INDIGENOUS WISDOM:
CENTURIES OF PUEBLO IMPACT IN NEW MEXICO

A Pueblo-Based Educational Curriculum • IndianPuebloEducation.org

Unit Plan:

Section A: Introductory Materials
Author: Paula Maxmin
Title of Unit: Transforming art with math
Content Area: Math- Geometry/Algebra
Grade Level: 8th

Rationale: As with most cultures, art plays an integral role in definition. It is no different in Pueblo communities. Many Pueblo artists make a living selling their pottery, jewelry and crafts. This work is often seen as a connection with the past and present. When creating, certain symbols emerge that are powerful to individual tribes. Interpretations can vary from tribe to tribe as well as within the same tribe. The two symbols used in this unit plan are the arrow and the spiral. Arrows have come to signify protection and defense against evil or enemies. The spiral can be seen as the cycle of life from birth to reincarnation. Spirals can also exude a deep spirituality.

The core values used in this unit plan center around love and respect. Love is seen as the artist creates his or her interpretation of the world within the medium of their choosing. Each artistic piece takes love and time. Artists spend weeks or months polishing their craft until they produce something that matches their standards. The respect for their culture is evident in every piece of art that is created.

Unit Goals:

1.Describe types of transformations that relate points by the motion of reflections, rotations and translations and methods for identifying and creating symmetric figures

a. Recognize properties of reflections, rotations, translations and dilations
b. Exploring techniques for using rigid motion transformations to create systematic designs
c. Invent coordinate rules for rigid transformations

Standards: 8.G.A.1, 8.G.A1b, 8.G.A 1c, 8.G.A.2, 8.G.A.3
Mathematical Practices: 1,3,7,8

Section B: Lesson Plans

Lesson Plan One
Title: Reflection Symmetry and Pueblo Art
Duration: 2 class period 120 minutes
Grade level : 8th

Lesson objectives:

1. Students will reflect a Pueblo image (arrow) across the x axis, y axis and the y=x axis
2. Students will create an algebraic rule to describe the reflection of the Pueblo image.
3. Students will be able to articulate that a 2- dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, translations and reflections
4. Students will be able to articulate that a 2- dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, translations and reflections

Prerequisite skills

1. Students need to be familiar with reflection symmetry
2. Students need to know the 4- quadrant coordinate plane and how to plot points

Materials and resources

1. Handout 1: Reflection arrow sheet
2. Handout 2: Reflection Lab sheet
3. Handout 3: Answer key for handout 2
4. Patty paper (much cheaper than tracing paper)
5. Butcher paper
6. Markers
7. Mini 4 quadrant grid for the exit ticket

Guiding questions:

1. When looking at the arrow on the coordinate plane, what do you notice is happening as you flip this design across the axes?
2. How can you describe how points "move" under a reflection with coordinate rules (x,y) -> (x ,y) when the reflection line is the x-axis, y- axis , and x=y axis ?

Core values: respect

Procedure:

1.Warm Up: Teacher should hand out coordinate graph paper and patty paper for the warm up.

a. Have students plot (1, 2) (1,6) (4,2) and (4,6) on a coordinate grid and connect the point

b. Handout patty paper and show them how to use it to reflect across the x axis.

c. Tell them to reflect the rectangle across the x- axis: Draw it

d. Tell them to go back to the original shape and reflect it across the y- axis: Draw it

e. Go over the answers

2. **Lesson Launch**

A. Have students look at Reflection Handout 1. Ask the following questions/ have a class discussion about: (Think, pair share)

1.What shape do you see in the coordinate grid? (arrow)

2.What does the arrow symbolize in your Pueblo/ Community? (example- protection)

a. How might you create a design with reflectional symmetry using this basic design element?

b. Are there lines of symmetry? Where? (horizontal only y= 5)

3. Lesson Explore

a. Have students use patty paper to reflect the arrow across the given axes.

b. Pass out Handout2 and have students start filling it out.

c. Debrief after A on the handout so students start getting an idea of how to write rules. Note: Students will not be perfect at writing rules. Focus on mastery during the summary. They will need these observation skills and rule writing capability in lesson 2 and 3.

d. Teacher should circulate to check out the rules' students are creating.

e. Students will struggle with writing the rules so you may want to interrupt the class and ask the following questions:

i. Look at point A, are the x coordinates staying the same? (no)

ii. What's happening? (the digit is staying the same but the sign is changing)

iii. After the above questions, students will most likely get what is happening.

4.Lesson Summary

1. Have a large piece of butcher paper titled **Reflection Symmetry** up on the wall so you can go over the table and discuss the rules. Keep it up for the whole unit so students can refer to other rules and make connections.

