

ROUND 1

TOSS-UP

1) LIFE SCIENCE *Short Answer* What process do autotrophs (read as: AW-toh-trōefs) use to make their own food from sunlight?

ANSWER: PHOTOSYNTHESIS

BONUS

1) LIFE SCIENCE *Short Answer* What gas essential to human life do plants give off when they photosynthesize?

ANSWER: OXYGEN

TOSS-UP

2) PHYSICAL SCIENCE *Multiple Choice* Which of the following is a chemical reaction?

- W) Evaporating rubbing alcohol
- X) Burning lamp oil
- Y) Dissolving table salt in water
- Z) Forming frost

ANSWER: X) BURNING LAMP OIL

BONUS

2) PHYSICAL SCIENCE *Multiple Choice* A person applies for a patent on an engine that is 100% efficient. This application would be rejected because the engine would violate the:

- W) Law of conservation of momentum
- X) Law of friction
- Y) Law of gravity
- Z) Laws of thermodynamics

ANSWER: Z) LAWS OF THERMODYNAMICS

TOSS-UP

3) EARTH AND SPACE SCIENCE *Short Answer* What is the name of the preserved remains, traces, or evidence of organisms that were formerly alive, often found in rocks and other geologic deposits?

ANSWER: FOSSIL

BONUS

3) EARTH AND SPACE SCIENCE *Multiple Choice* Fossils are most often found in what type of rock?

- W) Igneous (read as: IG-nee-us)
- X) Metamorphic
- Y) Sedimentary
- Z) Granitic

ANSWER: Y) SEDIMENTARY

TOSS-UP

4) MATH *Short Answer* Rounding your answer to the nearest whole number, what is $732.15 + 641.43$?

ANSWER: 1374

BONUS

4) MATH *Short Answer* Round 63,159.456 to the hundreds' (read as: hun-DREDS) place.

ANSWER: 63,200

TOSS-UP

5) MATH *Short Answer* What is the additive inverse of 3?

ANSWER: -3

BONUS

5) MATH *Short Answer* What is the sum of the multiplicative inverse of 2 and the multiplicative inverse of 5 as a fraction in simplest form?

ANSWER: 7/10

TOSS-UP

6) GENERAL SCIENCE *Short Answer* Sometimes brightly-colored signs advertising objects or places use a noble gas. Which noble gas is most commonly used to make these signs?

ANSWER: NEON

BONUS

6) GENERAL SCIENCE *Multiple Choice* Which of the following elements is NOT a noble gas?

- W) Xenon
- X) Radon
- Y) Krypton
- Z) Bromine

ANSWER: Z) BROMINE

TOSS-UP

7) GENERAL SCIENCE *Short Answer* While brushing your hair, you scrape electrons from your hair. This results in what type of charge for your hair?

ANSWER: POSITIVE CHARGE

BONUS

7) GENERAL SCIENCE *Multiple Choice* What type of energy production does NOT require a turbine with a shaft to spin a generator in order to create electricity?

- W) Geothermal power
- X) Hydropower
- Y) Hydrogen fuel cells
- Z) Nuclear (fission) reactors

ANSWER: Y) HYDROGEN FUEL CELLS

TOSS-UP

8) LIFE SCIENCE *Short Answer* In a symbiotic relationship, what is the minimum number of organisms that benefits from the relationship?

ANSWER: 0

BONUS

8) LIFE SCIENCE *Multiple Choice* For an environment where a long-lasting toxin has been introduced, in which organism of a food chain will you expect to find the least accumulation of the toxin?

- W) Producer
- X) Herbivore (read as: (H)URR-bi-vohr)
- Y) Primary predator
- Z) Secondary predator

ANSWER: W) PRODUCER

TOSS-UP

9) EARTH AND SPACE SCIENCE *Short Answer* The three components required for an oil reservoir to form are a source rock, a porous and permeable reservoir rock, and:

ANSWER: A CAP ROCK (ACCEPT: SEAL, TRAP)

BONUS

9) EARTH AND SPACE SCIENCE *Short Answer* Deposition of primarily which compound leads to the formation of stalactites and stalagmites in caves?

ANSWER: CALCIUM CARBONATE

TOSS-UP

10) GENERAL SCIENCE *Multiple Choice* Which of the following types of weathering is caused by acid rain?

- W) Chemical
- X) Mechanical
- Y) Biotic
- Z) Tropical

ANSWER: W) CHEMICAL

BONUS

10) GENERAL SCIENCE *Multiple Choice* Which of the following can cause an increase in the amount of acid rain?

