

Title: Tessellating Terriers are Flipping, Sliding and Turning. (Congruence and Motion – Geometry)

Brief Overview:

This performance based concept development unit integrates geometric problem solving with real life application. Students will demonstrate their knowledge of tessellations and the use of slides (translations), flips (reflections), and turns (rotations). These lessons are designed to be accessible for intermediate and primary students. Teachers should be able to teach the basic principles of motion (slides, flips and turns) in this unit, accessing prior knowledge such as congruence and symmetry. Extensions are created through the manipulation of tangrams. Furthermore, students will apply what they have learned by identifying movement and the creation of tessellations.

NCTM Content Standard/National Science Education Standard:

Geometry

Grade/Level:

Grades 2 - 5

Duration/Length:

Three 60-minute sessions

Student Outcomes:

Students will:

- identify and create flips (reflections), slides (translations), and turns (rotations) by manipulating objects and representing figures on paper.
- apply knowledge learned about flips (reflections), slides (translations), and turns (rotations) by using tangrams to create pictures.
- identify flips (reflections), slides (translations), and turns (rotations) within tessellations.
- apply knowledge learned about flips (reflections), slides (translations), and turns (rotations) by creating tessellations.

Materials and Resources:

- Snap cubes
- Pattern blocks
- Pencils
- Crayons or markers
- Plain paper
- Resource sheets
- Scissors
- Tape
- Screen
- T-Chart
- "Before" and "After" labels
- Grandfather Tang's Story ISBN 0-517-57487-X
- by Robert Andrew Parker
- Tiling Shapes ISBN 1-58273-477-1 by Kari Jenson Gold
- Transparencies and overhead projector
- "Tesselmania" software by MECC
- Computer lab access
- Vocabulary Cards (Teacher Resource Sheets 23-28)
- Answer keys
- Transparency markers

Development/Procedures:

Lesson 1

Preassessment

- Present the students with a 4-block figure made from snap cubes. The figure should resemble an L. The students are told that something will happen to the figure. Hold up a screen or large piece of paper to shield from view what you are going to do. The original figure will be in a "before" column on the board (Teacher Resource Sheet 1) and the resulting figure will be in the after "column" on the board (Teacher Resource Sheet 2). The resulting figure will be a demonstration of a slide (translation). In the T-Chart (Teacher Resource Sheet 3) labeled "similarities" and "differences", write down all of the things that the students say in the appropriate column. Ask the students to explain how they know the "before" figure and the "after" figures are congruent. This will assess whether or not the students understand congruence. If not, make certain that the student know that congruent figures are the same size and shape. The teacher will repeat this demonstrating a flip (reflection) and a turn (rotation).

Launch

- The story, Tiling Shapes, will be read to the students. Discuss the book as you read. Use Mrs. Tess E'illation (primary) (Teacher Resource Sheet 4) or pattern blocks (intermediate) to demonstrate slides (translations), flips (reflections), and turns (rotations). Ask the students how the figure in the "before" column changed to the figure in the "after" column. At this point, focus on the fact that the "before" and "after" figures are congruent, but turned, flipped, or slid into the "after" position. When discussing flips, introduce the geometric term "line of symmetry" (Teacher Resource sheet 5). A line of symmetry is the line that divides a figure into two congruent (equal) parts.

Teacher Facilitation

- Discuss the terms for the three movements demonstrated. The terminology will vary depending upon the level of the student. Provide frames (Student Resource Sheets 1 and 2) for students who have difficulty with organization and writing.
- Primary:
 - Slide – to move a geometric shape in a straight line across a flat surface to make a repeating pattern.
 - Flip – to turn a geometric shape over a line of symmetry making a reflection image.
 - Turn – to move a geometric shape by rotating on a stationary point.
- Intermediate:
 - Translation – occurs when you slide a figure a given distance in a given direction.
 - Reflection – occurs when a figure changes position and orientation by "flipping" over a line of symmetry to create a mirror image.
 - Rotation – occurs when a figure changes position and orientation by "turning" a given angle and direction around a stationary point.
- Hand out a student notes sheet (Student Resource Sheets 3 and 4). Model each definition using snap cubes (primary) or pattern blocks (intermediate) with the modeled movement already on the worksheet for the students to see ("Watch me"). The students will practice with teacher assistance ("Help me" and "Let me help you"). Answer keys are on Teacher Resource Sheets 6 and 7.

Student Application

- Students will work in pairs or small groups to demonstrate and justify responses. The students will use a worksheet (Student Resource Sheets 5 and

6) to help organize their responses. One student will take the snap cubes (primary) or pattern block (intermediate) and hold in the orientation on the worksheet. Then the student will perform a flip, slide or turn. The other students will identify the movement made and justify by explaining why they believe their answer is correct. Then all students will trace or draw the result in the appropriate box. All students will get a turn to move each figure into a new position.

Embedded Assessment

- The students will complete a short worksheet (Student Resource Sheets 7 and 8) to determine their understanding at this point. Students who are successful will move on to the Extension activity, while those students who are still struggling will work with the teacher in the re-teach group. The primary students will be given a snap cube model and will trace the slide, flip, and turn. The intermediate students will be drawing or tracing a selected pattern block to demonstrate a translation, reflection, or rotation. As a group, the students will present and justify their answers. Answer keys can be found on Teacher Resource Sheets 8 and 9.

Reteaching/Extension

- Reteaching – For those students, who require additional help, review the concept. Primary students will begin with the interlocking cubes. Begin with an L shaped figure, with the students tracing the beginning figure on inch grid paper (Student Resource Sheet 9). Intermediate students will begin with pattern blocks and will trace onto centimeter grid paper (Student Resource Sheet 10). All students, with teacher assistance, will begin by sliding (translating) the figure. Then the students will practice flipping (reflecting), then turning (rotating). Students will be continually assessed and will move on to the extension activity when at an independent level.
- Those students not having difficulty acquiring the concept will move on to the extension activity (Student Resource Sheets 11a, b, c & 12a, b, c). Answer keys are on Teacher Resource Sheets 10a, b, c and 11a, b, c. The extension will allow the students to practice creating slides (translations), flips (reflections) and turns (rotations). The worksheet will be reviewed and the students will complete a Brief Constructed Response (primary) (Student Resource Sheet 13) or an Extended Constructed Response (intermediate) (Student Resource Sheets 14). Answer keys can be found on Teacher Resource Sheets 12 and 13. For homework, the students will complete a journal entry (Student Resource Sheets 15 & 16) asking them where they see slides (translations), flips (reflections) and turns (rotations) in their lives. Answer keys can be found on Teacher Resource Sheets 14 and 15.

Lesson 2

Preassessment

- Review slide (translation), flip (reflection) and turn (rotation) (Student Resource Sheets 17 & 18). Primary will use snap cubes and intermediate students will use pattern blocks. Answer keys can be found on Teacher Resource Sheets 16 and 17.

Launch

- Present students with 7 tangram pieces (Student Resource Sheet 19). The tangram pieces will be labeled "F" front and "B" back. All pieces need to have the "F" side up. Read the story, Grandfather Tang's Story, using teacher's discretion. Show pictures of the animals from the book. The pictures in the story have been created using tangrams (Student Resource Sheets 20 to 24). Working in pairs the students will use their tangrams to reproduce the animal on the worksheet. Ask students to look for a slide (translation), turn (rotation) or flip (reflection) in the picture they created.

Teacher Facilitation

- Review the terms of the three movements demonstrated. Students will be given worksheets of the pictures being shown on transparencies (Student Resource Sheets 20 and 21). Show a transparency to the students and they will identify a slide (translation), turn (rotation) or flip (reflection). Color-code each movement. Demonstrate the movement: flips in green, slides in red, and turns in blue. Students will color in the movement, slide (translation), turn (rotation) or flip (reflection), on their paper using a crayon. Show another picture and with the help of the students they will identify another movement, slide (translation), turn (rotation) or flip (reflection). The movement, slide (translation), turn (rotation) or flip (reflection), will be demonstrated. A third picture will be shown and the students will work in cooperative learning groups to locate a movement, slide (translation), turn (rotation) or flip (reflection). They will prove their findings.

Student Application

- Show a transparency of a shape to the students (Student Resource Sheet 22). Ask students to make the shape with their tangrams ("F" side facing up) and locate a flip (reflection) in the picture. Trace the flip (reflection) in green. Then ask students to locate the line of symmetry on the picture. A student will draw the line of symmetry on the transparency. Show a second picture (Student Resource Sheet 23) and the students will create the picture. They will identify the animal created by the tangram. First, they will locate a slide

(translation) in the picture. Trace the slide in red. Then they will find the turn (rotation) in the picture. Trace the turn in blue. Students will show each other the flips (reflection), slides (translation) and turns (rotation) in the picture. They will repeat this with another tangram picture (Student Resource Sheet 24).

Embedded Assessment

- Students will create a picture using at least one movement for primary students. Two movements will be required for intermediate students.

Reteaching/Extension

- Simple pictures will be used to reteach identifying the different movements. Students who are working independently will continue to identify movements and create pictures using the different types of movements.

Lesson 3

Preassessment

- Show the tangram picture on Student Resource Sheet 25. They will be asked to locate all the movements, slide (translation), turn (rotation) or flip (reflection), in the picture. They will color the flip (reflection) in green, slide (translation) in red, and a turn (rotation) in blue.

Launch

- Show students a parallelogram. Ask students: "What would happen if I slid the shape over and over again?" Teacher will move the shape and trace it on the board. Keeping the shape intact, ask the students: "What if I flipped the shape?" *Remember to keep one side stationary and then flip the shape. Demonstrate the action and trace the shape. Ask: "What would happen if I turned the shape?" (Keep one side stationary, and then turn the shape). Demonstrate the action and trace the shape. Explain that a tessellation was created. Definition of a tessellation (Teacher Resource Sheet 18) is a pattern that repeats without overlaps or gaps using flip (reflection), turn (rotation), and slide (translation).

Teacher Facilitation

Primary:

- Students will be given a hexagon (Student Resource Sheet 26) and a piece of paper. Demonstrate a slide and students will copy what you did. Working in

pairs, the students will demonstrate a flip with the square (Student Resource Sheet 27). Student alone will demonstrate the movement turn.

Intermediate:

- The students will be given a hexagon made from cardstock paper (Student Resource Sheet 26). Teacher will give each student directions for creating a tessellation. Students may color in their tessellation that they created. (Student Resource Sheets 28a,b) They will tessellate showing a translation. Teacher Resource Sheets 19 can be used as a math center.

Embedded Assessment

- Give the students two tessellations to view (Student Resource Sheet 29). The students will identify what movements were used to create these tessellations. Answer can be found on Teacher Resource Sheet 20.

Reteaching/Extension

- The students will use the “Tesselmania” software to create their own tessellations and to view tessellations. Students who need additional help will be given teacher assistance in the use of the “Tesselmania” software. The teacher will help the students to translate (slide), reflect (flip), and rotate (turn) each piece. They will also look at created tessellations and identify what movements were made to create the tessellations.

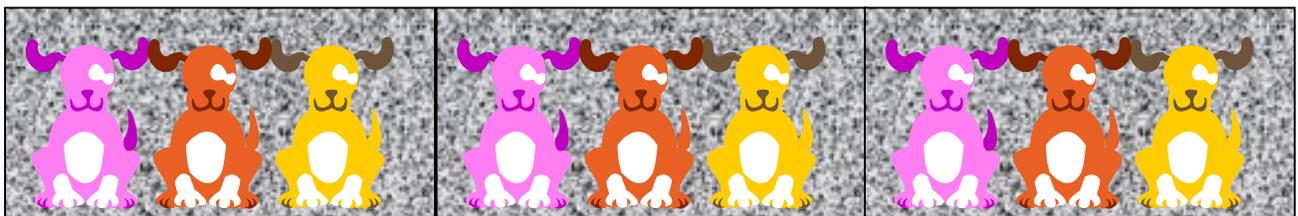
Summative Assessment:

The students will be given an assessment that will require them to identify and perform each movement. The students will be given tangrams and tessellations in the assessment (Student Resource Sheets 30a, b, c, d & 31a, b, c, d). Answer keys can be found on Teacher Resource Sheets 21 and 22.

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Before

After



Similarities

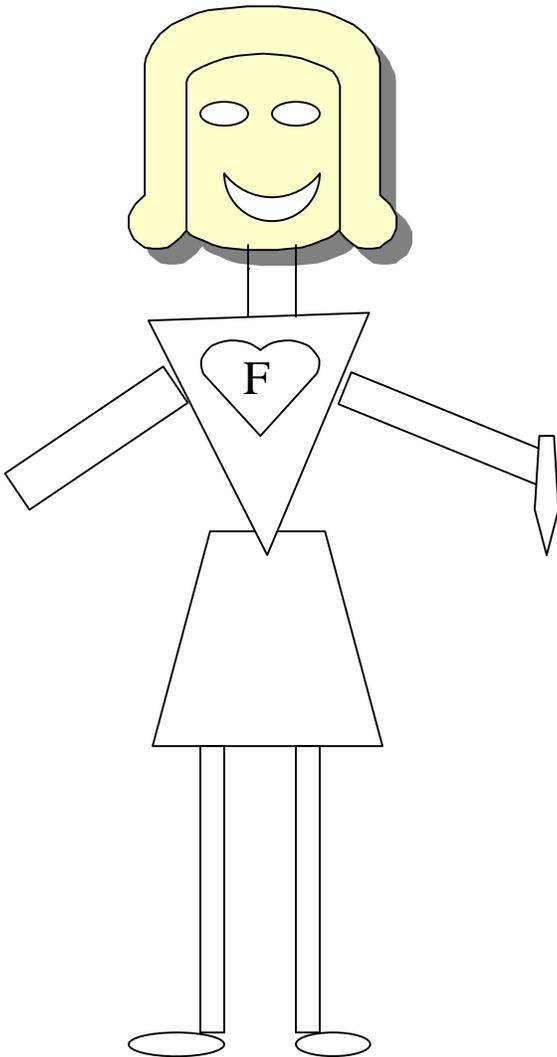
Differences

Similarities	Differences

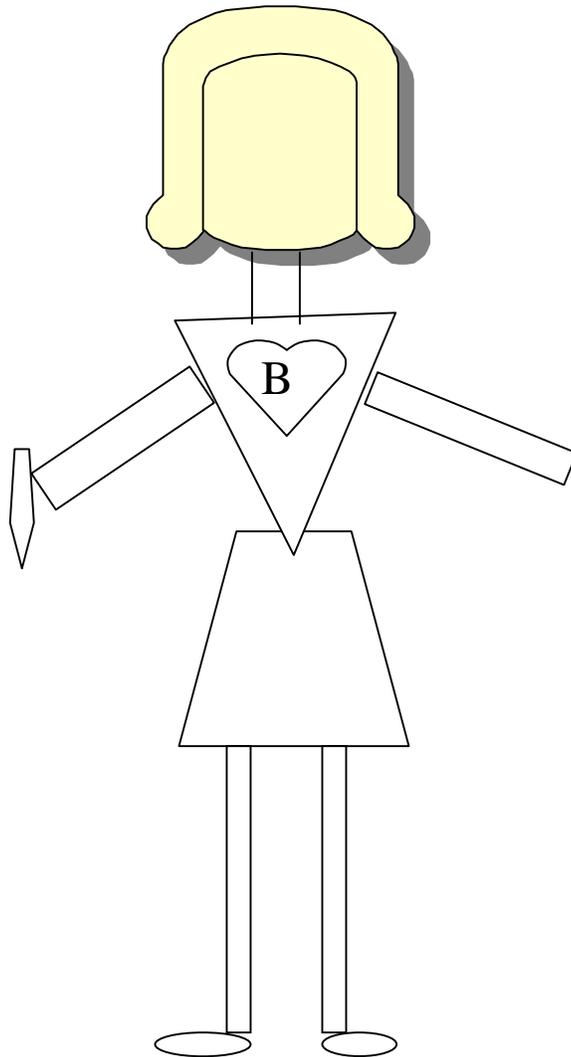


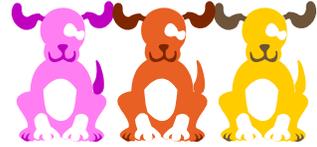
Mrs. Tess E'llation

Front



Back





Vocabulary

A **flip** is _____

A **slide** is _____

A **turn** is _____

Name _____ Date _____



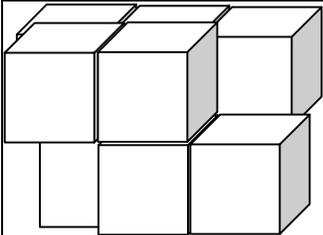
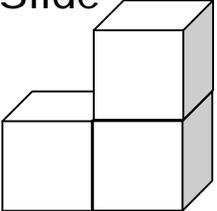
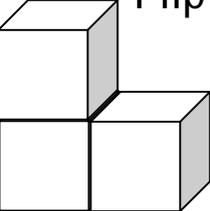
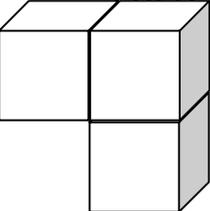
Vocabulary

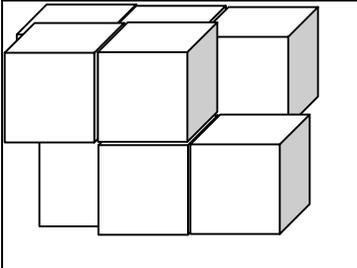
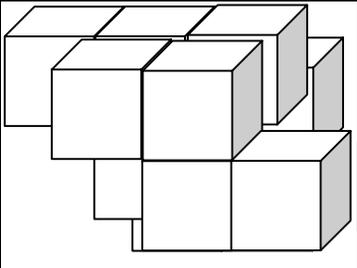
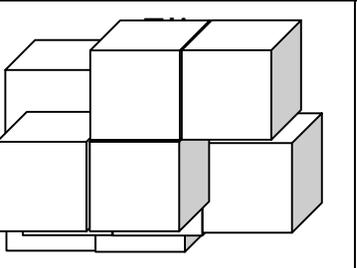
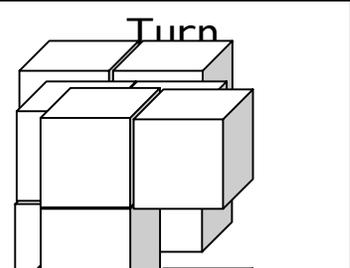
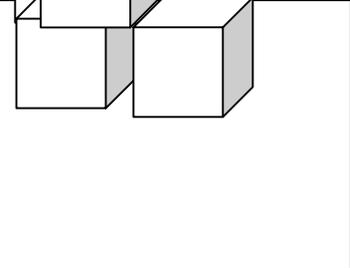
A **reflection** is _____