2. After everyone has answered the question A, B and C from Handout2, go over the Answers.

a. Have them look at the tables and ask "what do you notice?" Note: Get them to see:

i. that when you reflect across the y axis, the y stays the same and the x coordinate changes signs.

ii. When you reflect across the x axis, the x stays the same and the y coordinates changes signs.

iii. When you reflect across the y=x axis, the coordinates flip (x becomes y and y becomes). These observations may take a lot of coaching from the teacher but will pay off in the next few lessons.

b. Students should see that reflectional symmetry uses the general rule:

Across the y axis: (x,y)-> (-x, y)

Across the x axis: (x,y) -> (x, -y)

Across the y=x axis (x,y) -> (y,x)

Assessment- Exit ticket (5 minutes)

1. Give each student a mini 4-quadrant grid with a simple design in the first quadrant. Have them reflect it across the y axis, draw it and see if they can write a rule that describes the transformation.
2. Ask them what the arrow means to them and their community or Pueblo.

Modifications/Accommodations

1. Peer coaching
2. Timing accommodations: take more time to complete a task; have extra time to process oral information and directions
3. Organization skills accommodations: mark texts with a highlighter
4. Provide visual aids: use pictures or graphics
5. Show a model of the end product (such as a completed math problem or finished quiz)
6. Allow the student to use a calculator without penalty

Notes to teacher;

1. In Handout 2, Question C (reflecting across the y=x axis) is not directly part of the 8th grade standards but is good practice for writing Algebraic rules. If your students are really struggling or if you run out of time, feel free to skip this section.

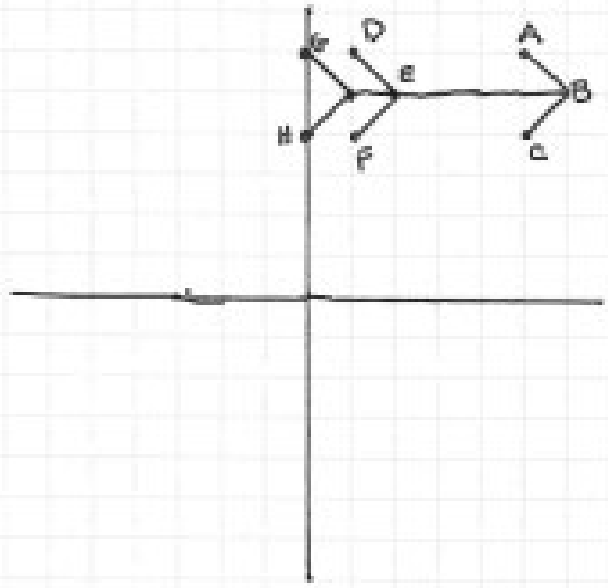
2. Please be aware that certain objects, animals, or traditional ceremonies, may be sensitive for some children to speak about. This depends on each Pueblo's traditional teachings. You can make the statement that assures students that if there is anything presented that is uncomfortable for them to please let you know. This is a sensitive area and students should be excused from writing or speaking of sensitive areas.

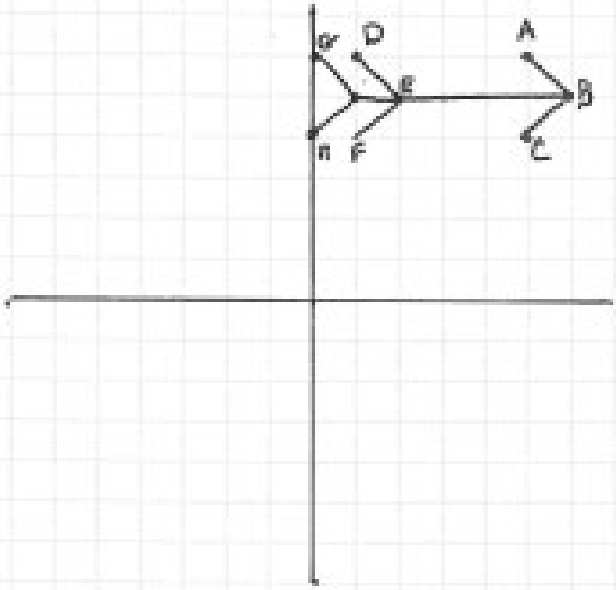
3. All labsheets / handouts have answer keys.

