

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Summer Science Review Packet - Due Aug 10, 2022

You may either print out a copy of this packet to answer the questions or Open the file in Kami and highlight the answers. There will be one answer per question. Choose the best answer for each question.

**LIFE SCIENCE**

1. Which diagram represents one type of human tissue?



Nerve cell  
A.



Muscle  
B.



Kidney  
C.



Digestive tract  
D.

2. Which sequence lists the levels of organization in the human body from simplest to most complex?
- a. organ system → tissue → cell → organ
  - b. tissue → cell → organ → organ system
  - c. organ → organ system → tissue → cell
  - d. cell → tissue → organ → organ system
3. When different gases are exchanged in the lungs and then transported throughout the body, the systems working together are the
- a. respiratory and integumentary
  - b. respiratory and digestive
  - c. respiratory and circulatory
  - d. respiratory and sensory
4. How is the circulatory system related to the digestive system?
- a. The brain stem controls the heart rate.
  - b. Blood carries nutrients to body cells.
  - c. Stomach muscles contract and expand.
  - d. The pharynx is a passageway for air and food.
5. Carbon dioxide produced by cells is **removed** from the body primarily by which body system?
- a. digestive
  - b. excretory
  - c. immune
  - d. respiratory
6. What are the basic structural units of living organisms?
- a. cells
  - b. nuclei
  - c. organs
  - d. tissues
7. Which of the following structures is **not** present in animal cells?
- a. cell membrane
  - b. cell wall
  - c. mitochondrion
  - d. nucleus

8. Which cellular organelle uses oxygen and glucose to provide **energy** for the cell?

- a. mitochondrion      b. nucleus      c. ribosome      d. vacuole

9. The following diagram shows a caterpillar, mold, and a fern.



Caterpillar



Mold



Fern

What do these organisms have in common?

- a. They are made of cells.      c. They decompose other organisms.  
b. They produce their own food.      d. They are disease-causing organisms.

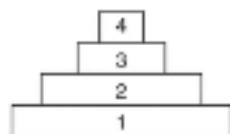
10. Which of the following statements best describes photosynthesis?

- a. Carbon dioxide and water are turned into sugar and oxygen.  
b. Sugar and oxygen are turned into water and carbon dioxide.  
c. Oxygen and carbon dioxide are turned into water and sugar.  
d. Water and sugar are turned into oxygen and carbon dioxide.

11. What are the products of respiration?

- a. carbon dioxide and sugar      b. carbon dioxide and water  
c. oxygen and water      d. oxygen and sugar

