Evaluation Results

Aut	[redacted]
Evaluated by:	Sandy Brownscombe *(evaluator's name is not visible to author)*
Date Evaluated:	03/23/2013 08:39:40 PM (EDT)
DRF template:	Student Teaching Portfolio 2012-13
Program:	Student Teaching Portfolio 2012-13
Evaluation Method:	Using Rubric

Evaluation Summary for EMU Outcomes 1-3: Document of Student Learning (Documentation of Student Learning)

Final Score:	Meets Requirement
Overall comme	[redacted] Well Done!! You do are finished. Sandy

Detailed Results (Rubric used: Capstone Documentation of Student Learning F10)

Description of the students and school [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Explicit description of the number of students, age, cultural profile, academic profile, and thorough description of the school	Complete description of the number of students, age, cultural profile, academic profile, and brief description of the school	Incomplete or missing description of the number of students, age, cultural profile, academic profile, and brief description of the school
Criterion Score: 2.00		
Learning environment [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Explicit description of the room set up, length of class, and available resources	Complete description of the room set up, length of class, and available resources	Incomplete or missing description of the room set up, length of class, and available resources
Criterion Score: 3.00		
Prior knowledge/ task analysis [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Precise and complete description of how you determined the prior knowledge of your students	Complete description of how you determined the prior knowledge of your students	Incomplete or missing description of how you determined the prior knowledge of your students
Criterion Score: 2.00		
Unit outcomes [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations

Rationale and unit outcomes relate directly and specifically to the assessment of student learning throughout all of the lessons	Rationale and unit outcomes relate to the assessment of student learning throughout all of the lessons	Rationale and unit outcomes relate somewhat to the assessment of student learning throughout some of the lessons
Criterion Score: 3.00		
Differentiation of Instruction [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Explicit description of the plan for support/differentiation of instruction to meet the diverse learning needs of all students	Complete description of the plan for support/differentiation of instruction to meet the diverse learning needs of all students	Incomplete or missing description of the plan for support/differentiation of instruction to meet the diverse learning needs of all students
Criterion Score: 3.00		
Five consecutive lesson plans from one block or content area [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Five or more consecutive lesson plans from one block or content area (the same group of students) and from a single unit of instruction	Five consecutive lesson plans from one block or content area (the same group of students) and from a single unit of instruction	Less than five consecutive lesson plans from one block or content area (the same group of students) or from a single unit of instruction lack coherence and connection within the unit
Criterion Score: 3.00		
Align outcomes for each lesson to an SOL/IEPs [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Outcomes for each lesson are aligned to Virginia SOL/IEPs	- -	Outcomes for some of the lessons are aligned to Virginia SOL/IEPs
Criterion Score: 3.00		
Each lesson clearly identifies your plan to support/differentiate instruction [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Each lesson includes a clear & complete description of the plan for support/ differentiation of instruction to meet the diverse learning needs of ALL students	Each lesson includes a description of the plan for support/differentiation of instruction to meet the diverse learning needs of ALL students	One or more lessons does not include a description of the plan for support/ differentiation of instruction to meet the diverse learning needs of your students
Criterion Score: 2.00		
Assessment Strategies [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Each lesson clearly identifies the assessment strategies that are aligned with the outcomes and instruction of the lesson; includes a culminating assessment	Each lesson identifies the assessment strategies that are aligned with the outcomes and instruction of the lesson; includes a culminating assessment	One or more of the lessons does not include assessment strategies or a culminating assessment, may not be aligned with the outcomes and/or instruction
Criterion Score: 2.00		
Student Achievement of the Learning Outcomes [Professional Knowledge]		
(3) Exemplary	**(2)** Competent	**(1)** Does Not Meet Expectations
Complete and accurate description of documenting how students achieved the learning outcomes of the lessons	A description documenting how students achieved the learning outcomes of the lessons	A description documenting how students achieved the learning outcomes of the lessons is missing or incomplete

Criterion Score: 3.00

Examples of Student Work [Professional Knowledge]

(3) Exemplary	(2) Competent	(1) Does Not Meet Expectations
Several examples of high, middle, and low achieving student work are provided to support your claim of student learning; the achievement level for each example is clearly identified	One example of high, middle, and low achieving student work is provided to support your claim of student learning; the achievement level for each example is clearly identified	Examples of high, middle, and low achieving student work do not support your claim of student learning, or are missing, and/or the achievement level for each example is not indicated

Criterion Score: 3.00

Number and explanation of students achieving the outcomes [Professional Knowledge]

(3) Exemplary	(2) Competent	(1) Does Not Meet Expectations
Clearly indicates number of students achieving/not achieving the outcomes; detailed explanation of why students did or did not achieve outcomes	Indicates number of students achieving/not achieving the outcomes; explanation of why students did or did not achieve outcomes	Number of students achieving/not achieving the outcomes is incomplete or missing; incomplete explanation of why students did or did not achieve outcomes

Criterion Score: 3.00

Enhancement of Student Learning [Professional Knowledge]

(3) Exemplary	(2) Competent	(1) Does Not Meet Expectations
Answer indicates an understanding of differentiated instruction and the diverse needs of learners; clearly articulates how you as the teacher enhanced the learning of each student	Answer indicates an understanding of differentiated instruction and the diverse needs of learners; provides evidence of how you as the teacher enhanced the learning of each student	Answer lacks or does not indicate an understanding of differentiated instruction, the diverse needs of learners, and/or does not provide evidence of how you as the teacher enhanced the learning of each student

Criterion Score: 3.00

Changes Made Throughout [Professional Knowledge]

(3) Exemplary	(2) Competent	(1) Does Not Meet Expectations
Several examples of significant changes made throughout to adapt instruction to meet different learning styles and levels of ability	One example of a significant change made throughout to adapt instruction to meet different learning styles and levels of ability	Examples of a significant change made throughout to adapt instruction to meet different learning styles and/or levels of ability are missing

Criterion Score: 3.00

Changes I Would Make the Next Time [Professional Knowledge]

(3) Exemplary	(2) Competent	(1) Does Not Meet Expectations
Examples of what you would do differently the next time the unit or content is taught clearly demonstrates how to improve student learning	Examples of what you would do differently the next time the unit or content is taught demonstrates how to improve student learning	Examples of what you would do differently the next time the unit or content is taught does not demonstrate how to improve student learning, or is missing

Criterion Score: 3.00

Introduction

Pine Middle School is located in a smaller city in Virginia. The population of the city is just under 50,000 and there are just over 5,000 K-12 students in the school division. This city has seen a lot of growth in the past five years and this has translated to the school division as well as it has seen a 15% increase in students in just the last five years. The result of this growth seen in the school required the building of the new middle school, Pine Middle School, which was completed just in time to begin welcoming students in the fall of 2008.

