BOXES! BOXES!

Pairs work with another pair to compare and contrast the attributes of their two Team Boxes. The class then sorts and classifies all of the Team Boxes. This lesson may take more than one class period.

Mathematical Emphasis

In this lesson, students
- Compare and contrast boxes.
- Classify and sort boxes.
- Compute informally.

Students add to their understanding that
- Classifying and sorting require the identification of specific attributes and the use of logical reasoning.
- Numbers can be used to describe quantities.

Social Emphasis

In this lesson, students
- Share materials.
- Listen to others.
- Include everyone.

Students continue to
- Develop group skills.

Group Size: 4

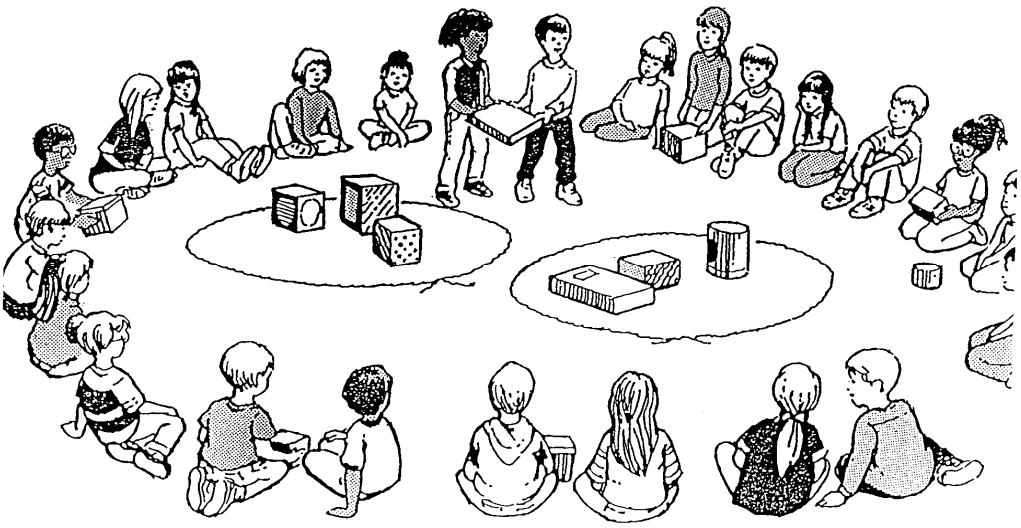
Teacher Materials
- Your box
- Boxes from class collection
- Large yarn loops
- "Ways We Work Together" chart

Student Materials
Each pair needs
- Team Box

Extension Materials
- Chart paper

Each pair needs
- Team Box

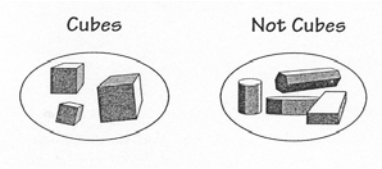
Each student needs
- Box Math Journal



[Source: Number Power ® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

Notes	Teacher	Students
As students describe other attributes, introduce and use mathematical terminology, such as *face, edge, cube*. Explain the terms as you use them. Model and encourage their usage to help students internalize the vocabulary. (It is not expected they will master the vocabulary.)	Hold up your box, and describe one of its attributes, such as the number of corners it has. Ask: **Q. What other ways can we describe my box?** Hold up a box from the class collection, and compare and contrast it to your box. For example, you might say, "This box is round on top, but my box is square on top." Ask students to offer other ways the boxes are alike and different.	● ● ● ● ● ● ● ●
Students may describe attributes of their boxes such as the shape, size, color, or decorative markings.	Explain that today pairs will work together in groups of four to describe their Team Boxes to each other and to find ways the boxes are alike and ways they are different. Form groups of four by having pairs work with a pair sitting near them. Facilitate a brief discussion about how working in a group of four might be different from working as a pair, and how the group can give each student a chance to participate and listen to each other.	
Assessment Observe how students interact. Note positive interactions or problems you might want to discuss when the class reflects on the lesson.	Observe groups and, when appropriate, ask questions, such as: **Q. How are the boxes the same? How are they different?** **Q. How do you know that you are including each other?** **Q. What is helping you work well together?**	● ● In groups, students ● ● 1. Describe the attributes of their boxes. 2. Compare and contrast their boxes.

