

CONTESTANT ID #: _____

*Place Contestant ID label here BEFORE
Contest Begins*

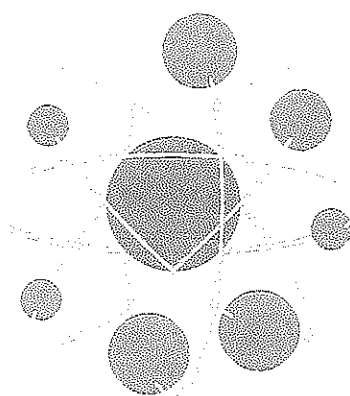
GRADE LEVEL : _____



Science

District Contest

Grades 6-8



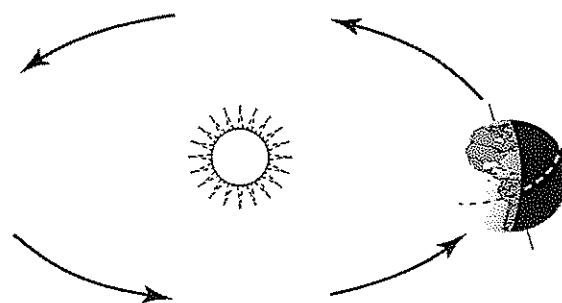
2022

FINAL SCORE: _____

(Please do not open test until the signal is given to begin.)

2022 PSIA District Science Contest

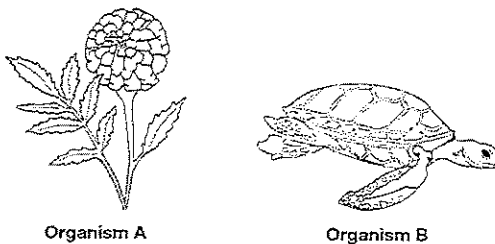
- (1) What is formed by the separation of tectonic plates on the ocean's floor?
A) abyssal plain D) a volcano
B) continental shelf E) mid-ocean ridge
C) ocean trench
- (2) Which type of seismic wave travels the slowest?
A) an S wave D) a Z wave
B) an L wave E) a surface wave
C) a P wave
- (3) Which of the following happens only during the full-moon and new-moon phases?
A) tidal ranges D) spring tides
B) low tides E) none of these
C) neap tides
- (4) Each red blood cell contains a protein called
A) hemoglobin. D) pathogens.
B) platelets. E) plasma.
C) antibodies.
- (5) How many atoms of oxygen are there in $Al_2(SO_4)_3$?
A) 3 D) 12
B) 4 E) 15
C) 7
- (6) Most of the wood in a typical 100-year-old oak tree is made of which of the following cells?
A) epidermis D) cork cells
B) xylem E) phloem
C) charcoal
- (7) What is the most common scientific term for the chemical reaction in which oxygen combines with a substance or hydrogens are removed from a substance?
A) phosphorylation D) hydration
B) evaporation E) hydrolysis
C) oxidation
- (8) The evolution of flowers in many plants is believed to have depended most directly on the presence and evolution of which of the following?
A) fungi
B) weather patterns
C) insect pollinators
D) symbiotic plant viruses
E) certain predatory carnivores
- (9) What is the joint that is formed by the direct interaction of the tibia, fibula, and femur?
A) toe D) ankle
B) knee E) wrist
C) elbow
- (10) Many scientists theorize that global warming will melt the polar ice caps. What would most likely happen if the polar ice caps melted?
A) Ocean levels would increase.
B) Islands would float up higher.
C) Human population would increase.
D) Vegetation in water would decrease.
E) Global precipitation would decrease.
- (11) The Earth is tilted on its axis as shown below. What is the result of the tilt of the Earth on its axis?



