

Lesson 1. It's Alive Or Is It

1) Which of the following statements is the best argument for the classification of fire?

- A. Fire is nonliving because it cannot maintain the conditions needed to grow and reproduce.
- B. Fire is living because it uses energy and grows.

2) When your body regulates its temperature through sweating, this is an example of

Choose all that apply:

- A. Metabolism
- B. Homeostasis
- C. Responding to stimuli
- D. Growth
- E. Reproduction

3) When leaves change color in autumn, this is an example of

Choose all that apply:

- A. Metabolism
- B. Homeostasis
- C. Responding to stimuli
- D. Growth
- E. Reproduction

4) Which of the following can consume or produce energy?

Choose all that apply:

- A. Lava lamp
- B. Marmoset
- C. Fungi
- D. Battery
- E. Sidewalk

5) Which of the following is the official definition of life?

- A. A self-sustaining chemical system capable of Darwinian evolution.
- B. A system capable of performing functions such as growth, metabolizing, moving, and reproduction.
- C. The locus of points in a plane that are equidistant to a single point.
- D. There is no official definition of life.

Lesson 2. What Are Cells

1) Why did Robert Hooke choose the name "cell" for the small parts of plants he observed?

- A. They look like tiny cell phones
- B. It's from the Greek word for "tiny".
- C. They look like they are made from cellophane wrap .
- D. They looked empty, like the unfurnished rooms of monks.

2) Select the item(s) that are made of cells.

Choose all that apply:

- A. carrots
- B. window
- C. bone
- D. sugar
- E. milk

3) The _____ accounts for most of the mass of a cell.

- A. Membrane
- B. Nucleus
- C. Cytoplasm
- D. Ribosomes

4) What did Leeuwenhoek call the little creatures he saw through his microscope?

- A. Atomicals
- B. Animalcules
- C. Microbials
- D. Critters

5) Select the item(s) that are made of cells.

Choose all that apply:

- A. Carbon
- B. Yeast
- C. Candles
- D. Cinnamon
- E. Tardigrade

6) What cell part is most responsible for protecting the cell and helping it communicate and filter nutrients from its environment?

- A. Nucleus
- B. Membrane
- C. Ribosomes
- D. Cytoplasm

Lesson 3. Parts of The Cell

1) Select the item(s) that EVERY living cell has:

Choose all that apply:

- A. Nucleus
- B. Membrane
- C. DNA
- D. Mitochondria
- E. Ribosomes
- F. Chloroplasts
- G. Cell wall

2) Cells that do not contain a nucleus are called

3) True or False: Most prokaryotic cells are much larger than eukaryotic cells.

- A. True
- B. False

4) Cell walls can be found in which type of cells:

Choose all that apply:

- A. Plant
- B. Animal
- C. Bacteria
- D. Fungi
- E. Algae

5) Is hair made of cells?

- A. Yes
- B. No

6) Are teeth made of cells?

- A. Yes
- B. No

Lesson 4. Single Celled To Multi Celled

1) All animals are multicellular.

- A. True
- B. False

2) Is an individual human nerve cell alive?

- A. Yes
- B. No

3) Algae is a type of plant.

- A. True
- B. False

4) All fungi are multicellular

- A. True
- B. False

5) Select the multicellular organism(s) below.

Choose all that apply:

- A. Amoeba
- B. Tardigrade
- C. Seaweed
- D. Bakers yeast
- E. Fern

Lesson 5. Cell Quiz Show

1) When was the first compound microscope (a microscope with multiple lenses) invented?

- A. 1220
- B. 1590
- C. 1822
- D. 1903

2) Coral is best described as being

- A. an animal
- B. a plant
- C. a protist
- D. a fungi

3) White laser light is the most powerful color of laser light.

- A. True
- B. False

4) There are microscopes today that are powerful enough to see atoms.

- A. True
- B. False

5) Haloquadratum (a single-celled organism in salty pools) has no cytoplasm.

- A. True
- B. False

6) The small tails that cells use to propel themselves are called _____.

7) Would you rather encounter a robotic alien or an organic alien?

- A. robotic alien
- B. organic alien

8) Which of the following statements is true?

- A. Every cell has a nucleus.
- B. Fungi cells do not contain mitochondria.
- C. Algae cells are prokaryotic.
- D. Animals are always multicellular.

9) All eukaryotes are multicellular

- A. True
- B. False

10) Honey is made of cells

- A. True
- B. False

11) Select the organisms that have a cell wall.

Choose all that apply:

- A. Snail
- B. Kelp
- C. Mushroom
- D. Elm tree
- E. Lactobacillus bacteria

12) Bacteria have no mitochondria.

- A. True
- B. False

13) Select each example of homeostasis below.

Choose all that apply:

- A. Gazelles startle when they hear a loud sound.
- B. Saltwater fish drink water to replenish the water they have lost.
- C. A person starts shivering to warm themselves up when they are cold.
- D. A bird lays an egg in a nest.

14) If you could only eat with one utensil for the next two years, would you choose a fork, knife, or spoon?

- A. fork
- B. knife
- C. spoon

15) Which of the following can be made of cells?

Choose all that apply:

- A. Sand
- B. Wood
- C. Plastic
- D. Cement

16) There are no multicelled prokaryotes.

- A. True
- B. False

17) DNA is only found in the nucleus of a cell.

- A. True
- B. False

Lesson 6. Biomolecules

1) What is the best definition for a polymer?

- A. A long narrow object
- B. A geometric figure with many sides
- C. Something that is made of smaller repeating units
- D. A protist with multiple flagella

2) Proteins are made of which monomer:

- A. Phospholipids
- B. Nucleic acids
- C. Amino acids
- D. Fatty acids
- E. Sugars

3) Which will be more stiff and unflexible?

- A. A polymer with long strands that are cross linked together.
- B. A polymer with very short strands that do not have cross-linking.

4) Which of the following are polymers?

Choose all that apply:

- A. Salt
- B. Plastic
- C. DNA
- D. Protein
- E. Starch
- F. Water

5) Starch is made of which monomer?

- A. Phospholipids
- B. Nucleic acids
- C. Amino acids
- D. Fatty acids
- E. Sugars

Lesson 7. Membranes

1) Cell membranes are

- A. permeable
- B. impermeable
- C. semipermeable

2) Water moves across a membrane towards

- A. towards a high concentration of solutes
- B. towards a low concentration of solutes

3) What is a phospholipid

- A. A polymer of fatty acids
- B. The main ingredient of membranes
- C. A type of oil
- D. A hydrophobic molecule

4) Which statements about membranes is false?