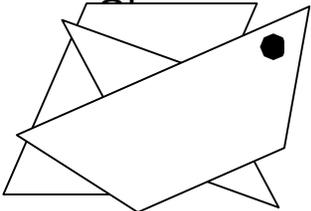
A **translation** is _____

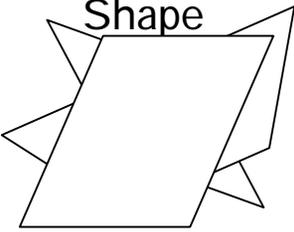
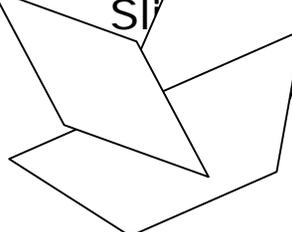
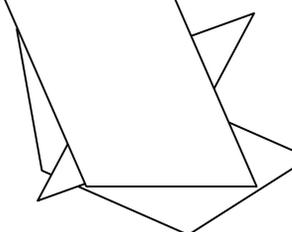
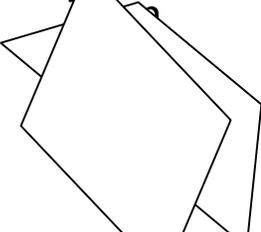
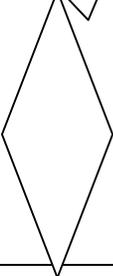
A **rotation** is _____

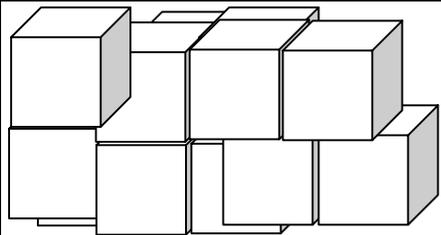
Name _____ Date _____

	<p>You will...</p>	<p>Slide</p> 	<p>Flip</p> 	<p>Turn</p> 
	<p>WATCH ME</p>			
	<p>HELP ME</p>			
	<p>LET ME HELP YOU</p>			

	You will...			
	WATCH ME			
	HELP ME			
	LET ME HELP YOU			

	You will...	Slide	Flip	Turn
	WATCH ME			
	HELP ME			
	LET ME HELP YOU			

 <p>Shape</p>	<p>You will...</p>	 <p>Shape</p>		
	<p>WATCH ME</p>			
	<p>HELP ME</p>			
	<p>LET ME HELP YOU</p>			

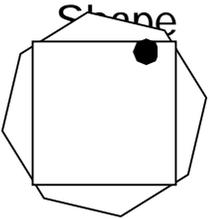
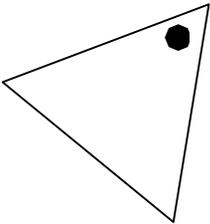


Slide

Flip

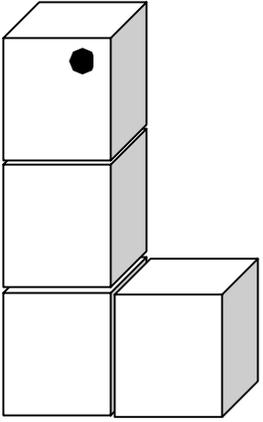
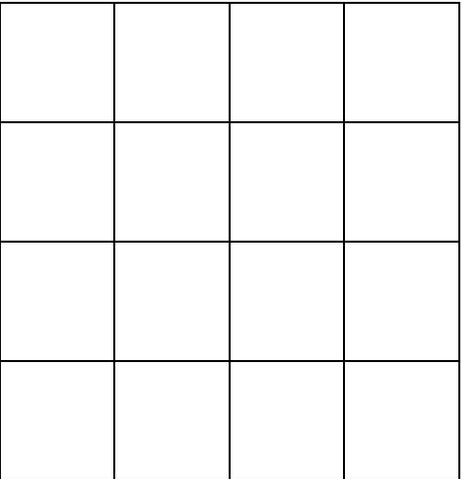
Turn



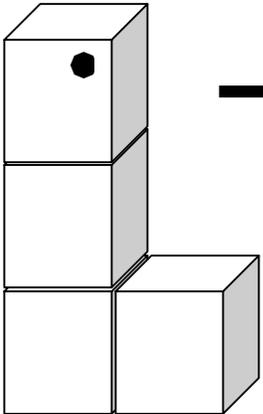
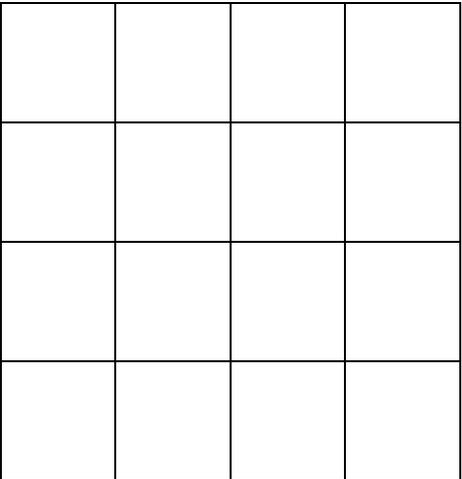
 <p>Slide</p>	Slide	Flip	Turn
			
			

Name _____ Date _____

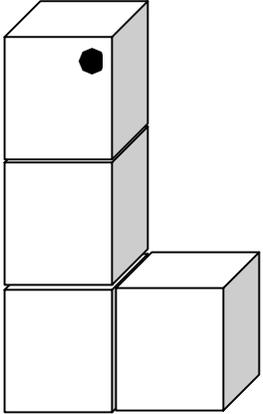
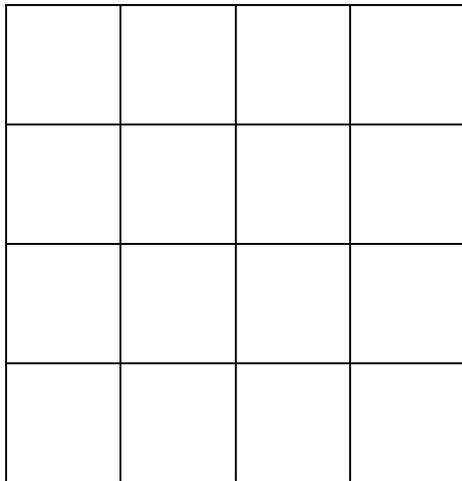
Directions: Use your snap cubes to trace a slide, flip, and turn. Place your answer on the grid.

1)  

Flip

2)  

Slide

3)  

Turn



Name _____ Date _____

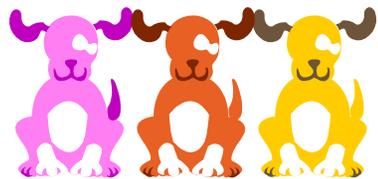
Directions: Use your snap cubes to trace a slide, flip, and turn. Place your answer on the grid.

1)

Flip

2)

Answers will vary for "Slide".



3)

Answers will vary for "Turn".



Name _____

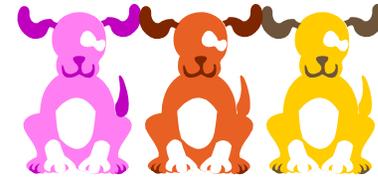
Date _____

Directions: Demonstrate a flip, slide and turn. Trace your answer next to the example.

Translation

Reflection

Rotation



Name _____

Date _____

Directions: Demonstrate a flip, slide and turn. Trace your answer next to the example.

Translation

Answers will vary

Reflection

Rotation

Answers will vary

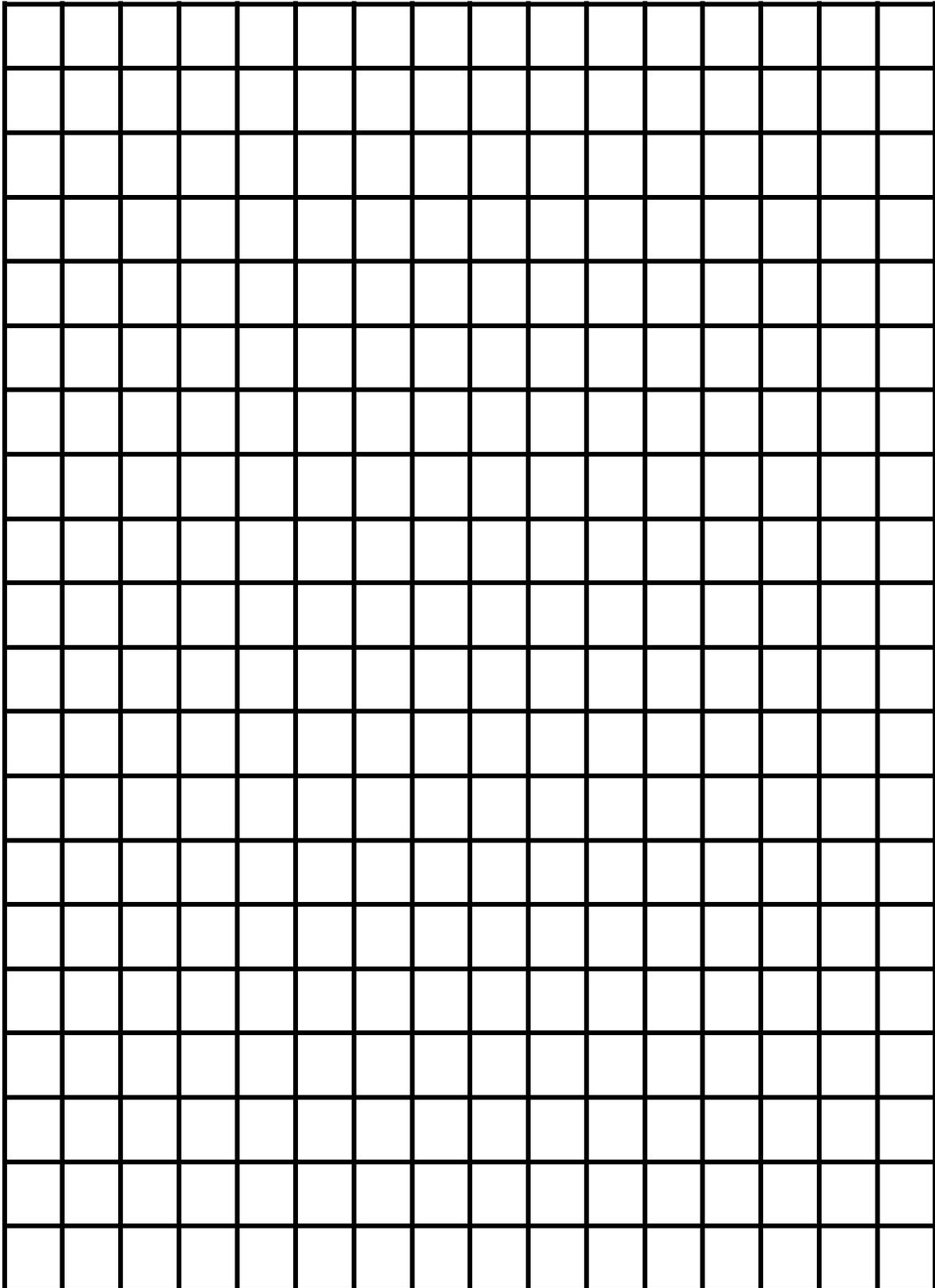
Answer

Answer

Answer

The diagram illustrates three types of transformations on a triangle with a black dot inside. 1. Translation: A triangle with a dot on its right side is shown on the left. An arrow labeled 'Translation' points to a box labeled 'Answer' containing the same triangle shifted to the right. Below the arrow is the text 'Answers will vary'. 2. Reflection: A triangle with a dot on its right side is shown on the left. An arrow labeled 'Reflection' points to a box labeled 'Answer' containing the triangle mirrored across a vertical line, with the dot now on the left side. 3. Rotation: A triangle with a dot on its right side is shown on the left. An arrow labeled 'Rotation' points to a box labeled 'Answer' containing the triangle rotated 180 degrees, with the dot now at the top. Below the arrow is the text 'Answers will vary'.

Student Resource Sheet 10

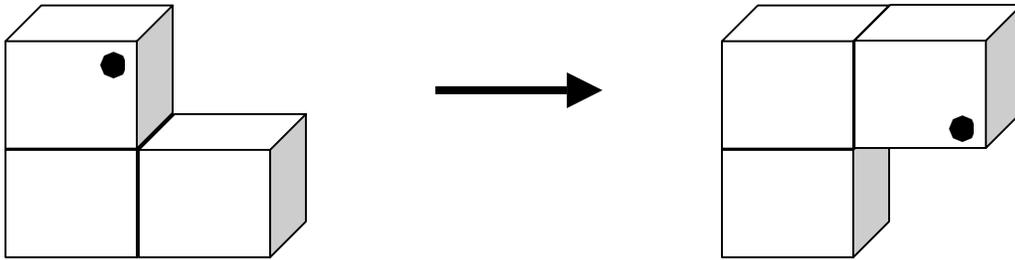




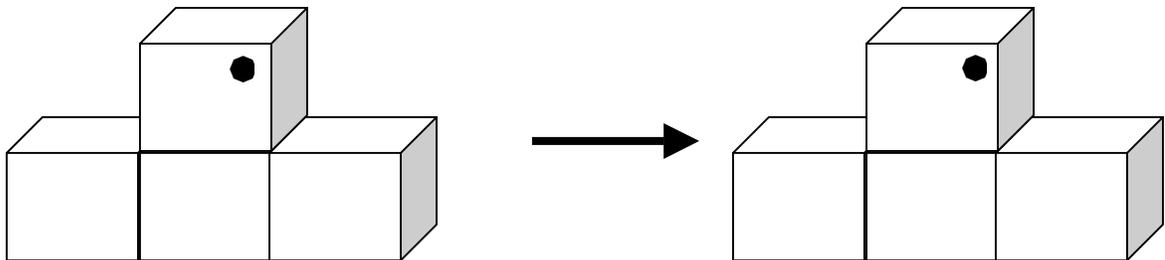
Name _____ Date _____

Identify each motion as a slide, turn or flip.

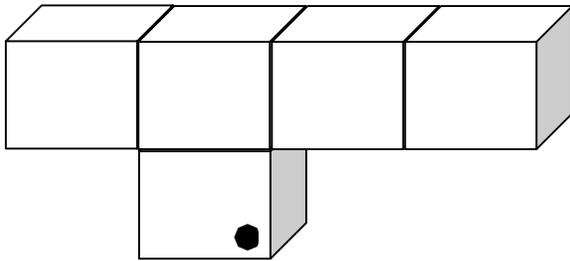
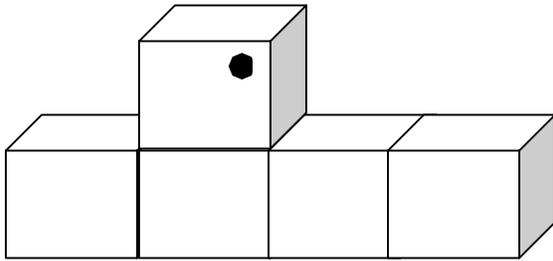
1.



2.

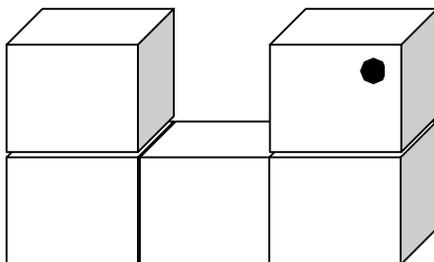


3.



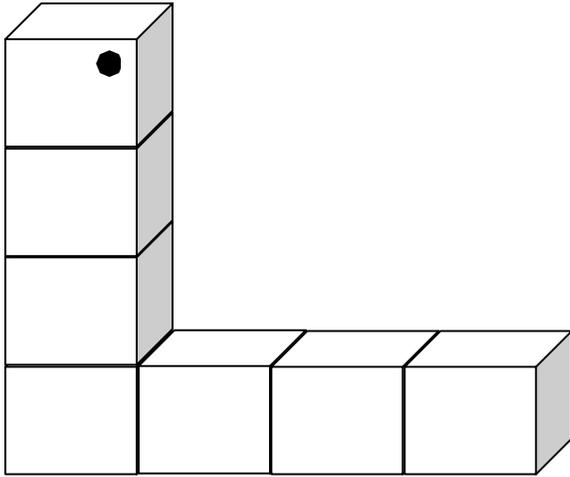
Move the following shape to the motion to demonstrate a flip, slide or shape.

4.



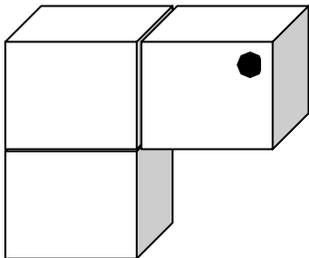
Flip

5.



Slide

6.



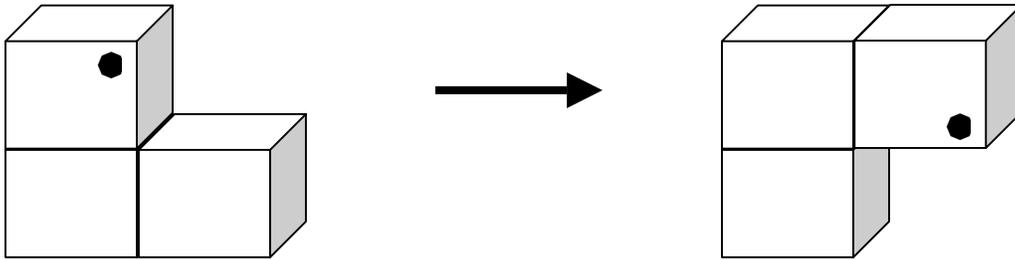
Turn



Name _____ Date _____

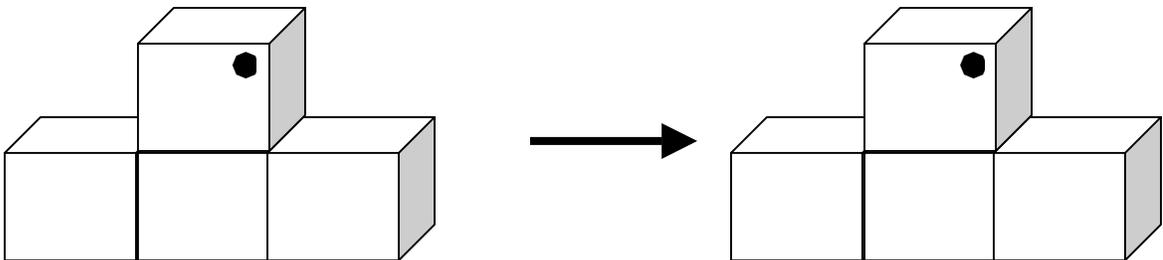
Identify each motion as a slide, turn or flip.

1.



