SCIENCE FOUNDATIONS

Dominant and recessive alleles

Difficulty level: Intermediate

Science Foundations

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Overview of the concept

This is how you predict whether a child will have a parent's dimples or attached earlobes, since some versions of a gene show up with just one copy and others need two. A recessive trait can skip a generation, hiding in parents who do not show it themselves. A doctor explaining a family health history uses this to work out the odds for a child. Knowing dominant and recessive alleles tells you why children can look like a grandparent more than either parent.



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Rule

Dominant and recessive alleles: one copy of a dominant allele is enough for the trait to show.

A recessive trait shows only when there are two copies of the recessive allele and no dominant allele. Dominant does not mean more common, it means it shows with one copy.

The pair of alleles a person carries is the genotype (like Bb); the trait that shows is the phenotype (like brown eyes). Two different alleles (Bb) is called heterozygous; two copies of the same allele (BB or bb) is called homozygous.

Worked examples

EXAMPLE 1

Q Brown eyes B dominant over blue b. What does Bb show?

SOLUTION

Read the genotype: one dominant B, one recessive b.

Apply the rule: one dominant copy is enough to show.

State the phenotype: brown eyes.

The result is brown eyes.

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EXAMPLE 2

Q Brown eyes B dominant over blue b. What does bb show?

SOLUTION

Read the genotype: two recessive copies, no dominant allele.

Apply the rule: recessive shows only with two copies, which it has.

State the phenotype: blue eyes.

The result is blue eyes.

Practice questions

1 Dominant allele needs how many copies?

- A Two
- B One
- C Three
- D Four

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2

What is an allele?

A A version of a gene

B A type of cell

C A pair of chromosomes

D A dominant trait

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3

P is dominant for purple flowers, p is recessive for white flowers. Genotype Pp: phenotype?

A White flowers

B Purple flowers

C Blue flowers

D Pink flowers

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4 **P is dominant for purple flowers, p is recessive for white flowers. Genotype pp: phenotype?**

- A Purple flowers
- B Pink flowers
- C White flowers
- D Blue flowers

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5 **In Bb, which letter is the dominant allele?**

- A B
- B b
- C Both letters
- D Neither letter

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6 Heterozygous definition?

- A Two copies of the same allele
- B Two different alleles
- C One allele only
- D Three different alleles

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7 Homozygous recessive definition?

- A Two dominant copies
- B One recessive copy
- C One dominant copy
- D Two recessive copies

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8 Does dominant mean more common?

A Yes

B No

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9 Two recessive copies: which trait shows?

A Dominant

B Recessive

C Neither

D Both equally

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10

One dominant plus one recessive: which shows?

A Recessive

B Neither

C Dominant

D Both equally

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ANSWER KEY

1. One

2. A version of a gene

3. Purple flowers

4. White flowers

5. B

6. Two different alleles

7. Two recessive copies

8. No

9. Recessive

10. Dominant

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