

## Math Tools

For this activity, students explore connections between mathematics and various tools. Discussions center on challenging how students think about mathematics and the connections between mathematics and their daily lives.

### I. About the lesson

1. Mathematics content and process learning objectives
  - a. Asking questions
  - b. Error analysis
  - c. Experimenting
  - d. Perceiving patterns
  - e. Problem solving
2. Related creativity traits
  - a. Making connections
  - b. Questioning norms
  - c. Being inquisitive
  - d. Having flexibility
  - e. Being unorthodox
  - f. Being motivated
3. Other disciplinary connections including to everyday life
  - a. How is mathematics connected to the objects and ideas we see on a daily basis?
  - b. How does this activity help you think differently about mathematics?

### II. Preparing for the lesson

1. Materials
  - a. Math tools worksheet
  - b. Poster Paper
  - c. Tools (examples):

Pattern blocks	Compass
Unit cubes	Empty coffee can
Scissors	Tape
Probability spinners	Pattern blocks
Geoboards	Rulers
Dice	Markers
Finger paint	Crayons
Plastic Gloves	Rubber bands
Water balloon launcher	String
	Golf ball
2. Preparation
  - a. Organize the tools so that each group receives at least 3 items.
  - b. Print one worksheet for each student

- c. (Modification: Students are put in groups and all tools are made available for them once the activity is explained. Tools are not assigned to groups instead students decide what tools they would like to use to complete the activity.)

### **III. Conducting the lesson**

1. Setting up for the exercise.
  - a. Students work in groups of 3 or 4.
  - b. Students are asked
  - c. Each person/group receives
    - i. At least 3 tools
    - ii. Recording sheets
2. Give the following instructions to perform the experiment:
  - a. Give students 35 minutes to collaborate using their tools and to create something mathematical.
  - b. Remind students that the purpose of the experiment is to identify mathematics in the objects they have (this could be in the form of a game, a way to teach mathematical concept, explaining a mathematical phenomenon, explicitly identifying mathematics in an everyday object). Give students time to develop these connections and complete the worksheet.
  - c. Students create the game, lesson, showcase of their math tools and devise a way to display these connections that were identified in preparation for a gallery walk.
  - d. Gallery Walk.
    - i. Given 25 minutes, students participate in a gallery walk to share their ideas. (One student from each group stays at their station to explain their ideas. After 10 minutes, students should switch to allow those that were stationary to view other projects.)
3. Making connections
  - How did your group engage in the process of identifying mathematical tasks from the items you were given?
  - What did you learn from viewing others' stations?
  - What did you learn about mathematics and its connections to the world around you?

### **IV. Assessment**

The lesson can be assessed by the following means:

- a. The discussion questions could be given as a homework assignment and/or turned into a journal entry for students to reflect on their experience. Student may also be encouraged to think of other tools and their connections to mathematics.
- b. Ask students to respond to the following questions

- i. What process did you employ to narrow the ideas down?
- ii. Did you find anything that sparked your curiosity or interest?
- iii. List all of the mathematical questions you discussed.
- iv. What else did you think about during this process?

#### **V. Modifications to this lesson**

This activity may work better with materials not related to mathematics: spatula, wire, candle, etc.