GROUP PREVIEW • Garden Boxes

Name	Date	Group

You are designing and building a raised garden box for your school.



Section 1: Area of the Base of a Garden Box

A classmate created a garden box. Figure 1 represents the base of the garden box.



Figure 1. Base of a Garden Box Design

Group Discussion

- What strategies can you use to determine the area of the base of the garden box?
- Which formula(s) can you use to calculate the area of the base of the garden box?

What is the area of the base of the garden box?

Use words and numbers to explain your work.

Section 2: Amount of Soil

The depth of the soil in the garden needs to be 18 inches. How many cubic **feet** of soil is needed for the raised garden shown in Figure 1?

Use words and numbers to explain your work.

Section 3: Design Your Own Garden Boxes

You now have the opportunity to be creative and design two new garden boxes. Draw on the graph below to sketch two **unique** bases of garden boxes that meet **all** of the following criteria.

- 1. The base of the garden box can only use straight lines.
- 2. The base must have four or more sides.
- 3. The base must have at least two corners that are **not** right angles.
- 4. Each corner of the base must be at a **lattice point** of the graph paper. (Your teacher will explain to the class what a lattice point is.)





Кеу
⊢ represents 1 foot

Discussion Questions

- 1. Compare strategies and the work completed for Sections 1 and 2.
- 2. How do you decide if it is better to decompose a figure or to use negative space to calculate the area?
- 3. How can you verify that your garden design in Section 3 meets **all** of the criteria?

INDIVIDUAL PERFORMANCE TASK • Garden Boxes

Name	Date

Section 1: Review Annie's Design

Your friend Annie created this design. She says that her garden box base meets all of the design criteria and has an area of 60.5 square feet.

- 1. The base of the garden box can only use straight lines.
- 2. The base must have four or more sides.
- 3. The base must have at least two corners that are **not** right angles.
- 4. Each corner of the base must be at a **lattice point** of the graph paper. (Your teacher will explain to the class what a lattice point is.)

Annie's Design



Do you agree with Annie? Explain below why or why not.

Section 2: Design a Garden Box

Use the grid below to draw the base of another garden box. You can either use a design you created in the group activity, or create a new box that meets **all** of the criteria listed in Section 1.



Key ⊢—⊣ represents 1 foot

Part A: What is the area of the base of your garden box?

Part B: The garden box will have a height of 2 feet. What is the total volume of your garden box?

Part C: Experts recommend filling a garden box $\frac{7}{8}$ of its total volume with soil. How many cubic feet of soil will you need for your garden box? Explain how you determined your answer by showing all work using math, words, and a diagram.