

- 4 The technique known as chromosome painting is the result of scientific research. Scientists use chromosome painting to mark the locations of genes on human chromosomes with fluorescent tags. It is also possible to apply this technique to the chromosomes of many different species. Chromosome painting allows for which of the following?
- F A comparison of the genomes (tells where markers are for every trait) of different species
 - G The sequencing of proteins (proteins – molecules that make cells) from many species
 - H An increase in mutations in many species (bull)
 - J The extraction of amino acids (21 possible parts of proteins) from different species
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- 6 Which of these statements best explains the process of energy conversion that takes place in the mitochondria (cellular respiration) ?
- F Energy is required for carbon dioxide (comes out of formula not in) molecules to form six-carbon sugar molecules.
 - G Water molecules and radiant energy (sun – not us – plants) are necessary for anaerobic respiration to take place.
 - H Oxygen molecules release energy in the form of heat during combustion reactions. (close)
 - J The energy in the bonds of glucose (from food) molecules is transferred to the phosphate bonds in ATP. (what we use as energy)

- 10 Enzymes are proteins that help increase the rate of chemical reactions inside cells. These proteins are composed of many simpler molecules called amino acids. Which of the following suggests that the shape of an enzyme determines the enzyme's function?
(enzymes are specific – lock and key)
- F Enzymes are specific to a substrate.
 - G Enzymes can operate in a wide range of conditions.
 - H Enzymes are activated by neighboring molecules.
 - J Enzymes can be found in all life-forms.
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- 12 Which of the following correctly describes how a diagram of cellular respiration would differ from a diagram of photosynthesis? (opposite of each other)
- F The cellular-respiration diagram would show electromagnetic waves as the final product. (what the XXXX)
 - G The cellular-respiration diagram would show glucose as the main source of energy. (true – from food)
 - H The cellular-respiration diagram would show energy stored in large protein molecules. (plants store energy)
 - J The cellular-respiration diagram would show water as the main source of chemical energy.
(water leaves the process)

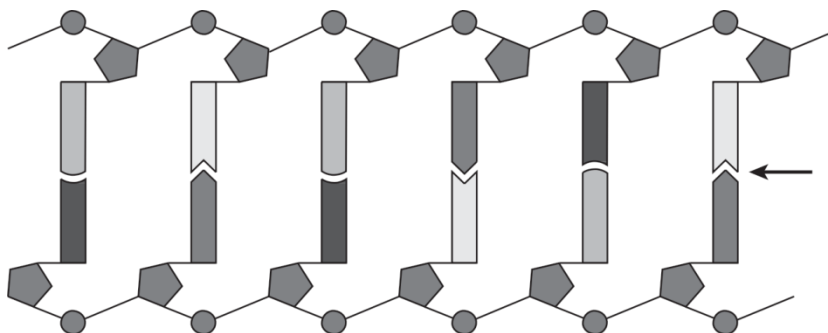
16 A photomicrograph of onion root tip cells during mitosis is shown below.



Which phase of mitosis is occurring in the cell indicated by the arrow?

- F** Prophase
- G** Metaphase
- H** Anaphase
- J** Telophase

18 A model of a DNA molecule is shown below.



?

The arrow indicates —

- F** the bond between adjacent phosphate and deoxyribose molecules (they make up the side ladder which is on the top and bottom here)
- G** the junction of introns and exons in the sense strand of DNA (huh?)
- H** the hydrogen bond between complementary nucleotides Yes!!!
- J** the junction of a codon and a DNA triplet (this is a part of protein translation not shown here)

20 Proteins and polysaccharides (sugars – carbohydrates) are polymers (many parts made of monomers – smaller parts). These polymers are formed by dehydration synthesis. Which statement correctly identifies a difference in the structure of proteins and polysaccharides?

- F** Only polysaccharides are comprised of repeating units of cytosine, adenine, guanine,

and thymine. (these 4 bases make a nucleic acid, not a protein or carb)

G Only proteins are formed from amino acids joined by peptide bonds.yes!

H Only polysaccharides can be folded and twisted to very specific shapes.(not)

J Only proteins can be large molecules with thousands of subunits.(not)

23 Both euglena (**A protist – eukaryote**) and cyanobacteria (**bacteria are all prokaryotes**) are photosynthetic unicellular organisms found in pond water.

The feature that distinguishes euglena from cyanobacteria is the —(what is the difference between a eukaryote and prokaryote?)