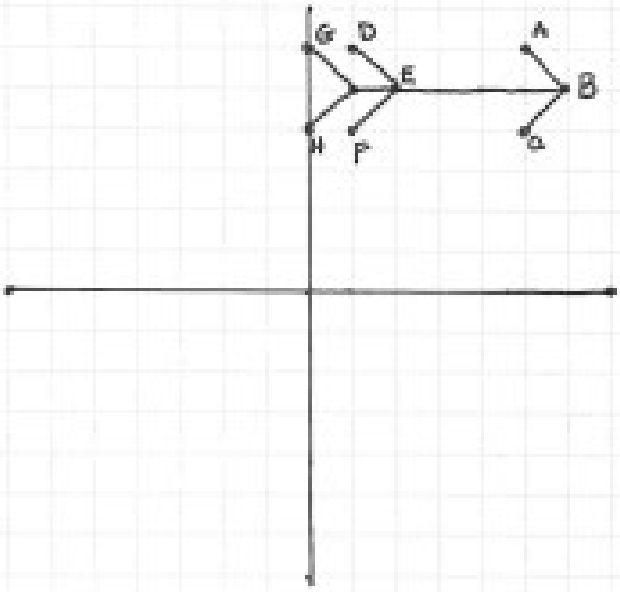
4. Note: Students will not be perfect at writing rules at first. Focus on mastery during the summary. They will need these observation skills and rule writing capability in lesson 2 and 3.

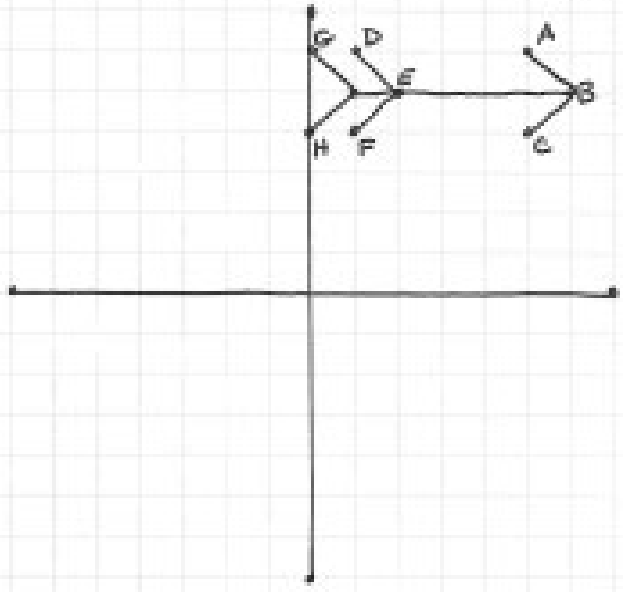
5. These observations may take a lot of coaching from the teacher but will pay off in the next few lessons.

Handout 1: Reflection Symmetry









Handout 2: Reflection Symmetry

Lesson 1:

A. Complete the table below showing the coordinates of points A- H and their images under a reflection in the y- axis.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)						
Coordinates after a y-axis reflection								

1. Look at the original points and the new points after the arrow has been reflected across the y axis. What do you notice (look at A, then B, etc.)

2. Write a rule relating the coordinates of the points and their images after a reflection in the y-axis. (x,y) -> (,)

3. Would the rule still apply if the arrow started in the second quadrant? Third? Pick a point and try it.

4. Do any points remain unchanged under this reflection? Why do you think they stayed the same?

B. Complete the table below showing the coordinates of points A- H and their images under a reflection in the x- axis.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)						
Coordinates after an x-axis reflection								

1.Look at the original points and the new points after the arrow has been reflected

across the y axis. What do you notice (look at A, then B..etc)

2. Write a rule relating the coordinates of the points and their images after a reflection in the y-axis. (x,y) -> (,)

3. Would the rule still apply if the arrow started in the second quadrant? Third?
Pick a point and try it.

4.Do any points remain unchanged under this reflection? Why do you think they stayed the same?

C. Complete the table below showing the coordinates of points A- H and their images under a reflection in the y=x axis.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)						
Coordinates after a y=x reflection								

1. Look at the original points and the new points after the arrow has been reflected across the y=x axis. What do you notice (look at A, then B..etc)
2. Write a rule relating the coordinates of the points and their images after a reflection in the y=x axis. (x, y) -> (,)
3. Would the rule still apply if the arrow started in the second quadrant? Third?

Pick a point and try it.

4. Do any points remain unchanged under this reflection? Why do you think they stayed the same?

Handout 3: Answer key for handout 2

A.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)	(5,4)	(1,6)	(2,5)	(1,4)	(0,6)	(0,4)
Coordinates after a y-axis reflection	(-5,6)	(-6,5)	(-5,4)	(-1,6)	(-2,5)	(-1,4)	(0,6)	(0,4)

1. The x value changes to a negative sign and the y stays the same
2. (x, y)-> (-x, y)
3. Yes, the rule stays the same because the negative sign symbolizes changing the sign. If it's negative, it changes to positive and if it positive it changes to negative.
4. The points that remain unchanged are the ones on the y axis (points G and H)

B.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)	(5,4)	(1,6)	(2,5)	(1,4)	(0,6)	(0,4)
Coordinates after a reflection	(5,-6)	(6,-5)	(5,-4)	(1,-6)	(2,-5)	(1,-4)	(0,-6)	(0, -4)

1. The y value changes to a negative sign and the y stays the same
2. (x, y)-> (x, -y)
3. Yes, the rule stays the same because the negative sign symbolizes changing the sign. If it's negative, it changes to positive and if it positive it changes to negative.
4. The points that remain unchanged would be the ones on the x axis, but since there aren't any, all points changed.

