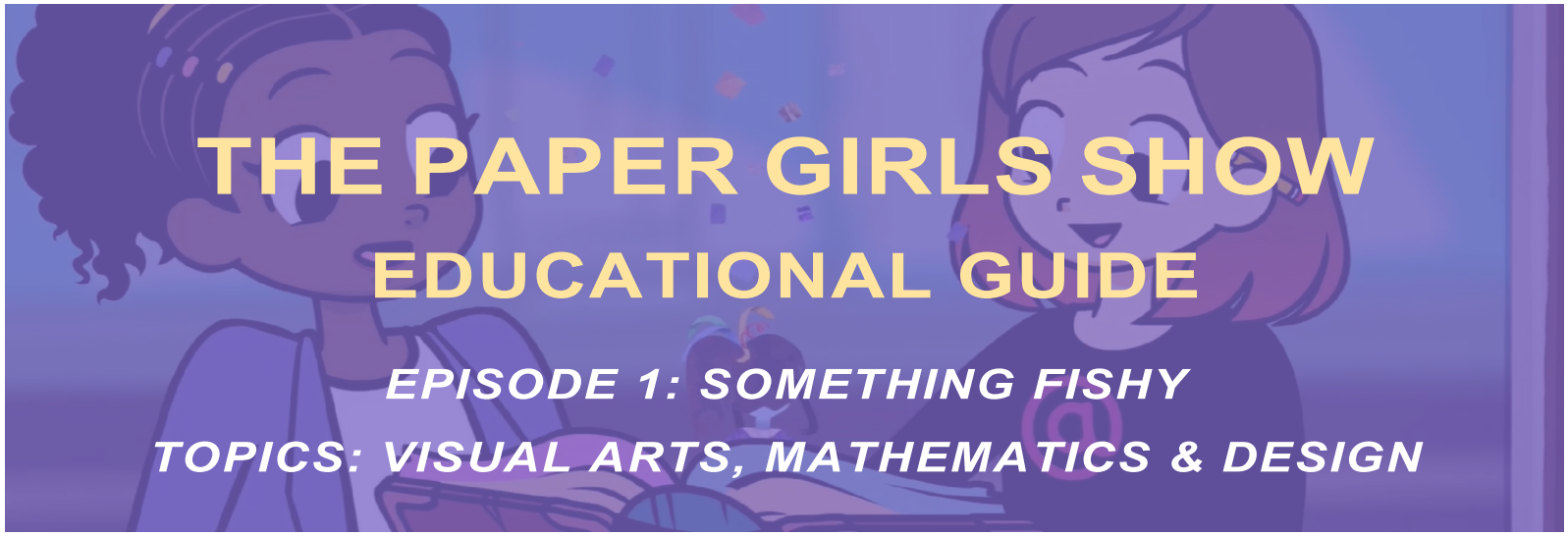


THE PAPER GIRLS SHOW

EDUCATIONAL GUIDE

EPISODE 1: SOMETHING FISHY

TOPICS: VISUAL ARTS, MATHEMATICS & DESIGN

EPISODE SYNOPSIS

When Caily and Reese encounter a "fashion emergency" prior to the hottest DIY fashion show in town, they travel to Confetti to search for a solution.

FEATURED STEAM TOPICS

BIG IDEA – Visual Art, Mathematics, and Design can be combined in creative and imaginative ways such as in the art of origami.

EXPLANATION FOR CHILDREN:

Origami is the art of paper-folding from Japan. The goal of origami is to fold a single sheet of paper into a small sculpture without cutting, gluing, or taping it. Paper folding requires that you think about both 2-dimensional and 3-dimensional shapes.

2D Shapes - These shapes are flat and can only be drawn or printed on paper. They have two dimensions – they are sometimes referred to as plane shapes. Examples of 2D shapes include square, rectangle, triangle, circle, pentagon, hexagon, heptagon, octagon.

3D Shapes - These shapes are solid or hollow. They have three dimensions and the flat surfaces (faces) of many 3D shapes are made up of 2D shapes. Examples of 3D shapes include cube, cuboid, sphere, cylinder, pyramid.

CORE CURRICULAR AIMS, N.G.S.S. AND RELATED STANDARDS IN THIS EPISODE

The standards and curricular aims listed below are linked to this episode's extension activities. Each activity is designed to promote children's thinking and action in geometry and the visual arts as they explore and create with shapes.

