

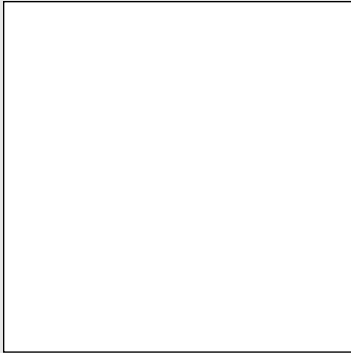
# Overview of the Concept: 2-D Measurement and Geometry

## Book Summaries

Title	Level	Summary
What Can We Make?	D	In this photographed realistic narrative, two children cover different shapes with other objects. They identify the four basic shapes while exploring the concept of area.
Two Little Houses	G	This illustrated fantasy narrative tells of two neighbours, Mrs. Brown and Miss Green, who are working on their homes to cover the floor, roof, and quilt with different shapes. They discover that some shapes work better than others, while exploring the concept of area.
The Busy Ants and the Lazy Ants	I	In this illustrated fantasy narrative, the busy ants and the lazy ants are each planting a garden. They discover that, although their gardens are different shapes, they have the same area.

## Target Outcomes

WNCP	Ontario	APEF
<p>Shape and Space (3-D Objects and 2-D Shapes)</p> <ul style="list-style-type: none"> <li>Compare, sort, and classify 2-D shapes.</li> </ul> <p>Shape and Space (Measurement)</p> <ul style="list-style-type: none"> <li>Estimate the number of uniform objects or shapes that will cover the surface of a design, and verify by covering and counting</li> <li>Estimate the number of irregular shapes that will cover a given area, and verify by covering and counting.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate an understanding of the relationship between the tiling of a surface and the number of units needed to cover the surface.</li> <li>Estimate and count the number of uniform and nonuniform shapes that will cover a surface.</li> <li>Use two-dimensional shapes to construct a picture of objects in the environment (e.g., stickers, stamps).</li> <li>Represent fractions (halves as part of a whole) using concrete materials.</li> <li>Compare the areas of shapes using non-standard units.</li> <li>Recognize symmetry in the environment.</li> </ul>	<p>Shape and Space:</p> <ul style="list-style-type: none"> <li>Measure and understand basic concepts and attributes of length, capacity, mass, area, and time.</li> <li>Explore and experiment with geometric shapes and relationships (including the orientation and perspectives of objects).</li> <li>Investigate and predict the results of combining, subdividing, and transforming shapes.</li> <li>Identify and use nonstandard and standard units of measurement and appreciate their role in communication.</li> </ul> <p>D3 Identify and use nonstandard units to estimate and measure length, capacity, time, mass, and area</p> <p>E5 Recognize, name, describe, and represent a variety of 2-D and 3-D shapes</p> <p>E8 Build, divide, and change 2-D shapes</p> <p>E11 Cover figures and fill shapes with countable nonstandard units</p>



## Level D

### Text Type

narrative (realistic)

### Word Count

111 (not including print within photographs), 112 (including print within photographs)

### High Frequency Words

a, all, are, big, here, I, is, it, made, my, of, the, them, they, this, to, too, we, with

### Content Words

covered, circle, loonies, same, size, lids, cover, triangles, small, jellybeans, half, rectangle, square, stickers, shapes, park

### Text Features

- 16-page book
- 2 lines per page
- photographs
- strong picture clues
- print within photographs

### Working with Words

Plurals

### Cross-Curricular Links

Mathematics

Art

## What Can We Make?

### Before Reading

Prepare cutouts of each of the four shapes—circle, square, rectangle, and triangle. Identify the shapes and challenge the students to cover each shape using a variety of nonstandard units of measurement (e.g., their fingers, cubes, paper clips). Discuss how the students chose their objects to cover the shape with, and what they discovered. Display the labelled shapes for students' reference.