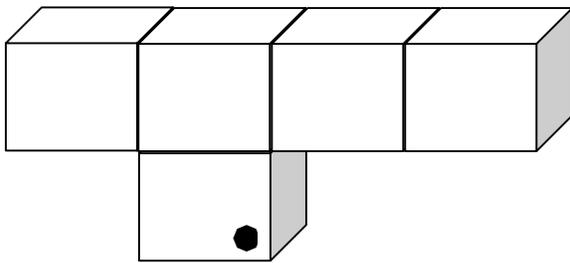
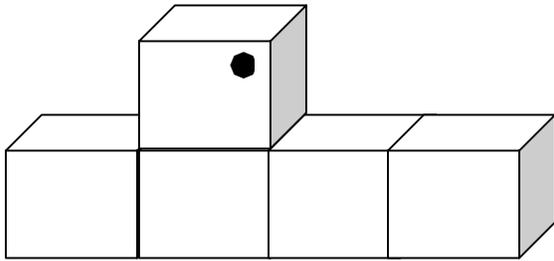
turn

2.



slide

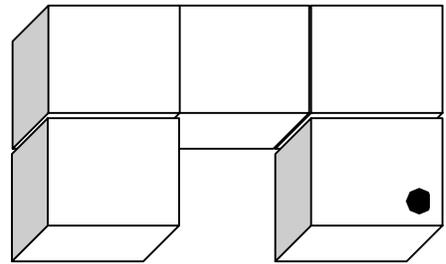
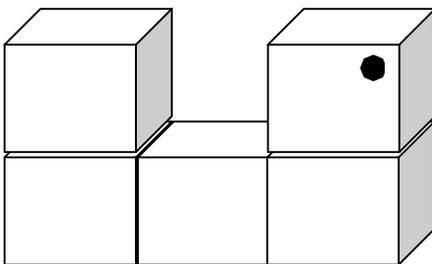
3.



flip

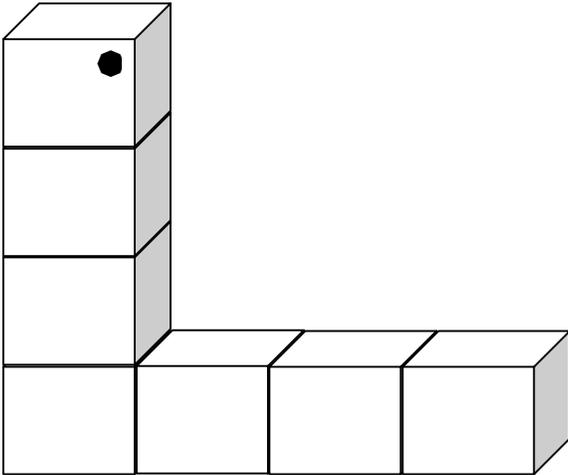
Move the following shape to the motion to demonstrate a flip, slide or shape.

4.

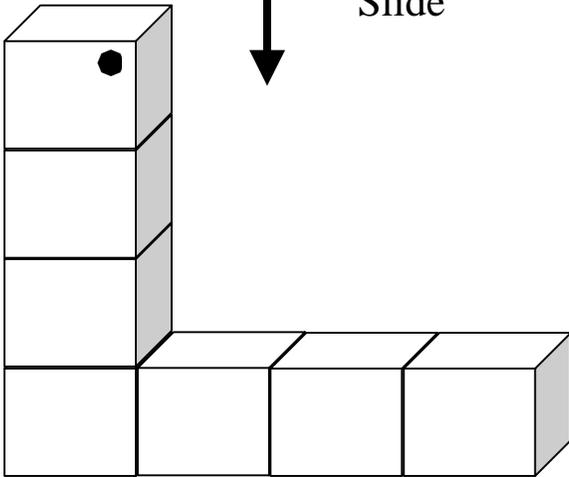


Flip

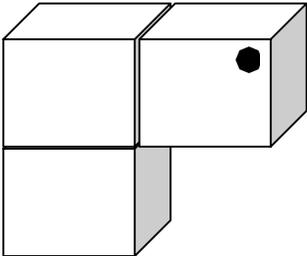
5.



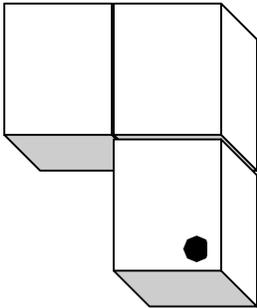
Slide



6.



Turn

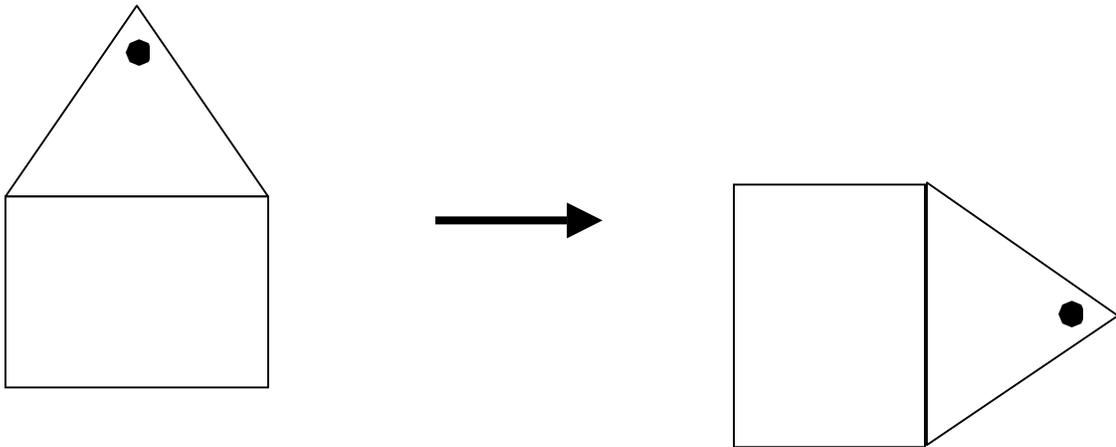




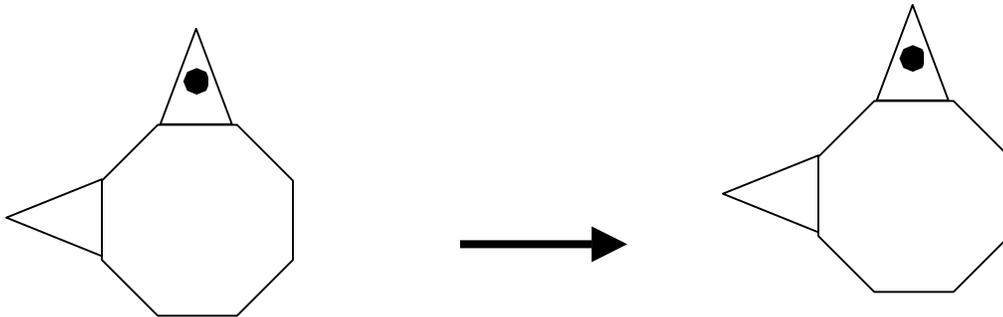
Name _____ Date _____

Identify each motion as a translation, reflection or rotation.

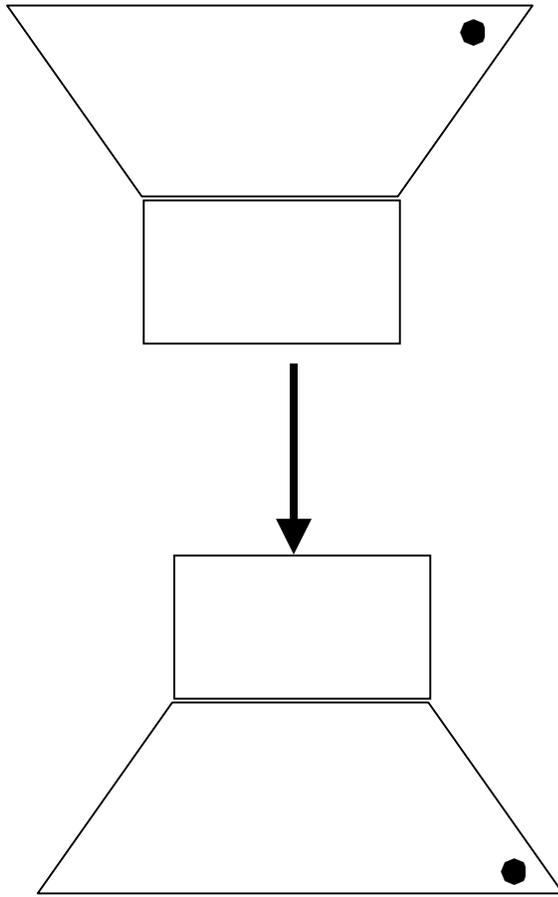
1.



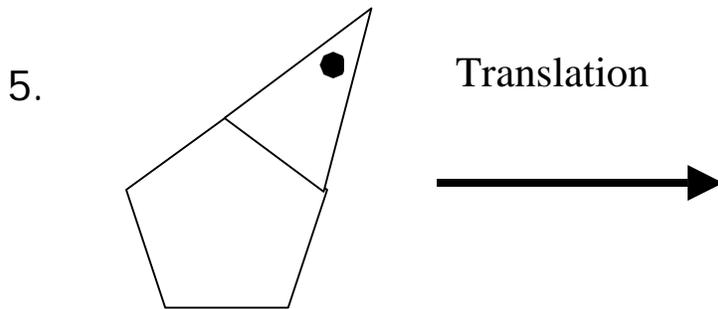
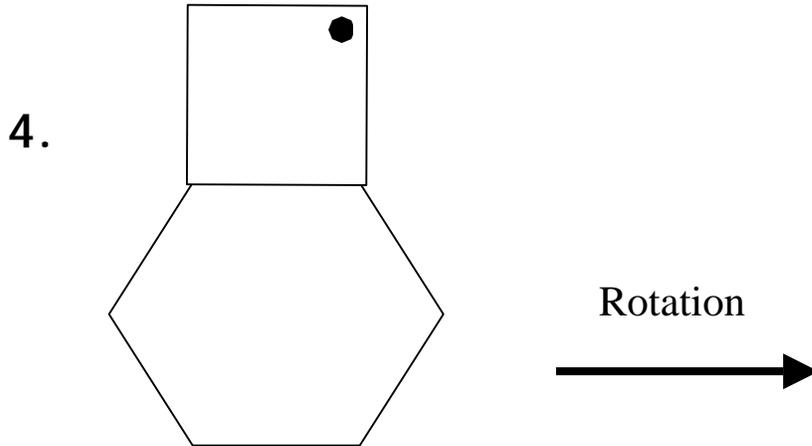
2.



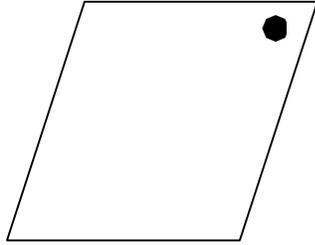
3.



Move the following shape to demonstrate a translation, reflection or rotation.



6.



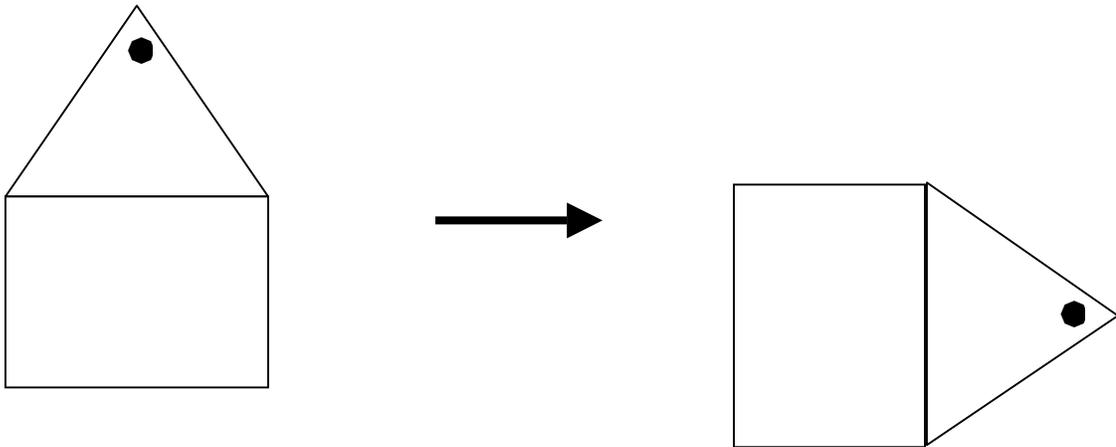
Reflection



Name _____ Date _____

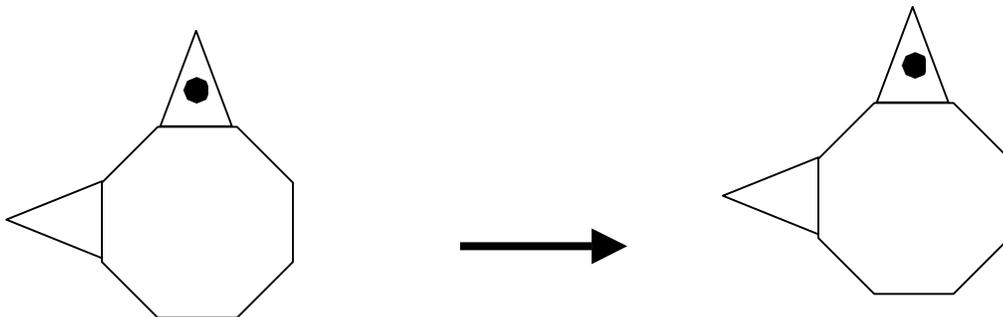
Identify each motion as a translation, reflection or rotation.

1.



rotation

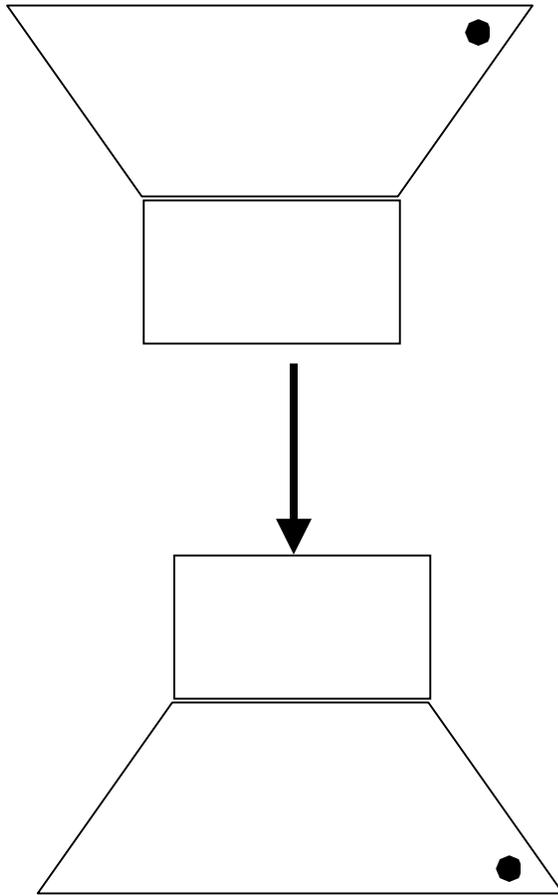
2.



slide

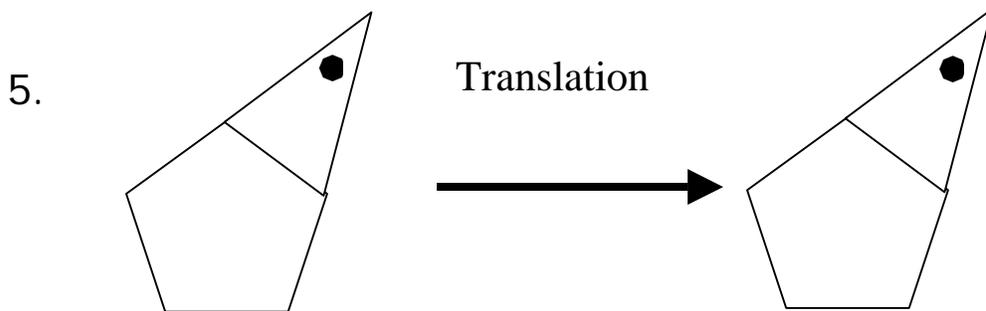
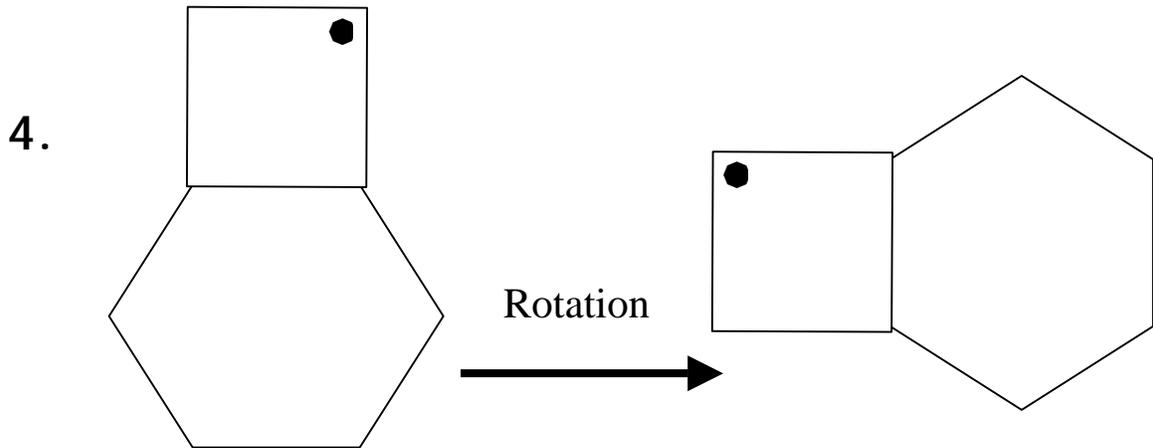


3.

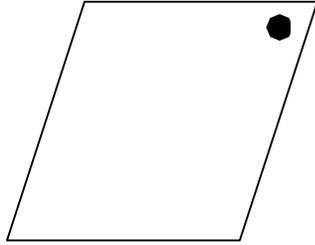


reflection

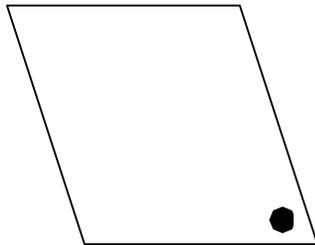
Move the following shape to demonstrate a translation, reflection or rotation.



6.



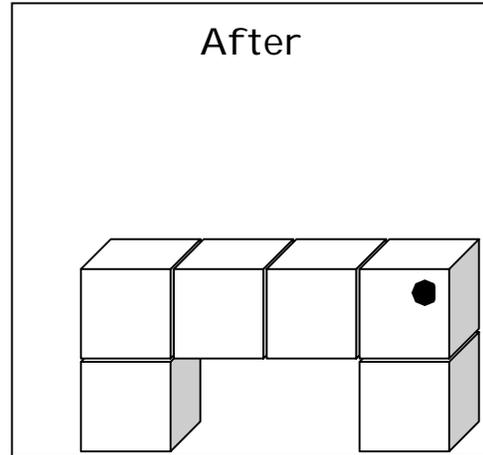
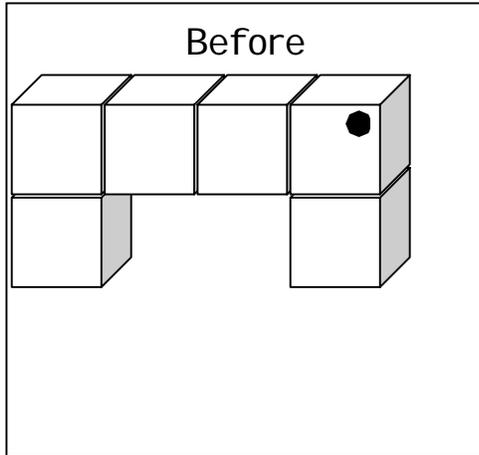
Reflection



Name _____

Date _____

Jaime's teacher asked him to demonstrate a turn of a shape. Jaime used his snap cubes to trace the drawing in the "After" box.