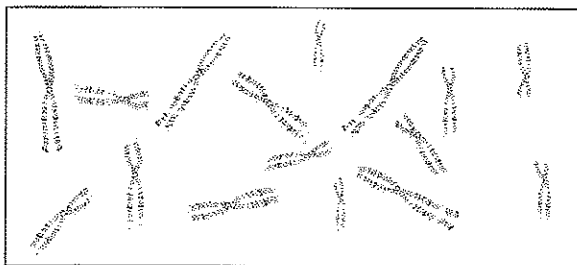
- A) phases of the moon
B) enlargement of the polar vortex
C) wind currents during day and night
D) water currents in the Atlantic Ocean
E) seasons in the northern and southern hemisphere

- (12) How does pollution of surface water affect rivers?
- A) The amount of water increases.
 - B) The number of floods decreases.
 - C) The quality of the water decreases.
 - D) The temperature of water decreases.
 - E) The quantity of organisms increases.

- (13) The two organisms shown in the diagram below are classified into different groups. What is the feature that best determines why Organism A and Organism B are placed in different groups?



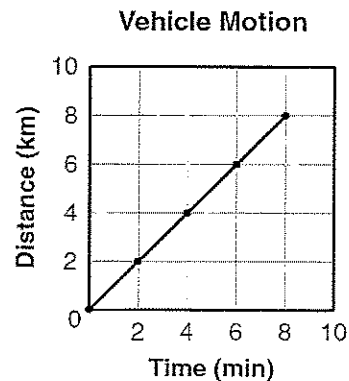
- A) the shape of the body
 - B) the method of growth
 - C) the multicellular body
 - D) the ability to reproduce
 - E) the method of obtaining food
- (14) The diagram below shows the chromosomes from a cell after they were photographed under a microscope. Which of the following questions may best be answered by studying an organism's chromosomes?



- A) What sex is the organism?
- B) Is the organism very happy?
- C) Where is the organism's ecosystem?
- D) Is the organism an endangered species?
- E) How does the organism obtain its food?

- (15) A researcher found shark fossils on top of a mountain. This evidence suggests which of the following about this region?
- A) It was once part of a riverbed.
 - B) It was once below a waterfall.
 - C) It was once covered by an ocean.
 - D) It was once near a freshwater lake.
 - E) Sharks had developed limbs for climbing mountains.

- (16) The graph below describes the motion of a vehicle traveling at a constant speed for 8 minutes. What is the average speed of the vehicle after 5 minutes?



- A) 1 km
- B) 1 km/min
- C) 5 km
- D) 5 km/min
- E) none of these

- (17) Which two processes work together to cycle oxygen through an ecosystem?
- A) respiration and precipitation
 - B) respiration and reproduction
 - C) evaporation and precipitation
 - D) respiration and photosynthesis
 - E) evaporation and photosynthesis

- (18) What causes Earth's year to be shorter than Jupiter's year?
- A) the mass and density of Jupiter
 - B) the distance between Earth and the Sun
 - C) the shape of Earth's orbit around the Sun
 - D) the gravitational pull of Jupiter's moons
 - E) Jupiter has many more moons than Earth

- (19) One function of the human excretory system is
- A) moving substances to and from body cells.
 - B) making materials that the body cells need.
 - C) removing excess heat energy from the body.
 - D) controlling the body's responses to stimuli.
 - E) control the locomotion process between arms and feet.

- (20) If an object is moving initially with some non-zero speed along the ground and then that speed doubles
- A) the object's kinetic energy halves.
 - B) the object's kinetic energy doubles.
 - C) the object's momentum amount halves.
 - D) the object's kinetic energy quadruples.
 - E) the object's momentum amount quadruples.

- (21) Why is an organism that reproduces asexually genetically identical to its parent?
- A) All of the offspring's genes came from the parent.
 - B) The offspring inherited only half of the parent's genes.
 - C) The offspring inherited only the parent's dominant genes.
 - D) All of the offspring's genes mutated to look like the parent's genes.
 - E) One of the parents of the offspring only contained half the genetic knowledge.