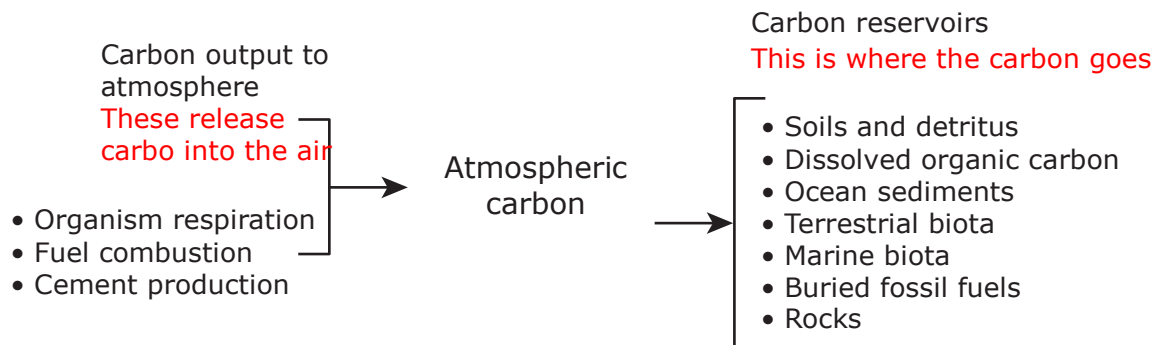
A ability to maintain homeostasis (all living things do)

B presence of ribosomes(all living things do)

C ability to reproduce(all living things do)

D presence of a nuclear membrane(because only eukaryotes have nuclei)

27 The carbon cycle includes processes that release carbon into the atmosphere and places that act as carbon reservoirs. The diagram below shows both major processes that release carbon and major carbon reservoirs.



Which of these disruptions would cause an excess output in the carbon cycle?

You are looking for something that decreases pollution

- A** The destruction of terrestrial biota(of land plants that clean carbon dioxide)
- B** Increases in marine biota(of water plants that clean carbon dioxide)
- C** A reduction in the use of fossil fuels (yes!!)
- D** A thickening of ocean sediments (not)

30 Characteristics such as a widow's peak or attached earlobes are determined by the genetic code. Which components of DNA are referred to as the genetic code?

(all other 3 are parts of dna but don't code)

F Phosphate groups

G Nitrogenous bases

H Deoxyribosesugars

J Hydrogen bonds

33 Which of these must occur during S phase of the cell cycle so that two daughter cells can be produced during M phase?

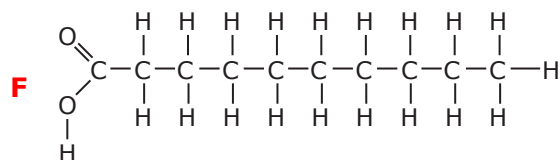
A The DNA must be replicated.(chromosomes are copied in s=synthesis)

B The chromosomes must be joined.

C The cytoplasm must be separated.

D The cell membrane must be expanded.

36 Which of these best represents a fatty-acid molecule? The pic below is The correct choice-remember I said to think of a long layer of fat floating on top of soup)(the test will have 3 other pics of molecules)



40 A student sets up a compost bin outdoors. Inside the bin microorganisms convert the student's vegetable and paper scraps into rich fertilizer. Which of the following best describes the role that these microorganisms play in natural habitats?

F The microorganisms help balance the numbers of producers and consumers.

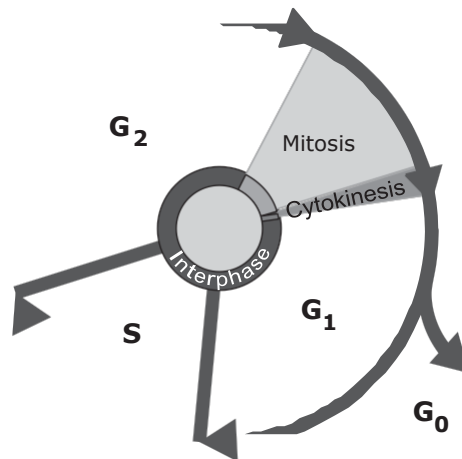
G The microorganisms help keep nutrients cycling through the ecosystem.(by decomposing, breaking down)

H The microorganisms turn solar energy into sugars.(no sun in a compost bin)

J The microorganisms function as autotrophs (they do not make their own food from the

sun)

41 The diagram below represents the cell cycle.



When cells leave the cell cycle, they exit during G_1 phase and then enter G_0 phase, a resting period. Most normal cells can leave G_0 phase and reenter the cell cycle at G_1 phase before entering S phase. Cancer cells are different because they cannot enter G_0 phase and are likely to do which of the following?(cancer is cells not knowing when to stop reproducing)

