

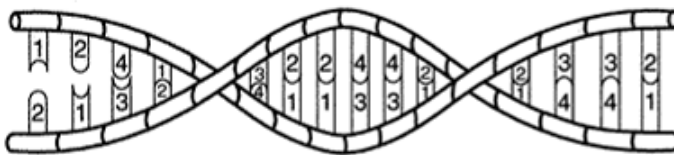
# Keystone Review 3

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Subject: «subject»  
Date: «date»

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1

The diagram below represents a section of a molecule that carries genetic information.



The pattern of numbers represents

- (1) a sequence of paired bases
- (2) the order of proteins in a gene
- (3) folds of an amino acid
- (4) positions of gene mutations

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2

In the human pancreas, acinar cells produce digestive enzymes and beta cells produce insulin. The best explanation for this is that

- (1) a mutation occurs in the beta cells to produce insulin when the sugar level increases in the blood
- (2) different parts of an individual's DNA are used to direct the synthesis of different proteins in different types of cells
- (3) lowered sugar levels cause the production of insulin in acinar cells to help maintain homeostasis
- (4) the genes in acinar cells came from one parent while the genes in beta cells came from the other parent

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3

Which statement is *not* part of the concept of natural selection?

- (1) Individuals that possess the most favorable variations will have the best chance of reproducing.
- (2) Variation occurs among individuals in a population.
- (3) More individuals are produced than will survive.
- (4) Genes of an individual adapt to a changing environment.

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4

In order for new species to develop, there *must* be a change in the

- (1) temperature of the environment
- (2) migration patterns within a population
- (3) genetic makeup of a population
- (4) rate of succession in the environment

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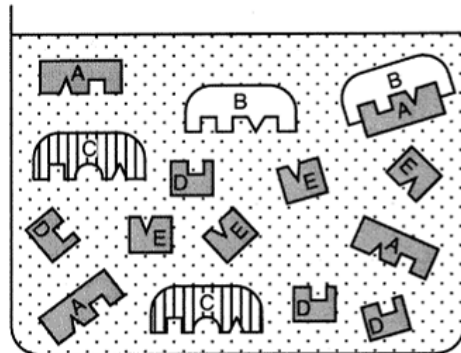
In sexually reproducing species, the number of chromosomes in each body cell remains the same from one generation to the next as a direct result of

- (1) meiosis and fertilization
- (2) mitosis and mutation
- (3) differentiation and aging
- (4) homeostasis and dynamic equilibrium

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6

The diagram below represents a beaker containing a solution of various molecules involved in digestion.



Which structures represent products of digestion?

- (1) A and D
- (2) B and C
- (3) B and E
- (4) D and E

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7

Arrows A, B, and C in the diagram below represent the processes necessary to make the energy stored in food available for muscle activity.



The correct sequence of processes represented by A, B, and C is

- (1) diffusion  $\rightarrow$  synthesis  $\rightarrow$  active transport
- (2) digestion  $\rightarrow$  diffusion  $\rightarrow$  cellular respiration
- (3) digestion  $\rightarrow$  excretion  $\rightarrow$  cellular respiration
- (4) synthesis  $\rightarrow$  active transport  $\rightarrow$  excretion

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8

Why do scientists consider any hypothesis valuable?

- (1) A hypothesis requires no further investigation.
- (2) A hypothesis may lead to further investigation even if it is disproved by the experiment.
- (3) A hypothesis requires no further investigation if it is proved by the experiment.
- (4) A hypothesis can be used to explain a conclusion even if it is disproved by the experiment.

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9

A great deal of information can now be obtained about the future health of people by examining the genetic makeup of their cells. There are concerns that this information could be used to deny an individual health insurance or employment. These concerns best illustrate that

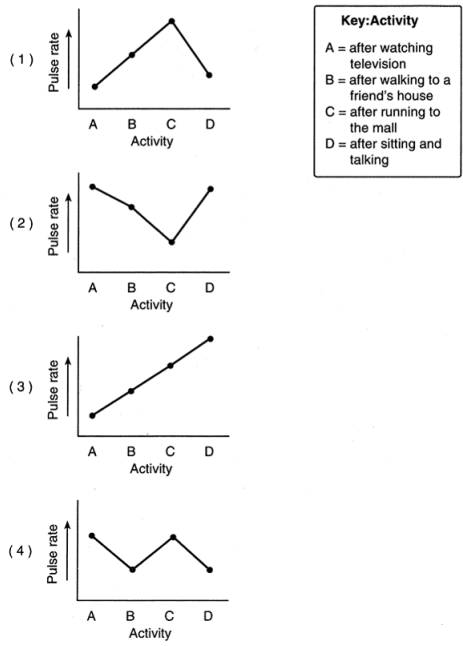
- (1) scientific explanations depend upon evidence collected from a single source
- (2) scientific inquiry involves the collection of information from a large number of sources
- (3) acquiring too much knowledge in human genetics will discourage future research in that area
- (4) while science provides knowledge, values are essential to making ethical decisions using this knowledge

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10

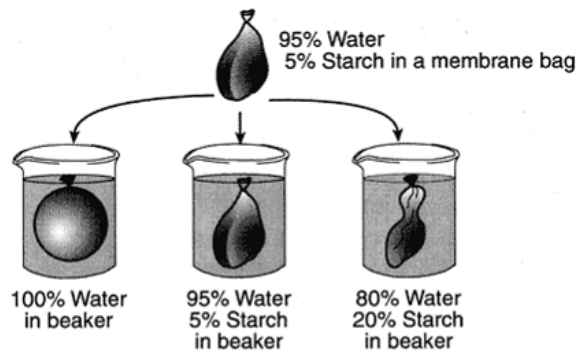
A student measures his pulse rate while he is watching television and records it. Next, he walks to a friend's house nearby and when he arrives, measures and records his pulse rate again. He and his friend then decide to run to the mall a few blocks away. On arriving at the mall, the student measures and records his pulse rate once again. Finally, after sitting and talking for a half hour, the student measures and records his pulse rate for the last time.

Which graph below best illustrates the expected changes in his pulse rate according to the activities described above?



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11 An investigation was set up to study the movement of water through a membrane. The results are shown in the diagram below.



Based on these results, which statement correctly predicts what will happen to red blood cells when they are placed in a beaker containing a water solution in which the salt concentration is much higher than the salt concentration in the red blood cells?

- (1) The red blood cells will absorb water and increase in size.
- (2) The red blood cells will lose water and decrease in size.
- (3) The red blood cells will first absorb water, then lose water and maintain their normal size.
- (4) The red blood cells will first lose water, then absorb water, and finally double in size.

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12

Which statement best describes human insulin that is produced by genetically engineered bacteria?

- (1) This insulin will not function normally in humans because it is produced by bacteria.
- (2) This insulin is produced as a result of human insulin being inserted into bacteria cells.
- (3) This insulin is produced as a result of exposing bacteria cells to radiation, which produces a mutation.
- (4) This insulin may have fewer side effects than the insulin previously extracted from the pancreas of other animals.

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