Pine Middle School serves 600 students in grades 5-8. The school itself is quite diverse as 44% are White, 40% Hispanic, 13% Black, and 3% Asian. This diversity is celebrated in the school and is something that they take great pride in. Out of the 594 students in the school, 62 are recognized as having a disability, 403 are economically disadvantaged, and 270 are English Language Learners.

The school is split up into four main sections of the building where each grade level has a section. There is very little interaction between the grade levels other than loading and unloading the buses. Each grade level has at least one but often two Math, Science, English, and Social Studies teachers as well as a Resource teacher. The core classes are an hour long and the specials are 45 minutes. At Pine Middle School, they do not follow an even/odd schedule so the students have the same schedule every day.

The math classroom, and many other classrooms, has tables rather than desks. They are in groups of four, which change every couple of weeks, and do a lot of work in their groups. Before each class, we will fill the tubs that are located in the center of the tables with the materials that the students will need for the day. This is a way for us to save time and keep the materials organized. At the front of the classroom, there is a SMART Board with a whiteboard on either side. The SMART Board, document camera, and the

whiteboards are incorporated in just about every lesson. There are also two whiteboards on the back dividing wall where we will put up the objective, essential question, and homework assignment for the day. The students know that as they come into the classroom, they are to "start their day" which means write the date and day number in their notes as well as the objective and homework assignment.

The classroom that I have the privilege of serving is a 7th grade math classroom, which is led by a female teacher who is in her 14th year of teaching. She has been very consistent and firm when it comes to classroom management. The students know her expectations and we both made it clear to them that my expectations will be no different. The classroom is made up of twenty-five 12 and 13 year old students, 14 male and 11 female. Of the 24 students, 11 are Caucasian, 9 Hispanic, 2 of which are ELL students, 3 Black and 2 Asian. 11 of the 26 students come from low-income families recognized by their eligibility for free and reduced lunch.

After having already taught these groups of students for the better part of three weeks, I know that some students in particular have specific needs that need to be met. Student C is a really bright student and is always providing answers in class. Many of the other students get annoyed with him because of this. Student L cannot seem to work in a group. My cooperating teacher has tried several different groups and whatever group he is in, there is always a problem. Student N has been convinced by his guardians that he is a genius. Because of this, he does not feel like he needs to study or do his homework. It also affects him because he shuts down when he does not understand because he is afraid to ask questions. There are at least five or six students in the class who are extremely shy and will not speak to you unless you first talk to them. For these students, it is very difficult to tell if they understand the material or not because they do not communicate any difficulties with you.

For Student C, there are several enrichment problems and activities that I have him do in order to keep him interested. Student N has been coming up before school to get help with his homework. I make an effort to check on him during class and call on him for problems that I know that he knows in order to give him confidence. Differentiating for student L is difficult because we do a lot of group work. I try to keep an eye out for his group so that I can monitor them. I do not believe that it is my role to make introverts into extraverts. For the students in the class that are introverts, I will not force them to put problems on the board or call on them as much as I do the other students, but I do check in with them one-on-one at least once during every class so that I know how they are doing.

Along with many of the other lesson plans that I have taught here at Pine Middle School, I have been collaborating with my cooperating teacher as well as the other 7th grade math teacher while planning and teaching this unit. We usually decide together what we are going to teach and what assessments we are going to use. This has been a very helpful resource to me at times because there are many good ideas that come from the three of us talking together. Other times, however, it can become a bit of a challenge because there is some compromising that I must do to keep the consistency with the other teacher. Another valuable resource that I have for this lesson is the textbook. We decided that we were going to follow the textbook fairly closely for this chapter because we decided that it did a good job planning the unit. A few minor adjustments were made on the pacing of the unit but for the most part, plan to follow directly from the textbook. The chapter took a total of about 3 and half weeks to complete so I decided to focus this documentation of student learning on a portion of the chapter, plane transformations. The two unit outcomes for this unit are described as follows:

Unit Outcomes:

1.) The student will be able to apply transformations to plane figures in order to graph them correctly.

2.) The student will be able to find the coordinates of a figure after a transformation.

The unit outcomes for this unit cover difficult material. I need to be using many formative assessments throughout the unit to make sure that the students are learning the material. The two unit outcomes are very closely intertwined. I decided that I was going to determine the student's ability to plot points because this is an essential skill that they must have in order to graph the transformations. I gave them a worksheet for homework where they were to plot points and get the coordinates of points on the coordinate plane. We went over this homework together and every student was comfortable with plotting points. The prior knowledge for each individual lesson was assessed during the warm-ups for the lessons. It was important for me to determine this because of the difficulty of the content. Because the content built on itself, I had to be sure that the students were comfortable with the prior knowledge that they needed so that they had a good foundation for the unit.

For each of the transformations, some of them knew the words (reflection, rotation, translation, dilation) from other contexts but did not know what they meant in a mathematical context. I was able to use this prior knowledge and build upon it to give new context to words they already know. I know from previous experience with this group of students that many of the students in this math class are in the top of their class and are self-motivated learners. My cooperating teacher and I both agree with this assessment of the students and recognize that not all of the students fall into this category.

