

## QUESTIONS ABOUT THE MOON

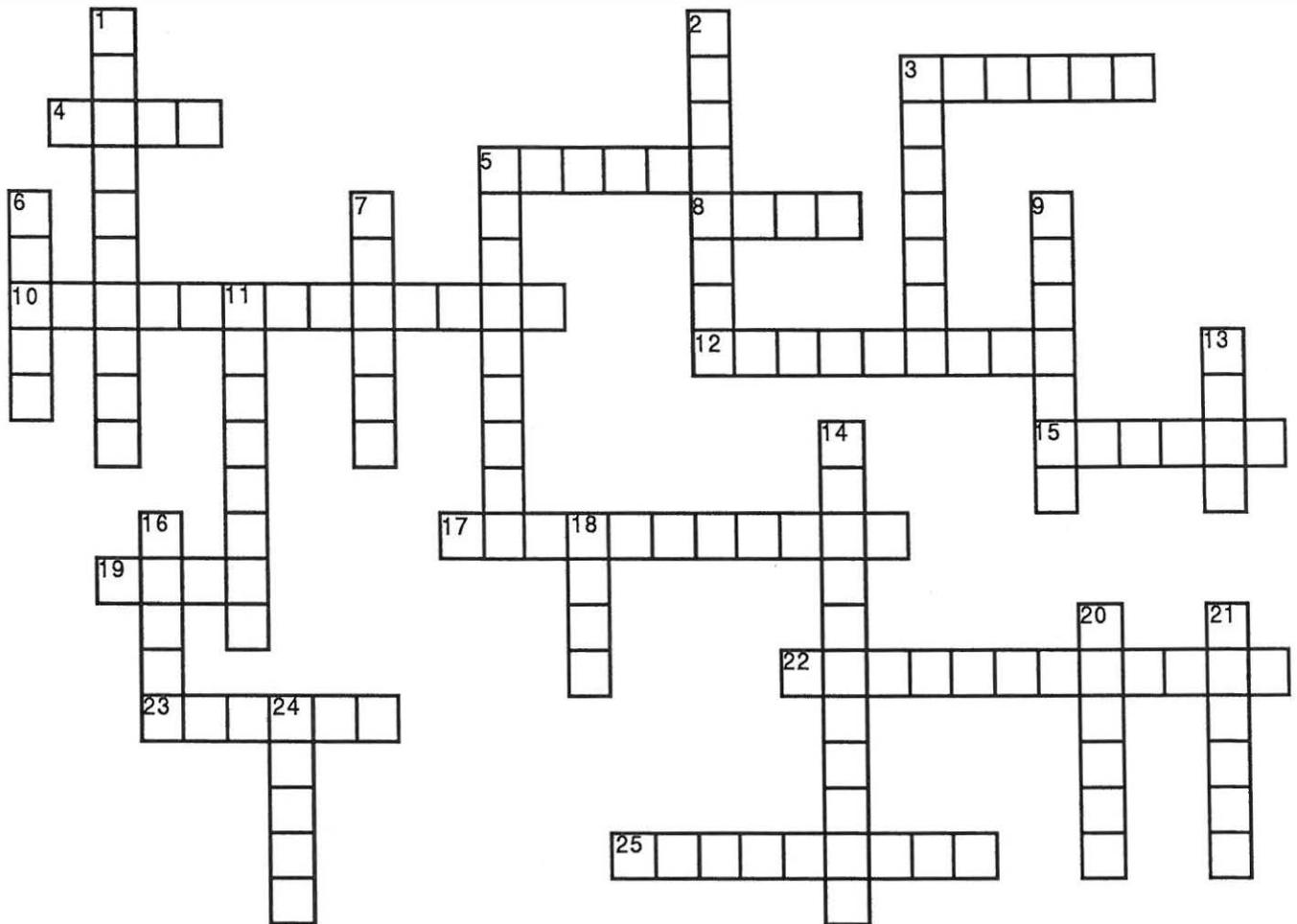
1. Why were the six Apollo lunar sites chosen?
2. The Apollo manned missions returned more than \_\_\_\_ pounds of lunar rocks and soils to Earth.
3. How long after the first manned mission which landed on the Moon did the Apollo missions end?
4. What is the age of the Moon?
5. How many moons are in our Solar System?
6. From what direction does the Moon orbit the Earth?
7. Explain why the same side of the Moon always faces the Earth.
8. What are the light-colored areas on the Moon called?
9. What are the dark-colored areas on the Moon called?
10. Are the light or the dark areas on the Moon more highly cratered? What does this prove?
11. The Highlands rise to \_\_\_\_\_ feet above the Seas.
12. What is the significance of the crater debris pattern which overlies other craters?
13. What is the range of sizes for craters on the Moon?
14. The Moon's lithosphere is much \_\_\_\_\_ than the Earth's lithosphere; thus, we call the Moon a \_\_\_\_\_ body.
15. The Moon has no magnetic field. Why?
16. When and how were the basins, which now are the Lunar Seas, formed?
17. Why are the Highlands more highly cratered than the Seas?
18. The youngest Moon rocks are the same age as the oldest Earth rocks. Why?
19. Compare the formation of the mountain ranges in the Lunar Seas with Earth's major mountain-building event.
20. How and when was the anorthositic material of the Highlands formed?
21. What are breccias and how did they form on the Moon?
22. What are Lunar basalt lavas? How and when did they form?
23. Because the Moon is/is not symmetrical, \_\_\_\_\_ lava flowed on the far side.
24. In what gas are the Lunar samples stored at the Lunar Sample Laboratory, Johnson Spacecraft Center, Houston? Why?
25. How many laboratories around the world have studied Lunar samples?
26. Why is there still so much scientific interest in the samples from the Moon?
27. What instrument does a scientist use to see inside a soil grain or a molecule?
28. What are the three theories on the origin of the Moon? Explain them.
29. Did the Apollo missions tell us which of the three origin-of-the-Moon theories is correct? If not, name the most popular theory.
30. What did our Apollo experience tell us?

