



TMSCA MIDDLE SCHOOL SCIENCE TEST #8 © JANUARY 19, 2019

GENERAL DIRECTIONS

1. About this test:
 - A. You will be given 40 minutes to take this test.
 - B. There are 50 problems on this test.
2. All answers must be written on the answer sheet/Scantron form/Chatsworth card provided. If you are using an answer sheet be sure to use **BLOCK CAPITAL LETTERS**. Clean erasures are necessary for accurate grading.
3. If using a Scantron answer form, be sure to correctly denote the number of problems not attempted.
4. You may write anywhere on the test itself. You must write only answers on the answer sheet.
5. You may use additional scratch paper provided by the contest director.
6. All problems have **ONE** and **ONLY ONE** correct [BEST] answer. There is a penalty for all incorrect answers.
7. On the back of this page is a copy of the periodic table of the elements as well as a list of some potentially useful information in answering the questions.
8. A simple scientific calculator with the following formulas is sufficient for the science contest: +, -, %, ^, log x, e^x, ln x, y^x, sin x, sin^{-x}, cos x, cos^{-x}, tan x, tan^{-x}, with scientific notation and degree/radian capability.
The calculator must be silent, hand-held and battery operated. The calculator cannot be a computer or cannot have built-in or stored functionality that provides scientific information and cannot have communication capability. If the calculator has memory, it must be cleared. Each student may bring one spare calculator. **NO GRAPHING CALCULATORS ARE PERMITTED.**
9. All answers within $\pm 5\%$ will be considered correct.
10. All problems answered correctly are worth **FIVE** points. **TWO** points will be deducted for all problems answered incorrectly. No points will be added or subtracted for problems not answered.
11. In case of ties, percent accuracy will be used as a tie breaker.

1A 1																	8A 18
1 H 1.01	2A 2											3A 13	4A 14	5A 15	6A 16	7A 17	2 He 4.00
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.31	3B 3	4B 4	5B 5	6B 6	7B 7	8B 8 9 10			1B 11	2B 12	13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.87	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.38	31 Ga 69.72	32 Ge 72.64	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (98)	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.90	54 Xe 131.29
55 Cs 132.91	56 Ba 137.33	57 La 138.9	72 Hf 178.49	73 Ta 180.95	74 W 183.84	75 Re 186.21	76 Os 190.23	77 Ir 192.22	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.20	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (264)	108 Hs (277)	109 Mt (268)	110 Ds (281)	111 Rg (281)	112 Cn (285)	113 Nh (286)	114 Fl (289)	115 Mc (289)	116 Lv (293)	117 Ts (293)	118 Og (294)

Specific heat of water = $4.18 \text{ J/g} \cdot ^\circ\text{C}$

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1. An atom has an atomic mass of 59 and 32 neutrons. What element is this?
A. Cobalt B. Germanium C. Carbon D. Praseodymium

2. A scientist that studies the atmosphere and conditions is called a what?

- A. climatologist
B. botanist
C. cytologist
D. meteorologist



3. Complete this analogy: Mammoth is to Cenozoic as Trilobite is to _____.
A. Cenozoic B. Paleozoic C. Cambrian D. Precambrian

4. When exploring the deep sea, a scientist team found an ecosystem that was powered by chemosynthesis. What does this mean?
A. Process in which chemicals are used for food.
B. Process in which water reacts with chemicals to produce energy.
C. Process that uses sunlight and inorganic materials to produce food.
D. Process that uses energy released by inorganic chemical reactions to produce food.

5. Which type of muscle below is smooth muscle?

- A. voluntary
B. involuntary
C. blood
D. striated

6. When Mendeleev first developed his periodic table, he left many places blank or put a dash in the spot because he realized that there were what?

- A. elements with names too long to fit in his chart
B. elements with valence electrons that were positively charged
C. undiscovered elements that should go in that spot
D. elements with atomic weights which were unrecognizable

7. What connects the bone to muscle in humans?

- A. tendons
B. ligaments
C. cartilage
D. nothing



8. Which of the following is most likely an angiosperm?

A.



B.



C.



D.



9. When an ancient living thing gets trapped in tree resin and is preserved for many years, this can form a fossil. The ancient tree sap that traps the living thing is called what?

