H

Worksheet: Principles of Geology (14 pts.)

name: _____

Each question is worth .5 point, except #25. It is worth 2 pts.

1. **Relative dating** (not "dating your relatives!) is discussed on page 326. What is your age **relative** to your teacher's age?

I am _____ than my teacher.

2. Read the section on the Law of Superposition and then look at the diagrams on p. 329. According to this law, what is the age of the Hermit Shale **relative** to the Supai Group?

The Hermit Shale is _____ than the Supai Group.

3. What does the principle of original horizontality claim? (*Use sentences.)

4. *Why aren't the layers in Figure 11.4 horizontal?

5. Look at figure 11.5. Use the principle of cross-cutting relationships (p. 327-328) to figure out which of these happened first (1), second, third, and last (4: most recent). Number them 1-4.

conglomerate formed	sandstone formed	dike A formed	fault A formed
_____	_____	_____	_____

6. Read about "inclusions" and look at figure 11.6. The rhyolite (formed when lava cools) just south of Helena has **inclusions** (rocks embedded in it). Which formed first? . . . the inclusions, or the rhyolite

7. Read about **unconformities** on pages 328-329. Look at the diagram on page 329. How many disconformities are there in the Grand Canyon? _____
How many **angular unconformities** are shown in the diagram on page 329? _____

8. *Both of the features listed in question 7 are formed by periods of erosion, followed by a time of deposition. Besides erosion, what else happened to make the angular unconformity different than the **disconformities**?

9. Look at figure 11.8. What happened during the time between B and C?

10. *Look at the list of trace fossils on page 334. What are "coprolites"?

11. *What are "gastroliths"?

12. *Look at the series of diagrams on page 331. How do "inclusions" help geologists figure out the relative age of the sill (D)?

13. What principle helps them know that F is younger (formed more recently) than A-E?

14. *Why is the angular unconformity (labeled in #5 and #6 on page 331) uneven, rather than smooth and straight?

15. *Why aren't the layers above the unconformity parallel to the layers below it?

16. Look at the diagram on page 332. Which two layers can be seen in both the Grand Canyon and Zion National Park?

_____ _____

Which two in Zion correlate to layers in Bryce Canyon?

_____ _____

17. *Why can't the Supai Formation be seen in Zion? (Where is it?)

18. *Why is there no Navajo Sandstone in the Grand Canyon? (What happened to it?)

19. Limestone is formed from material deposited in a shallow ocean basin. How many different limestone (Ls) formations can be found in the three-canyon area represented on page 332? _____

20. According to the section titled, "Conditions Favoring Preservation," what two conditions are needed in order for an organism to become a fossil?

21. What two criteria must be met for a fossil to qualify as an "**index fossil**"?

22. *How can the thickness of fossil shells help geologists figure out the position of ancient shorelines? (p. 336)

23. Read the section about "Difficulties . . ." on page 342. Based on what you read, what two parts shown on the diagram near the top of page 343 could be dated?

24. The Mancos Shale is between _____ and _____ million years old.

25. Go back to figure 11.5 and put everything that is labeled in order from first (earliest) to last (most recent). #8 is done for you. Use the principles of superposition and cross-cutting relationships.

1.	<-earliest	**4.**	**7.**
2.		**5.**	**8.** dike B and sill
3.		**6.**	**9.**