Geometry

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Pre-K-2 Expectations:

- Describe, name, and interpret relative positions in space and apply ideas about relative position;
- Describe, name, and interpret direction and distance in navigating space and apply ideas about direction and distance;
- Find and name locations with simple relationships such as "near to" and in coordinate systems such as maps.
- Apply transformations and use symmetry to analyze mathematical situations.

Pre-K-2 Expectations:

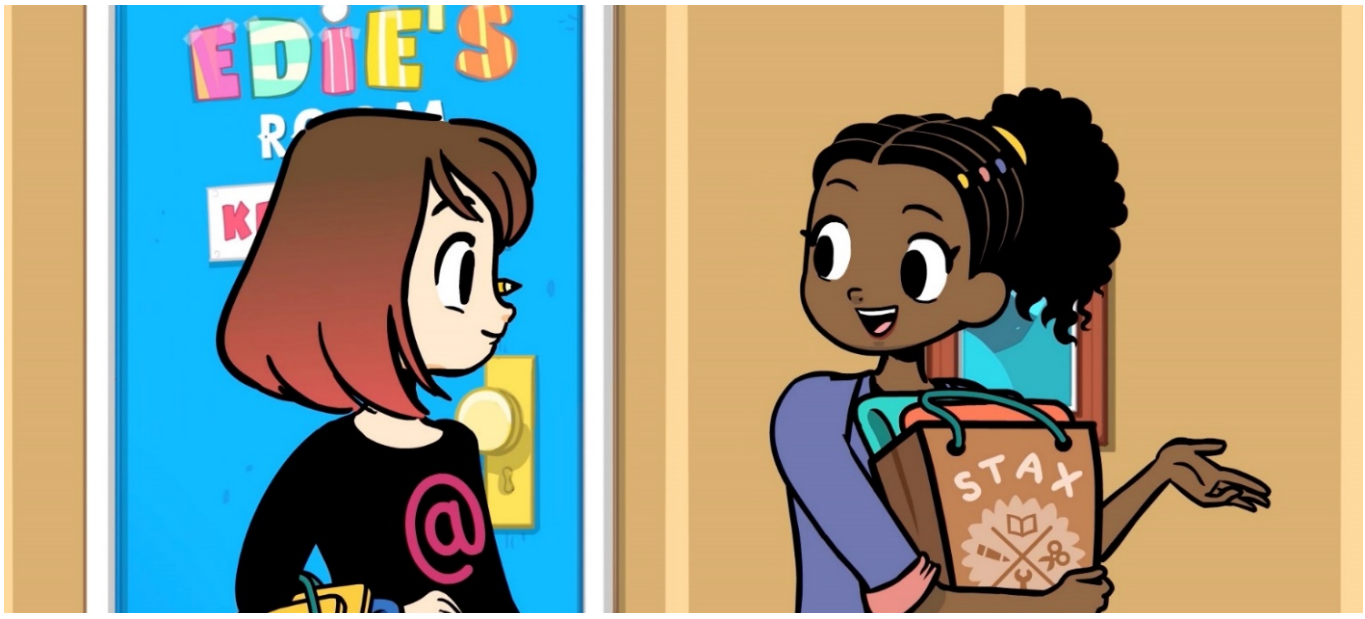
- Recognize and apply slides, flips, and turns;
- Recognize and create shapes that have symmetry.

Source: National Council of Teachers of Mathematics. (2000). Principles and standards for a school mathematics. Reston, VA: Author.

Visual Arts: Creating

- Engage in self-directed, creative making.
- Engage collaboratively in creative art-making in response to an artistic problem.
- Use observation and investigation in preparation for making a work of art.
- Make art or design with various materials and tools to explore personal interests, questions, and curiosity.

Source: National Coalition for Core Arts Standards. (2014). National Core Arts Standards: Visual Art, Grades Pre-K to 12. National Coalition for Core Arts Standards.



ACTIVITY EXTENSIONS FOR EPISODE TOPICS

In this episode, children are introduced to the idea that used paper can be folded into new and different shapes and objects. Below is a brief listing of activities that invite children to explore and work with paper. In each activity the emphasis is on the process of thinking, design, and making rather than a perfect end product as children take the lead in their own investigations. Parents and teachers can support children in their work by asking prompting questions such as: How did you can you fold that to make that shape?, What will you need to help you?, What's working and where can we change a fold?, What is the next step or thing you need to do?

