

ROUND 1

TOSS-UP

1) LIFE SCIENCE *Multiple Choice* Which of the following is NOT part of the human respiratory system?

- W) Pharynx [**FAR-ingks**]
- X) Larynx [**LAR-ingks**]
- Y) Esophagus [**i-SOF-uh-guhs**]
- Z) Trachea [**TRAY-kee-uh**]

ANSWER: Y) ESOPHAGUS

BONUS

1) LIFE SCIENCE *Multiple Choice* Plasma is the part of human blood that consists mostly of which of the following?

- W) Red blood cells
- X) White blood cells
- Y) Water
- Z) Hemoglobin [**HEE-muh-gloh-bin**]

ANSWER: Y) WATER

TOSS-UP

2) MATH *Short Answer* The thickness of a plastic sheet manufactured by Perky Plastics must satisfy: $|t - 2| \leq 0.001$ [**the absolute value of the quantity t minus 2 is less than or equal to 0.001**]. Providing your answer to the nearest thousandth, what is the maximum thickness t , in centimeters, this plastic sheet may have?

ANSWER: 2.001

BONUS

2) MATH *Short Answer* The perimeter of a rectangle is equal to 280 meters. The ratio of its length to its width is 5:2. What is the area of the rectangle in square meters?

ANSWER: 4000

TOSS-UP

3) PHYSICAL SCIENCE *Short Answer* What is the potential difference in volts between two points, located 2 meters apart, in a constant electric field of 1 volt per meter?

ANSWER: 2

BONUS

3) PHYSICAL SCIENCE *Multiple Choice* Which of the following cannot be classified within the classical three states of matter?

- W) Gasoline
- X) Liquid nitrogen
- Y) Bleach
- Z) Liquid crystal

ANSWER: Z) LIQUID CRYSTAL

TOSS-UP

4) MATH *Multiple Choice* Which of the following would be the approximate measure of the length of a soccer field?

- W) 1 decameter
- X) 10 kilometers
- Y) 100 meters
- Z) 1000 centimeters

ANSWER: Y) 100 METERS

BONUS

4) MATH *Short Answer* The volume of cube C is 8 cubic centimeters. Cube D has an edge 3 times the edge of cube C. What is the volume of cube D in cubic centimeters?

ANSWER: 216

TOSS-UP

5) GENERAL SCIENCE *Multiple Choice* Leaves with an undivided blade are called which of the following?

- W) Tendrils
- X) Spines
- Y) Compound
- Z) Simple

ANSWER: Z) SIMPLE

BONUS

5) GENERAL SCIENCE *Multiple Choice* Which of the following will allow measurement of a liquid's volume with the greatest precision?

- W) 50 milliliter cylinder graduated in 1 milliliter increments
- X) 100 milliliter cylinder graduated in 0.5 milliliter increments
- Y) 100 milliliter cylinder graduated in 1 milliliter increments
- Z) 200 milliliter cylinder graduated in 5 milliliter increments

ANSWER: X) 100 MILLILITER CYLINDER GRADUATED IN 0.5 MILLILITER INCREMENTS

TOSS-UP

6) ENERGY *Short Answer* A house built in the United States with passive solar capabilities needs to have its large windows facing which compass direction?

ANSWER: SOUTH

BONUS

6) ENERGY *Multiple Choice* Which of the following units is most commonly used in the U.S. to compare the energy content of two different fuel sources?

- W) BTU
- X) Barrel
- Y) Kilowatt
- Z) Gallon

ANSWER: W) BTU

TOSS-UP

7) LIFE SCIENCE *Multiple Choice* Which of the following annelids has a sucker at each end of its body?

- W) Earthworm
- X) Leech
- Y) Bristleworm
- Z) Polychaete [**POL-i-keet**]

ANSWER: X) LEECH

BONUS

7) LIFE SCIENCE *Short Answer* Put the following four stages of development in order from earliest to latest: 1) larvae [**LAHR-vee**], 2) adult, 3) egg, 4) pupa.

ANSWER: 3, 1, 4, 2 (ACCEPT: EGG, LARVAE, PUPA, ADULT)

TOSS-UP

8) EARTH AND SPACE *Multiple Choice* Which of the following types of maps would show the most accurate representation of the entire surface of the Earth?

- W) Mercator projection
- X) Equal-area projection
- Y) Globe
- Z) Contour projection

ANSWER: Y) GLOBE

BONUS

8) EARTH AND SPACE *Multiple Choice* Which of the following is the best explanation of how rift valleys are formed?

- W) The scouring of bedrock as glaciers retreat
- X) Tectonic divergence
- Y) The accumulation of glacial deposits deposited as glaciers retreat
- Z) A wide river scours out the land then shifts direction

ANSWER: X) TECTONIC DIVERGENCE

TOSS-UP

9) PHYSICAL SCIENCE *Short Answer* What is the kinetic energy in joules of a 10-kilogram object moving at a velocity of 2 meters per second?

