Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_

**Earth Systems Final Exam Study Guide**

|  |  |  |
| --- | --- | --- |
| **City** | **Latitude** | **Longitude** |
| **A** | 39º96'N | 82º99'W |
| **B** | 39º77'N | 86º16'W |
| **C** | 27º34'N | 82º53'W |
| **D** | 40º06'N | 80º72'W |

Use the table to answer questions.

1. Order the cities in the table above from North to South.



1. Label each letter marked in Figure 1-1.
2. The crust and uppermost mantle make up the rigid outer layer of Earth called the \_\_\_\_.
3. The distance, measured in degrees, north and south of the equator is referred to as \_\_\_\_.
4. What does a topographic map show?



1. How much of a rise in elevation exists from point D to point B?
2. Which would be the easiest route to climb and why?
3. What are the two sources of energy for the Earth system?
4. What is the difference between weather and climate?
5. The equator receives more energy from the sun year-round than other areas of Earth because…
6. What is an air mass?
7. An air mass that forms over the southwestern US and Mexico will have what 2 characteristics?
8. What are the key features of cold fronts? (Hint: what kind of weather do they bring?)
9. Put the steps of cloud formation in the correct order:

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | **B** | **C** | **D** |
| Moist air rises | Water droplets collect to form a visible cloud | Water condenses around a particle in the air (condensation nuclei) | The rising air begins to cool |

1. What is the greenhouse effect?
2. Aside from tornados, rotating thunderstorms can also produce…
3. What 3 substances cause chemical weathering?
4. What type of land will experience the most erosion? (Hint: also consider slope)
5. Define chemical weathering
6. Water and ice cannot perform erosion without the force of …

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1. What soil horizon would you most likely find sample 1?
2. Karst topography often is full of these 3 features.
3. Define frost wedging.
4. What are 3 causes of mechanical weathering?
5. Groundwater is found underground in the zone of \_\_\_.
6. Rocks are split into three categories based on \_\_\_\_.
7. If granite faces high temperatures and high pressures deep within Earth, what type of rock will be formed? (Assume that the granite did not melt.)
8. A rock that forms when magma hardens beneath Earth’s surface is called \_\_\_\_.
9. If lava cools faster, the crystals that form will be \_\_\_\_.
10. What are the steps (in order) involved in sedimentary rock formation?
11. Minerals are classified by \_\_\_\_.
12. What are the building blocks of minerals?
13. Which property is usually not useful in identifying minerals?
14. What are the 5 characteristics of minerals?
15. Moh’s scale is used to classify what property of minerals?
16. The appearance or quality of light reflected from the surface of a mineral is called \_\_\_\_.
17. The resistance of a mineral to being scratched is called \_\_\_\_.
18. What is the uneven breakage of a mineral called?



1. In Figure 3-1, what type of rock should occur in the part of the rock cycle labeled B?
2. In Figure 3-1, what process or processes would be occurring in the part of the rock cycle labeled E?
3. In Figure 3-1, what type of rock should occur in the part of the rock cycle labeled F?
4. The theory of plate tectonics helps scientists explain \_\_\_\_.
5. According to the plate tectonics model, what layers form Earth’s rigid, mobile plates?
6. Which of these factors affects the rate of weathering?
7. In a well-developed soil profile, which horizon is the uppermost layer?
8. A depositional feature that forms where a stream enters a lake or ocean is a(n) \_\_\_\_.
9. Permeable rock layers or sediments that transmit groundwater freely are called \_\_\_\_.
10. A cavern is an underground chamber formed by \_\_\_\_.
11. A seismogram shows that P waves travel \_\_\_\_.
12. The particles produced in volcanic eruptions are called \_\_\_\_.
13. The most violent volcanic eruptions are associated with what type of volcano?
14. A fault is \_\_\_\_.
15. During an earthquake, how can the ground surface move?
16. Overall, which seismic waves are the most destructive?
17. The distance between a seismic station and the earthquake epicenter is determined from the \_\_\_\_.
18. One piece of evidence that supports Wegener’s hypothesis of continental drift is that \_\_\_\_.
19. A divergent boundary at two oceanic plates can create \_\_\_\_.
20. What plays a major part in determining the type of volcano?
21. Most of the Earth’s active volcanoes are located in the \_\_\_\_.
22. An earthquake’s epicenter is \_\_\_\_.
23. In what type of rock layer would geologists most likely find evidence of past life forms?
24. An unconformity is a(n) \_\_\_\_.
25. Uniformitarianism says that the geological processes that shape Earth’s features today \_\_\_\_.
26. The principle of original horizontality says that \_\_\_ rocks are deposited in horizontal layers.



1. What is the youngest feature shown in Figure 12-1?
2. The footprints of a dinosaur are an example of what type of fossil?
3. Which two substances do geologists use in radiocarbon dating?
4. Assume you began with 10 atoms of a radioactive parent isotope. How many atoms of parent isotope will be present in the sample after 2 half-lives?
5. Carbon-14 cannot be used to accurately date what types of things?
6. In general, the law of superposition states that \_\_\_\_.
7. What is the most abundant gas in the atmosphere?
8. What is the lowest layer of the atmosphere?
9. The ratio of air’s water-vapor content to its capacity to hold water vapor at that same temperature is the \_\_\_\_.
10. Which of the following refers to the temperature to which air would have to be cooled to reach saturation?
11. The force exerted by the weight of the air above is called \_\_\_\_.