A Fail to complete S phase

C Repeat the cell cycle continuously

B Mutate during G phase

D Die after completing mitosis

43 How does DNA in cells determine an organism's complex traits?

A DNA contains codes for proteins, which are necessary for the growth and functioning of an organism.(sooo true)

B DNA separates into long single strands that make up each part of an organism.(only separate to make rna which later rebonds)

C DNA produces the energy an organism needs in order to grow.(dna does not make energy)

D DNA folds into the nucleus of each of the cells of an organism.(not)

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- 47** Cell differentiation (**all cells looking and functioning differently**) is critical during embryonic development. The process of cell differentiation results in the production of many types of cells, including germ, somatic, and stem cells. Cell differentiation is most directly regulated by —
(Dna tells cells what to be and how to work)

A

ATP(

no-

B DNA

C lipids

D sugars

- 48** The human digestive system (**from your mouth to your anus**) is approximately 900 cm long. Food is moved through the digestive tract primarily by —

F bile (**a chemical that breaks down fat**) produced by the pancreas

G the enzymes amylase and pepsin (**break down foods**)

H muscular contractions (**yes – it's called peristalsis**)

J hydrochloric acid in the stomach (breaks down food molecules)

- 49** The fact that a strain of yeast with a certain defective gene can use the human version of the gene to repair itself is evidence that yeast and humans —(**the yeast, which is alive takes part of your dna and plugs it in where it's dna does not work**)

A depend on the same food supply

B share a genetic code

C both have eukaryotic cells

D have identical genomes

20 Changes in water pressure within guard cells (like the muscles that open and close your eyes) cause the cells to open or close the stoma. This response helps the plant maintain homeostasis (balance within the plant) by —

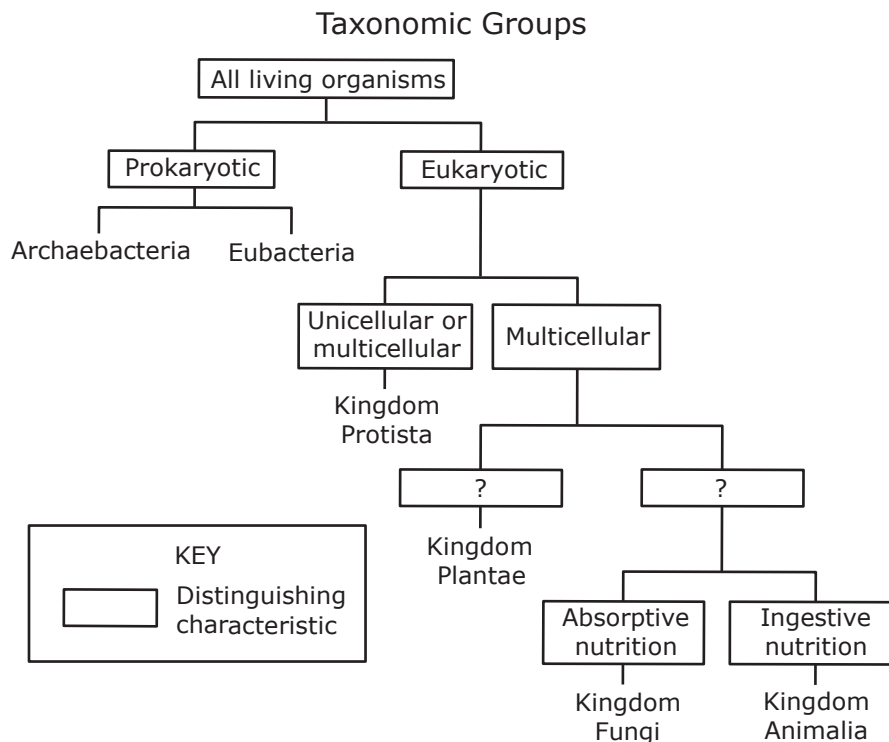
A stabilizing the plant's temperature (not the stoma) through the evaporation of water

B regulating the amount of water the plant loses during transpiration
(this is why plants are wet in the mornings!)

C allowing oxygen needed for photosynthesis to enter the plant
(oxygen from photosynthesis leaves a plant through the stoma)

D enabling the plant to release more carbon dioxide (plants take in carbon dioxide) at night for photosynthesis

21 The diagram shows taxonomic groups and a major distinguishing characteristic of all but two of them. (what could fit into the empty boxes?)



Which characteristics will be used to complete the chart?



(this means moves or doesn't move on its own)



(This choice would make plants non photosynthetic)



(yes – how do these multicellular plants make energy?)



(all multicellular are eukaryotes and therefore have a nucleus)