Lesson Plans

Day 1

Pre-Service Teacher: Date: 2/5/13

Course/Subject: Pre-Algebra Grade: 7th

Title of Unit: Angles and Polygons Title of Lesson: Polygons and Transformations

VA SOL(s): SOL 8.8 – The student will apply transformations to plane figures and identify applications of transformations.

Materials:
For Teacher: SMART Board Notes
Graph Paper
Worksheet
Exit Ticket
For Students: Colored Pencils
Blue Book

Instructional Objectives: Write 3 observable/measurable instructional objectives (one for every 30 minutes of instruction) using the ABCD format (**a**udience, **b**ehavior, **c**onditions & **d**egree of expectation).

1. The student will be able to perform a translation of a polygon correctly.

2. The student will be able to perform a dilation of a polygon correctly.

Task Analysis:

Prerequisite	Essential	Desired/Enrichment
The student must know how to graph polygons on a coordinate plane and understand points and ordered pairs.	The student will be able to perform a translation of a polygon correctly.	The student will be able to solve for any transformation of a polygon.
The student must know how to graph polygons on a coordinate plane and understand points and ordered pairs.	The student will be able to perform a dilation of a polygon correctly.	The student will be able to solve for any transformation of a polygon.

Assessment
Objective 1
1. The student will be able to perform a translation of a polygon correctly.

2. We are doing several guided practice examples where the students will have the opportunity to show me what they already know. I am going to be doing these problems with them and they will put them in their notes.

The independent practice is designed to see how well the students understood the guided practice examples and the lesson. I am going to have them work on these alone and then compare with their groups before we go over them.

The exit ticket is a summative assessment that I am going to use to see which students understood the lesson and which ones I need to check in with and re-teach them.

The homework is also a summative assessment where the students are going to complete the problems on their own and we will go over them the next day.

3. I am going to ask questions during the guided practice problems so that I can determine what the students already know. I am going to make colored pencils available to everyone so that they can keep track of the original figure and the image.

During the independent practice, I am going to be walking around the room helping those who are having trouble. Again, I will suggest that the student use the colored pencils to help keep track of the figures.

For the students who do not well on the exit ticket, I am going to call on them or at least check in with them tomorrow when we go over the homework.

Objective 2

1. The student will be able to perform a dilation of a polygon correctly.

2. We are doing several guided practice examples where the students will have the opportunity to show me what they already know. I am going to be doing these problems with them and they will put them in their notes.

The independent practice is designed to see how well the students understood the guided practice examples and the lesson. I am going to have them work on these alone and then compare with their groups before we go over them.

The exit ticket is a summative assessment that I am going to use to see which students understood the lesson and which ones I need to check in with and re-teach them.

The homework is also a summative assessment where the students are going to complete the problems on their own and we will go over them the next day.

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During the independent practice, I am going to be walking around the room helping those who are having trouble. Again, I will suggest that the student use the colored pencils to help keep track of the figures.

For the students who do not well on the exit ticket, I am going to call on them or at least check in with them tomorrow when we go over the homework.

Lesson Body:

Anticipatory Set: The warm-up is on the SMART Board. Begin working on the problem as I come around and check your homework.

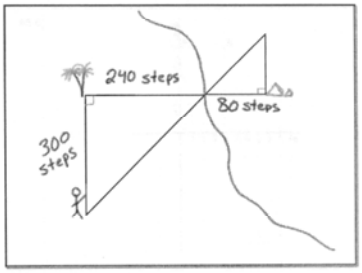
Instruction:

(Step-by-step procedures include teacher notes on content, teaching strategies, questions written out verbatim, guided practice, independent practice activities, and time allotments for each procedure.)	**Differentiation, Support Learning, & Adaptations** What modifications, accommodations, and adaptations will you make to meet the needs of your students?
1. Warm-up and check homework (7 mins) 2. Go over homework (8 mins) 3. SMART Board Notes **"If I translate from English to Spanish, I am not changing the words, I am simply moving it into a different language."** **"How many of you have gone to the eye doctor and had your eyes dilated? What happened to your pupils?"** (15 mins) 4. Guided Practice pg. 231-232 #5,6,11,12,13 (10 mins) 5. Go over problems from guided practice (5 mins) 6. Begin Homework (10 mins) 7. Exit Ticket (5 mins)	I want to start class with a warm up that we did not have time for yesterday. This is a way for me to check for understanding. I want to call on a variety of students after they have discussed in groups so that I can get a feel for how they did on the homework. I am asking these questions because I want to relate these terms to something that is hopefully familiar to many of the students. These are vocabulary terms that they know outside of math class and now we are giving them a different meaning. I am going to allow the students to use colored pencils so that they can keep track of the original figure as well as the image of the figure.

Closure: Pass out the exit ticket and have the students work on it before the end of class.

February 04, 2013

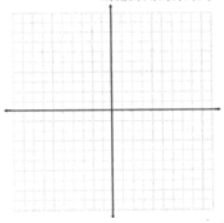
Warm-Up pg. 225 #12



Transformations

Translation - every point of the figure moves the same distance and in the same direction
*Also called a Slide
*Figure moves but does not turn

Translation Example Translate the following points 3 units left and 4 units up
A: (1,-2) B: (1, -5) C: (5,1) D: (5, -6)



Dilation - figure is made larger or smaller with respect to a fixed point called *center of dilation*

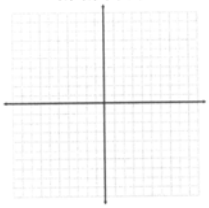
*The original figure and its image are similar

Scale Factor - the ratio of side lengths of the image to the corresponding side lengths of the original figure

Enlargement - scale factor is greater than 1

Reduction - scale factor is less than 1

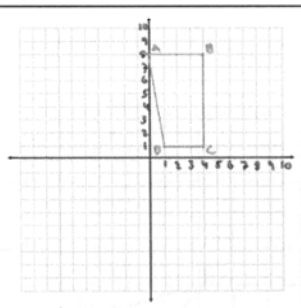
Dilation Example Draw the image of the kite after a dilation with a scale factor of 2. Identify the type of dilation.
F: (1,3) G:(2,4) H:(3,3) J:(2,1)



