LESSON MAKER PRO

Seeds in the Field

Classify plants and compare their occurrence in habitats.

HIGH SCHOOL · BOT.2.2

BOT.2.2 "Referencing the USDA plants database, identify, compare, and contrast seedless, naked seed, and enclosed-seed modifications for reproduction. Calculate the occurrence of seed types in given habitats."

NAME _____ DATE _____

COUNT, THEN COMPARE

Use USDA PLANTS group records to classify observations. Ferns and their allies are seedless and reproduce by spores, gymnosperms have naked seeds, and flowering plants have seeds enclosed in ovaries that mature into fruits. To find a type's percent occurrence, divide its count by the total observations in that habitat and multiply by 100.

WORKED EXAMPLE

A survey classifies these plants using USDA PLANTS groups. What percent of the observations have naked seeds?

MEADOW SURVEY

Plants counted	USDA PLANTS group	Count
Horsetails	Ferns and allies	11
Ginkgo	Gymnosperms	14
Milkweeds	Flowering plants	15

1. Add all observations: 11 + 14 + 15 = 40.
2. Use the gymnosperm count for naked seeds: 14/40.
3. Convert to a percent: 14/40 × 100 = 35%.

Answer: 35% of the observations have naked seeds.

PRACTICE 6 problems

1 What percent of these observations have naked seeds?

SCHOOLYARD PLANT SURVEY



observations

ANSWER _____

2 Use the USDA PLANTS groups in the table. What percent of these observations have enclosed seeds?

GARDEN OBSERVATIONS

Plant	USDA PLANTS group	Count
Bracken fern	Ferns and allies	3
Eastern white pine	Gymnosperms	1
Common sunflower	Flowering plants	6

ANSWER _____

3 How many observations are seedless, and what fraction of all observations are seedless?

TRAIL OBSERVATIONS

USDA PLANTS group	Count
Ferns and allies	2
Gymnosperms	3
Flowering plants	5

ANSWER _____

4 What percent of these observations are seed plants of either kind?

PARK OBSERVATIONS

USDA PLANTS group	Count
Ferns and allies	1
Gymnosperms	4
Flowering plants	5

ANSWER _____

5 Among only the seed plants, what fraction have naked seeds?

PATHSIDE OBSERVATIONS

USDA PLANTS group	Count
Ferns and allies	3
Gymnosperms	2
Flowering plants	3

ANSWER _____

6 Which habitat has a higher seedless occurrence, and by how many percentage points?

TWO HABITAT SURVEYS

Habitat	Ferns and allies	Gymnosperms	Flowering plants
Forest path	2	3	5
Creek bank	4	1	5

ANSWER _____

APPLY IT Show your work

1 A student group surveys plants near a school pollinator garden. They use USDA PLANTS groups to classify the observations shown. What percent of the observations have enclosed seeds?

POLLINATOR GARDEN SURVEY

USDA PLANTS group	Count
Ferns and allies	6
Gymnosperms	2
Flowering plants	12

ANSWER _____

2 A trail crew surveys plants beside two trails and classifies them using USDA PLANTS groups. Which trail has a higher naked-seed occurrence, and by how many percentage points?

TRAIL CREW SURVEYS

Trail	Ferns and allies	Gymnosperms	Flowering plants
Ridge trail	2	2	6
Stream trail	4	1	5

ANSWER _____

CHALLENGE One step up

Two restoration crews combine their plant surveys. What fraction of all their observations have naked seeds? Explain why you must combine the counts rather than treat the two habitats as equally sized.

RESTORATION SURVEYS

Habitat	Ferns and allies	Gymnosperms	Flowering plants
Open woodland	2	1	5
Shaded slope	6	3	7

WORK SPACE AND ANSWER

Seeds in the Field

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	What percent of these observations have naked seeds?	**20%**
2	Use the USDA PLANTS groups in the table. What percent of these observations have enclosed seeds?	**60%**
3	How many observations are seedless, and what fraction of all observations are seedless?	**2 observations; 2/10, or 1/5**
4	What percent of these observations are seed plants of either kind?	**90%**
5	Among only the seed plants, what fraction have naked seeds?	**2/5**
6	Which habitat has a higher seedless occurrence, and by how many percentage points?	**Creek bank, by 20 percentage points**

PART 2 · APPLY IT

1. **60%** There are 6 + 2 + 12 = 20 observations. Flowering plants have enclosed seeds, so 12/20 × 100 = 60%.
2. **Ridge trail, by 10 percentage points** Gymnosperms have naked seeds. Their occurrence is 2/10 = 20% on the ridge trail and 1/10 = 10% on the stream trail, a difference of 10 percentage points.

CHALLENGE

The combined fraction is (1 + 3)/(2 + 1 + 5 + 6 + 3 + 7) = 4/24 = 1/6. The habitats have different numbers of observations, so each observation, not each habitat, must have equal weight.

Survey counts are invented practice data; USDA PLANTS groups supply the classification, not the counts. Accept equivalent fractions and percent forms where appropriate, but require percentage points for differences between percentages.