[Source: Number Power® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

Notes	Teacher	Students
Mathematical Emphasis Classifying and sorting require the identification of specific attributes and the use of logical reasoning.	Have several groups share what they found out about their boxes. Asks questions, such as: **Q. What was the same about your boxes? What was different?** **Q. Did you find something that is special about your two boxes? Explain.** **Q. How is working as a group of four different from working as a pair?** **Q. What did you like about working together as a group? What was hard? Why?**	
You may want to do this part of the lesson during another class period. Consider sorting with some attributes that require boxes to fit into more than one category simultaneously. For example, if the categories are *has pictures* and *is a cube*, a cube with a picture will fit into both categories. Students might suggest putting such a box in the middle, making the two loops overlap and putting the box in that space, or putting the box outside the loops.	Define a sorting area with yarn loops. Have pairs sit around the yarn loops. Choose an attribute by which to sort (for example, cubes/not cubes). Hold up a few boxes from the class collection. Ask students where each box belongs, and place the boxes accordingly. For example:  Ask pairs to decide where to place their Team Box. Have pairs place their boxes in the appropriate yarn loop. Once all the boxes are sorted, have student decide if they agree with the sorting. Then, ask: **Q. What are some other ways we can sort our boxes?** As a class, sort the boxes according to several of the suggestions. Ask questions, such as: **Q. Where does this box belong? How do you know? What is the name of this category?** **Q. Did all the boxes fit into these categories? Why? Can you think of categories where no boxes would fit. Explain.**	

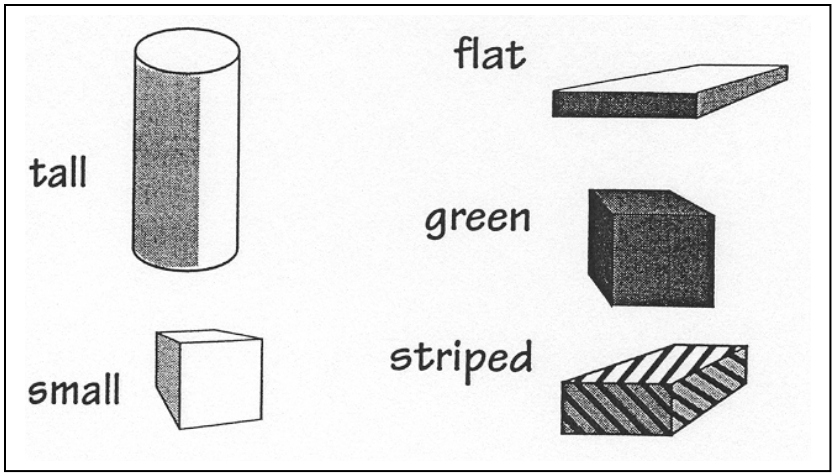
Notes	Teacher	Students
Mathematical Emphasis Numbers can be used to describe quantities.	**Q. Do you think there are more than or fewer than ten boxes in each category? Why?** **Q. About how many boxes do you think are in this category? How do you know? About how many boxes are in both categories altogether?** **Q. If [7] boxes are in this category, then about how many boxes are in the other category? How do you know?**	
Social Emphasis Develop group skills.	Help students reflect on how they worked together. Ask questions, such as: **Q. What helped us work together as a class? What might we do differently next time?** **Q. What could we add to the "Ways We Work Together" chart?** If appropriate, share some of your observations of the positive interactions and the problems you noted as students worked. Collect the Team Boxes for use in Lesson 3. To help students continue to have experiences with sorting and classifying, have pairs explore the Extension.	

