

ROUND 12

TOSS-UP

1) PHYSICAL SCIENCE *Multiple Choice* What component of the air does humidity measure?

- W) Nitrogen
- X) Dust and other particulate matter
- Y) Water vapor
- Z) Carbon monoxide

ANSWER: Y) WATER VAPOR

BONUS

1) PHYSICAL SCIENCE *Multiple Choice* An object suspended above the ground by a string is acted upon by:

- W) No net tension
- X) Tension that equals its weight
- Y) Tension that equals its mass
- Z) Tension independent of its mass

ANSWER: X) TENSION THAT EQUALS ITS WEIGHT

TOSS-UP

2) GENERAL SCIENCE *Short Answer* Which phylum of animals possesses a dorsal nerve cord?

ANSWER: CHORDATA

BONUS

2) GENERAL SCIENCE *Short Answer* Name by words or numbers all of the following four organelles found in plant cells that may have arisen as a result of a symbiotic relationship with prokaryotes (read as: prōe-KAHR-ee-ōets): 1) chloroplast, 2) endoplasmic reticulum (read as: ri-TI-kyuh-luhm), 3) ribosome (read as: RY-boh-sōem), or 4) mitochondria (read as: my-toh-KOHN-dree-ah)?

ANSWER: CHLOROPLAST AND MITOCHONDRIA (ACCEPT: 1, 4)

TOSS-UP

3) LIFE SCIENCE *Multiple Choice* Carrots, parsnips, radishes, and beets are all examples of:

- W) Stems
- X) Secondary roots
- Y) Modified leaves
- Z) Roots

ANSWER: Z) ROOTS

BONUS

3) LIFE SCIENCE *Short Answer* Kohlrabi, asparagus, cauliflower, and broccoli are all edible examples of which part of the plant?

ANSWER: STEM

TOSS-UP

4) EARTH AND SPACE SCIENCE *Multiple Choice* On which day does daylight last for 24 hours at the Arctic Circle?

- W) Vernal equinox
- X) Summer solstice
- Y) Autumnal equinox
- Z) Winter solstice

ANSWER: X) SUMMER SOLSTICE

BONUS

4) EARTH AND SPACE SCIENCE *Short Answer* What acid is formed when carbon dioxide is dissolved into water?

ANSWER: CARBONIC ACID

TOSS-UP

5) GENERAL SCIENCE *Short Answer* What is the only ice sheet that does not affect sea level change?

ANSWER: ANTARCTIC ICE SHEET

BONUS

5) GENERAL SCIENCE *Multiple Choice* A fault in the Earth's surface in which the hanging wall has moved down relative to the footwall is called:

- W) Downthrust fault
- X) Upthrust fault
- Y) Reverse fault
- Z) Normal fault

ANSWER: Z) NORMAL FAULT

TOSS-UP

6) EARTH AND SPACE SCIENCE *Multiple Choice* Through what medium can all kinds of earthquake waves travel?

- W) Plasma
- X) Liquids
- Y) Gases
- Z) Solids

ANSWER: Z) SOLIDS

BONUS

6) EARTH AND SPACE SCIENCE *Multiple Choice* When the Earth's interior finally cools, which of the following will stop?

- W) Water cycle
- X) Weathering and erosion
- Y) Plate tectonics
- Z) Solar energy reaching Earth

ANSWER: Y) PLATE TECTONICS

TOSS-UP

7) GENERAL SCIENCE *Multiple Choice* Which of the following materials has the greatest density?

- W) Lead
- X) Silver
- Y) Zinc
- Z) Copper

ANSWER: W) LEAD

BONUS

7) GENERAL SCIENCE *Multiple Choice* Which of the following does not belong to the alkaline earth metal group?

- W) Magnesium
- X) Calcium
- Y) Potassium
- Z) Barium

ANSWER: Y) POTASSIUM

TOSS-UP

8) PHYSICAL SCIENCE *Short Answer* A water strider is able to “walk on water” due to which property of water?

ANSWER: SURFACE TENSION (ACCEPT: HYDROGEN BONDING)

BONUS

8) PHYSICAL SCIENCE *Short Answer* Powerful magnets are usually alloys of platinum or neodymium and what other metal?

ANSWER: COBALT

TOSS-UP

9) EARTH AND SPACE SCIENCE *Short Answer* What greenhouse gas has the greatest impact on Earth's climate?

ANSWER: WATER VAPOR

BONUS

9) EARTH AND SPACE SCIENCE *Multiple Choice* Without a greenhouse effect, what would be Earth's approximate average temperature in degrees Celsius?

- W) -18
- X) -8
- Y) 8
- Z) 18

ANSWER: W) -18

TOSS-UP

10) MATH *Short Answer* Right triangle DEF has a hypotenuse with a length of the square root of 90. One leg's length is 9. What is the length of the other leg?