- A. Animal membranes contain cholesterol.
- B. Phospholipids have a hydrophobic tail and a hydrophilic head.
- C. Membranes are mostly made of lipids.
- D. Bacteria have a cell wall instead of a membrane.

5) In a glass of salty water, the salt is the _____ and the water is the _____.

- A. solvent, solute
- B. solute, solvent
- C. solution, precipitate

Lesson 8. Proteins

1) Approximately how many different types of amino acids are used in living cells?

- A. 2
- B. 20
- C. 200
- D. 2,000

2) The human body can make most of the amino acids that it needs for creating proteins.

- A. True
- B. False

3) Some of the fastest enzymes can cause _____ reactions to happen per second.

- A. 10
- B. 100
- C. 10,000
- D. 1,000,000

4) Which of these statements is **false**?

- A. Keratin is a structural protein.
- B. An enzyme is a type of catalyst.
- C. Rubisco is a enzymatic protein.
- D. After binding to an enzyme, the substrate is unchanged.

5) All enzymes are proteins but not all proteins are enzymes.

- A. True
- B. False

Lesson 9. Sugars And Carbs

1) Common table sugar, also called sucrose, is made of how many monomers or "saccharide units"?

- A. 1
- B. 2
- C. 20+

2) Which tastes sweeter?

- A. Fructose
- B. Glucose

3) Starch in bread, rice, or potatoes, is a polymer made of which monomer?

- A. Glucose
- B. Amino acids
- C. Phospholipids
- D. Fructose

4) Brown sugar is white sugar plus molasses.

- A. True
- B. False

5) Which statement best explains why cornstarch mixed with water forms a thick gravy after being heated?

- A. The long polymers of starch break apart when heated and the smaller monomers bind tightly together.
- B. It's a defense mechanism. The thick gravy is an exoskeleton to meant to hold the structure in place.
- C. Before heating, the starch polymers are tightly packed in granules that do not dissolve well in water. After heating, the granules break apart and the polymers are released to form a branched net.
- D. The heat makes the polymers longer.

Lesson 10. DNA

1) Approximately, how many base pairs of DNA are inside a single human cell?

- A. 3,000
- B. 300,000
- C. 3,000,000
- D. 3,000,000,000

2) How many types of nucleotides are there?

- A. 4
- B. 20
- C. 350
- D. 4 billion

3) Which monomer of DNA pairs with cytosine?

- A. Adenine
- B. Guanine
- C. Aquamarine
- D. Thymine

4) Select the true statement.

- A. DNA is indestructible.
- B. Every part of DNA has an important function.
- C. The sequences of nucleotides in DNA determine the sequences of amino acids and proteins.
- D. Once we figure out the structure of DNA, we'll be able to live forever.

5) When was DNA first discovered?

- A. 1869
- B. 1904
- C. 1940
- D. 1951

Lesson 11. Extracting DNA

1) Humans have two copies of their DNA. A strawberry has eight.

- A. True
- B. False

2) The purpose of adding soap during the DNA extraction is to

- A. break open the membranes so the DNA can exit the cell
- B. cause the DNA to clump together or precipitate
- C. separate the cells from each other

3) Strawberries are more reliable for the DNA extraction experiment because:

- A. They have more DNA than peas
- B. They have enzymes that help digest cell walls
- C. They have lots of seeds
- D. They have a very high sugar content

4) The active ingredient in meat tenderizers (bromelain) comes from strawberries.

- A. true
- B. false

5) Which statement about DNA is true?

- A. It is a triple helix.
- B. It is made of five different bases, or nucleotides.
- C. The sequence of the DNA will determine the order of amino acids in a protein.
- D. It cannot be changed.

Lesson 12. Mitosis

1) The longest phase of the cell cycle is:

- A. Interphase
- B. Prophase
- C. Metaphase
- D. Anaphrase
- E. Telophase and Cytokinesis

2) A cell with chromosomes paired together and lined up in the center of the cell is in:

- A. Interphase
- B. Prophase
- C. Metaphase
- D. Anaphrase
- E. Telophase and Cytokinesis

3) If a certain type of cell goes through mitosis every 10 minutes, how many minutes will it take for a population of 3 cells to grow to a population of 96 cells?

_____ minutes

4) In animal cells, the nuclear membrane stays intact throughout mitosis.

