

TMSCA MIDDLE SCHOOL SCIENCE TEST #9 © JANUARY 30, 2021

GENERAL DIRECTIONS

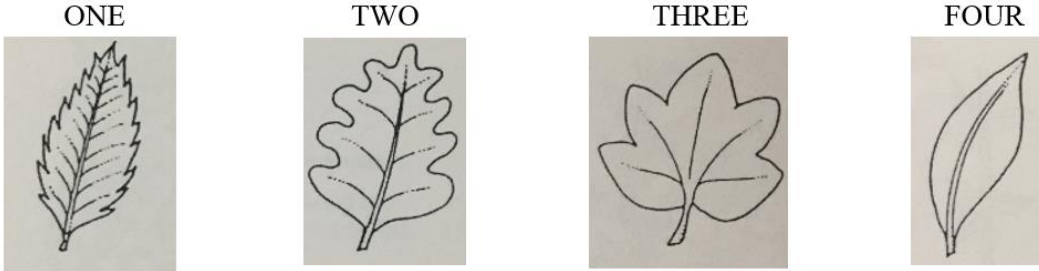
1. About this test:
 - A. You will be given 40 minutes to take this test.
 - B. There are 50 problems on this test.
2. All answers must be written on the answer sheet/Scantron form/Chatsworth card provided. If you are using an answer sheet be sure to use **BLOCK CAPITAL LETTERS**. Clean erasures are 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 = $4.18 \text{ J/g} \cdot ^\circ\text{C}$

2020-2021 TMSCA Middle School Science Test #9

1. Which of the drawings below is considered to have palmate venation?



- A. 1 B. 2 C. 3 D. 4

2. While on a fossil hunting trip, the teacher mentioned that the fossil of a dimetrodon that they found was an “apex predator.” What niche did this creature have in this environment?

- A. was a skilled hunter and stealthy at finding food
- B. would only hunt during the night/nocturnal
- C. was eaten by all the other animals in the ecosystem
- D. the highest of the trophic levels/top of food chain

3. The common center of mass that stars and planets actually orbit around is called the what?

- A. sun B. fulcrum C. apogee D. barycenter

4. Magnesium is to chlorophyll as “what” is to hemoglobin?

- A. blood B. oxygen C. plants D. iron

5. A type of chemical reaction in which two or more simple substances, either elements or simple compounds are directly joined is called what?

- A. decomposition
- B. combination or synthesis
- C. replacement
- D. oxidation/reduction

6. In 1980, Mount St. Helens in Washington state erupted and changed the landscape drastically. The area affected looked like the moon’s surface. Over time, life returned to the area. This is an example of what type of succession?

- A. primary B. secondary C. tertiary D. none of these

7. The prefix “peri” means what in medical terminology?

- A. all around B. far C. under D. both A and B

8. In Texas, some streams flow all year continuously (Type A), some at only certain times of year when springs or surface water provide water for it (Type B), and some flow only after precipitation, but don't have a spring or continuous surface water source (Type C). Which list below correctly matches these stream types to the flow type?

- A. Type A – perennial, Type B- intermittent, Type C-ephemeral
- B. Type A – ephemeral, Type B- intermittent, Type C- perennial
- C. Type A – intermittent, Type B- perennial, Type C-ephemeral
- D. Type A – perennial, Type B- ephemeral, Type C-intermittent

Shower	Approximate Dates	Associated Comet
Quadrantids	Jan. 4-6	
Lyrids	April 20-23	Comet 1861 I
Perseids	August 12	Comet 1862 I
Leonids	November 18	Comet 1866 I
Geminids	Dec. 4-16	

9. This table shows some of the major meteor showers.

What meteor shower would be happening during the spring season? (in northern hemisphere)

- A. Lyrids
- B. Perseids
- C. Leonids
- D. Geminids

10. Which of the following statements about the Coriolis force is untrue?

- A. The Coriolis force applies to movement on rotating objects.
- B. The Coriolis force is zero at the equator.
- C. The Coriolis force is weakest at the poles.
- D. Storms in the north swirl counter-clockwise.

11. This moon phase would be called what?

- A. 1st quarter
- B. 3rd quarter
- C. full moon
- D. gibbous

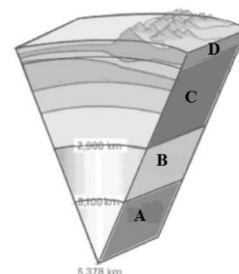


12. Which list below shows the Galilean moons of Jupiter in order from farthest from Jupiter to closest to Jupiter?

- A. Callisto, Ganymede, Europa, Io
- B. Io, Europa, Ganymede, Callisto
- C. Europa, Ganymede, Callisto, Io
- D. Ganymede, Io, Callisto, Europa

13. In this model of a slice of the Earth, what letter best represents the layer called the mantle?

- A. A
- B. B
- C. C
- D. D



23. Simon bought a 2-liter bottle of soft drink. He had a recipe to use 3 quarts of soft drink. Does he have enough soft drink for this recipe?

- A. yes, he will have just enough, 3.114 quarts
- B. yes, he will have enough because 1 quart is half a liter
- C. no, he will not have enough because 2 L is less than 3 quarts
- D. no, he will not have enough because 3 quarts is less than the 2 L bottle

24. Allison was tasting a new type of candy. She put it on the tip of her tongue because she heard that the tip of the tongue was the section that tastes sweets the best. Which statement below about tastes and the tongue is true?