1. 3D Paper Shapes

For this extension, your students will create their own 3D paper shape. Thick paper (cardstock) works well for this experience as it will allow the shape to stand up using only folds. In order to create basic 3D shapes, you will need 6″ x 2″ strips for pyramids, 6.5″ x 2″ strips for the cylinders, and 8″ x 2″ for the cubes. All shapes will be open on two sides once folded. This type of experience works best if you provide children 3D shape models to explore prior to asking them to create their own shapes.

After the children have looked at the 3D shape models, you can challenge them to experiment with folding their paper to create their desired shape. Trial and error and working and alongside you and other students will help them to explore different ways of folding their paper.

PROMPTING QUESTIONS

- What is the name of your shape?
- How do you know it is a "shape name"?
- How can you fold your paper to create this shape?; What do you need to do first?

Children's Book Extensions:

Snippets

Written & Illustrated by Diane Alber

Publisher: Diane Alber Art LLC

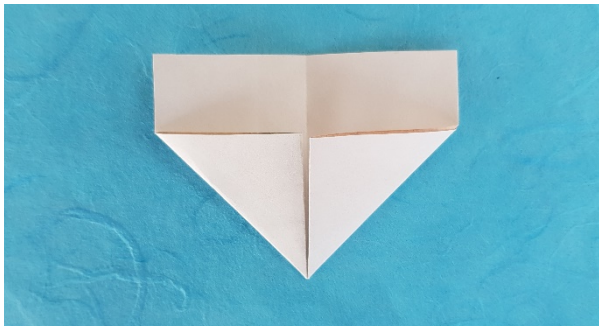
Commentary:

Through it's main character, an oddly shaped snippet of paper, Snippets supports children's social/emotional understandings of the importance of valuing what makes each one of us unique.

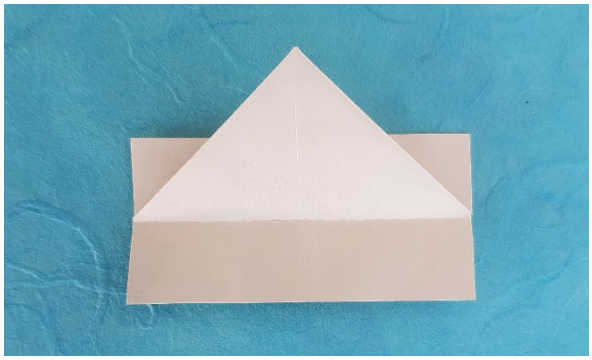
2. Origami Boat

This origami boat involves basic paper folds that young children can complete with a little guidance. The origami boat will even float once finished. (Instructional diagram is at the last page of this guide).

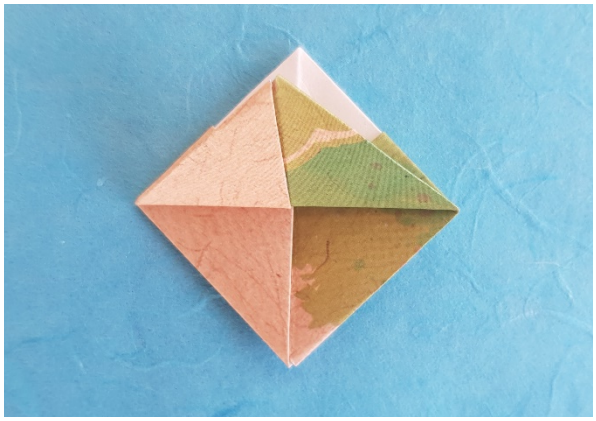
1. Begin with a small piece of rectangular paper (4x6 works well), oriented vertically (the longer sides going up and down). Fold the bottom half up to the top. Fold the bottom right corner over to the left corner making a light fold, just enough to crease the paper. Open it back up.



2. Using the crease as a guide, you will then fold the left and right bottom corners up and to the middle. Flatten the folded pieces down and rotate the orientation of the paper. Fold one layer from the bottom up along the bottom of the front flaps.