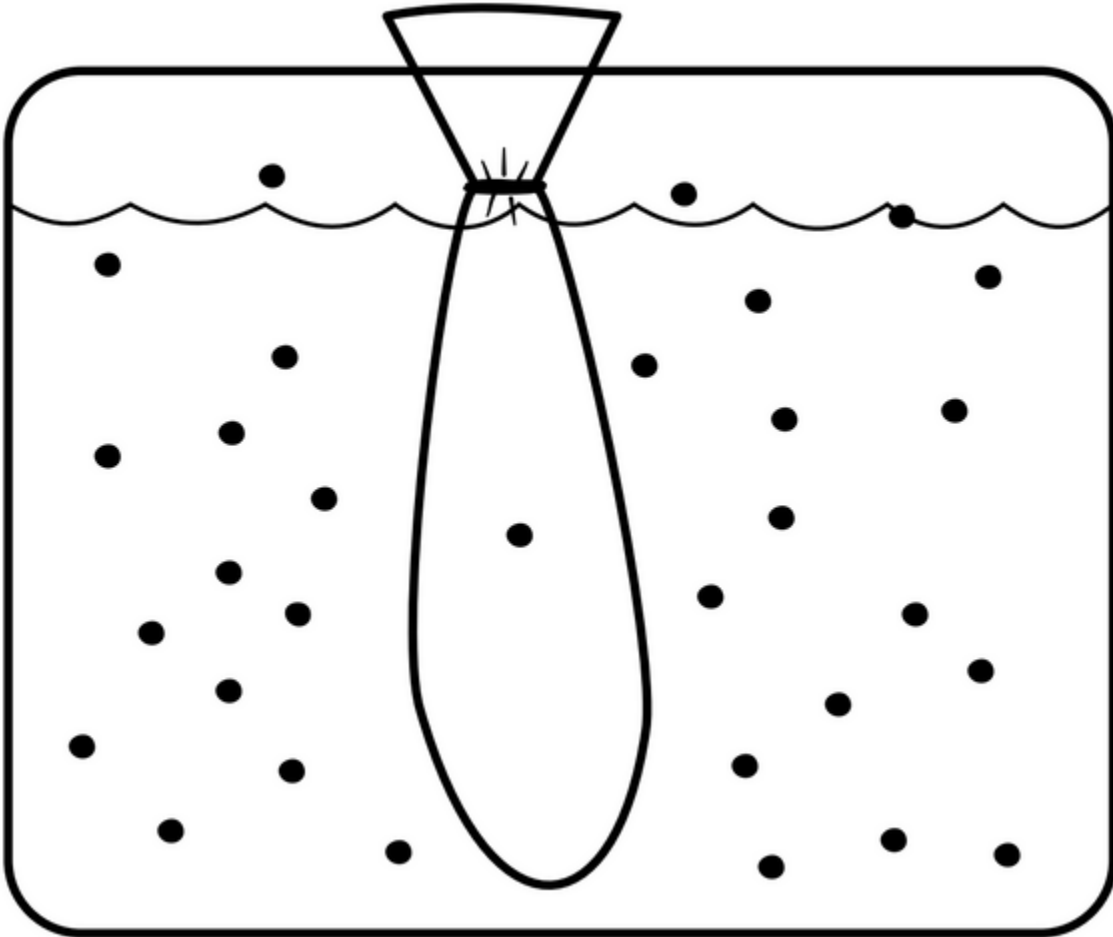
- A. True
- B. False

5) In a healthy animal, which types of cells go through mitosis most often?

- A. Skin and blood cells
- B. Nerve and kidney cells
- C. All cells maintain the same rate of cell division

Lesson 13. Biomolecules Quiz Show

1) The picture shows solute concentrations in water inside a bag with a semipermeable membrane.



What will happen next?

- A. Water will flow into the bag.
- B. Water will flow out of the bag.
- C. Nothing will change.

2) The biggest protein in the human body is made of 34,000 amino acids.

- A. True
- B. False

3) Protein is only found in animal products.

- A. True
- B. False

4) What is cholesterol's role in a cell membrane?

- A. It allows molecules to pass from one side to the other.
- B. It fights off invaders.
- C. It's the main ingredient of a membrane.
- D. It stabilizes the membrane.

5) People living in developed countries are more likely to suffer from protein excess than protein deficiency.

- A. True
- B. False

6) Select the true statement.

- A. DNA is a polymer of amino acids.
- B. Adenine always pairs with cytosine.
- C. Rubisco is the most abundant enzyme on Earth.
- D. The enzyme lactase can break down starch.

7) Which animal has fingerprints that are so indistinguishable from humans that they have been confused at a crime scene?

- A. Orangutan
- B. Koala
- C. Chimpanzee
- D. Marmoset

8) What is the most abundant biomolecule in your body by mass?

- A. Carbohydrates
- B. DNA
- C. Lipids
- D. Protein

9) A colony of bacteria grows from 5 bacteria to 80 bacteria in 1 hour. How long does it take for one member of this colony to divide?

- A. 4 minutes
- B. 10 minutes
- C. 12 minutes
- D. 15 minutes
- E. 20 minutes

10) What cells in your body have the fastest rate of division?

- A. intestinal, epithelial cells
- B. nerve cells
- C. liver cells
- D. blood cells

11) Would you rather have telekinesis (the ability to move things with your mind) or telepathy (the ability to read minds)?

- A. telekinesis
- B. telepathy

12) Who is credited as the first to discover and describe cells?

- A. Antonie van Leuvenhooke
- B. Robert Hooke
- C. Rosalind Franklin
- D. Watson and Crick

13) You can tell if water is safe to drink just by looking at it.

- A. True
- B. False

14) Cell membranes are made of

- A. Proteins
- B. Carbohydrates
- C. Lipids
- D. DNA

15) Which of the following statements about protein is false.

- A. All enzymes are made of proteins.
- B. Proteins are synthesized by mitochondria.
- C. Hair is mostly made of a structural protein called keratin.
- D. There are 9 essential amino acids that humans can't make on their own.

16) Table sugar is made of which monomer(s)?

Choose all that apply:

- A. sucralose
- B. glucose
- C. lactose
- D. galactose
- E. fructose

17) Of the nucleotides in a double helix strand of DNA, if 32% are thymine, then what portion of the nucleotides are adenine?

_____ %.

18) If you lined up all the DNA strands in a single strawberry end-to-end, it would stretch about 2 meters (6 and a half feet)?

- A. True
- B. False

19) Of the nucleotides in a double helix strand of DNA, if 20% are cytosine, then what portion of the nucleotides are thymine?

_____ %.

Lesson 14. Where Does Energy Come From

1) Which of the following is not an autotroph?

- A. Moss
- B. Cyanobacteria
- C. Kelp
- D. Streptococcus
- E. Methanogens

2) Food is the only energy source for animals and bacteria.

- A. True
- B. False

3) The Greek word "trophos" means

- A. Food or nourishment
- B. Self
- C. Other
- D. Change

4) Which of the following statements is true?

- A. All plants are autotrophs.
- B. All fungi are heterotrophs.
- C. A heterotroph makes its own food.
- D. There are no autotrophic bacteria.

5) All insects are heterotrophs.

- A. True
- B. False

Lesson 15. Animals And Fungi

1) Organisms that consume dead or decaying material are called

Choose all that apply:

- A. detritivores
- B. carnivores
- C. decomposers
- D. parasites
- E. herbivores

2) All animals have stomachs.

- A. True
- B. False

3) The visible mushroom is only a small part of a fungus. Most of the mass is underground.

- A. True
- B. False

4) Whales are primarily:

- A. herbivores
- B. carnivores
- C. omnivores
- D. detritivores

5) All fungi are decomposers

- A. True
- B. False

Lesson 16. Respiration

1) In respiration,

- A. glucose is used to create carbon dioxide.
- B. carbon dioxide is used to create glucose.

2) If a person uses a straw to blow bubbles in cabbage juice, the resulting color change is caused by:

- A. Oxygen
- B. Carbon Dioxide
- C. Glycolysis
- D. Respiration

3) Without oxygen, cells cannot extract energy from glucose.

- A. True
- B. False

4) What are the products of respiration?

- A. Glucose and oxygen
- B. Oxygen and carbon dioxide
- C. Glucose and water
- D. Carbon dioxide and water

5) Why is the mitochondria called the powerhouse of the cell?

- A. Most of the steps of respiration take place inside the mitochondria.
- B. The mitochondria used to be a free living prokaryotic cell.
- C. The mitochondria is the most abundant organelle in the cell.

Lesson 17. Plants

1) Corn, wheat, and rice provide more than half of the food energy for the human population.

- A. True
- B. False

2) Flowering plants are also called:

- A. Bryophytes
- B. Gymnosperms
- C. Pteridophytes
- D. Angiosperms

3) Which types of plants reproduce using spores?