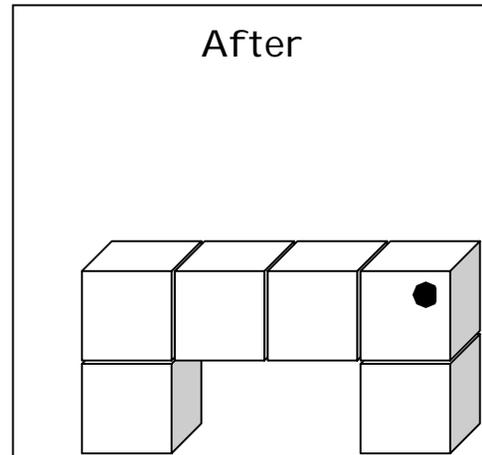
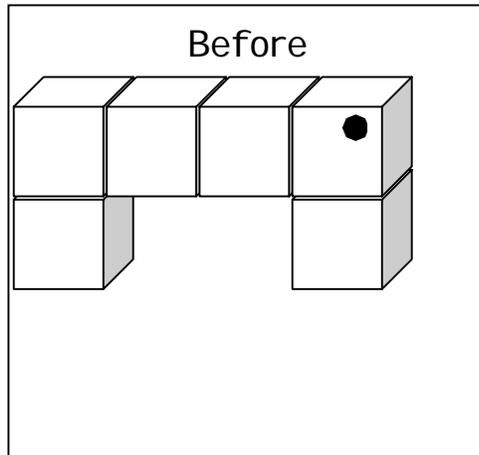
Did Jaime demonstrate a turn? _____

Use what you know about slides, flips, and turns to explain why your answer is correct. Use words and/or numbers in your explanation.

Name _____

Date _____

Jaime's teacher asked him to demonstrate a turn of a shape. Jaime used his snap cubes to trace the drawing in the "After" box.



Did Jaime demonstrate a turn? No

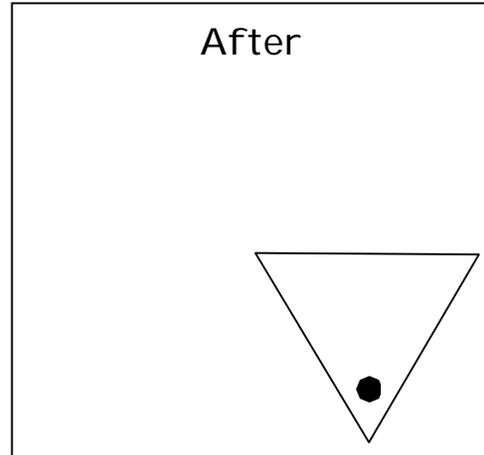
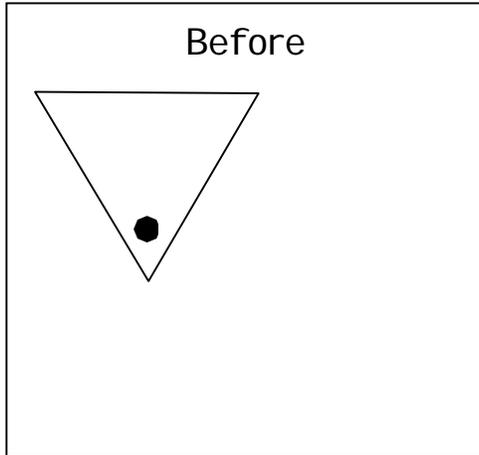
Use what you know about slides, flips, and turns to explain why your answer is correct. Use words and/or numbers in your explanation.

Sample Exemplary Response: My answer is right because the shape in the first box is a slide. It is facing the same way, but it moved down. If it were a turn, the shape would be facing a different direction.

Name _____

Date _____

Jaime's teacher asked him to demonstrate a rotation of a triangle. Jaime gave his teacher the drawing below.



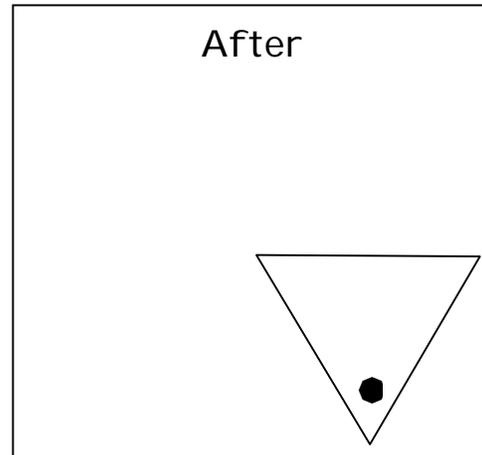
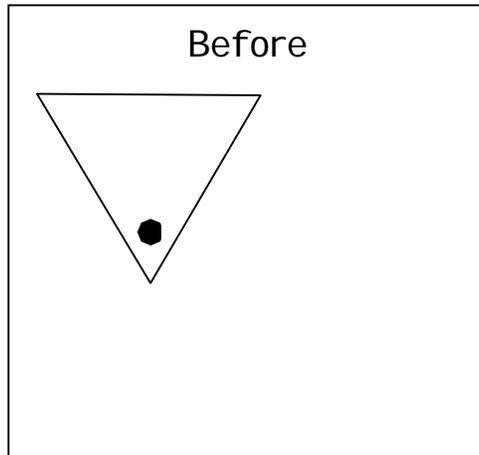
Did Jaime demonstrate a rotation? _____

Use what you know about translations, reflections, and rotations to explain why your answer is correct. Use words and/or numbers in your explanation. How would the "after" figure look if it had reflected? Explain using words and/or numbers.

Name _____

Date _____

Jaime's teacher asked him to demonstrate a rotation of a triangle. Jaime gave his teacher the drawing below.



Did Jaime demonstrate a rotation? No, this is not a rotation

Use what you know about translations, reflections, and rotations to explain why your answer is correct. Use words and/or numbers in your explanation. How would the "after" figure look if it had reflected? Explain using words and/or numbers.

Sample Exemplary Response: I know my answer is correct because Jaime's shape shows a translation, which means the shape will move without turning or flipping. Jaime's shape did not turn or flip. If the after shape had reflected, then it would look like a mirror image of the first shape (like it "flipped over").



Homework

Toady you were introduced to three new math vocabulary words: **flip**, **slide**, and **turn**. Think about how you use these three actions in your every day life. Give an example of the action and how you use it.



Toady you were introduced to three new math vocabulary words: **flip**, **slide**, and **turn**. Think about how you use these three actions in your every day life. Give an example of the action and how you use it.

A flip is used when my mom makes pancakes. She uses a flipper to cook both sides of a pancake.

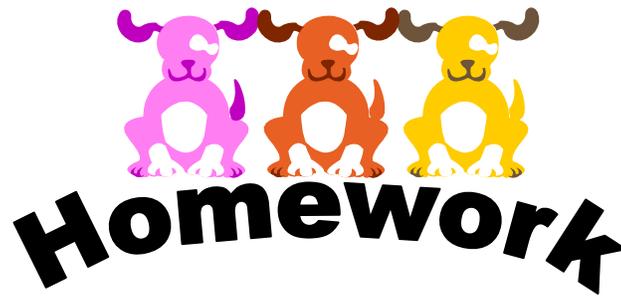
A slide is used when I go to the grocery store. I slide my money to the cashier.

A turn is used when I'm riding my bike and I turn at the stop sign.



Homework

Toady you were introduced to three new math vocabulary words: **translations**, **reflections**, and **rotations**. Think about how you use these three actions in your every day life. Give an example of the action and how you use it.



Toady you were introduced to three new math vocabulary words: **translations, reflections, and rotations**. Think about how you use these three actions in your every day life. Give an example of the action and how you use it.

I use translations when I give my money to the lunch lady.

I use rotations when I Play basketball with brother.
(Pivot turn)

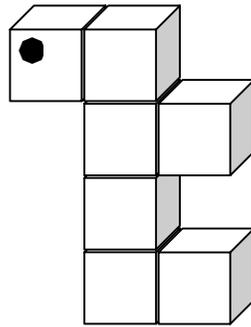
I use reflections when my mom cooks me an egg in the morning. _____

Name _____

Date _____

Engagement

Use Inch Grid Paper to demonstrate a slide, flip and turn of the figure below. If necessary, use the snap cubes to create the figure, then draw the figure on the Inch Grid Paper.

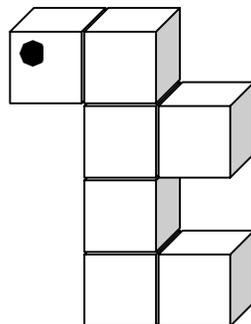


Name _____

Date _____

Engagement

Use Inch Grid Paper to demonstrate a slide, flip and turn of the figure below. If necessary, use the snap cubes to create the figure, then draw the figure on the Inch Grid Paper.

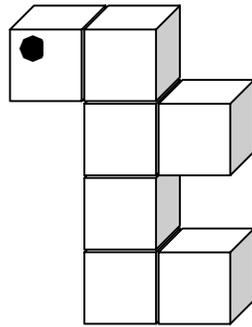


Name _____

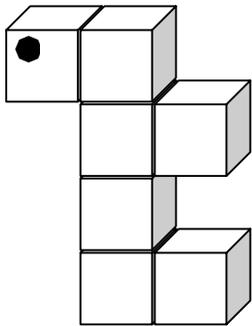
Date _____

Engagement

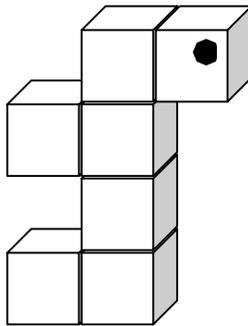
Use Inch Grid Paper to demonstrate a slide, flip and turn of the figure below. If necessary, use the snap cubes to create the figure, then draw the figure on the Inch Grid Paper.



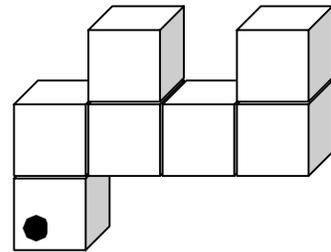
Slide



Flip



Turn



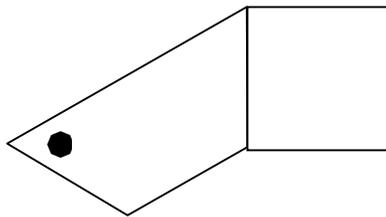
Answers may vary

Name _____

Date _____

Engagement

Use Centimeter Grid Paper to demonstrate a translation, reflection, and rotation of the figure below. If necessary, use the pattern blocks to create the figure. Then draw the figure on the Centimeter Grid Paper.

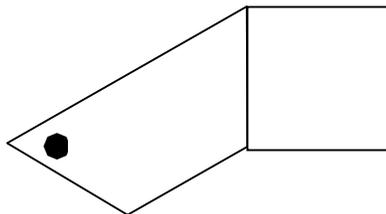


Name _____

Date _____

Engagement

Use Centimeter Grid Paper to demonstrate a translation, reflection, and rotation of the figure below. If necessary, use the pattern blocks to create the figure. Then draw the figure on the Centimeter Grid Paper.

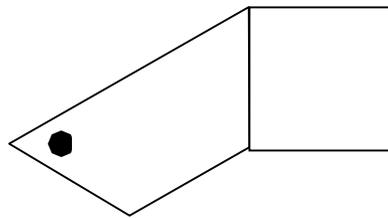


Name _____

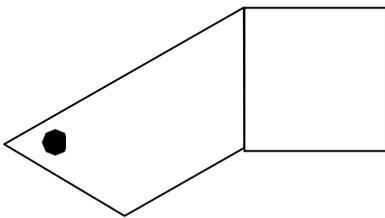
Date _____

Engagement

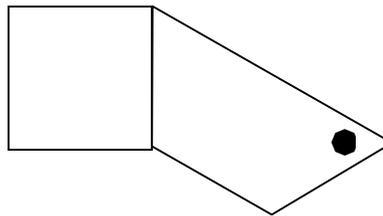
Use Centimeter Grid Paper to demonstrate a translation, reflection, and rotation of the figure below. If necessary, use the pattern blocks to create the figure. Then draw the figure on the Centimeter Grid Paper.



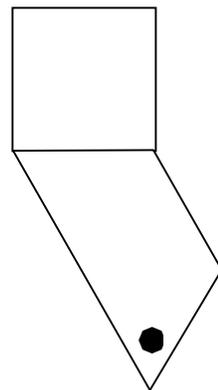
Translation

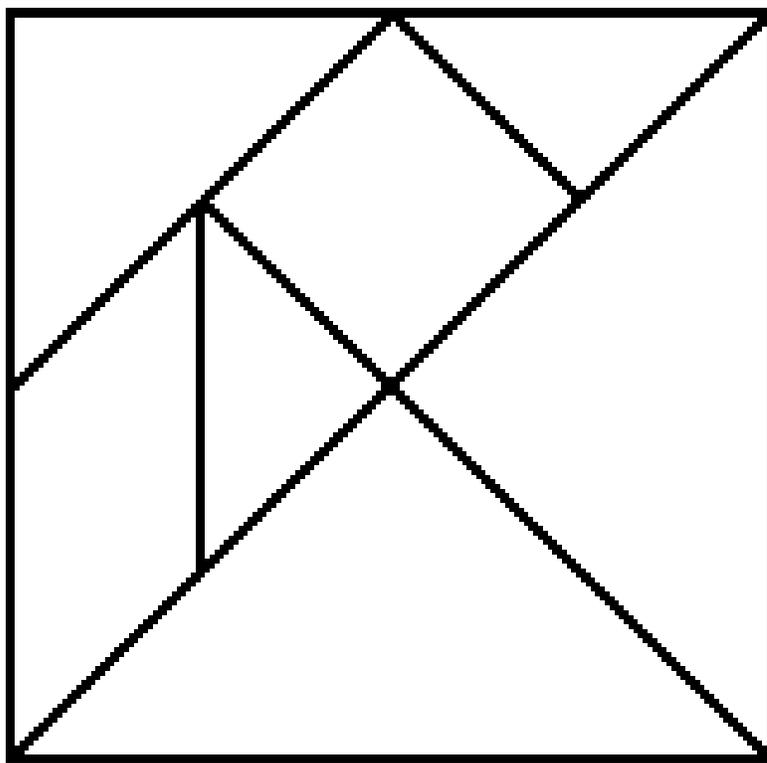
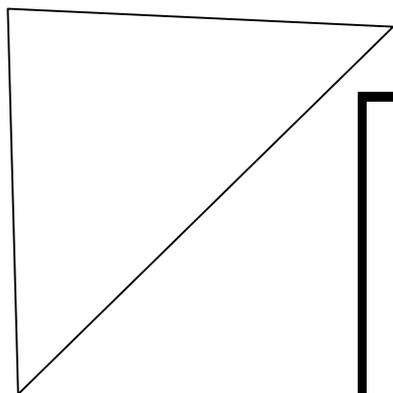
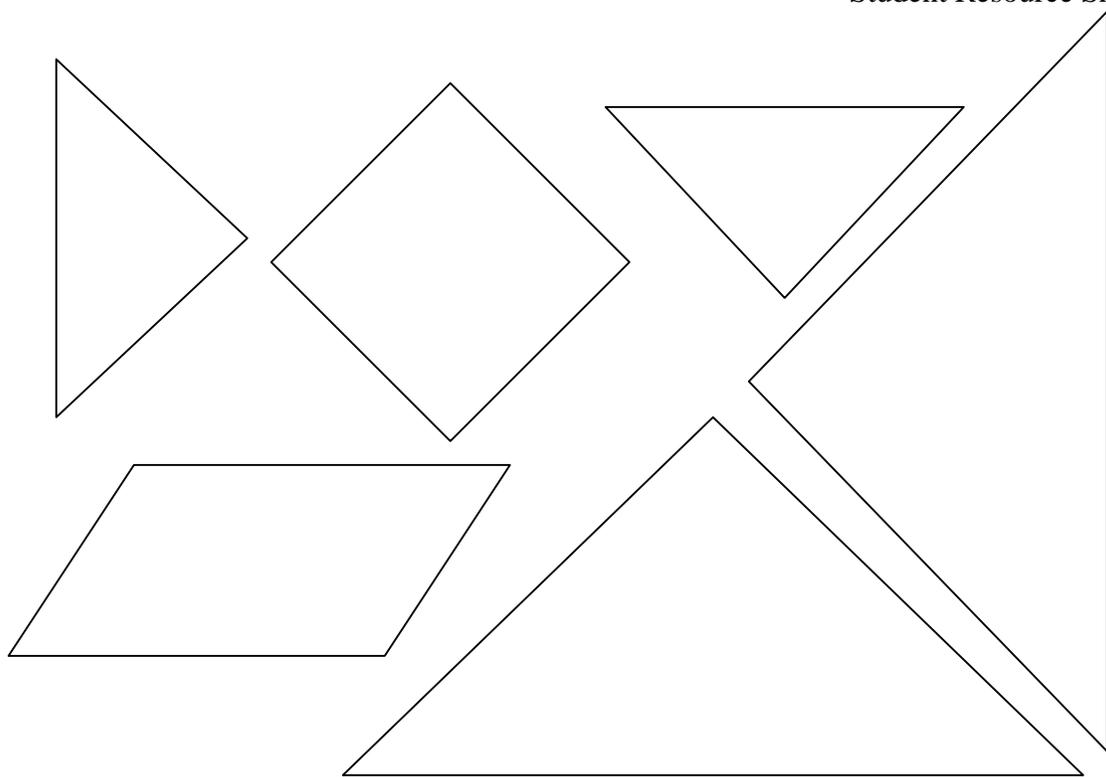


