HEXAFLEXAGONS

FESTIVAL GUIDE

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Julia Robinson Mathematics Festival

Materials and Setup

Per table (assuming 5 children per table), you will need:

Per Table	Material Preparation	
Scissors	It's helpful to have some left-handed scissors.	
Glue	Any gluestick will work, but the purple glue is easier to check for coverage. Tape will also work.	
Marker or pen	It's a good idea for children to write their name on their finished Hexaflexagon.	
1 table copy of Instructions	4-page sheet *print single-sided* *(Children need to be able to see all the pages simultaneously.)*	p. 5-8
Multiple copies of Task	1-page sheet	p. 9
1 copy of Table Sign	1-page sheet *print on cardstock for sturdiness*	p. 10

Per Table	Purchasing Materials		
Scissors	pack of 6 for $5.77		
Purple glue	pack of 6 for $5.49		
3 plastic sheet protectors	pack of 100 for $7.67	pack of 500 for $26.99	These are recommended in order to protect the documents that children will be handling.

Objective

Follow the instructions to make a hexaflexagon with six faces.

Materials

Each Hexaflexagon table needs:

1. Multiple copies of the task that children can cut out.
2. Hexaflexagon instructions (4 pages) displayed.
3. Scissors.
4. Purple glue.
5. Marker or pen.

How to Play

We strongly encourage you to explore the activity yourself ahead of time.

Flexagons are flat models constructed by folding strips of paper. They can be flexed or folded in certain ways to reveal faces besides the two that are originally on the back and front.

In this activity, you will be helping children make hexaflexagons that have six faces (and are actually called hexahexaflexagons!)

1. Depending on their age, some will need help with cutting and folding.
2. Model pressing firmly for sharp folds.

Standards

1. Make sense of problems and persevere in solving them. CCSS.MP1
2. Model with mathematics. CCSS.MP4
3. Attend to precision. CCSS.MP6
4. Look for and make use of structure. CCSS.MATH.PRACTICE.MP7

