

Grade 8 Pretest**Directions:** Read the questions. Choose the truest possible answer.

1. Shakira wants to know which location in her apartment is best for growing African violets. She has three African violets. She puts one on the balcony, one by the kitchen window, and one on the mantel in the living room. Each plant has the same size pot and the same soil, and Shakira gives each plant the same amount of water. In this experiment, what is the independent variable?
 - (A) type of plant
 - (B) type of soil
 - (C) plant location
 - (D) amount of water
2. Trevor wants to find out how temperature affects plant growth. He thinks that warmer temperatures will promote faster plant growth. Trevor stores four plants of the same type in locations with different temperatures. He controls all the other variables. Trevor records the growth of each plant every week for two months. What is the next step Trevor should take?
 - (F) analyze his data
 - (G) test his hypothesis
 - (H) identify the problem
 - (J) form his hypothesis
3. Latoya thinks her kindergarten students might learn to read faster if she uses a teaching method focused on the sounds different letters make. For two months, she teaches half of her class using this method. She keeps teaching the other half of the class by reading aloud with them. What is the control in this study?
 - (A) the two-month time period
 - (B) the students Latoya reads to
 - (C) the students Latoya teaches about letter sounds
 - (D) the number of new words the students learn to read
4. The particles in motion around the nucleus of a carbon-12 atom are called _____.
 - (F) quarks
 - (G) protons
 - (H) neutrons
 - (J) electrons
5. Carbon-14 differs from carbon-12 in terms of _____.
 - (A) atomic number
 - (B) number of protons
 - (C) number of neutrons
 - (D) number of electrons
6. Which type of element is sodium?
 - (F) halogen
 - (G) noble gas
 - (H) alkali metal
 - (J) alkaline earth metal



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7. Which of the following scenarios does *not* involve a chemical change?

(A) melting ice
(B) frying eggs
(C) burning wood
(D) rusting metal

8. How is a gas different from a liquid or solid?

(F) The particles in a gas are closer together.
(G) The particles in a gas move more slowly.
(H) Both liquids and solids have definite volumes.
(J) Substances can move between liquid and solid states.

9. Your family is driving to Atlanta for your grandparents' 50th wedding anniversary. If you live 800 miles from Atlanta, and your average driving speed is 60 mph, about how long will the drive take?

(A) 5 hours
(B) 8 hours
(C) 13 hours
(D) 26 hours

10. While riding her bicycle, your little sister goes from a full stop to 9 m/s in 3 minutes. How fast is she accelerating?

(F) 3.0 m/s
(G) 3.0 m/s²
(H) 1.5 m/s
(J) 1.5 m/s²

11. Which quality affects an object's inertia?

(A) its mass
(B) whether or not it is moving
(C) how much friction it encounters
(D) the direction in which it is moving

12. Tai's little brother Gan weighs 15 kg. His swing weighs 2 kg. How much force will Tai need to use to push Gan on the swing to make Gan accelerate at 4 m/s²?

(F) 4 N
(G) 12 N
(H) 60 N
(J) 68 N

13. When a car skids on ice, what kind of friction is acting on the wheels?

(A) cold friction
(B) static friction
(C) sliding friction
(D) rolling friction

14. When Raquel jumps up to make a basket, which force returns her to the ground?

(F) mass
(G) inertia
(H) gravity
(J) friction

15.

16.

17.

18.



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15. A rainbow is produced when light waves change speed as they pass through water droplets into air. This process is called _____ .
- (A) diffraction
 - (B) refraction
 - (C) reflection
 - (D) interference
16. Which of the following sentences about minerals is true?
- (F) Minerals are liquids at room temperature.
 - (G) Minerals are organic compounds.
 - (H) Minerals are always artificially created.
 - (J) Minerals have a definite chemical composition.
17. The Mohs scale is used to compare minerals in terms of their _____ .
- (A) streak
 - (B) luster
 - (C) hardness
 - (D) cleavage
18. What causes the red color of a ruby?
- (F) chromium
 - (G) zinc
 - (H) bauxite
 - (J) titanium
19. In X-ray crystallography, a crystal diffracts X-rays in a characteristic pattern. Which characteristic of the crystalline substance is this process used to determine?
- (A) age
 - (B) purity
 - (C) specific gravity
 - (D) atomic structure
20. When some volcanoes erupt, they eject molten material that later cools, forming rocks. Which type of rock is formed by this process?
- (F) igneous
 - (G) organic
 - (H) metamorphic
 - (J) sedimentary
21. Shells of mussels, clams, corals, and snails gather on the ocean floor. Over time they solidify into rock. Which type of rock is formed by this process?
- (A) intrusive igneous
 - (B) extrusive igneous
 - (C) organic sedimentary
 - (D) nonfoliated metamorphic

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22. Which geologic features are formed when two continental plates collide?