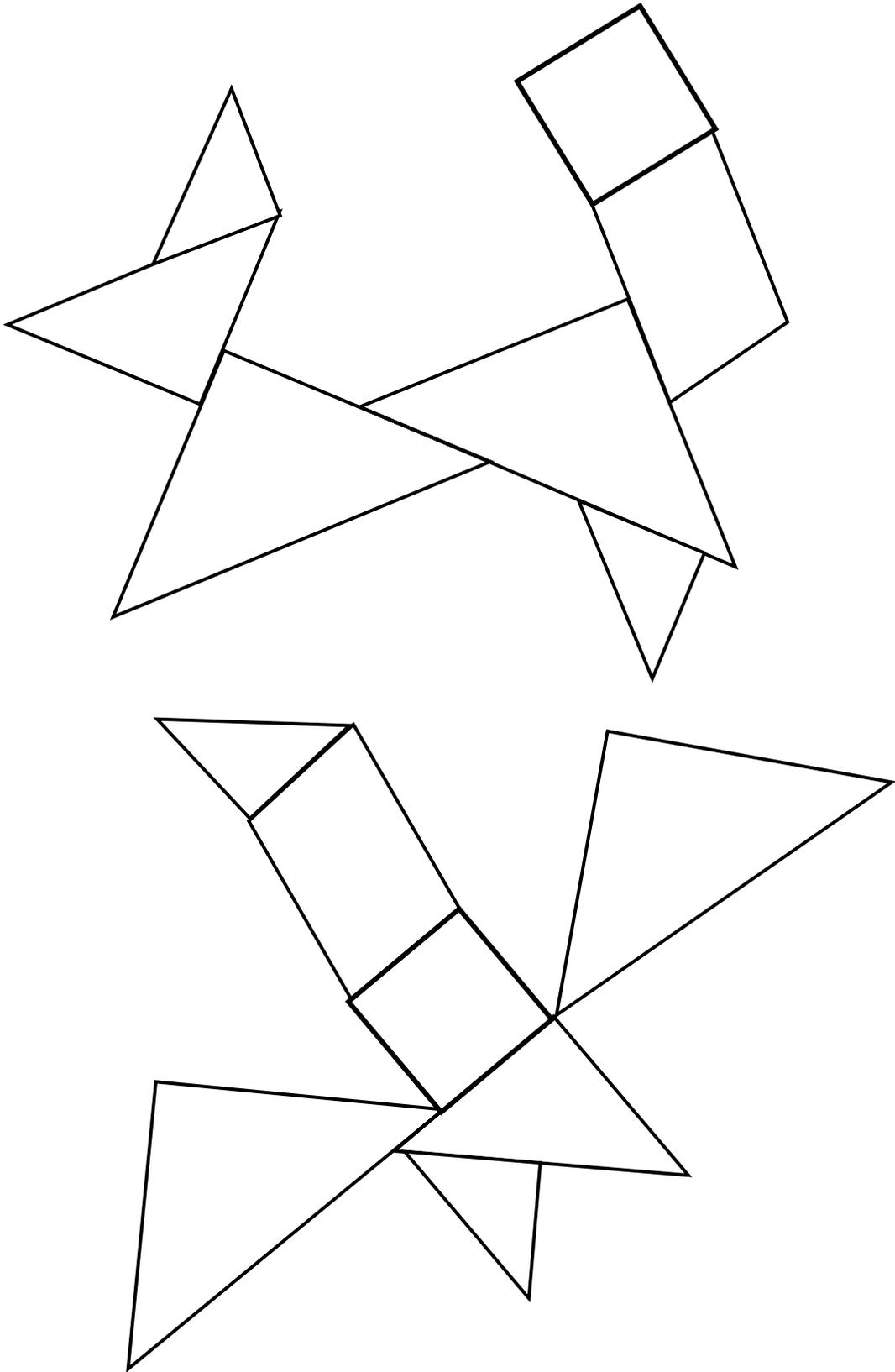
Reflection

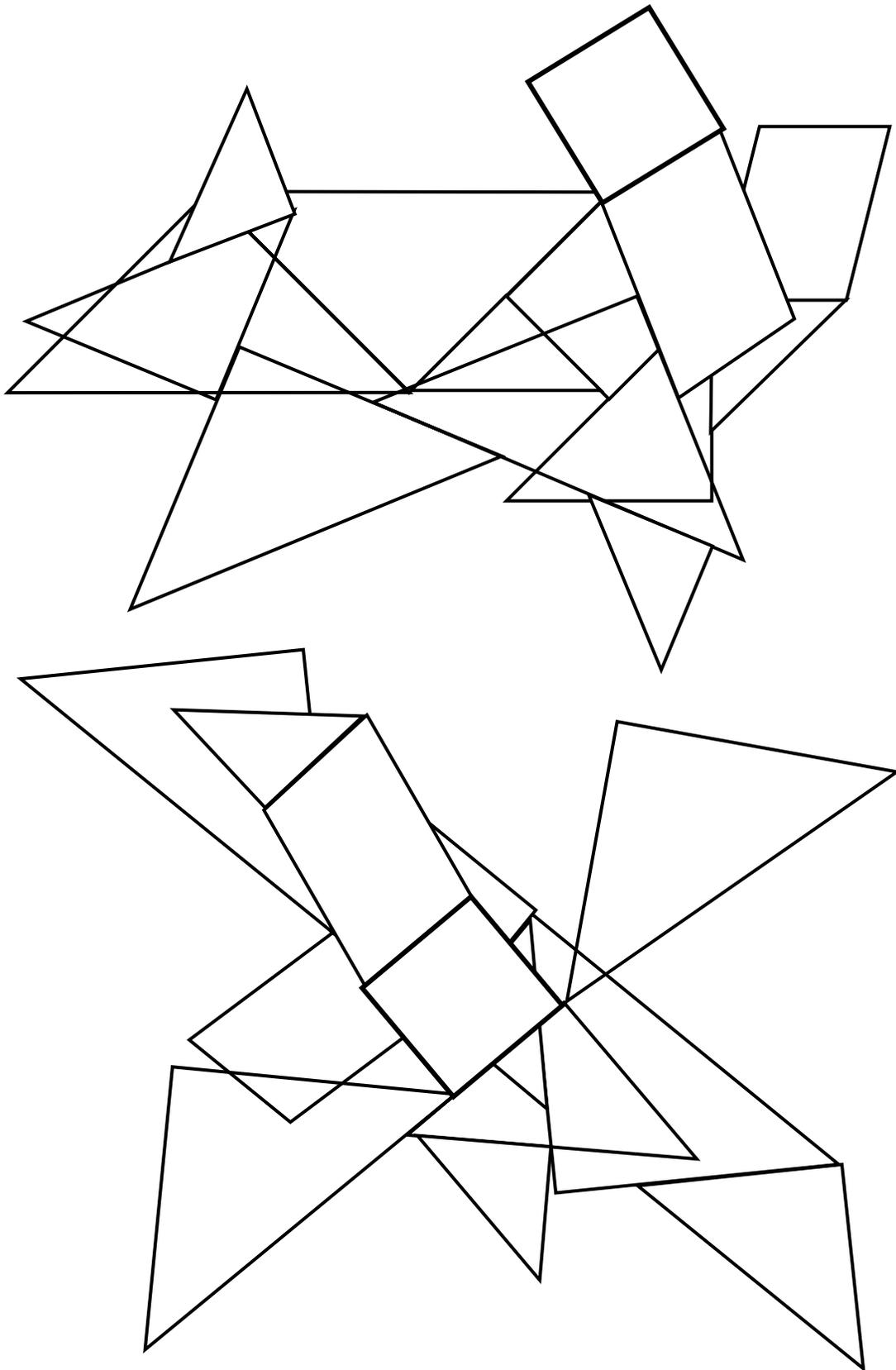


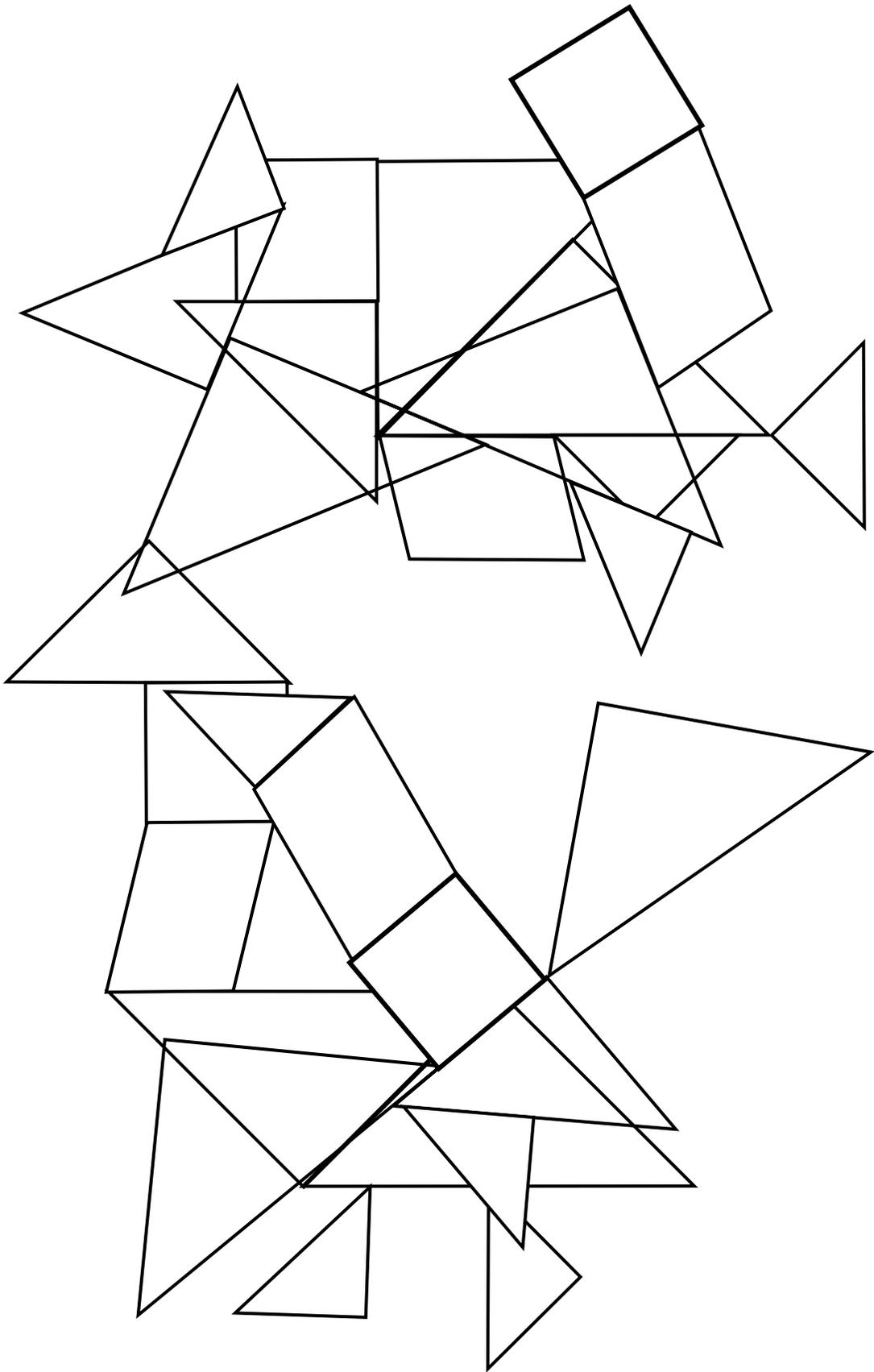
Rotation

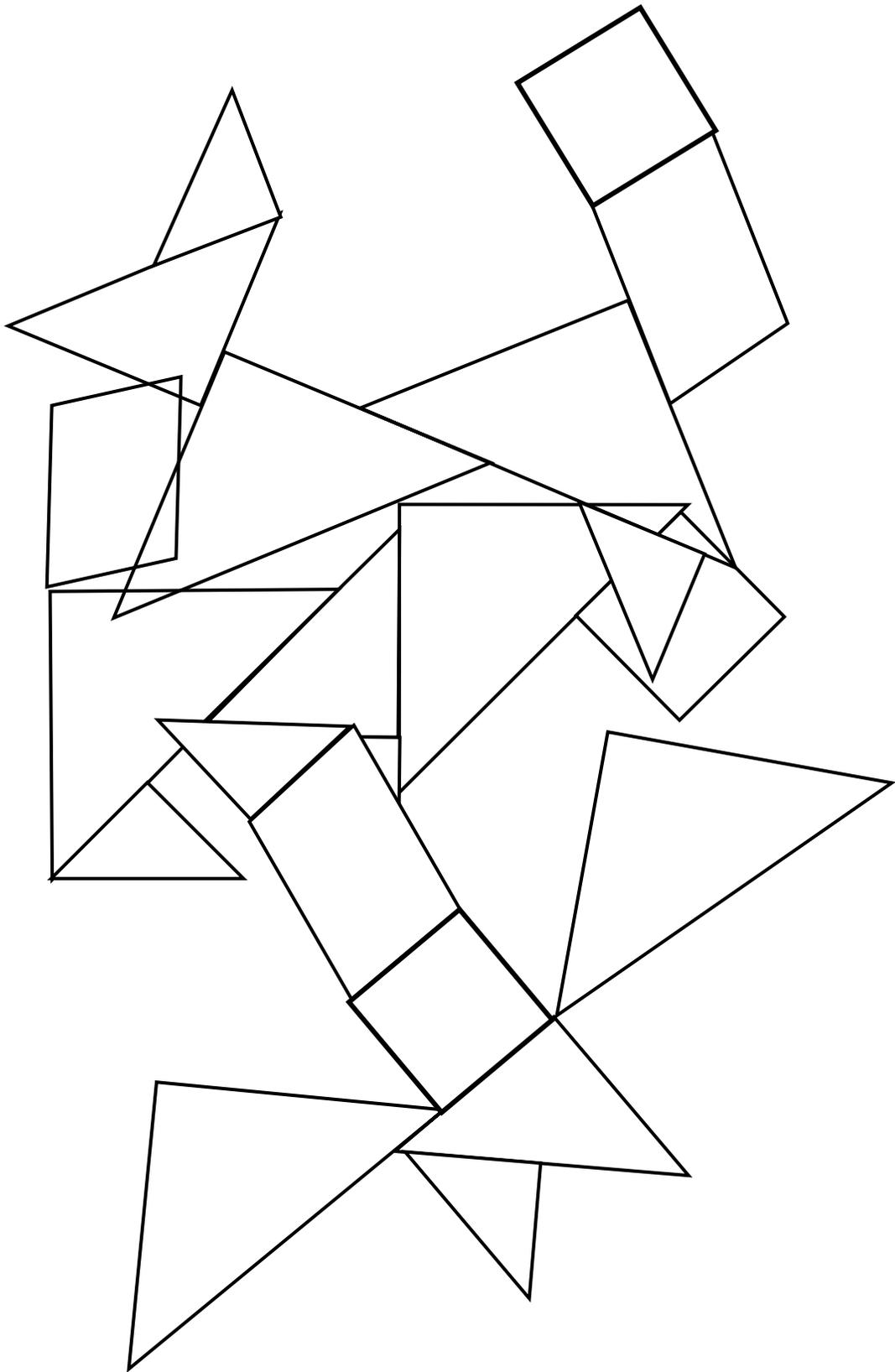


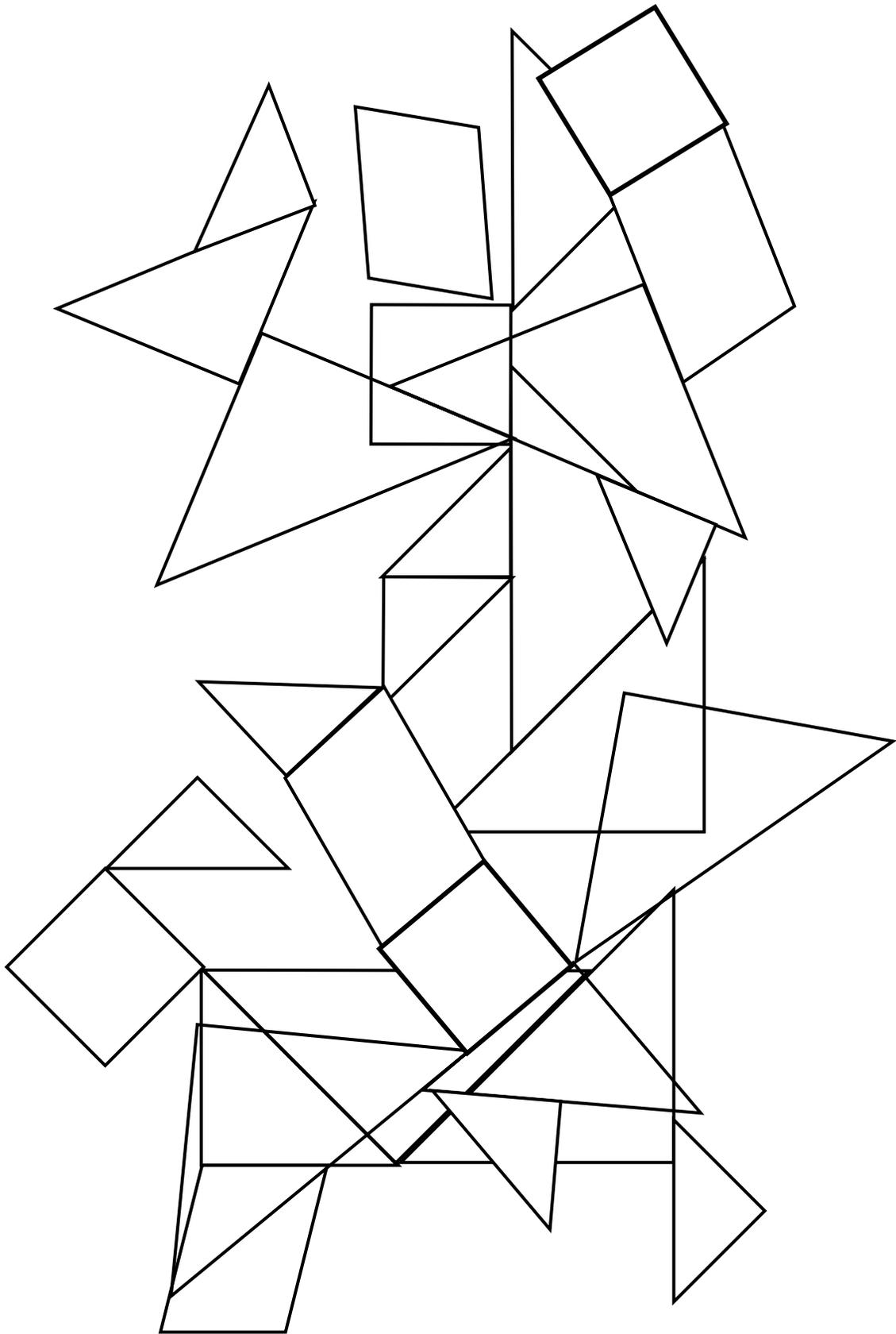




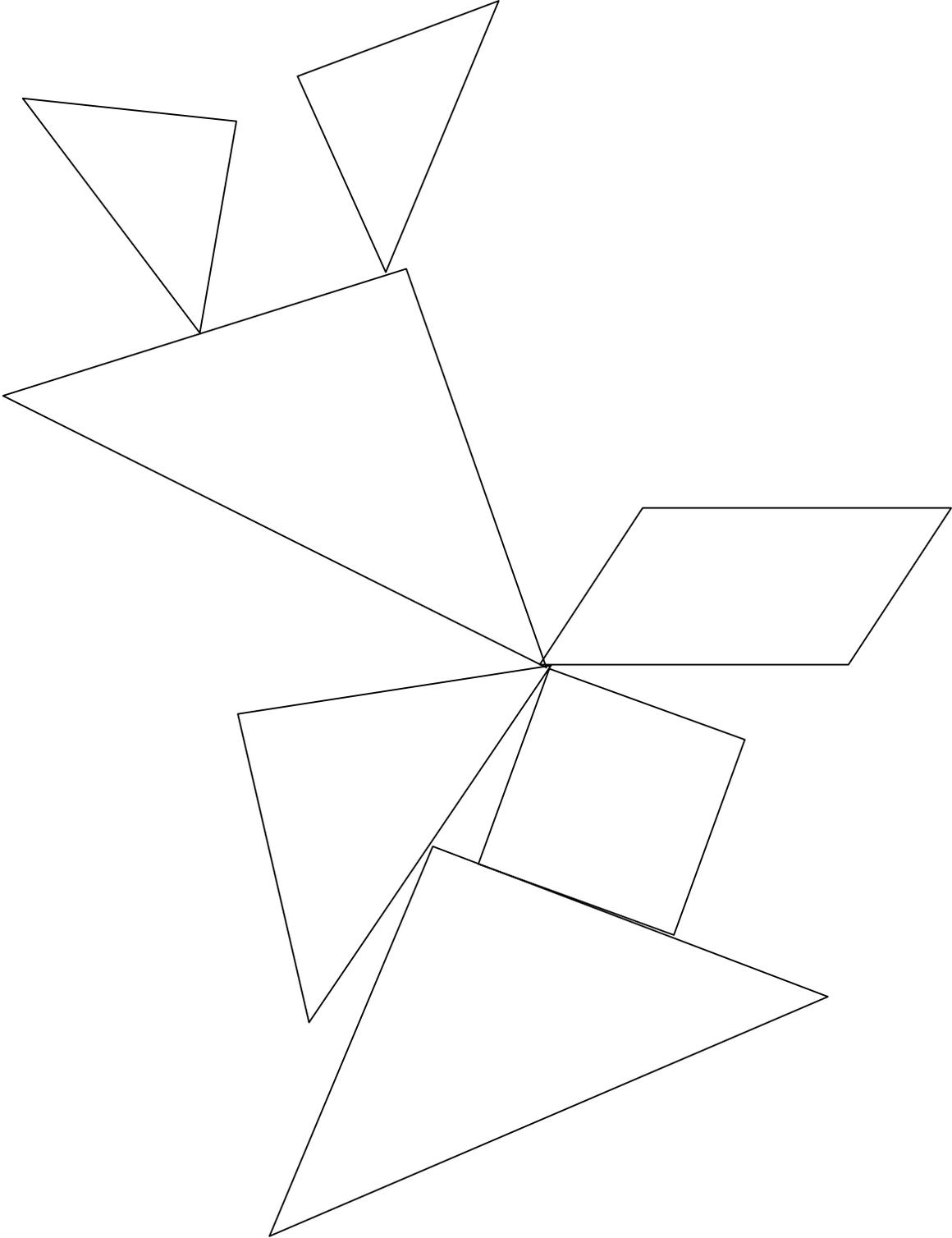




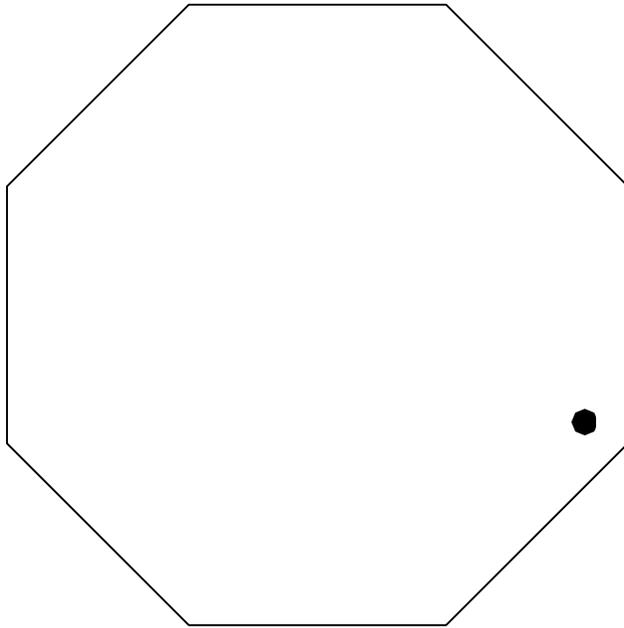




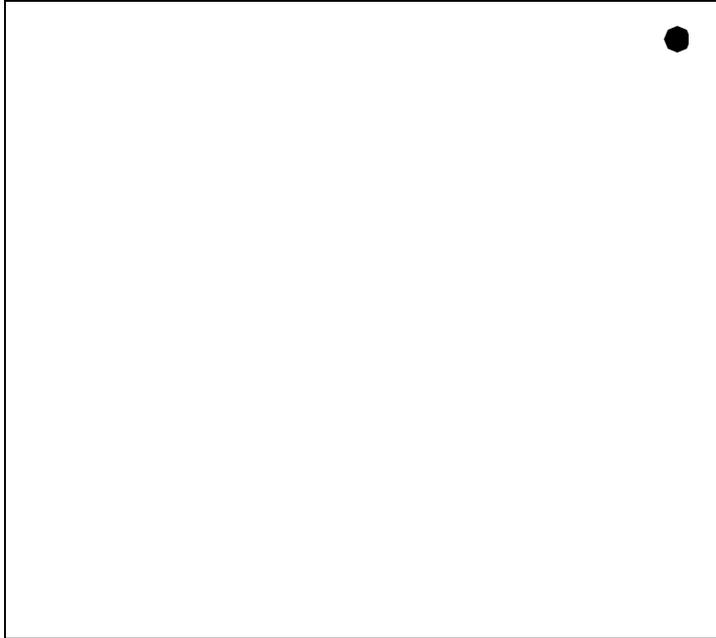
Identify the movements, flips, slides, or turns, in this picture.



Hexagon



Square



The students will need the following supplies:

- Scissors
 - A hexagon cut-out
 - Pencil
 - Tape
1. Have the students scribble on one side of the hexagon. This distinguishes between front and back.
 2. On the front side of the hexagon have the students draw a line that is wavy from one vertex to the other vertex of one side.
 3. Have the student cut on the line they drew.
 4. Check to make sure the piece fits into the cut piece.
 5. Then "SLIDE" the cut piece down and attach it with tape on the other side of the hexagon.

5. Make sure that the front side of both pieces is facing up (the shaded sides should not show). This assures that the translation was done correctly.
6. Repeat steps 3-5 two more times on the remaining pairs of sides.
7. When all translations have been completed have the students place the shape on blank paper and trace around it. Then slide the shape until it matches up like a puzzle piece and trace again. Repeat this step three more times. Explain to the students that they are tessellating.
8. Then have the students "slide" the figure vertically from the original traced shape and trace the new shape. Making sure that the two pieces fit together.

The students will need the following supplies:

- Scissors
 - A square cut-out
 - Pencil
 - Tape
1. Have the students scribble on one side of the square. This distinguishes between front and back.
 2. On the front side of the square have the students draw a line that is wavy from one vertex to another vertex.
 3. Have the student cut on the line they drew.
 4. Check to make sure the piece fits into the cut piece.
 5. Then have the students slide the cut piece to the opposite side of the square. The students will now "Flip" the piece horizontally. (The scribble side will now show facing up). Attach the piece with tape.
 6. Next, have the students choose another side of the square and repeat steps 2-5.
 7. Trace the shape in the center of the paper.
Flip the piece and trace as many times as desired.

TESSELLATING IS FUN!!!!