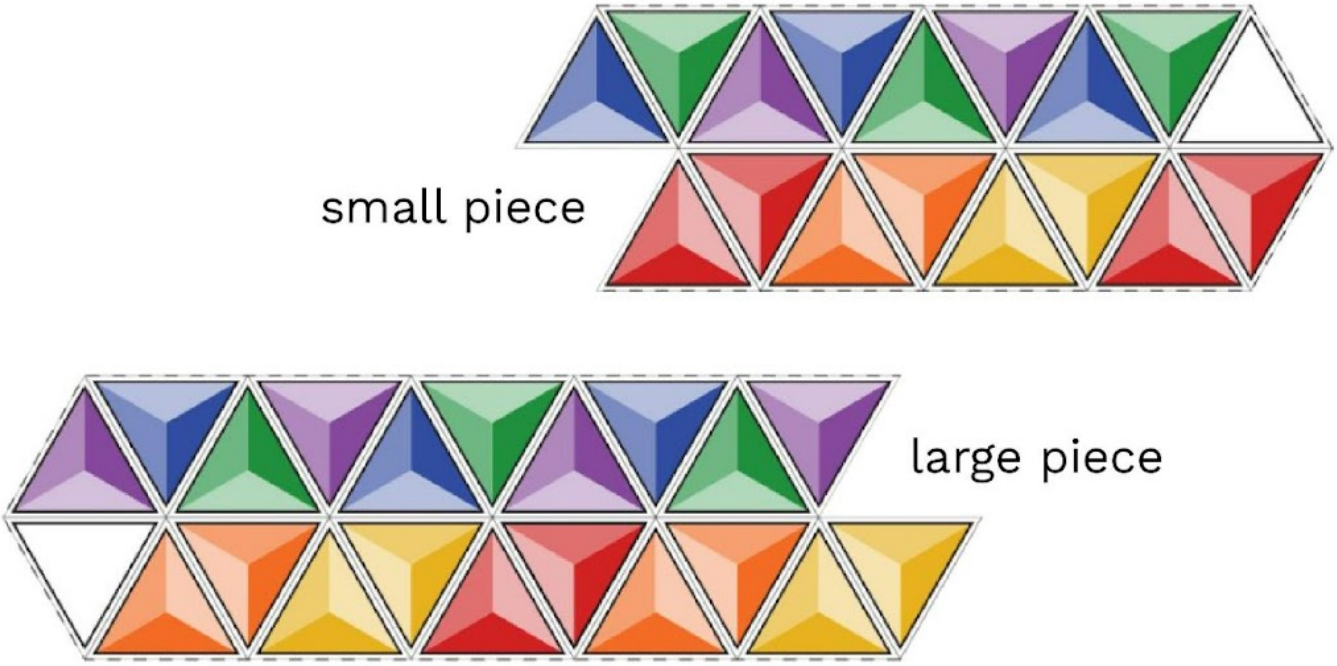
Asking Good Questions

Check in with the child and ask questions to encourage deeper thinking. Try some of these examples:

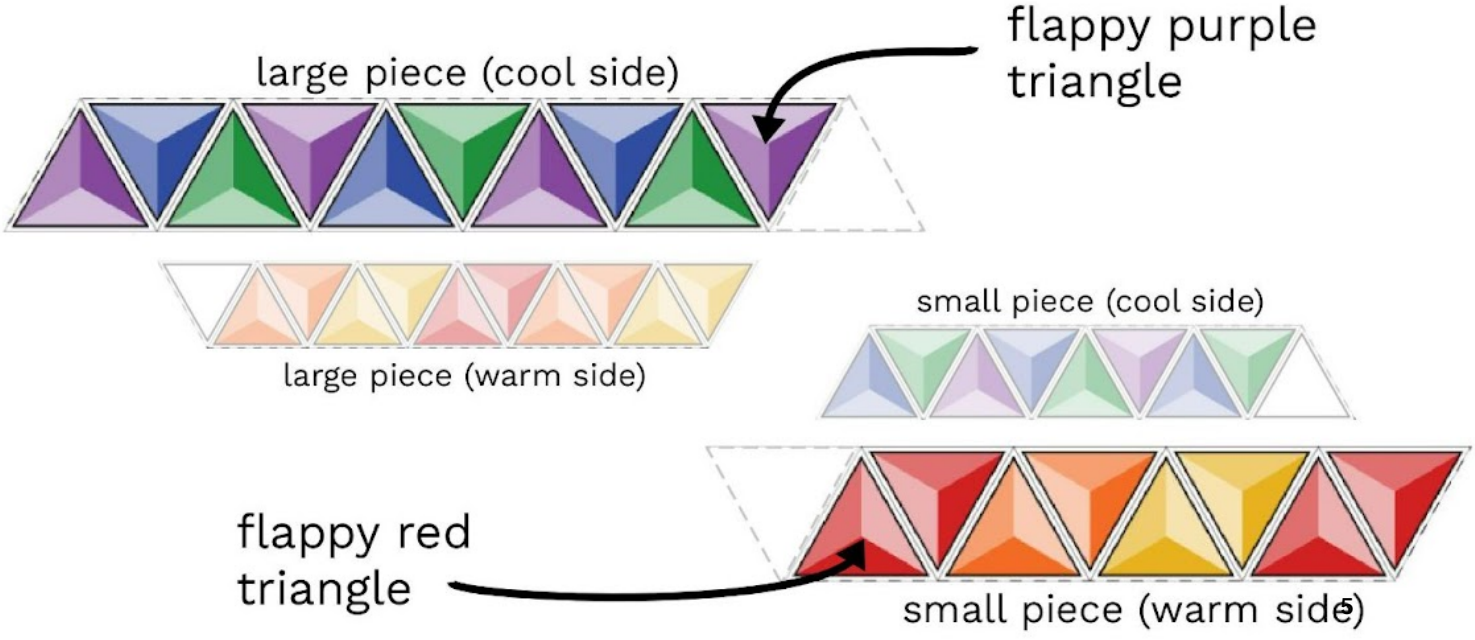
a. Flex the hexaflexagon so you can see different faces on front and back. Can you find every face this way? Are there any faces you cannot see?
b. Pick a face. Starting from that face, how many flexes do you need to do in order to see each face at least once? Is this the same for all faces?

c. Does your answer change depending on whether or not you're allowed to turn your hexaflexagon over before flexing it to switch between faces?
d. Do you think it would be useful to draw a picture to show how you can move from face to face? How would you draw this picture?
e. How can you make a tri-hexaflexagon, a flexagon that has only 3 different faces? How many triangles do you need to begin with?

