# Crafting the Classroom

## Integrating Visual and Tactile Learning into Core Subjects

EDUCATOR RESOURCES BY HOUSTON CENTER FOR CONTEMPORARY CRAFT

**How to Use *Crafting the Classroom***

Houston Center for Contemporary Craft (HCCC) is a nonprofit arts organization founded to advance education about the process, product and history of craft. HCCC's major emphasis is on objects of art made primarily from craft materials: clay, fiber, glass, metal, wood or found/recycled materials.

Each *Crafting the Classroom* lesson teaches a science, math, social studies, or language arts objective, and a corresponding craft-based art project. Through integrating art into the core subjects, these lessons are designed to increase student engagement with the objective, promote higher order thinking and creative expression, and provide tactile learners with opportunities to excel.

Use these lessons to connect craft with topics that are meaningful to your students and curriculum. For example, many tools, vessels, furniture, clothes, and other items integral to daily life used to be made by hand. Learning about these objects, as well as the skills needed to make and use them, can be a unique way to study world history or other cultures. Replicating decorative patterns can give students a better understanding of geometry. Learning about how craft materials are made and used relates to chemistry, physics, and natural science. These are just a few of the connections that can be made.

Pair these lessons with a visit to Houston Center for Contemporary Craft, where your group can enjoy a free guided tour, visit the craft garden, and observe resident artists in their studios. Optional, hands-on workshops are available upon request.

Please share these plans with other teachers, parents, and administrators.

**For more information about HCCC, or to schedule your visit,** please visit our website at www.crafthouston.org or call 713-529-4848 Ext. 0

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Drafting paper and found sales receipts
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# MATH AND ART WITH SCIENCE CONNECTION: ORIGAMI VESSELS

## LESSON OBJECTIVES

**Fine Arts:** Students will learn about the ancient Japanese art of origami. Students will develop fine motor skills as they create origami vessels.

**Mathematics:** Students will develop their understanding of geometry and measurement as they fold their papers along lines of symmetry, deconstruct squares into smaller rectangles or triangles, and create vessels of different volume using various sizes of origami paper.

**Science and Math Connection:** *(Optional)* Students will gain experience using graduated cylinders and/or other scientific tools to measure and compare volumes of different sized vessels.

*Relating to Craft Media:* ***Fiber (Paper)***

## MATERIALS

- Origami paper or squares of colorful copy paper in a variety of sizes (2-4 squares per student)
- Origami Instruction Sheet (1 for each student)
- Water **or** dried beans/other counters *(optional)*
- Graduated cylinders, beakers, different sizes of measuring cups, and/or scales *(optional, depending on grade level)*

## LESSON OVERVIEW

### Introduction of New Material: The Japanese Art of Origami

Explain to students that **origami** is the ancient Japanese art of folding paper. Today they are going to make origami vessels.

A **vessel** is a hollow container, such as a cup or bowl, especially one used to hold liquid.

### Guided and Independent Practice: Creating Origami Vessels

Provide students with paper and the instruction sheet. Walk students through creating an origami cup. Use thicker paper if planning to fill with liquid.

Show them the proper folding technique – line up the edges and angles before creasing the paper, then use the back of the thumbnail to make a nice clean fold.

Ask students to notice how the shape of the paper changes as they create new **edges**, **angles**, and **lines of symmetry**.

Allow students to make several different vessels using different sizes of paper.

## Optional Science and Math Connection: Measuring and Comparing Volume

### Pre-K/Kindergarten Adaptation

- **Sand and Water Table:** Place origami cups of different sizes at the sand/water table and encourage students to experiment filling their vessels with water (if using heavy paper), sand, or other objects such as dried beans or pasta. Ask students what they notice about the different amounts needed to fill small cups versus larger cups.

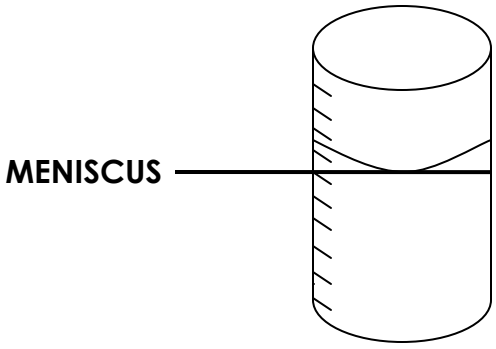
- **Math Center:** Place a set of scales and origami cups of various sizes in the math center. Encourage students to use the scales to compare the amounts of cubes or counters needed to fill the different sized cups. For example, are the cubes from the small cups *heavier* or *lighter* than the cubes from the large cup? Students can also count the amounts of cubes in each cup, and compare to determine if a small cup holds *more* or *less* than a large cup.