C.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)	(5,4)	(1,6)	(2,5)	(1,4)	(0,6)	(0,4)
Coordinates after a y-axis reflection	(6,5)	(5,6)	(4,5)	(6,1)	(5,2)	(4,1)	(6,0)	(4,0)

1. The x and y values flipped
2. (x, y)-> (y, x)

3. Yes, the rule stays the same because the numbers are changing position. Nothing else is affected.
4. The points that remain unchanged would be the ones on the y=x axis, but since there aren't any on that axis, all points changed.

Hand Out 3:

The Arrow Symbol

The Arrow Symbol

The arrow is very important to Native Indians. ... Arrows also signified direction, force, movement, power and direction of travel. When an arrow pointed to the left it meant warding off evil, pointing to the right meant protection and an arrow pointing down meant peace.

Arrows could represent the ability of the higher spirits to travel wide and fast. They could also represent the ability of a person to free his or her spirits and travel far and wide across the galaxy in his dreams. This ability to aspire, that is, "soar" to the heavens, is a particularly strong symbolism. Sep 29, 2020

Lesson Plan Two
Title: Translation Symmetry and Pueblo Art
Duration: 60. minutes
Grade level: 8th grade

Lesson objectives:

1. Students will look at pictures and write the coordinates of the points.
2. Students will write rules to describe translations.
3. Students will be able to articulate that a 2- dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, translations and reflections.
4. Students will be able to articulate that a 2- dimension all figure is congruent to another if the second can be obtained from the first by a sequence of rotations, translations and reflections.

Prerequisite skills

1. Students need general knowledge about a translation.
2. Students need the ability to write rules from lesson 1.
3. Students need to know how to use patty paper with translations.
4. Students need to know how to write points from a coordinate plane.

Materials and resources

1. Handout 1: Translation lab sheet
2. Patty paper
3. Chart paper
4. Document camera
5. Butcher paper
6. Markers

Guiding questions

1. What kind of coordinate rule (x, y)-> (,) tells you how to "move" any point to its image under a translation.

Core values

Respect, Love

Procedure:

1. Warm-up: Write the questions below on chart paper or document camera. Allow students time to make meaning
    a. Give the students a point eg. (4,7)
    b. Without plotting the point, ask them to reflect this point across the y -axis and write the new point. If they are struggling or you need to modify, they can plot it on graph paper.
    c. Have them write the rule.
    d. Discuss what the rule means (x changes signs and y stays the same)
    e. Repeat the process with the same point reflected across the x- axis.
2. Lesson Launch

a. Tell students we are going to be looking at translations today. Pose the question: What a translation? (slide to the left, right, up or down) Ask for volunteers.
b. We will be looking to write rules about how the picture moves on the coordinate grid.
c. Ask: Do you think the rules will be the same? Why or why not?

3.Lesson Explore

a. Distribute translation Handout 1.

b. Ask them what symbol they see. If appropriate, have students share what the spiral means to them or their tribe. (some students will be hesitant because of tribal norms around sharing information. Don't push it. Whatever is shared will be ok for the lesson)

c. Have the students fill in the points and answer the questions.
d. Teacher should circulate to check out the rules' students are creating.
e. Students will try to use the same rules as reflection symmetry so you might want to interrupt the class if you notice the majority of them going in this direction. Some questions you might ask include:
    i. Look at point A, are the x coordinates staying the same? (answer- no)
    ii. What's happening (answer-adding or subtracting- use a number line as a possible reference)
    iii. After the above questions, students will most likely get what is happening. If not, do some direct teaching. Ask a question like : *"When you move to the right , you are adding 2 blocks so we would write this as x+2"*

4.Lesson Summary

1. Have another large piece of butcher paper titled **Translational Symmetry** up on the wall so you can go over the table and discuss the rules. Just like in lesson 1, keep up the poster for the whole unit.

2. Students should see that translational symmetry uses the general rule:

(x, y)-> (x+a, y+b)

Assessment Exit Ticket

1. Create 2 shapes that are the same on a 4- quadrant coordinate grid. After the students have finished this lesson, have them write the rule for this translation
2. When might an artist need the idea of a translation in his or her work?

