



KINDERGARTEN SUPPLEMENT

Set C2 Geometry: Locations

Includes

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Skills & Concepts

- ★ describe the location of one object relative to another object using words such as *in, out, over, under, above, below, beside, between, next to, across from, behind, in front of, near, and far*
- ★ identify the given information that can be used to solve a problem
- ★ recognize when additional information is required to solve a problem
- ★ use the directional words *left* and *right* to describe movement

Bridges in Mathematics Kindergarten Supplement

Set C2 Geometry: Locations

The Math Learning Center, PO Box 12929, Salem, Oregon 97309. Tel. 1 800 575–8130.

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Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

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Set C2 ★ Activity 1



ACTIVITY

The Bear in the Box

Overview

Students learn to describe the location of one object relative to another by following and giving directions using positional terms such as *in*, *out*, *over*, *under*, *above*, *below*, and so on.

Skills & Concepts

- ★ describe the location of one object relative to another object using words such as *in*, *out*, *over*, *under*, *above*, *below*, *beside*, *between*, *next to*, *across from*, *behind*, *in front of*, *near*, and *far*
- ★ identify the given information that can be used to solve a problem
- ★ recognize when additional information is required to solve a problem

You'll need

- ★ a teddy bear or other stuffed animal (see Advance Preparation)
- ★ a cardboard carton with a lid (see Advance Preparation)
- ★ 15 Unifix cubes (see Advance Preparation)
- ★ chart paper and marking pens
- ★ helper jar
- ★ a piece of drawing paper for each student (optional)
- ★ crayons (optional)
- ★ All about Where, by Tana Hoban (optional)

Advance Preparation Find a cardboard carton large enough to hold the teddy bear. An empty 10-ream paper box with a lid is ideal. Place the teddy bear inside the box, put the lid on the box, and tape it lightly in place. Make three stacks of 5 Unifix cubes, each stack a single color different from the other two.

Instructions for The Bear in the Box

1. Place the sealed cardboard carton in the middle of your discussion area. Gather children to your discussion circle. When everyone is settled and can see the chart paper you've posted, explain that you have hidden something in the box. In order to find out what's in the box, they will have to ask you questions, but only questions you can answer with a "yes" or a "no".
2. Encourage your students to discuss the possibilities with one another. What are some of the things that could be in the box? Can they think of anything it couldn't be, just by looking at the box?

Students *It probably can't be really, really big like a tree or a bike because it couldn't fit in there. It could be a toy tree or a little bike.
Is it something to eat?
Is it a birthday cake?*

3. Show students the three stacks of Unifix cubes you've prepared. Count the cubes with the children and explain that you will remove a cube from one of the stacks for each question they ask. When all 15 cubes are gone, you will give them more clues if they haven't already figured out what's in the box. Can one of them ask a question you can answer "yes" or "no" to get a clue right now? Guide the questioning a

Activity 1 The Bear in the Box (cont.)

bit if necessary to steer children away from naming specific items and toward getting descriptive information.

Eloise Do we get to eat it?

Teacher No.

Marco Is it something to play with?

Teacher Yes.

Sara Is it a doll house?

Teacher How could you find out if it's a doll house? Talk to the person next to you, and then I'll call on someone with a hand up.

David Is it a place for dolls to live?

Teacher No.

Hiroko I know! It's a toy car. Is it a toy car?

4. If students persist in naming specific items, brainstorm with them some of the information that might help them figure out what's in the box, such as color, shape, size, what people do with it, weight, texture, what it's made of, and so on. Then have them ask more questions. As you answer each question, record the information on your chart paper. Count the remaining cubes with the class periodically to help children determine how many questions they have asked and how many they have left.

What's in the box?	
Yes	No
can play with it	cannot eat it
brown	not a place for dolls
bigger than a block	not a vehicle
made of cloth	not made of plastic
soft	not red
	not blue
	not hard

5. Continue in this way until the children have gathered 15 clues. If your class isn't close to figuring out what is in the box at that time, offer them 5 more questions and provide a clue or two to get them on track. Finally, take the lid off the box and hold up the bear for everyone to see.

