TOSS-UP

1) LIFE SCIENCE *Multiple Choice* Which species of tuna is in immediate danger of extinction due to overfishing?

W) Big eye tuna  
X) Albacore  
Y) Yellowfin tuna  
Z) Southern bluefin tuna

ANSWER: Z) SOUTHERN BLUEFIN TUNA

BONUS

1) LIFE SCIENCE *Short Answer* What four categories of biological macromolecules make up cells?

ANSWER: PROTEINS, NUCLEIC ACIDS, CARBOHYDRATES, AND LIPIDS (DO NOT ACCEPT: FATS)

TOSS-UP

2) PHYSICAL SCIENCE *Multiple Choice* Which of the following best describes how a chemical change occurs in a substance?

W) It changes state  
X) It gains, loses, or shares electrons  
Y) It reaches its boiling point  
Z) It is ground into a powder

ANSWER: X) IT GAINS, LOSES, OR SHARES ELECTRONS

BONUS

2) PHYSICAL SCIENCE *Short Answer* Every ocean wave is generated by an energy source. What is the most likely cause of waves that reach over 100 feet in amplitude?

ANSWER: EARTHQUAKES
TOSS-UP

3) ENERGY Multiple Choice In which of the following states would you be more likely to find a methane digester on a farm or ranch?

W) Missouri
X) Wisconsin
Y) Utah
Z) Maryland

ANSWER: X) WISCONSIN

BONUS

3) ENERGY Multiple Choice The amount of CO₂ produced from burning natural gas will be what percent of the CO₂ produced from burning coal, for the same amount of energy output?

W) 30%
X) 50%
Y) 65%
Z) 80%

ANSWER: X) 50%

TOSS-UP

4) GENERAL SCIENCE Multiple Choice If you have a parent flower that has red petals and the other parent has white petals and they have offspring that are pink, which of the following genetic terms best applies?

W) Co-dominance
X) Expressivity
Y) Pleiotropy [play-O-truh-pee]
Z) Incomplete dominance

ANSWER: Z) INCOMPLETE DOMINANCE

BONUS

4) GENERAL SCIENCE Short Answer What organ system, unique to aquatic vertebrae, is used to detect movements and pressure changes in water?

ANSWER: LATERAL LINE
TOSS-UP

5) EARTH AND SPACE Short Answer What is the spectral class of the Sun?

ANSWER: G (ACCEPT: G2, G2V)

BONUS

5) EARTH AND SPACE Multiple Choice Which of the following accurately describes the structure of the Sun?

W) Convective core, convective envelope
X) Radiative core, radiative envelope
Y) Convective core, radiative envelope
Z) Radiative core, convective envelope

ANSWER: Z) RADIATIVE CORE, CONVECTIVE ENVELOPE

TOSS-UP

6) MATH Multiple Choice A couple bought a house and calculated that they would pay 30% of their combined monthly income of $5,700 toward the monthly mortgage payment on the house. How much will the couple pay for their monthly mortgage payment?

W) $1,650
X) $1,710
Y) $1,900
Z) $2,400

ANSWER: X) $1,710

BONUS

6) MATH Short Answer The perimeter of your garden is 10 4/5 [10 and four-fifths] yards. You purchased wooden planks to edge the garden, but you accidentally bought 12 1/3 [12 and one-third] yards of wood. How many yards of wood will be unused?

ANSWER: 1 8/15 (ACCEPT: 23/15)
**TOSS-UP**

7) LIFE SCIENCE *Multiple Choice* In the spring of 2013, scientists from the University of Michigan and Louisiana State University predicted that a particular coastal region of the US would experience a record breaking dead-zone. For what region was this prediction made?

W) Gulf of Mexico  
X) Puget Sound  
Y) Gulf of California  
Z) George’s Bank

**ANSWER:** W) GULF OF MEXICO

**BONUS**

7) LIFE SCIENCE *Short Answer* What is the MOST common term for the general type of nourishment characteristic of mushrooms, in which the organism derives its nutrients by absorbing the biological products of a dead or dying organism?

**ANSWER:** SAPROPHYTIC (ACCEPT: SAPROBE, SAPROPHAGE, SAPROPHYTE, SAPROZOIC, OR SAPROTROPH)

**TOSS-UP**

8) PHYSICAL SCIENCE *Multiple Choice* Which of the following is NOT correct about the gravitational force between two objects?

W) It behaves independently of the law of conservation of energy  
X) It is a form of potential energy  
Y) It is directly proportional to the mass of the two objects  
Z) It is related to the distance between the objects

**ANSWER:** W) IT BEHAVES INDEPENDENTLY OF THE LAW OF CONSERVATION OF ENERGY

**BONUS**

8) PHYSICAL SCIENCE *Multiple Choice* What substances, by definition, produce ions when dissolved in water?

