

ROUND 2

TOSS-UP

1) PHYSICAL SCIENCE *Multiple Choice* Which of Newton's laws tells us that when a force acts upon an object, an equal and opposite force acts on another body?

- W) First
- X) Second
- Y) Third
- Z) Fourth

ANSWER: Y) THIRD

BONUS

1) PHYSICAL SCIENCE *Short Answer* Two stones are dropped in a pond and the ripples interfere with each other to create a bigger ripple than each of the original ripples. What is this type of interference called?

ANSWER: CONSTRUCTIVE

TOSS-UP

2) GENERAL SCIENCE *Multiple Choice* Within a given period, what happens to the size of atoms as you move across a period of the periodic table, from left to right?

- W) They increase
- X) They decrease
- Y) They stay the same
- Z) There is no pattern

ANSWER: X) THEY DECREASE

BONUS

2) GENERAL SCIENCE *Short Answer* How many electrons does a chlorine atom have?

ANSWER: 17

TOSS-UP

3) LIFE SCIENCE *Multiple Choice* *Homo sapiens* is the scientific name for which of the following?

- W) Neanderthals (read as: nee-ANH-dehr-thohls)
- X) Dolphins
- Y) Monkeys
- Z) Humans

ANSWER: Z) HUMANS

BONUS

3) LIFE SCIENCE *Multiple Choice* Toads and salamanders live in water and on land. They are both examples of:

- W) Amphibians
- X) Reptiles
- Y) Invertebrates
- Z) Mollusks

ANSWER: W) AMPHIBIANS

TOSS-UP

4) EARTH AND SPACE SCIENCE *Short Answer* Is the radius of Mars 1/4, 1/2, 2, or 4 times the size of Earth's radius?

ANSWER: 1/2

BONUS

4) EARTH AND SPACE SCIENCE *Short Answer* Name the two moons which orbit Mars.

ANSWER: PHOBOS AND DEIMOS

TOSS-UP

5) GENERAL SCIENCE *Multiple Choice* While recognizing that evolution is a continual process for all organisms, historically speaking, which of the following kinds of organisms evolved most recently on Earth?

- W) Reptiles
- X) Insects
- Y) Mammals
- Z) Fish

ANSWER: Y) MAMMALS

BONUS

5) GENERAL SCIENCE *Multiple Choice* Which of the following is a characteristic of endothermic animals?

- W) They have a higher metabolism in warm weather
- X) They are more aggressive overall as compared to cold-blooded animals
- Y) They are found only in warm climates
- Z) They maintain a constant internal temperature at all air temperatures

ANSWER: Z) THEY MAINTAIN A CONSTANT INTERNAL TEMPERATURE AT ALL AIR TEMPERATURES

TOSS-UP

6) ENERGY *Multiple Choice* What wattage of light bulb is closest to the energy used by the human brain?

- W) 0.1
- X) 1
- Y) 10
- Z) 100

ANSWER: Y) 10

BONUS

6) ENERGY *Multiple Choice* About how many watts does the average human generate over an 8 hour period, if not doing additional exercise or other activities?

- W) 1
- X) 10
- Y) 100
- Z) 1000

ANSWER: Y) 100

TOSS-UP

7) GENERAL SCIENCE *Short Answer* The elements chlorine, fluorine, iodine, and bromine are all members of what group of elements?

ANSWER: HALOGENS (ACCEPT: GROUP 17)

BONUS

7) GENERAL SCIENCE *Multiple Choice* Which of the following elements would be expected to possess very different chemical properties from the others based on its placement in the periodic table?

- W) Chlorine
- X) Argon
- Y) Iodine (read as: EYE-oh-dyn)
- Z) Fluorine

ANSWER: X) ARGON

TOSS-UP

8) PHYSICAL SCIENCE *Short Answer* At room temperature, what is the state of matter of most elements?

ANSWER: SOLID

BONUS

8) PHYSICAL SCIENCE *Short Answer* Most submarines can only store enough fresh water to last for about 10 days. In order to obtain fresh water, most submarines are equipped with an apparatus that converts sea water into fresh water. What is the name of the process used to convert the sea water?

ANSWER: REVERSE OSMOSIS (ACCEPT: DESALINATION)

TOSS-UP

9) EARTH AND SPACE SCIENCE *Short Answer* Extrusions from a volcano produce what types of rock?

