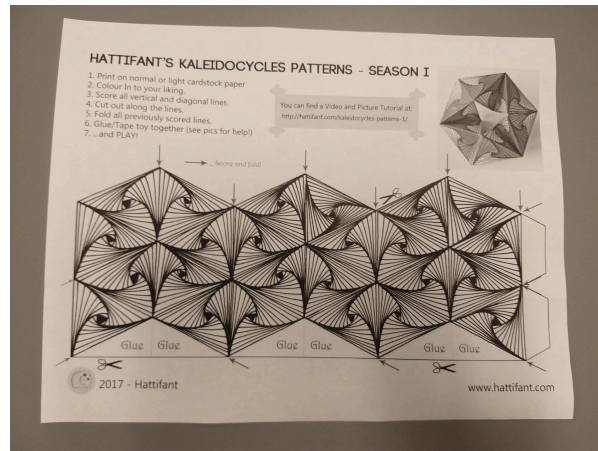
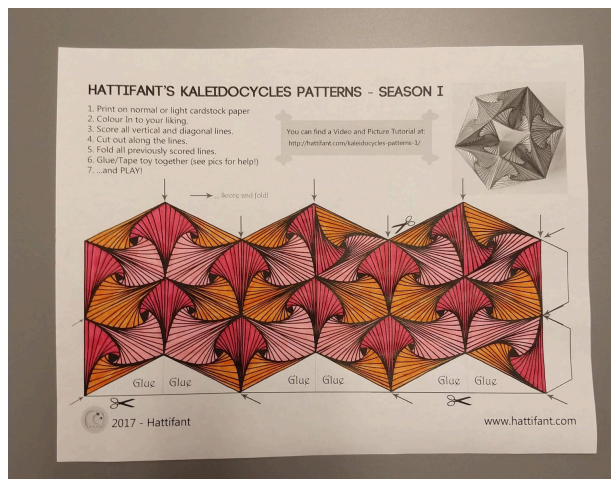


Steps to Create a Flexagon

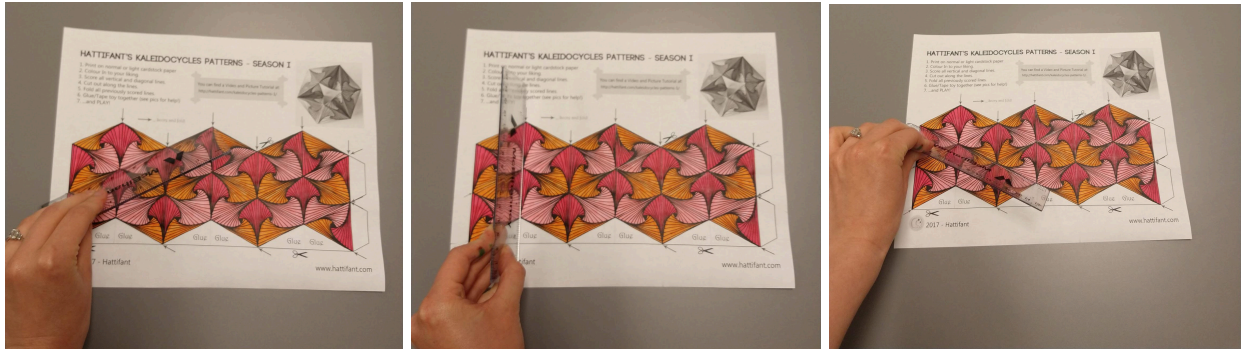
1. Print out the template on 8.5 x 11" white printer paper.
 - a. The template used in my demonstration can be found at <http://hattifant.com/kaleidocycles-patterns-1/> or you can find it attached as a PDF.
 - b. A variety of different patterns are also available at the website link.



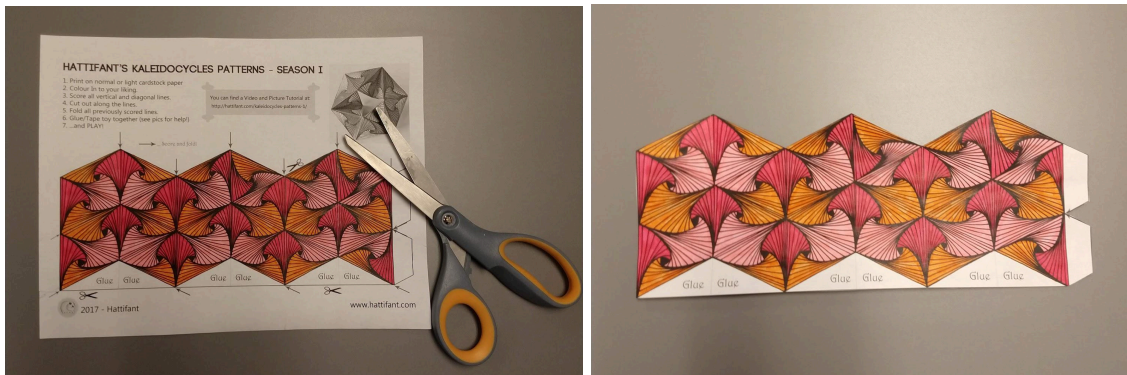
2. Colour the template to your taste. It is best to use three distinct colours to accentuate the triangles and segments in the pattern.



