



ACTIVITY

- THREE-DIMENSIONAL FIGURES -



Educational Goals

- ❖ Highlight the playful potential of mathematics
- ❖ Work on spatial representation
- ❖ Work on orthogonal projections

Key Features of the Targeted Competency

- ❖ To mobilize mathematical concepts and processes appropriate to the given situation
- ❖ To apply mathematical concepts and processes appropriate to the given situation
- ❖ To justify actions or statements by referring to mathematical concepts and processes

Concepts Used

- ❖ Spatial representation
- ❖ Orthogonal projection
- ❖ Perceive objects in space

Materials

- ❖ A box of multibase blocks or small Lego pieces
- ❖ One “Three-dimensional Figures” Activity Sheet per student
- ❖ “Three-dimensional Figures” Explanation Sheet for the teacher
- ❖ Pencils
- ❖ Graph paper

Targeted Academic Levels
Grades 3 to 6

Mathematical Field Concerned



Suggested Teaching Formulas



or



Time Required
Approximately 50 minutes



SUGGESTED PROCESS



Step 1: Introduction (10 minutes)

Explain the activity to the students by presenting the example in the “Three-dimensional Figures” Activity Sheet. You can also do the first exercise with them to show them what they have to do.

Step 2: Building (30 minutes)

Distribute the “Three-dimensional Figures” Activity Sheet and the multibase blocks. For each figure, the students must assemble the blocks to build a three-dimensional figure that corresponds to the three projections presented. After they succeeded to build the figure, the students must represent it on graph paper. It is possible that there are many possible ways of building, that is why we suggest that you ask the students to find the minimum number of pieces necessary to represent the figure and the maximum possible number.

Step 3: Reveal the solutions (10 minutes)

Refer to the “Three-dimensional Figures” Explanation Sheet to present the maximum and minimum solutions. Since there are several valid intermediate solutions that are not presented in the sheet, the best way to verify is to check if the figure presented by the student really corresponds to the projections that were given to him.

Step 4: Challenge (Optional; variable duration)

To push the students’ reflection further, you can ask them to find, for one or several figures that do not have only one solution, the biggest possible number of different solutions. Compare the answers the whole class together.

Step 5: Assimilation (Optional, variable duration)

After you have done the activity, you can invite the students to create their own three-dimensional figures (<https://www.buildwithchrome.com/> or with the multibase blocks), then draw the different possible orthogonal projections on graph paper. After that, you will be able to reuse their creations to do the activity again.