### Previewing the Text

- Show the cover and discuss the art. Read the title of the book. Ask, *What materials do the children have to work with?* Elicit the words *circle*, *rectangle*, *triangle*, and *square* in your discussion.
- Say, *This book is about two children who are covering shapes with different things.*
- Support the students in a book walk. Discuss the pictures to help students access the meaning of the text, and introduce any unfamiliar vocabulary, expressions, and language structures.

**Page 2:** Ask, *What did the girl on this page use to cover her big circle?* (loonies) Point out that the word “circle” starts with a soft “c” sound, unlike the word “covered,” which starts with a hard “c” sound. Ask the students to locate the two words on the page.

**Page 3:** Ask, *What did the boy use to cover his circle?* (lids) Say, *The children's paper circles are the same size.* Ask, *Which circle is covered with more?*

**Pages 4–5:** Ask, *What shapes are the children covering in these photos?* (triangles) *Are the four triangles the same size? What is different about the last sentence on page 5?* (the word “too”)

**Pages 6–7:** Ask, *What did the children cover their small circles with?* (jellybeans) *What letter do you think the word “jellybeans” starts with?* Say, *Find the word “jellybeans” on these pages.* Ask, *How many times does the word appear? Which circle is covered with more jellybeans? How do you know?* (picture and text)

**Pages 8–9:** Ask, *What shapes are being covered on these pages? (rectangles) How much of her rectangle did the girl cover? (elicit the word “half”) How much of his rectangle did the boy cover?*

**Pages 10–11:** Ask, *How many small triangles did each child cover? What do you notice about all the triangles? (they are the same size and they are all covered)* Ask the students to locate the sentence that says “I covered all of them.”

**Pages 12–13:** Ask, *How much of the square is covered? (elicit “half”) What has the girl used to cover half of the square?* Ask the students to find and identify the two “s” words on this page. (square, stickers)

**Pages 14–15:** Say, *The children used all of the shapes to make a picture. Ask, What place have they made by putting all the shapes together? (a park)* Draw the students’ attention to the sign in the picture and then ask them to find the matching word in the text.

**Page 16:** Ask, *Who is playing in the park? What shapes do you see in this picture?*

## Reading the Text

Encourage students to read the book independently, at their own pace. Remember that subvocalizing (reading softly out loud) by early readers is to be expected and is often helpful. Observe and assist individual students as necessary. Give specific praise to students you observe using reading strategies.

## Revisiting the Text

You may choose to do only some of these activities, over several days.

- In pairs, have the students go through the book, retelling the story using only the pictures. Then have the students go back and read the text to each other, with each one taking one of the characters’ roles and reading only the right-hand or left-hand pages.
- Ask the students to look back through the text to complete **BLM 11-1: Find the Sentence** Have the students record the page number on which they found the sentence, and then illustrate the underlined word.
- Have the students complete **BLM 11-2: Scramboli** by unscrambling the word at the end of each sentence and writing it to complete the sentence. Encourage them to look through the book for answers.
- Print the shape words (circles, squares, rectangles, triangles) on sticky notes. Print the following sentences on chart paper: *The children covered the \_\_\_\_\_ with loonies and big lids. Then they covered \_\_\_\_\_. They put jellybeans on small \_\_\_\_\_. They covered half of the \_\_\_\_\_. The children covered 4 small \_\_\_\_\_. The girl covered half of the \_\_\_\_\_ with stickers.* Complete the story together with the students, putting the shape word cards in the appropriate blanks.

## **Working with Words: plurals**

Explain to the students that plurals are words that mean more than one. Write several examples of singular words and their plural versions on the board (e.g., girl/girls; boy/boys). Point out that by adding the letter “s” to a word, the word becomes plural. Remind the students that not all words ending with an “s” are plural (e.g., “yes”). Have the students work in pairs to list the plural words they find in the book. (loonies, lids, triangles, jellybeans, stickers, shapes) Review the students’ findings. Then, challenge the students to add to their list of plural words throughout the day, by looking for plurals in other books, on posters, and on signs.