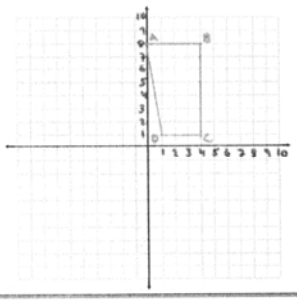
February 04, 2013

Work on pg. 231
#5, 6,11,12, and 13

#5-6



#11-13



Name _____ Date _____

8-10 Practice

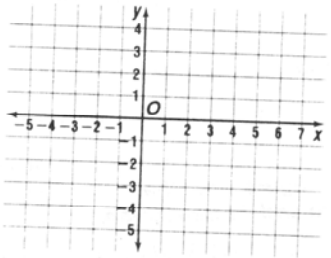
Integration: Geometry
Dilations

Find the coordinates of the image of each point for a dilation with a scale factor of $\frac{3}{2}$.

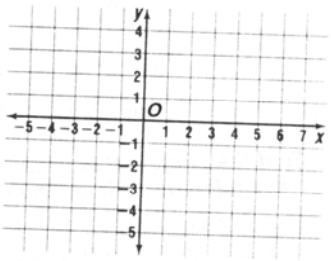
1. $A(4, 8)$
2. $B(3, 10)$
3. $C(-2, -5)$

Triangle PQR has vertices P(−2, 2), Q(3, 2), and R(0, −2). Find the coordinates of its image for a dilation with each given scale factor. Graph △PQR and each dilation.

4. 2



5. $\frac{1}{2}$



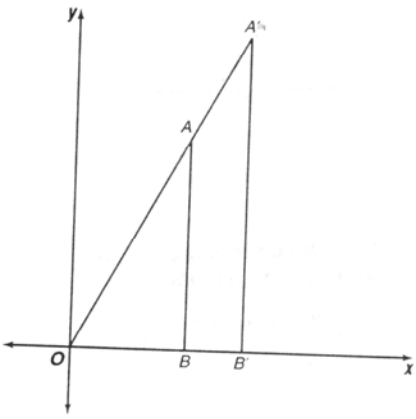
In the figure at the right, △A′OB′ is a dilation of △AOB.

6. Find the image of $A(3, 4)$ for a dilation with a scale factor of 3.

7. Find the image of $B(6, 0)$ for a dilation with a scale factor of 1.3.

8. Find the scale factor if $OA = 12$, $OB = 9$, and $OA' = 72$.

9. Find the length of $A'B'$ if AB is 32 inches long and the scale factor is 1.5.



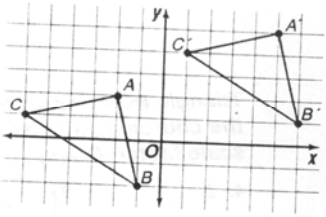
Name _____ Date _____

10-7 Study Guide

Integration: Geometry Translations

To **translate** a figure in the direction described by an ordered pair, add the ordered pair to the coordinates of each vertex of the figure.

Example **The vertices of $\triangle ABC$ are $A(-2, 2)$, $B(-1, -2)$, and $C(-6, 1)$. Graph the triangle. Then graph the triangle after a translation 7 units right and 3 units up.**



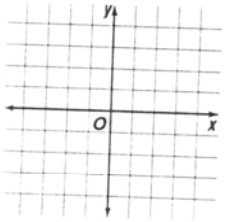
$A(-2, 2) + (7, 3) \longrightarrow A'(5, 5)$
$B(-1, -2) + (7, 3) \longrightarrow B'(6, 1)$
$C(-6, 1) + (7, 3) \longrightarrow C'(1, 4)$.

The vertices of the translated figure are $A'(5, 5)$, $B'(6, 1)$, and $C'(1, 4)$.

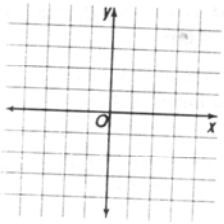
Graph $\triangle ABC$ and $\triangle A'B'C'$.

Find the coordinates of the vertices of each figure after the translation described. Then graph the figure and its translation.

1. $\triangle XYZ$ with vertices $X(-1, 2)$, $Y(2, 3)$, and $Z(3, -1)$, translated by $(-2, -3)$



2. polygon $KLMN$ with vertices $K(-1, 1)$, $L(-3, 0)$, $M(-2, -3)$, $N(0, -2)$, translated by $(4, 3)$



Find the coordinates of the vertices of each figure after the translation described.

3. $\triangle DEF$ with vertices $D(0, 5)$, $E(-1, 3)$, and $F(-3, 4)$, translated by $(2, -1)$

