

**2021-2022 TMSCA Middle School Science Test – BANA**

1. What type of energy is being produced at the power plant site in this diagram?

- A. solar                      B. geothermal                      C. hydro                      D. nuclear



2. Which scientist below made contributions to the science of geology?

- A. Alfred Wegener    B. Albert Einstein    C. Gregor Mendel    D. Mario Molina

3. Ohm's Law involves which of the following?

- A. sunlight    B. electrical resistance    C. stellar measurement    D. subatomic particles

4. Which statement about oxygen is true?

- A. Air has more oxygen than water at the same temperature.  
B. Oxygen is the 9<sup>th</sup> element on the Periodic Table.  
C. Oxygen has an atomic mass of 8.  
D. Oxygen makes up 30% of Earth's atmosphere.

5. Complete this analogy: Charles Darwin is to Natural Selection as Dimitri Mendeleev is to what?

- A. Periodic Table of the Elements  
B. The Theory of Evolution  
C. Continental Drift  
D. The Law of Conservation of Energy

6. Out of the following waves on the electromagnetic spectrum, which has the longest wavelength?

- A. radio            B. infrared            C. gamma            D. ultraviolet

7. When exploring the deep sea, a scientist team found an ecosystem that was powered by chemosynthesis. What is chemosynthesis?

- A. Process in which water reacts with chemicals to produce energy.  
B. Process that uses sunlight and inorganic materials to produce food.  
C. Process that used energy released by inorganic chemical reactions to produce food.  
D. Process in which chemicals are used for food.

8. The Lanthanides on the Periodic Table of the Elements include which of these elements?

- A. Mercury, Tungsten, Tin  
B. Sodium, Potassium, Cesium  
C. Neodymium, Promethium, Cerium  
D. Neon, Argon, Krypton

9. An accurate way to measure lung capacity involves what?

- A. plethysmography    B. electrocardiography    C. sphygmomanometer    D. ultrasound

10. Marge was diagnosed after going to the doctor with severe pain. The doctor said she had small hard deposits of acid salts and minerals in concentrated urine. What does she most likely have?

- A. appendicitis      B. tonsillitis      C. kidney stones      D. cirrhosis

11. In 1795, a geologist from Scotland, James Hutton described in a book how the Earth processes that we see today are the same as those that happened in the past before we could observe these changes. This principle is known as what?

- A. Catastrophism      B. Superposition      C. Relativism      D. Uniformitarianism

12. Which of the following famous scientists was not involved with Earth science?

- A. Ernest Rutherford      B. Luis Alvarez      C. James Hutton      D. Louis Agassiz

13. A field scientist was studying the effect of temperature on the growth of milkweed plants. She used a range of temperatures to see what would provide optimal growth. What would be the independent variable in her investigation?

- A. the temperature range chosen  
B. the number of plants chosen  
C. the growth of the plants  
D. there is no independent variable in this investigation

14. Which list below only contains heterotrophs?

- A. zooplankton, phytoplankton, bacterioplankton  
B. carnivore, omnivore, producer  
C. mushroom, lion, eel  
D. algae, lichens, house plant

15. A boundary ecosystem between two adjacent ecosystems that might have characteristics of both systems is called what?

- A. citadel      B. ambit      C. ecotone      D. restraint

16. Close to the Rodriguez family's beach house, is a water body that is a mixture of freshwater and saltwater from the nearby ocean. This is known as what?

- A. estuary      B. epilimnion      C. benthic zone      D. aphotic zone

17. Which of the following is not a characteristic of zooplankton?

- A. lives in water      B. single-celled animal      C. multicellular animal      D. primary producer

18. The symbol on a weather map that stands for a warm front is made up of a string of what?

- A. triangles      B. circles      C. semi-circles      D. rectangles

19. Salts can be obtained by replacing the hydrogens of an acid with a what?

- A. carbon      B. metal      C. pepper      D. electrons

20. Which of the following is a good conductor of electric current?  
A. graphite                      B. glass                      C. rubber                      D. mica
21. When the force of friction of a falling object is equal to the mass, the object has reached what?  
A. instantaneous velocity    B. terminal velocity    C. minimal velocity    D. angular acceleration
22. The passing of a solvent through a semipermeable membrane is known as what?  
A. osmosis                      B. solubility                      C. aqueous conducting                      D. emulsion
23. Which of the following statements is true?  
A. Gold has an atomic number of 78.  
B. The atomic number of an element is based on the number of neutrons.  
C. A diamond is an atomic solid made only of silica.  
D. Atoms have weight.
24. Texas is underlain by 600-million-year-old rocks from what time of Earth's history?  
A. Cenozoic                      B. Mesozoic                      C. Precambrian                      D. Paleozoic
25. Which of the following fossils have been found in Texas?  
A. T. rex                      B. dimetrodon                      C. megalodon tooth    D. all of these
26. A long, straight, and deep valley that is produced by crustal plates separating is called what?  
A. rift valley                      B. canyon                      C. glacier valley                      D. trench
27. Protium, Deuterium, and Tritium are examples of what?  
A. radioactive substances  
B. elements 1, 2, and 3 on the Periodic Table of the Elements  
C. isotopes of Hydrogen  
D. non-related substances involving carbon
28. When certain rocks are weathered, eroded, and bonded together, they become what?  
A. slate                      B. gneiss                      C. breccia                      D. granite
29. When the road department was building a bridge across a creek, they noticed that there were freshwater mussels living in that creek. What would be the ethical way to solve this problem?  
A. Build the bridge anyway, the mussels will swim away with no problem.  
B. Capture and relocate the mussels away from the construction.  
C. Leave them alone because they will dig down deeper than the construction area.  
D. Let the locals collect and eat all the population.
30. Which of the following is used to describe the center of a black hole?  
A. resonance                      B. singularity                      C. retrograde loop                      D. Roche limit