## **Extending Activities**

### **Making Shape Pictures**

Challenge the students to work in pairs to create a picture using a variety of shapes of different sizes. Provide a variety of nonstandard units of measurement (e.g., buttons, play coins, square stickers) for the students to use to cover their shapes. Ask the students to count and label the number of nonstandard units of measurement they used to cover each shape. Encourage the students to present their pictures and explain their choice of objects for covering the shapes.

### **Cover a Circle**

Show the students a large cutout circle, and a variety of smaller circular objects (e.g., bottle lids, circular candy, coins). There must be enough of each object to cover the circle. Ask the students to choose one of the objects and write their predictions about how many of the object it will take to cover the circle. Then ask the students to cover the circle with the objects and to count how many objects were used. Compare the actual total with the students’ predictions. Repeat the process using different objects.

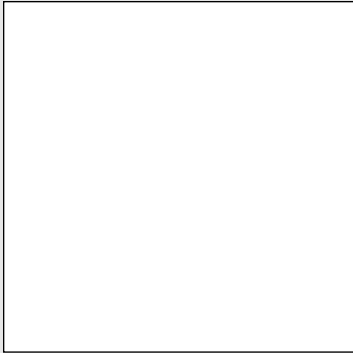
## **Cross-Curricular Links**

### **Mathematics/Art**

Assist the students in cutting out three sizes of each shape (circle, square, rectangle, triangle). Ask the students to paste the shapes on a large piece of paper, in order from smallest to largest. Using markers, paint, and/or crayons, challenge the students to make the shapes into a realistic object (e.g., a large square building, a small square stamp).

### **Mathematics**

Provide the students with a variety of shapes in different sizes, as well as paperclips, pipe cleaners, coins, and so on, for the students to cover the shapes. Ask the students to try covering half of one of the shapes using different objects. Have the students decide which is the best object to cover half of the shape, and present their findings to the class. Discuss any differences the students may find in using different shapes.



## Level G

### Text Type

narrative (fantasy)

### Word Count

247

### High Frequency Words

all, and, are, be, by, but, do, good, had, have, her, it, little, me, my, no, now, of, said, she, some, the, there, they, this, to, too, want, was, with, will

### Content Words

river, work, dirt, floor, covering, square, tiles, stars, beautiful, problem, spaces, quilt, rectangles, warm, triangles, more, roof, wood, circles, pouring, rain, leaking, muddy, fire

### Text Features

- 16-page book
- 3–7 lines per page
- illustrations
- moderate picture clues
- dialogue

### Cross-Curricular Link

Art

# Two Little Houses

## Before Reading

Divide the class into four groups and provide each group with a set of the same shape (e.g., triangles, rectangles, circles, squares). Instruct each group to cover a piece of equal-sized paper with their shapes, and tell them that the shapes cannot be overlapping. Have the groups bring their covered paper back to the group. Ask, *Which shapes covered the paper the best? Why?* (circles and triangles would have spaces between them so there would be areas left uncovered, rectangles and squares would cover the area completely)

## Previewing the Text

- Show the cover and discuss the art. Read the title of the book aloud. Ask, *What do you notice about the two women’s houses?*
- Say, *This story is about two neighbours, Mrs. Brown and Miss Green. They have some work to do on their houses.*
- Support the students in a book walk. Discuss the pictures to help students access the meaning of the text, and introduce any unfamiliar vocabulary, expressions, and language structures.

**Pages 2–3:** Say, *Mrs. Brown and her house are on the left and Miss Green and her house are on the right.* Ask, *What can you tell me about Mrs. Brown’s house from looking at this picture?* (elicit “little house,” “river”) *Who lives next door to Mrs. Brown?*

**Pages 4–5:** Ask, *What was Mrs. Brown covering her dirt floor with?* (square tiles) Say, *She is almost done covering the dirt with square tiles.*

**Pages 6–7:** Say, *Miss Green had a dirt floor, too.* Ask, *What did Miss Green use to cover her floor?* (stars) Say, *Miss Green thinks the stars are beautiful.* Ask the students to find the word “beautiful” on the page. Ask, *What was the problem with covering the floor with stars?* (elicit the phrase “the stars left spaces”)

**Pages 8–9:** Ask, *What was Mrs. Brown making?* (a quilt) *What shapes did she use to make her quilt?* (big squares and rectangles) *Why did Mrs. Brown make a quilt? What does she say?* Have the students find Mrs. Brown’s dialogue on the page, and read it aloud.

