LESSON MAKER PRO

Leaf Area Lab

Compare leaf surfaces in a school garden.

HIGH SCHOOL · BOT.1.5

BOT.1.5 "Calculate surface area of leaves/roots and compare surface areas of various plant specimens to explain adaptations of the various plant types."

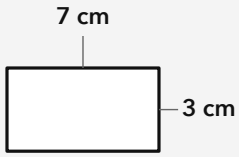
NAME _____ DATE _____

COUNT BOTH FACES

Approximate a flat leaf blade as a rectangle. Multiply length by width, then multiply by 2 to include both faces. Under similar conditions, more surface area can help a leaf capture light, but it may also allow more water loss.

WORKED EXAMPLE

Approximate the leaf as the rectangle shown. Find the area of both faces.



1. One face: 7 cm * 3 cm = 21 cm^2.
2. Both faces: 2 * 21 cm^2 = 42 cm^2.

Answer: 42 cm^2

PRACTICE 4 problems

1 A leaf is 8 cm long and 2 cm wide. Find the area of both faces.

ANSWER _____

2 A leaf is 9 cm long and 4 cm wide. Find the area of both faces.

ANSWER _____

3 One face of a leaf has an area of 30 cm^2. Find the area of both faces.

ANSWER _____

4 Leaf A is 10 cm by 5 cm. Leaf B is 6 cm by 2 cm. How much greater is the area of both faces of A than of B?

ANSWER _____

APPLY IT Show your work

1 A class is choosing leaves to study in a shaded school garden. Plant A has a leaf measuring 12 cm by 5 cm. Plant B has one measuring 6 cm by 5 cm. Which leaf has more area on both faces, and by how much?

WORK SPACE

ANSWER _____

2 For a water-saving garden, compare a narrow leaf measuring 10 cm by 1 cm with a broad leaf measuring 10 cm by 6 cm. Find each leaf's area on both faces. If other conditions are alike, which might lose less water?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A garden team counts leaves on two plants. Find the total area of both faces for each leaf group. Which group has more total area despite having fewer leaves? Explain how that area could help the plant.

LEAF GROUPS

Plant	Leaf size	Leaf count
Shade plant	8 cm by 6 cm	5
Dry-site plant	5 cm by 2 cm	12

WORK SPACE AND ANSWER

Leaf Area Lab

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A leaf is 8 cm long and 2 cm wide. Find the area of both faces.	**32 cm^2**
2	A leaf is 9 cm long and 4 cm wide. Find the area of both faces.	**72 cm^2**
3	One face of a leaf has an area of 30 cm^2. Find the area of both faces.	**60 cm^2**
4	Leaf A is 10 cm by 5 cm. Leaf B is 6 cm by 2 cm. How much greater is the area of both faces of A than of B?	**76 cm^2**

PART 2 · APPLY IT

1. **Plant A's leaf, by 60 cm^2.** Plant A has 2 * 12 * 5 = 120 cm^2; Plant B has 2 * 6 * 5 = 60 cm^2. The difference is 60 cm^2.
2. **Narrow: 20 cm^2. Broad: 120 cm^2. The narrow leaf might lose less water.** Multiply each leaf's length and width by 2. The narrow leaf has less exposed area, so it may lose less water if other conditions are alike.

CHALLENGE

Shade plant: 5 * 2 * 8 * 6 = 480 cm^2. Dry-site plant: 12 * 2 * 5 * 2 = 240 cm^2. The shade plant has more total area despite having fewer leaves. Its greater leaf area could help it capture more light.

Accept equivalent calculations with correct square-centimeter units. Explanations about water loss should note that other conditions must be alike.