ANSWER: IGNEOUS

BONUS

9) EARTH AND SPACE SCIENCE *Short Answer* Which of the following is not a form of metamorphic rock: slate, marble, gypsum, or gneiss (read as: NYS)?

ANSWER: GYPSUM

TOSS-UP

10) MATH *Multiple Choice* Which of the following integers is closest to the product of 0.00009 (read as: zero point zero zero zero zero nine) and 1.00001 (read as: one point zero zero zero zero one)

- W) -1
- X) 0
- Y) 1
- Z) 9

ANSWER: X) 0

BONUS

10) MATH *Multiple Choice* Which of the following integers is closest to 0.00009 (read as: zero point zero zero zero zero nine) to the power of -1?

- W) -9
- X) -1
- Y) 0
- Z) 10,000

ANSWER: Z) 10,000

TOSS-UP

11) PHYSICAL SCIENCE *Short Answer* What pH is considered neutral?

ANSWER: 7

BONUS

11) PHYSICAL SCIENCE *Multiple Choice* Work is done on the box in all of the following scenarios except:

- W) A boy raising the box above his head
- X) A boy holding the box still above his head
- Y) A boy pushing the box up a ramp
- Z) A boy kicking the box from rest across a frictionless floor

ANSWER: X) A BOY HOLDING THE BOX STILL ABOVE HIS HEAD

TOSS-UP

12) LIFE SCIENCE *Multiple Choice* What system in a mammalian body is responsible for removing liquids and solid wastes?

- W) Circulatory
- X) Respiratory
- Y) Endocrine (read as: EHN-doh-krin)
- Z) Excretory (read as: EHK-skreh-tohr-ee)

ANSWER: Z) EXCRETORY

BONUS

12) LIFE SCIENCE *Short Answer* When an organism becomes too large for muscular contractions and diffusion to effectively move nutrients throughout the body, what system is needed to transport the nutrients?

ANSWER: CIRCULATORY (DO NOT ACCEPT: DIGESTIVE)

TOSS-UP

13) MATH *Multiple Choice* Simplify:

$\frac{2a + 2b + 2c}{4}$ (read as: the quantity of 2a plus 2b plus 2c divided by 4).

W) $\frac{abc}{2}$

X) $\frac{a + b + c}{2}$

Y) $\frac{2(abc)}{2}$

Z) $2(a + b + c)$

ANSWER: X) $\frac{a + b + c}{2}$

BONUS

13) MATH *Short Answer* Simplify $8 \times 23 + 8 \times 7 + 8 \times 5$ (read as: 8 times 23 plus 8 times 7 plus 8 times 5). Express the answer as a natural number.

ANSWER: 280

TOSS-UP

14) ENERGY *Multiple Choice* Food provides energy in what form?

W) Chemical

X) Kinetic

Y) Electrical

Z) Nuclear

ANSWER: W) CHEMICAL

BONUS

14) ENERGY *Multiple Choice* What form of energy do plants use to produce the sugars present in fruit?

W) Gravitational

X) Chemical

Y) Heat

Z) Light

ANSWER: Z) LIGHT

TOSS-UP

15) PHYSICAL SCIENCE *Short Answer* What is the general term for the most basic device used to change the direction or magnitude of a force?

ANSWER: SIMPLE MACHINE

BONUS

15) PHYSICAL SCIENCE *Short Answer* Name four of the six kinds of simple machines.

ANSWER: (ACCEPT 4) LEVER, WEDGE, PULLEY, WHEEL & AXLE, INCLINED PLANE, SCREW

TOSS-UP

16) MATH *Short Answer* Simplify: $3f + 7 - 2f - 3$.

ANSWER: $f + 4$

BONUS

16) MATH *Short Answer* What is the multiplicative inverse, in simplest form, of 43 times 25?

ANSWER: $\frac{1}{1075}$ (read as: one, one thousand seventy-five ten thousandths, or 1 over 1075)

TOSS-UP

17) LIFE SCIENCE *Multiple Choice* Which of the following is an example of organisms found living next to hydrothermal vents.

- W) Extremophiles (read as: ik-STREE-moh-FYLS)
- X) Hydrophiles (read as: hy- drōe -FYLS)
- Y) Oceanophiles (read as: oh-sheh-nōe-FYLS)
- Z) Bacteriophiles (read as: bahk-TIR-ōe-FYLS)

ANSWER: W) EXTREMOPHILES

BONUS

17) LIFE SCIENCE *Multiple Choice* Most extremophiles belong to which group of organisms?