**Pages 10–11:** Ask, *What shape did Miss Green use to make her quilt?* (small triangles) *What was the problem? What does Miss Green say exactly?* (“I need a lot more triangles.”)

**Pages 12–13:** Ask, *What shape was Mrs. Brown using to cover her roof?* (rectangles) *What shape was Miss Green using?* (circles) *What were the shapes made of?* (wood) *How do you know?* (picture and text) *What was the problem with Miss Green’s roof?* (elicit “the circles left spaces”)

**Pages 14–15:** Say, *It was pouring rain.* Ask, *What problems did Miss Green have?* (the roof was leaking, the floor was all muddy, and the quilt she made didn’t keep her warm) *What did Mrs. Brown say to Miss Green?*

**Page 16:** Ask, *Where did they sit at Mrs. Brown’s house?* Have the students read the dialogue to find out what Mrs. Brown and Miss Green are saying.

## Reading the Text

Encourage students to read the book independently, at their own pace. Remember that subvocalizing (reading softly out loud) by early readers is to be expected and is often helpful. Observe and assist individual students as necessary. Give specific praise to students you observe using reading strategies.

## Revisiting the Text

You may choose to do only some of these activities, over several days.

- Encourage the students to reread the book together as a group, independently, or with a partner. The students could also read this story as a play.
- Have students look closely at page 3 or page 13 and look for the similarities and differences between the two houses and yards. Help them notice the symmetry within the illustration.
- Have the students fold a piece of paper into four sections. Ask the students to retell the story by illustrating the three things that Mrs. Brown and Miss Green did in the story (covered their floors, made quilts, covered their roofs). Then, in the last section, have them illustrate the end of the story. Ask the students to write a sentence below each illustration, describing their picture.
- Ask each student to choose a page from the book. Have students devise dialogue for one or both characters, and write a speech balloon on a sticky note. Then have them stick the speech balloon onto the page.

## Extending Activities

### Investigate Floors

Ask the students to do a survey of the uncarpeted floors in the school and in their homes. Have the students take home and complete **BLM 11-3: Floor Search** by writing three of the names of the rooms (e.g., kitchen, gymnasium), and drawing the shapes found on the floors. Discuss the students’ findings.

### **Cover a Quilt**

Provide the students with a number of small squares that can be cut diagonally to make small triangles, and a sheet of paper to represent a quilt. Ask the students to estimate the number of triangles they think they will need to cover the area of their paper, and record their estimation on the back of the paper. Then have the students use their triangles to cover the quilt, with no spaces showing. When they are finished, have the students record the actual number of triangles they used beside their estimate. Estimates and actual results can be recorded on a class graph.

### **Solve Miss Green’s Problems**

Recall the problems that Miss Green experienced in the story. Have the students use **BLM 11-4: Problem Solved!** and describe one of Miss Green’s problems, and then draw how she could have solved the problem, using Mrs. Brown’s example.

### **Cross-Curricular Link**

#### **Art**

Students can each create a diorama of a little house, using shoeboxes, cardboard, construction paper, paint, markers, and so on. Have them cover the floor and the roof of their house with uniform shapes, leaving no spaces in between shapes. If desired, the students may also furnish the houses, and decorate them.

# The Busy Ants and the Lazy Ants

## Before Reading

Prepare two rectangular pieces of construction paper that are different shapes but have the same area (e.g., one very tall and thin, the other more square), plus a third rectangle that does not have the same area. Use three different colours to make it easier to refer to them. Tell the students that two of the shapes are the same size (area) and discuss which two they might be. Talk about how they could go about comparing and proving which two are the same. You may want to record their ideas for looking at later. Leave the solution open for now, and plan to return to the problem after reading the story.

