Shadows All Around Us

Science Inquiry

In this project, students will use the **Shadow** tool to indicate their understanding of where a shadow should fall based on the position of the sun.

Grade Levels: 1–3

Materials:

- one or more of the following books:
  - *Bear Shadow* by Frank Asch
  - *My Shadow* by Robert Louis Stevenson
  - *Guess Whose Shadow?* by Stephen R. Swinburne (great for explaining/investigating shadows)
  - *Nothing Sticks Like a Shadow* by Ann Tompert
- wood blocks or anything that would cast a shadow
- flashlight or direct light source for casting shadows
- globe and/or model of the earth and sun (optional)
- copies of the **Shadows All Around Us** planning sheet–page 52 (also available on the CD-ROM as *Shadowpl.doc*)
- (*Shadow.doc*) template from the CD-ROM

Before the computer:

- Read one of the books mentioned above to students or any book that addresses shadows.
- Conduct a whole-class demonstration lesson on shadow casting. This can be done in the early morning with the sun at a low angle or in a dimly lit room with a flashlight acting as the sun. If desired, you can relate the time of day/position of shadows to the daily cycle of earth rotation and of the sun hitting the earth.
- Allow the children, in small groups, to experience shadow casting on their own. The students can work from the **Shadows All Around Us** planning sheet.

On the computer:

- Open the (*Shadow.doc*) template from the CD-ROM.
- Using the **Shadow** tool, cast a shadow in the proper direction based on the position of the sun.

Extensions:

- Allow the students to move the sun on the template and adjust the shadows for the new sun position.
- Have the students create their own templates—a little differently! Instead of determining which direction a shadow would be cast by looking at the position of the sun, the student could create shadowed objects, and have a classmate determine the position of the sun.
- Pose the question—Would the shadows look the same at 10:00 in the morning on June 1st and December 1st? Why or why not?
- Would the shadows look the same in your town and in [choose a location in an opposite hemisphere at approximately the same longitude] at the same time on the same day?

Shadows All Around Us *(cont.)*

Step-by-Step Instructions

Step 1

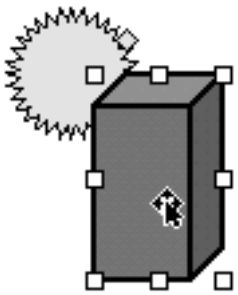
Open the (*Shadow.doc*) template from the CD-ROM.

Step 2

Start with the first rectangular cube in the upper left corner. Note that the sun is behind the cube.

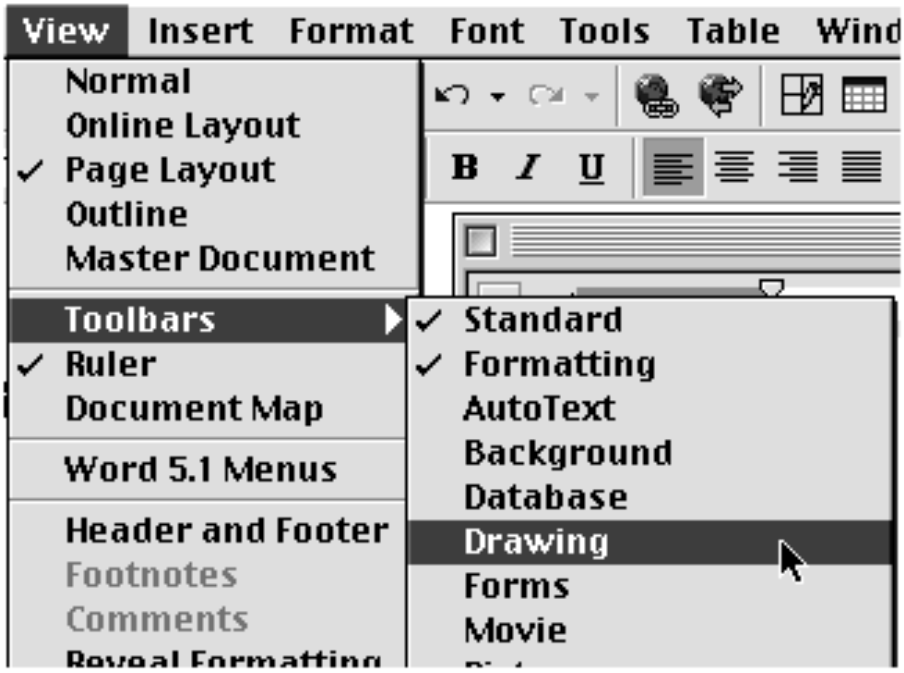
Step 3

Click once on the cube to select it. You should see the selection handles around the cube, but not around the sun.



