Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_ Date \_\_\_\_\_\_

Sample Earth Science MCAS Questions

1. An engineer is analyzing which areas in a city might become flooded if there are heavy rains. Which of the following maps is best to use for this analysis?

A. a map showing the routes of city buses

B. a map showing the locations of streets

C. a map showing the locations of houses

D. a map showing the elevations of ground surfaces

2. On the map below, dark circles indicate the positions of volcanoes in the "Ring of Fire" in and around the Pacific Ocean. Dark lines indicate tectonic plate boundaries of Earth’s crust.



According to this map, which of the following describes where volcanoes are most likely to form in the Ring of Fire?

A. Volcanoes form in the middle of a tectonic plate.

B. Volcanoes form below the surface of tectonic plates.

C. Volcanoes form where tectonic plates meet other plates.

D. Volcanoes form where earthquakes are least likely to occur.

3 A layer of solid brittle rock comprises the outer 100 kilometers of Earth. This layer, which contains both the crust and the upper mantle, is called the

A. core.

B. sediment.

C. lithosphere.

D. hemisphere.

4. A map with contour lines is shown below.



Which of the following is the best estimate of the difference in elevation between Black Bear Camp and Eagle Peak?

A. 400 m

B. 900 m

C. 1200 m

D. 1500 m

5. Sal is looking at a map of Massachusetts. He has measured the distance, in inches, from Boston to Salem on the map. He wants to know how many actual miles the inches represent.

What feature of the map should he look for?

A. key

B scale

C. legend

D. compass

6. Which of the following Earth layers has the greatest density?

A. crust

B. mantle

C. inner core

D. outer core

7. Which of the following statements best explains why the lower mantle of Earth is much more rigid and dense than the upper mantle?

A. The lower mantle is older than the upper mantle.

B. The lower mantle is cooler than the upper mantle.

C. The lower mantle is under more pressure than the upper mantle.

D. The lower mantle is farther from the core than the upper mantle.

8. The axes below relate the temperature to the depth below Earth’s surface.



Which of the following graphs **best** represents temperatures inside Earth?

|  |  |
| --- | --- |
| A. | C |
| B | D |

9. Heat from deep in Earth's interior is transferred to its crust by which of the following?

A. conduction in the ocean

B. convection in the mantle

C. radiation from the solid core

D. evaporation at mid-ocean ridges

10. A class conducts an experiment to determine the best color to paint a solar water heater that they plan to build.

For their experimental test, the students have four identical cans. They paint one black, one green, one red, and one white. Each can is filled with 500 mL of 22°C water, and is allowed to sit in the sun for two hours.

Which color can will have the greatest increase in water temperature?

A. black

B. green

C. red

D. white

11. Kendra’s mom is purchasing a car, but cannot decide what color to get. Kendra advises her mom that a car with a black exterior will be uncomfortable in the summer. This observation is correct because dark objects, as compared to lighter colored objects,

A. reduce heat transfer.

B. are generally more dense.

C. absorb more of the Sun’s energy.

D. reflect sunlight more efficiently.

12. Which of the following statements best explains why earthquakes occur more frequently in California than in Massachusetts?

A. The rock found in California is igneous, but the rock found in Massachusetts is sedimentary.

B. California is located on the boundary of two crustal plates, but Massachusetts is not.

C. The rock under California is soft, but the rock under Massachusetts is hard.

D. California is located on a continental plate, but Massachusetts is not.

13. An earthquake is caused by sudden shifts in which of the following layers of Earth?

A. outer core

B. crust

C. inner core

D. mesosphere

14. When air near the ground is warmed by sunlight, which of the following occurs?

A. The warm air radiates and becomes cool again.

B. The warm air evaporates into the cooler air.

C. The warm air expands and rises, resulting in convection.

D. The warm air loses its ability to hold water and precipitates.

15 . The maps below show the positions of two continents at two different times.



The movement of the two continents as shown may best be explained by

A. volcanic eruptions.

B. magnetic changes.

C. coastal flooding.

D. plate tectonics.

16. Which of the following statements best describes one way that the Moon is different from Earth?

A. The Moon is not solid.

B. The Moon has no gravity.

C. The Moon has almost no atmosphere.

D. The Moon receives almost no solar light.

17. Mercury, the planet nearest to the Sun, has extreme surface temperatures, ranging from 465°C in sunlight to −180°C in darkness.

Why is there such a large range of temperatures on Mercury?

A. The planet is too small to hold heat.

B. The planet is heated on only one side.

C. The planet reflects heat from its dark side.

D. The planet lacks an atmosphere to hold heat.

18. A researcher found shark fossils on top of a mountain. This evidence suggests which of the following about this region?

A. It was once below a waterfall.

B. It was once part of a riverbed.

C. It was once covered by an ocean.

D. It was once near a freshwater lake.

19. The four pictures below show how a pond environment changed from 1900 to 2000.



Which of the following processes was most directly responsible for the changes that occurred in the pond environment?

A. freezing

B. evaporation

C. sediment deposition

D. chemical weathering

20. The diagram below shows a river.

|  |  |
| --- | --- |
|  | The shaded land areas on either side of the river were most likely formed by  A. tectonic activity.  B. the deposition of sediments.  C. land development by humans.  D. compression of preexisting rock. |
|  |  |

21. The table and descriptions below show some of the characteristics of the planets in our solar system.



A Identify the planet that has the greatest density. Include data from the table to support your answer.

B. Describe the relationship between a planet’s distance from the Sun and its orbital period. Include data from the table for at least two planets to support your answer.

*(Hint … What do you notice about the orbital period the further away you are from the sun?)*

C. Identify the planet that rotates the fastest on its axis. Include data from the table to support your answer.

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