## Previewing the Text

- Show the cover and read the title. Ask, *Which group of ants do you think are the busy ants? Who do you think are the lazy ants?*
- Say, *This story is about two groups of ants, the busy ants and the lazy ants, who are each planting a garden. Their gardens are different shapes, and they try to find out whose garden is bigger.*
- Support the students in a book walk. Discuss the pictures to help students access the meaning of the text, and introduce any unfamiliar vocabulary, expressions, and language structures.

**Pages 2–3:** Say, *Look at the gardens that the ants have prepared. Ask, Do you think one garden is bigger or do you think they are the same size? Say, The busy ants on page 2 are working together. Ask, What are they doing? (planting seeds) Two of the lazy ants are planting seeds, but what are most of them doing? (elicit “rest”)*

**Pages 4–5:** Ask, *Why do you think the busy ants look so proud? (they are done planting their garden) Say, The lazy ants think that the busy ants have a smaller garden. They believe that their garden is bigger, so they will have more food to eat. Point out the word “rest” on the page and discuss its difference in meaning from the word “rest” on page 3.*

## Level I

### Text Type

narrative (fantasy)

### Word Count

373

### High Frequency Words

a, all, and, are, be, but, can, do, don't, eat, going, good, had, have, is, it, little, look, no, not, now, of, put, said, so, some, that, the, them, then, there, they, this, to, too, want, we, what, when, will, with, you, your

### Content Words

busy, planting, garden, seeds, lazy, rest, covering, circles, measuring, leave, spaces, half, rectangles, triangles, shapes, size, beside, squares, exactly, amount

### Text Features

- 16-page book
- 2–12 lines per page
- illustrations
- moderate picture clues
- dialogue
- italics

### Working with Words

Verb Endings

### Cross-Curricular Links

Drama

Mathematics

**Pages 6–7:** Say, *The busy ants are measuring their garden to see whose garden is bigger.* Ask, *What shape are they using to measure the area of their garden?* (circles) *Do you think this is a good thing to measure with? Why not?* (elicit “circles leave spaces”) Ask the students to find where the lazy ants are laughing in the text. Point out the unconventional spelling of the word “laughed.”

**Pages 8–9:** Ask, *What shape are the busy ants using to measure their garden in this picture?* (rectangles) *Are there any spaces between the rectangles? How much of the garden have they covered?* (half) *Why is it taking a long time to cover their garden?* (they are using little rectangles)

**Pages 10–11:** Say, *The busy ants used triangles to cover their garden.* Ask, *What is wrong with the triangles that they are using to measure?* (they are not the same size, the ants have to put them beside each other)

**Pages 12–13:** Ask, *What shape did the busy ants use to cover the surface of their garden?* (squares) *Why do you think this is a good shape to use?* (they are all the same size, they are beside each other) *What are the lazy ants going to do now? Why do the lazy ants think that it will take a long time to measure their garden?*

**Pages 14–15:** Ask, *How many squares did it take to cover each garden?* (16 squares) *What have the ants found out about their gardens?* (they are exactly the same size) Ask the students to locate the word “exactly” on the page. Ask, *Do you think they will grow exactly the same amount of food? Why or why not?*

**Page 16:** Say, *It is two months later.* Ask, *Why do you think the busy ants are laughing?*

## Reading the Text

Encourage students to read the book independently, at their own pace. Remember that subvocalizing (reading softly out loud) by early readers is to be expected and is often helpful. Observe and assist individual students as necessary. Give specific praise to students you observe using reading strategies.

## Revisiting the Text

You may choose to do only some of these activities, over several days.