ANSWER: 20

BONUS

9) PHYSICAL SCIENCE *Short Answer* A glass of water with ice cubes in it has a mass of 300 grams. What will the mass in grams be immediately after the ice has melted?

ANSWER: 300

TOSS-UP

10) MATH *Short Answer* If both coordinates of a point are negative, in which quadrant in the Cartesian coordinate system would it be located?

ANSWER: III (ACCEPT: THIRD)

BONUS

10) MATH *Short Answer* If $ab = 12$, $a + b = 8$, and a is greater than b , what is the value of $a - b$?

ANSWER: 4

TOSS-UP

11) GENERAL SCIENCE *Short Answer* Identify all of the following four choices that all living things must do to survive: 1) excrete wastes, 2) maintain homeostasis [*hoh-mee-uh-STAY-sis*], 3) ingest food, 4) metabolize.

ANSWER: 1, 2, 4 (ACCEPT: EXCRETE WASTES, MAINTAIN HOMEOSTASIS, METABOLIZE)

BONUS

11) GENERAL SCIENCE *Multiple Choice* Which of the following statements is NOT true?

- W) Some species of Archeobacteria [*ahr-ke-bak-TEER-ee-uh*] are the oldest organisms on Earth
- X) Some species of Archeobacteria are extremophiles
- Y) Some species of Eubacteria have a membrane-bound nucleus
- Z) Some species of Eubacteria are found in your mouth

ANSWER: Y) SOME SPECIES OF EUBACTERIA HAVE A MEMBRANE-BOUND NUCLEUS

TOSS-UP

12) ENERGY *Multiple Choice* Emma puts a thermometer into a glass filled with hot water. Why does the mercury inside the thermometer rise?

- W) Air bubbles are released
- X) Heat from the water makes it expand
- Y) Heat from the water makes it contract
- Z) Air pressure above the water pulls it up

ANSWER: X) HEAT FROM THE WATER MAKES IT EXPAND

BONUS

12) ENERGY *Multiple Choice* Which of the following is, to date, the most promising method of disposing of nuclear waste?

- W) Combining it with carbon dioxide
- X) Storing it underground in a geologic formation
- Y) Storing it in a low-level disposal vault
- Z) Diluting it before pouring it into the ocean

ANSWER: X) STORING IT UNDERGROUND IN A GEOLOGIC FORMATION

TOSS-UP

13) LIFE SCIENCE *Multiple Choice* Which of the following types of feather helps birds maintain a constant body temperature?

- W) Contour
- X) Down
- Y) Barbed
- Z) Ribbed

ANSWER: X) DOWN

BONUS

13) LIFE SCIENCE *Multiple Choice* Which of the following is an adaptation in birds that facilitates flight?

- W) Hollow bones
- X) Sharp claws
- Y) Smooth feathers
- Z) Small beaks

ANSWER: W) HOLLOW BONES

TOSS-UP

14) EARTH AND SPACE *Short Answer* In approximately 5.5 billion years, our Sun will move to which next phase in its life cycle?

ANSWER: RED GIANT

BONUS

14) EARTH AND SPACE *Multiple Choice* Which of the following cosmic phenomena gave rise to most of the iron found on Earth?

- W) Red giants
- X) Supernovae [*soo-per-NOH-vee*]
- Y) Quasars [*KWAY-zahrs*]
- Z) Pulsars

ANSWER: X) SUPERNOVAE

TOSS-UP

15) PHYSICAL SCIENCE *Short Answer* A metal spoon, a wooden spoon and a plastic spoon are all placed in hot water. After 15 seconds, which spoon will feel the hottest?

ANSWER: METAL

BONUS

15) PHYSICAL SCIENCE *Short Answer* What form of electromagnetic radiation causes sunburns?

ANSWER: ULTRAVIOLET (ACCEPT: UVA AND UVB; DO NOT ACCEPT: UVC)

TOSS-UP

16) MATH *Short Answer* Providing your answer as a fraction in lowest terms, what is the slope of a line that is perpendicular to a line with the equation $y = 5x - \frac{2}{3}$?

ANSWER: -1/5

BONUS

16) MATH *Short Answer* What is the greatest integer less than or equal to $\sqrt{888}$?

ANSWER: 29

TOSS-UP

17) GENERAL SCIENCE *Multiple Choice* Which of the following statements is true?

- W) Lightning never strikes the same location twice
- X) A car's rubber tires will protect its occupants from lightning
- Y) If outside during a lightning storm, it is best to take a low, crouching position with feet together
- Z) Lightning strike victims retain an electrical charge and will shock someone who touches them

ANSWER: Y) IF OUTSIDE DURING A LIGHTNING STORM, IT IS BEST TO TAKE A LOW, CROUCHING POSITION WITH FEET TOGETHER

BONUS

17) GENERAL SCIENCE *Short Answer* If you see a flash of lightning and ten seconds pass before you hear a clap of thunder, about how far away to the nearest mile is the thunderstorm?