W) Electrolytes  
X) Elements  
Y) Molecules  
Z) Nonpolar

**ANSWER:** W) ELECTROLYTES
TOSS-UP

9) GENERAL SCIENCE Short Answer What term refers to the tip of a plant shoot or root that produces auxin [AWK-sin], causing the shoot or root to increase in length?

ANSWER: APICAL MERISTEM (DO NOT ACCEPT: APICAL OR MERISTEM ALONE)

BONUS

9) GENERAL SCIENCE Multiple Choice Which of these trees does NOT belong to the family Juglandaceae [joo-gluhn-DAH-cee-ee]?

W) Pecan
X) Butternut
Y) Tree of heaven
Z) Walnut

ANSWER: Y) TREE OF HEAVEN

TOSS-UP

10) EARTH AND SPACE Multiple Choice The dark low-lying areas of the Moon are composed of which type of rock?

W) Basalt
X) Gabbro
Y) Rhyolite [RY-uh-lyt]
Z) Granite

ANSWER: W) BASALT

BONUS

10) EARTH AND SPACE Short Answer Nephrite is a metamorphic rock that is better known as what green ornamental stone?

ANSWER: JADE
TOSS-UP

11) MATH *Multiple Choice* The mean of four observations is 15. What is the new mean after an additional observation with value 25?

W) 15  
X) 17  
Y) 25  
Z) 32

ANSWER: X) 17

BONUS

11) MATH *Short Answer* When $500 is divided between three people, one person gets 2/5 of the money, and another gets 3/10 of the money. How much money in dollars does the third person get?

ANSWER: $150

TOSS-UP

12) ENERGY *Short Answer* What is the largest component of solar irradiance on a clear day?

ANSWER: DIRECT NORMAL IRRADIANCE (ACCEPT: DNI, BEAM RADIATION, DIRECT, DIRECT IRRADIANCE, DIRECT RADIATION)

BONUS

12) ENERGY *Short Answer* Coal plants, hydroelectric plants, nuclear power plants, and wind farms all have what two pieces of machinery in common?

ANSWER: TURBINES AND GENERATORS (ACCEPT: TURBINE, GENERATOR)
TOSS-UP

13) LIFE SCIENCE Multiple Choice Which organism existed over 3.5 billion years ago and is considered a living fossil?

W) Stromatolite [stroh-MAT-l-yt]
X) Algae
Y) Krill
Z) Trilobite

ANSWER: W) STROMATOLITE

BONUS

13) LIFE SCIENCE Multiple Choice Which of the following leukocytes [LOO-kuh-sits] occurs in the LEAST abundance in the healthy human body?

W) Lymphocyte [LIM-fuh-syt]
X) Eosinophil [ee-uh-SIN-uh-fil]
Y) Neutrophil [NOO-truh-fil]
Z) Basophil

ANSWER: Z) BASOPHIL

TOSS-UP

14) PHYSICAL SCIENCE Multiple Choice The largest voltage drop would be measured across which of the following circuit components?

W) Conduction loop with 7 amp current and 2 ohm resistance
X) Individual circuit component with 2 amp current and 8.5 ohm resistance
Y) Conduction loop with 4 amp current and 4.5 ohm resistance
Z) Individual circuit component with 5 amp current and 3 ohm resistance

ANSWER: Y) CONDUCTION LOOP WITH 4 AMP CURRENT AND 4.5 OHM RESISTANCE

BONUS

14) PHYSICAL SCIENCE Short Answer A diffraction grating for light acts somewhat like a prism: when light is viewed through it, the constituent colors that blend to create the original light are separated. If a white LED bulb is viewed through a diffraction grating, give the constituent colors that will be viewed by the observer looking through the grating, in the order that they appear.

ANSWER: RED, ORANGE, YELLOW, GREEN, BLUE, INDIGO, AND VIOLET (ACCEPT: VISABLE SPECTRUM OR COLORS IN REVERSE ORDER)
TOSS-UP

15) GENERAL SCIENCE Multiple Choice Which is the FARTHEST planet from the Sun?

W) Pluto
X) Neptune
Y) Saturn
Z) Mars

ANSWER: X) NEPTUNE

BONUS

15) GENERAL SCIENCE Short Answer Identify all of the following four features that serve to distinguish vascular plants from nonvascular plants: 1) sporophytes \([\text{SPOH-uh-fyts}]\); 2) specialized conducting tissue; 3) rhizoids \([\text{RY-zoids}]\); 4) secondary growth

ANSWER: 2 AND 4 (ACCEPT: SPECIALIZED CONDUCTING TISSUE AND SECONDARY GROWTH)

TOSS-UP

16) ENERGY Multiple Choice The United States imports most of its crude oil from what country?