ANSWER: 3

BONUS

10) MATH *Multiple Choice* If points A, B, and C create an equilateral triangle with side lengths of 4 units, and D is the image of C by a reflection across the line (AB), then what is the area of parallelogram ACBD in square units?

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

ANSWER: X) 8

TOSS-UP

11) PHYSICAL SCIENCE *Short Answer* What is the most common term for the height of the peak of a wave above its average value?

ANSWER: AMPLITUDE

BONUS

11) PHYSICAL SCIENCE *Short Answer* The station KDOE is broadcasting at 1000 kiloHertz. What is its broadcasting wavelength in meters?

ANSWER: 300

TOSS-UP

12) LIFE SCIENCE *Short Answer* What is the general term for an area of land where the water table is near or above the surface of the ground for most of the year?

ANSWER: WETLAND

BONUS

12) LIFE SCIENCE *Short Answer* What kind of wetland is characterized by spongy peat deposits, acidic waters, and a floor covered by a thick carpet of sphagnum (read as: SFAHG-nuhm) moss?

ANSWER: BOG

TOSS-UP

13) MATH *Short Answer* A certain tree is 6 feet at the very beginning of spring, and grows 2 inches per day during the spring and summer. How many days will it take for the tree's height to reach 10 feet?

ANSWER: 24

BONUS

13) MATH *Short Answer* Give an algebraic equation to express the following situation: A certain tree is 6 feet tall at the very beginning of spring, and grows 2 inches per day during the spring and summer. Use n to represent the number of days, and h for the tree's total height in feet.

ANSWER: (ACCEPT: $6h = 36 + n$)

TOSS-UP

14) ENERGY *Multiple Choice* Assuming no friction, in order to accomplish a specific task, using simple machines can change all of the following except:

- W) Distance of force
- X) Energy expenditure
- Y) Path of object
- Z) Intensity of force

ANSWER: X) ENERGY EXPENDITURE

BONUS

14) ENERGY *Multiple Choice* Bob can either raise a crate 4 feet using a pulley or push a crate up a 4 foot tall ramp. If using the pulley takes 5 seconds and using the ramp takes 10 seconds, which method requires greater average power?

- W) The pulley
- X) The ramp
- Y) Both methods take the same amount of average power
- Z) It depends on how steep the ramp is

ANSWER: W) THE PULLEY

TOSS-UP

15) PHYSICAL SCIENCE *Short Answer* If the air in a room is in a gaseous state of matter, what happens to the molecules that make up the gas when the temperature in the room increases?

ANSWER: THEY MOVE FASTER (ACCEPT: MOLECULES MOVE FURTHER APART, DISTANCE BETWEEN MOLECULES INCREASES – if the students says that air is allowed to leak out)

BONUS

15) PHYSICAL SCIENCE *Multiple Choice* The ratio of the amount of water vapor in the air to the amount required to saturate the air is:

- W) Specific humidity
- X) Absolute humidity
- Y) Relative humidity
- Z) Dew point

ANSWER: Y) RELATIVE HUMIDITY

TOSS-UP

16) MATH *Short Answer*

Solve for a : $\frac{a-2}{9} = \frac{2}{3}$

(read as: the quantity a minus two over 9 equals two thirds)

ANSWER: 8

BONUS

16) MATH *Short Answer* You are going to meet a friend at a movie theater which is 4 miles from your house. You are riding your bike at an average rate of 10 miles per hour. Your friend lives 1.5 miles from the movie theater and walks at an average rate of 3 miles per hour. How many minutes ahead of you should your friend leave so that you meet at the movie theater at the same time?

ANSWER: 6

TOSS-UP

17) LIFE SCIENCE *Multiple Choice* Which of the following is NOT considered connective tissue?

- W) Cartilage
- X) Muscle
- Y) Blood
- Z) Ligaments

ANSWER: X) MUSCLE

BONUS

17) LIFE SCIENCE *Short Answer* By name or number, identify all the places on your body where would you find elastic cartilage: 1) outer ear, 2) epiglottis, 3) nose, or 4) the disks between your vertebrae?

ANSWER: OUTER EAR AND EPIGLOTTIS (ACCEPT: 1 AND 2)

TOSS-UP

18) ENERGY *Multiple Choice* Why aren't birds electrified when standing on power lines?