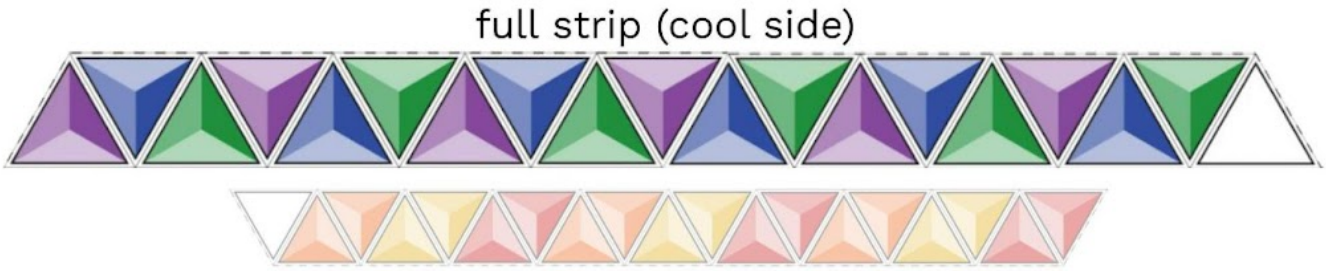
1 Cut out the two pieces.



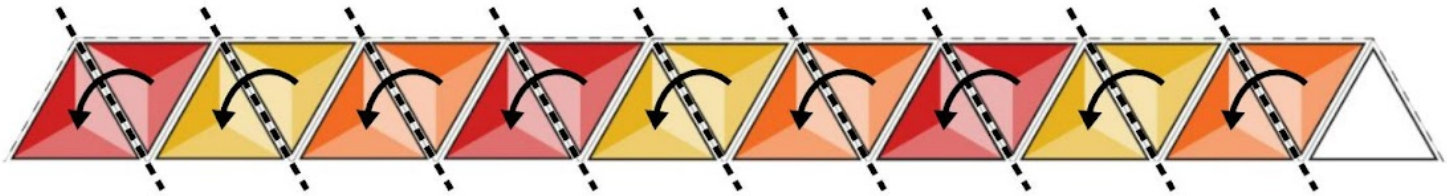
2 Fold each piece lengthwise. Paste down the flappy purple triangle on the long piece and the flappy red triangle on the short piece.