The students will need the following supplies:

- Scissors
 - A right angle triangle
 - Pencil
 - Tape
1. Have the students scribble on one side of the triangle. This distinguishes between front and back.
 2. On the front side of the triangle identify the hypotenuse (the midpoint of the longest side of the triangle) have the students draw a line that is wavy from one vertex to the hypotenuse of the triangle.
 3. Have the student cut on the line they drew.
 4. Check to make sure the piece fits into the cut piece.
 5. Then have the students rotate the cut piece around the midpoint, to the other side of the hypotenuse attaching it with tape.
 6. Next, have the students choose another side of the triangle.
 7. Have the students draw a wavy line from one corner to another corner.

8. Have the students cut out, making sure it fits perfectly.
9. Holding one end of the cut shape, rotate the piece around the vertex and tape the piece to the other side of the triangle.
10. Place the shape that has been created in the center of a piece of paper and trace it. Rotate the piece until it fits perfectly into the one that has been traced. Now, trace that piece and continue rotating the piece and tracing.

TESSELLATING IS FUN!!!!

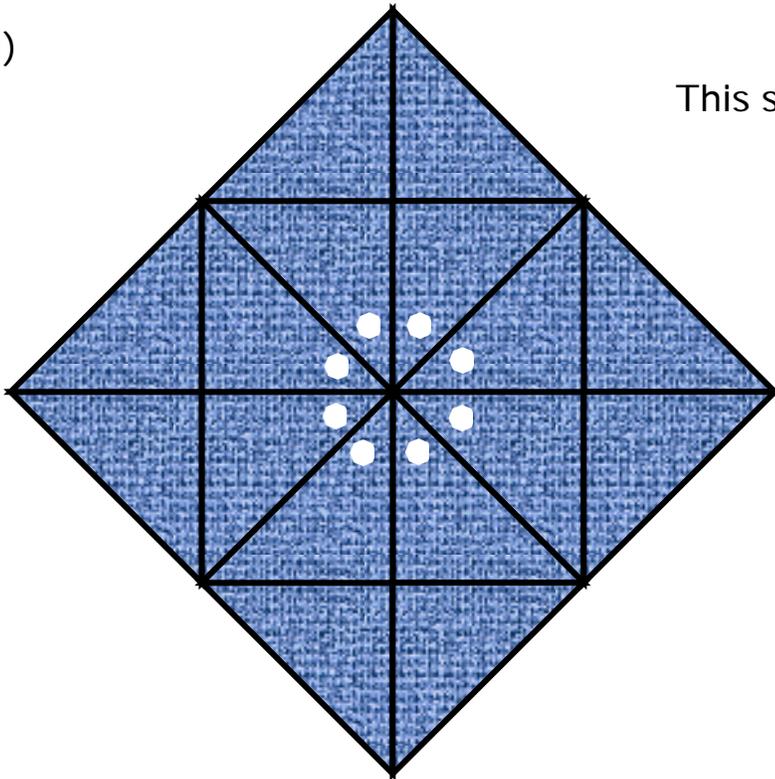
Name _____

Date _____

How are we Tessellating?

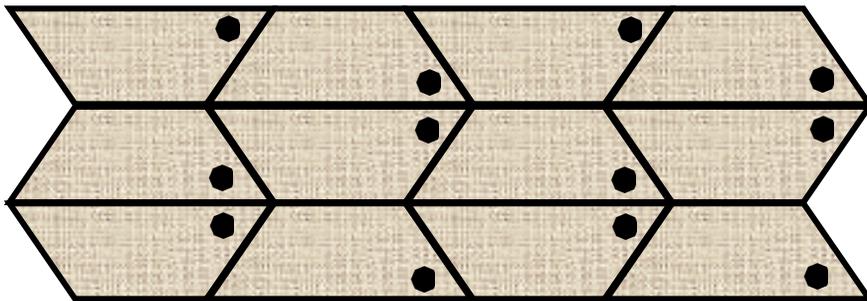
Directions: I identify and circle the movements in the tessellations below.

1)



This shape is _____

2)



This shape is

3)



This shape is

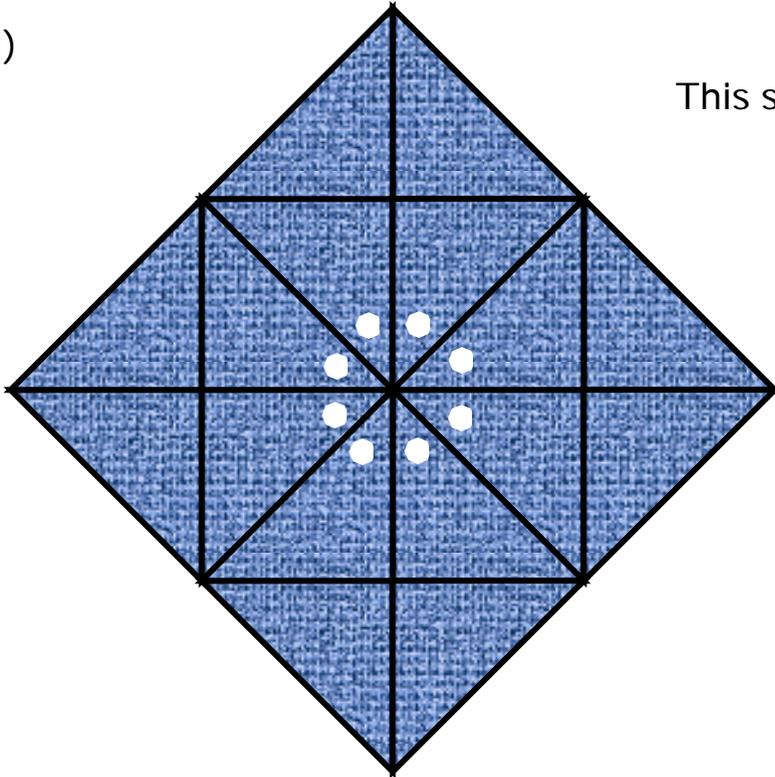
Name _____

Date _____

How are we Tessellating?

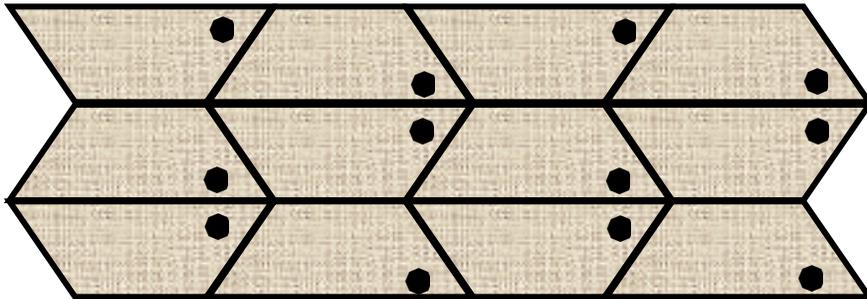
Directions: I identify and circle the movements in the tessellations below.

1)



This shape is **turning/rotating**

2)



This shape is flipping/reflecting

3)



This shape is sliding/translating

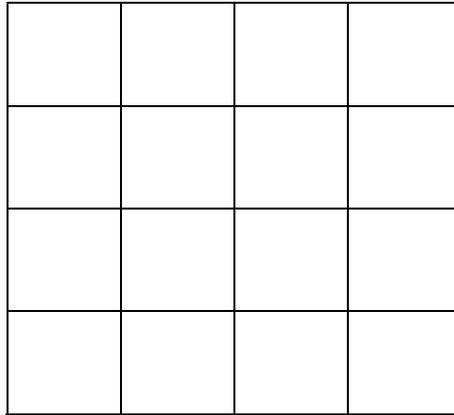
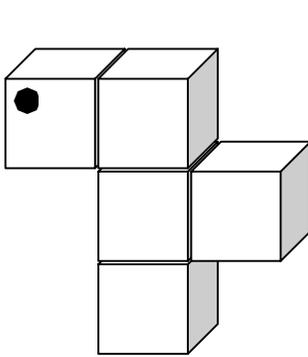
Name _____

Date _____

Tessellating Terriers do Flips, Slides, and Turns Summative Assessment

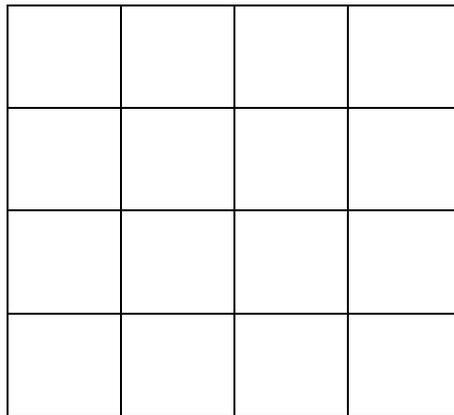
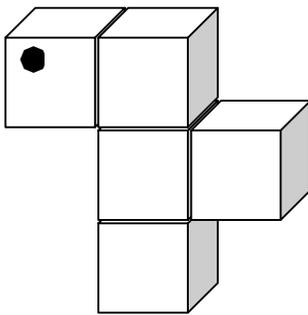
Use your Snap Cubes to trace a flip, a slide, and a turn.

1)



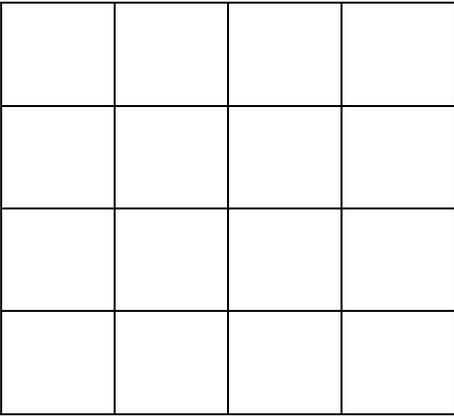
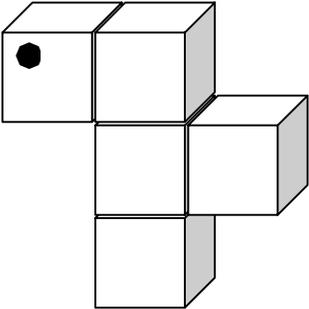
FLIP

2)



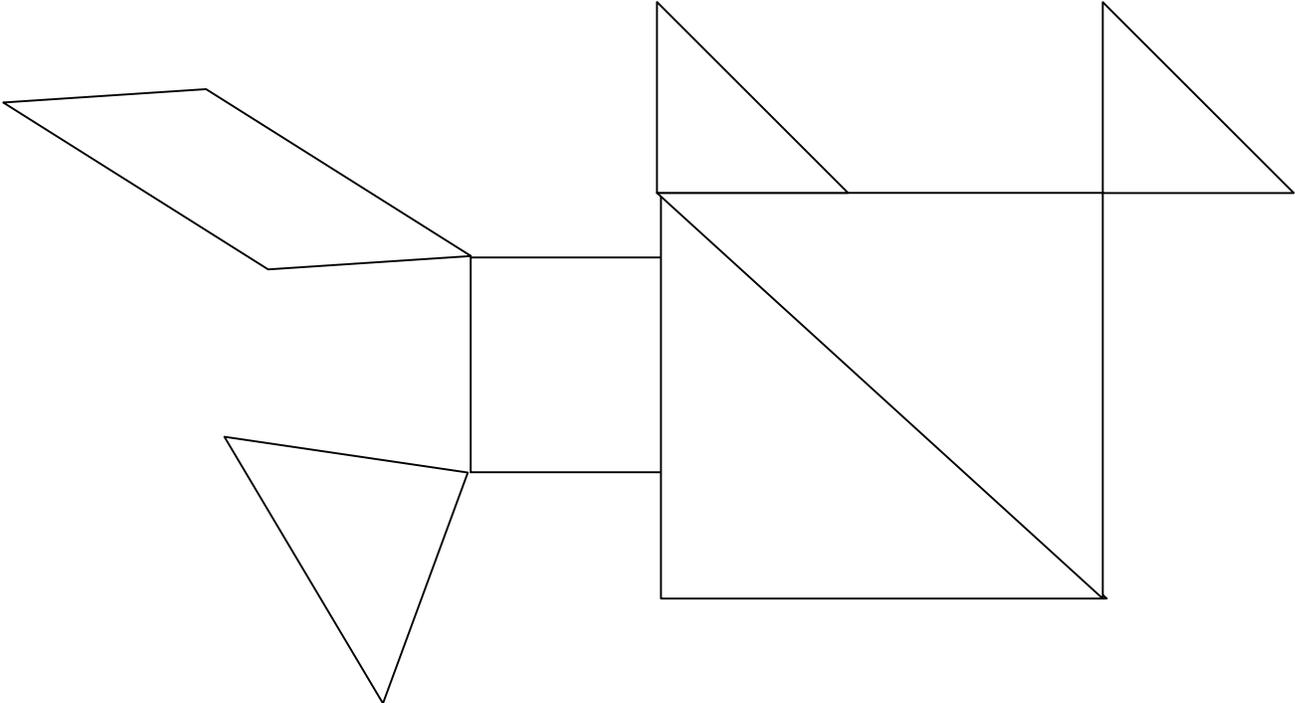
TURN

3)



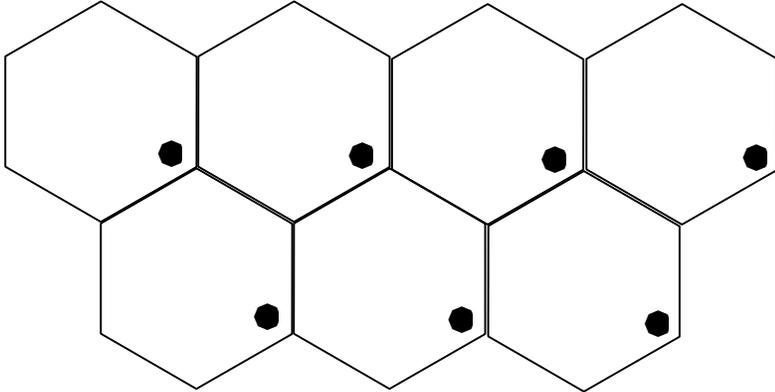
SLIDE

4 & 5) For the figure below, identify two movements (flip, slide or turn) in the tangram. Circle and label the movement.