12. Four levels of an energy pyramid are represented. Which statement about this energy pyramid is correct?

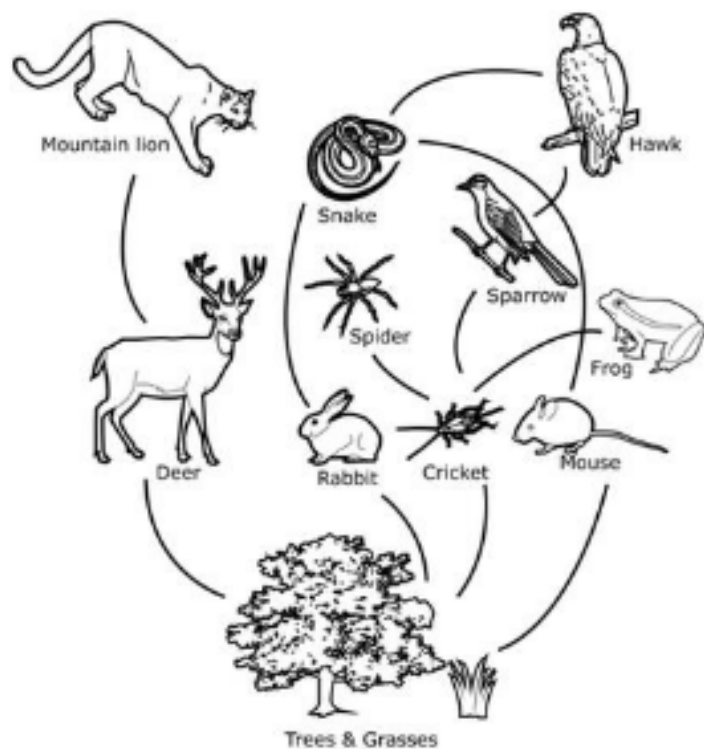


- a. Organisms in level 4 receive their energy directly from the sun.  
b. Organisms in level 2 are carnivores.  
c. Organisms from level 2 receive their energy from level 3.  
d. Organisms in level 1 receive their energy directly from the sun.

13. What is the main role of decomposers in an ecosystem?

- a. The production of food using the sun's energy.  
b. The recycling of nutrients.  
c. The spreading of disease.  
d. The transfer of energy from the second to the third level of consumption.

Use the following diagram of a prairie food web to answer questions 14 through 16.



14. Identify a secondary consumer in this food web.

- a. trees and grasses
- b. deer
- c. frog
- d. hawk

15. What group of organisms are missing from this food web?

- a. omnivores
- b. decomposers
- c. carnivores
- d. consumers

16. Which of the following could possibly increase the total amount of energy the sparrow population receives within the food chain?

- a. increase in the number of crickets
- b. increase in the number of hawks
- c. decrease in trees and grasses
- d. decrease in the number of hawks

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17. Each body cell of a goldfish contains 94 chromosomes. How many chromosomes would be contained in a goldfish sex cell?

- a. 23
- b. 47
- c. 94
- d. 188

18. Which of the following *best* describes the number of chromosomes in a normal human liver cell?

- a. 23 pairs of chromosomes
- b. 46 different types of chromosomes
- c. 46 male chromosomes and 46 female chromosomes
- d. 23 original chromosomes and 23 duplicate chromosomes

19. Chromosomes are located in which organelle?

- a. vacuoles                      b. nucleus                      c. cytoplasm                      d. ribosomes

20. The cows in a rancher's herd of cattle have been selectively bred to produce milk. Which of the following will cause the next generation of cows to receive the trait for producing large quantities of milk?

- a. nutrients in the cows' food                      b. essential minerals in the cows' water  
c. electrical impulses in the cows' brains                      d. information in the cows' chromosomes

21. The diagram shows the chromosomes from a cell after they were photographed under a microscope. Which of the following questions may **best** be answered by studying an organism's chromosomes?



- a. What sex is the organism?  
b. Is the organism endangered?  
c. Where is the organism's ecosystem?  
d. How does the organism obtain its food?

22. Which of the following is an example of **sexual** reproduction?

- a. a cell from a male trout joins a cell from a female trout                      b. budding of a hydra  
c. bacteria undergoing binary fission                      d. fragmentation in planarian worms

23. Single-celled organisms can reproduce and create cells *exactly* like themselves *without* combining genes from two parent cells. When they do this, they use a type of

- a. asexual reproduction                      b. gamete formation  
c. natural selection                      d. sexual reproduction

24. *Spirogyra* are green algae that can reproduce sexually. Which of the following identifies reproduction in *Spirogyra* as **sexual** reproduction?

- a. The cells of a parent algae have nuclei.                      b. Each offspring contains chloroplasts.  
c. Several offspring may be produced at once.                      d. Genetic material is contributed by 2 parent cells.

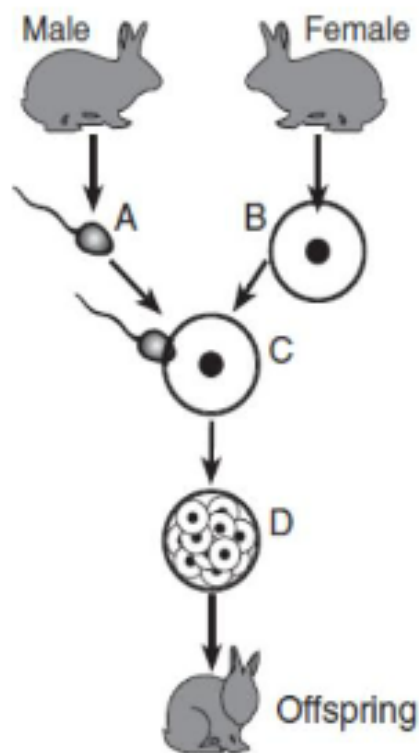
Use the diagram below to answer questions 25 through 26.

