

# Playground Design Task

## Summary

Students will be able to discover, explore and create their own idea of a square unit and how it is used to measure area.

## Main Core Tie

Mathematics Grade 3

[Strand: MEASUREMENT AND DATA \(3.MD\) Standard 3.MD.5](#)

## Additional Core Ties

Mathematics Grade 3

[Strand: MEASUREMENT AND DATA \(3.MD\) Standard 3.MD.6](#)

## Time Frame

2 class periods of 60 minutes each

## Group Size

Pairs

## Life Skills

Thinking & Reasoning

## Materials

- Graph paper
- Chart paper
- Markers, colored pencils, crayons
- Scissors
- colored tiles or cm cubes

## Background for Teachers

Students should have a firm foundation in multiplication for this lesson. Students could cut out graph paper areas to model the area needed for the playground. Once students have found the area for each piece of playground equipment they should be able to add the areas. The total area must be under 1,000 square feet.

## Student Prior Knowledge

Connections to multiplication/division is necessary for students to understand area. Teachers can make connections to arrays, and repeated addition for multiplication. The distributive property can also be used to show area.

## Intended Learning Outcomes

Students will be able to recognize area as an attribute of plane figures and understand concepts of area measurement.

Mathematical Practice #1 - Make sense of problems and persevere in solving them.

Mathematical Practice #7 - Look for and make use of structure.

## Instructional Procedures

Explain the task to the students:

Your parents have decided to let you help design a playground in your backyard. You will have 400 square feet to work with. The list is attached for the type of playground equipment with the total area for each item. Have fun designing your backyard playground!

Ask students if they have any questions before starting the task. (Some students will work out the area for each playground piece of equipment, while others may want to cut out from graph paper the squares and add it to another sheet of paper.) You may ask the following questions to help focus your students:

What do you know?

What do you need to find out?

Show me your pictures.

Where would you find that information?

What tools would be most helpful?

How did you figure that out?

Is there another way to do that?

what have you discovered?

Describe...Explain...Tell me more

This may take more than one class period. Students will need plenty of time to work out the area and then add the areas together to be less than 400 square feet. Select students from simple to more complex designs. Ask how they know they have under 400 feet? Are your pieces connected? Why or why not?

Ask the following questions:

Did anyone do it the same?

Did anyone do it different?

How are your strategies alike? Different?

Explain the strategies you used to find the total area.

## Strategies for Diverse Learners

For struggling learners:

Pair struggling students together with a more advanced student. Ask questions to get them started... What do you know? What do you need to find out? Show me your pictures. What tools do you need to solve the problem?

To challenge students: tell them they have to keep the cost at under \$1,000. have them add up the cost of their items. What pieces would they trade out and why?

## Extensions

For extensions or fast finishers:

have the students find the cost of the playground. Also determine a shape different than a rectangle. Would the shape be more of an "L" shape? why or why not? What other shapes could it be?

## Bibliography

Core Academy Task Lessons 2012

Adapted from: Smith, Margaret Schwan, Victoria Bill, and Elizabeth K. Hughes. "Thinking Through a Lesson Protocol: Successfully Implementing High-Level Tasks." Mathematics Teaching in the Middle School 14 (October 2008): 132-138.

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