- (F) islands
- (G) canyons
- (H) mountains
- (J) rift valleys

23. What causes earthquakes?

- (A) sections of rock breaking apart
- (B) tsunamis forming underwater
- (C) upwellings of magma underneath the continental plates
- (D) plates of Earth's crust colliding with plates of the upper mantle

24. Mount St. Helens, which erupted violently in 1980, is a composite volcano. Which of the following did its eruption release?

- (F) ash
- (G) lava
- (H) rocks
- (J) cinders

25. What is a gene?

- (A) a section of DNA that codes for a protein
- (B) a molecule found in the backbone of DNA
- (C) a part of DNA that codes for a trait, such as skin color
- (D) a molecule found on the rungs of the DNA ladder

26. How does phenotype differ from genotype?

- (F) Phenotype is observable.
- (G) Genotype changes over time.
- (H) Phenotype determines gender.
- (J) Genotype is affected by heredity.

27. White fur is recessive in mice. If both parents have white fur, what is the likelihood that one of their offspring will have white fur?

- (A) 25%
- (B) 50%
- (C) 75%
- (D) 100%

28. Female elephants prefer mates with larger tusks. According to the principle of natural selection, which of the following will occur over time?

- (F) Female elephants will bear fewer young.
- (G) The preferences of female elephants will change.
- (H) The less desirable trait will begin to disappear in male elephants.
- (J) Male elephants will begin to fight each other to win mates.

29. What can scientists tell from the amount of carbon-14 in a human bone?

- (A) how old the bone is
- (B) where the bone was buried
- (C) whether the person was poisoned
- (D) whether the person was a man or a woman



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30. Which of the following organisms appeared first in geologic time?

- (F) fish
- (G) mice
- (H) humans
- (J) crocodiles

31. Which gas is most common in Earth's atmosphere?

- (A) oxygen
- (B) nitrogen
- (C) water vapor
- (D) carbon dioxide

32. How is air in high mountains different from air at sea level?

- (F) The air in the mountains is warmer.
- (G) The air in the mountains is less dense.
- (H) The air at sea level contains more ozone.
- (J) The air at sea level can carry radio waves.

33. The ozone layer is beneficial to human health because it _____.

- (A) absorbs chlorofluorocarbons
- (B) serves as a source of oxygen
- (C) protects the Earth against meteors
- (D) shields us from the full force of the sun

34. Clouds are formed by which process?

- (F) conduction
- (G) evaporation
- (H) precipitation
- (J) condensation

35. Many scientists have linked rising global temperatures to an increase in _____.

- (A) ozone
- (B) fishing
- (C) plant matter
- (D) carbon dioxide

36. Why may shark meat contain toxic substances used in pesticides?

- (F) because sharks are plant eaters
- (G) because sharks have highly absorbent skin
- (H) because sharks are bred near human habitation
- (J) because sharks eat fish that eat plants

37. Why does paving land for parking lots and highways increase the risk of flooding?

- (A) Asphalt absorbs heat.
- (B) Water can't soak into the pavement.
- (C) Car emissions increase rainfall.
- (D) Parking lots and highways prevent evaporation.

38. During the process of phytoremediation, plants _____.

- (F) prevent erosion of landfills
- (G) block nutrient runoff
- (H) create gasoline from garbage
- (J) absorb metals from contaminated soil



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39. Which of the following is the smallest organizational level in the human body?

- (A) cell
- (B) organ
- (C) tissue
- (D) muscle

40. What is the primary function of the kidneys?

- (F) digesting food
- (G) removing waste
- (H) producing energy
- (J) regulating respiration

41. Why do we see only one side of the moon?

- (A) The moon is only visible at night.
- (B) The sun only lights one side of the moon.
- (C) The shadow of the earth blocks the other side of the moon.
- (D) The rotation and orbit of the moon take the same amount of time.

42. Which of the following planets is closest to the earth?

- (F) Mars
- (G) Saturn
- (H) Mercury
- (J) Neptune

43. Before the 1500s, most people believed the center of the universe was _____.

- (A) the sun
- (B) Earth
- (C) the moon
- (D) a black hole

44. What causes a star to shine?

- (F) reflected light from the sun
- (G) energy released from the fusion of hydrogen atoms
- (H) a collapse of the core to the point that it has no volume
- (J) gradual combustion of the elements making up the core

45. During lab work, you should wear a thermal mitt when _____.

- (A) working with a strong acid
- (B) heating a solution on a hot plate
- (C) dissecting something using a scalpel
- (D) working with something that might stain your hands

46. Which best explains why broken thermometers are dangerous?

- (F) Mercury is highly toxic.
- (G) The contents evaporate rapidly.
- (H) It is easy to cut yourself on broken glass.
- (J) The substances inside thermometers degrade unpredictably.

