

# 3.5 Planting Preferences—

## Written Assessment



### Action Synopsis

Students work in groups to rank four sites according to their suitability for planting shrubs, then independently complete a diagram showing a nutrient cycle for the preferred site.

#### One Session

40–60 minutes

- |                                                                                                          |                                                                                       |                    |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------|
| 1. Read a challenge that requires choosing a planting site where shrubs will get adequate nutrients.     |  | posing a challenge |
| 2. Discuss scoring criteria.                                                                             |  | setting standards  |
| 3. Work in groups to list the pros and cons of each site, and then rank them.                            |  | applying knowledge |
| 4. Talk about rankings and share reasons for the choices.                                                |  | communicating      |
| 5. Discuss the second part of the challenge—tracking the flow of nutrients—and complete it for homework. |  | applying knowledge |

# Desired Outcomes

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By the end of this assessment activity, students should:

- ✓ Understand that the nutrients available on a site depend on the history and current conditions of the site.
- ✓ Be able to weigh pros and cons to make and support judgments.
- ✓ Be able to diagram steps in a nutrient cycle.
- ✓ Be able to judge their own work and reflect on their understanding of nutrient cycling.

## What You'll Need



For each group of 3–4 students:

- copy of four "Planting Preferences Cards" (pages 322-323—see "Getting Ready")
- copy of "Scoring Sheet" (page 321—see "Getting Ready")

For each student:

- copy of "Challenge Sheet, Part 1" (page 319)
- copy of "Challenge Sheet, Part 2" (page 320)
- copy of "Scoring Sheet" (page 321)
- copy of "Reflections" (page 41)

# Getting Ready

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- ◆ If possible, laminate each set of "Planting Preferences Cards" you make.
- ◆ You'll need a copy of the "Scoring Sheet" for each group as well as one for each student, because students receive a group score for Part 1 of the challenge, and an individual score for Part 2.
- ◆ When you copy the two "Challenge Sheet" pages, don't collate them because you'll hand them out separately.
- ◆ You can plan to have students work in their research groups, or form new groups for this activity.

# Action Narrative

**We're going to do an activity that challenges you to use your knowledge about nutrient cycling. Here is the first part of your challenge.**

Hand out and have students read the "Challenge Sheet, Part 1." Go over it to make sure they understand their task.

**After you finish this part of the challenge in groups, I'll give you the second part for each person to do alone. What do you think I'll look for when I score your work?**

Encourage students to articulate their ideas about what knowledge they can demonstrate by fulfilling the challenge. Make sure that they understand that there is not necessarily one right answer to the challenge. What is most important is how well they support their choices. Hand out a "Scoring Sheet" to each student, and review the objectives listed for Part 1.

**Begin the challenge as soon as you get the cards that describe each location the Community Club is considering.**

Assign students to groups, and give each a set of the four "Planting Preferences Cards." You might want to suggest that each group member read a different card aloud to the rest of the group, to involve everyone. They might also want to choose one student per group to record the pros and cons they generate.

As you circulate and listen to the groups' discussions, make sure they are encouraging each person to contribute ideas. If students get into heated arguments over differences of opinion, help them focus on using argumentation skills to explore and refine ideas. This requires good listening skills, open-mindedness, and critical reflection, as well as the ability to give the person advancing an idea positive acknowledgement, even while disagreeing with the idea itself.

Groups will need about 20 minutes to complete the challenge. Make a chart on the board to record how they rank the sites.

	1st	2nd	3rd	4th
Green Acre Gardens				
Brady Forest				
Office District				
Town Lot				

**How many groups ranked Green Acre Gardens as your first choice? Your second? Your third? Your fourth?**

Tally the class results for Green Acre Gardens, then repeat the process for each of the other sites.

	1st	2nd	3rd	4th
Green Acre Gardens	1	1	4	1

Once the chart is complete, have students share the reasons for their choices. See below for pros and cons students might mention. Hold a discussion to help them examine their ideas and assumptions.

**Each group needs to hand in one completed "Challenge Sheet, Part 1" with everyone's names on it.**

Attach a group "Scoring Sheet" to each, to use for scoring Part 1 of the challenge.

**Now here is the second part of the challenge for you to do on your own as homework.**

Give each student a copy of the "Challenge Sheet, Part 2." Go over it to make sure they understand that their diagram should show several steps in a nutrient cycle that is specific to the site where they've chosen to plant the shrubs.

Review the objectives listed under Part 2 of the "Scoring Sheet" so that students understand how their individual work will be evaluated. Have them attach their own "Scoring Sheet" to their "Challenge Sheet, Part 2."

After you score their completed homework assignment, you can transfer group scores for Part 1 to each individual's "Scoring Sheet" so that each student receives a combined score for group and individual work.

