



# Masu Traditional Box

## *Instructor Guide*

### **Math concepts/skills:**

- Properties of geometric shapes
- Parallel
- Perpendicular
- Congruent
- Angles

### **Objective:**

- Students will fold a three-dimensional box.
- Students will identify geometric properties of their boxes.
- Students will examine the unfolded unit and determine what relationships exist between the fold lines.

### **Vocabulary:**

- **Angles:** Two rays that share an endpoint.
- **Congruent:** Having exactly the same size and shape.
- **Diagonal:** A line joining two non-adjacent vertices of a polygon.
- **Isosceles triangle:** A triangle that has at least two congruent sides.
- **Midpoint:** The point on a line segment that divides it in half.
- **Parallel Lines:** Lines that are always the same distance apart.
- **Perpendicular Lines:** Lines that intersect at right angles to each other.
- **Right angle:** An angle that measures exactly  $90^\circ$
- **Right triangle:** A triangle that has one  $90^\circ$  angle.
- **Symmetry:** An object is symmetrical when one half is a mirror image of the other half.

### **Supplies:**

- 8 x 8 paper for model
- 6 x 6 paper for exploration
- Origami tool
- Student handout
- Rulers
- Origami notebook
- Pompoms (optional-for lid)



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### **Video:**

<https://www.youtube.com/watch?v=kFCR-0YyOEs>

### **Procedure:**

Give each student one sheet of 8 x 8 origami paper.

Guide students through the folding process step by step.

When each student has successfully assembled their box, hand out the student handout.

Students should work together in small groups to answer the questions. Have students construct a model of their folded unit using the 6 x 6 inch square paper. Encourage students to use rulers when drawing their diagrams to ensure their lines are as accurate as possible.

When groups have finished, close with a class discussion.

### **Extensions:**

1. Determine the relationship between the size of the original square and the dimensions of the finished box.
2. Have students determine how to make boxes that fit neatly inside each other and write out their plan and test it.

*Optional: If there is time and enough supplies, students can repeat the process with a second square to make a lid for their box. The lid should be made just slightly smaller or larger than the original square.*