

Sample Test Solutions

1) Which of the images is the youngest?

A) There are no craters in this image.

2) What is at the center of our solar system.

B) The Sun

4. How old is the Earth estimated to be based on radiometric dating?

C) 4.6 Billion years old (average surface age is 200 million years old)

5. What is the structure of Earth and Venus?

A) Thin atmosphere over rocky crust, mantle, and core.

6. What feature are the pink arrows pointing to in Image C?

B) A dry river bed.

7. The 3 most massive things in our solar system (the Sun, Jupiter, and Saturn) are made mostly of...

B) Hydrogen

8. What is the structure of Europa and Ganymede?

D) Ice crust over a water ocean over a rocky mantle and core.

10. About how old is the surface of Image A?

A) Under a few million years old as there are no craters.

12. Since terrestrial planets have crusts which are lighter than their cores, what else can I infer?

D) They have differentiated, and so must have been liquid (molten) at some time in the past.

13. Planets with densities near 5.0 g/cc are mostly made of while planets with densities near 1.0 g/cc are made mostly of

D) Rock Gas.

14. What causes Earth's seasons?

C) The tilt of the Earth's spin axis.

15. Aristarchus measured the relative sizes of the Earth, Moon, and Sun using eclipses and phase timings. Since the Moon is smaller than the Earth and orbits the Earth and the Earth is smaller than the Sun, he deduced that the Earth must orbit the Sun. This last phrase is what part of the scientific method?

B) Theory. (He is explaining something.)

16. About how old is the surface of Image B?

E) 4-4.5 billion years old. It is saturated with craters.

17. All items listed below are an important part of science, except...

D) An expert says it is correct.

18. Why is Mars' atmosphere so thin compared to Venus', even though it is made of the same stuff and Venus is hotter?

B) Mars' mass (escape velocity) is much lower than Venus'.

19. Our Moon, Mars' moons, and Io all show that our solar system is...

D) dynamic and always changing, even though most changes are quite slow.

20. If I observe a moon that has a similar composition as its planet's crust, has a small core, and orbits nearly over the spin equator, how did that planet most likely get that moon?

C) Spun off the surface of the planet.

21. List 3 observations of Image D and describe what they mean.

Many possibilities:

1) Well-defined features so a solid surface.

2) Several craters, so probably about 1-2 Gyrs old.

3) Little change in color, so probably composed of mainly one material.

4) The roughly area looks like higher elevation, and the split looks like a broken continent, which could indicate plate tectonics.

5) etc.....

22. Estimate the surface age of Image C and describe how you do it.

About 1-2 Gyrs old, based on the number of craters present. The image looks fairly close up, yet there are 10-20 craters present, though it is far from saturated.

23. Put the images in order from youngest to oldest.

A, C or D, B

24. In two sentences, describe the object in Image B.

This is a solid, old, heavily cratered object. There is no evidence of an atmosphere or any form of erosion.

25. What does the coloring of Image A tell us?

There is a reddish color in between the lighter colored hills and the plain on the right is also lighter colored. I would presume this difference is composition, as the plain and the red regions seem to be at the same level.