

ROUND 2A

TOSS-UP

1) LIFE SCIENCE *Multiple Choice* Which scientist is credited with discovering cells?

- W) Charles Darwin
- X) Anton van Leeuwenhoek [**LAY-vuhn-hook**]
- Y) Robert Hooke
- Z) Francis Crick

ANSWER: Y) ROBERT HOOKE

BONUS

1) 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

TOSS-UP

2) PHYSICAL SCIENCE *Multiple Choice* The electron volt is a measure of which of the following?

- W) Energy
- X) Inertia
- Y) Power
- Z) Charge

ANSWER: W) ENERGY

BONUS

2) PHYSICAL SCIENCE *Short Answer* What is the term given to the result of adding multiple waves together?

ANSWER: SUPERPOSITION

TOSS-UP

3) ENERGY *Multiple Choice* Which of the following energy sources produces the greatest carbon dioxide emissions?

- W) Wind
- X) Coal
- Y) Nuclear
- Z) Geothermal

ANSWER: X) COAL

BONUS

3) ENERGY *Multiple Choice* In the coming years, most of the increases in U.S. natural gas production is expected to come from hydraulic fracturing in which type of sedimentary rock?

- W) Sandstone
- X) Limestone
- Y) Shale
- Z) Gypsum

ANSWER: Y) SHALE

TOSS-UP

4) GENERAL SCIENCE *Multiple Choice* Which of the following atmospheric layers contains the ozone layer?

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

ANSWER: Y) STRATOSPHERE

BONUS

4) GENERAL SCIENCE *Multiple Choice* Which of the following organelles is full of digestive enzymes?

- W) Central vacuole [**VAK-yoo-oh**]
- X) Endoplasmic reticulum [**EN-duh-plaz-mik ri-TIK-yuh-luhm**]
- Y) Lysosome [**LY-suh-sohm**]
- Z) Golgi apparatus

ANSWER: Y) LYSOSOME

TOSS-UP

5) EARTH AND SPACE *Multiple Choice* The wavelength of an ocean wave is defined by which of the following?

- W) The distance from crest to trough
- X) The height of the wave from crest to trough
- Y) The height change from trough to trough
- Z) The distance between crests

ANSWER: Z) THE DISTANCE BETWEEN CRESTS

BONUS

5) EARTH AND SPACE *Short Answer* Which class of star cluster is most spherical in shape?

ANSWER: GLOBULAR CLUSTERS

TOSS-UP

6) MATH *Multiple Choice* Which of the following pairs of angles is supplementary?

- W) 44° and 126°
- X) 75° and 105°
- Y) 65° and 25°
- Z) 36° and 54°

ANSWER: X) 75° AND 105°

BONUS

6) MATH *Short Answer* Use the distributive property to rewrite the following expression: $6t(4s - 3t + 7)$ [**6t times the quantity 4s minus 3t plus 7**].

ANSWER: $24ts - 18t^2 + 42t$ (ACCEPT: $24st - 18t^2 + 42t$)

TOSS-UP

7) LIFE SCIENCE *Multiple Choice* Which of the following animals feeds by standing on its head and kicking food in its mouth?

- W) Limpet
- X) Barnacle
- Y) Sea star
- Z) Crab

ANSWER: X) BARNACLE

BONUS

7) LIFE SCIENCE *Short Answer* In a marine environment, what name is given to the collective group of organisms that serve as primary producers?

ANSWER: PHYTOPLANKTON

TOSS-UP

8) PHYSICAL SCIENCE *Multiple Choice* The smallest particle that maintains the chemical properties of a compound is called which of the following?

- W) A molecule
- X) An isotope
- Y) A proton
- Z) An atom

ANSWER: W) A MOLECULE

BONUS

8) PHYSICAL SCIENCE *Short Answer* How far will an object travel, in meters, if it is moving at 30 meters per second for 20 seconds?

ANSWER: 600

TOSS-UP

9) GENERAL SCIENCE *Multiple Choice* Which of the following best describes the overall process of meiosis [*my-OH-sis*]?