Modifications/Accommodations:

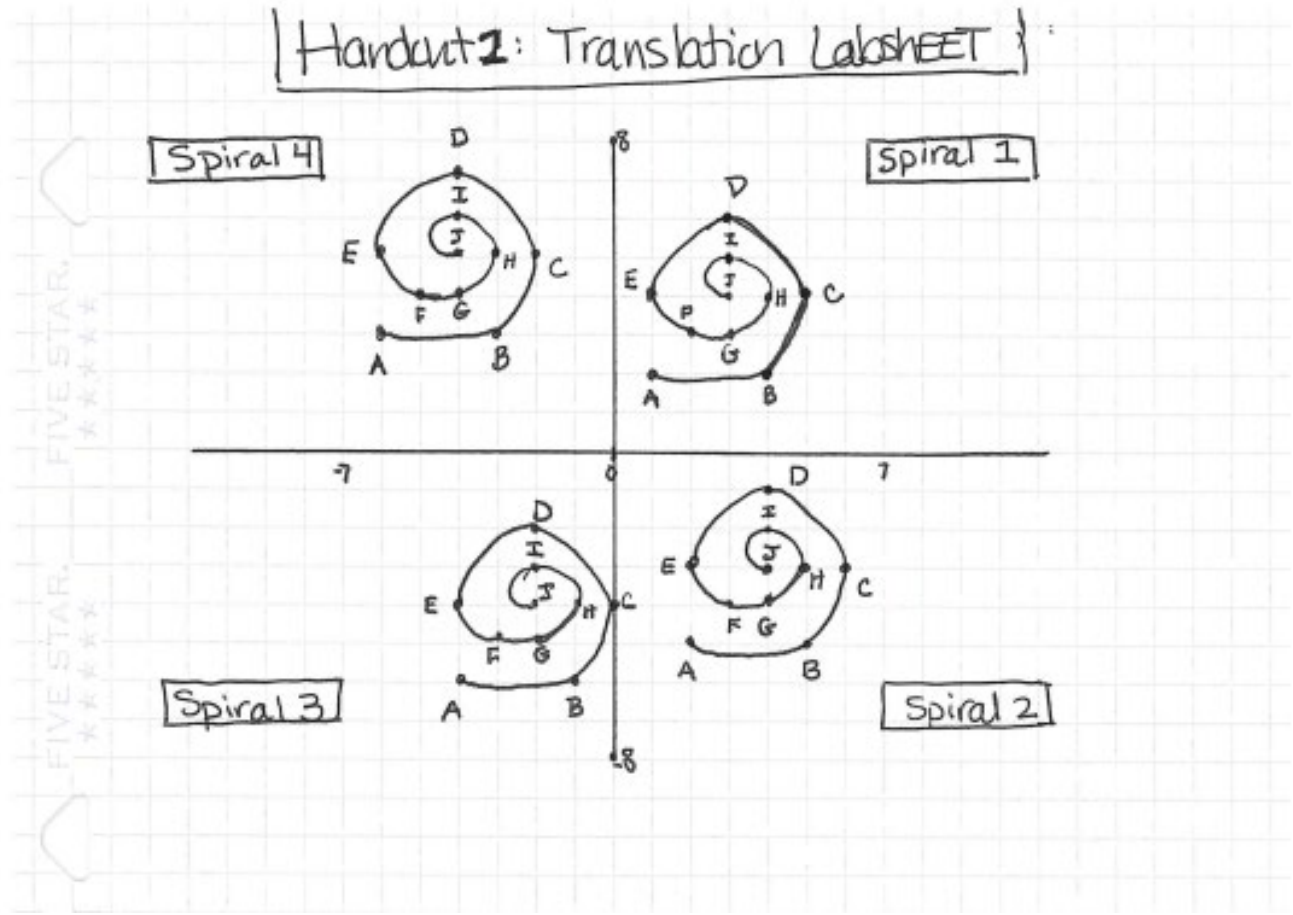
1. Peer coaching
2. Timing accommodations: take more time to complete a task; have extra time to process oral information and directions.
3. Organization skills accommodations: mark texts with a highlighter
4. Provide visual aids; use pictures or graphics.
5. Show a model of the end product (such as a completed math problem or finished quiz)
6. Allow the student to use a calculator without penalty.

Notes to teacher

1. Please be aware that certain objects, animals, or traditional ceremonies, may be sensitive for some children to speak about. This depends on each Pueblo's traditional teachings. You can make the statement that assures students that if there is anything presented that is uncomfortable for them to please let you know. This is a sensitive area and students should be excused from writing or speaking of sensitive areas.

2. All labsheets / handouts have answer keys.

Handout 2: Translation Labsheet



A. Fill in the chart

Point	A	B	C	D	E	F	G	H	I	J
Coordinates of spiral 1	(1,2)	(4,2)								
Coordinates of spiral 2										
Coordinates of spiral 3										
Coordinates of spiral 4										

1. Think about the warm -up; Pick a point (A , B ...) What do you notice is happening from: (words)

    a. Spiral 1 to 2?

    b. Spiral 2 to3?

c. Spiral 3 to 4?
d. Spiral 4 to 1?