- W) Decrease in the ozone layer
- X) Increase in oil spills
- Y) Increased burning of fossil fuels
- Z) Decrease in pesticide use

ANSWER: Y) INCREASED BURNING OF FOSSIL FUELS

TOSS-UP

11) ENERGY *Multiple Choice* Ethanol is being used as a way to reduce dependence on fossil fuels. Which of the following best describes the production of ethanol?

- W) Distilling gases available in waste, such as methanol
- X) Exposing batteries to sunlight
- Y) Fermenting crops like corn and sugar cane
- Z) Using broken parts from cars as they get rusty

ANSWER: Y) FERMENTING CROPS LIKE CORN AND SUGAR CANE

BONUS

11) ENERGY *Multiple Choice* Biodiesel, which is another form of biomass energy, is obtained from:

- W) Food products, including vegetable oils and animal fats
- X) Refining the available diesel
- Y) Combining diesel with extractions from mineral beds
- Z) Using a plant's photosynthesis (read as: fōe-tōe-SIN-teh-sis) process

ANSWER: W) FOOD PRODUCTS, INCLUDING VEGETABLE OILS AND ANIMAL FATS

TOSS-UP

12) GENERAL SCIENCE *Short Answer* How many hours of daylight does the South Pole receive on June 21?

ANSWER: 0

BONUS

12) GENERAL SCIENCE *Multiple Choice* Changes in length of daylight are primarily a result of:

- W) Change in the distance Earth is from the Sun
- X) Change in the direction the Earth tilts relative to the Sun
- Y) Change in the Moon's position relative to the Sun
- Z) Change in how fast the Earth turns on its axis

ANSWER: X) CHANGE IN THE DIRECTION THE EARTH TILTS RELATIVE TO THE SUN

TOSS-UP

13) PHYSICAL SCIENCE *Multiple Choice* Neutrons are approximately the mass of:

- W) Protons
- X) Positrons
- Y) Electrons
- Z) Neutrinos

ANSWER: W) PROTONS

BONUS

13) PHYSICAL SCIENCE *Multiple Choice* Imagine if you could weigh electrons and protons on a simple balance. How many electrons do you need to balance a single proton?

- W) 18 hundred
- X) 18 thousand
- Y) 18 million
- Z) More than a billion

ANSWER: W) 18 hundred

TOSS-UP

14) EARTH AND SPACE SCIENCE *Short Answer* What type of boundary is described as two lithospheric plates moving toward one another and colliding?

ANSWER: CONVERGENT

BONUS

14) EARTH AND SPACE SCIENCE *Short Answer* The largest volcano on Mars is about 15 miles above the surrounding planes. What is the name of this volcano?

ANSWER: OLYMPUS MONS

TOSS-UP

15) MATH *Short Answer* Evaluate $\sqrt{(8 \times 5 \times 3 + 1)}$ (read as: the square root of open parenthesis 8 times 5 times 3 plus 1 close parenthesis).

ANSWER: 11

BONUS

15) MATH *Short Answer* Providing your answer as a decimal to the nearest tenth, evaluate $\left| \frac{6x + 3}{-5x} \right|$ (read as: open absolute value, open parenthesis 6x + 3 close parenthesis divided by -5x, close absolute value) for $x = 6$.

ANSWER: 1.3

TOSS-UP

16) PHYSICAL SCIENCE *Short Answer* A yellow ball has a mass of 5 grams and a volume of 2 cubic centimeters. What is the density of the yellow ball in grams per cubic centimeter?

ANSWER: 2.5

BONUS

16) PHYSICAL SCIENCE *Multiple Choice* A red ball has a mass of 2 grams and a volume of 8 cubic centimeters. A yellow ball has a mass of 5 grams and a volume of 2 cubic centimeters. When both balls are placed into a bucket of water, which of the following is true?

- W) The yellow ball floats and the red ball sinks
- X) The red ball floats and the yellow ball sinks
- Y) Both the red and yellow ball float
- Z) Both the red and yellow ball sink

ANSWER: X) THE RED BALL FLOATS AND THE YELLOW BALL SINKS

TOSS-UP

17) LIFE SCIENCE *Multiple Choice* You find a new creature measuring over 4 millimeters in size in your bedroom. You notice that it has 6 legs so you know it is some type of:

- W) Arachnid (read as: ah-RAHK-nid)
- X) Larva
- Y) Insect
- Z) Echinoderm (read as: i-KY-neh-dehrm)

ANSWER: Y) INSECT

BONUS

17) LIFE SCIENCE *Multiple Choice* Which of the following is the scientific class to which spider belong?