Choose all that apply:

- A. Bryophytes
- B. Gymnosperms
- C. Pteridophytes
- D. Angiosperms

4) If a plant makes seeds but does not have flowers it is a:

Choose all that apply:

- A. Bryophyte
- B. Gymnosperm
- C. Pteridophyte
- D. Angiosperm

5) Plants are found growing on every continent, including Antarctica.

- A. True
- B. False

Lesson 18. Photosynthesis

1) Is energy required or produced by the reactions of photosynthesis?

- A. Required
- B. Produced

2) Which statement about photosynthesis is false?

- A. Animals do not perform photosynthesis and plants do not perform respiration.
- B. Most of the mass of a tree comes from air and water.
- C. The plant kingdom contains both autotrophs and heterotrophs.
- D. Photosynthesis takes place inside chloroplasts

3) The products of photosynthesis are:

- A. Glucose and oxygen
- B. Carbon dioxide and glucose
- C. Glucose and water
- D. Water and carbon dioxide
- E. Carbon dioxide and oxygen

4) Which of the following are capable of performing photosynthesis?

Choose all that apply:

- A. Bacteria
- B. Protists
- C. Plants
- D. Fungi
- E. Animals

5) The oxygen we breathe is a product of photosynthesis. Did it come from water or carbon dioxide?

- A. Water
- B. Carbon dioxide

Lesson 19. Archaea And Bacteria

1) Which of the following are locations where prokaryotes are found?

Choose all that apply:

- A. Inside animals
- B. In permafrost
- C. By hydrothermal vents at the bottom of the ocean
- D. In salt flats and brine pool
- E. In lava

2) A species of bacteria survived being in outer space for 3 years.

- A. True
- B. False

3) Which of the following statements about bacteria and archaea are true?

Choose all that apply:

- A. All bacteria need oxygen to survive
- B. Some bacteria live inside other organisms
- C. Most bacteria are pathogenic
- D. Archaea do not have cell walls
- E. By number, prokaryotes are the most numerous and diverse organisms on Earth

4) Which of the following is not something that is commonly used to sterilize a surface?

Choose all that apply:

- A. Autoclave
- B. Alcohol
- C. Salt
- D. Ultraviolet light

5) There's a bacteria that can withstand 1,000 times the amount of radiation that would be fatal to a human.

- A. True
- B. False

Lesson 20. DIY Petri Dishes

1) An area that is free from bacteria or other living microorganisms is called:

Sterile

Clean

Endemic

Contaminated

Caustic

- A. Caustic
- B. Clean
- C. Endemic
- D. Sterile
- E. Contaminated

2) There are thousands of fungal spores in every cubic meter of air.

- A. True
- B. False

3) Every type of bacteria can be grown on a petri dish.

- A. True
- B. False

4) Which of the following statements about agar is false?

- A. Agar is an extract derived from sea weed.
- B. Agar is the best source of food for many bacteria and fungi.
- C. Agar is indigestible to many bacteria and fungi.
- D. Gelatin can be substituted for agar when making DIY petri dishes.

5) Why is it important for an experiment to have a control group?

- A. Scientists need to be in control of the results of their experiments.
- B. A control group is one where conditions are changed the most.
- C. A control group helps determine whether the experiment is testing what it claims to be testing.
- D. A control group can be forced to behave a certain way.

Lesson 21. Diversity Of Life Quiz Show

1) Select each domain of life that has no autotrophs.

Choose all that apply:

- A. Plant
- B. Animal
- C. Fungus
- D. Bacteria
- E. Protist
- F. Archaea

2) Select each domain of life that contains organisms that can photosynthesize.

Choose all that apply:

- A. Plant
- B. Animal
- C. Fungus
- D. Bacteria
- E. Protist
- F. Archaea

3) Select each domain of life with cells that contain a nucleus.

Choose all that apply:

- A. Plant
- B. Animal
- C. Fungus
- D. Bacteria
- E. Protist
- F. Archaea

4) It takes about 2 hours to grow a visible colony of bacteria in a Petri dish at room temperature.

- A. True
- B. False

5) If a certain type of bacteria goes through mitosis once every hour, how many hours will it take for a colony of 10 bacteria to become a colony of 320 bacteria? _____ hours

6) The most massive organism on the planet today is a

- A. Plant
- B. Animal
- C. Fungus
- D. Bacteria
- E. Protist
- F. Archaea

7) Which things does a plant absolutely require to survive?

Choose all that apply:

- A. Water
- B. Soil
- C. Light
- D. Carbon Dioxide
- E. Bees

8) The largest protist is smaller than the smallest animal.

- A. True
- B. False

9) What are the products of respiration?

Choose all that apply:

- A. Glucose
- B. Water
- C. Carbon Dioxide
- D. Oxygen
- E. Light Energy
- F. Chemical Energy

10) Under the scope mystery: What is this an image of? (Submitted by Carter and William)



- A. Bird Egg
- B. Marble
- C. Deer Antler
- D. Paint Chip

11) All the yellow stuff falling in the image is pollen.



- A. True
- B. False

12) Select each domain of life that can come as a single-celled organism.

Choose all that apply:

- A. Plant
- B. Animal
- C. Fungus
- D. Bacteria
- E. Protist
- F. Archaea

13) What type of plant has seeds but no flowers?

- A. Bryophyte
- B. Pteridophyte
- C. Angiosperm
- D. Gymnosperm

14) Would you rather have a time machine or a teleporter?

- A. Time machine
- B. Teleporter

15) A tardigrade is an example of

- A. an autotroph
- B. a heterotroph

16) What type of plant is shown below?



- A. Bryophyte
- B. Pteridophyte
- C. Angiosperm
- D. Gymnosperm

17) I am a single-celled organism with a cell wall made of chitin. What am I?

- A. E-coli
- B. Volvox
- C. Tardigrade
- D. Duckweed
- E. Yeast

18) What are the products of photosynthesis?

Choose all that apply:

- A. Glucose
- B. Water
- C. Carbon Dioxide
- D. Oxygen
- E. Light Energy
- F. Chemical Energy

19) Some plants use only photosynthesis for energy, while other plants use respiration for energy.

- A. True
- B. False

Lesson 22. Systems Of The Body

1) Adult humans have how many bones?

- A. 88
- B. 135
- C. 176
- D. 206

2) What is the largest organ of the body?

- A. Heart
- B. Skin
- C. Brain
- D. Bladder
- E. Liver

3) More than half of your bones are in your hands and feet.

- A. True
- B. False

4) Humans have one bone that isn't connected to any other bones.

