

**ROUND 1**

**TOSS-UP**

1) LIFE SCIENCE *Short Answer* Of the 4 general types of biological molecules, proteins, carbohydrates, lipids and nucleic acids, which one typically accounts for the majority of dietary calories in the human diet?

ANSWER: CARBOHYDRATES

**BONUS**

1) LIFE SCIENCE *Short Answer* Starch and glycogen are polymers of what simple sugar?

ANSWER: GLUCOSE

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**TOSS-UP**

2) PHYSICAL SCIENCE *Short Answer* What is the only common substance on Earth that exists naturally in the solid, liquid and gaseous states?

ANSWER: WATER

**BONUS**

2) PHYSICAL SCIENCE *Short Answer* Silicon dioxide is made of what two elements?

ANSWER: SILICON AND OXYGEN

**TOSS-UP**

3) EARTH SCIENCE *Short Answer* What energy source is the primary driver of the Earth's water cycle?

ANSWER: SUN (ACCEPT: SOLAR)

**BONUS**

3) EARTH SCIENCE *Short Answer* Name all the terrestrial planets from the one that is CLOSEST to the Sun to the one that is FARTHEST from the Sun:

ANSWER: MERCURY; VENUS; EARTH; MARS

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**TOSS-UP**

4) MATH *Multiple Choice* Which of the following is closest in value to the number 10:

W) 9.995

X) 10.01

Y) 9.99

Z) 10.05

ANSWER: W) 9.995

**BONUS**

4) MATH *Short Answer* What is the average of the positive whole numbers of 1 through 29?

ANSWER: 15

**TOSS-UP**

5) GENERAL SCIENCE *Short Answer* Convert 300 milliliters into liters:

ANSWER: 0.3

**BONUS**

5) GENERAL SCIENCE *Short Answer* What is the name for the manipulated variable group in all experiments that is compared to the experimental group?

ANSWER: CONTROL (ACCEPT: CONTROL GROUP)

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**TOSS-UP**

6) LIFE SCIENCE *Multiple Choice* An intracellular substance is so named because it is located in which of the following places:

- W) inside and outside of cells
- X) underneath cells
- Y) outside of cells
- Z) within cells

ANSWER: Z) WITHIN CELLS

**BONUS**

6) LIFE SCIENCE *Short Answer* What process involves a nucleated cell doubling its DNA and duplicating chromosomes so the cell can then divide and produce two identical daughter cells?

ANSWER: MITOSIS

**TOSS-UP**

7) PHYSICAL SCIENCE *Short Answer* The overall charge of an atom of a certain element depends on the gaining or losing of what sub-atomic particles?

ANSWER: ELECTRONS

**BONUS**

7) PHYSICAL SCIENCE *Short Answer* How many electrons are in the outer shell of a noble gas with an atomic mass greater than 3?

ANSWER: 8

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**TOSS-UP**

8) EARTH SCIENCE *Short Answer* Which 2 of the following 5 elements is the Earth's outer core thought to be primarily made of: aluminum; sodium; iron; silicon; nickel

ANSWER: IRON AND NICKEL (in any order)

**BONUS**

8) EARTH SCIENCE *Multiple Choice* In a 24 hour period, when does the coldest temperature of the day typically occur:

- W) at midnight
- X) just after sunrise
- Y) just after sunset
- Z) between 3 and 4 AM

ANSWER: X) JUST AFTER SUNRISE

**TOSS-UP**

9) MATH *Short Answer* Giving your answer to the second decimal place, add the following three numbers:  $47 + 4.7 + 0.47$

ANSWER: 52.17

**BONUS**

9) MATH *Short Answer* Giving your answer to the third decimal place, subtract the following two numbers:  $18 - 2.049$

ANSWER: 15.951

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**TOSS-UP**

10) GENERAL SCIENCE *Short Answer* What planet in our Solar System is about the same size as the Earth, is tectonically active, and has a thick atmosphere composed of carbon dioxide?

ANSWER: VENUS

**BONUS**

10) GENERAL SCIENCE *Short Answer* The amount of energy stored in food is commonly measured in what unit?

ANSWER: CALORIE (ACCEPT: KILOCALORIE)

**TOSS-UP**

11) LIFE SCIENCE *Short Answer* What are the most photosynthetic organs of most higher plants?

ANSWER: LEAVES

**BONUS**

11) LIFE SCIENCE *Short Answer* What higher plant cell organelle is responsible for using sunlight to convert carbon dioxide and water into sugar and oxygen?

ANSWER: CHLOROPLAST

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**TOSS-UP**

12) PHYSICAL SCIENCE *Short Answer* What is the common term for the force of gravity that is exerted on an object?

ANSWER: WEIGHT

**BONUS**

12) PHYSICAL SCIENCE *Short Answer* What metric unit is most appropriate for weight?

ANSWER: NEWTON

**TOSS-UP**

13) EARTH SCIENCE *Multiple Choice* Which of the following does NOT satisfy the scientific definition of a mineral:

- W) it is always an inorganic substance
- X) it has a distinct chemical composition
- Y) it can be a solid or a molten substance
- Z) it must form by natural processes

ANSWER: Y) IT CAN BE A SOLID OR A MOLTEN SUBSTANCE

**BONUS**

13) EARTH SCIENCE *Short Answer* Which 2 of the following 5 elements are most abundant in the Earth's crust: iron; nickel; carbon; silicon; oxygen

ANSWER: SILICON AND OXYGEN (in any order)

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**TOSS-UP**

14) MATH *Short Answer* Giving your answer as a decimal number, what does 10 to the minus three power equal?