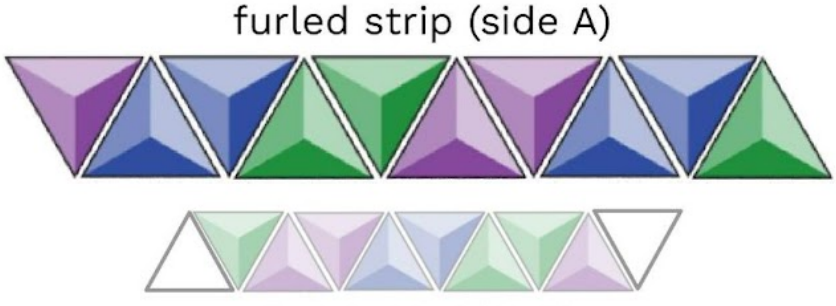


3 Paste the white triangle on the long piece's cool side to the white triangle on the short piece's warm side.

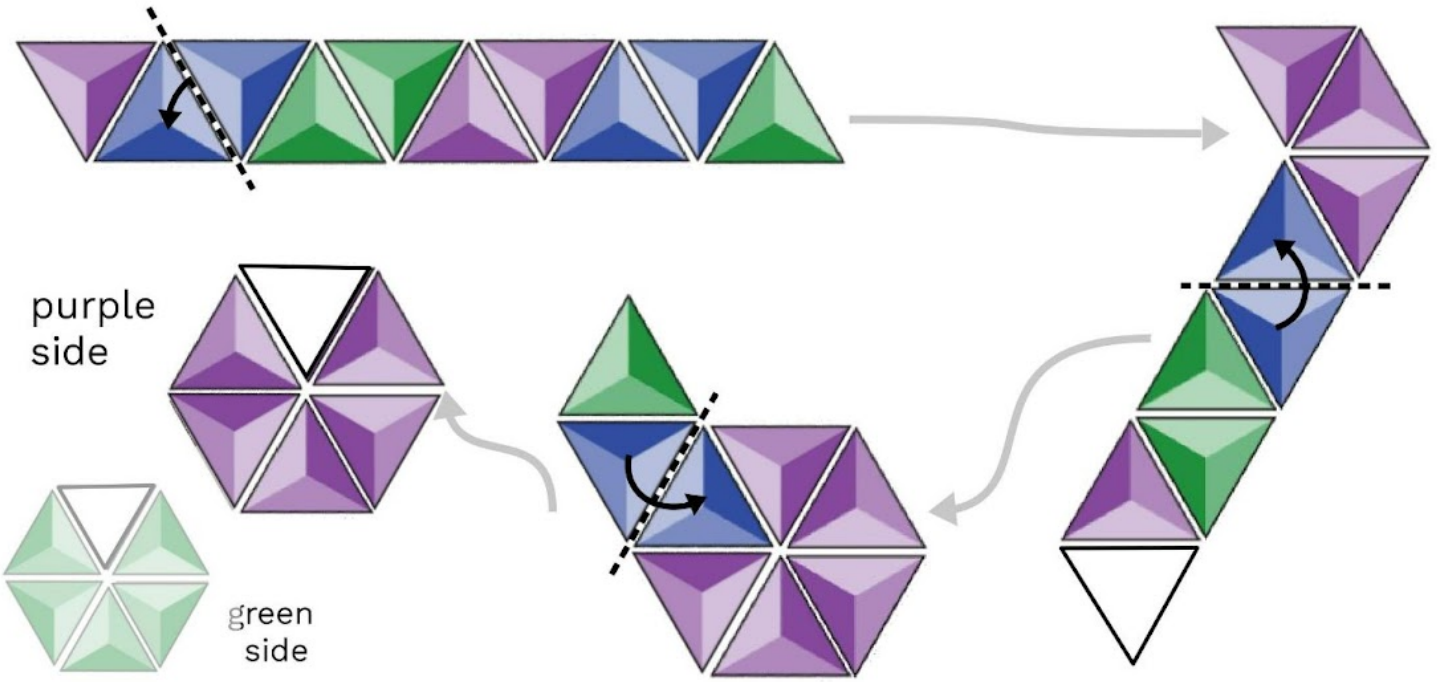


4 Fold every warm diamond in half so red touches red, orange touches orange, and yellow touches yellow, furling the strip.