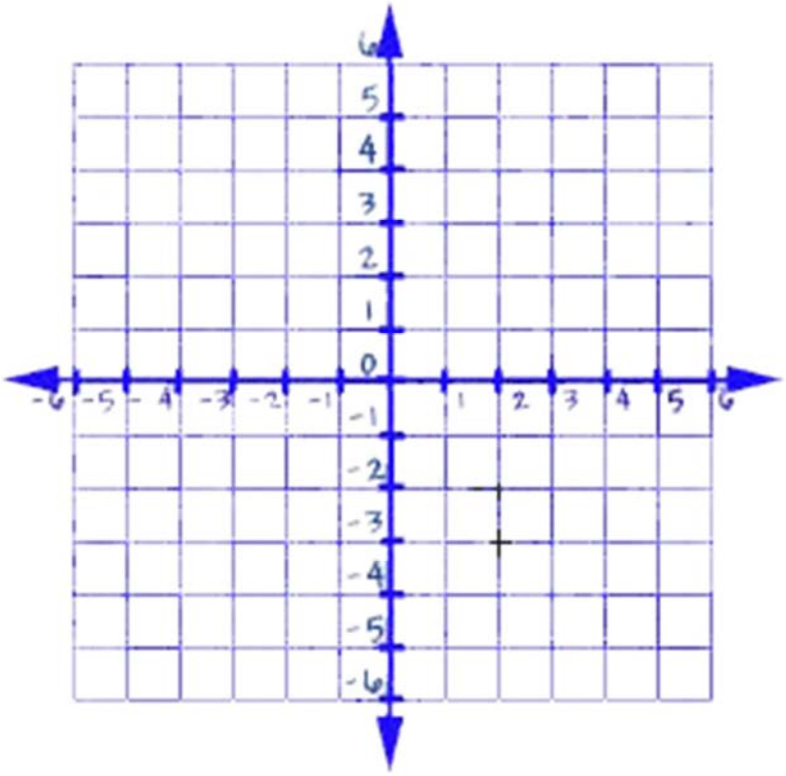
4. pentagon $ABCDE$ with vertices $A(4, -1)$, $B(3, 2)$, $C(1, 4)$, $D(-2, 1)$, and $E(-3, -3)$, translated by $(-2, 1)$

Exit Ticket

Name _____

Directions: Translate the following figure 2 units left and 3 units up and color that image RED.

Then, dilate the figure with a scale factor of 3 and color that figure BLUE.



Day 2

Eastern Mennonite University: Middle/Secondary School Lesson Design

Pre-Service Teacher: Date: 2/6/13

Course/Subject: Pre-Algebra Grade: 7th

Title of Unit: Angles and Polygons Title of Lesson: Polygons and Transformations

VA SOL(s): SOL 8.8 – The student will apply transformations to plane figures and identify applications of transformations.

Materials:
For Teacher: SMART Board Notes
Graph Paper
Worksheet
For Students: Colored Pencils
Blue Book

Instructional Objectives: Write 3 observable/measurable instructional objectives (one for every 30 minutes of instruction) using the ABCD format (**a**udience, **b**ehavior, **c**onditions & **d**egree of expectation).

1. The student will be able to perform a reflection of a polygon correctly.

2. The student will be able to perform a rotation of a polygon correctly.

Task Analysis:

Prerequisite	Essential	Desired/Enrichment
The student must know how to graph polygons on a coordinate plane and understand points and ordered pairs.	The student will be able to perform a reflection of a polygon correctly.	The student will be able to solve for any transformation of a polygon.
The student must know how to graph polygons on a coordinate plane and understand points and ordered pairs.	The student will be able to perform a rotation of a polygon correctly.	The student will be able to solve for any transformation of a polygon.

Assessment
Objective 1
1. The student will be able to perform a reflection of a polygon correctly.

2. We are doing several guided practice examples where the students will have the opportunity to show me what they already know. I am going to be doing these problems with them and they will put them in their notes.

The independent practice is designed to see how well the students understood the guided practice examples and the lesson. I am going to have them work on these alone and then compare with their groups before we go over them.
The homework is also a summative assessment where the students are going to complete the problems on their own and we will go over them the next day.

3. I am going to ask questions during the guided practice problems so that I can determine what the students already know. I am going to make colored pencils available to everyone so that they can keep track of the original figure and the image.

During the independent practice, I am going to be walking around the room helping those who are having trouble. Again, I will suggest that the student use the colored pencils to help keep track of the figures.

Objective 2
1. The student will be able to perform a rotation of a polygon correctly.

2. We are doing several guided practice examples where the students will have the opportunity to show me what they already know. I am going to be doing these problems with them and they will put them in their notes.

The independent practice is designed to see how well the students understood the guided practice examples and the lesson. I am going to have them work on these alone and then compare with their groups before we go over them.

The homework is also a summative assessment where the students are going to complete the problems on their own and we will go over them the next day.

3. I am going to ask questions during the guided practice problems so that I can determine what the students already know. I am going to make colored pencils available to everyone so that they can keep track of the original figure and the image.

During the independent practice, I am going to be walking around the room helping those who are having trouble. Again, I will suggest that the student use the colored pencils to help keep track of the figures.

Lesson Body:

Anticipatory Set: The warm-up is on the SMART Board. Begin working on the problem as I come around and check your homework.

Instruction:

(Step-by-step procedures include teacher notes on content, teaching strategies, questions written out verbatim, guided practice, independent practice activities, and time allotments for each procedure.)	**Differentiation, Support Learning, & Adaptations** What modifications, accommodations, and adaptations will you make to meet the needs of your students?

1. Warm-up and check homework (7 mins) 2. Go over homework (13 mins) 3. SMART Board Notes **"Is rotating clockwise by 180 and counterclockwise by 180 the same thing? Are there always two ways to get the same result"** **"Where do we hear the word reflection in everyday life?"** (15 mins) 4. Guided Practice pg. 231-232 #7-10 (15 mins) 5. Go over problems from guided practice (5 mins) Homework: Worksheet Front and Back	I want to start class with a warm up that we did not have time for yesterday. This is a way for me to check for understanding. I want to call on a variety of students after they have discussed in groups so that I can get a feel for how they did on the homework. I am asking these questions because I want to relate these terms to something that is hopefully familiar to many of the students. These are vocabulary terms that they know outside of math class and now we are giving them a different meaning. I am going to allow the students to use colored pencils so that they can keep track of the original figure as well as the image of the figure.

Closure: Tell the students what their homework is and explain the directions.

February 06, 2013

RACECAR

BOB

Never odd or even

MOM

EYE

Reflection - figure is reflected in a line called *the line of reflection*

*Creates a mirror image of the original figure

*Also called a flip

We can reflect across the x-axis or y-axis

BOB

RACECAR

EYE

Never odd or even

Plot the pentagon. Then, reflect across the y-axis and plot the image.

