pennsylvania DEPARTMENT OF EDUCATION

SAS Standards Aligned System

- Name:
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1

Scientific studies show that identical twins who were separated at birth and raised in different homes may vary in height, weight, and intelligence. The most probable explanation for these differences is that

(1) original genes of each twin increased in number as they developed

(2) one twin received genes only from the mother while the other twin received genes only from the father

(3) environments in which they were raised were different enough to affect the expression of their genes

(4) environments in which they were raised were different enough to change the genetic makeup of both individuals

2

The photographs below show some physical similarities between John Lennon and his son Julian.

Lewis, Ricki *Life* 3rd edition WCB/McGraw Hill

Which conclusion can be drawn regarding these similarities?

(1) The DNA present in their body cells is identical.

(2) The percentage of their proteins with the same molecular composition is high.

(3) The base sequences of their genes are identical.

(4) The mutation rate is the same in their body cells.

3

Fruit flies with the curly-wing trait will develop straight wings if kept at a temperature of 16°C during development and curly wings if kept at 25°C. The best explanation for this change in the shape of wings is that the

(1) genes for curly wings and genes for straight wings are found on different chromosomes
(2) type of genes present in the fruit fly is dependent on environmental temperature
(3) environment affects the expression of the genes for this trait
(4) higher temperature produces a gene mutation

4

To produce large tomatoes that are resistant to cracking and splitting, some seed companies use the pollen from one variety of tomato plant to fertilize a different variety of tomato plant. This process is an example of

(1) selective breeding
(2) DNA sequencing
(3) direct harvesting
(4) cloning

5

Strawberries can reproduce by means of runners, which are stems that grow horizontally along the ground. At the region of the runner that touches the ground, a new plant develops. The new plant is genetically identical to the parent because

(1) it was produced sexually
(2) nuclei traveled to the new plant through the runner to fertilize it
(3) it was produced asexually
(4) there were no other strawberry plants in the area to provide fertilization

6

Which process will increase variations that could be inherited?

(1) mitotic cell division
(2) active transport
(3) recombination of genes
(4) synthesis of proteins

7

Which statement best explains the observation that clones produced from the same organism may *not* be identical?

(1) Events in meiosis result in variation.
(2) Gene expression can be influenced by the environment.
(3) Differentiated cells have different genes.
(4) Half the genetic information in offspring comes from each parent.

8

Even though identical twins have the same genetic material, they may develop slightly different characteristics because

(1) each twin receives different chromosomes from the egg
(2) one twin may only have genes from the father
(3) gene expression may be influenced by factors that switch genes on and off
(4) a gene mutation may have occurred before the zygote divided

9

Young birds that have been raised in isolation from members of their species build nests characteristic of their species. This suggests that the nest-building behavior is

(1) genetically inherited from parents
(2) learned by watching members of their species
(3) a disadvantage to the survival of the species
(4) a direct result of the type of food the bird eats