6. Explain that this bear has come to class to play a game with the children. Ask students to rearrange themselves so everyone is sitting in a semi-circle facing the box. Place the bear in front of the box, behind the box, in the box, near the box, far from the box, and beside the box. Turn the box over. Put the

Activity 1 The Bear in the Box (cont.)

bear under the box. Each time you change the bear's location, tell the students what you are doing, for instance, "I am putting Little Bear in front of the box," "I am putting Little Bear near the box," and so on.

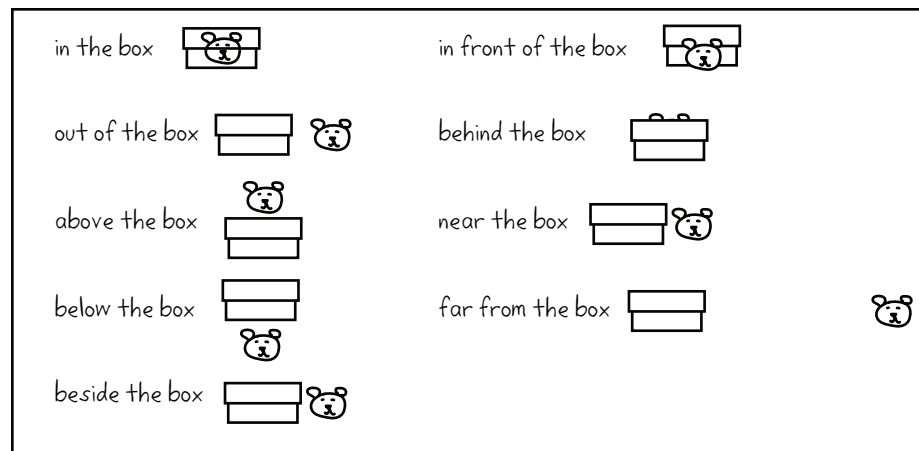
7. Next, pull children's names out of your helper jar one at a time to change the bear's location as you give directions such as:

- Put Little Bear between me and the box.
- Put Little Bear on top of the box.
- Put Little Bear across from the box.
- Hold Little Bear above the box.

8. Finally, place the bear in the box. Ask students to tell you where the bear is. Change the bear's location several more times, placing it in front of the box, behind the box, above the box, and under the box. Each time, have students tell you where the bear is.

Extensions

- Later in the day, or the next day ask students to each draw a picture of a stuffed bear, or another favorite stuffed animal and a box. Before you give out the drawing paper, have the class brainstorm a list of possible locations. Where could they put the stuffed animal relative to the box in their drawings? List their ideas on the board with simple illustrations. Circulate as students are working to discuss their drawings with them. Ask them to describe the location of the stuffed animal, and work with them to record a sentence that includes the animal's position relative to the box, e.g., "My duck is hiding behind the box". Display the labeled drawings in the classroom or the hallway.



- Review some of the terms you introduced during this activity by reading *All about Where*, by Tana Hoban, to the class. Other good books for reinforcing positional language include *Over, Under, and Through*, by Tana Hoban and *Becca Backward, Becca Forward*, by Bruce McMillan (optional).

Set C2 ★ Activity 2



ACTIVITY

Left & Right

Overview

Students use their hands to learn about *right* and *left*, and practice the language of location and direction.

Skills & Concepts

- ★ use the directional words *left* and *right* to describe movement
- ★ describe the location of one object relative to another object using words such as *in*, *out*, *over*, *under*, *above*, *below*, *beside*, *between*, *next to*, *across from*, *behind*, *in front of*, *near*, and *far*

You'll need

- ★ $\frac{3}{4}$ " red adhesive dots OR a non-toxic red marking pen
- ★ a piece of 12" x 18" drawing paper for each student (optional)
- ★ pencils and crayons (optional)
- ★ *Left Hand, Right Hand*, by Janet Allison Brown (optional)

Instructions for Left & Right

1. On the day you conduct this activity, label the back of each student's right hand with a small red dot. Use either a red adhesive dot or a non-toxic red marking pen to do this. As you do so, explain that the hand with the red dot is their right hand, and the hand with no dot is their left hand.
2. Once every student has a dot on his or her right hand, gather the children to your discussion area. Seat them in rows all facing the same way for this activity. Ask them to raise their right hand over their head. Then ask them to raise their left hand. How do they know which one is right, and which one is left?

