

Traits by Choice

How questions and evidence guide selective breeding decisions.

S7L3.c "Ask questions to gather and synthesize information about the ways humans influence the inheritance of desired traits in organisms through selective breeding."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline three kinds of evidence a breeder could gather, then circle one possible cost that a breeder should investigate before continuing a plan.

Choosing Parents, Checking Evidence

- ① Selective breeding happens when people choose which organisms will reproduce because they have desired inherited traits. A trait is inherited when genetic information from parents helps shape it in offspring. For example, a gardener may save seeds from tomato plants that resist a common disease. The next generation will not all be identical, but plants with parents that carry useful versions of genes are more likely to show the desired trait. Repeating choices over many generations can make that trait more common in a population.
- ② To learn whether a breeding choice is working, people gather evidence instead of guessing. A sheep farmer might compare health records from lambs whose parents were selected for resistance to a parasite with records from other lambs raised under similar conditions. The farmer can ask whether the lambs inherited more resistance and whether the result appears in several groups over time. Records about food, housing, illness, and parentage help separate the effect of breeding from effects of the environment.
- ③ Good decisions require synthesizing information from more than one source. A breeder could combine offspring records, advice from a veterinarian or plant scientist, and research about the species. The breeder should also ask about possible costs. Selecting only a few parents can reduce genetic diversity, and mating closely related organisms can raise the chance of harmful inherited conditions. A responsible plan names the desired trait, checks that organisms stay healthy, and changes the plan when evidence shows an unexpected problem.

2 ANSWER WITH EVIDENCE Use the passage

1 How could saving seeds from certain tomato plants influence traits in later generations?

2 What comparison should the sheep farmer make to investigate whether parasite resistance was inherited?

3 Why should the farmer collect information about food, housing, illness, and parentage?

4 Name two sources of information a breeder could combine, and name one possible cost the breeder should investigate.

3 YOUR TURN Your own words

Choose a crop, pet, or farm animal. In five sentences, name one desired inherited trait, write two questions a breeder should ask, explain what information the breeder would gather, and include one possible cost the breeder would monitor.

PART 1 • READ AND MARK

Underline three kinds of evidence a breeder could gather, then circle one possible cost that a breeder should investigate before continuing a plan. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How could saving seeds from certain tomato plants influence traits in later generations?	Saving seeds from disease-resistant plants makes it more likely that later plants will show disease resistance. Repeating the choice can make the trait more common.
2	What comparison should the sheep farmer make to investigate whether parasite resistance was inherited?	Compare health records of lambs whose parents were selected for parasite resistance with records of other lambs raised under similar conditions.
3	Why should the farmer collect information about food, housing, illness, and parentage?	These records help separate effects of breeding from effects of the environment.
4	Name two sources of information a breeder could combine, and name one possible cost the breeder should investigate.	Accept any two: offspring records, advice from a veterinarian or plant scientist, or research about the species. Possible costs include reduced genetic diversity or harmful inherited conditions from closely related mating.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A bean grower wants plants with resistance to a leaf disease. Do offspring of resistant parent plants show less disease than offspring of other plants grown in the same conditions? Do the results appear in several groups over more than one growing season? The grower would compare parentage and health records and consult plant-science research. The grower would also track whether using only a few parents reduces genetic diversity.

Accept reasonable organisms and desired inherited traits. A strong response includes two investigable questions, evidence from more than one source or type of record, and a realistic health or genetic-diversity concern.