Mississippi 8th Grade Science Practice Quiz – Genetics and Inheritance

Questions 1–3: Inherited vs. Acquired Traits (L.8.2B.1)

1. Which of the following is an inherited trait?
A) A tattoo on a person's arm
B) Eye color
C) A scar from a cut
D) Learning to ride a bike

2. A student notices that all the children in her family have curly hair, while her friend's family has mostly straight hair. This is an example of:
A) Acquired traits
B) Learned behaviors
C) Inherited traits
D) Environmental effects

3. Which statement best differentiates inherited traits from acquired traits?
A) Acquired traits are controlled by genes; inherited traits are not.
B) Acquired traits are passed to offspring; inherited traits cannot be passed on.
C) Inherited traits are always visible; acquired traits are always invisible.
D) Inherited traits come from DNA; acquired traits result from life experiences or environmental influences.

Questions 4–6: Mendelian Genetics / Principles of Heredity (L.8.2B.2)

4. Gregor Mendel studied pea plants and observed that some traits appear in offspring even when only one parent shows the trait. Which principle does this illustrate?
A) Law of Independent Assortment
B) Law of Segregation
C) Law of Probability
D) Law of Mutation

5. In pea plants, tall (T) is dominant over short (t). A heterozygous tall plant (Tt) is crossed with a short plant (tt). What is the probability the offspring will be short?
A) 0%
B) 25%
C) 50%
D) 75%

6. A cross between two heterozygous pea plants (Tt x Tt) is performed. Which ratio represents the expected phenotypes?
A) 3 tall : 1 short
B) 1 tall : 3 short

C) 2 tall : 2 short
D) 4 tall : 0 short

Questions 7–8: Punnett Squares (L.8.2B.3)

7. A Punnett square shows the cross Bb x Bb (B = brown eyes, b = blue eyes). What is the expected genotype ratio of the offspring?
A) 1 BB : 2 Bb : 1 bb
B) 2 BB : 1 Bb : 1 bb
C) 3 BB : 1 bb
D) 4 Bb : 0 BB

8. A Punnett square predicts offspring from a cross of Rr x rr (R = dominant red, r = recessive white). Which of the following represents the expected phenotype of the offspring?
A) 50% red, 50% white
B) 75% red, 25% white
C) 25% red, 75% white
D) 100% white

Questions 9–10: Ethics of Artificial Selection (L.8.2B.4)

9. A farmer selectively breeds cows to produce more milk. Which statement represents an ethical consideration of this practice?
A) All offspring will be identical and have no variation.
B) Selective breeding has no consequences and is completely safe.
C) Selective breeding could reduce genetic diversity and make the population more vulnerable to disease.
D) Selective breeding creates new species immediately.

10. A student argues that artificial selection can improve human health, while another argues it could be unfair or harmful. Which type of skill is the student practicing?
A) Observing
B) Calculating probability
C) Measuring
D) Making a claim and supporting it with evidence