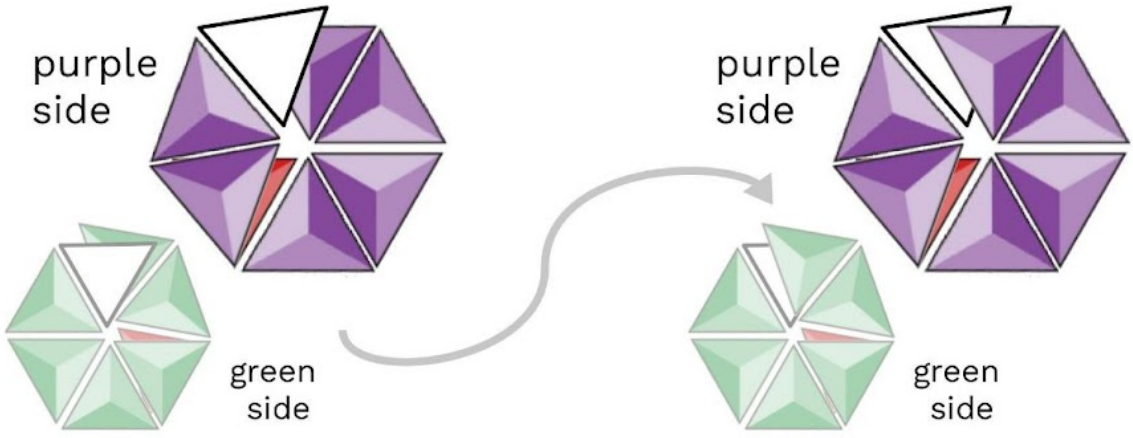




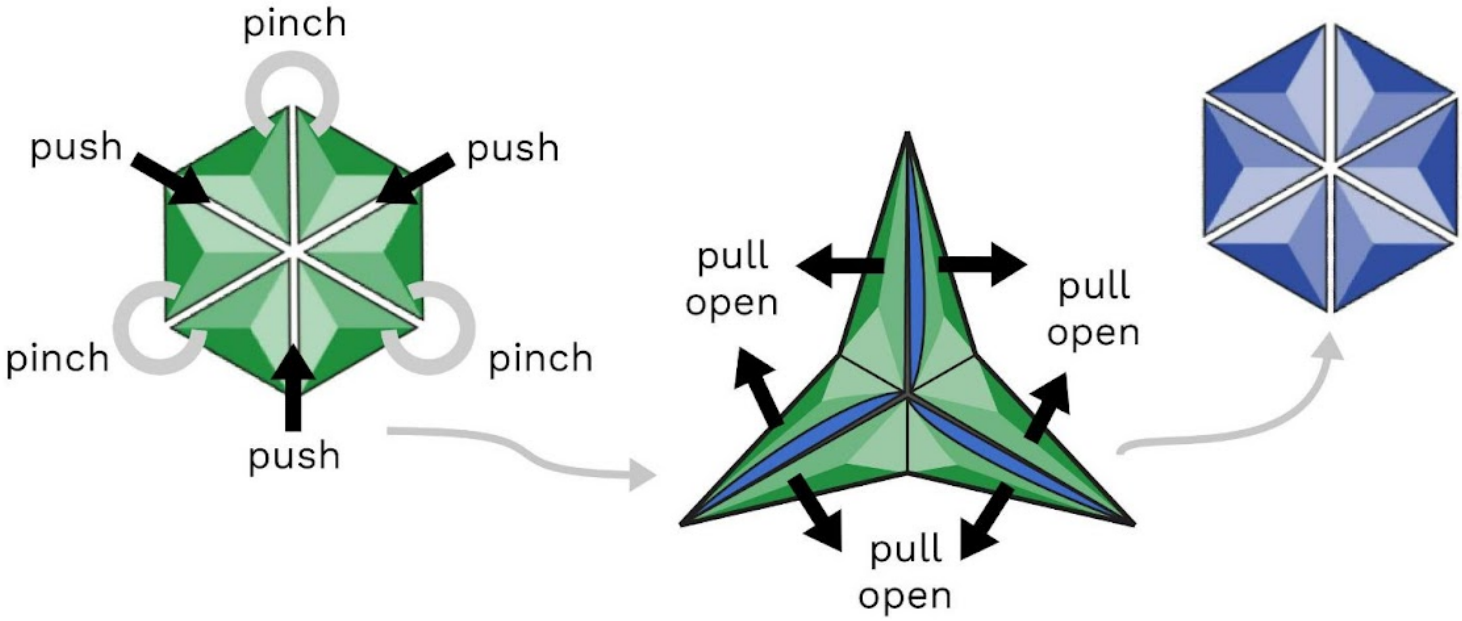
5 Fold every blue diamond in half, coiling the strip into a hexagon.