Pentagon vertices:

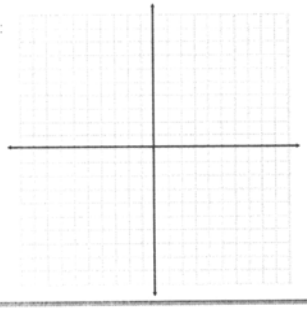
V (-4 , -5)

W(-4 , -1)

X(-2 , -1)

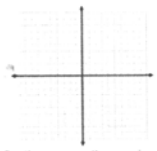
Y(-1 , -3)

Z(-2, -5)



Finding the image of a reflection without graphing

If reflecting across the x-axis:



If reflecting across the y-axis:

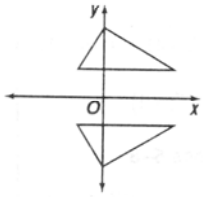
Switch signs of the opposite coordinate!!

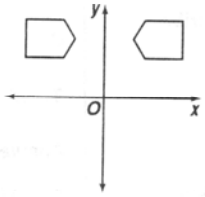
Name _____ Date _____

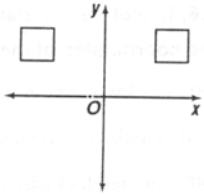
10-8 Practice

Integration: Geometry Reflections

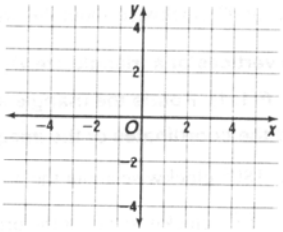
Name the line of symmetry for each pair of figures.

1. 

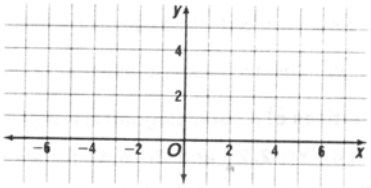
2. 

3. 

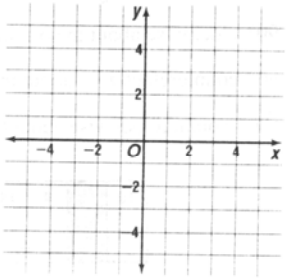
4. Graph $\triangle BAT$ with vertices $B(1, 1)$, $A(2, 3)$, and $T(5, 3)$
   a. Reflect $\triangle BAT$ over the x-axis.
   b. Reflect $\triangle BAT$ over the y-axis.



5. Graph parallelogram $KENT$ with vertices $K(1, 2)$, $E(5, 4)$, $N(7, 3)$, and $T(3, 1)$.
   a. Find the coordinates of the vertices after a reflection over the y-axis.
   b. Graph the parallelogram $K'E'N'T'$.



6. Graph $\triangle USA$ with vertices $U(0, 4)$, $S(4, 4)$, and $A(4, 0)$.
   a. Reflect $\triangle USA$ over the y-axis, and label $U'S'A'$.
   b. On the same coordinate plane, reflect $\triangle USA$ over the x-axis.
   c. On the same coordinate plane, reflect $U'S'A'$ over the x-axis.
   d. Write a statement describing the final appearance of the four graphs.



Day 3

Eastern Mennonite University: Middle/Secondary School Lesson Design

Pre-Service Teacher: Date: 2/7/13

Course/Subject: Pre-Algebra Grade: 7th

Title of Unit: Angles and Polygons Title of Lesson: Polygons and Transformations

VA SOL(s): SOL 8.8 – The student will apply transformations to plane figures and identify applications of transformations.

Materials:
For Teacher: SMART Board Notes
Graph Paper
In class Worksheet
Patty Paper
NLVM website for rotations
For Students: Colored Pencils
Homework worksheet

Instructional Objectives: Write 3 observable/measurable instructional objectives (one for every 30 minutes of instruction) using the ABCD format (**a**udience, **b**ehavior, **c**onditions & **d**egree of expectation).

1.The student will be able to perform a rotation of 90 degrees and 180 degrees counterclockwise and clockwise correctly.

Task Analysis:

Prerequisite	Essential	Desired/Enrichment
The student must know how to graph polygons on a coordinate plane and understand points and ordered pairs.	The student will be able to perform a rotation of 90 degrees and 180 degrees counterclockwise and clockwise correctly.	The student will be able to solve for any transformation of a polygon.

Assessment
Objective 1
1. The student will be able to perform a rotation of 90 degrees and 180 degrees counterclockwise and clockwise correctly.

2. We are doing several guided practice examples where the students will have the opportunity to show me what they already know. I am going to be doing these problems with them and they will put them in their notes.

The independent practice is designed to see how well the students understood the guided practice examples and the lesson. I am going to have them work on these alone and then compare with their groups before we go over them.

The homework is also a summative assessment where the students are going to complete the problems on their own and we will go over them the next day.

3. I am going to ask questions during the guided practice problems so that I can determine what the students already know. I am going to make colored pencils available to everyone so that they can keep track of the original figure and the image.

During the independent practice, I am going to be walking around the room helping those who are having trouble. Again, I will suggest that the student use the colored pencils to help keep track of the figures. The students will also be given patty paper so that they can trace the figure and get the image of the figure after the rotation is performed.

Lesson Body:

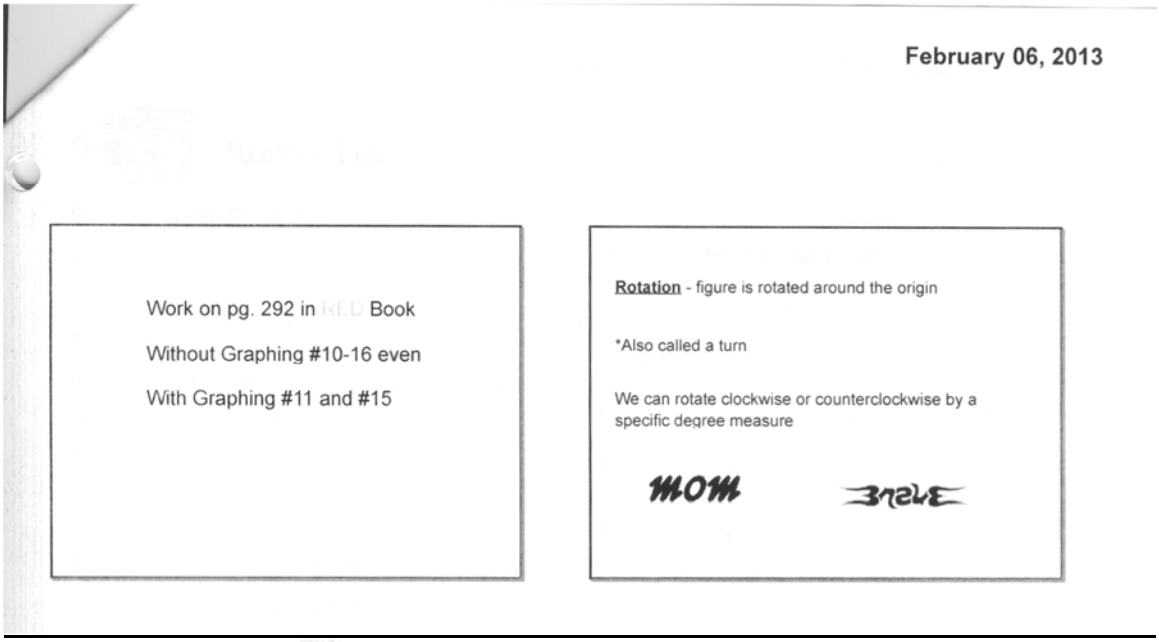
Anticipatory Set: The NLVM website is going to be the warm-up for today. The students will explore the website as they come in and they we will discuss together.

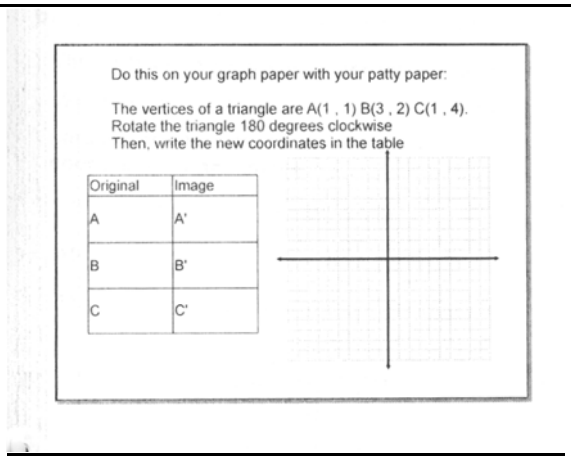
Instruction:

(Step-by-step procedures include teacher notes on content, teaching strategies, questions written out verbatim, guided practice, independent practice activities, and time allotments for each procedure.)	**Differentiation, Support Learning, & Adaptations** What modifications, accommodations, and adaptations will you make to meet the needs of your students?
1. Check and go over homework (12 mins) 2. NLVM demonstration **"What happens when we rotate the figure 90 degrees clockwise?"** (13 mins) 3. SMART Board Notes **"Is rotating clockwise by 180 and counterclockwise by 180 the same thing? Are there always two ways to get the same result"** (10 mins) 4. Guided Practice -Worksheet -use patty paper **"Read top part on your own and then explain to a partner how you find the coordinates before you graph the points."** (20 mins)	We will be going over the homework together. Today, I am going to display the answers on the screen so that they can see them and we can save a little bit of time. This is a virtual manipulative that I want to show the students so that they can visualize the rotations that are being performed. We are going to do an example together and I am going to see which students need help. I am going to allow the students to use colored pencils so that they can keep track of the original figure as well as the image of the figure. I am also going to have the students use patty paper so that they can trace the image after the rotation.

5. Go over problems from guided practice (5 mins) Homework: Back side of the worksheet	

Closure: Tell the students what their homework is and explain the directions.





ame _____ Date _____

7.3 Puzzle Time

What Jam Can't You Eat?

Write the letter of each answer in the box containing the exercise number.

The vertices of a triangle are $A(2, 3)$, $B(7, 4)$, and $C(6, 1)$. Rotate the triangle as described. Find the coordinates of the image.

1. 90° clockwise about the origin
2. 180° clockwise about the origin
3. 90° counterclockwise about the origin
4. 360° clockwise about the origin

The vertices of a triangle are $D(3, 4)$, $E(3, 1)$, and $F(1, 1)$. Rotate the triangle as described. Find the coordinates of the image.

5. 180° clockwise about the origin

8. 90° clockwise about the origin

7. 360° counterclockwise about the origin

6. 90° counterclockwise about the origin

The vertices of a parallelogram are $W(-6, 3)$, $W(-4, 4)$, $Y(-2, 2)$, and $Z(-4, 1)$. Rotate the parallelogram as described. Find the coordinates of the image.

9. 90° clockwise about the origin
10. 90° counterclockwise about the origin
11. 180° counterclockwise about the origin

Answers for Exercises 1–4

A. $A'(-3, 2)$, $B'(-4, 7)$, $C'(-1, 6)$

F. $A'(3, -2)$, $B'(4, -7)$, $C'(1, -6)$

C. $A'(-2, -3)$, $B'(-7, -4)$, $C'(-6, -1)$

T. $A'(2, 3)$, $B'(7, 4)$, $C'(6, 1)$

Answers for Exercises 5–8

F. $D'(-3, -4)$, $E'(-3, -1)$, $F'(-1, -1)$

J. $D'(4, -3)$, $E'(1, -3)$, $F'(1, -1)$

M. $D'(-4, 3)$, $E'(-1, 3)$, $F'(-1, 1)$

A. $D'(3, 4)$, $E'(3, 1)$, $F'(1, 1)$

Answers for Exercises 9–11

R. $W'(6, -3)$, $X'(4, -4)$, $Y'(2, -2)$, $Z'(4, -1)$

A. $W'(-3, -6)$, $X'(-4, -4)$, $Y'(-2, -2)$, $Z'(-1, -4)$

I. $W'(3, 6)$, $X'(4, 4)$, $Y'(2, 2)$, $Z'(1, 4)$

10		4	11	7	1	5	9	2		8	3	6

Day 4

Eastern Mennonite University: Middle/Secondary School Lesson Design

Pre-Service Teacher: Date: 2/8/13

Course/Subject: Pre-Algebra Grade: 7th

Title of Unit: Angles and Polygons Title of Lesson: Rotations

VA SOL(s): SOL 8.8 – The student will apply transformations to plane figures and identify applications of transformations.