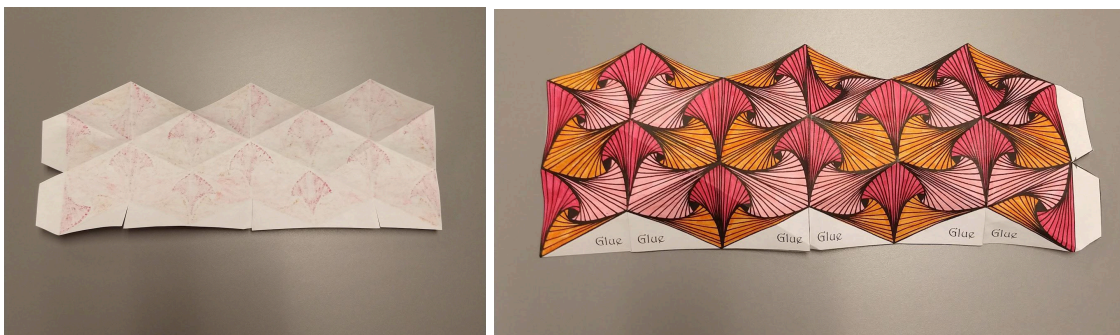
- Score the template with a ruler along the vertical and diagonal lines. Follow the arrows on the template as an indication of where to score.



- Cut the template out. Follow the solid lines around the outside of the template as your guide. Make a small cut along the dotted lines in the areas that say "Glue" to allow easy folding.



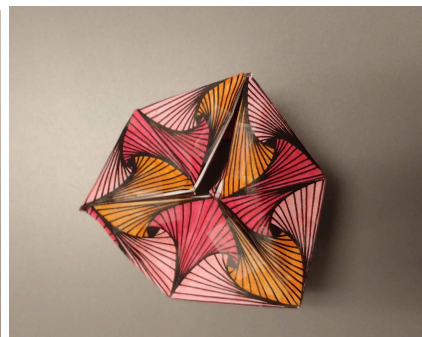
- Turn the template so that the coloured side is down and you are looking at the blank, uncoloured side. Fold the template along the vertical and diagonal lines that were previously scored. It is best to smooth out the folds with a ruler as you go to ensure the folds are crisp.



6. Take your time and neatly fold the template to form the triangular prisms. Secure the segments with tape as you go. Be sure to leave the blank white tabs out for now.
 - a. You can use glue instead of tape, but tape is quicker and easier to use.



7. Finally, tuck the blank white tabs into the opposite open end to form a circle. Secure it with tape.



8. Enjoy! Cycle the pattern by pushing the paper down and through.

Connections to the B.C. Curriculum

This activity would be appropriate for grades 3-6 depending on the mathematical concepts and the level of depth that is explored.

Generally, flexagons could be used to provide a hands-on approach to exploring geometric shapes, transformations, symmetry, patterns, and angles. For grade 3, at the primary level, flexagons could be used to explore concepts such as shapes and patterns. This activity would also provide an opportunity to practice folding and cutting neatly. For grades 4-6, at the intermediate level, flexagons could be used to explore concepts such as symmetry, angles, and transformation. They could also be used to explore concepts of perimeter, area, and volume.

Below, I have included lists of the relevant grade-level specific curricular competencies and content that flexagons could be used to address.

Grade 3:

Big Ideas:

- Standard units are used to describe, measure, and compare attributes of objects' shapes.

Curricular Competencies:

- Reasoning and analyzing:
 - Use reasoning to explore and make connections
- Understanding and solving:
 - Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
 - Visualize to explore mathematical concepts
- Communicating and representing:
 - Communicate mathematical thinking in many ways
 - Use mathematical vocabulary and language to contribute to mathematical discussions
- Connecting and reflecting:
 - Reflect on mathematical thinking

Content:

- Pattern rules using words and numbers, based on concrete experiences
- Construction of 3D shapes

Grade 4

Big Ideas:

- Polygons are closed shapes with similar attributes that can be described, measured, and compared.

Curricular Competencies:

- Reasoning and analyzing:
 - Use reasoning to explore and make connections
- Understanding and solving:

- Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
- Visualize to explore mathematical concepts
- Communicating and representing:
 - Communicate mathematical thinking in many ways
 - Use mathematical vocabulary and language to contribute to mathematical discussions
- Connecting and reflecting:
 - Reflect on mathematical thinking

Content:

- Regular and irregular polygons
- Perimeter of regular and irregular shapes
- Line symmetry

Grade 5

Big Ideas:

- Closed shapes have area and perimeter that can be described, measured, and compared.

Curricular Competencies:

- Reasoning and analyzing:
 - Use reasoning to explore and make connections
- Understanding and solving:
 - Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
 - Visualize to explore mathematical concepts
- Communicating and representing:
 - Communicate mathematical thinking in many ways
 - Use mathematical vocabulary and language to contribute to mathematical discussions
- Connecting and reflecting:
 - Reflect on mathematical thinking

Content:

- Classification of prisms and pyramids
- Single transformations

Grade 6

Big Ideas:

- Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles.

Curricular Competencies:

- Reasoning and analyzing:

- Use reasoning and logic to explore, analyze, and apply mathematical ideas
- Understanding and solving:
 - Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
 - Visualize to explore mathematical concepts
- Communicating and representing:
 - Use mathematical vocabulary and language to contribute to mathematical discussions
 - Communicate mathematical thinking in many ways
- Connecting and reflecting:
 - Reflect on mathematical thinking

Content:

- Perimeter of complex shapes
- Angle measurement and classification
- Volume and capacity
- Triangles
- Combinations of transformations