Students *You gave us a red dot on our right hand.*

Red for right!

How come we didn't get a dot on our other hand?

So we can tell which one is right, and which one isn't.

That other one is the left one.

3. Now have students place their right hand in different locations relative to their body, such as:
 - *in* their lap
 - *on* their right knee, *on* their left knee
 - *beside* their right leg, *beside* their left leg
 - *above* or *over* their head
 - *below* their waist
 - *under* their right foot, *under* their left foot
 - *behind* their back
 - *in front of* their chest
 - *near* their right ear, *near* their left ear
 - *far away* from their mouth
 - *between* their knees

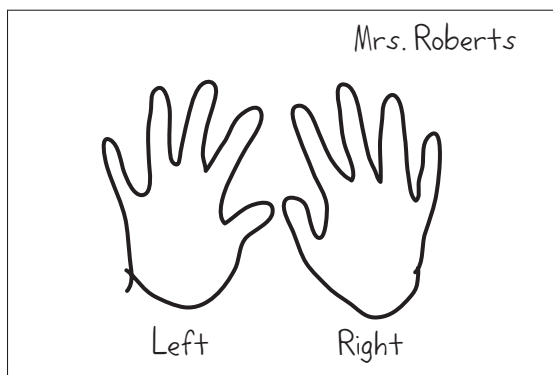
Activity 2 Left & Right (cont.)

4. Have students repeat some of these actions with their left hand. Then have them stand up in place. Stand in front of the class with your back turned to the children for a second. Extend your right arm to the side and point to the right. Ask students to do the same, moving slowly and carefully so they don't bump into one another. Which direction are you all pointing? How do they know? With the class, take 3 side-steps to the right. Then put your right arm down, extend your left arm to the side, and take 3 side-steps to the left.

5. Through the remainder of the day, talk with students about their right and left hands. Which hand do they color with, write with, eat with? In which hand do they hold a pair of scissors, a crayon, a pencil? If they are right-handed, how does their left hand help them at different times? When you leave the room to go to the playground, the gym, or the library, do you have to turn right or left? How can they use their hands to help find out? As you walk down the corridor with your class, ask them to identify the direction of any turns you have to make.

Extensions

- Repeat some of the activities described above on other days so students begin to internalize right and left, in terms of their own bodies and the directions they move throughout the day.
- Over a period of several days, trace each student's right and left hand on a piece of 12" x 18" drawing paper, and have the student label the paper with his or her name. Make a tracing of your own hands as well. When you have a tracing for each student, return the papers to their owners, and post yours on the board. Place your hands in the tracings at the board as students do so at their tables. Which is the right hand? Which is the left? Can they remember and help one another?



Label your own hand tracings with the letters “R” and “L” or the words “right” and “left”, and ask students to do the same on their papers. Ask students to make a red dot on the tracing of their right hand. After that, you might have students color their hands to match their skin tone and add bracelets, rings, thunderbolts, and various other decorations. Circulate and talk with students as they work to reinforce the terms “right” and “left”.

- If you have access to *Left Hand, Right Hand: A “Hands-On Book about Left and Right*, by Janet Allison Brown, read the book with your class. Another cute book that addresses the topic of left and right is *Bear’s Left & Right*, by Keith Faulkner.
- When you’re in the gym with students or during organized games on the playground, make it a point to reinforce directional words by having students move (walk, hop, jump, slide, and so on) forward, backward, to the right, and to the left. You can also have them stand or hop on their right foot or their left foot, and move their right and left hands or arms in a variety of ways.

