LESSON MAKER PRO

Survival Odds Lab

Use fractions to explain how traits can be favored.

GRADES 6-8 · MS-LS4-4

MS-LS4-4 "Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment..."

NAME _____ DATE _____

PART 1: PRACTICE

For each inherited trait, divide the number that survive and reproduce by the number that started. Compare the fractions. A larger fraction means a greater probability in that environment, so that trait is more likely to be passed on.

WORKED EXAMPLE

Of 21 beetles with a speckled shell, 7 survive a heat wave and reproduce. What is their probability of surviving and reproducing?

1. Start with successful beetles: 7.
2. Divide by speckled beetles at the start: 7/21.
3. Simplify: 1/3.

Answer: The probability is 1/3.

PRACTICE 5 problems

1 In a marsh, 16 of 40 long-legged frogs survive and reproduce. What is the probability?

ANSWER _____

2 After a flood, 9 of 36 frogs with webbed feet survive and reproduce. What is the probability?

ANSWER _____

3 In a cold pond, 12 of 30 wide-tailed fish survive and reproduce. For narrow-tailed fish, 15 of 50 survive and reproduce. Which trait has the greater probability?

ANSWER _____

4 A seed-coat trait has a survival-and-reproduction rate of 10/25. In a group of 65 plants with that trait, how many would you expect to survive and reproduce at the same rate?

ANSWER _____

5 On pale sand, 14 of 28 light moths and 11 of 44 dark moths survive and reproduce. State both probabilities and name the trait with the higher probability.

ANSWER _____

APPLY IT Show your work

1 A school garden club grows bean plants with inherited waxy leaves and inherited thin leaves. After a dry month, 28 of 42 waxy-leaf plants survive and make seeds, while 16 of 64 thin-leaf plants survive and make seeds. Write a 2-sentence explanation using the evidence.

WORK SPACE

ANSWER _____

2 An aquarium club keeps guppies with inherited dark or light body colors in a tank with dark gravel. During a month, 35 of 70 dark guppies and 24 of 96 light guppies survive and produce fry. Write a 2-sentence explanation using the evidence.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

On black lava, 36 of 48 black mice survive and reproduce, while 18 of 72 tan mice survive and reproduce. Black mice were 48 of 120 mice at the start. Write a 2-sentence explanation that includes both survival-and-reproduction probabilities and compares the black mice's starting share with their share among the 54 mice that reproduced.

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ANSWER KEY

Survival Odds Lab

GRADES 6-8 · MS-LS4-4

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	In a marsh, 16 of 40 long-legged frogs survive and reproduce. What is the probability?	**2/5**
2	After a flood, 9 of 36 frogs with webbed feet survive and reproduce. What is the probability?	**1/4**
3	In a cold pond, 12 of 30 wide-tailed fish survive and reproduce. For narrow-tailed fish, 15 of 50 survive and reproduce. Which trait has the greater probability?	**Wide tails: 2/5. Narrow tails: 3/10. Wide tails have the greater probability.**
4	A seed-coat trait has a survival-and-reproduction rate of 10/25. In a group of 65 plants with that trait, how many would you expect to survive and reproduce at the same rate?	**26 plants**
5	On pale sand, 14 of 28 light moths and 11 of 44 dark moths survive and reproduce. State both probabilities and name the trait with the higher probability.	**Light moths: 1/2. Dark moths: 1/4. Light color has the higher probability.**

PART 2 · APPLY IT

1. **Waxy-leaf plants had a survival-and-reproduction probability of 28/42 = 2/3, while thin-leaf plants had 16/64 = 1/4. In the dry garden, waxy leaves increased the probability of surviving to make seeds, so the inherited waxy-leaf trait was more likely to be passed to offspring.** Find each survival-and-reproduction fraction, then compare them. The explanation should connect the higher rate to passing an inherited trait to offspring.
2. **Dark guppies had a probability of 35/70 = 1/2, compared with 24/96 = 1/4 for light guppies. Against dark gravel, the inherited dark-body trait increased the chance of surviving to produce fry, so dark guppies were more likely to pass it on.** Calculate the fraction that survived and reproduced for each color. Connect the larger fraction in the dark-gravel environment to greater chances of passing on that inherited color.

CHALLENGE

Black mice had a survival-and-reproduction probability of 36/48 = 3/4, versus 18/72 = 1/4 for tan mice. Black mice were 48/120 = 2/5 of the starting population but 36/54 = 2/3 of the mice that reproduced, so the inherited black-fur variation was favored on black lava and was likely to become more common.

Accept equivalent fractions. For written explanations, require both evidence-based probabilities and a link between the higher probability, the specific environment, and passing an inherited trait to offspring.