## Ongoing Assessment

### Student Reflections

Have students complete a "Scoring Sheet" to score their own group and individual work. This is also a good time for them to complete a "Reflections" sheet (page 41).

### Teacher Reflections

*Challenge Sheet, Part 1*

The chart below lists some of the pros and cons of each site, to look for in students' work.

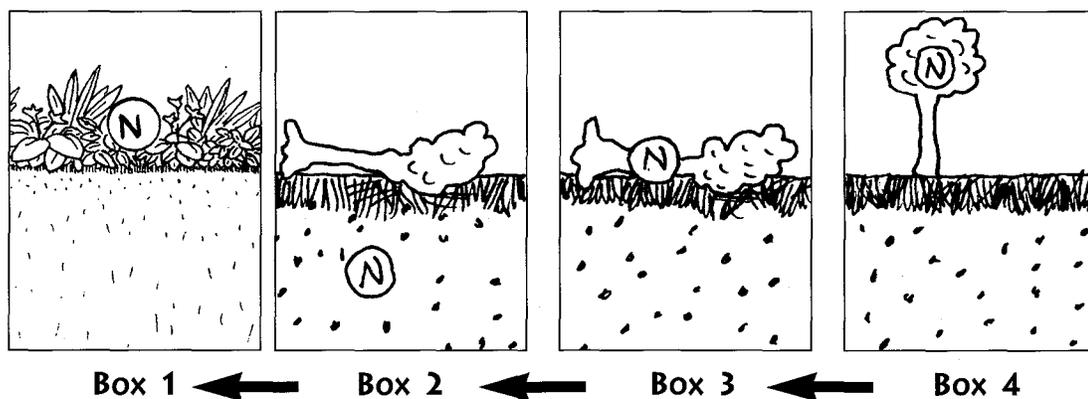
<u>Site</u>	<u>Pros</u>	<u>Cons</u>
<b>A: Green Acre Gardens</b>	<ul style="list-style-type: none"><li>• there might still be fertilizer or compost in the ground</li><li>• some of the garden plants might have rotted and returned nutrients to the soil</li><li>• land has been worked so will be easy to plant in</li></ul>	<ul style="list-style-type: none"><li>• harvesting garden plants might have used up all the nutrients in the soil</li><li>• some weeds grow best in poor soil, so weeds might mean that the soil is low in nutrients</li><li>• could be hard to get rid of the weeds</li><li>• pesticides in the soil might have killed some of the decomposers that recycle nutrients</li></ul>

Site	Pros	Cons
<b>B: Brady Forest</b>	<ul style="list-style-type: none"> <li>lots of dead plants are there to provide nutrients</li> <li>mushrooms and other decomposers are breaking down the dead plants and releasing nutrients</li> </ul>	<ul style="list-style-type: none"> <li>logs and branches don't break down very quickly</li> <li>it could be hard to clear the site to make room for the shrubs</li> </ul>
<b>C: Office District</b>	<ul style="list-style-type: none"> <li>the ground is bare so it would be easy to plant shrubs</li> </ul>	<ul style="list-style-type: none"> <li>probably all of the topsoil where there are the most nutrients was scraped away</li> <li>since nothing has grown there in the year since the building came down, the soil must be low in nutrients or toxic</li> </ul>
<b>D: Town Lot</b>	<ul style="list-style-type: none"> <li>leaves at the bottom of the layer are probably decomposing and returning nutrients to the soil</li> <li>leaves could stay around the shrubs once they are planted to keep weeds from growing up, and to keep providing nutrients to the shrubs</li> </ul>	<ul style="list-style-type: none"> <li>not sure what is under leaves—if it is pavement, it would not be good for the shrubs</li> <li>it could be a lot of work to clear away the leaves to make room for the shrubs</li> </ul>

*Challenge Sheet, Part 2*

The student's diagram below illustrates the steps in a nutrient cycle for the Brady Forest site. The diagrams for all sites should be similar, showing:

shrubs ← soil ← dead plants ← living plants.



Students' explanation of how nutrients get out of dead plants and into soil (question #2) should mention that decomposers consume the dead plants and release the nutrients that were in the plants into the soil. They might name specific decomposers, such as mushrooms, which are mentioned in the Brady Forest site description.

NAME(S) \_\_\_\_\_ DATE \_\_\_\_\_

# PLANTING PREFERENCES

The Community Club of Pleasantville received a donation of flowering shrubs. They had a meeting to talk about where to plant them. They thought of four possible locations. All four places:

- get sunlight all day;
- get the same amount of rain; and
- are where lots of people will see and enjoy the shrubs.

The club doesn't have any money for fertilizer, so they want to plant the shrubs where they'll get plenty of nutrients naturally.