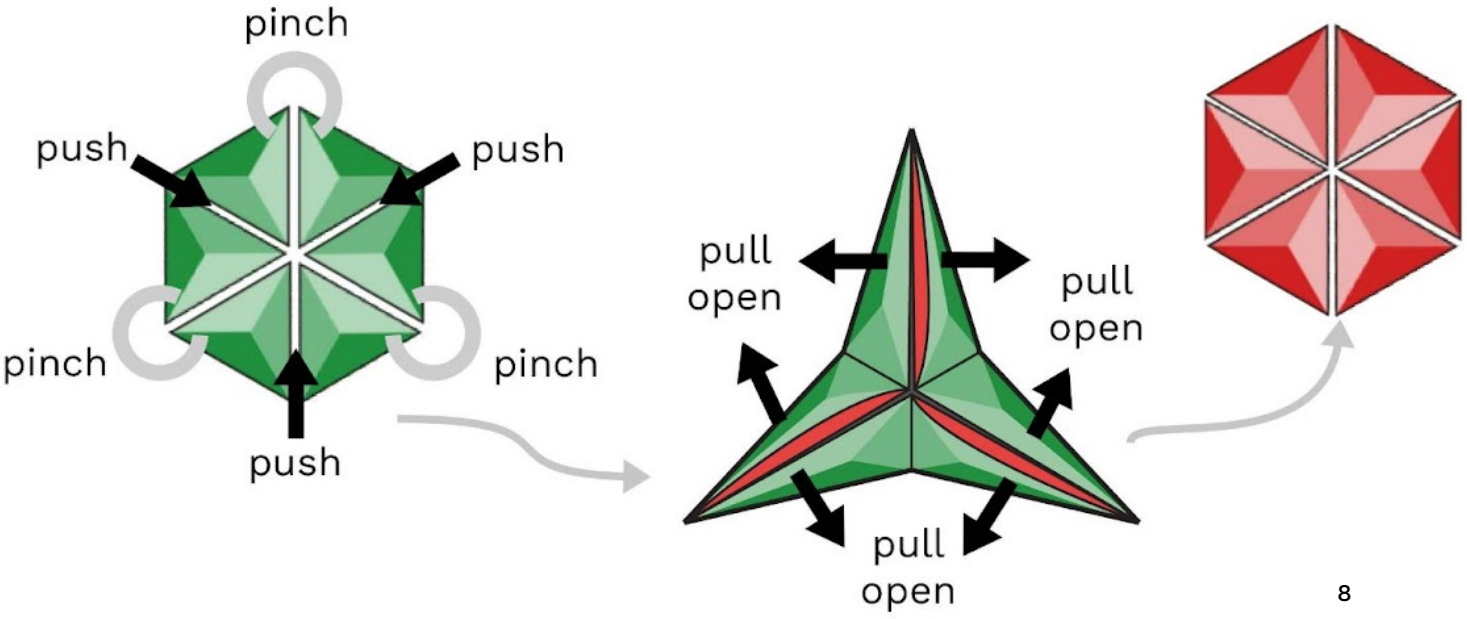
6 Tuck the white triangle behind the purple triangle behind it so that one side is completely purple and the other green. Paste the white triangles together.



7 To flex your flexagon, pinch three folds into mountains leaving the folds in between as valleys. Then open the shape along the mountain folds.



Pinching along medium green will reveal a blue face while pinching along light green will reveal red! What other colors can you flex to?