B. Look from Spiral 1 to 2, write an algebraic rule to model the situation
(x,y) -> (,)

C. Look from Spiral 2 to 3, write an algebraic rule to model the situation
(x,y) -> (,)

D. Look from Spiral 3 to 4, write an algebraic rule to model the situation
(x,y) -> (,)

E. Look from Spiral 4 to 1, write an algebraic rule to model the situation
(x,y) -> (,)

Handout1: lesson 2: Answer key to Handout 1

A

Point	A	B	C	D	E	F	G	H	I	J
Coordinates of spiral 1	(1,2)	(4,2)	(5,4)	(3,6)	(1,4)	(2,3)	(3,3)	(4,4)	(3,5)	(3,4)
Coordinates of spiral 2	(2,-5)	(5,-5)	(6,-3)	(4,-1)	(2,-3)	(3,-4)	(4,-4)	(5,-3)	(4,-2)	(4,-3)
Coordinates of spiral 3	(-4,-6)	(-1,-6)	(0,-4)	(-2,-2)	(-4,-4)	(-3,-5)	(-2,-5)	(-1,-4)	(-2,-3)	(-2,-4)
Coordinates of spiral 4	(-6,3)	(-3,3)	(-2,5)	(-4,7)	(-6,5)	(-5,4)	(-4,4)	(-3,5)	(-4,6)	(-4,5

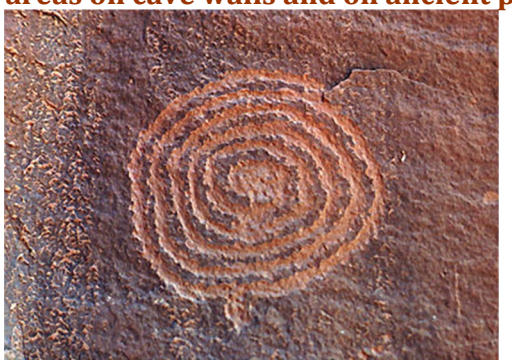
B. The numbers are changing so the rules will look different from reflectional symmetry
C. Spiral 1 to 2 (x, y)-> (x+1, y-7)
D. Spiral 2 to 3 (x, y)-> (x-6,y-1)
E. Spiral 3 to 4 (x, y)-> (x-2,y+9)
F. Spiral 4 to 1 (x, y)->(x+7, y-1)

HAND OUT 3:

It represents **the cycle of life; birth, growth, death, and re-incarnation**. Spiritually the spiral represents a connectivity with the divine, spiraling from the outer ego (the outside world) into the inner soul (cosmic awareness and enlightenment). The spiral represents evolution and growth of the spirit.

Spiral

The spiral is one of the oldest symbols used by humans. It appeared thousands of years ago in southwestern Native American tribal areas on cave walls and on ancient pottery.



Spirals to the Zunis and Puebloans represent water, wind and creatures associated with water such as snails and serpents.

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Lesson Plan Three
Title: Rotational Symmetry
Duration; 120 minutes
Grade level: 8th

Lesson objectives

1. Students will be able to rotate an image on a coordinate plane 90 and 180 degrees
2. Students will be able to write a rule that describes a translation on the coordinate plane
3. Students will be able to articulate that a 2- dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, translations and reflections
4. Students will be able to articulate that a 2- dimension all figure is congruent to another if the second can be obtained from the first by a sequence of rotations, translations and reflections

Prerequisite skills

1. Students need to be familiar with Rotational Symmetry.
2. Students need to know how to use patty paper.
3. Students need to know how to plot points on a coordinate plane.

Materials and resources

1. Handout 4: Rotational Symmetry
2. Handout 5: Rotational Symmetry questions
3. Patty paper or tracing paper
4. Document camera
5. Butcher paper
6. Markers
7. Graph paper

Guiding questions:

1. What are the coordinate rules that describe "motion" of points on a grid under a 90 and 180 degree turn?

Core values: Respect, Love

Procedure:

1. Warm up
    a. Put a simple rectangle on your document camera in quadrant 1 with the points label A, B, C, D and ask the question:
        i. What would this image look like if you rotated it 90 degrees counterclockwise?(remind them which way this is)
        ii. Draw it on your graph paper
        iii. Give students time to struggle and remind them it might be useful to use patty (tracing) paper.
        iv. Have students come up to the document camera and show their results.
        v. Ask if any points stayed the same.