Set C2 ★ Activity 3



ACTIVITY

Little Frog's Playground

Overview

Students share observations about the names and locations of 5 shapes on Little Frog's Playground. Then they each color a sheet and move a small plastic frog around the playground in response to directions from you and classmates.

Skills & Concepts

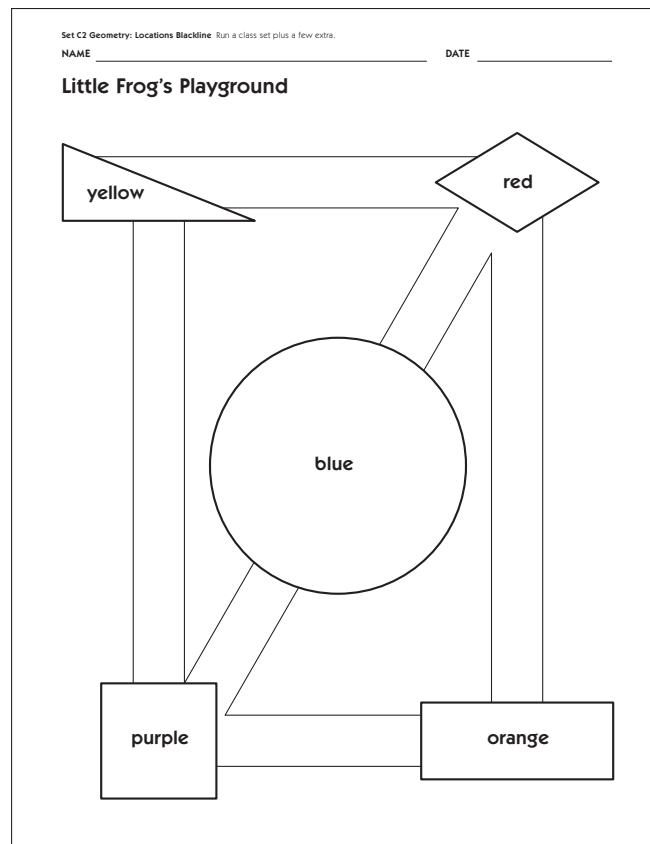
- ★ use the directional words *left* and *right* to describe movement
- ★ describe the location of one object relative to another object using words such as *in*, *out*, *over*, *under*, *above*, *below*, *beside*, *between*, *next to*, *across from*, *behind*, *in front of*, *near*, and *far*

You'll need

- ★ Little Frog's Playground (page C2.11, run a class set plus a few extra)
- ★ a plastic frog for each student from your bucket of frogs
- ★ crayons
- ★ helper jar

Instructions for Little Frog's Playground

1. Post a copy of Little Frog's Playground on an easel or the whiteboard near your discussion area.



Activity 3 Little Frog's Playground (cont.)

2. Then gather the students and seat them so they can all see the sheet. Show them one of the plastic frogs and explain that today, they're each going to color in a playground for a little frog. Once they've done that, they'll hear and tell some stories about Little Frog's adventures on the playground.

3. Ask students to pair-share observations about the sheet. Then call on volunteers to share their ideas with the class.

Students *There's a big circle in the middle.*

Maybe that's like a pond for the frog.

I see a square.

There's a triangle at the top.

There are things like roads on that paper.

4. Name the five different shapes on the sheet with the class: rhombus, rectangle, square, triangle, and circle. Then ask students to name the shape as you point to each of the following locations on the sheet:

- top right hand corner (rhombus)
- bottom right hand corner (rectangle)
- bottom left hand corner (square)
- top left hand corner (triangle)
- middle (circle)

5. Next, pull a name from your helper jar, and have that student to come up and point to one of the 5 shapes on the sheet. Ask the rest of the children to name the shape and identify its location (i.e., rhombus, top right-hand corner). Call on a different student to point to a second shape while the class identifies it by name and location. Repeat until the class has identified all 5 shapes by name and location.

