

Name: _____

Date: _____

Earth Science Term 1 Review

- 1) Which of the following statements is the best reason the big bang is an accepted scientific theory?
 - A. A group of people met together and decided to make it a theory
 - B. There is no other way to explain the formation of the universe
 - C. Distant galaxies were observed to be moving away from Earth
 - D. Edwin Hubble was an honest man

- 2) Why was the discovery of moons orbiting Jupiter a significant event?
 - A. we discovered life on another world
 - B. it proved that not everything revolved around the earth
 - C. we discovered geological activity on another world
 - D. it proved that astronomy was a useful science

- 3) V.M. Slipher noted that most of the galaxies had red shifts and that the fainter the object, the larger the red shift. Edwin Hubble formed a law describing the relationship between red shift and the distance of the object being measured. Which of the following statements best describes the relationship between Slipher and Hubble?
 - A. Scientists usually work in direct competition with each other.
 - B. Scientists often build upon the evidence gathered by other scientists.
 - C. Scientists work individually and do not usually interact with each other.
 - D. Scientists each have jobs where they study completely different areas of science.

- 4) Red shift and blue shift measurements were recorded for a group of stars and a group of galaxies. Using the collected data shown below, explain how they support the idea that the universe is expanding.

Galaxy	% Red Shift	% Blue Shift
1	25%	
2	5%	
3	3%	
4	15%	
5	18%	
6	5%	
7	7%	
8	9%	
9	11%	

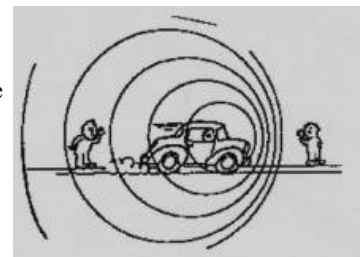
Star	% Red Shift	% Blue Shift
A	2%	
B	0%	0%
C		2%
D		1%
E		.5%
F		.125%
G	.5%	
H	.125%	
I	0%	0%

- A. The stars showing a blue shift suggest the universe is expanding
 - B. The red shift in all the galaxies suggests the universe is expanding
 - C. The blue shifted stars suggest the universe is not expanding
 - D. The 0 shift in stars B and I suggest the universe is not expanding

- 5) Measurements of light from 7 nearby stars were made. Doppler analysis was performed and red shift was observed in all the measurements. What does this evidence suggest about the stars?
 - A. All the stars measured are moving away from the Earth
 - B. All the stars measured are moving toward the Earth
 - C. Four of the stars measured are moving away from the Earth
 - D. All of the stars are not moving relative to the Earth

- 6) In the drawing, two observers are hearing the sound of the car. The sound is higher pitched to one observer and lower to the other observer. Which hears the sound as a higher pitch and why?
 - A. The observer on the left - because each wave hits his ear less quickly than the observer on the right.
 - B. The observer on the right - because each wave hits his ear more quickly than the observer on the left
 - C. The observer on the right - because each wave hits his ear less quickly than the observer on the left
 - D. The observer on the left - because each wave hits his ear more quickly than the observer on the right

- 7) Scientists are able to look at distant galaxies and planets due to technological advances. Which instrument has helped them look the farthest into the universe?
 - A. Space Probes
 - B. Space Shuttle
 - C. Hubble Telescope
 - D. Ground-based Observatories



- 8) In the 1600's Copernicus and Galileo stated that the earth and other planets orbited the sun. Why were their ideas not accepted at first?
- They had no good research to support their claims
 - People did not study the night sky in the 1600's
 - Their books were not published until after their deaths
 - Their claims could not be verified by the instruments of the time
 - Their claims contradicted those of the prevailing churches
- 9) Data from a Doppler analysis of the sun show a red shift on the west side of the sun and a blue shift on the east side. What does that data suggest about the sun?
- The sun is the center of the solar system
 - The sun is near the end of its life cycle
 - The sun is near the end of its life cycle
 - The sun is a smaller, less massive star
 - The sun is spinning on its axis
- 10) Which of the following events that can occur in a star will also happen to our sun?
- It will become a red giant
 - It will become a neutron star
 - It will go supernova
 - It will become a black hole
- 11) Why is the back side of the Moon more heavily cratered than the front?
- the back side has a thicker atmosphere
 - the front side has less gravity
 - craters on the front side have been obliterated by lava flows
 - the back side is closer to the sun
 - erosion has covered up ore of the front side's craters
- 12) Why does the earth experience day and night?
- the earth rotates on its axis
 - the earth revolves around the sun
 - the moon revolves around the earth
 - the earth is tilted on its axis
- 13) If science accepts the conclusion that heavy elements found on earth were formed in stars, what are they assuming is true?
- Stars and planets have similar sizes and life cycles.
 - Planets are constantly collecting heavy elements from nearby stars.
 - Heavy metals are the first elements created in stars so they stay massive.
 - Nuclear fusion in stars occurs in the same way it happens on earth.
- 14) Studying star clusters allows scientists to observe stars similar in age, composition, and distance, but different in size. It provides information that scientists would not be able to observe about one star because of the length of its life cycle. What does this information explain about the nature of science?
- Science findings are based upon observation and evidence.
 - Scientific information needs to be studied in a group.
 - Scientific knowledge takes a long period of time to change.
 - Science has contributions from numerous scientists.
- 15) Which answer below best describes the future of models of the life cycles of stars?
- Models will probably stay the same because scientists do not enjoy creating new models.
 - Models will probably stay the same because scientists have learned all there is to know about the life cycle of stars.
 - Models will probably change because scientists like to make changes.
 - Models will probably change because new technology will provide better information about the life cycle of stars.