2. **Lesson Launch**
    a. Pass out Rotation handout 1 and 2
    b. Have students look at Rotation Handout 1. Ask the following questions/ have a class discussion about:
    1.What shape do you see in the coordinate grid? (answer-arrow)
    2.What does the arrow symbolize in your Pueblo/ Community? (ex. Protection but let students give their opinions. There is no right answer. As before, do not push if students are hesitant with answers)
    c. Say :" *Today we are going to create a new design using rotational symmetry like we did in the warm up"*

3. Lesson Explore

a. Have students use patty paper to rotate the arrow according to the directions on Handout 2.
b. Teacher should circulate to check out the rules' students are creating. Students will pick up these rules quickly after doing lesson 1 and 2.
c. When students are partway through A, ask them if it looks like the rules might be more like reflection symmetry or translation symmetry. If they don't see it yet, let them keep working and attend to each group when you see they are ready.

4.Lesson Summary

1. Have a large piece of butcher paper titled **Rotation Symmetry** up on the wall so you Can go over the table and discuss the rules.
2. After everyone has answered the question A, B from Handout 2, go over the answers
3. Ask the question again:
" After finishing the lesson, do your rules look more like reflection or translation symmetry? (reflection). Why do you think that is? Do a think, pair share
4. Students should see:
    i. 90 degree rotation: (x, y) -> (-y, x)
    ii. 180 degree rotation (x, y)-> (-x,-y)

Assessment: Exit ticket

1.Create another image like you did in the warm up and have students draw the new image after a 90 and 180 degree counter clockwise rotation. Ask them to use the rules if it works for them or patty paper.

2. Where might a Pueblo artist use this technique?

Modifications/Accommodations

1. Peer coaching
2. Timing accommodations: Take more time to complete a task; Have extra time to process oral information and directions
3. Organization skills accommodations: Mark texts with a highlighter
4. Provide visual aids; Use pictures or graphics
5. Show a model of the end product (such as a completed math problem

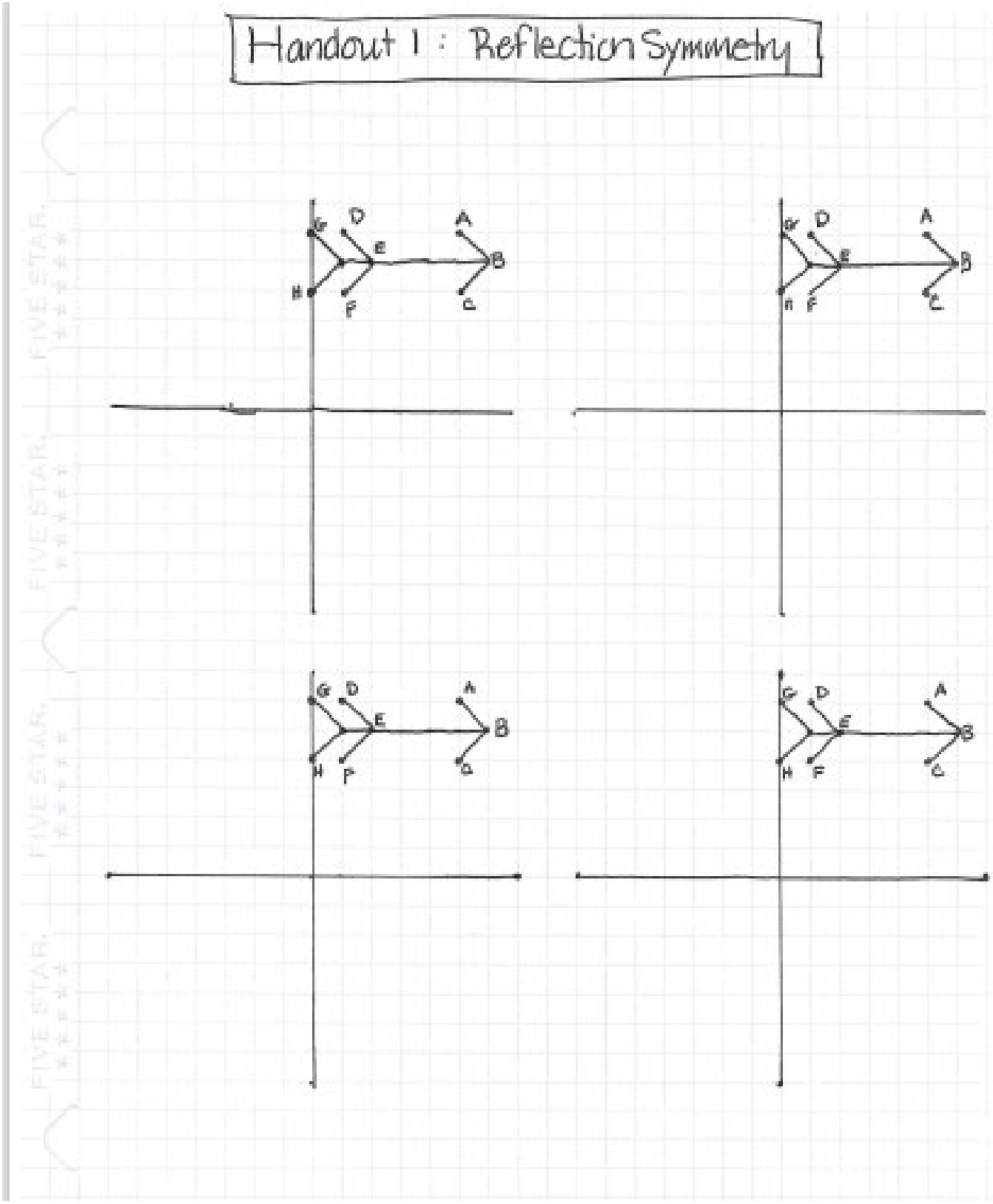
or finished quiz)