### Younger Grades (1st-3rd)

- Allow students to experiment filling their vessels with water or dried beans.
- Students can use their own vessels to make comparative observations about volume. For example, how many small cups of water does it take to fill a larger cup?
- Students could also use standard units of measurement (measuring cups) to measure and compare the volume of their cups.
- Ask students to record their observations of how vessel size affects volume on the attached worksheet.

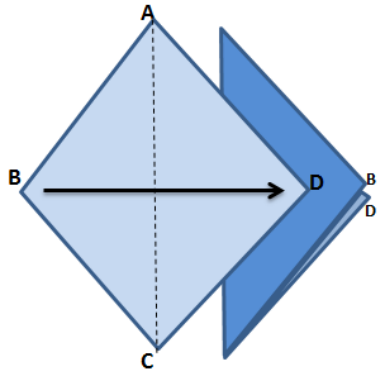
### Older Grades (4th-8th)

- Allow students to experiment filling their vessels with water.
- Students can use graduated cylinders and/or beakers to measure and compare the volume of liquid held by each vessel they make.
- Model for them how to correctly read the volume of a graduate cylinder by taking the number at the bottom of the **meniscus**.

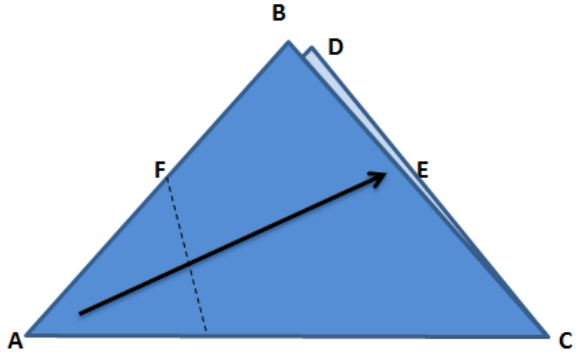



- Ask students to record their observations of how vessel size affects volume on the attached worksheet.

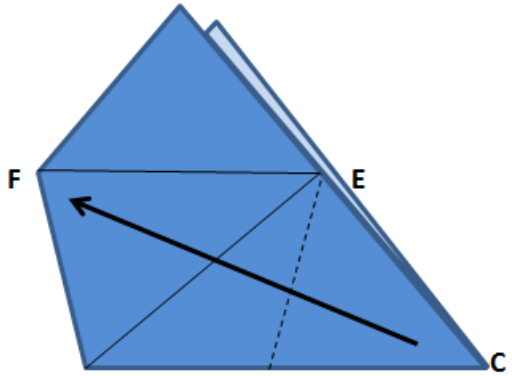
## ORIGAMI CUP INSTRUCTION SHEET



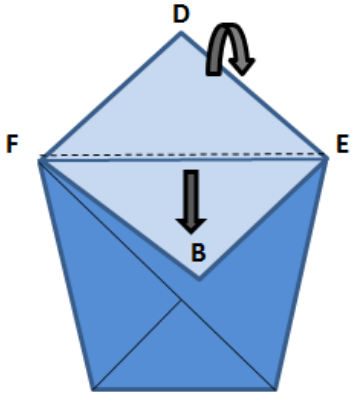

**1.** Place paper color side down. Fold your paper in half to make a triangle, bringing point B to point D. Crease line A-C.




**2.** Bring point A to point E.




**3.** Bring point C to point F.




**4.** Fold flap B down. Crease along line F-E. Now turn your shape over and fold down point D.

**5.** Open your vessel by pressing in points F and E.

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**ORIGAMI VESSELS: RECORD YOUR OBSERVATIONS!**

Grade Level: 1st-3rd

| Paper size used to make the vessel | Vessel Contents | Measurement Tool or Unit of Measurement | Volume |
|---|---|---|---|
| *Ex: Medium* | *Water (or dried beans)* | *Measuring Cups* | *½ Cup* |
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**New Vocabulary**

- Vessel – a hollow container, like a cup or jar, especially one that can hold water or other liquids
- Volume – the capacity, or amount that a vessel can hold

**ORIGAMI VESSELS: RECORD YOUR OBSERVATIONS!** Grade Level: 4th-8th

| **Paper size used to make the vessel** | **Measurement Tool** | **Unit of Measurement** | **Volume** |
|---|---|---|---|
| *Ex: 5 inches by 5 inches* | *Graduated Cylinder* | *Milliliter (ml)* | _____ ***ml*** |
| | | | |
| | | | |
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**New Vocabulary**

- Vessel – a hollow container, like a cup or jar, especially one that can hold water or other liquids
- Volume – the capacity, or amount that a vessel can hold
- Milliliter – a unit of volume that is one thousandth of a liter