- W) One parent cell produces two daughter cells
- X) One parent cell produces four daughter cells
- Y) Two parent cells produce one daughter cell
- Z) Two parent cells produce two daughter cells

ANSWER: X) ONE PARENT CELL PRODUCES FOUR DAUGHTER CELLS

BONUS

9) GENERAL SCIENCE *Short Answer* Carbon has three isotopes: carbon-12, carbon-13, and carbon-14. How many protons are in the nucleus [*NOO-klee-uhs*] of these carbon atoms, respectively?

ANSWER: 6, 6, 6 (ACCEPT: 6 IN ALL 3)

TOSS-UP

10) EARTH AND SPACE *Multiple Choice* Which of the following does NOT increase ocean wave height?

- W) Increasing wind speed
- X) Longer periods of sustained winds
- Y) Increased distance over which the wind blows the water
- Z) Irregular water depth

ANSWER: Z) IRREGULAR WATER DEPTH

BONUS

10) EARTH AND SPACE *Short Answer* Temperature increases with height in the stratosphere due to the absorption of UV energy by what molecule?

ANSWER: OZONE

TOSS-UP

11) MATH *Multiple Choice* Which of the following fractions is the SMALLEST?

- W) $5/10$
- X) $3/7$
- Y) $3/8$
- Z) $4/9$

ANSWER: Y) $3/8$

BONUS

11) MATH *Short Answer* Find the height of a right triangle whose area and base are 10 and 5, respectively.

ANSWER: 4

TOSS-UP

12) ENERGY *Short Answer* Which molecule is used for energy transfer and storage inside cells?

ANSWER: ATP (ACCEPT: ADENOSINE TRIPHOSPHATE)

BONUS

12) ENERGY *Multiple Choice* Destruction of Earth's ozone layer is expected to increase the incidence of all but which of the following?

- W) Diabetes
- X) Skin cancers
- Y) Cataracts
- Z) Skin aging

ANSWER: W) DIABETES

TOSS-UP

13) LIFE SCIENCE *Multiple Choice* Which of the following groups are all invertebrates?

- W) Snails, bats, fish, and earthworms
- X) Snails, honeybees, sea star, and sea sponges
- Y) Grasshoppers, fruit flies, electric eels, and sea horses
- Z) Cows, pigs, horses, and chickens

ANSWER: X) SNAILS, HONEYBEES, SEA STAR, AND SEA SPONGES

BONUS

13) LIFE SCIENCE *Multiple Choice* Which of the following terms is used by microbiologists to describe a bacterium with a rod shape?

- W) Coccus [**KOK-uhs**]
- X) Bacillus [**buh-SIL-uhs**]
- Y) Spirochete [**SPY-ruh-keet**]
- Z) Helical

ANSWER: X) BACILLUS

TOSS-UP

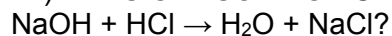
14) PHYSICAL SCIENCE *Multiple Choice* Which of the following subatomic particles are charged?

- W) Only electrons
- X) Electrons and neutrons
- Y) Electrons and protons
- Z) Electrons, neutrons, and protons

ANSWER: Y) ELECTRONS AND PROTONS

BONUS

14) PHYSICAL SCIENCE *Short Answer* What are the reactants in the equation:



ANSWER: NaOH, HCl (ACCEPT: SODIUM HYDROXIDE, HYDROGEN CHLORIDE OR HYDROCHLORIC ACID)

TOSS-UP

15) GENERAL SCIENCE *Multiple Choice* What era are we currently living in?

- W) Mesozoic
- X) Paleozoic
- Y) Proterozoic
- Z) Cenozoic

ANSWER: Z) CENOZOIC

BONUS

15) GENERAL SCIENCE *Short Answer* In an aquatic system, what are the TWO major microbial producers?

ANSWER: ALGAE AND PHYTOPLANKTON

TOSS-UP

16) ENERGY *Multiple Choice* Which of the following gases is being captured at landfills and used as a fuel?

- W) Methylene [**METH-uh-leen**]
- X) Molecular hydrogen
- Y) Hydrogen sulfide
- Z) Methane

ANSWER: Z) METHANE

BONUS

16) ENERGY *Multiple Choice* Which country is expected to have the largest shale gas reserves in the world?

- W) United States
- X) Norway
- Y) China
- Z) Brazil

ANSWER: Y) CHINA

TOSS-UP

17) EARTH AND SPACE *Short Answer* Where do the charged particles that strike the Earth's atmosphere near the poles and cause the northern lights, or aurora, originate?