25. Which type of cell is labeled **B** in the diagram?

- a. seed
- b. ovule
- c. zygote
- d. sperm
- e. egg

26. After the "A" cell and "B" cell join, what would we call the cell that is labeled **D** in the diagram?

- a. seed
- b. ovule
- c. zygote
- d. sperm
- e. egg



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27. If Jessica has light eyes ( $bb$ ) but both of her parents have dark eyes ( $Bb$ ), which statement is true?

- a. Jessica inherited both genes from her father.
- b. Jessica inherited both genes from her mother.
- c. Jessica inherited one recessive form of the gene from each parent.
- d. Jessica inherited one dominant form of the gene from each parent.

28. A homozygous black guinea pig was crossed with a homozygous white guinea pig and **all** the resulting offspring were black. Black fur is most likely what type trait?

- a. strong
- b. recessive
- c. sex-linked
- d. dominant

29. A person with Huntington's disease has the genotype  $Hh$ .

This person is \_\_\_\_\_ for this trait.

- a. homozygous dominant
- b. homozygous recessive
- c. heterozygous

30. The key describes alleles that code for human hairlines. Why will **Aa** individuals have a straight hairline rather than a peaked hairline?

- a. The peaked hairline occurs only in females.
- b. The peaked hairline is a mutation.
- c. The straight hairline is recessive.
- d. The straight hairline is dominant.

KEY	
<b>A</b>	= Straight hairline (dominant)
<b>a</b>	= Peaked hairline (recessive)

31. Use the chart to the right. Some offspring of a cross in pea plants were tall and green. According to the chart, these plants could be represented by

- a. TT, YY
- b. tt, Yy
- c. Tt, yy
- d. Tt, Yy

Symbol for Gene	Trait Represented
T	tall
t	short
Y	yellow
y	green

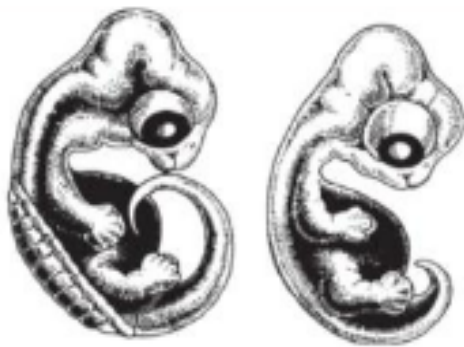
32. Over the last several decades, bacteria that cause illness in humans have become more and more difficult to kill with antibiotics – medicines that kill bacteria. The ability of populations of bacteria to develop this resistance to antibiotics is an example of which of the following?

- a. competition
- b. speciation
- c. ineffective medication
- d. natural selection

33. A population of birds eats the green moths that live in a pine forest. Every so often, the green moths have a brown offspring. The brown moths are usually seen more quickly by the birds and eaten sooner. Now, imagine that increased pollution caused the pine trees in the forest to be heavily covered in brown particles. What is most likely to happen?

- a. The green moths would survive but would become covered in brown particles.
- b. The green moths would decide to have more brown offspring in order to survive.
- c. The green moths would be less likely to be eaten by the birds. Over time, the moth population would still have more green moths.
- d. The brown moths would be less likely to be eaten by the birds. Over time, the moth population would have more brown moths.

34. The drawings below show a turtle embryo and a chicken embryo. Which of the following statements is supported by the similarities between these embryos?



Turtle

Chicken

- a. The turtle is more advanced than the chicken.
- b. The chicken has more offspring than the turtle.
- c. The turtle and the chicken are similar as adults.
- d. The chicken and the turtle share a common ancestor.