- W) Because there is no difference in potential energy when they stand on top of power lines
- X) Because they're not wet
- Y) Because the kinetic energy remains the same
- Z) Because there is a differential in potential that allows the flow of energy through them

ANSWER: W) BECAUSE THERE IS NO DIFFERENCE IN POTENTIAL ENERGY WHEN THEY STAND ON TOP OF POWER LINES

BONUS

18) ENERGY *Multiple Choice* The only way for a bird to receive an electric shock when touching power lines at the same voltage and phasing is to:

- W) Touch the box where a transformer is enclosed
- X) Touch both the power line and another bird simultaneously
- Y) Have one leg touch a power line and the other leg touch the ground
- Z) Touch two power lines at the same time

ANSWER: Y) HAVE ONE LEG TOUCH A POWER LINE AND THE OTHER LEG TOUCH THE GROUND

TOSS-UP

19) EARTH AND SPACE SCIENCE *Multiple Choice* There are two groups of planets, terrestrial and Jovian, in our Solar System. Terrestrial planets have which of the following characteristics?

- W) Few moons, located near the asteroid belt, no solid surfaces, extremely cold
- X) Located relatively far from the Sun, gaseous, largest planets in the Solar System
- Y) Rich in rock, relatively very large in size, many moons, extremely high temperature at the surface
- Z) Located relatively close to the Sun, relatively small in size, iron-rich, solid, few or no moons

ANSWER: Z) LOCATED RELATIVELY CLOSE TO THE SUN, RELATIVELY SMALL IN SIZE, IRON-RICH, SOLID, FEW OR NO MOONS

BONUS

19) EARTH AND SPACE SCIENCE *Short Answer* Consider the following facts: Neptune is greater than 17 times more massive than Earth and orbits the Sun at less than 20% of the speed that Earth travels in its orbit. Also, Neptune is spinning almost 6 times faster than Earth. How does Neptune's day length compare to Earth's?

ANSWER: IT IS SHORTER THAN AN EARTH DAY

TOSS-UP

20) MATH *Multiple Choice* Which of the following equalities is NOT true, when a and b are nonzero, nonequal integers?

- W) $a \times b = b \times a$
- X) $a + b = b + a$
- Y) $a - b = b - a$
- Z) $a/b = 1/b \cdot a$ (read as: a over b equals 1 over b times a)

ANSWER: Y) $a - b = b - a$

BONUS

20) MATH *Short Answer* Sara's mom is recovering the dining room chair seats. The measurement of a seat is 12 inches by 14 inches. What would the area of the fabric be, in square inches, if an extra border of two inches is needed around the square in order to cover the seat?

ANSWER: 288

TOSS-UP

21) LIFE SCIENCE *Short Answer* Name the process in which eukaryotic (read as: yuh-KEHR-ee-ōetik) chromosomes are visually inspected, counted and abnormalities are recorded.

ANSWER: KARYOTYPE

BONUS

21) LIFE SCIENCE *Short Answer* How is the condition Down syndrome genetically identified?

ANSWER: TRISOMY (ACCEPT: THREE COPIES) OF THE 21ST AUTOSOMAL CHROMOSOME (ACCEPT: FRAGILE X, MISSING PART OF THE X CHROMOSOME)

TOSS-UP

22) GENERAL SCIENCE *Multiple Choice* A new chemical is produced that is slippery and has a bitter taste but is not very corrosive. What is the most likely pH of this chemical?

- W) 3
- X) 7
- Y) 9
- Z) 13

ANSWER: Y) 9

BONUS

22) GENERAL SCIENCE *Multiple Choice* Which of the following geologic periods is the oldest?

- W) Silurian
- X) Devonian
- Y) Jurassic
- Z) Permian

ANSWER: W) SILURIAN

TOSS-UP

23) EARTH AND SPACE SCIENCE *Short Answer* What is the SI unit for temperature?

ANSWER: KELVIN (ACCEPT: K)

BONUS

23) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is NOT an SI unit?

- W) Meter
- X) Kilogram
- Y) Liter
- Z) Ampere

ANSWER: Y) LITER

TOSS-UP

24) MATH *Multiple Choice* Which of the following lines has the steepest slope?

- W) $y = x + 4$
- X) $2y = 3x + 2$
- Y) $4y = 3x + 20$
- Z) $3y - 4x = 3$

ANSWER: X) $2y = 3x + 2$

BONUS

24) MATH *Multiple Choice* Which of the following graphs could represent a negative correlation?

- W) A straight line passing through (0, 5) and (5, 1)
- X) An upward U-shaped curve with a vertex at (3, 3)
- Y) A straight line passing through (-2, 4) and (3, 10)
- Z) A downward U-shaped curve with a vertex at (0, 0)

ANSWER: W) A STRAIGHT LINE PASSING THROUGH (0, 5) AND (5, 1)

TOSS-UP

25) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following minerals is the softest?

- W) Quartz
- X) Diamond
- Y) Talc
- Z) Iron

ANSWER: Y) TALC

BONUS

25) EARTH AND SPACE SCIENCE *Short Answer* Which of the following five minerals is the most abundant in Earth's continental crust: quartz, mica, talc, calcite, or iron?

ANSWER: QUARTZ