1 Introduction

This activity combines origami, area, and angle measures. Using eight easily constructed shapes we can make a magic pinwheel. The instruction sheet is from [1] and the discussion questions are from [2].

2 Materials Required

1. Origami paper (two sided)
2. Diagram on how to make a Magic Pinwheel
3. Example of a constructed Magic Pinwheel

3 Lesson Plan

This activity can be done in a class period or less. Review of area and measuring angles can be done if needed. A slow walk through of the instructions to make a unit will be needed. Eight units are needed to make a Magic Pinwheel.

Once the pinwheel has been constructed the students can gently slide the pieces apart to find various shapes. 13 different shapes can be found:

1. point
2. line segment
3. triangle
4. square
5. pentagon
6. hexagon
7. heptagon
8. octagon
9. a rhombus that is not a square
10. a parallelogram that is not a rhombus
11. an isosceles trapezoid
12. a right trapezoid
13. a rectangle that is not a square

4 References

Magic Pinwheel

1. What is the area of the square origami paper?

2. In step 2, what is the area of one of the folded triangles.

3. In step 2, what is the area of the shape?

4. In step 4, what is the area of the shape? How can it be related to the area of the original square?

5. What are the measures of the interior angles of the parallelogram?

6. Once you have constructed your pinwheel, gently slide the pieces of your pinwheel apart. What shapes can you find on the inside of the pinwheel?
Robert Neale’s Magic Pinwheel

1. Crease paper down the middle
2. Fold top corners to center line
3. Fold figure in half along crease
4. Bring bottom right corner to left edge to form parallelogram
5. Partially open the paper and push triangular region inside
6. Flatten the parallelogram
7. Insert one piece into another so that the folded edge of each module is on the outside
8. Be sure to tuck the inside piece as far into the fold as possible
9. Tuck the corners of the outside module into the groove of the inside module as snuggly as possible
10. Continue to add modules around the octagon. Be careful to tuck the corners of the last module on either side of the parallelogram sitting in the groove of the first module.
11. Push gently until the octagon becomes a pinwheel. You may need to make creases sharper and jiggle the figure. Slide it back and forth a few times.

Figure 1: [Image Link]