6. Then read the color names on each shape, and explain that in a minute, you're going to give students each their own sheet to color according to the labels. What colors will they use for the two shapes on the right-hand side of the sheet? (red and orange) What colors will they use for the two shapes on the left-hand side of the sheet? (yellow and purple) What about the shape in the middle? (blue). Let them know that they can color the paths between the shapes any color they want. When students understand what to do, hand out the sheets and let them go to work.

7. When most students have finished coloring their sheets, ask them to return to the discussion area. Have them bring their sheets along, and give them each a plastic frog. When everyone is seated, tell a story similar to the one below as students move their frog around the sheet in response to your directions.

One day, Little Frog went to the playground. None of her friends was there, so she decided to stay and play by herself. First, she sat on the shape below the pond to the left. Which shape is that? You're right. It's the purple square.

Then she ran up the path between the purple and the yellow shape, and stopped on the yellow shape. Which shape is that? Right, it's the triangle.

Then she took a big hop and landed right in the middle of the blue circle. When she landed, she found out it was actually a pond! The water was freezing cold, so she jumped back out as fast as she could.

She sat beside the pond to dry off for a minute.

Activity 3 Little Frog's Playground (cont.)

Then she took another giant hop and flew right over the red rhombus. She landed in the top right hand corner of the playground, above the rhombus.

She was still a little cold, so she crawled under the paper for a minute to get warm. Then she got back onto the paper and sat on the shape at the top of the sheet across from the triangle. Which shape is that? Yep, it's the red rhombus.

8. Finish your story by asking the students to pair-share ideas about how Little Frog might get from one location to another on the sheet without going near the pond. Let students know that Frog has to stay on the paths. After they've had a minute to talk, call on volunteers to share their ideas with the group.

Now Little Frog wants to get back to the purple square, but she doesn't want to get near the pond. How can she get from the red rhombus to the purple square without going through the pond and still stay on the paths?

As students share their ideas, encourage them to use directional language. After each idea is shared, have the children test it.

Johnny *She can go to the triangle, and then go down to the square.*

Teacher *What direction will she have to go to get from the rhombus to the triangle?*

Students *Straight.*

Across!

That way!

Teacher *Will she have to go right or left across the sheet?*

Shanti *She has to go left to get to the triangle. Then she has to go down to get to the square.*

Teacher *Let's all try that out with our frogs. Did it work? Okay, let's put Little Frog back on the red rhombus. Can someone tell us a different way she can get from the rhombus to the square without going across the pond?*

9. If student interest holds and time allows, pull a few names from your helper jar and have those students continue your story as their classmates move their plastic frogs in response. If not, collect the sheets for use again another day.

Extensions

- During another session, display your copy of Little Frog's playground. Work with students to list some of the words they might use to place the frog in various locations or help Little Frog move from one location to another: in, out, over, under, below, above, beside, between, next to, across from, behind, in front of, near, far, left, and right. Give students their playground sheets and plastic frogs. Pull names from your helper jar and have those students tell their classmates where to place their frogs on the sheet and how to move them from one location to another.
- Send the sheets home with students, along with a note about the activity. Ask families to continue telling Little Frog stories at home with their children.
- If you have a computer in your classroom with Internet access, some of your kindergartners may enjoy two of the applets found on the Utah State National Library of Virtual Manipulatives web site:

Activity 3 Little Frog's Playground (cont.)

Ladybug Leaf and Ladybug Mazes. The web site is free to all, and can be accessed at <http://nlvm.usu.edu/>. Follow the links to the Pre-K through 2 geometry section, where you'll find a variety of applets including Ladybug Leaf and Ladybug Mazes. Both of these activities involve programming a ladybug around the screen to either hide behind a leaf (easier) or move through a maze (more challenging). Both provide good spatial problem-solving challenges, as well as practice with directional language and skills (forward, backward, right, left). Instructions are included with each applet on the web site, along with suggestions for parents and teachers.

NAME _____

DATE _____

Little Frog's Playground

