LESSON MAKER PRO

Flowers That Succeed

Compare flower traits using fruit-set rates.

HIGH SCHOOL · BOT.3.6

BOT.3.6 "Identify differences in flower structure and shape. Provide a rationale that explains the value of these differences in flower structure to reproductive success (e.g., pollinators, flower shape, smell, color, size, orientation)."

NAME _____ DATE _____

COMPARE THE RATES

Fruit-set rate is the number of flowers that form seed-bearing fruits divided by the number of flowers checked, multiplied by 100. A higher rate suggests a possible reproductive advantage, but the data alone cannot prove which flower trait caused it.

WORKED EXAMPLE

Moths visit these night-blooming flowers. Which scent group had the higher fruit-set rate?

NIGHT-BLOOMING FLOWERS

Scent	Flowers checked	Seed-bearing fruits
Strong	24	18
Faint	24	6

1. Strong scent: 18/24 × 100 = 75%.
2. Faint scent: 6/24 × 100 = 25%.
3. 75% is 50 percentage points higher than 25%.

Answer: The strong-scent group had the higher rate. Its scent might help moths find the flowers.

PRACTICE 4 problems

1 Bees visit red flowers. If 7 of 10 red flowers form seed-bearing fruits, what is their fruit-set rate?

ANSWER _____

2 Of 20 upright flowers, 13 form seed-bearing fruits. Of 20 downward-facing flowers, 7 do. Which group has the higher rate, and by how many percentage points?

ANSWER _____

3 Of 20 trumpet-shaped flowers, 16 form seed-bearing fruits. Of 35 flat flowers, 21 do. Which group has the higher rate?

ANSWER _____

4 Moths with long tongues visit a garden. Of 20 long-tubed flowers, 14 form seed-bearing fruits; 10 of 20 flat flowers do. Which shape has the higher rate? Give a possible reason.

ANSWER _____

_____

APPLY IT Show your work

1 Your school pollinator club compares two colors of the same flower grown side by side. Which color has the higher fruit-set rate, by how many percentage points, and why might color matter?

SCHOOL GARDEN

Color	Flowers checked	Seed-bearing fruits
Yellow	35	28
White	35	21

ANSWER _____

2 A community garden is choosing evening-opening flowers for moths. Which scent group has the higher fruit-set rate, by how many percentage points, and how might scent help?

COMMUNITY GARDEN

Scent	Flowers checked	Seed-bearing fruits
Sweet	20	17
Little scent	20	11

ANSWER _____

CHALLENGE One step up

In a school garden, 36 of 45 tubular flowers grown in sun formed seed-bearing fruits. In shade, 28 of 35 flat flowers did. In two sentences, give both fruit-set rates and explain why these data do not show that tubular shape improves success.

WORK SPACE AND ANSWER

Flowers That Succeed

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Bees visit red flowers. If 7 of 10 red flowers form seed-bearing fruits, what is their fruit-set rate?	**70%**
2	Of 20 upright flowers, 13 form seed-bearing fruits. Of 20 downward-facing flowers, 7 do. Which group has the higher rate, and by how many percentage points?	**Upright flowers, by 30 percentage points (65% versus 35%).**
3	Of 20 trumpet-shaped flowers, 16 form seed-bearing fruits. Of 35 flat flowers, 21 do. Which group has the higher rate?	**Trumpet-shaped flowers (80% versus 60%).**
4	Moths with long tongues visit a garden. Of 20 long-tubed flowers, 14 form seed-bearing fruits; 10 of 20 flat flowers do. Which shape has the higher rate? Give a possible reason.	**Long-tubed flowers have the higher rate (70% versus 50%). Their shape might help moths reach nectar and pick up pollen.**

PART 2 · APPLY IT

1. **Yellow, by 20 percentage points (80% versus 60%). Color might help bees find the flowers.** Calculate 28/35 × 100 = 80% and 21/35 × 100 = 60%, then subtract the rates.
2. **Sweet-scented flowers, by 30 percentage points (85% versus 55%). Scent might help moths find them at night.** Calculate 17/20 × 100 = 85% and 11/20 × 100 = 55%, then subtract the rates.

CHALLENGE

Both groups had an 80% fruit-set rate. The rates are equal, and the different light conditions also prevent a fair test of flower shape.

Accept other plausible links between a flower trait and pollinator visits or pollen transfer. Treat these links as possible explanations, not proven causes.