



Playground Modeling Lesson Plan

Overview

In this two-lesson series (Playground Modeling and [Playground Mapping](#)), children will use and develop their spatial visualization skills as they learn to represent features and physical objects on their playground. Working in groups, students will use everyday classroom materials (blocks, crayons, counters, etc.) to build a simple physical model of their school playground. This activity will introduce mathematical ideas of perspective and scale. In the second lesson ([Playground Mapping](#)), children will examine a satellite image and corresponding map, and then use their playground model to draw their own *map* of the playground. As extensions, children can use their models and maps to locate (and measure between) objects on the playground, and to think about plant and animal habitats on the playground and how humans can affect those habitats.

Suggested Lesson Sequence	Please see the Earth Systems Foundations - Maps and Images Theme, and Global Visions module descriptions.
Lesson Level	Entry
Math Connections	<ul style="list-style-type: none"> Students will visualize space at a fine scale. Students will explore models and scale. Students will use modeling to represent physical space.
Science Connections	<ul style="list-style-type: none"> Students will explore representations of the Earth.
Human Connections	<ul style="list-style-type: none"> Students explain how their play may influence plants and animals.
Lesson Assessment Tools	<ul style="list-style-type: none"> Assessment and Standards Table (Word) Assessment Activity Description (below) Authentic Assessments (below)

Materials

- Pencil and crayons
- Large sheets of paper to represent the playground space
- Blocks and other materials for building a miniature playground

Vocabulary Words

- Proportional - two or more objects that are of the same scale
- Scale - the relative size of one object to another object
- Model - a representation of a real object

Procedures

I. Assessing Prior Knowledge

Background for the teacher By the end of this lesson, children should develop understanding of scale and physical representation through symbols. Models are usually miniature versions of "the real thing." Ideally, all parts of the model are scaled down (or up) equally. For example, it wouldn't make sense to have a toy car or a doll house with some very small parts as well as some full-size parts. The parts should be *proportional* to one another as they appear in the real object. The same holds true for the *distance* between objects in a model. The distances in the model should be proportional to the distances they represent in the actual physical space. In addition, students should understand that some models look very much like the real thing -- like a toy car or doll house -- but other models such as buildings, car, or airplane constructed with Legos are not as realistic.

Begin to assess children's understandings of scale and modeling by asking them if they know what a "model" is. Students might take several minutes to look around the room to identify any objects that are "models" of another physical object.

II. Contextual Preparation

1. Build on the previous discussion by displaying one or two models from your classroom or school (a globe, a dollhouse, model cars, etc.). Engage children in discussion about ways in which scientists and mathematicians use models to help them understand and explain interesting things that may be too small or too big to study on their own. (For example, it would be impossible to bring a real car into the classroom, although a small model car fits easily.)
2. Ask students to share observations about the model(s) and any thoughts or questions that they have about the model. This discussion will give you and the students a starting point for the rest of lesson.

III. Activity - Building a Model

This activity requires ample space. You might choose to do it in the hallway, or clear a large area on the floor in your classroom. You could also have one group work at a time, and record their work with a digital camera so that their model can be dismantled to make room for the next group.

1. Provide each "architectural team" with a paper mat to represent the playground. As much as possible, customize these sheets according to the shape and size of your playground and the amount of space you have in your classroom. Paper mats that measure about 1 m x 1m (3 feet x 3 feet) would be ideal. Carefully select classroom materials that students will be building with to be proportional to the building space. The larger the blocks, for example, the larger the building space. Relationships between equipment size (blocks) and playground space (paper) should be realistic so that children can explore scale.

3. Using blocks, markers, paper, other manipulatives, or any other materials in the classroom, each team should build a model of the playground. Using markers, the students might wish to label the structures that they build.

4. After all of the teams have completed their models, allow for plenty of sharing and discussion time so that children can make comparisons among the models. Focus the discussion on differences between the sizes of the structures and space between the structures that each team used, as well as the orientation of each model. Possible questions might include...

- How did you decide how big different pieces of equipment should be?
- How did you decide where to place objects?
- What did you use to represent the slide? The swings? Other objects...
- How are your models the same? How are they different?

The class should come to the conclusion that it would be helpful if some standards were used when making the models. While each team maybe able to interpret their model, other teams may struggle because they don't have enough information or there is a difference between how the viewer and builder are thinking about the model. This conversation will get children thinking about the need for a consistent scale, a symbol key, and a compass, even if they do no know what these systems are called or how they work.

After completing work with the models for this lesson, please keep the models for use in the [Playground Mapping](#) lesson.

IV. Assessment

Ask students to think about their physical models as an example as they answer the following questions:

- What if you had a friend that lived in another state who was interested in your playground? It would be very difficult to mail your friend the existing model, complete with the blocks and other materials you used. How could you use your model to create something that you *could* mail to a friend that would still illustrate what your playground is like? *Taking a photo or making a map of the playground model could illustrate what the model, and the playground itself, is like.*

Lesson Extensions for Authentic Assessment

1. Children may enjoy creating shoebox dioramas of their bedrooms or other places they know well.
2. Invite children to search for models outside of school and share their findings with the class.
3. Invite an architect, zoo planner, or interior designer to speak to the class about how they use physical models in their professional careers.