ANSWER: THE SUN (ACCEPT: SOLAR WIND)

BONUS

17) EARTH AND SPACE *Multiple Choice* A Keplerian [**kep-LEER-ee-uhn**] orbit is a description of an orbiting body considering the gravitational interaction of two point masses. Which of the following is NOT a Keplerian orbit?

- W) Ellipse
- X) Parabola
- Y) Circle
- Z) Reuleaux curve [**roo-LOH**]

ANSWER: Z) REULEAUX CURVE

TOSS-UP

18) MATH *Multiple Choice* All vertices of a triangle are within quadrant 3. If the triangle is rotated clockwise about the origin 180 degrees, in which quadrant will the new triangle be located?

- W) Quadrant I
- X) Quadrant II
- Y) Quadrant III
- Z) Quadrant IV

ANSWER: W) QUADRANT I

BONUS

18) MATH *Short Answer* Convert $2 \frac{1}{8}$ to a decimal and to a percent.

ANSWER: 2.125 AND 212.5%

TOSS-UP

19) LIFE SCIENCE *Short Answer* A dinoflagellate [*din-uh-FLAJ-uh-layt*] is responsible for what phenomenon, which ultimately kills fish?

ANSWER: RED TIDE (ACCEPT: HARMFUL ALGAL BLOOM; HAB)

BONUS

19) LIFE SCIENCE *Multiple Choice* Which of the following is the primary feeding pattern for Cnidarians [*ny-DAIR-ee-uhns*]?

- W) Piscivores [*PI-si-vohrs*]
- X) Herbivores [*HUR-buh-vohrs*]
- Y) Scavengers
- Z) Carnivores

ANSWER: Z) CARNIVORES

TOSS-UP

20) PHYSICAL SCIENCE *Multiple Choice* What makes a material a good insulator?

- W) Having electrons that are bound and cannot move completely away from their nucleus [*NOO-kee-uhs*]
- X) Having a nucleus that contains a number of positively charged protons
- Y) Having electrons that are farther away from the nucleus
- Z) Having electrons that can drift away

ANSWER: W) HAVING ELECTRONS THAT ARE BOUND AND CANNOT MOVE COMPLETELY AWAY FROM THEIR NUCLEUS

BONUS

20) PHYSICAL SCIENCE *Multiple Choice* In general terms, an electric generator converts which of the following?

- W) Mechanical energy to electrical energy
- X) Mechanical energy to heat
- Y) Heat to electrical energy
- Z) Chemical energy to mechanical energy

ANSWER: W) MECHANICAL ENERGY TO ELECTRICAL ENERGY

TOSS-UP

21) GENERAL SCIENCE *Multiple Choice* Which of the following is an example of vascular tissue in plants?

- W) Chloroplasts
- X) Xylem [**ZY-luhm**]
- Y) Cotyledon [**kat-uhl-EED-uhn**]
- Z) Stomata

ANSWER: X) XYLEM

BONUS

21) GENERAL SCIENCE *Short Answer* Put the following four in order from LEAST to MOST complex: 1) organs, 2) molecules, 3) tissues, 4) cells.

ANSWER: MOLECULES, CELLS, TISSUES, AND ORGANS (ACCEPT: 2, 4, 3, 1)

TOSS-UP

22) EARTH AND SPACE *Short Answer* What is the main mechanism of marine transport of most terrigenous [**te-RIJ-uh-nuhs**] sediments?

ANSWER: GRAVITY

BONUS

22) EARTH AND SPACE *Multiple Choice* The part of a sea, lake, or river that is close to the shore is called which of the following?

- W) Littoral zone
- X) Riparian zone
- Y) Wetland
- Z) Marsh

ANSWER: W) LITTORAL ZONE

TOSS-UP

23) MATH *Short Answer* John's height is 0.23 meters less than Mike's height. Given that Mike's height is 1.88 meters, what is John's height in meters?

ANSWER: 1.65

BONUS

23) MATH *Short Answer* What length of packing tape, in inches, is needed to wrap 3 times around a circular mirror with a radius of 8 inches?

ANSWER: 48π