

ROUND 3

TOSS-UP

1) ENERGY *Multiple Choice* Approximately what percentage of the energy need in the U.S. is currently met by biomass?

- W) 15%
- X) 10%
- Y) 4%
- Z) 1%

ANSWER: Y) 4%

BONUS

1) ENERGY *Multiple Choice* Which of the following is an advantage of using biomass in the form of corn to produce ethanol?

- W) Using corn to produce ethanol means that the U.S. will no longer need to import petroleum-based products
- X) Corn-based ethanol is more fuel efficient than gasoline
- Y) Corn-based ethanol production has little impact on water supply
- Z) Food for cattle is produced when corn grain is converted to ethanol

ANSWER: Z) FOOD FOR CATTLE IS PRODUCED WHEN CORN GRAIN IS CONVERTED TO ETHANOL

TOSS-UP

2) GENERAL SCIENCE *Short Answer* What is the shape of the orbits of the planets around the Sun in our Solar System?

ANSWER: ELLIPSE (ALSO ACCEPT ELLIPTICAL)

BONUS

2) GENERAL SCIENCE *Short Answer* What was the first planet discovered with a telescope?

ANSWER: URANUS

TOSS-UP

3) PHYSICAL SCIENCE *Multiple Choice* When looking through a glass of water with a straw in it, why might the straw appear bent and somewhat distorted?

- W) Refraction
- X) Diffraction
- Y) Reflection
- Z) Pressure

ANSWER: W) REFRACTION

BONUS

3) PHYSICAL SCIENCE *Multiple Choice* Which of the following regions of the electromagnetic spectrum has a longer wavelength than visible light?

- W) Ultraviolet
- X) Gamma rays
- Y) Microwaves
- Z) X-rays

ANSWER: Y) MICROWAVES

TOSS-UP

4) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following activities will increase your carbon footprint?

- W) Eating a more beef-rich diet
- X) Eating a more local vegetarian diet
- Y) Keeping your family's car tires inflated to the correct level
- Z) Using public transportation like buses and trains

ANSWER: W) EATING A MORE BEEF-RICH DIET

BONUS

4) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is least likely to be impacted by climate change?

- W) Atmosphere
- X) Hydrosphere
- Y) Cryosphere
- Z) Mantle

ANSWER: Z) MANTLE

TOSS-UP

5) MATH *Multiple Choice* Which of the following must be true about the product of an integer and one greater than the integer?

- W) The product is negative
- X) The product is positive
- Y) The product is even
- Z) The product is odd

ANSWER: Y) THE PRODUCT IS EVEN

BONUS

5) MATH *Short Answer* The circumference of a circle is 6π . What is its area in terms of π ?

ANSWER: 9π

TOSS-UP

6) PHYSICAL SCIENCE *Short Answer* Melting an ice cube and boiling water are examples of what type of change that does not produce a new substance?

ANSWER: PHYSICAL (ACCEPT: PHASE)

BONUS

6) PHYSICAL SCIENCE *Multiple Choice* Thermodynamics tells us that we cannot reduce entropy in a closed system; it will always increase. Of what does entropy serve as a measure?

- W) System size
- X) Temperature
- Y) Disorder
- Z) Flux

ANSWER: Y) DISORDER

TOSS-UP

7) LIFE SCIENCE *Multiple Choice* What do we call the evaporation of water from plants that occurs chiefly while their stomata are open for the passage of carbon dioxide and oxygen during photosynthesis (read as: fōe-tōe-SIN-teh-sis)?

- W) Transpiration
- X) Chemotaxis (read as: kee-MŌE-tahk-SIS)
- Y) Chemosynthesis
- Z) Chlorophyll

ANSWER: W) TRANSPIRATION

BONUS

7) LIFE SCIENCE *Multiple Choice* Which of the following organisms cannot perform photosynthesis?

- W) Cyanobacteria (read as: SY-ah-nōe-bahk-TIR-ee-ah)
- X) Ferns
- Y) Mushrooms
- Z) Trees

ANSWER: Y) MUSHROOMS

TOSS-UP

8) MATH *Short Answer* What is the largest prime number less than 9?

ANSWER: 7

BONUS

8) MATH *Multiple Choice* The lengths of two sides of a triangle are 3 and 12. Which of the following could be the length of the third side?