35. The pictures below show bone structures in three animals. The similarity in structure of the bones of these animals suggests that



Dolphin Flipper



Bat Wing



Human Arm

- a. the size of these bones is the same
  - b. these species share common ancestors
  - c. these species developed at the same time and location
  - d. the chemical make-up of these animals is exactly the same
36. What do fungi have in common with animals?
- a. They are autotrophs.
  - b. They use spores to reproduce.
  - c. They have cell walls.
  - d. They are heterotrophs.

37. *Lactobacillus acidophilus* and *Clostridium tetani* are single-celled organisms that **do not contain a nucleus**. Which category would they best fit into?
- a. protist                      b. bacteria                      c. plants                      d. fungi                      e. animals
38. Which of the following are consumers, multicellular, have no cell walls and no chloroplasts?
- a. protist                      b. bacteria                      c. plants                      d. fungi                      e. animals
39. While hiking through Granville State Forest, a student finds an unusual plant-like organism that appears to lack chlorophyll. When the student examines a sample using a microscope, he sees many cells with cell walls and no chloroplasts. The organism is **most likely** a member of what Kingdom?
- a. Animalia                      b. Eubacteria                      c. Fungi                      d. Protista



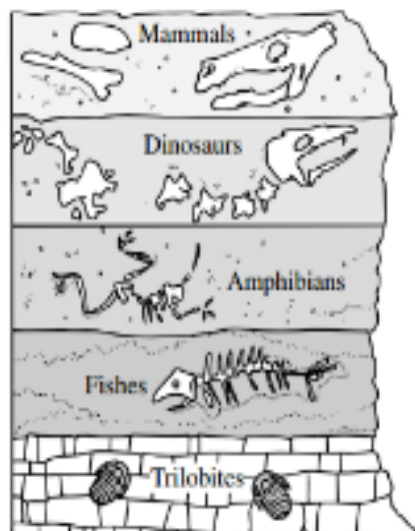
37. *Lactobacillus acidophilus* and *Clostridium tetani* are single-celled organisms that **do not contain a nucleus**. Which category would they best fit into?  
a. protist                      b. bacteria                      c. plants                      d. fungi                      e. animals

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40. The diagram represents a cross-section of a cliff. It shows several rock layers containing fossils. Which of the following layers of rock is **most likely** the youngest?

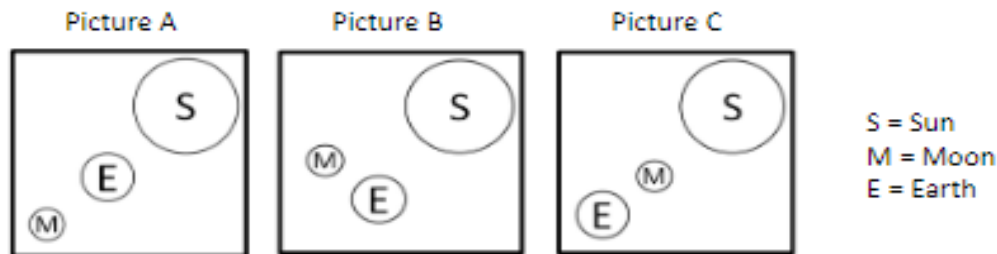
- a. the layer containing trilobites
- b. the layer containing fishes
- c. the layer containing amphibians
- d. the layer containing dinosaurs



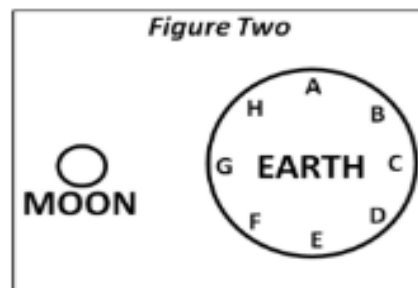
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EARTH/SPACE SCIENCE

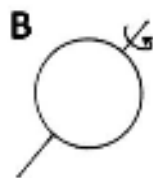
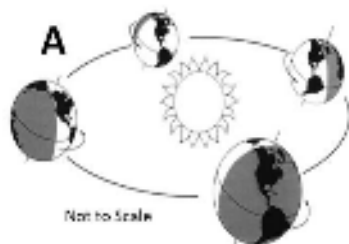
Use the three diagrams below to answer Questions 1 through 3.



