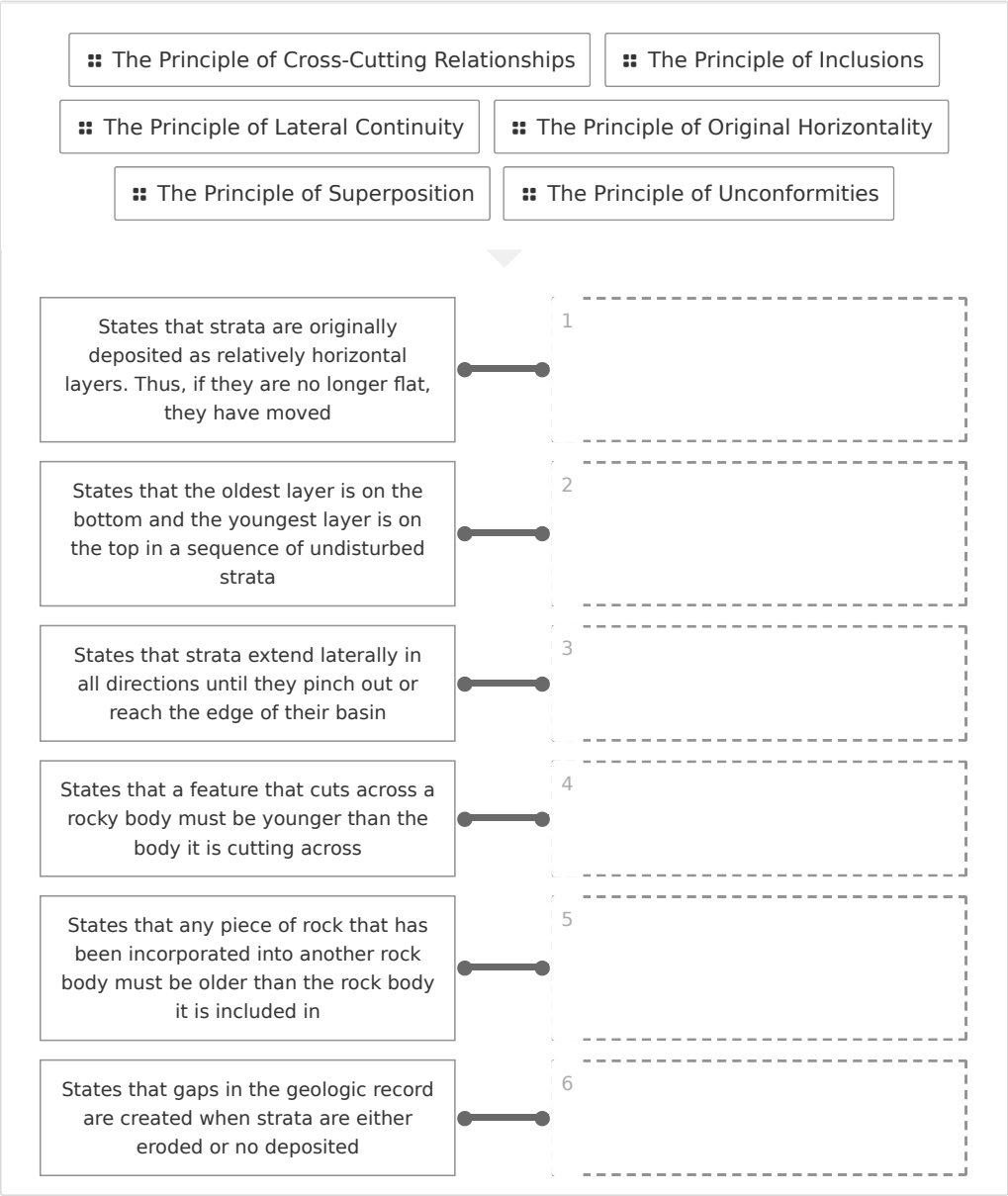
The Principle of Catastrophism is based on the idea that the Earth continues to be affected by sudden, violent events that shape the planets.