- A. True
- B. False

5) Where is the largest muscle of the body?

- A. arms
- B. legs
- C. butt
- D. abdomen
- E. neck

Lesson 23. What Is Blood

- 1) The flow of blood between the heart and the lungs is called
 - A. Limbic Circulation
 - B. Pulmonary Circulation
 - C. Systemic Circulation
 - D. Aortic Circulation

- 2) Which component of blood prevents bleeding?
 - A. Plasma
 - B. Red Blood Cells
 - C. White Blood Cells
 - D. Platelets

- 3) The most numerous type of cell in the human body is a
 - A. red blood cell
 - B. white blood cell
 - C. skin cell
 - D. nerve cell

- 4) How long does it take a red blood cell to do a full circuit of the body?
 - A. 1 min
 - B. 1 hour
 - C. 1 day
 - D. 120 days

- 5) What causes people to have different blood type (such as A positive or O negative)?
 - A. Different types of cell membranes
 - B. Different concentrations of plasma
 - C. Different platelet shapes
 - D. Different proteins on red blood cells

Lesson 24. Respiratory System

1) Which of the following statements is true?

- A. Insects don't breathe.
- B. Lungs cells are coated with mucus.
- C. Horses breathe through their mouths.
- D. If you inhale pollen or dust, those particles become trapped inside your lungs. There is no way to get them out.

2) What causes hiccups?

- A. Swallowing air
- B. A condition of the nerves around the lungs
- C. The trachea contracting
- D. Muscle spasms from the diaphragm

3) A person can live with only one lung.

- A. True
- B. False

4) The exchange of gases in the human body occurs primarily in the:

- A. Trachea
- B. Bronchial tubes
- C. Alveoli
- D. Liver
- E. Spleen

5) Approximately how many times does a person breathe each day?

- A. 230
- B. 2,300
- C. 23,000
- D. 230,000

Lesson 25. Nervous System

1) How do neurons communicate with each other?

Choose all that apply:

- A. Chemically
- B. Radio Waves
- C. Electrically
- D. Light Signals

2) All animals have nerves.

- A. True
- B. False

3) What is a synapse?

- A. A brief summary of a story
- B. The long fiber in a nerve cell
- C. The gap between two neurons
- D. A type of reflex

4) Without the nervous system, you couldn't

Choose all that apply:

- A. walk
- B. think
- C. breathe
- D. feel

5) Some nerves are so long that they connect your spinal cord to your feet.

- A. True
- B. False

Key:

1. C, A

2. B

3. C

4. B, A, C, D

5. A

Lesson 26. Digestive System

1) What system of the body contains the liver?

- A. Digestive
- B. Circulatory
- C. Respiratory
- D. Urinary

2) Select each true statement below?

Choose all that apply:

- A. Most of our digestion takes place in the stomach.
- B. The esophagus leads to the lungs.
- C. The stomach can expand and shrink.
- D. It takes 2 weeks for food to move through the GI tract.

3) There are more bacteria cells in the body than there are human cells.

- A. True
- B. False

4) The digestive process starts in

- A. stomach
- B. mouth
- C. bathroom
- D. intestines

5) Organisms in the microbiome are responsible for

Choose all that apply:

- A. helping to harvest energy from food
- B. producing vitamins
- C. producing red blood cells
- D. preventing pathogenic bacteria from causing infections
- E. producing methane

Lesson 27. Immune System

1) Which of the following organs are part of the immune system?

Choose all that apply:

- A. Tonsils
- B. Liver
- C. Kidney
- D. Spleen
- E. Thymus
- F. Adenoids

2) Which statement about the lymphatic system is false?

- A. The lymph system delivers fluid to the circulatory system.
- B. The lymph system contains red blood cells.
- C. The lymph system is connected to hundreds of lymph nodes.
- D. Lymph is a colorless fluid containing white blood cells.

3) The immune system behaves differently towards a pathogen it has seen before compared to one it hasn't seen before.

- A. True
- B. False

4) Which of the following can be part of an immune response?

Choose all that apply:

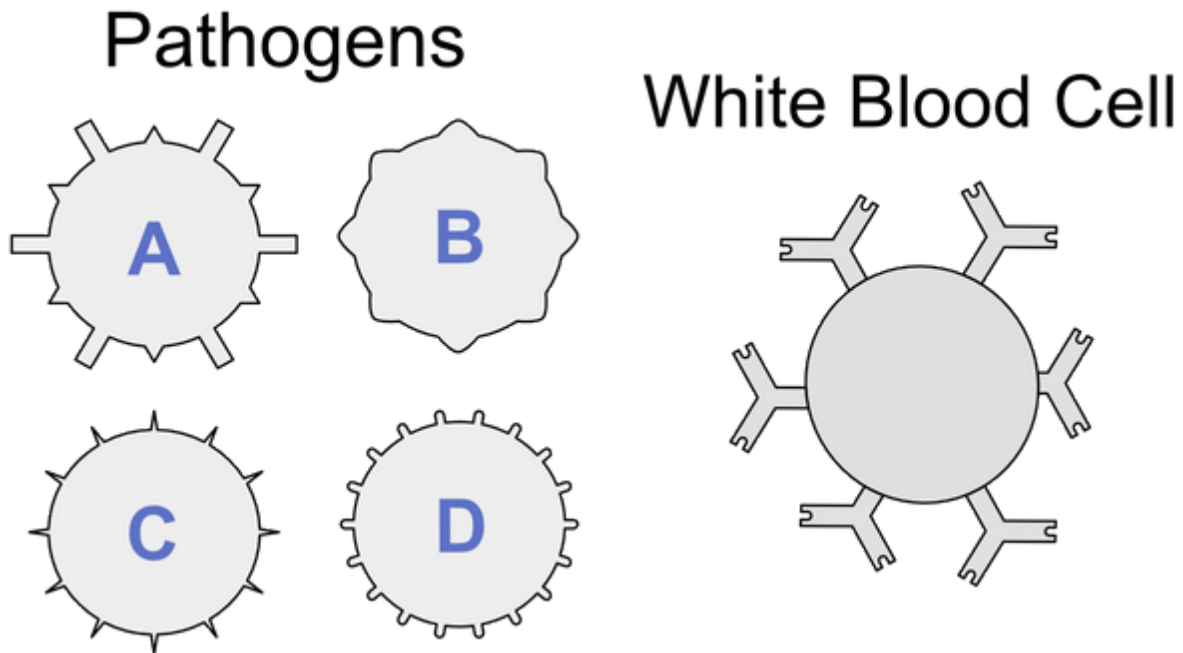
- A. Blood Clots
- B. Reduced Body Temperature
- C. Fever
- D. Dehydration
- E. Inflammation

5) If you have been sick with Salmonella before, then your immune system knows how to fight the pathogen, so you will never be sick with Salmonella again.