31. An astronomer discovered a brown dwarf star in a section of the galaxy. What should he/she do next?

- A. Warn everyone that there is a dangerous situation about to happen!
- B. Win a Nobel prize for astronomy because no one has discovered one yet.
- C. Continue to study it as other stars in the galaxy.
- D. There is no such thing as a brown dwarf star.

32. If a moon is primordial, then it most likely formed when?

- A. one million years after the planet that it orbits
- B. at the same time as the planet that it orbits
- C. years before the planet that it orbits
- D. primordial does not have anything to do with when the moon formed



33. Nathan was doing a survey of the macroinvertebrates in a local stream. He made the following observations: high diversity of species, lots of stoneflies, mayflies, and caddisflies. What does this say about the water quality of the stream?

- A. toxic pollution is present
- B. high sedimentation of the stream bed
- C. lots of algal growth
- D. good water quality

34. Look at the lists below. Which one is a list of geological features?

- A. ridges, valleys, canyons, peaks
- B. loam, clay, silt, peat, sand
- C. humidity, rainfall, temperature, pressure
- D. roads, buildings, bridges, borders

35. Which of the following best describes how many cells a human has?

- A. thousands
- B. millions
- C. trillions
- D. hundreds

36. What type of cells in the human body go through mitosis more often than the others?

- A. brain cells
- B. skin cells
- C. liver cells
- D. sperm cells

37. What hormone is released usually in the morning, but also when you are experiencing stress?

- A. cortisol
- B. insulin
- C. melatonin
- D. prolactin

38. Which cycle transports water between the atmosphere, oceans, and Earth's watersheds?

- A. water cycle
- B. hydrologic cycle
- C. carbon-oxygen cycle
- D. Both A and B

39. What scientific tool is used to view extremely small objects?

- A. telescope
- B. microscope
- C. tongs
- D. Both A and B

40. What is one difference between eukaryotic and prokaryotic cells?  
A. Prokaryotic cells have a membrane-bound nucleus.  
B. Eukaryotic cells are only found in plants.  
C. Prokaryotic cells are only found in animals.  
D. Eukaryotic cells have a membrane-bound nucleus.
41. Anything with magnitude and direction can be represented using what?  
A. scalars                      B. vectors                      C. arrows                      D. speed
42. Which of the following statements below is true?  
A.  $N_2$  (Nitrogen in gaseous state) is not usable by plants and most algae.  
B. Phosphorus is normally found in watersheds in extremely large amounts.  
C. Nitrogen fixing bacteria transforms  $N_2$  into Phosphorus.  
D. Animals are not part of the Nitrogen cycle.
43. A largemouth bass eats a green sunfish which ate a caddisfly larva. The caddisfly larva ate some algae. What is the secondary consumer in this food chain?  
A. largemouth bass    B. green sunfish            C. caddisfly larva            D. algae
44. Mechanical weathering can be caused by what?  
A. chemicals in the soil            B. plants and animals            C. iron                      D. Both A and C
45. A virus can reproduce only when it is in what?  
A. in a warm environment    B. water                      C. a living host cell            D. the reproductive stage
46. The Earth's crust and lithosphere float on the upper part of the mantle. This statement involving density is called what?  
A. Isostasy Principle    B. Uniformitarianism    C. Doppler Effect            D. Law of Superposition
47. What do you call a combination of two or more substances that have not chemically combined, they maintained their properties, and they can be physically separated?  
A. mixtures            B. compounds            C. elements            D. molecules
48. If one ounce of weight is equal to 28.3 grams, then how many grams are in 3 pounds?  
(1 pound is 16 ounces)  
A. 84.9 grams    B. 452.8 grams            C. 1,000 grams            D. 1,358.4 grams
49. A reasonable explanation in science that can be tested is called what?  
A. hypothesis            B. law                      C. principle                      D. data
50. How many protons does an atom of Iron have?  
A. 56                      B. 30                      C. 26                      D. 8

**2021 - 2022 TMSCA Middle School Science Test- BANA - Key**

1. D	18. C	35. C
2. A	19. B	36. B
3. B	20. A	37. A
4. A	21. B	38. D
5. A	22. A	39. B
6. A	23. D	40. D
7. C	24. C	41. B
8. C	25. D	42. A
9. A	26. A	43. B
10. C	27. C	44. B
11. D	28. C	45. C
12. A	29. B	46. A
13. A	30. B	47. A
14. C	31. C	48. D
15. C	32. B	49. A
16. A	33. D	50. C
17. D	34. A	