6. Allow the student to use a calculator without penalty

Notes to teacher

1. It is not important that students memorize the rules but rather that they can start making algebraic meaning while looking at number patterns. Some students are ready for this while others are still making meaning concretely. Both are ok

Handout #1: Reflection Symmetry



Handout 2 : Lesson 3: Rotational Symmetry:

A. Complete the table below showing the coordinates of points A- H and their images under a 90- degree rotation.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)						
Coordinates after a 90 degree rotation								

1.Look at the original points and the new points after the arrow has been rotated 90^{o}. What do you notice? (Pick a point and study it)

2. Write a rule relating the coordinates of the points and their images after a reflection in the y-axis. (x, y) -> (,)

3. Would the rule still apply if the arrow started in the second quadrant? Third? Pick a point and try it.

4. Do any points remain unchanged under this reflection? Why do you think they stayed the same?

B. Complete the table below showing the coordinates of points A- H and their images under a 180- degree rotation

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)						
Coordinates after a 180 degree rotation								

1.Look at the original points and the new points after the arrow has been reflected across the y axis. What do you notice (look at A, then B..etc)

2. Write a rule relating the coordinates of the points and their images after a reflection in the y-axis. (x, y) -> (,)

3. Would the rule still apply if the arrow started in the second quadrant? Third?
Pick a point and try it.

4. Do any points remain unchanged under this reflection? Why do you think they stayed the same?

Handout 2 : Lesson 3: Rotational Symmetry: Answer key

A. Complete the table below showing the coordinates of points A- H and their images under a 90- degree rotation.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)	(5,4)	(1,6)	(2,5)	(1,4)	(0,6)	(0,4)
Coordinates after a 90 degree rotation	(-6,5)	(-5,6)	(-4,5)	(-6,1)	(-5,2)	(-4,1)	(-6,0)	(-4,0)

1. The numbers stay the same but they move positions. X and y flip. One of the signs change.
2. Write a rule relating the coordinates of the points and their images after a reflection in the y-axis. (x, y) -> (-y , x)
3. Yes, it doesn't matter where the point is, the rule applies
4. All the points moved since they are not the center of the rotation

B. Complete the table below showing the coordinates of points A- H and their images under a 180- degree rotation.

Point	A	B	C	D	E	F	G	H
Original Points	(5,6)	(6,5)	(5,4)	(1,6)	(2,5)	(1,4)	(0,6)	(0,4)
Coordinates after a 180 degree Rotation	(-5,-6)	(-6,-5)	(-5,-4)	(-1,-6)	(-2,-5)	(-1,-4)	(0,-6)	(0,-4)

1.They all turn to negative or they all change signs but the numbers stay the same.
2. Write a rule relating the coordinates of the points and their images after a reflection in the y-axis. (x,y) -> (-x ,-y)
3. The rule still applies no matter which quadrant you are in.
4 All points changed because none of them are the center of the rotation.

Culminating Activity

1. Have students find a Pueblo (or any Indigenous) design that is important to them.(Many students may want an elaborate designs. They will find it is REALLY difficult and they might lose interest in the project. Encourage them to look for simplistic designs or modify a more elaborate one).
2. On a full sheet of coordinate grid paper, have students draw the shape making sure to hit corners.
3. Have students write the coordinates out on a piece of paper.
4. Decide which transformation you want to perform (reflection, rotations translation).
5. Write the rule next to the original and perform that rule on all points. Write them to the right of the original points

Original Design Points Example only	Rule example Translation (x,y) ->(x+3, y-4)
(1 ,3)	(4,-1)

6. Plot the new points on a different coordinate grid paper
7. Color for effect and to honor the design
8. Present them to the class- have students explain why they chose their design and what it means to them.