16) Which of the following is the most appropriate title for this chart?

- Theories of Solar System Formation
- Characteristics of the Solar System
- Differences in Planet Types
- Astronomical Theory of the Planets

<u>Shape of the Solar System</u>	<u>Planet Types</u>
- Disk shaped. - Orbits in similar planes. - Rotation and revolution of planets in the same direction. - Gravity and angular momentum describe the force and the motion in the system.	- Inner: Terrestrial, high density. - Outer: Mostly gaseous, low density, ring systems for most.

- 17) Scientists have recently discovered planets orbiting other stars. Evidence shows that the current hypothesis of how our solar system formed may not accurately describe how these newly discovered systems formed. Which of the following best describes what should be done with the current hypothesis?
- A. Ignore all of the old evidence and create a completely new hypothesis.
 - B. Make careful revisions to the current hypothesis based upon the new evidence.
 - C. Make no changes to the current hypothesis because it is already accepted by scientists.
 - D. Conduct further research to disprove the new evidence that does not complement the current hypothesis.
- 18) What produces energy in a nuclear reaction?
- A. Radioactive atoms move more rapidly than others
 - B. The splitting or fusing of atomic nuclei
 - C. Electricity running through the radioactive atoms
 - D. Burning of uranium or other radioactive substances
 - E. Light from atoms as they change
- 19) Why does a comet's ion tail always point away from the sun?
- A. galactic gravity pulls it out toward space
 - B. solar wind pushes it outward
 - C. the comet moves faster than the tail
 - D. it is still in the Oort Cloud
 - E. comets move slowly when they are close to the sun
- 20) What is the relationship between the mass of a star and the relative mass of elements produced?
- A. As more massive stars are examined, temperature and pressure are seen to be greater, and heavier elements are produced
 - B. As more massive stars are examined, temperature and pressure are seen to be less, and lighter elements are produced
 - C. As less massive stars are examined, temperature and pressure are seen to be greater, and lighter elements are produced
 - D. As less massive stars are examined, temperature and pressure are seen to be less, and heavier elements are produced
- 21) Why does the Moon only have 1/6 of the earth's gravity?
- A. it is so far away from the earth
 - B. it has no atmosphere
 - C. it is not as massive as Earth
 - D. it is made of basalt
 - E. it has cooled over time to be completely solid
- 22) Which of the following planets has a very hot atmosphere and is about the same size as our earth?
- A. Jupiter
 - B. Mars
 - C. Uranus
 - D. Venus
- 23) Why would a red giant star be brighter than a white dwarf?
- A. the giant is hotter
 - B. the giant has more surface area
 - C. the giant is closer to the earth
 - D. the dwarf is cooler
- 24) Which of the following most accurately explains the origin of heavy elements on Earth?
- A. Formed by nuclear reactions in massive, ancient stars
 - B. Formed by radioactive decay deep within Earth's core
 - C. Formed by black holes scattered throughout the galaxy
 - D. Formed by comets and asteroids falling to the Earth
- 25) Which two factors combine together to cause an object to remain in a stable orbit?
- A. gravity and inertia
 - B. mass and magnetism
 - C. fusion and fission
 - D. heat and electricity
- 26) Consider the claim "The process that formed the heavy elements on Earth continues today." What would be at least one thing that would have to happen for this claim to be called a theory?
- A. At least fifty scientists would have to prove the claim to be true.
 - B. Some theories would have to be rejected by science investigations.
 - C. New planets would need to be discovered and studied in other solar systems.
 - D. The claim would need to have support from the data of repeated experiments.

27) What causes the earth's seasons?

- A. the distance to the sun
- B. the tilt of the earth's axis
- C. the elliptical orbit of the earth
- D. the sun is brighter in the summer
- E. the closeness of the moon to the earth

28) The nebular hypothesis created by Pierre de Laplace states that the solar system was created by a rotating cloud of matter flattened to a disk by gravity. Today, scientists are still gathering evidence that supports this hypothesis. What is the importance of Laplace's work in the modern theory of solar system formation?

- A. Other scientists contradicted Laplace to provide support for their hypotheses.
- B. Laplace was helpful in getting scientists the recognition that they deserved.
- C. Laplace combined previous scientific knowledge into a hypothesis that is being built upon by modern day scientists.
- D. Research would have stopped if Laplace had NOT given enough evidence for the hypothesis.