W) Iraq
X) Saudi Arabia
Y) Venezuela
Z) Canada

ANSWER: Z) CANADA

BONUS

16) ENERGY Multiple Choice A 100 watt light bulb is on for 10 hours in the U.S. What is the average approximate cost in electricity for that one hour?

W) $.02
X) $.10
Y) $.25
Z) $.50

ANSWER: X) $.10
TOSS-UP

17) EARTH AND SPACE Short Answer The solar wind is essentially the Sun's atmosphere boiling off. What ion makes up 96% of the solar wind?

ANSWER: HYDROGEN (ACCEPT: H⁺; DO NOT ACCEPT: ALPHA PARTICLES)

BONUS

17) EARTH AND SPACE Multiple Choice Which of the following plates is NOT a past or present tectonic plate?

W) Farallon [fa-ruh-LON]
X) Scotia
Y) Laurentian [lo-REN-shuhn]
Z) Juan de Fuca [WAHN di FYOO-kuh]

ANSWER: Y) LAURENTIAN

TOSS-UP

18) MATH Multiple Choice A florist buys roses at 50 cents apiece and sells them for one dollar apiece. If there are no other expenses, how many roses must be sold in order to make a profit of $300?

W) 150
X) 200
Y) 300
Z) 600

ANSWER: Z) 600

BONUS

18) MATH Short Answer Arrange the following three numbers in order from least to greatest: π, √10, and 22/7.

ANSWER: π, 22/7, √10
**TOSS-UP**

19) LIFE SCIENCE *Multiple Choice* What is the location of the biceps femoris muscle?

W) Chest  
X) Leg  
Y) Abdomen  
Z) Thigh  

**ANSWER:** Z) THIGH

**BONUS**

19) LIFE SCIENCE *Short Answer* In the U.S., what potentially lethal disease is carried by deer mice and transferred to humans?

**ANSWER:** HANTAVIRUS (ACCEPT: HANTAVIRUS HEMORRHAGIC FEVER; HANTAVIRUS PULMONARY SYNDROME; SIN NOMBRE HANTAVIRUS)

**TOSS-UP**

20) PHYSICAL SCIENCE *Multiple Choice* LHC is an acronym for an instrument used in particle physics experiments located in Europe. For which of the following phrases is LHC the acronym?

W) Long Hadron Collider  
X) Large Hadron Collider  
Y) Large Higgs Collider  
Z) Large Hadron Collinearator  

**ANSWER:** X) LARGE HADRON COLLIDER

**BONUS**

20) PHYSICAL SCIENCE *Short Answer* A universal property of waves is that they transfer what quantity?

**ANSWER:** ENERGY
TOSS-UP

21) GENERAL SCIENCE *Multiple Choice* A monsoon refers to which of the following?

W) A heavy rain storm
X) A tropical, wet equatorial zone
Y) A larger than average flood
Z) A seasonally, dominant wind pattern

**ANSWER: Z) A SEASONALLY, DOMINANT WIND PATTERN**

**BONUS**

21) GENERAL SCIENCE *Short Answer* Zebra mussels, Burmese pythons, silver carp, and nutria are all examples of what type of ecological threat?

**ANSWER: INVASIVE SPECIES (ACCEPT: INVASIVE EXOTICS, NONNATIVE INVASIVE SPECIES)**

TOSS-UP

22) EARTH AND SPACE *Short Answer* Geysers are located near what kind of areas?

**ANSWER: VOLCANIC (ACCEPT: GEOLOGICALLY ACTIVE OR THERMAL)**

**BONUS**

22) EARTH AND SPACE *Multiple Choice* In which of the following depositional settings will sedimentary rock layers be deposited non-horizontally?

W) Prograding delta
X) Lake
Y) River
Z) Ocean basin

**ANSWER: W) PROGRADING DELTA**
TOSS-UP

23) MATH Multiple Choice What is the value of y if (3, y) [the ordered pair 3, y] is a solution to the equation: 5x – 3y = 18?

W) -11
X) -1
Y) 1
Z) 3

ANSWER: X) -1

BONUS

23) MATH Short Answer In the arithmetic operation long division, answers are often expressed as a whole number quotient with a whole number remainder. Indicate all of the following four choices that are also commonly used to represent the result of long division: 1) improper fraction, 2) mixed fraction, 3) decimal, 4) logarithm

ANSWER: MIXED FRACTION AND DECIMAL (ACCEPT: 2 AND 3)