Step 4

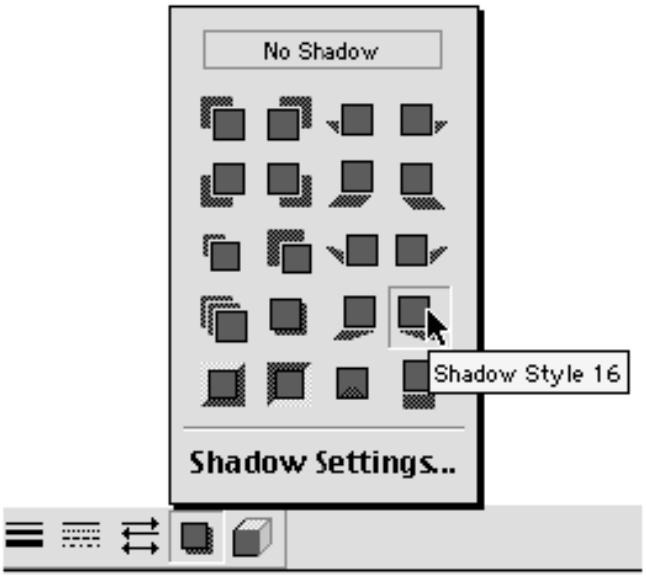
Make sure you have access to the **Drawing Toolbar**. Pull down the **VIEW** menu and select ***Toolbars***. From the toolbars pop-up menu, move over to the right and down to ***Drawing***.



Shadows All Around Us *(cont.)*

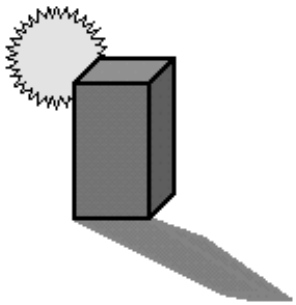
Step 5

From the **Drawing Toolbar**, click on the **Shadow** tool, and the **Shadow Styles** will pop up.



Step 6

Drag the mouse and choose the shadow style which best fits the shadow you think would be cast from the cube.



Step 7

Repeat steps 3–6 for the remaining five shapes on the page.

Step 8

To save your document, pull down the **FILE** menu and select ***Save As***. Give your file the name (*shadow your initials*).

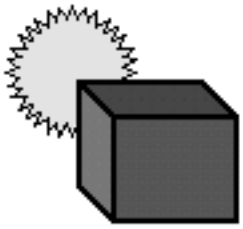
Step 9

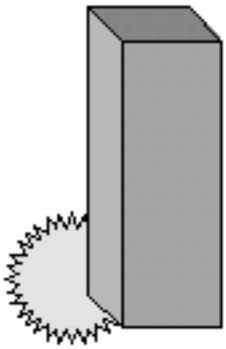
If you want to print, pull down the **FILE** menu and select ***Print***. Click **OK** (PC) or **Print** (Mac).

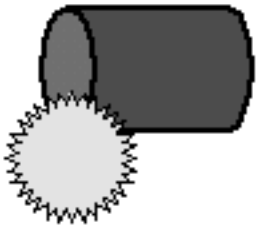
Shadows All Around Us *(cont.)*

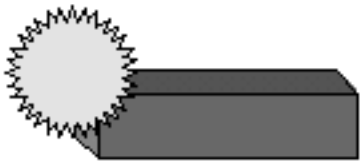
Template

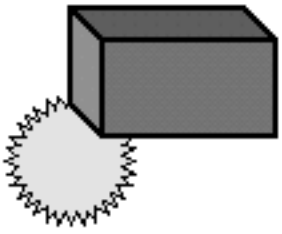
Shadows All Around Us

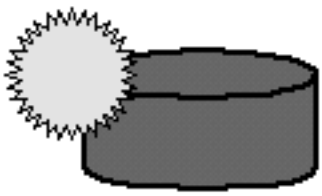










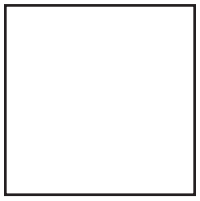


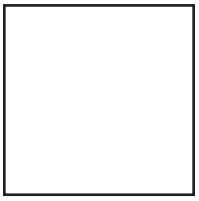
Shadows All Around Us *(cont.)*

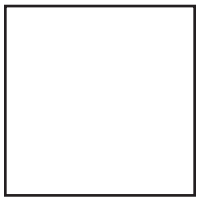
Name _____

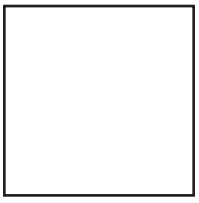
Planning Sheet

Directions: Place four objects that are at least two inches tall (small wooden blocks work nicely) on the squares on the paper. If you can't do it outside in the sun, be creative indoors. Try using a flashlight or some other point source of light. Use a pencil to shade the shadows where they are cast on the paper.









Shadows All Around Us *(cont.)*

Example Page

Shadows All Around Us