- W) 4
- X) 8
- Y) 12
- Z) 16

ANSWER: Y) 12

TOSS-UP

9) ENERGY *Multiple Choice* Which of the following is NOT true about incandescent lamps?

- W) They have the least expensive initial purchase price
- X) They typically can last over one million hours
- Y) They provide warm light
- Z) They operate without a ballast

ANSWER: X) THEY TYPICALLY CAN LAST OVER ONE MILLION HOURS

BONUS

9) ENERGY *Multiple Choice* In most developing countries excluding China and India, which of the following is the primary source of energy for household energy consumption in rural and poor areas?

- W) Hydroelectricity
- X) Wind
- Y) Biomass
- Z) Solar

ANSWER: Y) BIOMASS

TOSS-UP

10) PHYSICAL SCIENCE *Short Answer* If a heavy box is sitting on a table, not moving at all, what force is counteracting the pull of gravity?

ANSWER: NORMAL FORCE

BONUS

10) PHYSICAL SCIENCE *Short Answer* You are standing on a scale in an elevator that is accelerating upwards as it goes from the basement to the roof. How does the reading of the scale compare with that obtained when the elevator was standing still?

ANSWER: GREATER (ACCEPT: HIGHER, LARGER)

TOSS-UP

11) MATH *Short Answer* Express $\frac{50}{14}$ as a simplified mixed number.

ANSWER: $3\frac{4}{7}$

BONUS

11) MATH *Short Answer* At the oil spill in the Gulf of Mexico, underwater robots dove down in the water 5000 feet. If the robot dove down another 3000 feet, then rose up 6500 feet, where would the robot be in relation to sea level?

ANSWER: -1500 (ACCEPT: 1500 BELOW SEA LEVEL)

TOSS-UP

12) LIFE SCIENCE *Short Answer* In vascular plants, what is the name of the transport tissue that primarily carries water to the plant?

ANSWER: XYLEM

BONUS

12) LIFE SCIENCE *Short Answer* What force allows the xylem to transport water against gravity?

ANSWER: CAPILLARY ACTION

TOSS-UP

13) ENERGY *Multiple Choice* Which of the following is a primary issue associated with harnessing solar power via panels?

- W) Low efficiency
- X) Overheating the foundation under the panels
- Y) Difficult assembly
- Z) Rain damage to the solar panels

ANSWER: W) LOW EFFICIENCY

BONUS

13) ENERGY *Short Answer* Based solely on wind speeds, rank the following states in order from most to least windy: Florida, Missouri, Nebraska, Arkansas.

ANSWER: NEBRASKA, MISSOURI, ARKANSAS, FLORIDA

TOSS-UP

14) EARTH AND SPACE SCIENCE *Short Answer* What is the name of a fracture or zone of fractures in the Earth that allows large masses of rocks to move relative to each other?

ANSWER: FAULT (ACCEPT FAULT LINE, FAULT ZONE)

BONUS

14) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is used to describe a thrust fault?

- W) Divergent
- X) Transverse
- Y) Spreading
- Z) Convergent

ANSWER: Z) CONVERGENT

TOSS-UP

15) MATH *Multiple Choice* In the Pythagorean theorem, $a^2 + b^2 = c^2$. If all side lengths are smaller than 1 unit long, which of the following is largest?

- W) a^2
- X) b^2
- Y) c^2
- Z) c

ANSWER: Z) c

BONUS

15) MATH *Short Answer* What is the length of the hypotenuse in a right triangle with legs of length 7 and 24?

ANSWER: 25

TOSS-UP

16) LIFE SCIENCE *Multiple Choice* The human genome has been mapped. In this mapping process, they identified genes that coded for all of the following, except:

- W) Race
- X) Hair color
- Y) Handedness
- Z) Vision

ANSWER: W) RACE

BONUS

16) LIFE SCIENCE *Multiple Choice* Feather color in chickens can be a codominant trait. You cross a white chicken with a black chicken. Which of the following phenotypes will you see in the first generation of chicks?

- W) All of the chicks will be gray
- X) The chicks will be more black than white
- Y) Each of the chicks will be black and white in about equal proportions
- Z) The chicks will be more white than black

ANSWER: Y) EACH OF THE CHICKS WILL BE BLACK AND WHITE IN ABOUT EQUAL PROPORTIONS

TOSS-UP

17) GENERAL SCIENCE *Short Answer* What element is considered the main building block of life on Earth?