2

Absolute dating is the process of determining when geologic events occurred in relation to one another.

Uniformitarianism states that geologic processes change over time.

Match each principle of relative age dating to its description.



Correct answers:

1 The Principle of Original Horizontality

2 The Principle of Superposition

3 The Principle of Lateral Continuity

4 The Principle of Cross-Cutting Relationships

5 The Principle of Inclusions

6 The Principle of Unconformities

Exploration

Relative dating refers to the process of determining the exact age of each rock strata.

- True
- False ✔

Large-scale, catastrophic events can cause rapid changes in the geologic record.

- True ✔
- False

An unconformity that occurs between parallel layers of strata is called a _____.

- Nonconformity
- Angular Unconformity
- Horizontal Unconformity
- Disconformity ✔

The Principle of _____ states that the oldest layer is on the bottom and the youngest layer is on the top in a sequence of undisturbed strata.

- Inclusion
- Lateral Continuity
- Superposition ✔
- Cross-Cutting Relationships

Exercise 1

Why is perspective important when using relative dating techniques? Explain using your experience from this exercise.

What type of unconformity is represented by H in Model 3? Describe how this unconformity formed.

Could Rock A in Model 3 have been deposited before H? Explain your reasoning.

Look at Model 1. If Rock B was formed in the Silurian Period, and Rock C was formed in the Permian Period, what type of boundary lies between B and C? Explain how this could have formed.

Look at Model 3. Do you think there are any age gaps present between any of the layers? Explain your reasoning.

Data Table 1: Model 1
(SAMPLE ANSWER BELOW)

	Rock Formation (Letter)	Type of Event	Relative Dating Principle(s)
Youngest	D	Igneous Intrusion	Cross-Cutting Relationships
	A	Deposition	Superposition
	C	Deposition	Superposition
	B	Deposition	Superposition
Oldest	E	Deposition	Superposition

Data Table 2: Model 2
(SAMPLE ANSWER BELOW)

	Rock Formation (Letter)	Type of Event	Relative Dating Principle(s)
Youngest	B	Deposition	Superposition
	G	Deposition	Superposition
	D	Tectonic (Faulting)	Original Horizontality
	E	Deposition	Superposition
	A	Deposition	Superposition
	F	Deposition	Superposition
Oldest	C	Deposition	Superposition

Data Table 3: Model 3
(SAMPLE ANSWER BELOW)

	Rock Formation (Letter)	Type of Event	Relative Dating Principle(s)
Youngest	G	Deposition	Superposition
	A	Igneous Intrusion	Cross-Cutting Relationships
	B	Deposition	Superposition
	H	Tectonic (Faulting)	Original Horizontality
	E	Deposition	Superposition
	D	Deposition	Superposition
	C	Deposition	Superposition
Oldest	F	Deposition	Superposition

Exercise 2

How many nonconformities are in the diagram?

How many disconformities are in the diagram?

How many angular unconformities are in the diagram?

How did you determine the relative age of rock unit “J”?

Data Table 4: Unconformities
(SAMPLE ANSWER BELOW)

Relative Age	Unconformity Letter
(Youngest) 6	U
5	V
4	W
3	X
2	Y
(Oldest) 1	Z

Data Table 5: Rock Units
(SAMPLE ANSWER BELOW)

Relative Age	Rock Unit Letter
(Youngest) 17	M
16	N
15	O

14	P
13	Q
12	I
11	H
10	G
9	F
8	J
7	E
6	D
5	C
4	B
3	A
2	K
(Oldest) 1	L

Competency Review

The Principle of Uniformitarianism states that geologic processes change over time, resulting in different geologic processes today than in the past.