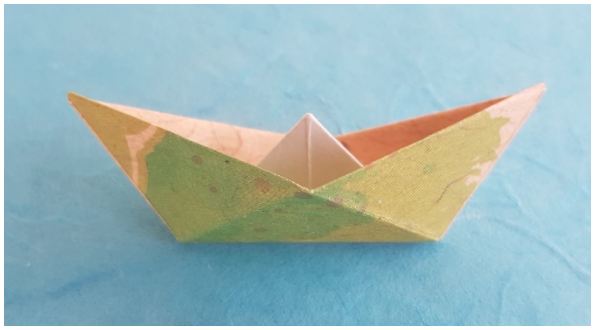


3. Flipping the paper over to the other side, fold the bottom edge up in the same way. Unfold, and then fold the bottom right corner in along the crease. Repeat this step on the bottom left flap.



4. Next, you will re-fold the bottom edge back up and open the bottom of the paper. For the corners, you will need to flatten and then insert the overlapping flap on the left underneath the right section.

5. Fold one layer up to the top and repeat this action on the back. Open the bottom of the paper and pull apart the left and right flaps. You can flatter the paper out and then open it slightly to take on the shape of a boat.



PROMPTING QUESTIONS

- What do you notice about this boat?; What shapes can you find?
- Does the fold you made look like mine?; Do you need to do anything differently?
- What other objects or animals could we try to create by folding?; How should we begin?

Children's Book Extensions:

The Paper Crane

Written & Illustrated by Molly Bang

Publisher: Greenwillow Books

Commentary:

The Paper Crane shares a Japanese folktale about a magical paper crane that comes to life. The book's imaginative illustrations are mixed media cut-paper collages and paintings.

Website with Extension Info/Images:

American Museum of Natural History – Origami How-to-Videos (frog and Barosaurus)

https://www.amnh.org/explore/origami/how-to-videos

3. Paper Sculptures with 3D Shapes

This extension activity can make use out of the 3D paper shapes made in Extension activity 1 as well as paper scraps in your classroom in order to promote creative thinking as well as creative re-use of materials. Creating a 3D paper sculpture is a challenging experience where your students will need to explore issues of balance, uprightness, and symmetry. Inviting your students to create a sketch or plan for their sculpture prior to beginning construction will help them to think about shape, form, and the translation from 2 dimensions to 3 dimensions.

This experience also works well when children work as a team with a partner – doing so provides an extra set of hands during the building phase, which can help to provide stability and support. Older students can be challenged to create a sculpture of a particular height or with a designated number of 3D shapes.

PROMPTING QUESTIONS

- Tell me about your plan?; Which shapes will you use?
- How can you get your sculpture to balance?; Which shapes could be moved?
- Does your sculpture look different when you see it from a different side or angle?

Extension Website with Images, Videos, and Resources from Origami USA:

https://origamiusa.org/

ABOUT Angela Eckhoff, PhD

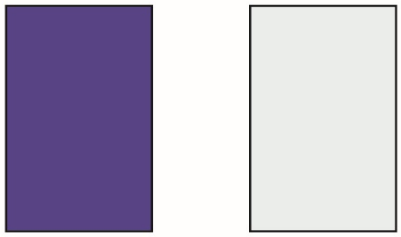
Angela Eckhoff, is an Associate Professor of Teaching and Learning and the Director of the Virginia Early Childhood Policy Center at Old Dominion University. Dr. Eckhoff studies the role of creativity in child development and learning, arts-based research and pedagogical practices, and early STEAM learning in both classroom and museum settings.

She is a co-editor of the Full STEAM Ahead column for Teaching Young Children from NAEYC as well as the author of ‘Provoking Curiosity” and the four-book “Creative Investigations” series from Gryphon House Inc. Dr. Eckhoff holds a dual PhD from the University of Colorado–Boulder in educational psychology and cognitive science.

Origami Boat Instructional Diagram

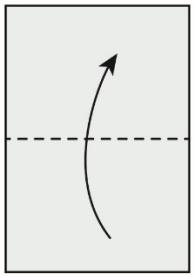
Origami Boat

Use a Rectangular sheet of paper .
A 4x6 inches works well.



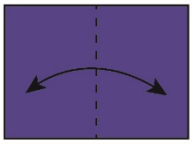
Front Back

1



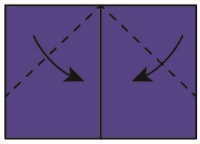
Fold the bottom half up to the top.