- A. True
- B. False

Lesson 28. Antibodies And Antigens

1) The picture below shows some pathogens and a white blood cell. Which pathogen will the white blood cell destroy?



- A. A
- B. B
- C. C
- D. D

2) Tim has type **A-** blood. Which types of blood could Tim safely receive?

Choose all that apply:

- A. A-
- B. A+
- C. B-
- D. B+
- E. AB-
- F. AB+
- G. O-
- H. O+

3) Tim has type **A-** blood. If Tim donates blood, which blood types could receive Tim's blood?

Choose all that apply:

- A. A-
- B. A+
- C. B-
- D. B+
- E. AB-
- F. AB+
- G. O-
- H. O+

4) Which are examples of innate immunity?

Choose all that apply:

- A. After a paper cut, inflammation prompts the arrival of macrophages.
- B. When exposed to measles, memory B-cells produce antibodies.
- C. The body recognizes the tetanus bacterium because it already has antibodies that match the tetanus antigens.
- D. Mucous membranes catch foreign particles that enter the body.

5) The diameter of a typical animal cell is how many times bigger than a typical antibody?

- A. 20 times
- B. 200 times
- C. 2,000 times
- D. 20,000 times

Lesson 29. What Causes Allergies

1) When someone takes an antihistamine for allergies it works by

- A. inactivating white blood cells
- B. inactivating a signal that mobilizes white blood cells.
- C. impersonating one of your own cells
- D. causes the white blood cell to attack the histamine instead of the allergen.

2) Rheumatoid arthritis is an autoimmune disease caused by

- A. the immune system attacking connective tissue
- B. the immune system deactivating near the joints
- C. too much pollen in the air
- D. contact with animal fur

3) Symptoms of an allergic reaction can include

Choose all that apply:

- A. rash
- B. memory loss
- C. hives
- D. difficulty breathing
- E. watering eyes

4) If you've never had hay fever by this point in your life, then you're safe from ever getting hay fever.

- A. True
- B. False

5) Which of the following statements is true?

- A. Everyone will develop a rash when exposed to poison ivy.
- B. Gluten is the most common food allergy.
- C. A lone star tick bite can cause people to be allergic to meat.
- D. It's not possible to be allergic to fish.

Lesson 30. What Makes Things Poisonous

1) Scorpions are

- A. poisonous
- B. venomous
- C. neither poisonous or venomous

2) It's okay for dogs to eat chocolate as long as it is dark chocolate.

- A. True
- B. False

3) Select each true statement below.

Choose all that apply:

- A. Activated charcoal will cure any type of poisoning.
- B. Oxygen is poisonous to some organisms.
- C. The digestive system is the only system that does not impact the nervous system.
- D. Botulinum toxin primarily affects the circulatory system.

4) Why is chocolate poisonous to dogs but not to people?

- A. Dogs have a slower digestive system than humans.
- B. Dogs can't digest sugar.
- C. Dogs are lactose intolerant.
- D. Dogs can't metabolize caffeine as quickly as human beings.

5) Which of the following statements are true?

Choose all that apply:

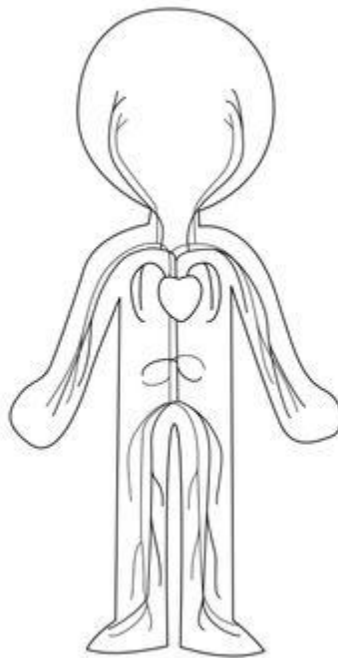
- A. All chemicals are toxic.
- B. Rattlesnakes are the most poisonous snake.
- C. Anything can be poisonous in a high enough dose.
- D. The most potent toxin known is from the foxglove plant.
- E. Every poison has an antidote.

Lesson 31. Human Anatomy Art Project

1) Whose art project was better?

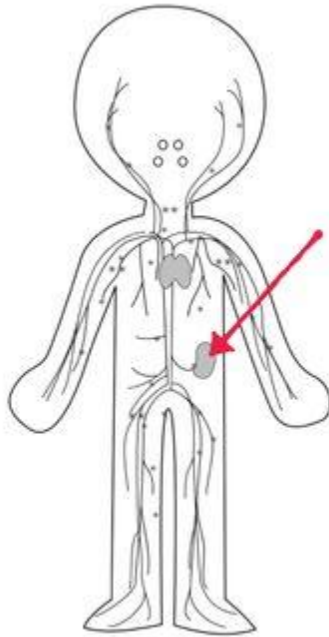
- A. Math Dad
- B. Science Mom

2) Which system of the body is pictured below?



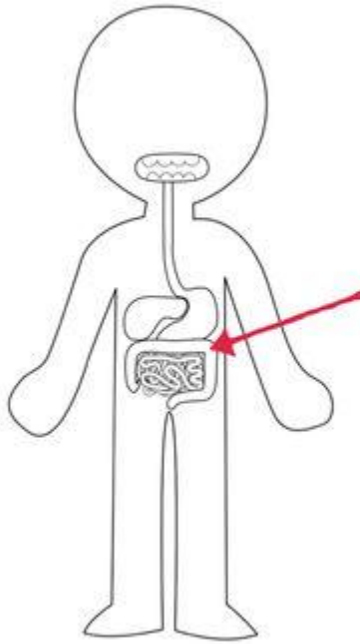
- A. Circulatory System
- B. Immune System
- C. Nervous System
- D. Integumentary System

3) Which organ is the arrow pointing to in the image below?



- A. Kidney
- B. Liver
- C. Thymus
- D. Spleen

4) Which organ is the arrow pointing to in the image below?



- A. Liver
- B. Colon
- C. Bladder
- D. Small Intestine

5) Select each body part that is part of the central nervous system.

Choose all that apply:

- A. Sciatica nerve
- B. Brain
- C. Capillaries
- D. Spinal Cord

6) How many consecutive cartwheels can Math Dad chain together?

Lesson 32. Anatomy Quiz Show

1) These form clots when needed.