- W) Vertebrate
- X) Echinoderm (read as: i-KY-neh-dehrm)
- Y) Arachnid (read as: ah-RAHK-nid)
- Z) Amphibian (read as: ahm-FI-bee-ehn)

ANSWER: Y) ARACHNID

TOSS-UP

18) MATH *Short Answer* Simplify $\frac{8}{52}$ to a fraction in simplest terms.

ANSWER: $\frac{2}{13}$

BONUS

18) MATH *Short Answer* Express $\frac{(1/5 + 3.4)}{2}$ (read as: open parenthesis one fifth plus 3.4 close parenthesis divided by two) as a fraction in lowest terms.

ANSWER: $\frac{9}{5}$

TOSS-UP

19) ENERGY *Short Answer* What is the general name for material that is used to block the flow of heat?

ANSWER: INSULATOR

BONUS

19) ENERGY *Multiple Choice* A metal coin and a plastic coin are heated to the same temperature. The two coins have the same size and shape, are dropped into the same tub of cold water at the same time, and are left for 30 seconds. Which coin will have the lower temperature?

- W) Metal coin
- X) Plastic coin
- Y) Both coins will have the same temperature
- Z) Cannot be determined

ANSWER: W) METAL COIN

TOSS-UP

20) PHYSICAL SCIENCE *Multiple Choice* What is the metric unit for mass?

- W) The pound
- X) Stones
- Y) The kilogram
- Z) The micron

ANSWER: Y) THE KILOGRAM

BONUS

20) PHYSICAL SCIENCE *Short Answer* What is the SI unit of force?

ANSWER: NEWTON

TOSS-UP

21) MATH *Multiple Choice* Which of the following distances is longest?

- W) Half a kilometer
- X) Half a decimeter
- Y) 600 meters
- Z) 40 decameters

ANSWER: Y) 600 METERS

BONUS

21) MATH *Short Answer* What is the name of a line that intersects two or more coplanar lines in different points?

ANSWER: TRANSVERSAL

TOSS-UP

22) LIFE SCIENCE *Short Answer* What are the basic units of heredity?

ANSWER: GENES (ACCEPT: DNA)

BONUS

22) LIFE SCIENCE *Short Answer* Which structural component of the cell cytoskeleton has alpha and beta subunits and is involved with intracellular transport?

ANSWER: MICROTUBULES

TOSS-UP

23) ENERGY *Multiple Choice* Which of the following is NOT a fossil fuel?

- W) Coal
- X) Natural gas
- Y) Petroleum
- Z) Uranium

ANSWER: Z) URANIUM

BONUS

23) ENERGY *Multiple Choice* Using current technologies, which of the following sources of energy is nonrenewable?

- W) Solar
- X) Wind
- Y) Nuclear
- Z) Geothermal

ANSWER: Y) NUCLEAR

TOSS-UP

24) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is NOT something a river can do to rock?

- W) Cut down through hundreds of meters of rock
- X) Polish rock
- Y) Transport rock hundreds of miles
- Z) Melt rock

ANSWER: Z) MELT ROCK

BONUS

24) EARTH AND SPACE SCIENCE *Short Answer* Thousands of rivers drain the continental United States. These rivers primarily drain into which three bodies of water?

ANSWER: GULF OF MEXICO, ATLANTIC OCEAN (ACCEPT: GULF OF ST. LAWRENCE), PACIFIC OCEAN (ACCEPT: SEA OF CORTEZ, GULF OF CALIFORNIA)

TOSS-UP

25) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following describes how sea ice is different from continental ice?

- W) Continental ice is denser than sea ice
- X) Sea ice is saline while continental ice is fresh
- Y) Sea ice floats on the water while continental ice sits on land
- Z) Sea ice is constantly changing while continental ice remains the same

ANSWER: Y) SEA ICE FLOATS ON THE WATER WHILE CONTINENTAL ICE SITS ON LAND

BONUS

25) EARTH AND SPACE SCIENCE *Multiple Choice* Sea ice floating on the oceans is the first to melt as the Earth's climate warms. Which of the following most accurately models the impact melting sea ice has on global sea level?

- W) Like the water level in a basin when you pour a glass of water into it, sea level will rise significantly
- X) The ocean floor rocks and sediments are porous like sponges. They will absorb the additional water from the ice and sea level will not rise significantly
- Y) Like a melting ice cube sitting in a glass of water, the water and the melted cube will evaporate and sea level will drop
- Z) Like ice cubes in a glass of water, the ice has already displaced the water so as the ice melts, sea level will not rise significantly

ANSWER: Z) LIKE ICE CUBES IN A GLASS OF WATER, THE ICE HAS ALREADY DISPLACED THE WATER SO AS THE ICE MELTS, SEA LEVEL WILL NOT RISE SIGNIFICANTLY