ANSWER: 2

TOSS-UP

18) ENERGY *Short Answer* Electric energy is used to power an incandescent lamp. Is the amount of light energy produced more than, less than, or equal to the electrical energy used?

ANSWER: LESS THAN

BONUS

18) ENERGY *Short Answer* In 1800, Alessandro Volta made the first electric battery by alternating discs of copper and zinc with cloth dampened with a solution of water and salt. What was the name of his invention?

ANSWER: VOLTAIC PILE (ACCEPT: ELECTRIC ORGAN)

TOSS-UP

19) LIFE SCIENCE *Multiple Choice* Which of the following kinds of mammal teeth are used to bite and cut?

- W) Incisors
- X) Premolars
- Y) Molars
- Z) Grinders

ANSWER: W) INCISORS

BONUS

19) LIFE SCIENCE *Short Answer* What is the term for the non-living physical and chemical components of an ecosystem?

ANSWER: ABIOTIC

TOSS-UP

20) EARTH AND SPACE *Short Answer* What is the name of the artificial satellite, launched in 1957, that was a partial cause for the formation of the National Aeronautics and Space Administration?

ANSWER: SPUTNIK

BONUS

20) EARTH AND SPACE *Multiple Choice* The size of a wind-generated wave formed in open ocean depends on which of the following pairs of characteristics of wind?

- W) Strength and duration
- X) Strength and direction
- Y) Fetch and direction
- Z) Fetch and temperature

ANSWER: W) STRENGTH AND DURATION

TOSS-UP

21) PHYSICAL SCIENCE *Multiple Choice* Which of the following is an example of a compound?

- W) O₂
- X) O₃
- Y) HCl
- Z) Cl₂

ANSWER: Y) HCl

BONUS

21) PHYSICAL SCIENCE *Multiple Choice* Which of the following properties is NOT a property of a covalent molecular compound?

- W) Low melting point
- X) Low boiling point
- Y) Good electrical conductivity
- Z) Poor thermal conductivity

ANSWER: Y) GOOD ELECTRICAL CONDUCTIVITY

TOSS-UP

22) MATH *Short Answer* If an angle measures 34°, what is the measure in degrees of its supplement?

ANSWER: 146°

BONUS

22) MATH *Short Answer* Given a triangle ABC in which side AB = 10 centimeters, side AC = 10 centimeters, and angle A = 72°, what is the measure in degrees of angle B?

ANSWER: 54°

TOSS-UP

23) GENERAL SCIENCE *Multiple Choice* In the chemical formula for ammonia, NH_3 , which of the following does the subscript 3 represent?

- W) The number of hydrogen atoms in each molecule of ammonia
- X) The number of nitrogen atoms in each molecule of ammonia
- Y) The number of nitrogen and hydrogen atoms in each molecule of ammonia
- Z) The number of ammonia molecules that will bond together

ANSWER: W) THE NUMBER OF HYDROGEN ATOMS IN EACH MOLECULE OF AMMONIA

BONUS

23) GENERAL SCIENCE *Short Answer* Providing your answer in scientific notation with the correct number of significant digits, what is the sum of 1.2×10^{-3} and 2.7×10^{-4} ?

ANSWER: 1.5×10^{-3}

TOSS-UP

24) EARTH AND SPACE *Short Answer* In Earth's interior, where temperature and pressures are high, what is the term for molten rock?

ANSWER: MAGMA

BONUS

24) EARTH AND SPACE *Multiple Choice* Extremely coarse grained igneous rocks, with minerals larger than 1 inch, are evidence of which of the following?

- W) Volcanic rocks with previously formed crystals
- X) Volcanic rocks cooled rapidly along ocean floor fissures
- Y) Magma cooling with high volatile content
- Z) Magma cooling quickly to form aplite

ANSWER: Y) MAGMA COOLING WITH HIGH VOLATILE CONTENT

TOSS-UP

25) LIFE SCIENCE *Multiple Choice* Which of the following biomes, on average, receives the lowest amount of annual precipitation?

W) Temperate deciduous forest [*di-SIJ-oo-uhs*]

X) Tundra

Y) Taiga

Z) Grasslands

ANSWER: X) TUNDRA

BONUS

25) LIFE SCIENCE *Short Answer* Name all of the following five animals which can be found in a wetlands environment: 1) pronghorn antelope 2) beaver, 3) muskrat, 4) salamander, 5) hedgehog.

ANSWER: 2, 3, 4 (ACCEPT: BEAVER, MUSKRAT, SALAMANDER)