- W) Protists (read as: PRŌE-tists)
- X) Fungi
- Y) Eukaryotes (read as: yuh-KEHR-ee-ōets)
- Z) Archaea (read as: arh-KEE-ah)

ANSWER: Z) ARCHAEA

TOSS-UP

18) ENERGY *Multiple Choice* Fossil fuel combustion in power plants creates heat. In order to run an electrical generator, heat is converted into what form of energy?

- W) Electrical energy
- X) Chemical energy
- Y) Light energy
- Z) Mechanical energy

ANSWER: Z) MECHANICAL ENERGY

BONUS

18) ENERGY *Short Answer* Temperature is a measure of energy based on which property of a substance?

ANSWER: MOLECULAR ACTIVITY (ACCEPT: MOLECULAR MOTION, AVERAGE KINETIC ENERGY, HEAT ENERGY)

TOSS-UP

19) EARTH AND SPACE SCIENCE *Short Answer* Which of the three main rock types contains most of the fossil fuels we use as energy resources today?

ANSWER: SEDIMENTARY ROCK

BONUS

19) EARTH AND SPACE SCIENCE *Multiple Choice* What fossil fuel is responsible for most of the acid rain in the United States?

- W) Oil
- X) Natural Gas
- Y) Coal
- Z) Oil Shale

ANSWER: Y) COAL

TOSS-UP

20) MATH *Multiple Choice* Which of the following is closest to the area in square centimeters of a circle with a radius of 4 centimeters?

- W) 12
- X) 24
- Y) 48
- Z) 192

ANSWER: Y) 48

BONUS

20) MATH *Short Answer* The area of a rectangle is 24 square centimeters. If you double both the length and width, what is the new area in square centimeters?

ANSWER: 96

TOSS-UP

21) LIFE SCIENCE *Short Answer* In most organisms that reproduce sexually, what proportion of genetic material comes from the mother?

ANSWER: 50%

BONUS

21) LIFE SCIENCE *Multiple Choice* Which of the following statements is true about pollen?

- W) Pollen must be transferred between plants by insects
- X) Pollen travels through the style and directly fertilizes the ovule
- Y) Either before or after arriving on the stigma, each pollen grain undergoes a mitotic cell division producing two sperm
- Z) Pollen is a gamete

ANSWER: Y) EITHER BEFORE OR AFTER ARRIVING ON THE STIGMA, EACH POLLEN GRAIN UNDERGOES A MITOTIC CELL DIVISION PRODUCING TWO SPERM

TOSS-UP

22) GENERAL SCIENCE *Short Answer* By what name is our galaxy typically called?

ANSWER: THE MILKY WAY

BONUS

22) GENERAL SCIENCE *Multiple Choice* Which of the following do most asteroids orbit in our solar system?

- W) Jupiter
- X) The Earth
- Y) The Moon
- Z) The Sun

ANSWER: Z) THE SUN

TOSS-UP

23) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following natural disasters is NOT commonly caused by the movement of tectonic plates?

- W) Volcanoes
- X) Earthquakes
- Y) Hurricanes
- Z) Tsunamis

ANSWER: Y) HURRICANES

BONUS

23) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following environmental conditions is NOT commonly associated with hurricanes?

- W) Warm ocean waters
- X) Further than 300 miles from the equator
- Y) Greater than 25 miles per hour change in wind speed between the surface and upper troposphere
- Z) Moist air near the mid-level of the troposphere

ANSWER: Y) GREATER THAN 25 MILES PER HOUR CHANGE IN WIND SPEED BETWEEN THE SURFACE AND UPPER TROPOSPHERE

TOSS-UP

24) MATH *Short Answer* What is the largest prime number less than 20?

ANSWER: 19

BONUS

24) MATH *Short Answer* What is the sum of the largest prime number less than 50 and the largest square number less than 50?

ANSWER: 96

TOSS-UP

25) EARTH AND SPACE SCIENCE *Short Answer* What atmospheric trace gas is a product of aerobic respiration?

ANSWER: CARBON DIOXIDE

BONUS

25) EARTH AND SPACE SCIENCE *Multiple Choice* What is the approximate concentration of carbon dioxide, in parts per million, in Earth's atmosphere?

W) 380

X) 3,800

Y) 38,000

Z) 380,000

ANSWER: W) 380