- A. Red blood cells
- B. White blood cells
- C. Plasma
- D. Platelets
- E. Antibodies

2) Which body system is the liver in?

- A. Circulatory System
- B. Respiratory System
- C. Digestive System
- D. Nervous System

3) How long does it take for a red blood cell to loop all the way through the circulatory system?

- A. 1 minute
- B. 6 minutes
- C. 60 minutes
- D. 120 days

4) What do we call the gaps between neurons?

- A. Axons
- B. Synapses
- C. Somas
- D. Dendrites

5) What muscle is responsible for hiccups?

- A. Abdominals
- B. Gluteus Maximus
- C. Diaphragm
- D. Hamstring

6) The integumentary system is the only body system without any organs.

- A. True
- B. False

7) Simplify: $\sum_{k=2}^5 k =$ _____

8) What is the name of the loop of the circulatory system where the heart pumps blood out the aorta and to the entire rest of the body

- A. Systemic loop
- B. Channel loop
- C. Pulmonary loop
- D. Extremity loop

9) Select each organ below that you could survive not having for a week.

Choose all that apply:

- A. spleen
- B. heart
- C. a lung
- D. stomach
- E. brain

10) The bronchial tubes are part of which body system?

- A. Circulatory System
- B. Respiratory System
- C. Digestive System
- D. Nervous System

11) Insects have no lungs.

- A. True
- B. False

12) If you got to stay the same age for the next 50 years, how old would you choose to be?

13) Most of the digestion takes place in the

- A. stomach
- B. colon
- C. esophagus
- D. small intestine

14) This organ of the immune system stores white blood cells and filters the blood.

- A. Thymus
- B. Lymph node
- C. Spleen
- D. Adenoids

15) What causes an autoimmune disease?

- A. The memory cells get amnesia.
- B. The body starts producing toxins when the immune system responds.
- C. The immune system stops responding to pathogens.
- D. The body develops antibodies against its own cells.

16) The cells of the nervous system are called _____.

17) Which of the following is the largest?

- A. Red blood cell
- B. Platelet
- C. Antigen
- D. Antibody

Lesson 33. Most Wanted Microbes

1) All diseases are caused by microorganisms.

- A. True
- B. False

2) Which microorganism has no ribosomes or cellular structure and cannot reproduce on its own.

- A. Bacteria
- B. Protist
- C. Virus
- D. Fungi

3) Malaria is caused by a

- A. Plasmodium Bacteria
- B. Plasmodium Parasite
- C. Plasmodium Virus
- D. Plasmodium Fungi

4) Select each true statement below.

Choose all that apply:

- A. Most fungal infections are lethal.
- B. The flu virus only infects human beings.
- C. Lyme disease is caused by a bacteria.
- D. Tuberculosis is caused by a protist.

5) Select each true statement below.

Choose all that apply:

- A. More people die of cancer now than 100 years ago.
- B. The flu is no longer a danger to life because of modern medicine.
- C. Average life expectancy has doubled in the last 100 years.
- D. Mortality rates have dropped drastically over the last century.

Lesson 34. Preindustrial Medicine

1) Arsenic can be very beneficially to illnesses caused by eukaryotic pathogens.

- A. True
- B. False

2) In the 1700s, doctors treated their patients with ineffective methods so that the patients would remain sick so they would need even more help from the doctor.

- A. True
- B. False

3) Select each true statement below.

Choose all that apply:

- A. Humorism is a theory of disease that is still **accepted** by doctors today.
- B. The miasma theory of disease is still **accepted** by doctors today.
- C. Humorism is a theory of disease that has been **rejected** by doctors today.
- D. The miasma theory of disease has been **rejected** by doctors today.

4) You can treat malaria by eating the bark of a cinchona tree.

- A. True
- B. False

5) Is this an example of an anecdote or a study?

"I know 4 people who had high blood pressure, but they stopped eating fish and their blood pressure problems went away. Eating fish is detrimental to our health."

- A. Anecdote
- B. Study

Lesson 35. Scurvy And Clinical Trials

1) Who is credited with carrying out the first controlled clinical trial?

- A. Alexander Flemming
- B. Benjamin Franklin
- C. John Snow
- D. James Lind

2) The most abundant protein in the human body is

- A. Keratin
- B. Collagen
- C. Hemoglobin
- D. Insulin

3) Select each true statement.

Choose all that apply:

- A. "Placebo treatments" typically outperform "no treatment."
- B. Using a placebo is unethical because it requires doctors to lie to patients.
- C. Placebos can only be used for trials on medication that a patient eats or drinks.
- D. The more dramatic the placebo treatment, the larger the effect will typically be.

4) Scurvy is caused by

- A. an inability to process vitamin C
- B. lack of vitamin C in the diet
- C. lack of exercise
- D. a genetic mutation affecting collagen

5) Your body can naturally produce vitamin C if you get enough sunlight.

- A. True
- B. False

Lesson 36. Smallpox

1) The name of the smallpox virus is

- A. vaccinia virus
- B. orthopox virus
- C. entero virus
- D. variola virus

2) Which of the following is true of a person who catches smallpox?

Choose all that apply:

- A. If they survive, they won't catch smallpox again.
- B. They have a 90% chance of survival.
- C. They won't get monkeypox any time soon.
- D. They will repeatedly suffer smallpox flair-ups for the rest of their life.
- E. If they survive, they will likely have scars.

3) Someone who has been infected with cowpox is unlikely to get sick from smallpox.

- A. True
- B. False

4) What is variolation?

- A. the act of avoiding people who have contracted smallpox
- B. infecting someone with cowpox so that they will have immunity to smallpox
- C. exposing someone to material from smallpox virus scabs so that they will have immunity to smallpox
- D. to pop the pustules of someone who is sick with smallpox

5) Smallpox is the most contagious disease known to man.

- A. True
- B. False

Lesson 37. The Problem With Polio

1) Which statement(s) are true?

Choose all that apply:

- A. Most people infected with polio will develop nerve damage.
- B. The polio virus is spread by airborne transmission.
- C. Polio is more contagious than the flu.
- D. There were no cases of polio reported in the world in 2019.
- E. During a polio outbreak, good handwashing habits can help reduce the spread of polio.

2) In a population of 1,000,000 people, a smallpox outbreak would likely cause

Choose all that apply:

- A. more than 300,000 deaths
- B. more than 100,000 people become blind.
- C. approximately one death.
- D. about 1,000 people to experience adverse symptoms such as skin lesions, central nervous system disorders, or allergic reactions.