For numbers 6, 7, and 8, identify the movements in the tessellation (flip, slide or turn). Circle the correct movement say why your answer is correct.

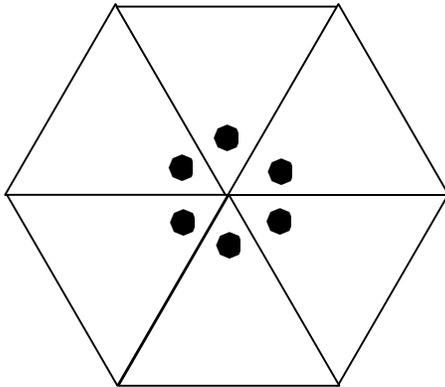
6)



Flip Slide Turn

I know that this is a _____ because _____

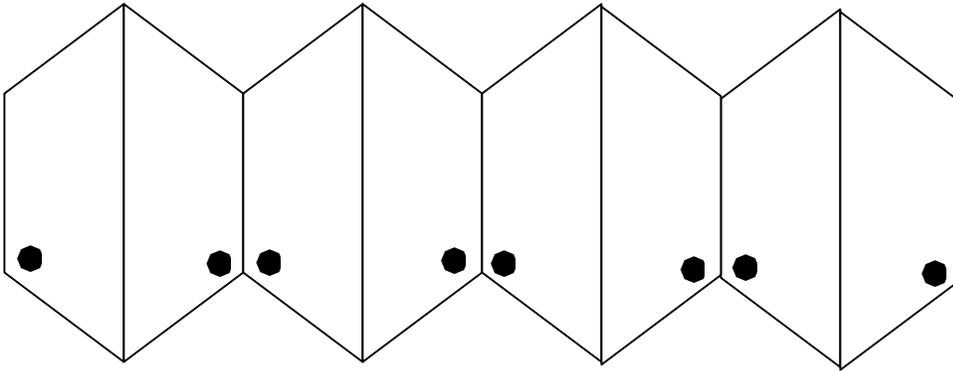
7)



Flip Slide Turn

I know that this is a _____ because _____

8)



Flip Slide Turn

I know that this is a _____ because _____
_____.

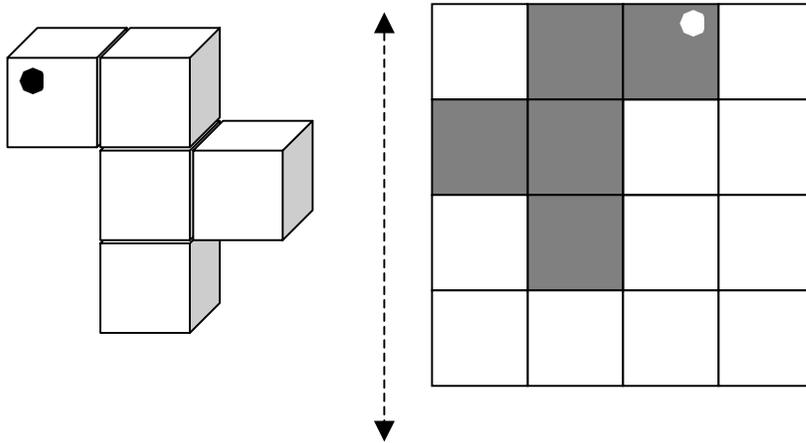
Name _____

Date _____

Tessellating Terriers do Flips, Slides, and Turns Summative Assessment

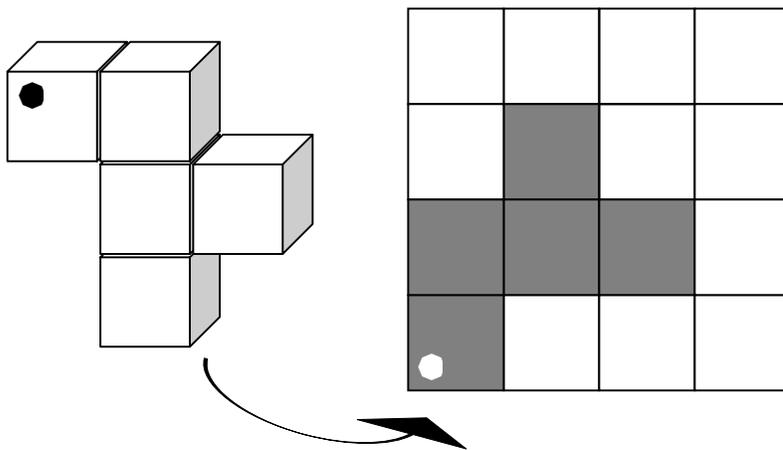
Use your Snap Cubes to trace a flip, a slide, and a turn.

1)



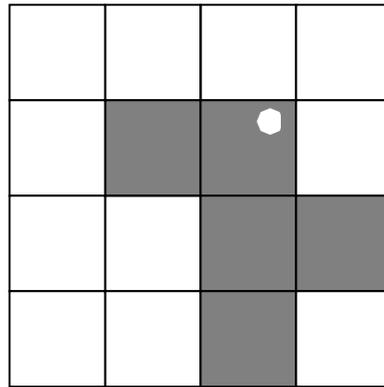
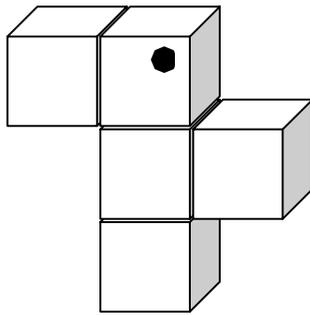
FLIP

2)



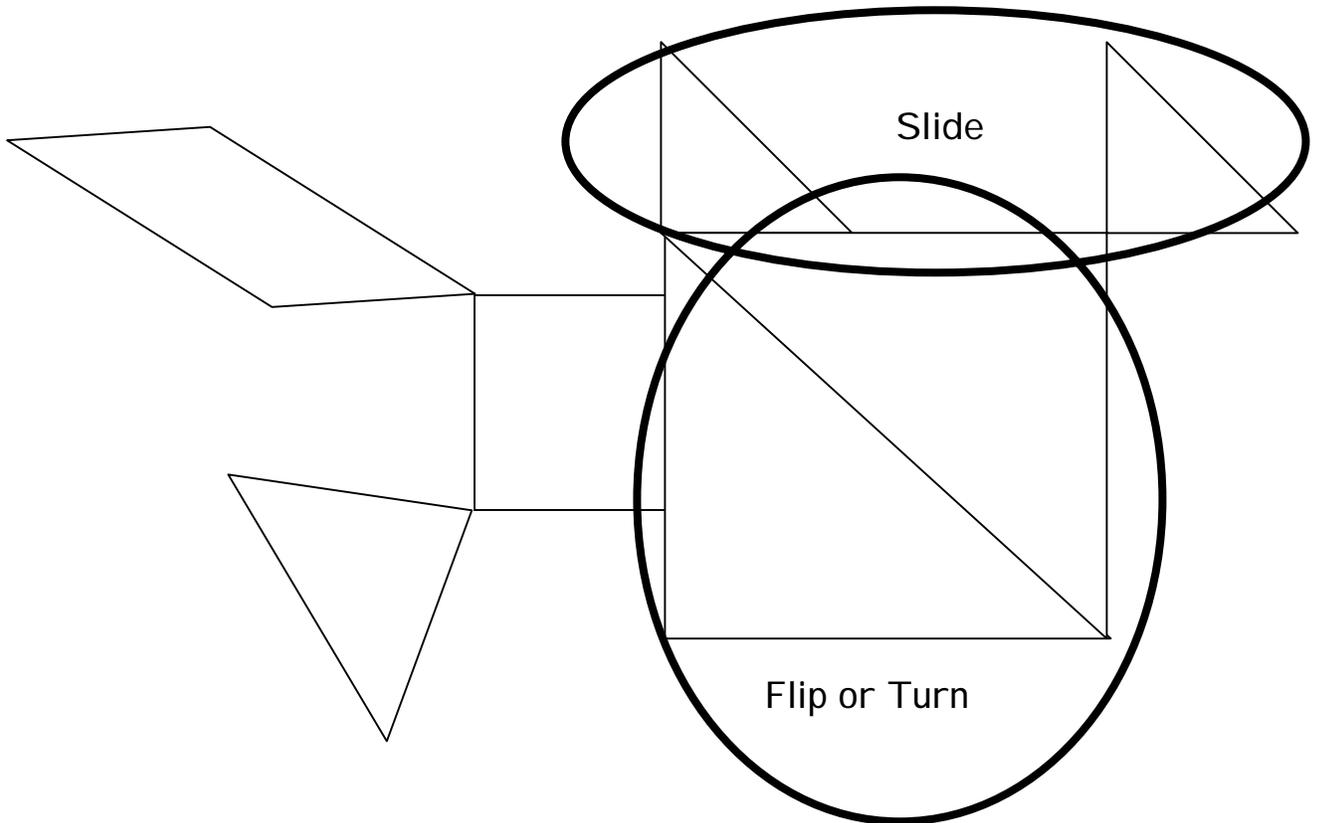
TURN

3)

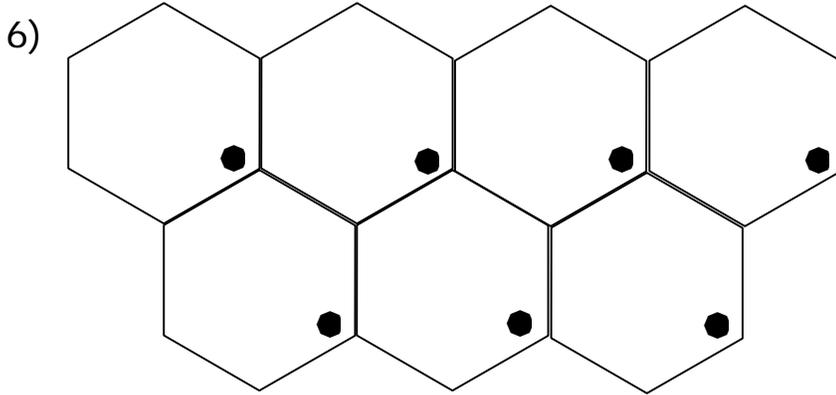


SLIDE

4 & 5) For the figure below, identify two movements (flip, slide or turn) in the tangram. Circle and label the movement.

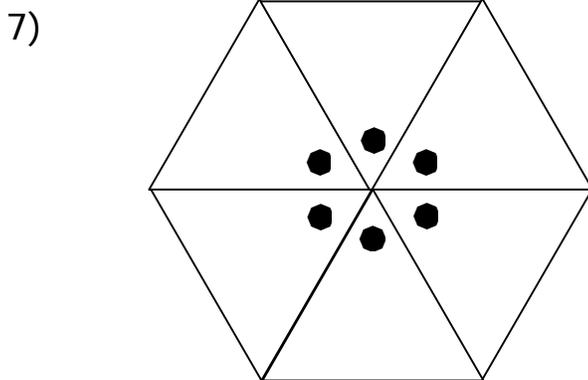


For numbers 6, 7, and 8, identify the movements in the tessellation (flip, slide or turn). Circle the correct movement say why your answer is correct.



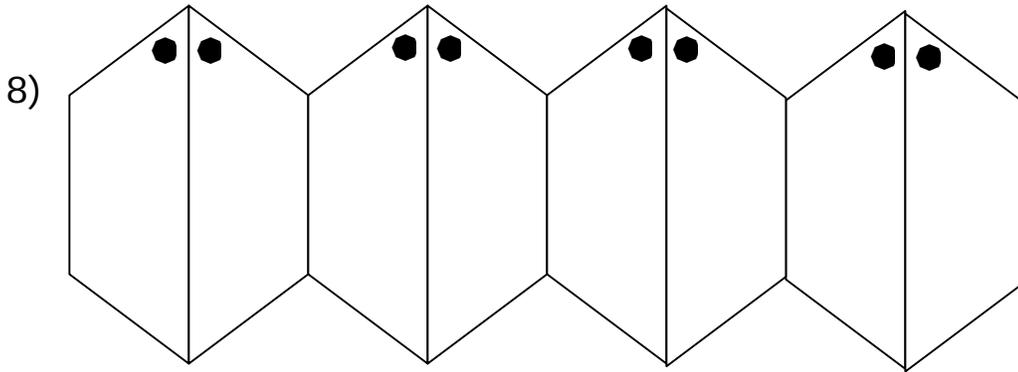
Flip Slide Turn

I know that this is a slide because the pieces are sliding and not turning or flipping.



Flip Slide Turn

I know that this is a turn because the pieces are turning around the middle.



Flip Slide Turn

I know that this is a flip because the pieces look like reflections in the mirror.

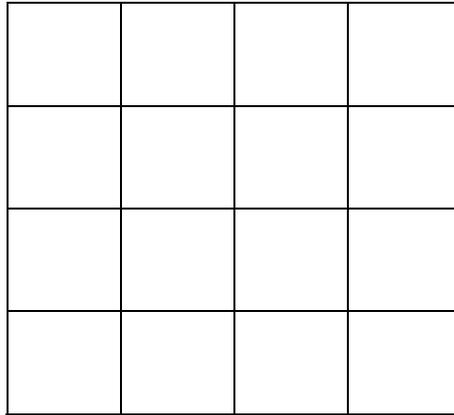
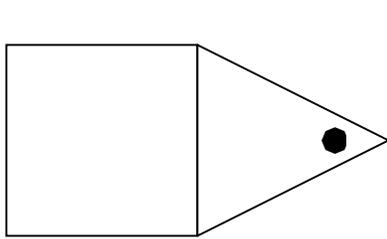
Name _____

Date _____

Tessellating Terriers do Flips, Slides, and Turns Summative Assessment

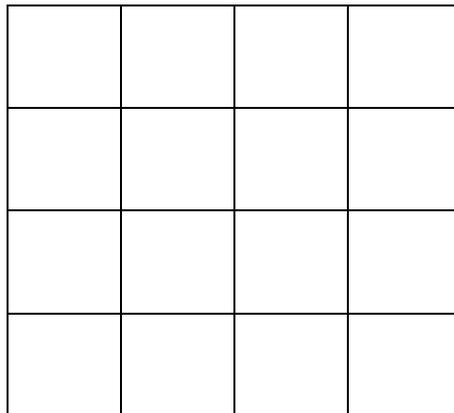
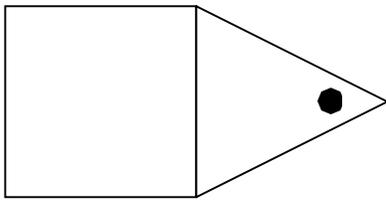
Use your Pattern Blocks to create a translation, a reflection, and a rotation.

1)



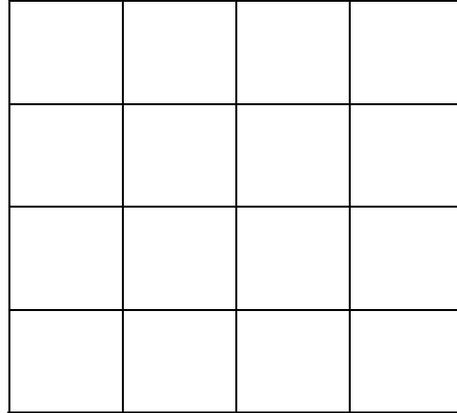
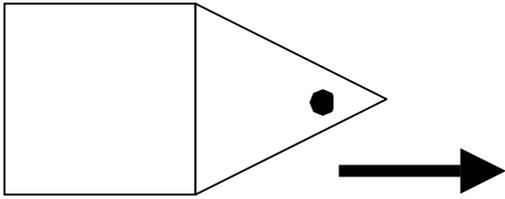
reflection

2)



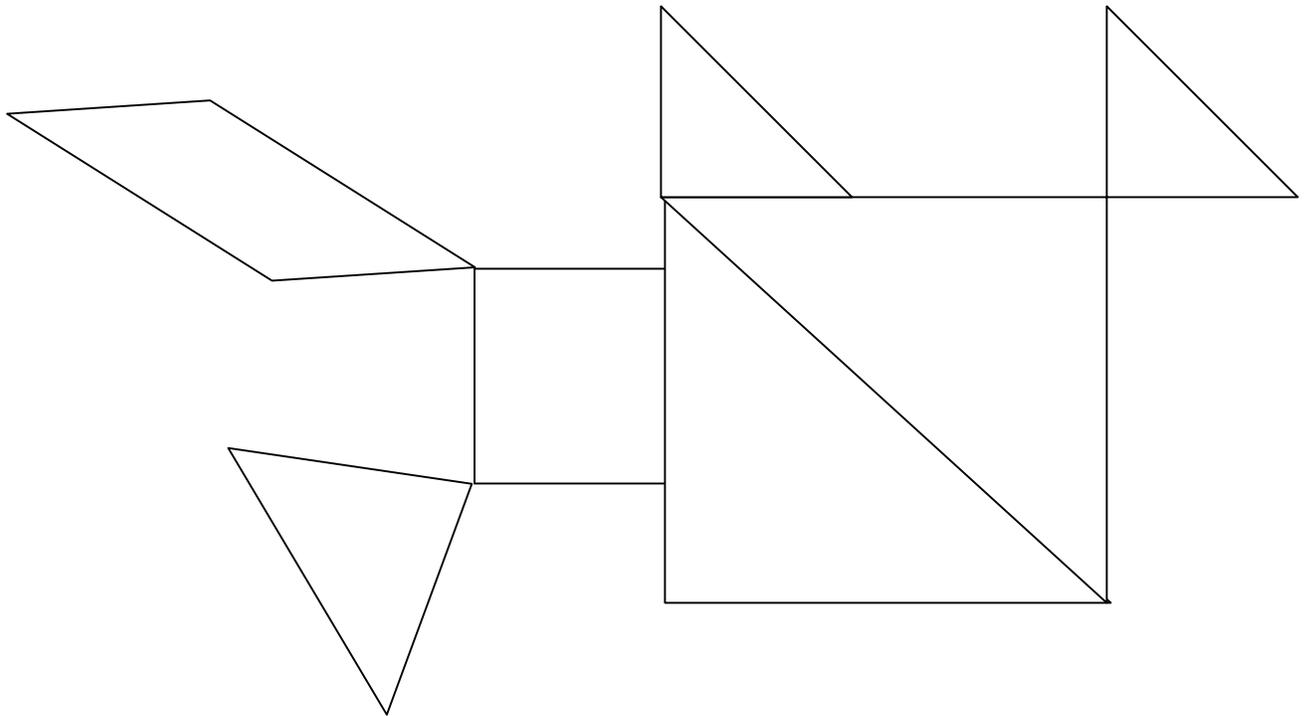
rotation

3)

