

BE A BUILDER: A Kindergarten Unit

TEACHER'S GUIDE

Correlation to NCTM Curriculum Focal Points and Connections to the Focal Points for Kindergarten

(CFP) Geometry: Describing shapes and space

Children interpret the physical world with geometric ideas (e.g., shape, orientation, spatial relations) and describe it with corresponding vocabulary. **They identify, name, and describe a variety of shapes** such as squares, triangles, circles, rectangles, (regular) hexagons, and (isosceles) trapezoids presented in a variety of ways (e.g., with different sizes or orientations), **as well as such three-dimensional shapes as spheres, cubes and cylinders. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.**



It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Bold print in the description of the focal point identifies the topics addressed in the unit.

Prerequisite Knowledge or Skills

To be successful in this unit, students should know the names of each shape before you begin. To be successful in this unit students should have experience constructing with blocks and using spatial reasoning to make different three-dimensional buildings.

Suggested Materials

- Geoblocks (geometric shape blocks that include triangular prisms)
- Various cans (cylinders)
- Boxes (rectangular prisms)
- Small balls (spheres)

Literature Connection

Jack the Builder by Stuart J. Murphy
Changes, Changes, by Pat Hutchins

WARM UP 1 ACTIVITY

Place a cube, a sphere and a cylinder in front of the teacher. The teacher gives clues and the students identify which 3-dimensional shape (or shapes) matches the clue. Use attributes of the shapes.

Warm Up 1 Activity Suggestions

As students correctly identify the shape, ask them to tell you about the attributes of the shape: flat sides, curved sides, the number of sides, etc. (*Suggestions continue...*)

Teacher's Guide: Kindergarten

Each unit is correlated to the NCTM Curriculum Focal Points and/or the Connections to the Focal Points. Look for correlations to your state on the TTT website.

Each unit includes one or more Warm Up Problems, a Problem Solving Task and one or more Extension Problems.

This TTT program encourages visual solutions.

Possible solutions are included when one answer is appropriate.

WARM UP 2 ACTIVITY

Snatch A Shape

Divide students into four teams, and have them go to four spots in your room.

Directions:

- Teacher names a 3-dimensional shape.
- Each team sends a member to snatch that shape from a mixed collection of 3-dimensional shapes that are in a pile in the center of the room. If they have difficulty knowing which shape to grab, they go back and consult with their team members.

Warm Up 2 Activity Suggestions


Use spheres, cubes and cylinders with this activity. Demonstrate the shape by holding it up and naming the shape with the whole group. Use complete sentences so that students understand how to use the terms in context. Practice many times.

Note: This activity is especially good for students with limited English proficiency.


(Suggestions continue...)

PROBLEM SOLVING TASK

Tell students: *Make one building with these eight blocks.* Then ask students to name, identify or describe the shapes.

2  cubes

2  rectangular prisms

2  cylinders

1  triangular prism

1  sphere

Build a building.

Teacher's Guide: Kindergarten (continued)

Pages have been reduced in size and combined for this sample folder.

Each unit includes black line masters of all problems with permission for one classroom teacher to make copies for his/her students.

Problem Solving Task Suggestions

This may work best by using two to three sets of eight blocks, and pulling students a few at a time during free center exploration time to solve the problem. Take pictures of each child's work and transcribe (or record) what they say about the shapes.

Can students name, identify or describe: sphere, cube, cylinder, triangular prism and rectangular prism?

- **Naming** (teacher holds shape): "What is this shape?"
- **Identifying** (this is easier than naming): "Show me the cube. Show me the cylinder. Show me the sphere (etc.)."
- **Describing**: "Describe this shape. What do you see?"

EXTENSION

Tell students:

Rudy used five blocks to build his building.

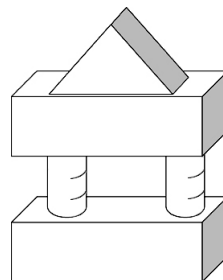
Build three buildings just like this.

Then use all the blocks to build one large building.

When students are finished, tell them:

Name the shapes and tell where they are in the building.

Build 3 buildings like this.
Then use all the blocks.
Build one large building.



Extension Suggestions

Ask students to build one of Rudy's buildings.

Ask:

- What is the name of this shape? (Point to each shape in turn.)
- How many (rectangular prisms) are used?
- How many (cylinders) are used?

Next, have them build two more buildings, just like the first one. Then they will need to deconstruct the three "Rudy" buildings to get the materials for the one large building.

Finally, ask students to describe where the shapes are in relationship to each other. (A student may say, "Three cylinders are above the rectangular prism" or "I stuck the sphere with the triangular prism so it wouldn't roll.")

Teacher's Guide: Kindergarten (continued)

The range of difficulty, from the first Warm Up to the hardest Extension, provides appropriate challenge for students of diverse skill levels.

Extension problems are included in each unit for students who need additional challenge.

A.7 BE A BUILDER

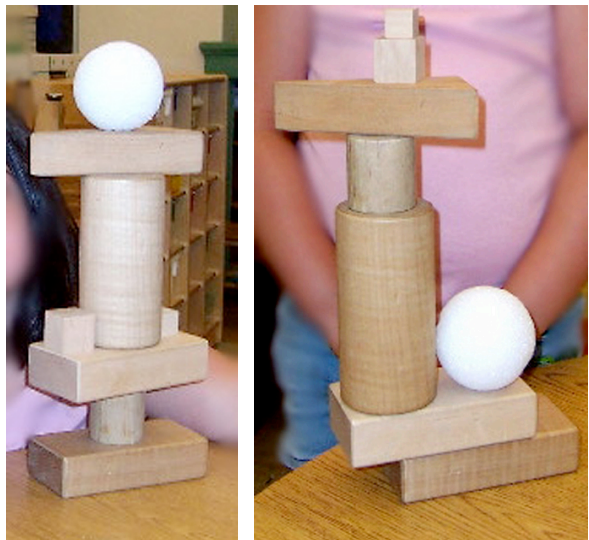
Student Sample and Scored Commentary

Sample (S) 2: Proficient

When the teacher said the name of each shape, this student was able to point out the correct blocks successfully. All of the required eight pieces were used. After the student built the structure, she was able to describe it using the words “triangle” and “rectangle.” Then she was able to decompose her structure and rebuild it a different way, which goes beyond the scope of this task.

Sample (S) # 2

PAM



“It’s a castle where you can step up. The top is kind of weird with a triangle shape. This is the door (points to the sphere). The queen can stay under the rectangle.”

TEACHER SELF-EVALUATION FORM

Check the strategies you used in this unit and note what you said or did.

WAYS TO HELP STUDENTS MAKE SENSE OF PROBLEM SOLVING	√	WHAT I SAID OR DID
<ul style="list-style-type: none"> Be aware of the mathematics embedded in each unit—Warm Up(s), Task and Extension(s)—so you can engage students in discussions that will deepen mathematical understanding. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> Encourage visualization of solutions, especially with the use of manipulatives. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> Encourage students to rely on their own and each other’s thinking. 	<input type="checkbox"/>	

(Form continues...)

Teacher’s Guide: Kindergarten (continued)

Each Problem Solving Task has several samples with scored commentaries based on an individual rubric.

The samples, commentaries and individual rubrics assist teachers in evaluating the work of their students.

The Teacher Self-Evaluation Form is included at the end of each unit. It can assist teachers as they learn to incorporate these instructional strategies into their daily problem-solving lessons.