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# Building My Port

In this lesson, students learn about the structures at the port terminals in Prince Rupert and identify the shapes that these structures are made up of. Inspired by picture books on marine activities and transportation, students create their own 2D pictures of port-related structures using basic mathematical shapes. The lesson, which develops students' familiarity with the port in their town, is informed by the big idea of Community.

## CLASSROOM TIME REQUIRED

One 40 – 50 minute lesson

## LEARNING OBJECTIVES AND OUTCOMES

Students will:

- Identify and describe shapes that are part of the human-built port environment by creating a 2D picture based on 3D human-built structures

## MATERIALS REQUIRED

- Slideshow of images of structures, equipment and machines at the Port of Prince Rupert (see *Resources*)
- Printed copies of the slideshow images
- Class set of geoboards and rubber bands (or paper and pencils)
- Blackboard and chalk or whiteboard and appropriate pens
- The following picture books by Donald Crews:
  - *Freight Train*. Greenwillow Books. (1992). ISBN-10: 0688117015; ISBN-13: 978-0688117016
  - *Harbor*. Greenwillow Books. (1987). ISBN-10: 0688073328; ISBN-13: 978-0688073329
  - *Truck*. Greenwillow Books. (1991). ISBN-10: 0688104819; ISBN-13: 978-0688104818
- Sufficient amounts of the following for the whole class:
  - 30 x 45 cm sheets of black construction paper (enough for every student in the class)
  - Scissors
  - School glue (or a glue stick)
  - Assorted colourful art or recycled papers
- List of images of the Port of Prince Rupert (see *Attachments*)

## TECHNOLOGY RESOURCES REQUIRED

Computer and projector or Smart Board

## TEACHER PREPARATION

- Set up computer and projector with slideshow images of the Port of Prince Rupert (see *Resources*)
- Print and photocopy slideshow images (see *Resources*)
- Collect the picture books by Donald Crews – *Freight Train, Harbor and Truck*
- Collect art materials: 30 x 45 cm sheets of black construction paper, scissors, school glue (or glue sticks) and assorted colourful art or recycled papers

## CRITICAL VOCABULARY (see Glossary for definitions)

Circle	Cylinder	Sphere
Cone	Pyramid	Square
Cube	Rectangle	Triangle

## LESSON DEVELOPMENT

### Activity 1

- Hand out geoboards and rubber bands to students and explain that they can use them to make the shapes that they will see in the pictures of the Port of Prince Rupert.
- Show students the slide show of images of human-built structures, equipment and machines at the Port of Prince Rupert. Encourage them to use the geoboards and rubber bands to make the shapes that they see. If geoboards are not available, have students draw the shapes.
- Pair students and have them share the shapes that they found in the images.
- Brainstorm with students a list of terms that describe the shapes that were found.
- Draw and label the shapes on the board.

### Activity 2

- Show students the picture books by Donald Crews. Have students notice how the pictures represent the human built environment using mathematical shapes. Focus students' attention particularly on the transportation pictures in the books.
- Give students the choice of what Port structure, machine or piece of equipment they would like to make a picture of. Group together students who are creating the same image. Place a printed image of the appropriate structure, piece of equipment or machine at the table to support students' work. Make the Donald Crews books available for students to look at.
- Distribute sheets of 30 x 45 cm black construction paper, scissors, some school glue (or glue sticks) and assorted colourful art or recycled papers to students.
- Direct students to create their own picture by drawing and then cutting out the various shapes that their structure, machine or piece of equipment is made up of, using the colourful paper. Ask students to arrange all the parts onto the black construction paper before gluing in case something needs to be repositioned. The brainstormed list on the board can be used as a reference for students as they complete their picture.

- Explain to students that they will label their picture with the name of the structure, machine or piece of equipment and describe the shapes they used to make their picture. Provide the list of *Images of the Port of Prince Rupert* if students need to know how to spell the names of their structures, machines or equipment.

## ASSESSMENT

Assess the following components and outcomes of the lesson:

- Brainstormed list of shapes from the images of structures, equipment and machines at the Port
- Students' construction of a 2D picture based on 3D human-built and natural shapes found at the Port by combining shapes to create new two-dimensional images
- Students' labelling of their pictures with the name of the structure, machine or piece of equipment and their ability to describe the shapes that they used to create the picture

## MODIFICATIONS

- Students can be given: paper scraps that are already cut into various shapes, buttons for circles, or templates to trace.
- Students can use approximated writing, copy pre-written words, dictate to a scribe, or write their own labels to go with their shape picture.

## EXTENSIONS

- Students could use clay, recycled boxes and other materials to create 3D objects of structures at the Port.
- Look at books by Donald Crews and Loise Ehlert. Compare how these two artists have used mathematical shapes to represent natural and human built environments. Create pictures of natural and human built environments using mathematical shapes.

## LESSON PLAN RESOURCES

- Slideshow of images of structures, equipment and machines at the Port of Prince Rupert (see *Resources*)
- Picture books by Donald Crews:
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## ATTACHMENTS

List of images of structures, equipment and machines at the Port of Prince Rupert

## Images of structures, equipment and machines at the Port of Prince Rupert

Coast Guard vessel	freight truck
container	log grappler
container ship	Super B grain truck
dry bulk carrier	top lift
fork lift	tug boat
gantry crane	train engine
grain elevator	Port Office and Interpretative Centre