

Activity Description:

Students will create and unfold pieces of origami. Once they've unfolded and flattened the origami paper, they can use the crisscrossing lines to identify relationships formed by the creases.

Materials Needed:

- Paper
- Markers

Steps:

1. Fold an 8 ½ in x 11 in (21.5 cm x 28 cm) sheet of paper in half. Lay the paper down vertically and fold it from left to right so that its corners meet up. You can use ordinary white printer paper, construction paper, or origami paper. This is called folding the paper "hot dog style." Make a neat crease along the paper
2. To strengthen the crease, run your finger down the fold 3-4 more times.
3. Unfold the paper, rotate it 90 degrees, and fold it in half again. At this point, the paper should be lying down horizontally. Once you've adjusted the paper, fold from left to right. This "hamburger style" fold will create a new crease in the center of the page. You should now have 2 creases along both centers (x-axis and y-axis) of the page.
4. Flip the paper so that the fold opens toward you. Then, fold down the top corners towards the middle of the paper while leaving 1-2 in (2.5-5 cm) of space at the bottom. Make sure the folds line up with the center crease. Crease along the edges to secure the folds. Use the crease you made before to help line up the folds coming in from the corners.
5. Bring the bottom of the paper up to fold it against both sides. Grab the flap at the bottom of the paper and fold it up against the bottom of the 2 folded triangles. Turn the paper over and do the same thing to the flap on that side. This will make a paper hat
6. Take the bottom corners and fold them in. On 1 side of the paper, grab the corners of the rectangle that are sticking out over the triangle. Wrap these parts of the paper around the edges of the triangle and crease them so that they stay wrapped around the edge of the triangle. Then, fold the bottom flaps around the edges of the triangle and back towards you.
7. Make the triangle into a square. Pick up the triangle, rotate it 45 degrees, then use your fingers to open up the bottom of the triangle. Pull the paper apart gently until it pops into a square shape. Make sure the bottom corners of the triangle fold over each other and become the bottom corner of a diamond
8. Fold up the bottom flaps. Arrange your paper so that the bottom points of the diamond can fold upward. Fold up 1 corner, aligning it with the top corner. Then, flip the paper over and do the same thing to the other side
9. Construct the triangle into a square again. Just like last time, pick up the triangle, rotate it 45 degrees, then open up the bottom of your new triangle with your fingers. Crease the paper along its edges so that it stays in the square shape. Pull out the triangles on the side of the square. Start at the top of the diamond, and gently pull the two sides apart so

that the seam running down the middle of the diamond blooms. Crease the bottom of the folded out sides to make the boat a bit stronger

10. Unfold your boat until it's a flat piece of paper with crisscrossing lines.

11. Highlight the following relationships:

- a. Vertical angles
- b. Supplementary angles
- c. Complimentary angles
- d. Acute angles
- e. Obtuse angles
- f. Straight angles
- g. Alternate interior angles
- h. Parallel lines
- i. Perpendicular lines
- j. Right angles