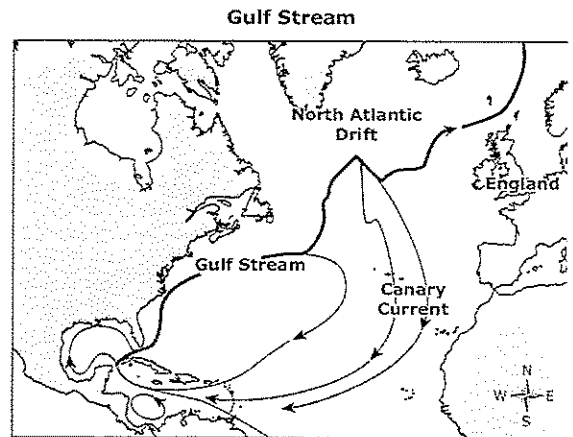
- (22) Abnormal cell division causes which health problem?
- A) cancer
 - B) incontinence
 - C) bulimia
 - D) infection
 - E) weight gain

- (23) The gravitational force between two objects is most affected by their
- A) mass and volume.
 - B) motion and volume.
 - C) mass and distance apart.
 - D) motion and distance apart.
 - E) magnetic fields and mass.

- (24) Warm air rising in the atmosphere is an example of heat being transferred by
- A) conduction.
 - B) collusion.
 - C) radiation.
 - D) absorption.
 - E) convection.

- (25) Which event can destroy existing landforms or create new landforms, and is measured using a seismograph?
- A) earthquake
 - B) torrential rains
 - C) polar vortex
 - D) tornado
 - E) hurricane

- (26) The map below shows ocean currents in the Atlantic Ocean. If the Gulf Stream weakened or ceased to exist, which of the following would most likely be a consequence?



- A) Average temperatures in the eastern United States would increase.
- B) Average temperatures in England and western Europe would increase.
- C) Average temperatures in England and western Europe would decrease.
- D) Average temperatures in the midwestern United States and eastern Canada would decrease.
- E) Average temperatures in the midwestern United States and eastern Canada would increase.

- (27) Which of the following is a mixture?
- A) pure gold
 - B) air
 - C) hydrogen gas
 - D) distilled water
 - E) carbon dioxide

- (28) The region on Earth of low pressure that is referred to as the Doldrums is located at the
A) South Pole D) Equator
B) North Pole E) Prime Meridian
C) 90th parallel
- (29) The contour interval for a topographic map is 150 meters. Starting at 150 meters and on a uniform incline, what is the elevation 6 contour lines away?
A) 25 meters D) 1050 meters
B) 750 meters E) 1200 meters
C) 900 meters
- (30) As an atom's atomic mass increases, more of what type of particles are needed to maintain nuclear stability?
A) neutrons D) electrons
B) protons E) anti-protons
C) Higgs's bosons
- (31) What is the primary metal associated with the ore cinnabar?
A) iron D) aluminum
B) copper E) titanium
C) mercury
- (32) Houseflies are in the order Diptera. What does "Diptera" mean?
A) two eyes D) two bodies
B) two stingers E) two wings
C) two stomachs
- (33) Choice isotopes of which of the following elements would allow you to determine the age of the oldest rocks on Earth?
A) carbon D) uranium
B) oxygen E) lead
C) iron
- (34) Which of the following is not a member of the order Cetacea?
A) manatees D) dolphins
B) porpoises E) all are members
C) whales
- (35) Dennis believes that the Earth's crust is evenly thick everywhere around the globe. Andy says that Dennis is wrong, but he does not know any facts to help him win the argument. Which fact would help Andy?
A) Earth has a solid spherical inner core that is mostly iron.
B) Earth's plates are constantly moving at a very slow rate.
C) Earth is somewhat flattened at the Poles due to its rotation.
D) The continents are thick rock masses, unlike the ocean floors.
E) Global warming is causing the ice caps to melt at a faster rate than ever before.
- (36) In which group of animals below are all the members well adapted to living in a forest ecosystem?
A) cats, dogs, squirrels
B) coyote, antelope, bison
C) squirrel, deer, woodpecker
D) gull, tree frog, grasshopper
E) field mouse, rabbit, pheasant
- (37) A species of rabbit eats only one type of plant. Due to drought conditions, this plant is very hard to find. As a result, the rabbit population decreases. What would most likely happen to enable this species of rabbit to survive in this changing environment?
A) Some of the rabbits would consume only water.
B) Some of the rabbits would start eating insects.
C) Some of the rabbits would make food from sunlight.
D) Some of the rabbits would start eating a different plant.
E) Some of the rabbits would start eating other rabbits.
- (38) Which is classified as an element?
A) air D) vinegar
B) iron E) water
C) salt