- Which Picture best shows the relative positions of the Earth, the Moon, and the Sun during a lunar eclipse?
  - Picture A
  - Picture B
  - Picture C
- Look at Picture B. Which of the following best shows how the moon would look from Earth in Picture B?
  - 
  - 
  - 
  -
- The phase of the moon you see depends on
  - where you are on Earth's surface.
  - how much of the sunlit side of the moon faces Earth.
  - whether or not an eclipse is occurring.
  - how much of the moon's surface is lit by the sun.
- If a spacecraft travels from Earth to the edge of the solar system, what will happen to the gravitational pull between Earth and the spacecraft?  
The gravitational pull between Earth and the spacecraft will \_\_\_\_\_.
  - increase
  - decrease
  - remain the same
- One factor responsible for the strength of gravitational attraction between a planet and the Sun is the
  - degree of tilt of the planet's axis
  - how much sunlight reaches the planet
  - how long a planet takes to rotate on its axis
  - distance between the planet and the Sun
- The height of tides changes throughout the day mainly because
  - the Earth rotates on its axis, changing the side of Earth that faces the moon.
  - the Earth rotates on its axis, changing the side of Earth that faces the sun.
  - the moon revolves around Earth throughout the day.
  - the Earth rotates on its axis and the spin causes water to be "left behind".
- The part(s) of the Earth experiencing low tide in Figure Two is
  - A
  - G
  - C and G
  - A and E



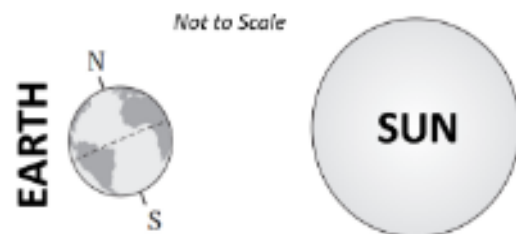
The diagrams below show two of Earth's motions in space. Use the diagrams to answer Questions 8 and 9.



8. Which diagram shows the movement that is most responsible for Earth's day/night cycle?  
 a. A      b. B      c. both A and B      d. neither A nor B
9. The movement of Earth in Picture A represents what length of time?  
 a. one rotation      b. one season      c. one year      d. one day
10. Earth has seasons because  
 a. of Earth's rotation      b. the distance between Earth and the Sun changes  
 c. the temperature of the Sun changes      d. Earth's axis is tilted as it moves around the Sun

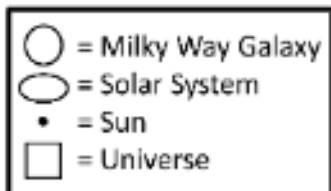
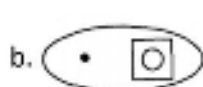
11. The diagram to the right shows the relative positions of the Earth and Sun at a certain time of year. Based on this, which season is occurring in the Southern Hemisphere of Earth?

- a. winter      b. spring  
 c. summer      d. fall



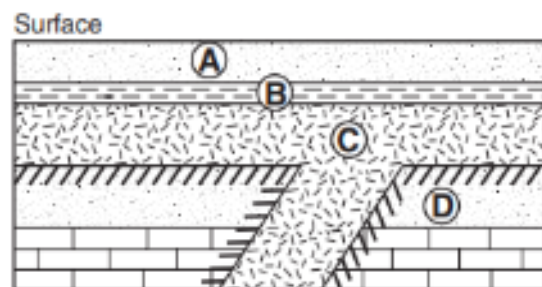
12. Which of the following statements is TRUE?  
 a. The Sun is larger than the inner planets but smaller than the outer planets.  
 b. The Sun is the largest object in the solar system.  
 c. The Sun has the smallest mass in the solar system.  
 d. The Sun is about the same size as Saturn.