[Source: Number Power® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

EXTENSIONS

For the Next Day

Have the class brainstorm words that describe their Team Boxes. List the words with picture clues on chart paper where all can see. For example:



Then, have students write about their boxes in their Box Math Journals using frame sentences, such as:

Our box is _____.

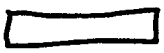
Our box is not _____.

Students might write:

Our box is green.

Our box is not red.

Our box is .

Our box is not  .

Have several students share one of their statements with the class. As students read their statements, ask pairs to hold up their Team Box if it has the same attribute.

[Source: Number Power® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

MEASURING OUR BOXES

Students use string and plastic links to measure around their box in two directions. They then use the measurements for estimating, counting in a variety of ways, and making comparisons.

Mathematical Emphasis

In this lesson, students

- Measure using comparisons.
- Count in a variety of ways.

Students add to their understanding that

- Measurement is approximate. Objects can be measured by making direct comparisons.
- Counting can be demonstrated in a variety of ways.

Social Emphasis

In this lesson, students

- Make decisions.
- Share materials.

Students continue to

- Develop group skills.

Group Size: 2

Teacher Materials

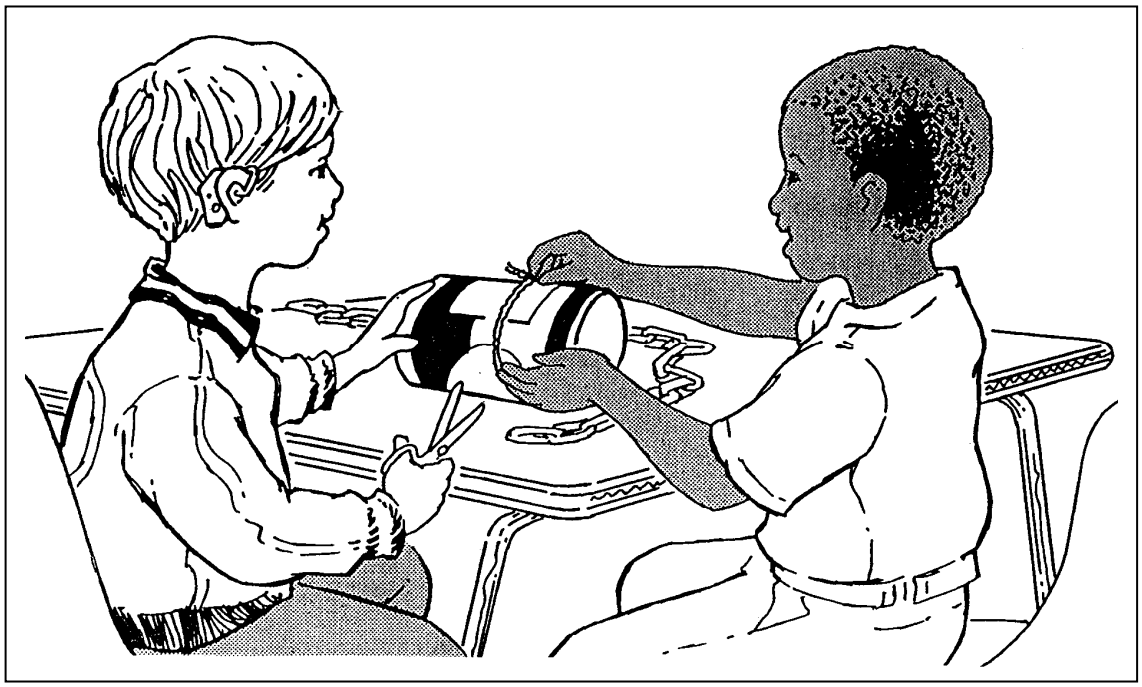
- 2 lengths of string and a chain of 50 plastic links in your box and in each Team Box (see Before the Lesson on the following page)