3) Vaccinating a population of 1,000,000 people for smallpox would likely cause

Choose all that apply:

- A. more than 300,000 deaths
- B. more than 100,000 people become blind.
- C. approximately one death.
- D. about 1,000 people to experience adverse symptoms such as skin lesions, central nervous system disorders, or allergic reactions.

4) Which activity carries more risk?

- A. Getting polio
- B. Being vaccinated against polio

5) Select each disease that only infects human beings.

Choose all that apply:

- A. Influenza
- B. Smallpox
- C. Polio
- D. Covid 19
- E. Rabies

Lesson 38. Elementary Epidemiology

1) Which of the following statements is true?

Choose all that apply:

- A. Viruses with airborne transmission are always more contagious than viruses with fecal-oral transmission.
- B. Measles infects multiple species of animals.
- C. The higher the value of R_0 (R-nought), the more contagious the disease.

2) A carrier or vector is:

- A. something that transmits a disease from one reservoir to another.
- B. a symptom of a disease.
- C. something that can be used to reduce the spread of a disease
- D. none of the above

3) The place where a pathogen naturally lives and reproduces is called a:

- A. infection
- B. reservoir
- C. contagion
- D. parasite

4) Select each true statement about incubation periods:

Choose all that apply:

- A. The shortest incubation of any pathogen period is 5 minutes.
- B. The incubation period is the amount of time between first exposure to a pathogen and symptoms of illness.
- C. Most viruses have an incubation period of 4 weeks.
- D. The rabies virus has an incubation period of up to 12 months.

5) Select each true statement about herd immunity.

Choose all that apply:

- A. Herd immunity occurs when a large portion of a community becomes immune to a disease, making the spread of disease from person to person unlikely.
- B. Herd immunity occurs when 90% of the population is immune to a disease.
- C. Herd immunity is difficult to attain against a pathogen that mutates frequently.
- D. There will be no cases of a disease once a population has herd immunity against it.

Lesson 39. Antibiotics

1) In what year was Penicillin discovered?

2) How does penicillin fight off bacterial infections?

- A. It slows down the metabolism of bacteria.
- B. It increases the temperature of cells to the point where they can't reproduce.
- C. It attacks the cell walls of bacteria.
- D. It actively hunts down microbes that are harmful to the body and engulfs them.

3) Penicillin only affects harmful bacteria (pathogens).

- A. True
- B. False

4) There are over 100 different types of antibiotics.

- A. True
- B. False

5) Select each true statement.

Choose all that apply:

- A. Stepping on a nail could be fatal without antibiotics.
- B. Blood poisoning is the medical term for when someone injects poison through a syringe.
- C. Antibiotics are especially effective against viral infections.
- D. Penicillin is deadly to plants.

Lesson 40. Antibiotic Resistance

1) MRSA was named after its first patient “Mr. Sawyer” but was later shortened to MRSA.

- A. Fact
- B. Fiction

2) About 1% of the population has been colonized with MRSA bacteria but doesn't know it.

- A. Fact
- B. Fiction

3) The most likely place to get MRSA is the hospital.

- A. Fact
- B. Fiction

4) Which statement about MRSA is true?

Choose all that apply:

- A. MRSA is a type of staph infection.
- B. MRSA will cause severe skin infections whenever it is present.
- C. MRSA is one of the largest viruses.
- D. There is no treatment for MRSA

5) Which actions will contribute to an increase in antibiotic-resistant bacteria?

Choose all that apply:

- A. Taking each dose of an antibiotic as directed.
- B. Stopping a course of antibiotics as soon as the symptoms are gone.
- C. Requesting antibiotics any time you are sick.
- D. Giving a healthy person antibiotics.

6) Penicillin used to be an effective treatment for many types of infections, but now it's ineffective against several of them. What caused this?

- A. People's bodies became used to the antibiotic so it stopped having an effect.
- B. Certain bacteria developed new abilities which made them resistant to the antibiotic.
- C. The penicillium fungus went extinct.

Lesson 41. Microbio Final Quiz Show

1) Which of these diseases are zoonotic (infect multiple species)?

Choose all that apply:

- A. Influenza
- B. Smallpox
- C. Covid
- D. Measles

2) Select each true statement about vitamin C.

Choose all that apply:

- A. A lack of vitamin C will lead to scurvy.
- B. The body only needs vitamin C if it is deficient in vitamin D.
- C. Lemons have more vitamin C than any other food.
- D. Dogs make their own vitamin C, so they don't need it from their diet.

3) Who first discovered the technique of variolation?

- A. Edward Jenner
- B. Jonas Salk
- C. John Smith
- D. Variolation was used thousands of years ago in China.

4) Which disease below is the most deadly once you have contracted it?

- A. Measles
- B. Covid 19
- C. Rabies
- D. Smallpox

5) Which diseases below could be effectively treated with antibiotics.

Choose all that apply:

- A. Influenza
- B. Staph infection
- C. Malaria
- D. Athlete's foot

6) Select each true statement.

Choose all that apply:

- A. Both plants and animals perform cellular respiration.
- B. Glucose is required to perform cellular respiration.
- C. Cellular respiration produces oxygen.
- D. Cellular respiration harnesses light energy.

7) Which disease below is the most contagious?

- A. Smallpox
- B. Mumps
- C. Flu
- D. Polio
- E. Measles

8) The person credited with developing the first polio vaccine is

- A. James Lind
- B. Edward Jenner
- C. Jonas Salk
- D. Alexander Flemming

9) What is the name of the artery that takes blood from the heart to the rest of the body?

- A. Vena Cava
- B. Ventricle
- C. Pulmonary Artery
- D. Aorta

10) What are the products of photosynthesis?

Choose all that apply:

- A. glucose
- B. water
- C. sunlight (energy)
- D. carbon dioxide
- E. oxygen

11) Which types of life are eukaryotic?

Choose all that apply:

- A. Fungi
- B. Protists
- C. Bacteria
- D. Animals
- E. Archaea
- F. Plants

12) A certain DNA strand is made up of 30% adenine. How much of the strand is guanine?

- A. 70%
- B. 30%
- C. 20%
- D. 10%

13) What type of plant is a pine tree?

- A. Angiosperm
- B. Gymnosperm
- C. Pteridophyte
- D. Bryophyte

14) Select each true statement.

Choose all that apply:

- A. Starch is a chain of glucose molecules.
- B. The scientific name for table sugar is fructose.
- C. Glucose is the primary molecule your cells use for energy.
- D. Brown sugar comes from sugar beets. White sugar comes from sugar cane.

15) How long does a typical red blood cell circulate in the body?

- A. 7 days
- B. 40 days
- C. 120 days
- D. 2 years