13. The symbols to the right represent the Milky Way galaxy, the solar system, the Sun and the Universe. What arrangement of symbols is most accurate?



14. The diagram to the right shows a geologic cross section. Letters A through D represent different rock units. Which sequence correctly shows the age of the lettered rock units, from oldest to youngest?

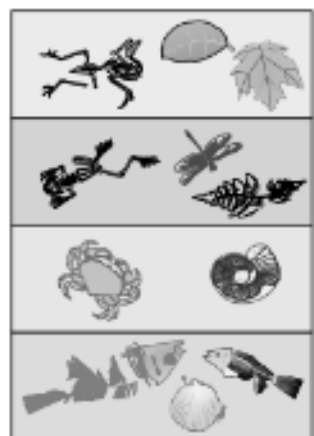
- a. A → B → C → D  
 b. C → D → A → B  
 c. D → B → A → C  
 d. D → C → B → A



15. Fossils usually form in which type of rock?  
 a. metamorphic      b. igneous      c. sedimentary      d. All of these commonly contain fossils.

16. Which of the following would be the best evidence that the climate and geology of an area have changed over time?
- Different age layers of a rock show many different types of fish.
  - Sea shell fossils are found in a mountain-top cave in New Hampshire.
  - Fossilized impressions of palm tree leaves were dug up near a swamp in Florida.
  - Highly weathered and eroded rocks are found in the bed of a quickly moving stream.

17. Examine the diagram to the right. What can the presence of different types of fossils tell us about how this environment changed over time?
- This environment has been an ocean from long ago through more recent times.
  - This environment has slowly changed from being an ocean to a swamp to a forest.
  - This environment has gotten much cooler over the period of time represented by these fossils.
  - This environment has become covered with water.



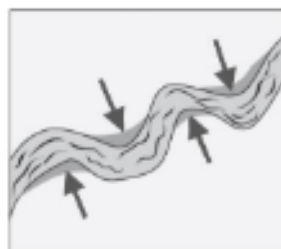
#### Question 18



18. Examine the picture to the left. It shows a rock that has cracks in it. The rock is exposed to the rain. Which of the following statements best describes how the rock would be affected if the temperature were to go below freezing?
- The water in the cracks would expand when the water freezes, causing the cracks to get bigger.
  - The lower temperatures would cause the acid in the rain to act more quickly, making cracks expand faster.
  - Over time glaciers would form, eroding the rock.
  - The freezing temperatures would protect the rock from weathering even more.

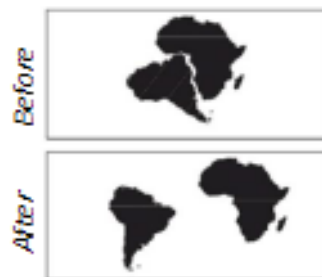
19. When carbon dioxide reacts with water it forms carbonic acid, a weak acid. Carbonic acid can be responsible for what type of change to the Earth's surface?
- erosion
  - chemical weathering
  - deposition
  - mechanical weathering
20. The Appalachian Mountains, which extend from Canada to Alabama, were much taller in the past than they are today. Which of the following two processes are most responsible for the decrease in the height of the Appalachian Mountains?
- weathering and erosion
  - sedimentation and flooding
  - volcanic eruptions and landslides
  - tectonic plate collisions and earthquakes
21. The rock cycle shows that each type of rock (metamorphic, sedimentary, igneous) can
- provide materials to make other rocks
  - form other types of rocks
  - be changed by natural processes
  - all of the above
  - none of the above
22. Sedimentary rock is most formed by
- melting and solidification
  - evaporation
  - burial and compaction
  - heat and/or pressure

23. The diagram to the right shows a river. The shaded areas on either side of the river were most likely formed by
- tectonic activity
  - the deposition of sediments
  - land development by humans
  - compression of preexisting rock