2



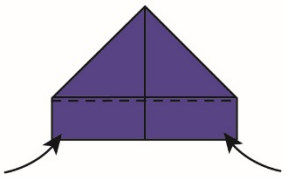
Fold the bottom right corner over to the left corner making a light fold, just enough to crease the paper. Open it back up.

3



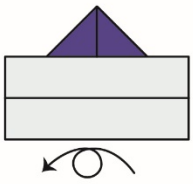
Using the crease as a guide, you will then fold the left and right bottom corners up and to the middle.

4



Flatten the folded pieces down. Fold one layer from the bottom up along the bottom of the front flaps.

5

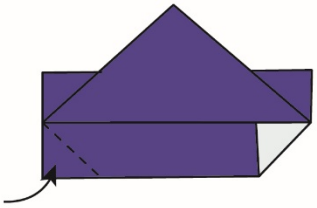


Flipping the paper over to the other side, fold the bottom edge up in the same way.

6

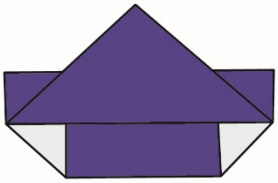
Flipping the paper over to the other side, fold the bottom edge up in the same way.

7



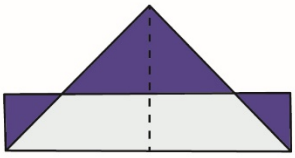
Unfold, and then fold the bottom right corner in along the crease. Repeat this step on the bottom left flap.

8



Next, you will re-fold the bottom edge back up and open the bottom of the paper.

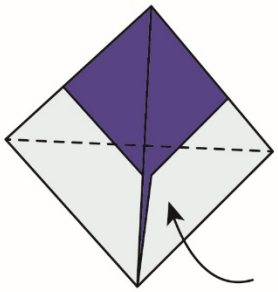
9



For the corners, you will need to flatten and then insert the overlapping flap on the left underneath the right section.

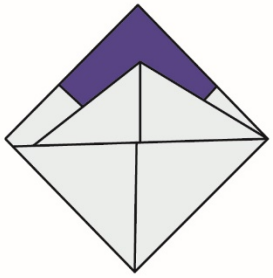
Origami Boat Instructional Diagram

10



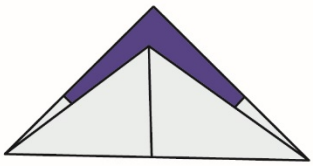
Fold the front flap from the bottom upwards across the dotted line.

11



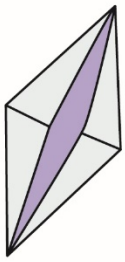
Fold the back flap from the bottom upwards across the dotted line.

12



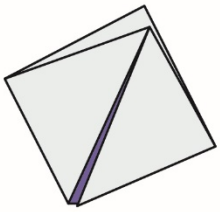
Open the bottom of the model.

13



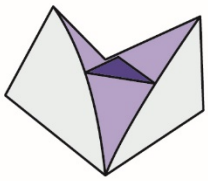
Fold one layer up to the top and repeat this action on the back

14



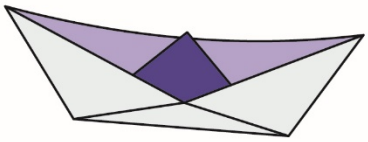
Open the bottom of the paper and pull apart the left and right flaps.

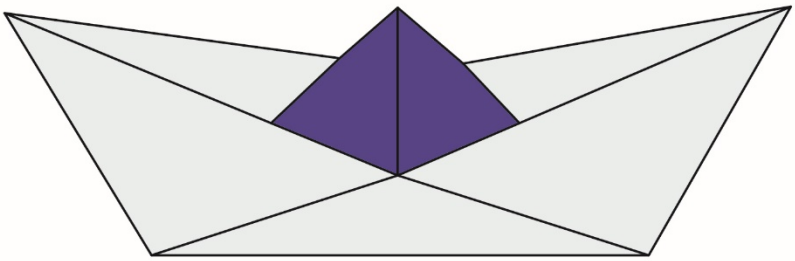
15



You can flatten the paper out and then open it slightly to take on the shape of a boat.

16





Boat