ANSWER: CARBON

BONUS

17) GENERAL SCIENCE *Short Answer* What is the most abundant element in the universe?

ANSWER: HYDROGEN

TOSS-UP

18) EARTH AND SPACE SCIENCE *Short Answer* Which of the following well types is used to determine whether oil or gas is present: exploration, confirmation, or development?

ANSWER: EXPLORATION

BONUS

18) EARTH AND SPACE SCIENCE *Multiple Choice* What is the purpose of a confirmation well?

- W) To verify that the site will physically support a drilling platform
- X) To verify that the oil is accessible
- Y) To verify that a formation has enough hydrocarbons to make it worth developing
- Z) To verify that the cost of extricating the oil will not be too high

ANSWER: Y) TO VERIFY THAT A FORMATION HAS ENOUGH HYDROCARBONS TO MAKE IT WORTH DEVELOPING

TOSS-UP

19) MATH *Short Answer* A bicyclist rode 25,000 meters in 30 minutes. How many kilometers per hour is this?

ANSWER: 50

BONUS

19) MATH *Short Answer* What is the product of the first three even negative integers?

ANSWER: - 48

TOSS-UP

20) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is NOT a mineral?

- W) Quartz
- X) Marble
- Y) Feldspar
- Z) Calcite

ANSWER: X) MARBLE

BONUS

20) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is a type of metamorphic rock that is created from sandstone?

- W) Andesite (read as:AHN-di-zyt)
- X) Schist (read as:SHIST)
- Y) Gneiss (read as: NYS)
- Z) Quartzite

ANSWER: Z) QUARTZITE

TOSS-UP

21) PHYSICAL SCIENCE *Multiple Choice* When you stretch a rubber band and hold it, what type of energy results?

- W) Kinetic
- X) Stationary
- Y) Torque
- Z) Potential

ANSWER: Z) POTENTIAL

BONUS

21) PHYSICAL SCIENCE *Short Answer* Name two forms of potential energy.

ANSWER: (ACCEPT TWO) CHEMICAL, MECHANICAL, NUCLEAR, GRAVITATIONAL OR ELECTRICAL

TOSS-UP

22) GENERAL SCIENCE *Short Answer* What is the name for a narrow, cylindrical container that is scaled and used in a laboratory to measure exact amounts of a liquid, which is then poured out of the top?

ANSWER: GRADUATED CYLINDER

BONUS

22) GENERAL SCIENCE *Multiple Choice* Which of the following is true about the use of boiling chips in an experiments?

- W) The addition of boiling chips increases the safety of the boiling process
- X) The addition of boiling chips slows down the boiling process
- Y) Boiling chips provide a surface area upon which chemical reactions can occur
- Z) Larger boiling chips are more effective than smaller boiling chips

ANSWER: W) THE ADDITION OF BOILING CHIPS INCREASES THE SAFETY OF THE BOILING PROCESS

TOSS-UP

23) LIFE SCIENCE *Short Answer* What kind of vertebrates have hair or fur and feed their young with milk?

ANSWER: MAMMALS

BONUS

23) LIFE SCIENCE *Short Answer* By name or number, indicate which one or ones of the following biomes that animals with thick fur and large amounts of fat storage would most likely live in: 1) coniferous forest, 2) savannah, 3) rainforest, 4) tundra, and/or 5) temperate forest.

ANSWER: CONIFEROUS FOREST AND TUNDRA (ACCEPT: 1 AND 4)

TOSS-UP

24) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is an inevitable consequence of the global climate change we are facing today?

- W) Extinction of humans
- X) Rise in sea level
- Y) World war
- Z) Closing down of Arctic waterways

ANSWER: X) RISE IN SEA LEVEL

BONUS

24) EARTH AND SPACE SCIENCE *Multiple Choice* Which part of Earth's atmosphere is farthest from Earth's surface?

- W) Stratosphere
- X) Exosphere
- Y) Thermosphere
- Z) Troposphere

ANSWER: X) EXOSPHERE

TOSS-UP

25) GENERAL SCIENCE *Multiple Choice* Which of the following animals does NOT live in or around Antarctica?

- W) Seal
- X) Polar bear
- Y) Penguin
- Z) Nematode

ANSWER: X) POLAR BEAR

BONUS

25) GENERAL SCIENCE *Short Answer* What is the name given to ground that is continuously frozen for at least two years?

ANSWER: PERMAFROST