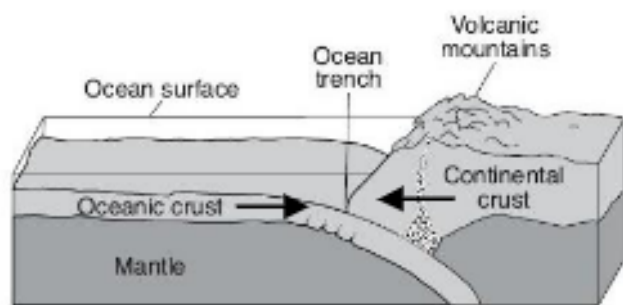


24. The process that transports rocks, soil and sediments to a different location is called \_\_\_\_\_.
- chemical weathering
  - mechanical weathering
  - erosion
  - abrasion
25. Earth's crust would best be modeled by using a material that is
- liquid and hot
  - dense and smooth
  - soft and flexible
  - thin and solid
26. Heat from deep in Earth's interior is transferred to its crust by which of the following?
- conduction in the ocean
  - convection in the mantle
  - radiation from the solid core
  - evaporation at mid-ocean ridges
27. Seafloor spreading provides evidence of which of the following Earth processes?
- erosion of coastlines
  - weathering of mountains
  - movement of crustal plates
  - formation of sedimentary rock
28. The "Ring of Fire" is a long chain of volcanoes that encircles the Pacific Ocean. Which of the following is the best explanation for the arrangement of these volcanoes?
- They outline the crater caused by the impact of an asteroid.
  - They follow the shape of the adjacent tectonic plates under the sea.
  - One volcano usually triggers a second volcano with its hot magma.
  - Volcanoes always form in rings because of underwater convection currents.

29. The maps to the right show the positions of two continents at two different times. The movement of the continents as shown may best be explained by
- volcanic eruptions
  - magnetic changes
  - coastal flooding
  - plate tectonics



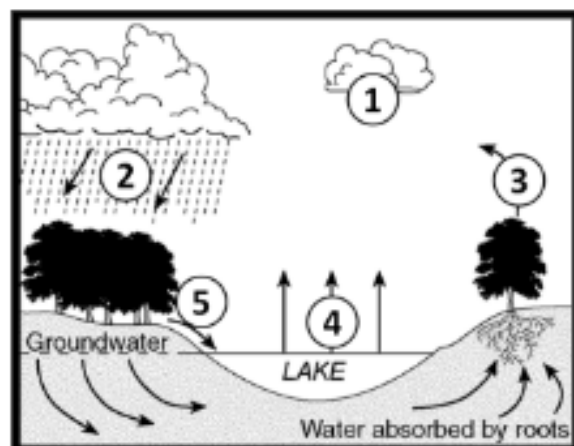
Use the diagram below to answer questions 30 and 31.



30. What type of plate boundary is shown in the diagram?
- convergent
  - divergent
  - transform
  - uniform
31. What will happen to the oceanic crust plate?
- It will become a part of the hot, molten mantle.
  - It will go above the continental crust.
  - It will undergo the weathering process.
  - It will become solid rock.

32. Scientists claim that the continents of South America and Africa were once a single landmass. All of the following observations support this claim EXCEPT
- the mountains on these continents have similar rocks of the same age
  - these continents appear to fit together like the pieces of a puzzle
  - similar fish live in the ocean off the coasts of these continents
  - the same kinds of fossils have been found on these continents
33. A rift valley is evidence of which kind of plate boundary?
- convergent
  - divergent
  - transform
  - uniform
34. What do scientists believe is the force behind the plate tectonics theory?
- the sun's gravity
  - gravity slab pull
  - convection currents
  - rotation of Earth on its axis

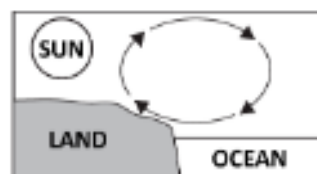
Use the diagram and data table below to answer Questions 35 through 37.