- A. amber
- B. mold
- C. cast
- D. petrification

10. Which of these is correctly matched?

- A. speed (distance/time)
- B. velocity (change in distance/change in speed)
- C. acceleration (change in time/change in velocity)
- D. none of these

11. The prefix “dino” means which of the following?

- A. large
- B. terrifying
- C. medium size
- D. eats

12. Group 2A on the Periodic Table is made up of elements called what?

- A. noble gases
- B. halogens
- C. alkali metals
- D. alkaline Earth metals

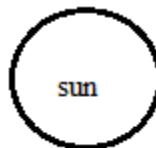
13. The Earth experiences seasons because of what?

- A. the 23.5 degree tilt
- B. winds moving from west to east
- C. earthquakes
- D. tectonic plate movement

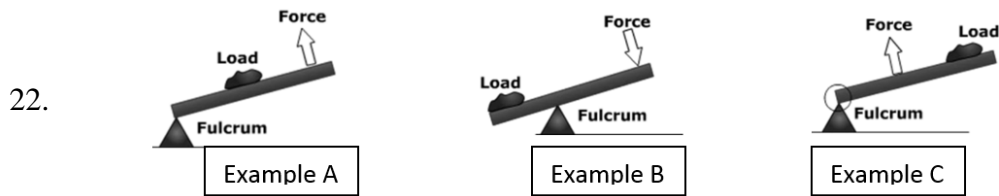
14. Which statement about force is false?

- A. Forces act in pairs
- B. Forces act in no particular direction
- C. Forces are measured in Newtons (N).
- D. Forces cause acceleration

15. Organisms that get energy from consuming other organisms are called what?
 - A. heterotrophic
 - B. autotrophic
 - C. eukaryotic
 - D. somatic
16. The luminous spots cause by the sunlight as it is refracted when passing through ice crystals are called what?
 - A. sun dogs
 - B. parapet
 - C. parhelion
 - D. Both A and C
17. An instrument used to view and analyze a range of a characteristic of a substance is called what?
 - A. Petri dish
 - B. stereoscope
 - C. spectrometer
 - D. autoclave
18. An atom or molecule that has an electric charge due to the loss or gain of one or more electrons is called what?
 - A. isotope
 - B. transient
 - C. t-particle
 - D. ion
19. The eggs of brine shrimp can survive extreme conditions. This is an example of what?
 - A. Cryptobiosis
 - B. Metabolism
 - C. Cryogenics
 - D. Symbiosis
20. These prefixes are used quite often in science, but sometimes can be confused. Which is correct?
 - A. "inter" means inside and "intra" means between
 - B. "inter" means across and "intra" means outside
 - C. "inter" means outside and "intra" means across
 - D. "inter" means between and "intra" means inside
21. When the Earth is between the moon and the sun, which of these is possible on Earth?
 - A. neap tides
 - B. lunar eclipse
 - C. solar eclipse
 - D. quarter moon



Earth moon



Which example shows the arrangement of a second-class lever?

- A. Example A
 - B. Example B
 - C. Example C
 - D. all of these
23. Which human body systems help with transporting oxygen and carbon dioxide?
- A. Circulatory and Respiratory
 - B. Digestive and Endocrine
 - C. Integumentary and Skeletal
 - D. Endocrine and Digestive
24. Which Ecoregion of Texas would include the cities of Tyler and Nacogdoches?
- A. Edward's Plateau
 - B. Rolling Plains
 - C. Pineywoods
 - D. Trans Pecos
25. Cirrus clouds look like what?
- A. wispy, thin curls
 - B. breaking ocean waves
 - C. a UFO (flying saucer)
 - D. a cylinder along the horizon
26. What is the most abundant gas found on Venus?
- A. Oxygen
 - B. Hydrogen
 - C. Nitrogen
 - D. Carbon Dioxide
27. Which statement about Boron is not true?
- A. Boron has an atomic number of 5.
 - B. Boron's atomic mass is 10.81.
 - C. The chemical symbol for Boron is "Bo"
 - D. Boron is a member of Group 3A.

28. The largest group of animals on Earth include what?
 A. Mollusks B. Annelid worms C. Echinoderms D. Arthropods
29. During a lab, students were trying to identify 3 unknown crystal substances.
 Here are the results of their tests:

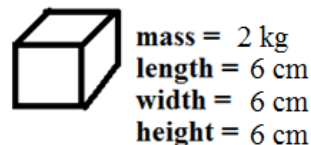
Substance	Crystal shape	Dissolves in drops of water?	Size of grains
A	cubic	yes	small fine
B	hexagonal prism	yes	Small fine
C	cubic	Not immediately	larger crystals

According to these results, which list below is most likely correct?