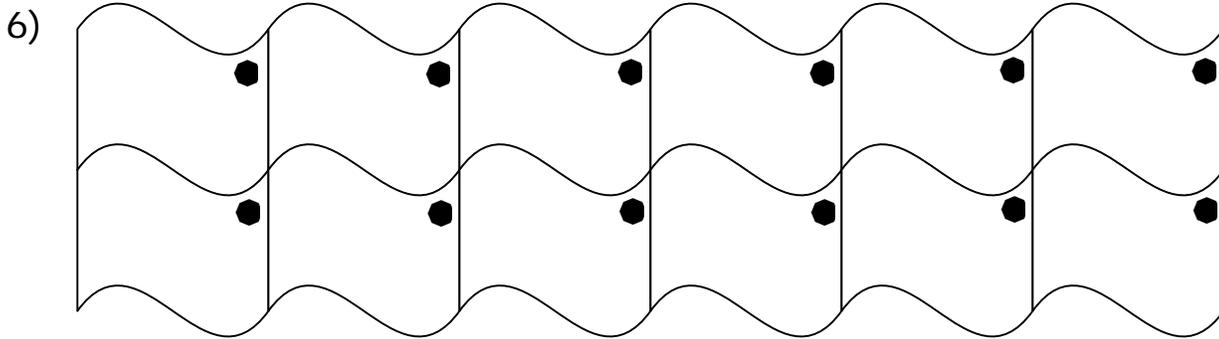


translation

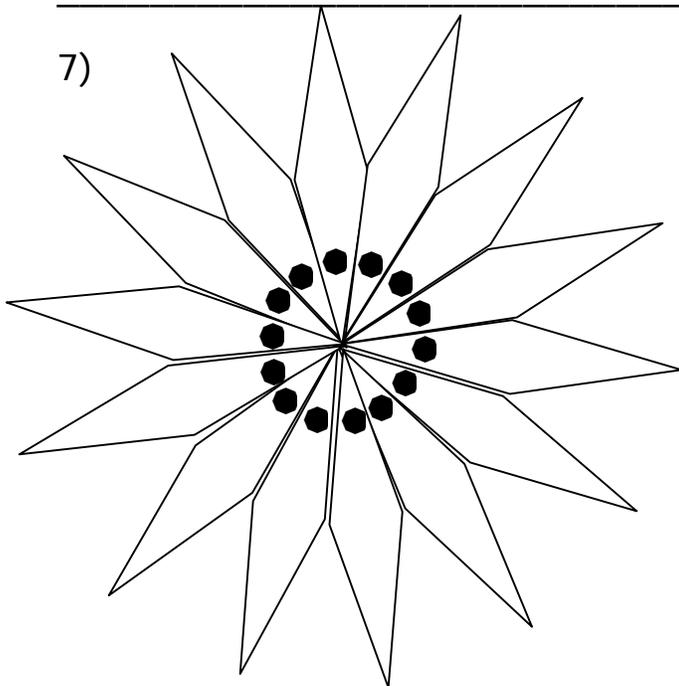
4 & 5) For the figure below, identify two movements (reflection, translation, or rotation) in the tangram. Circle and label the movement.



For numbers 6, 7, and 8, identify the movement or movements in the tessellation (reflection, translation, or rotation). Explain how you know your answer is correct



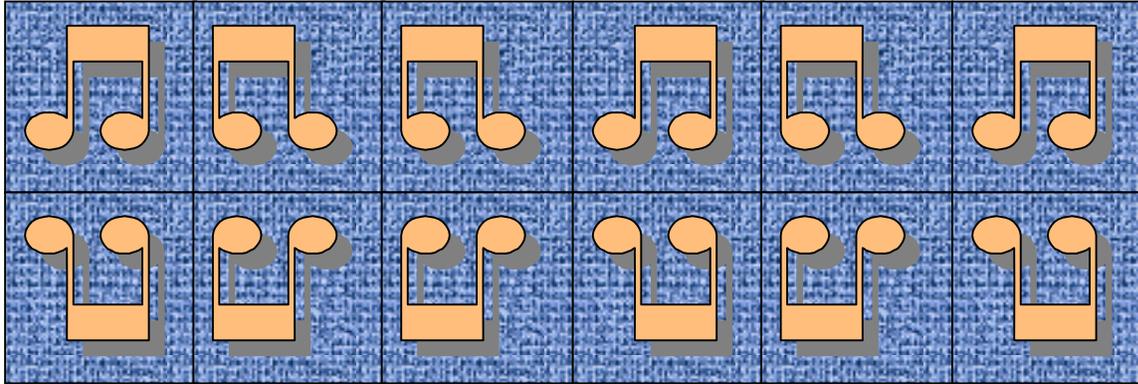
This tessellation is _____. I know this because _____



This tessellation is _____

I know this because _____

8)



This tessellation is _____. I know this because _____

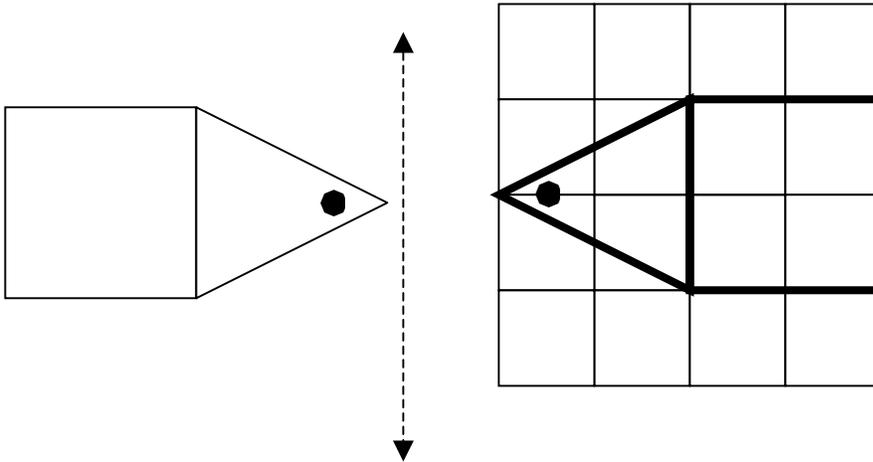
Name _____

Date _____

Tessellating Terriers do Flips, Slides, and Turns Summative Assessment

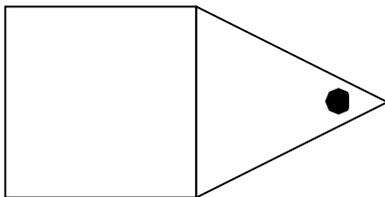
Use your Pattern Blocks to create a translation, a reflection, and a rotation.

1)

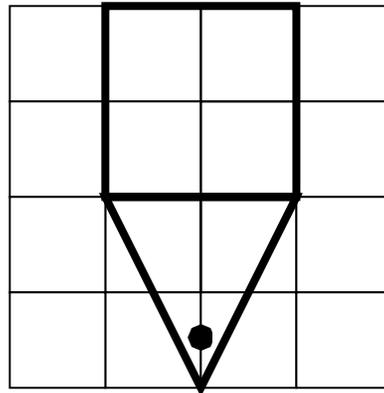


reflection

2)



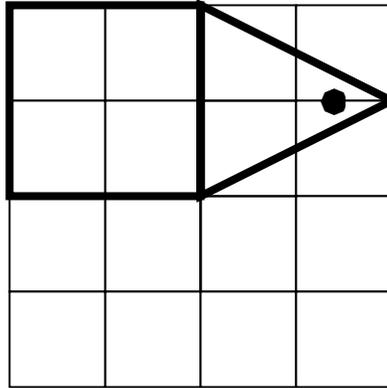
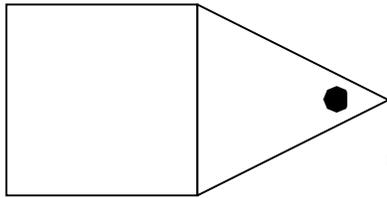
Answers will vary



rotation



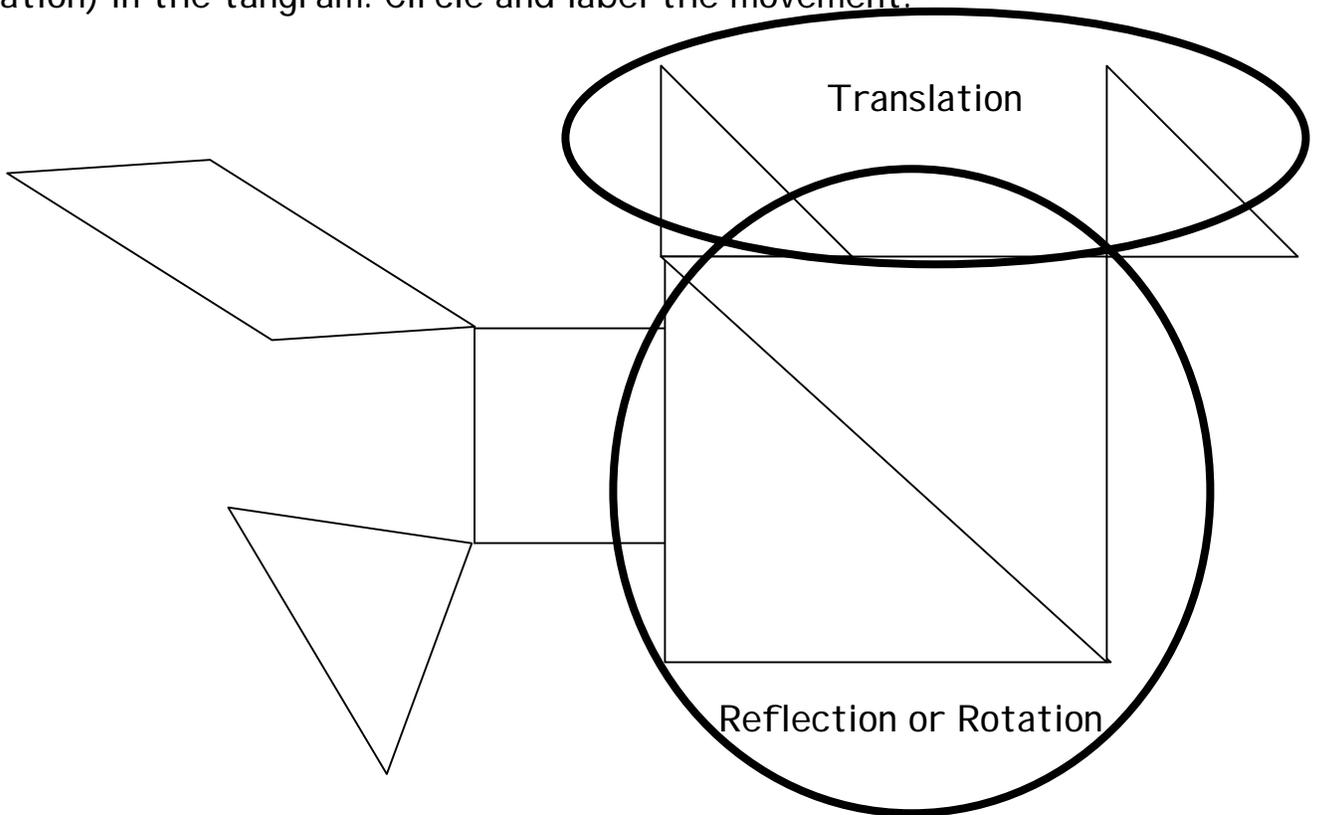
3)



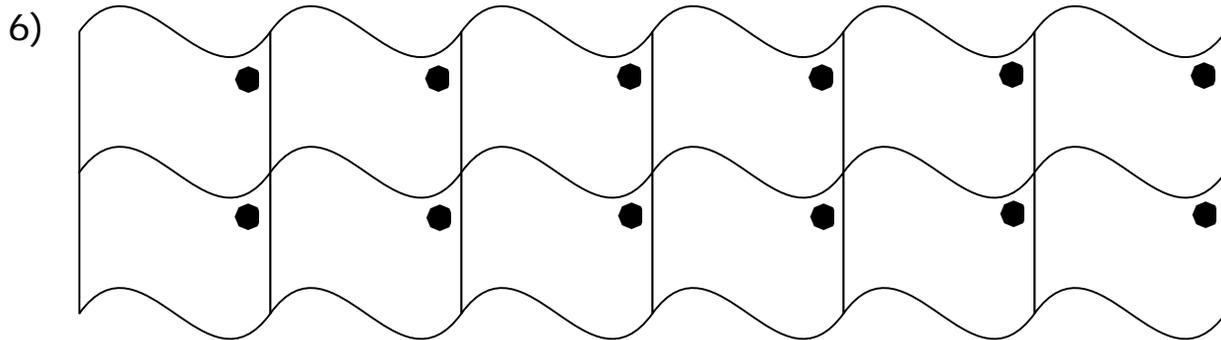
translation

Answers will vary

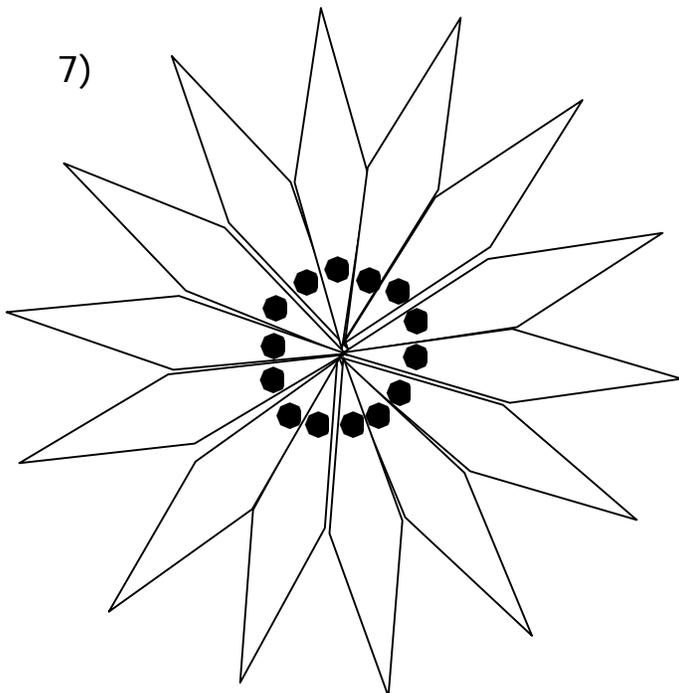
4 & 5) For the figure below, identify two movements (reflection, translation, or rotation) in the tangram. Circle and label the movement.



For numbers 6, 7, and 8, identify the movement or movements in the tessellation (reflection, translation, or rotation). Explain how you know your answer is correct



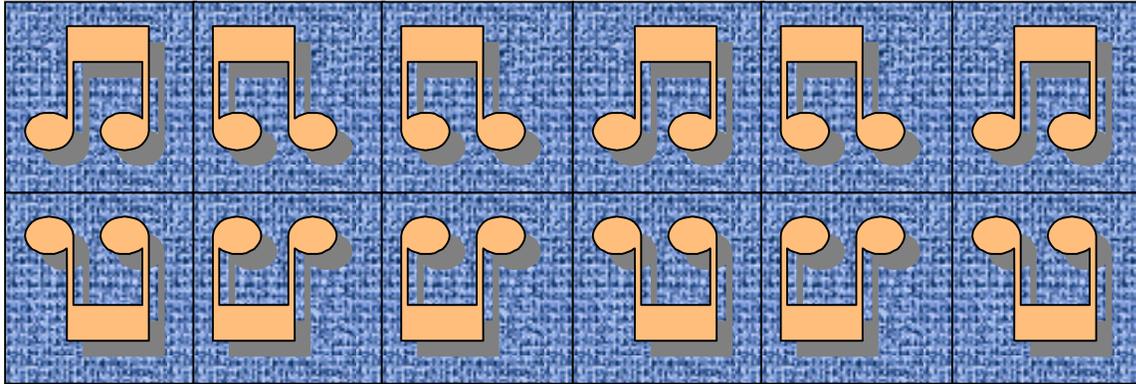
This tessellation is a translation. I know this because the pattern is changing by moving the piece across the plane. The piece is not turning or flipping.



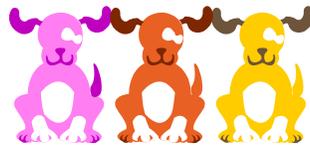
This tessellation is a rotation.

I know this because pattern changes by turning on a stationary point. It is not flipping or sliding.

8)



This tessellation is a reflection. I know this because the musical notes look like a reflection in a mirror. It is reflecting horizontally (side to side), vertically (up and down), and diagonally.



Flip

To turn a geometric
shape over the line
of symmetry
making a reflection
image



Slide

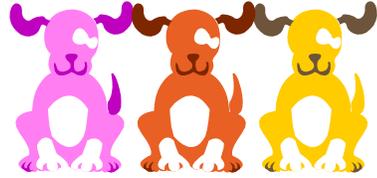
To move a
geometric shape in
a straight line
across a flat surface
to make a repeating
pattern.



Student Resource Sheet 34

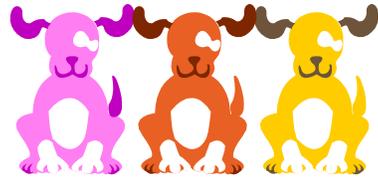
Turn

To move a
geometric shape by
rotating on a
stationary point.



Translation

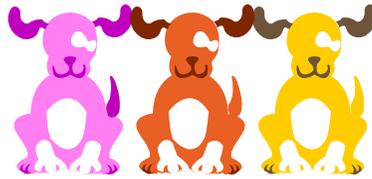
Occurs when a figure moves its position in space without changing its orientation by flipping or turning.



Student Resource Sheet 36

Reflection

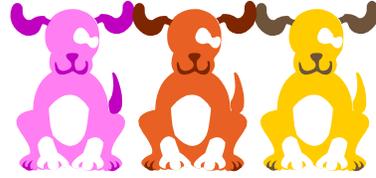
Occurs when a figure changes position and orientation by “flipping” over the line of symmetry.



Student Resource Sheet 37

Rotation

Occurs when a figure changes position and orientation by “turning” around on a stationary point.

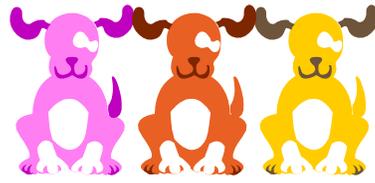


Student Resource Sheet 38

Tessellation

Is a tiling made up of a repeated use of a shape.

These repeated shapes completely fill in a plane without any gaps or overlaps.



Line of Symmetry

A line that divides a
figure into two
congruent (equal)
parts.