35. The clouds at number 1 have formed primarily because moist air
- expands and cools
  - compresses and cools
  - expands and warms
  - compresses and warms
36. Which process is represented by the number 2?
- precipitation
  - condensation
  - transpiration
  - evaporation
  - runoff
37. Which process is represented by the number 5?
- precipitation
  - condensation
  - transpiration
  - evaporation
  - runoff
38. Which of the following statements is TRUE?
- The water cycle has no true beginning or end – it is a continuous loop.
  - Water in the oceans is the last place a droplet ends up in the water cycle.
  - Once a water droplet ends up in an underground aquifer, it no longer can enter the atmosphere.
  - Once a water droplet becomes a part of a plant, it exits the water cycle.
39. Where does the energy that powers the water cycle come from?
- ocean currents
  - plants
  - clouds
  - the Sun
40. Which of the following statements best describes the climate of an area rather than its weather conditions?
- The summers are hot and humid.
  - The temperature at noon was 86°F.
  - Total rainfall on April 9 was 2 inches.
  - Strong winds are expected tomorrow evening.
41. The Sun strikes the Earth the most at the Equator and the least at the poles. This causes warm air to \_\_\_\_\_ from the equator and cold air to \_\_\_\_\_ at the poles.
- stay, leave
  - leave, stay
  - rise, sink
  - sink, rise

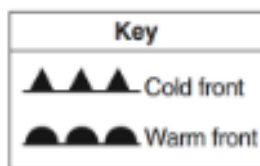
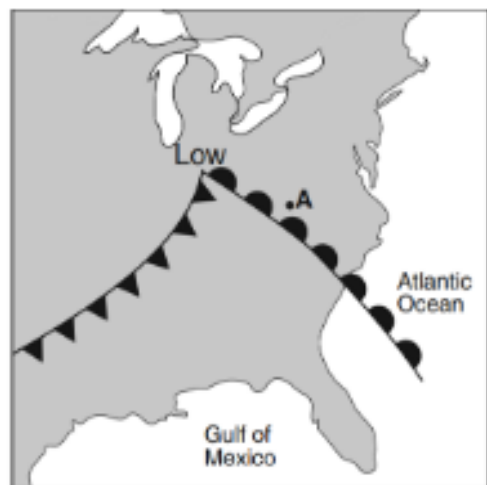
42. A boundary in which two different air masses meet and do not mix, causing a change in the weather is:  
 a. the jet stream      b. the greenhouse effect      c. air pressure      d. a weather front

43. The arrows in the diagram to the right show the circulation of air on a sunny day. The air circulation shown is caused by  
 a. both hot air and cool air sinking      b. hot air rising and cool air sinking  
 c. hot air sinking and cool air rising      d. both hot air and cool air rising



44. High pressure is associated with what type of weather?  
 a. cloudy weather      b. cold weather      c. rainy weather      d. fair/good weather

Use the diagram below to answer Questions 45 and 46.



45. The word LOW on the map refers to  
 a. air temperature  
 b. air pressure  
 c. relative humidity  
 d. cloud coverage

46. Precipitation is most likely occurring at A because it is located  
 a. on a cold ocean surface      b. near the cold front  
 c. on a warm land surface      d. near the warm front

47. A large section of air with the same temperature and moisture level is called \_\_\_\_\_.  
 a. a pressure gradient      b. an air mass  
 c. a hemisphere      d. a hurricane

48. Ice samples from glaciers provide evidence that today's atmosphere contains more carbon dioxide than ancient atmospheres did. This increase concerns scientists because  
 a. increased carbon dioxide may cause plants to grow very rapidly.  
 b. this may cause a loss in the amount of energy reaching the Earth from the Sun.  
 c. this may contribute to a gradual warming of the atmosphere.  
 d. this may contribute to a rapid cooling of the oceans.

49. Which component of Earth's atmosphere is classified as a greenhouse gas?  
 a. oxygen      b. nitrogen      c. helium      d. carbon dioxide

50. The flowchart to the right shows some of the causes and effects of global warming. Which cause best completes the flowchart?  
 a. Increase in recycling practices  
 b. Destruction of tropical rainforests  
 c. Decreases in pollution  
 d. Loss of biodiversity