Student Materials

Each student needs
- Box Math Journal

Extension Materials

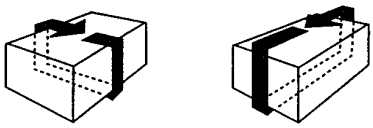
Each pair needs
- Team Box with a chain of plastic links
- Length of string (see Before the Lesson on the following page)



[Source: Number Power® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

Before the Lesson

- Cut enough 36" lengths of string to put two strings in each pair's box and in your box. Cut additional lengths of string for use in Extensions.
- Have each pair make five sets of ten plastic links: two sets of one color and three sets of another color. Have pairs join the five sets of ten together, alternating the colors, into a chain of 50 (for example, ten red, ten blue, ten red, ten blue, ten red). Have pairs put the chain into their box. Make a similar chain of 50 plastic links for yourself.

NOTES	TEACHER	STUDENTS
A cooperative structure such as "Turn to Your Partner" can provide opportunities for all students to be involved in the discussion.	Introduce the lesson by informally discussing measurement. Ask questions, such as: **Q. What does it mean to measure something?** **Q. Have you ever seen anything being measured? What? How was it measured?** **Q. What have you measured? How did you do it?** **Q. What do you think people need to measure things?** Explain that in this lesson pairs will use string to measure around their Team Box in two directions. For example:  Show your box to the class, and wonder aloud about the length of string needed to measure around the box. Ask: **Q. Will my box need more string to go around one direction than another direction? Explain.**	● ● ● ● ● ● ● ●

[Source: Number Power® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

NOTES	TEACHER	STUDENTS

Mathematical Emphasis

Measurement is approximate. Objects can be measured by making direct comparisons.

To model the activity, choose a partner and use a length of string to measure around your box in one direction. Cut the string at that length, and throw away the unused portion of the string. (Emphasize that the unused portion of the string should be thrown away.)

Hold up the string used to measure the box, and ask:

Q. How do you think the length of this string will compare to the chain of 50 links? Do you think it will be longer or shorter than the chain? Why?

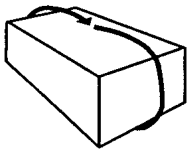
Hold your chain of 50 links and the string next to each other. Ask:

Q. About how many links long is the string? Explain.

Break off the chain at the length of the string, and ask:

Q. How can we count the links? What other ways can we count them?

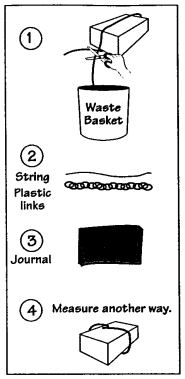
Count the links with the class, draw a picture of your box, and record the measurement where all can see. For example:



It was 14 links
around this way.

Repeat the activity, measuring around the box in another direction.

[Source: Number Power® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

NOTES	TEACHER	STUDENTS
You might want to write the directions using picture clues where all can see. For example:  	Explain that pairs will use string to measure around their Team Box in two directions and that, each time they measure, they will cut a string at the measurement and throw away the unused portion. Explain that they will then make their chain of 50 links the same length as the string and count the links. Add that each student will individually record the number of links for each measurement in their Box Math Journal. Write "Measuring Our Box" where all can see, and ask students to write this title on a page in their Box Math Journal. Facilitate a discussion about fair and responsible ways to share the materials and the work. Ask questions, such as: **Q. What did you notice about how my partner and I worked together? What helped us?** **Q. What are some ways you might share the materials and the work? Explain.** Distribute the Team Boxes.	● ● ● ● ● ● ● ●
Assessment As you observe students, ask yourself questions, such as: Q. Are students counting by tens and ones, or are they counting by ones only? Q. How are partners working together? Are they sharing the materials and the work? If so, how?	Observe pairs and, when appropriate, ask questions, such as: **Q. What do you think you are going to find out about the distances around your box?** **Q. How are you counting the links? Can you count them another way? How?** **Q.** (Point to the two measurements.) **How many more links are in one chain than in the other chain?** **Q. Did the first measurement help you find the second measurement? If so, how?** **Q. How did you share the materials and the work?**	● ● In pairs, students **1.** Measure around their box in one direction with the string, cut the string at the proper length, and throw away the unused portion. **2.** Compare the string with the chain of 50 links, make the chain the same length as the string, and count the links in the chain. **3.** Individually record the measurement in their Box Math Journal. **4.** Repeat the activity, measuring in another direction.