- Encourage the students to reread the book together as a group, independently, or with a partner.
- Have the students use the art to answer questions such as the following:
  - What did the busy ants plant in their garden?*
  - What are the differences between the homes of the busy ants and the lazy ants?*
  - Where did the busy ants get the shapes they used to cover their garden?*
  - What food items are the circles? rectangles? triangles? squares?*
  - What do the busy ants do with the shapes when they take them off the garden?*

- Have the students reread the story taking on the roles of the characters. Working in groups of three, have one student read the part of the narrator, the second read the part of the busy ants, and the third read the part of the lazy ants. Encourage them to practise reading using the italicized words and punctuation to emphasize their expression.
- Ask the students to retell the story, outlining what shapes the busy ants tried to use to measure the area of their garden. Have the students explain why the different shapes either worked, or didn't work.
- Ask the students to choose their favourite page of the book, and explain their choice.

### Working with Words: verb endings

Create a chart with simple verbs from the book, as shown.

Root Word	Ending "s"	Ending "ing"	Ending "ed"
work			
cover			
laugh			

Have the students look through the book for a form of each root word. As they find the words with endings, write them in the appropriate column on the chart, and put the page number where the word was found in parentheses. When all the forms of all the root words that appear in the book have been recorded, go back and complete the chart.

Root Word	Ending "s"	Ending "ing"	Ending "ed"
work			worked (2, 14)
cover		covering (6)	covered (8, 12)
laugh			laughed (6, 8, 10, 16)

Have the students complete **BLM 11-6: Verb Forms** by completing the chart, then choosing the form of the word that best completes each sentence.

### Extending Activities

#### Write a Story

Have the students work in pairs, or individually, to write a story in which the ants have a different problem (e.g., They are building a sandcastle, which must be protected from the waves. They decide to build a wall.). The students develop the story to tell how the lazy ants and the busy ants handle the situation.

## **Problem Solving**

Review the problem you presented during the Before Reading activity, and the students' suggested solutions. Discuss any new ideas they may have, having read the story of the ants' gardens. Working as a group, try different ways of measuring and comparing the large shapes, as the busy ants did. Use smaller cutouts of some or all of squares, rectangles, triangles, and circles. Discuss how to place the smaller shapes and the pros and cons of using each shape for covering. You may also want to have the students estimate the number of a particular shape that would be needed to cover any or all of the larger shapes, before completing the measuring. Alternatively, provide materials for each pair of students to work on the problem themselves, then discuss their findings as a group.

## **Cross-Curricular Links**

### **Drama**

Working in small groups, or as a class, the students can present the story as a play. Some students may want to write their own script while others may choose to follow the text. The students can use props, such as antennae headbands, and create a backdrop or scenery. Once they are prepared, the students present their play for their class.

### **Mathematics**

Challenge the students to create two new (paper) gardens that are different shapes, but the same size (area). If they need help to get started, you could brainstorm with them what they could use to measure the garden spaces before drawing and cutting out the shapes. For example, they could use 12 squares and arrange them 3 by 4, and 2 by 6, draw an outline around them, and cut them out. Tell the students to be prepared to demonstrate that their two gardens are the same size.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Find the Sentence

Write the page number for each sentence and draw the underlined word.

	Page Number	Draw the Underlined Word
1. My <u>circle</u> is the same size.		
2. My <u>triangles</u> are the same size.		
3. I covered half of this <u>square</u> .		
4. I covered all of this <u>rectangle</u> .		
5. I covered it with 21 <u>jellybeans</u> .		

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Scramboli

Unscramble the words. (Hint: Use the page numbers to find the words in the book.)

		Page Number
sespha	<u>  s  </u> _____	14
liccre	<u>  c  </u> _____	3
qrasue	<u>  s  </u> _____	12
alhf	<u>  h  </u> _____	8
amsll	<u>  s  </u> _____	6
rpak	<u>  p  </u> _____	14

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Floor Search

Write the room name and draw the floor.