- True
- False ✔

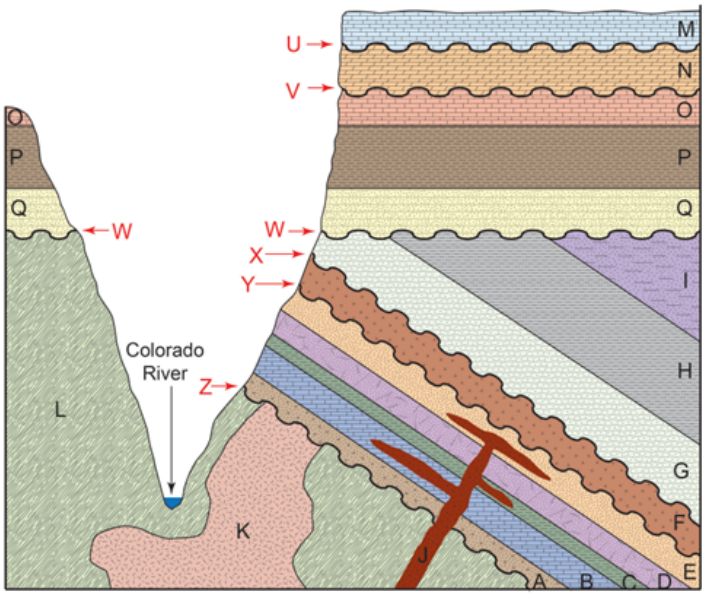
Which principle of relative dating states that strata are originally deposited as relatively flat layers; therefore if they are no longer flat, they have been moved?

- The Principle of Superposition
- The Principle of Original Horizontality ✔
- The Principle of Cross-Cutting Relationships
- The Principle of Lateral Continuity

An unconformity between younger sedimentary strata and igneous/metamorphic rocks is called a(n) ____.

- Disconformity
- Nonconformity ✔
- Angular Unconformity
- Parallel Unconformity

In the diagram below, which unconformity represents an angular unconformity?

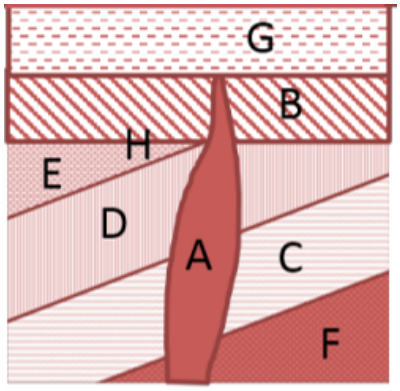


- W ✔
- X
- Y
- Z

The Principle of ____ states that any piece of rock that has been incorporated into another rock body must be older than the rock body it is incorporated into.

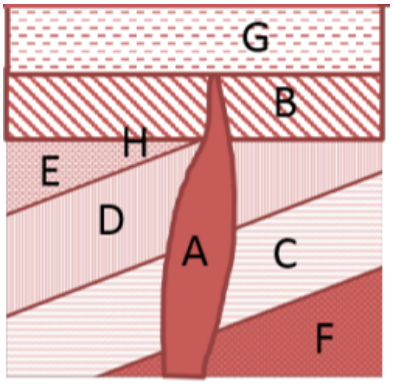
- Cross-Cutting Relationships
- Unconformities
- Inclusions ✔
- Lateral Continuity

Which relative dating principle supports the observation that rock A in the diagram below is younger than rock B?



- The Principle of Lateral Continuity
- The Principle of Cross-Cutting Relationships ✔
- The Principle of Original Horizontality
- The Principle of Superposition

In the diagram below, which rock layer is the youngest?



- A
- B
- E
- G ✔

Disconformities occur between parallel layers of strata.

- True ✔
- False

Extension Questions

When standing in a stream bed, you observe identical layers of sedimentary strata on both sides of the bed. Which came first, the sedimentary rocks or the stream? Explain your reasoning, including what principle you are using. (SAMPLE ANSWER BELOW)

The sedimentary layers were horizontally deposited before the stream. The stream is eroding the layers of sedimentary rock. This would fit under the Principle of Cross-Cutting Relationships.