- (39) Which best explains why all the Earth's freshwater is not available for human use?
A) Most of Earth's freshwater is only in lakes.
B) Most of Earth's freshwater is frozen water.
C) Most of Earth's freshwater is still in the water cycle.
D) Most of Earth's freshwater is underground.
E) Most of Earth's freshwater is being used for manufacturing processes.
- (40) If a lake has excess levels of phosphates and nitrates in its water, what will most likely result?
A) The level of heavy metals will increase.
B) The growth of algae in the lake will increase.
C) The turbidity levels of the lake will decrease.
D) The temperature of the lake water will decrease.
E) The dissolved-oxygen levels in the lake will increase.
- (41) Where do plants get the food they need for energy?
A) They absorb it directly from the sun.
B) They absorb it directly from the soil.
C) They produce it during photosynthesis.
D) They receive it from atmospheric gases.
E) They receive it from the fertilizers farmers use on their crops?
- (42) Which best represents the flow of energy within an aquatic ecosystem?
A) algae→insects→fish→turtle→sunlight
B) insects→algae→fish→turtle→sunlight
C) sunlight→insects→algae→fish→turtle
D) sunlight→algae→insects→fish→turtle
E) insects→fish→algae→turtle→sunlight
- (43) A major function of a plant's roots is to
A) take in water. D) transport CO₂.
B) repel insects. E) release oxygen.
C) produce flowers.
- (44) A lamp converts electrical energy to light energy. In addition to the light energy, much of this electrical energy is also converted to
A) heat energy.
B) elastic energy.
C) nuclear energy.
D) chemical energy.
E) mechanical energy.
- (45) Which atmospheric gas has the greatest effect on the weather conditions associated with an air mass?
A) oxygen D) carbon dioxide
B) methane E) water vapor
C) nitrogen
- (46) The longitude of a location determines which time zone it is in. Different time zones are the result of the
A) Sun's rotation. D) Moon's rotation.
B) Earth's rotation. E) Moon's revolution.
C) Earth's revolution.
- (47) What is the outermost structure in a plant cell?
A) cell membrane D) cytoplasm
B) chloroplast E) epidermis
C) cell wall
- (48) Which human body system produces the hormones that regulate growth?
A) circulatory D) digestive
B) reproductive E) endocrine
C) skeletal
- (49) Except for birds, dinosaurs became extinct after which of the following periods?
A) Triassic D) Jurassic
B) Cretaceous E) Devonian
C) Permian
- (50) An organism that inhabits a fluvial environment is one that inhabits
A) a desert.
B) a volcano.
C) a lake and ponds.
D) a polar ice range.
E) a river and streams.



Science

District Contest

Contestant Answer Sheet

GRADERS: Write scores and initial.

Score 1: _____

Score 3: _____

Score 2: _____

FINAL: _____

Contestant ID: _____

Grade Level: _____

INSTRUCTIONS: Place the PRINTED CAPITAL letter of each answer choice (A, B, C, D, or E) in the blank corresponding to the test item number. SCORING: +5 for each correct answer; -2 for each incorrect answer; no deduction for skipped or unanswered items. Visible erasures and mark-outs constitute a 2-point deduction ONLY if a correct answer is not written in the answer space.

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



Science
District 2022

ANSWER KEY

REMINDERS: PRINTED CAPITAL letters only. SCORING: +5 for each correct answer; -2 for each incorrect answer; no deduction for skipped or unanswered items. Visible erasures and mark-outs constitute a 2-point deduction ONLY if a correct answer is not written in the answer space.

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