Room Name	Floor

Name: \_\_\_\_\_

Date: \_\_\_\_\_

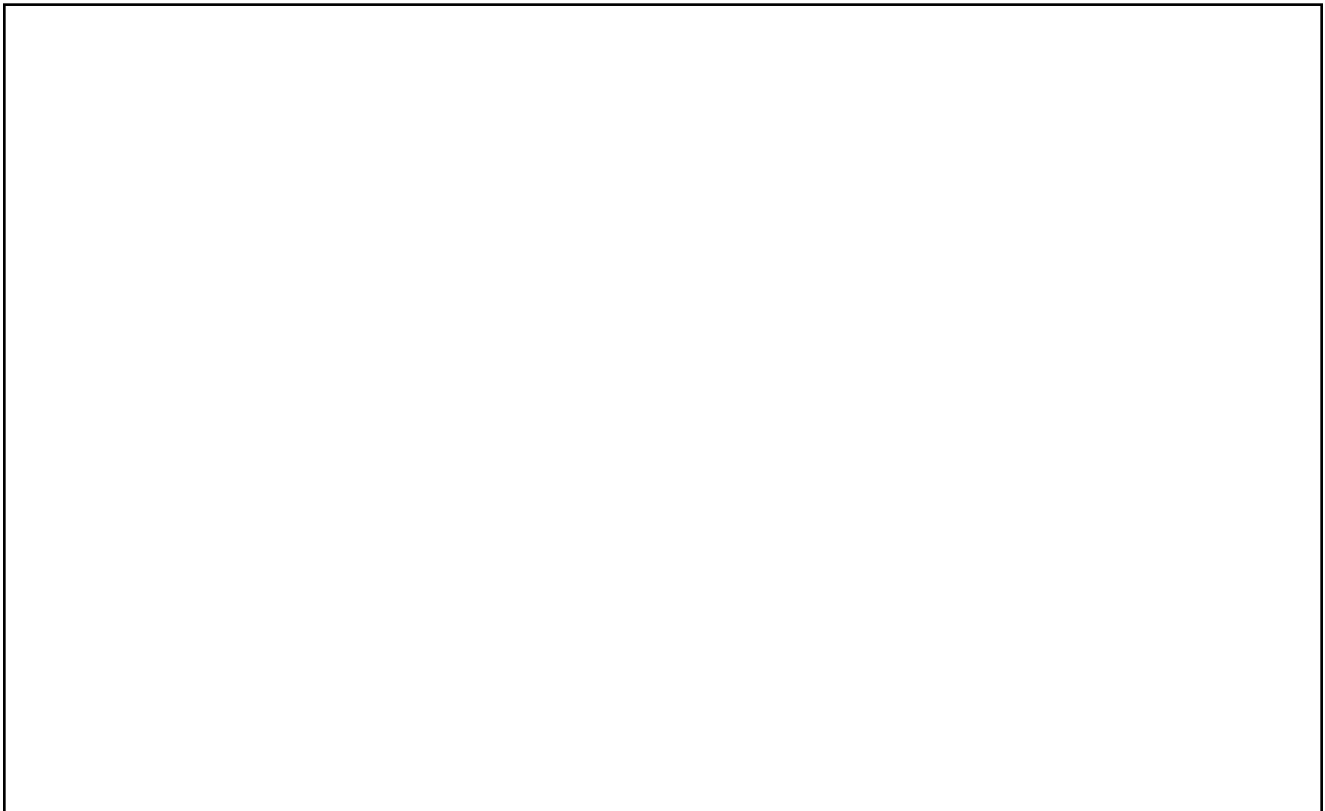
## Problem Solved!

Choose one of Miss Green's problems to describe, and then draw how she could solve the problem.

Miss Green had a problem with \_\_\_\_\_.  
(her dirt floor; her quilt, her roof)

The problem was \_\_\_\_\_  
\_\_\_\_\_

This is how she could have solved her problem.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Verb Forms

Complete the chart. Choose one of the words to complete the sentence.

Root Word	Ending "s"	Ending "ing"	Ending "ed"
plant			
ask			
finish			
help			

1. They were \_\_\_\_\_ a garden.  
(plant)

2. "What are you doing?" \_\_\_\_\_ the lazy ants.  
(ask)

3. "Look, we're \_\_\_\_\_ already."  
(finish)

4. "We can \_\_\_\_\_," said the busy ants.  
(help)