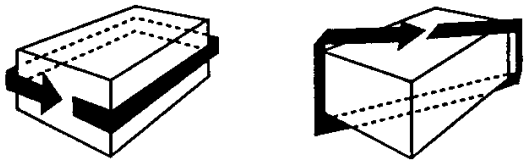
[Source: Number Power® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

NOTES	TEACHER	STUDENTS
As students share different counting strategies, ask the class to count the links using that strategy. This provides an opportunity for all students to practice different ways to count. For example, with a chain of 24 links, students might count: o 10, 20, 21, 22, 23, 24. o 10, 20, 24. o 1, 2, 3, 4,, …, 24.	Have several pairs share their finding with the class. Ask questions, such as: **Q. Were you surprised at some of your measurements? Why?** **Q. How did you count the links in the chain? Did any pair count another way? How?** Help students reflect on the lesson by asking questions, such as: **Q. What is something you liked about how you and your partner shared the materials and the work? How did this help you?** **Q. What problems did you have that you would like to have the class help you solve?** Have pairs put their links back together into the original chain of 50 links and put the chain into their Team Box.	● ● ● ● ● ● ● ●

Extensions

For Pairs That Finish Early

o Have pairs use new string and their chain of 50 links to measure around their Team Box in another direction, then discuss their findings. These are other ways pairs might measure:



For the Next Day

o Begin the ongoing "Count by Tens" activities, with Activity 1 below:

<u>Activity1</u>
Show a chain of ten links, and establish that there are ten links in the chain. Attach chains of ten links, alternating the colors, and have students count the links by tens as you add the chains. (Encourage students to count by tens; however, at first, some students will need to count the links by ones.) Repeat several times using different numbers before going on to Activity 2. (See Source listed below.)

[Source: Number Power®Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]

Dear Parent or Guardian:

During the next few weeks, we will explore the concept of number through several measurement activities using boxes. Your child will do a variety of informal measurement tasks with a box, then use these measurements to explore quantities and how numbers relate to other numbers.

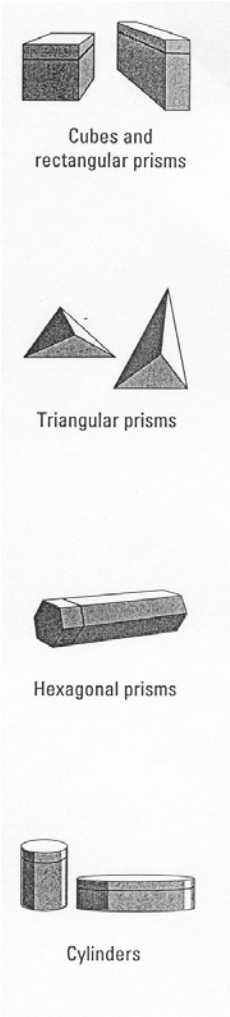
We need your help to collect sturdy boxes or containers of different shapes and sizes. Boxes of appropriate size include coffee mug boxes, tennis ball cylinders, and stationery boxes. All boxes need lids. A jewelry box would be too small, and a standard shoe box would be too large. We are interested in having a variety of shapes as well. (See some examples to the right.)

We would like to have the boxes by

_____.

Thank you for your help!

Sincerely,



[Source: Number Power® Grade One, Contestable, Regan, Alldredge and Robertson, Developmental Studies Center, www.devstu.org, 1999]