- A. Substance A is rock salt, B is table salt, C is table sugar.
 B. Substance A is rock salt, B is table sugar, C is table salt.
 C. Substance A is table salt, B is rock salt, C is table sugar
 D. Substance A is table salt, B is table sugar, C is rock salt.
30. The oceanic crust is composed mainly of which type of rock?
 A. Granite
 B. Slate
 C. Quartzite
 D. Basalt
31. Red blood cells live about how many days before they die and then parts are recycled?
 A. 2 years
 B. 120 days
 C. 20 days
 D. 1 month
32. The lowest frequency on the electromagnetic spectrum is which of the following?
 A. ultraviolet B. gamma rays C. radio waves D. x-rays
33. The prefix “terra” means what?
 A. water B. under C. ground D. cloud
34. Geothermal energy is considered to be which type of energy?
 A. renewable energy
 B. nonrenewable energy
 C. fossil fuel
 D. permeable energy

35. Craig's class was creating genetic "monsters" to show how some traits are dominant and recessive. He tossed a coin to determine the traits of his creation. His monster was heterozygous for green skin color. (G for green dominant, g for purple recessive). Also, his monster turned out to be homozygous dominant for eye shape. (L for large eyes, l for small eyes) Which genotype below would show Craig's monster?
- A. GGLl
 - B. GgLL
 - C. ggll
 - D. Ggll
36. Ohm's Law involves which of the following?
- A. sunlight
 - B. electrical resistance
 - C. stellar measurement
 - D. subatomic particles
37. What is a common name for acetic acid?
- A. juice
 - B. vinegar
 - C. soda
 - D. ammonia
38. Which of the following rocks formed under the Earth's surface?
- A. intrusive igneous rock
 - B. clastic sedimentary rock
 - C. breccia
 - D. extrusive metamorphic rock
39. Along the coast of Florida, people are concerned about the red tide this year. The term "red tide" is a common name used for what?
- A. pollution released by local factories
 - B. a school of small red fish that have over-populated
 - C. the tide when it brings in too much zooplankton from the sea
 - D. harmful algal bloom
40. A basketball player standing on the free shot line shoots a basketball toward the net. What forces are acting on the basketball?
- A. gravity and friction
 - B. drag force, buoyant force, magnus force, gravity
 - C. kinetic force
 - D. only gravitational force

41. The Saffir-Simpson Hurricane Wind Scale is a what?
 A. rating from 1 to 5 based on a hurricane's sustained wind speed
 B. rating from 1 to 5 based on the top wind speed
 C. rating from 1 to 6 based on the damage the storm will cause
 D. rating from 1 to 6 based on the low-pressure readings
42. A plant hormone that is thought of an "aging" hormone and is connected with ripening is called what?
 A. indole acetic acid
 B. ethylene
 C. abscisic acid
 D. stomata
43. Lye soap would be about what level on the pH scale?
 A. 2 B. 13 C. 6 D. 8
44. Which statement about planet Earth is true?
 A. Earth is the only planet with water.
 B. Earth is a perfectly round sphere.
 C. Earth at the equator spins at about 5,000 mph.
 D. Earth is located in an area called the Circumstellar Habitable Zone.
45. What unit of measure would be most precise to measure the mass of a medicine?
 A. deciliter B. milligram C. centimeter D. millimeter
46. What is the density of this cube?
 A. 216 g/cm^3
 B. $.009 \text{ g/cm}^3$
 C. 9.26 g/cm^3
 D. 10.8 kg/cm^3



47. Chloroplasts are found in plant cells. Why are they not in animal cells?
 A. animal cells are too small
 B. animal cells do not carry out photosynthesis
 C. animal cells have no cell membrane
 D. animal cells reproduce by endocytosis
48. Parícutin in Mexico was a volcano that formed quickly in a cornfield. It had steep, conical sides, but is now dormant. What type of volcano was Parícutin?
 A. cinder cone B. shield C. composite D. basaltic

49. The root word “nova” means what in regard to science?
A. science B. new C. huge D. old
50. When learning about chemical bonding, what type of bond occurs when electrons are shared?
A. covalent B. ionic C. nitrogen D. nonmetallic

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