## ANSWERS TO QUESTIONS ABOUT THE MOON

1. To represent different geologic terrains
2. 800
3. Approximately 3-1/2 years
4. Approximately 4.6 billion years
5. Video says 32; 44 have been discovered as of 1984
6. West to east
7. The Moon makes one axis rotation per each Earth revolution.
8. Highlands
9. Video says Seas; also called Maria or Mare
10. Light-colored areas; This proves that the light-colored areas are older than the dark-colored areas of the Moon.
11. 29,000
12. The overlying debris pattern of a crater is evidence that the crater is from a more recent impact.
13. From several 100 miles across to smaller than can be seen by the naked eye.
14. Thicker; rigid
15. It has no molten metallic core.
16. By intense meteoroid impact from approximately 4 billion years ago to 3.9 billion years ago.
17. The Highlands remain basically unchanged since the intense cratering of the Moon ended approximately 3.9 billion years ago. The basins formed by meteoroid impacts were filled by basalt lavas after this intense cratering had occurred.
18. The Moon has remained relatively unchanged for approximately three billion years (no plate movement), while the Earth has changed rapidly due to crustal plate movements.
19. The Lunar Sea mountain ranges were formed during meteoroid impacts as a result of faulting around the newly-formed basin; but the Earth's major mountain-building event is plate movement.
20. By high temperature melt of the Moon during its accretion approximately 4.6 billion years ago.
21. Breccias are coarse-grained clastic rocks composed of broken rock fragments cemented together in a finer-grained matrix. Lunar breccias consist of rock and soil fragments which were welded together by the high temperature generated by meteorite impacts.
22. Lunar basalt lavas are igneous flows which extruded into the impact craters (basins) on the Moon and solidified into the crystalline rock called basalt. These basalt flows were caused by melting in the lithosphere by the heat generated from radioactive decay in the Moon's interior. The lava flows started approximately 3.9 billion years ago and lasted approximately one billion years.
23. Is not; little
24. Dry nitrogen; The "chemically dry" iron in the rocks and soils from the "dry" Moon would immediately absorb water or oxygen molecules and rust.
25. Approximately 150

26. Except for a few meteoroid samples (and some cosmic dust particles collected in the stratosphere), the Lunar samples are the only extra-terrestrial material that is available for scientific research.
27. An electron microscope.
28. Capture - Moon was captured by Earth from a nearby orbit.  
Fission - Moon was part of the Earth; spun out of the Earth while it was still molten.  
Accretion - Moon accreted at approximately the same time as the Earth.
29. Not conclusively; accretion
30. There is no life on the Moon, because not even the simplest life forms were found.  
There has never been any life on the Moon, because there were no fossils found.  
The Moon is dry. There was no water found in the samples that were returned from the Moon.  
Approximately 4.6 billion years ago, the Solar System was condensed from more primitive materials.  
The Earth and the Moon have common elements but in different proportions. The Moon is rich in calcium and aluminum and poor in sodium compared to Earth. This indicates that extensive chemical separation took place during the formation of the Solar System. Each body in the Solar System is unique.  
We know what questions need to be asked about the Universe and can develop the strategies and techniques to do the research.

## LUNAR CROSSWORD PUZZLE



### ACROSS

3. Gigantic features formed by meteorite impacts. (No. 4 flowed into these.)
4. Lunar molten extrusive which began flowing about 3.9 billion years ago.
5. The god of the Sun for which American manned missions were named.
8. The Roman goddess of the Moon; the name of the Russian automated missions.
10. Soft, warm zone of the Moon's interior (located below No. 14).
12. Mountainous areas on the Moon.
15. The Moon is much drier than any \_\_\_\_\_ on Earth.
17. The oldest rock material on the Moon.
19. Another name for a lunar sea (Latin).
22. The Moon is \_\_\_\_\_, because one side is different than the other side.
23. The canyons of the Moon.
25. The planetary body mentioned in No. 20.

### DOWN

1. When the first missions returned from the Moon, the astronauts, equipment, and samples were placed in this.
2. The lunar soil is called \_\_\_\_\_.
3. Rocks formed by heat generated by meteorite collisions with the Moon.
5. Best theory of lunar origin.
6. Droplets, beads, and agglutinates are all composed of this.
7. Collision of a meteorite with the surface of the Moon.
9. The part of the Moon we never see from Earth. (It has few seas.)
11. Returned lunar samples are stored in this inert gas to prevent rusting.
13. The seas are \_\_\_\_\_ in color.
14. The thick, rigid crust of the Moon.
16. There was no \_\_\_\_\_ found in the lunar samples which were returned to Earth (proves No. 15).
18. Debris patterns formed by subsurface material "blown" onto the surface by No. 7.
20. The depression formed when a planetary body collides with the Moon.
21. The rock formed by the cooling of the igneous, extrusive flows.
24. The mountainous areas of the Moon are \_\_\_\_\_ in color.