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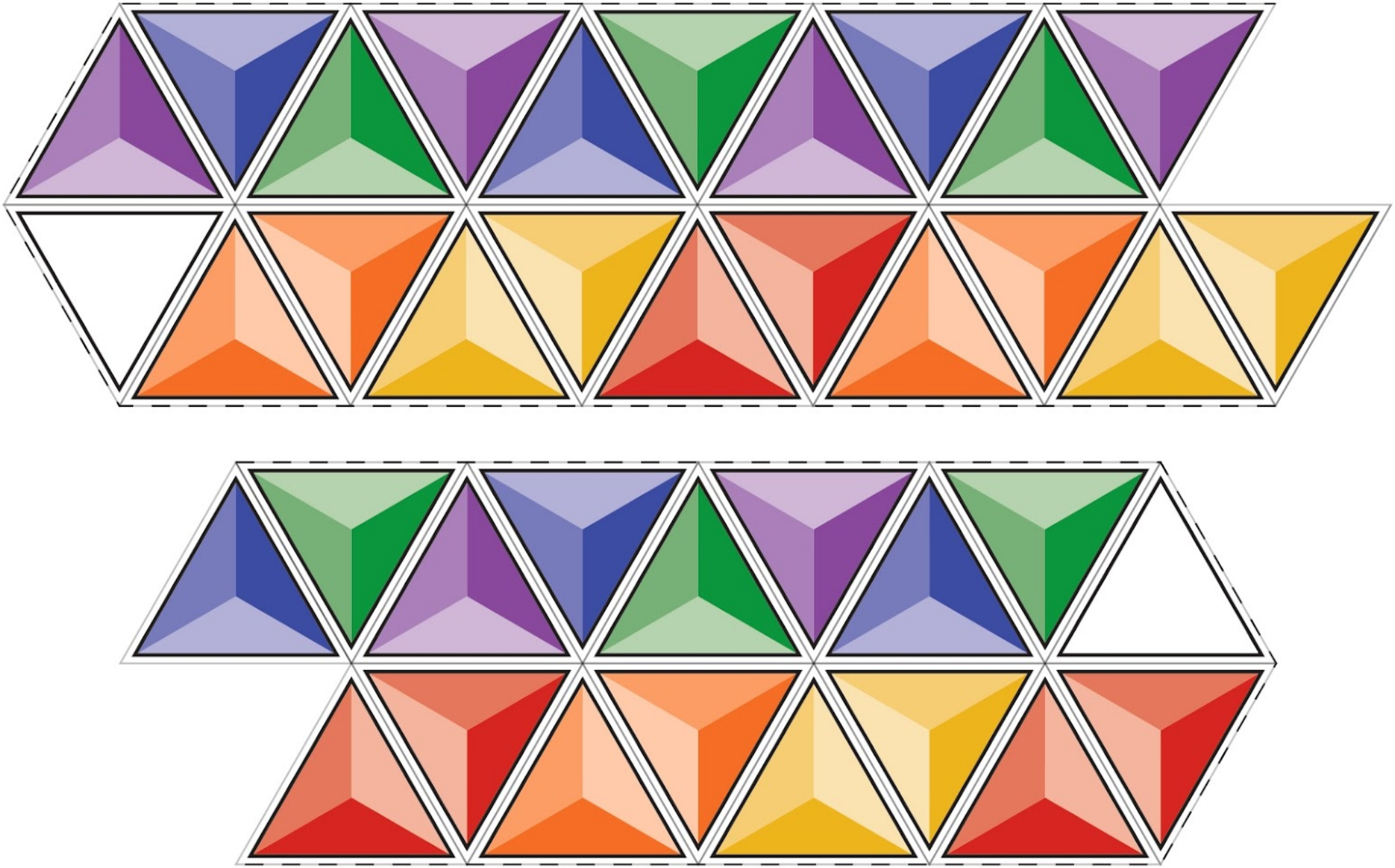
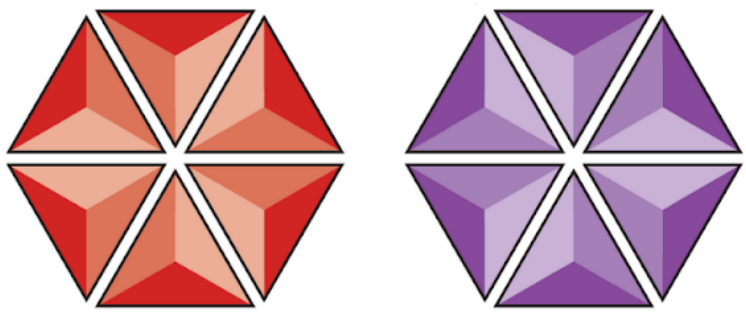
Hexa-hexaflexagon



Play for free at
jrmf.org/puzzle/hexaflexagons



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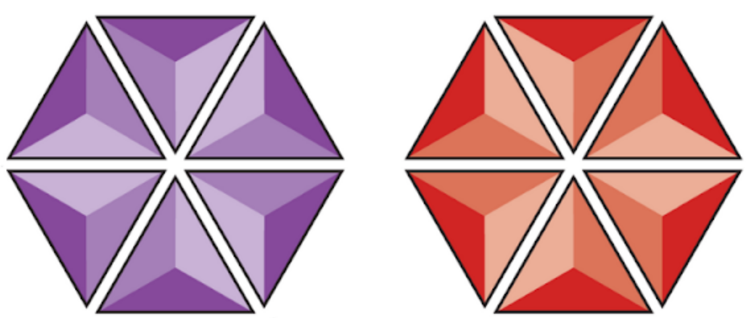

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