

**GEOMETRY AND SPATIAL SENSE**  
**GRADE 2**  
**ONTARIO EDITION**

*hands-on*  
**mathematics**

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# Introduction

The study of geometry helps students represent and describe objects and their interrelationships. Students learn to manipulate concrete shapes as well as to visualize, describe, draw, build, and compare two-dimensional shapes and three-dimensional objects. They also gain experience with transformational geometry using concrete materials and drawings.

In this module, students are encouraged to:

- name, describe, and construct a variety of two-dimensional shapes and three-dimensional objects
- apply positional language, orally and in written or numeric form

## Mathematics Vocabulary

Throughout this module, teachers should use, and encourage students to use, vocabulary such as: *polygon, triangle, quadrilateral, pentagon, hexagon, heptagon, octagon, cube, sphere, cone, cylinder, pyramid, prism, face, edge, vertex, skeleton, two dimensional, three dimensional, symmetrical, and line of symmetry.*

Continue to use your classroom Math Word Wall as a means of reinforcing new vocabulary. As new terms are introduced throughout the module, record these words on index cards, and display them on the wall under the appropriate alphabet letter. Students can then refer to the words when discussing, describing, and writing about their math experiences.

# 5 Positional Language

## Materials

- positional term cards (included. Copy, and cut out.) (4.5.1)
- pattern blocks
- books (one for each pair of students, to act as a screen between them)
- geoboards
- elastic bands
- dot paper (included with lesson 5) (4.5.6)

## Activity: Part One: Reviewing Positional Terms

Begin the lesson by asking students to stand up. Explain that you are going to play a game of “Simon Says.” Remind students to listen carefully to your directions.

Give students directions that include one of the positional terms from the positional term cards (4.5.1). For example:

- Simon says stand *beside* your desk.
- Simon says jump to the *right*.
- Simon says point to the person *in front* of you.

Have students sit down if they do an action for which the direction did not include “Simon says.” Play the game until only one student remains standing. Ask students:

- What did my “Simon Says” directions all have in common?

Explain to students that each direction included a *positional* term. Restate some of the directions you gave, emphasizing the positional terms.

Next, hold up the positional term cards (4.5.1) one at a time. Have students read each word aloud, and then ask them to create a “Simon Says” direction using that word. Finally, ask students:

- When do we use positional terms? (when giving directions, when describing where an object can be found)
- How do positional terms help us?

Now, distribute Activity Sheet A (4.5.2), and have students fill in each blank using a positional term.

## Activity Sheet A

### Directions to students:

Look carefully at the pictures. Fill in each blank using a positional term (4.5.2).

## Activity: Part Two: Using Positional Terms

Divide the class into pairs of students. Ask the students in each pair to sit facing one another. Have each pair place a book (or something else to act as a screen) between them. Distribute ten pattern blocks and a copy of Activity Sheet B (4.5.3) to each student.

**Note:** Each student should have the same pattern blocks as his/her partner.

Have one student in each pair use the pattern blocks to create a design and then record directions for reproducing the design on the activity sheet. Next, have students slowly read their directions to their partners, and have partners try to reproduce the designs. After, have students remove the screens to compare designs. Encourage partners to ask each other:

- Do our designs/pictures match?
- If not, what is different about our two pictures?
- Were the directions clear?
- If not, what should we change/add?

Have partners switch roles, and repeat the activity.

# 5

## Activity Sheet B

### Directions to students:

Create a design with pattern blocks. Record directions for reproducing your design on your activity sheet. Slowly read your directions to your partner so he/she can make the same design (4.5.3).

### Problem Solving

Have each student use elastic bands to make a shape on a geoboard. Then, have students make their shapes again on dot paper. Ask students to record directions for making the shape. For example:

- Use one elastic band to connect the first peg in the first row to the first peg in the third row.
- Use another elastic band to connect the first peg in the first row to the fifth peg in the third row.
- Use a third elastic band to join the first and fifth pegs in the third row.
- What shape did you make?

Ask students to trade their directions with their partner, and then use their partner's directions to recreate each other's shape on their own geoboards. Have students check to see if their new shapes are the same size and in the same place as their partners' drawings on the dot paper. If not, have partners work together to determine where the error occurred. (Were the directions correct? Did the student follow the directions correctly?)

## Extensions

- Add the positional terms to your classroom Math Word Wall.
- Play a game of "I Spy" that combines positional terms and three-dimensional objects in the classroom. For example, "I Spy something that rolls, beside the globe, and under the window."
- Play a listening directional game during physical education. Have students spread out and find their own spots in the gymnasium. Now, provide a series of directions for them to follow, such as the following:
  - Take three giant steps backward.
  - Make two jumps to the right
  - Take five small steps forward.

Consider providing opportunities for students to give the directions.

## Assessment Suggestion

Have students reflect on their abilities to give accurate directions to their partners during Activity: Part Two. Have students use the Student Self-Assessment sheet, found on page 23, to record their thoughts.

## Positional Word Cards

**in front**

**behind**

**beside**

**under**

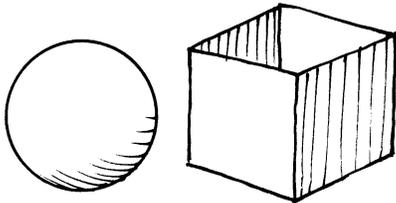
**over**

**right**

**left**

**on**

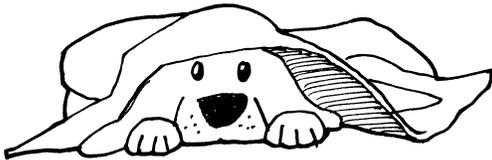
# Where Is It?



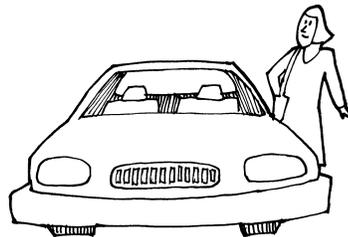
The ball is to the \_\_\_\_\_  
of the box.



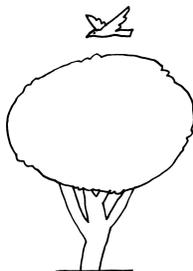
The boy is \_\_\_\_\_  
the chair.



The puppy is \_\_\_\_\_  
the blanket.



The woman is \_\_\_\_\_  
the car.



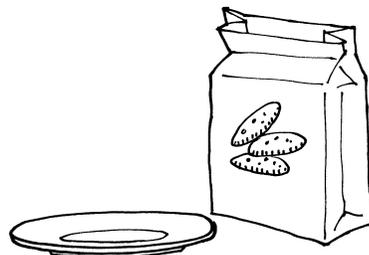
The bird is flying \_\_\_\_\_  
the tree.



The boys are \_\_\_\_\_  
the girl.



The children are \_\_\_\_\_  
of the house.



The cookies are to the \_\_\_\_\_  
of the plate.

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

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

# My Design

Here are directions to make my design:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_