29) "Scientists would expect most stars to have planets because they form with disks of gas and dust around them. This process should be common for most stars." Which of the following best describes this statement?

- A. It is a fact.
- B. It is evidence.
- C. It is an inference.
- D. It is a scientific law.

30) A newly discovered planet in another solar system is about the same distance from its sun as Earth is from our sun. This planet is also about the same size as Earth. This planet has an atmosphere similar to Earth's but it lacks oxygen. Does this data suggest there is life similar to that on Earth on the newly discovered planet? Why or why not?

- A. Yes, the distance from the sun is the most important thing for life
- B. Yes, the size of the planet is the same as Earth so it will have life
- C. No, the atmosphere lacks oxygen, a waste product of life
- D. No, the tilt of its axis may be different than that of Earth

31) What is it about the Earth, as compared to other planets in our solar system, which makes it conducive to life?

- A. It is at the only distance from the sun that would support life in the solar system
- B. It is the only planet with an atmosphere
- C. It is the only planet with a 24-hour day
- D. It has liquid water

32) Based on the data table, which of the following is an inference?

- A. Mercury has the shortest year and smallest diameter of these five planets.
- B. Venus and Mars have atmospheres containing carbon dioxide.
- C. Jupiter is 778, 300, 000 million kilometers from the Sun.
- D. Venus and Mars have similar atmospheres.

	Mercury	Venus	Earth	Mars	Jupiter
Distance from Sun (millions of km)	57.9	108.2	149.6	227.9	778.3
Year	88 days	224.7 days	365.2 days	687 days	11.86 yrs
Day	59 days	243 days retrograde	23 hr 56 min 4 sec	24 hr 37 min	9 hr 55 min 30 sec
Diameter (km)	4,880	12,100	12,756	6,794	142,800
Atmosphere (main components)	Virtually none	Carbon dioxide	Nitrogen Oxygen	Carbon dioxide	Hydrogen Helium
Satellites	0	0	1	2	16
Rings	0	0	0	0	3

33) Data from many spacecraft have revealed evidence that water was once present on Mars in the form of floods, runoff channels and possible shorelines of ancient oceans. Recently, the images from the Hubble Space Telescope have indicated that there are minerals present on Mars that form only in the presence of water. Why is the information from this new technology important?

- A. It offers proof that life once existed on Mars.
- B. It provides further evidence that water once existed on Mars.
- C. It helps scientists conclude that Mars is suitable for human colonization.
- D. It is evidence that the current temperature on Mars is warm enough to turn ice into liquid water.

34) Why is it theoretically possible to fly through the upper layers of Jupiter and Saturn?

- A. they aren't solid
- B. they have no gravity
- C. they are fusing inside
- D. internal pressures are very low
- E. they receive a lot of solar energy

35) The Earth, the moon, Venus and Mars are all made of similar elements. What factors contribute to the existence of life on Earth while the other neighbor planets and moons are lifeless?

- A. The tilt of the axis is different from that of the Earth on other planets and moons.
- B. Liquid water and a protective atmosphere are found on Earth and not on the others.
- C. Earth has active tectonic plates that continue to create and destroy mountains and basins.
- D. The laws governing the behavior of atoms and molecules is different here than elsewhere.

36) The Earth's early atmosphere was much different than it is today. Which important gas was not present?

- A. nitrogen
- B. oxygen
- C. carbon dioxide
- D. ozone

37) Which of the following best describes why Mercury, Venus and Mars do not support abundant life?

- A. They are all smaller in diameter than Earth, so there is not enough room for life.
- B. Their orbits bring them too close to the Sun which makes them too hot.
- C. They are lacking atmospheric nitrogen which is essential to plant life.
- D. The length of their year is not long enough to sustain life.

38) From the above data table, which planet has the atmosphere with the most oxygen?

- A. Mercury
- B. Venus
- C. Earth
- D. Mars

	Mercury	Venus	Earth	Mars	Jupiter
Distance from Sun (millions of km)	57.9	108.2	149.6	227.9	778.3
Year	88 days	224.7 days	365.2 days	687 days	11.86 yrs
Day	59 days	243 days retrograde	23 hr 56 min 4 sec	24 hr 37 min	9 hr 55 min 30 sec
Diameter (km)	4,880	12,100	12,756	6,794	142,800
Atmosphere (main components)	Virtually none	Carbon dioxide	Nitrogen Oxygen	Carbon dioxide	Hydrogen Helium
Satellites	0	0	1	2	16
Rings	0	0	0	0	3

39) Even though Mercury is closer to the sun than Venus, why isn't it hotter?

- A. Mercury's clouds reflect heat
- B. Mercury is too small to catch heat
- C. Mercury is in Venus' shadow
- D. Mercury has no atmosphere
- E. Mercury has thick icecaps

40) Why might Mercury have virtually no atmosphere?

- A. A year on Mercury is very short at only 88 days in length.
- B. Mercury's rotation is slower than planets with thick atmospheres.
- C. Mercury is the smallest and closest to the sun.
- D. Mercury has no moons and no rings to hold an atmosphere.