ANSWER: 0.001

**BONUS**

14) MATH *Short Answer* What is the total price of admission to the theater for 2 adults and 4 children if the ticket price for adults is \$30.00 and for children is \$18.00?

ANSWER: \$132.00

**TOSS-UP**

15) GENERAL SCIENCE *Multiple Choice* In which of the following biomes will there be trees whose leaves change color in autumn, fall off in winter, and grow back in the spring:

- W) temperate deciduous forest
- X) rainforest
- Y) coniferous forest
- Z) scrubland

ANSWER: W) TEMPERATE DECIDUOUS FOREST

**BONUS**

15) GENERAL SCIENCE *Multiple Choice* Which of the following metric masses are NOT equal:

- W) 1000 milligrams = 1 gram
- X) 100 milligrams = 1 centigram
- Y) 100 decigrams = 1 decagram
- Z) 100 grams = 1 hectogram

ANSWER: X) 100 MILLIGRAMS = 1 CENTIGRAM

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**TOSS-UP**

16) LIFE SCIENCE *Multiple Choice* To which of the following categories of living organisms does *E. coli* belong:

- W) viruses
- X) protozoans
- Y) fungi
- Z) bacteria

ANSWER: Z) BACTERIA

**BONUS**

16) LIFE SCIENCE *Short Answer* What outer structure possessed by plant cells protects them from environmental changes and helps them maintain their shape during stress and times of water loss?

ANSWER: CELL WALL (ACCEPT: WALL)



**TOSS-UP**

17) PHYSICAL SCIENCE *Multiple Choice* Air is best described as a:

- W) compound
- X) mixture
- Y) solution
- Z) hydrocarbon

ANSWER: X) MIXTURE

**BONUS**

17) PHYSICAL SCIENCE *Short Answer* In the reaction sodium plus fluorine yields sodium fluoride, what are the reactants and products, respectively?

ANSWER: REACTANTS = SODIUM AND FLUORINE; PRODUCTS = SODIUM FLUORIDE

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**TOSS-UP**

18) EARTH SCIENCE *Multiple Choice* The size, shape and arrangement of crystals or mineral grains in igneous rocks is called:

- W) hardness
- X) density
- Y) texture
- Z) streak

ANSWER: Y) TEXTURE

**BONUS**

18) EARTH SCIENCE *Short Answer* Which one of the following 5 choices is NOT a mineral: diamond; asbestos; graphite; coal; talc

ANSWER: COAL

**TOSS-UP**

19) MATH *Short Answer* Round the number 590,695 to the nearest hundred:

ANSWER: 590,700

**BONUS**

19) MATH *Short Answer* Name all the prime numbers greater than 20 and less than 30:

ANSWER: 23 AND 29

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**TOSS-UP**

20) GENERAL SCIENCE *Short Answer* Most plastics are based on monomers that are composed of what element that forms the backbone of the polymer?

ANSWER: CARBON

**BONUS**

20) GENERAL SCIENCE *Short Answer* What natural polymer is the main component of cotton?

ANSWER: CELLULOSE

### TOSS-UP

21) LIFE SCIENCE *Multiple Choice* Which of the following is the most basic function of human eye lashes:

- W) to shade the eye from bright sun
- X) to prevent small particles from entering the eyes
- Y) to attract a mate
- Z) to help disperse tears when blinking

ANSWER: X) TO PREVENT SMALL PARTICLES FROM ENTERING THE EYES

### BONUS

21) LIFE SCIENCE *Short Answer* What molecule is released from muscles as a waste product, transported to the lungs in blood, and exhaled as a gas?

ANSWER: CARBON DIOXIDE (ACCEPT: CO<sub>2</sub>)

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### TOSS-UP

22) PHYSICAL SCIENCE *Short Answer* Which one of the 4 states of matter is described as having a definite shape and volume?

ANSWER: SOLID

### BONUS

22) PHYSICAL SCIENCE *Short Answer* What is the specific name for the type of solid where the atoms or molecules of the solid are arranged in a geometric repeating arrangement?

ANSWER: CRYSTAL (ACCEPT: CRYSTAL LATTICE)

**TOSS-UP**

23) EARTH SCIENCE *Multiple Choice* Which of the following sea creatures is LEAST likely to be living in the intertidal shore along the state of Maine's rocky coast:

- W) zebra mussel
- X) barnacle
- Y) anemone
- Z) limpet

ANSWER: W) ZEBRA MUSSEL

**BONUS**

23) EARTH SCIENCE *Short Answer* What is the specific name for the very high and very low tides that occur when the Sun and Moon are in line with the Earth?

ANSWER: SPRING (TIDES)

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**TOSS-UP**

24) MATH *Short Answer* Evaluate the following expression:  $|20 - 30| + |30 - 20|$  (read as: open absolute value 20 minus 30 close absolute value, plus open absolute value 30 minus 20, close absolute value)

ANSWER: 20

**BONUS**

24) MATH *Short Answer* Giving your answer as a decimal to two places, divide the following:

$$\frac{327}{11}$$

ANSWER: 29.73

**TOSS-UP**

25) GENERAL SCIENCE *Short Answer* 10 kilowatts is equal to how many watts?

ANSWER: 10,000

**BONUS**

25) GENERAL SCIENCE *Short Answer* What are the SI units for length and time?

ANSWER: METER AND SECOND