### YOUR GROUP'S CHALLENGE:

- ① Read the descriptions of the four places on the Planting Preferences Cards.
- ② Discuss and record the pros and cons of each place for growing shrubs.
- ③ Decide which place would be best for planting all of the shrubs. Give that place "1st" in the Rank column. Then rank the others as your 2nd, 3rd, and 4th choices.

		PROS	CONS	RANK
<b>A</b>	Green Acre Gardens			
<b>B</b>	Brady Forest			
<b>C</b>	Office District			
<b>D</b>	Town Lot			

- ④ Explain why your 1st choice is the best location. Use the back of the sheet.

NAME \_\_\_\_\_ DATE \_\_\_\_\_

# PLANTING PREFERENCES

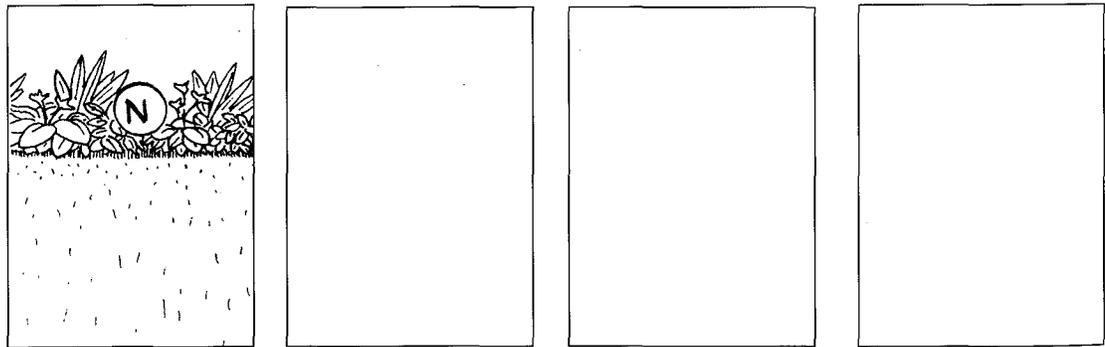
The Community Club of Pleasantville wants an explanation of how the shrubs will get the nutrients they need at your 1st choice location.

**YOUR CHALLENGE:**

① In Box #2, draw a picture that shows where the nutrients (N) might have been before they became part of the shrubs. In Box #3, draw where the nutrients might have been before that. In Box #4, draw where the nutrients might have been before that.

Use this symbol (N) in your drawings to show where the nutrients are located.

Below each box, write what the nutrients were in.



**Box 1** ← **Box 2** ← **Box 3** ← **Box 4**

One month after the shrubs are planted, the nutrients are in:

Before that, the nutrients were in:

Before that, the nutrients were in:

Before that, the nutrients were in:

The Shrubs \_\_\_\_\_

② Explain how nutrients get out of dead plants and into soil. Use the back of the sheet.

NAME(S) \_\_\_\_\_ DATE \_\_\_\_\_

# PLANTING PREFERENCES

OBJECTIVES	POINTS				SCORE
	3 High Quality	2 Meets Objectives	1 Falls Short	0 Not Done	
<b>PART 1:</b> <b>GROUP CHALLENGE</b>					
1. Pros explain why some sites would have more nutrients.	_____	_____	_____	_____	_____ x 2 = _____
2. Cons explain why some sites would have fewer nutrients.	_____	_____	_____	_____	_____ = _____
3. Ranking of choices shows that all pros and cons were weighed.	_____	_____	_____	_____	_____ = _____
4. Pros and cons include other reasons why sites are good or bad for planting shrubs.	_____	_____	_____	_____	_____ = _____
<b>PART 2:</b> <b>INDIVIDUAL CHALLENGE</b>					
5. Drawings and labels correctly show steps in a nutrient cycle.	_____	_____	_____	_____	_____ x 2 = _____
6. Steps shown make sense for the chosen site.	_____	_____	_____	_____	_____ = _____
7. Explanation of how nutrients are released is clear and correct.	_____	_____	_____	_____	_____ = _____
<b>COMMENTS:</b>					<b>FINAL SCORE:</b> _____
					Total Possible Score: 27 Overall Achievement: 23-27 High 18-22 Sound 9-17 Limited 0-8 Inadequate

**SITE A**

**GREEN ACRE GARDENS**

This site used to be a community garden. Four families shared it and grew vegetables here for ten years. They stopped using it three years ago. Now a lot of tall weeds grow here.

**SITE B**

**BRADY FOREST**

This site was a small forest. The town recently cut it down, leaving logs, leaves, and branches on the ground. A lot of mushrooms grow here.

### **SITE C**

## **OFFICE DISTRICT**

This site used to have an office building on it. The building was torn down about a year ago. All parts of the building were taken away. Now the ground is bare.

### **SITE D**

## **TOWN LOT**

This site is where the town crew dumps the leaves it collects from lawns. The crew spreads the leaves over the lot. The ground now has a layer of leaves about 15 cm deep.