- A. Allison is correct. The tip of the tongue is best for tasting sweets.
- B. Any part of the tongue can test the sweets.
- C. The back part of the tongue is for tasting sweets.
- D. The tongue has sections for tasting different types of tastes and the middle is for sweets.

25. Scientists were trying to find out what causes locusts to gather in large groups (which can be devastating to crops). They know that insects emit pheromones that can communicate to others of their species. Knowing this, a group of scientists decided to try to locate the one chemical scent that these locusts use to aggregate. They isolated 6 scents that might be the possible one they use to get a group to gather together. They tested the scents on locusts separately to see if the locusts would gather in a large group.

What would be the dependent variable in this experiment?

- A. whether or not the locusts gathered together when the scent was used
- B. the six types of scents
- C. the time it takes for the locust to gather together
- D. the amount of scent used in the experiment



26. The prefix “micro” means what?

- A. small
- B. large
- C. lens
- D. medium

27. Saltwater has a lower freezing point temperature than freshwater. Which statement below supports this?

- A. When you mix salt with ice water, the water temperature increases.
- B. The ocean freezes faster than a freshwater lake.
- C. When making homemade ice cream, the salty water slush helps to slow down the freezing process.
- D. When you put salt on ice on a sidewalk, the ice melts.

28. Which of the following organisms are not considered to be herbivores?

- A. white-tailed deer
- B. monarch caterpillars
- C. jackrabbits
- D. raccoons

29. The act of an organism hunting, killing, and eating another organism is called what?

- A. predation
- B. commensalism
- C. parasitism
- D. mutualism

30. Which statement about flowers is not true?
- A. Some flowers may not have all four of the basic flower parts – sepals, petals, stamens, and pistils.
 - B. Ovules develop in the ovary of the flower.
 - C. The stamens produce the pollen for the flower.
 - D. The sepals produce the ovules of the flower that make the seeds.
31. What do you call the muscular chamber found inside a bird's stomach where consumed plant material is ground into a pulp?
- A. keel
 - B. gizzard
 - C. crop
 - D. pygostyle
32. When in the field of genetics, you may see the acronym CRISPR. What does this stand for?
- A. crimson regular international speedy progress repetition
 - B. clustered regularly interspaced short palindromic repeats
 - C. counting regular interval signs per ribonucleic acid
 - D. none of these
33. One way to tell the age of a freshwater fish is to do what?
- A. look at the formation of the gills
 - B. measure the length of the caudal fin
 - C. look at the growth rings on the scales
 - D. measure the opening in the mouth
34. Some plants release protective chemicals to keep other plants from growing close to them. This allows the plants to grow without other competition for resources. What is this process called?
- A. allelopathy
 - B. germination
 - C. tropisms
 - D. auxin
35. This part found in the circulatory system makes sure that the blood or fluid that passes through the vessels and passageways continue to move in the right direction. What is it?
- A. valve
 - B. capillaries
 - C. node
 - D. platelet
36. If an insect belongs to the order Lepidoptera, then it may be a what?
- A. moth
 - B. bee
 - C. butterfly
 - D. Both A and C
37. Which of the following would be found on an insect leg?
- A. tarsus
 - B. spiracle
 - C. antennae
 - D. ganglion
38. The suffix “emia” associates the root word with what?
- A. blood
 - B. pain
 - C. breathing
 - D. inflammation

39. Mammals can be classified into subclasses by how they reproduce and the embryonic development. Which of the following mammals are born very tiny and then climb into their mother's pouch?

- A. marsupials
- B. placental
- C. monotremes
- D. no mammals develop this way



40. Which statement below about Monarch butterflies is not true?

- A. Monarchs sense most smells with their antennae.
- B. Monarchs use chemoreceptors on the back of the leg to taste dissolved sugar.
- C. Monarchs can see polarized light.
- D. Monarchs have exceptional hearing.

41. The specialized tissue of a plant that transports water to the leaves is called what?

- A. phloem
- B. xylem
- C. cambium
- D. both A and C

42. Which of the following organisms have a parasitic relationship with a host?

- A. helminths
- B. amoebas
- C. copepods
- D. all of these

43. Which of the following cells are somatic cells in humans?

- A. germ cells
- B. sperm cells
- C. nerve cells
- D. egg cells

44. A chemical reaction in which a compound (reactant) is broken down into simpler elements or compounds (products) is called what?

- A. decomposition
- B. synthesis
- C. replacement
- D. oxidation/reduction

45. What is the atomic number for Polonium?

- A. 84
- B. 15
- C. 78
- D. 208

46. Which of these planets in our solar system has the lowest amount of axial tilt?

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

47. What moon of Jupiter has been noted as the only moon with a magnetic field?

- A. Io
- B. Europa
- C. Titan
- D. Ganymede

48. Look at the chart below.

Gas in atmosphere	Earth without life	Earth with life
Carbon dioxide	98%	0.03%
Nitrogen	1.9 %	78%
Oxygen	trace	21%
Argon	0.1%	1%

According to this projection of what Earth's atmosphere would be without life present on Earth, what is the most affected gas?

- A. Argon
- B. Oxygen
- C. Nitrogen
- D. Carbon dioxide

49. The moon rotates as it revolves around the Earth just enough to do what?

- A. rotate 8 times before the month is over
- B. keep the same side of the moon always facing Earth
- C. create enough gravity to keep moon in place
- D. cause craters to form on both sides

50. What type of clouds are in this photo?

- A. stratocumulus
- B. cumulonimbus
- C. stratus
- D. cirrocumulus



2020 - 2021 TMSCA Middle School Science Test #9 - Key

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