Materials:
For Teacher: Graph Paper
In class Worksheet
Transformation Rules worksheet
Patty Paper
For Students: Colored Pencils

Instructional Objectives: Write 3 observable/measurable instructional objectives (one for every 30 minutes of instruction) using the ABCD format (**a**udience, **b**ehavior, **c**onditions & **d**egree of expectation).

1.The student will be able to perform a rotation of 90 degrees and 180 degrees counterclockwise and clockwise correctly.

Task Analysis:

Prerequisite	Essential	Desired/Enrichment
The student must know how to graph polygons on a coordinate plane and understand points and ordered pairs.	The student will be able to perform a rotation of 90 degrees and 180 degrees counterclockwise and clockwise correctly.	The student will be able to solve for any transformation of a polygon.

Assessment
Objective 1
1. The student will be able to perform a rotation of 90 degrees and 180 degrees counterclockwise and clockwise correctly.

2. We are doing several guided practice examples where the students will have the opportunity to show me what they already know. I am going to be doing these problems with them and they will put them in their notes.

The independent practice is designed to see how well the students understood the guided practice examples and the lesson. I am going to have them work on these alone and then compare with their groups before we go over them.

The homework is also a summative assessment where the students are going to complete the problems on their own and we will go over them the next day.

3. I am going to ask questions during the guided practice problems so that I can determine what the students already know. I am going to make colored pencils available to everyone so that they can keep track of the original figure and the image.

During the independent practice, I am going to be walking around the room helping those who are having trouble. Again, I will suggest that the student use the colored pencils to help keep track of the figures. The students will also be given patty paper so that they can trace the figure and get the image of the figure after the rotation is performed.

Lesson Body:

Anticipatory Set: "I need students to come up to graph their rotations from the homework on the board."

Instruction:

(Step-by-step procedures include teacher notes on content, teaching strategies, questions written out verbatim, guided practice, independent practice activities, and time allotments for each procedure.)	**Differentiation, Support Learning, & Adaptations** What modifications, accommodations, and adaptations will you make to meet the needs of your students?
1. Anticipatory set and check homework (20 mins)	I want the students to come up to the board to display some of their homework problems. The students at their seats are going to ask the presenter two questions so that they are actively listening.
2. Independent practice **"Read top part on your own and then explain to a partner how you find the coordinates before you graph the points."** (30 mins)	I am going to allow the students to use colored pencils so that they can keep track of the original figure as well as the image of the figure. I am also going to have the students use patty paper so that they can trace the image after the rotation.
3. Notes *Rules for all of the transformations* **"We already know the rule for rotating 180 degrees. What is the rule for rotating 90 degrees?"** (10 mins)	The rules for all of the transformations is something that I want all the students to have because it is important that they study these and know the rules.

Closure: "Your job this weekend is to study the rules for the transformations."

Name _____ Date _____

10-9 Study Guide

Integration: Geometry Rotations

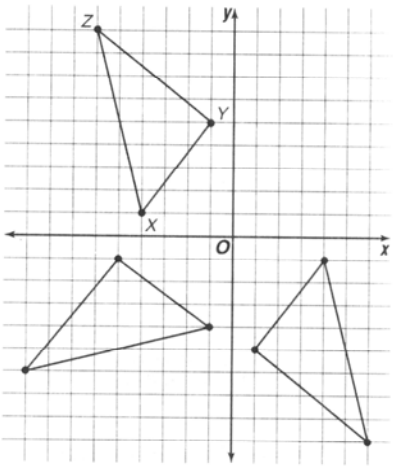
Triangle XYZ has vertices $X(-4, 1)$, $Y(-1, 5)$, and $Z(-6, 9)$.

To **rotate** $\triangle XYZ$ 180°, multiply each coordinate by -1.

$(-4, 1) \rightarrow (4, -1)$
$(-1, 5) \rightarrow (1, -5)$
$(-6, 9) \rightarrow (6, -9)$

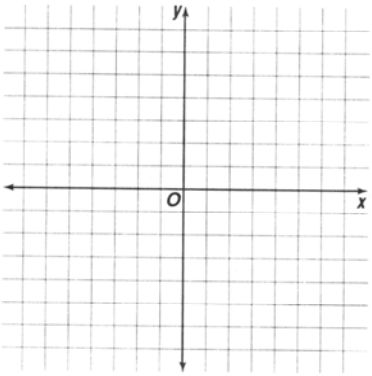
To rotate $\triangle XYZ$ 90° counterclockwise, switch the coordinates and multiply the first by -1.

$(-4, 1) \rightarrow (-1, -4)$
$(-1, 5) \rightarrow (-5, -1)$
$(-6, 9) \rightarrow (-9, -6)$



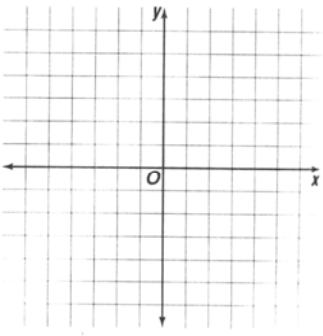
Triangle RST has vertices R(−2, −1), S(0, −4), and Y(−4, −7).

1. Graph $\triangle RST$.
2. Find the coordinates of the vertices after a 90° counterclockwise rotation. Graph the rotation.
3. Find the coordinates of the vertices after a 180° rotation. Graph the



Rectangle TWIN has vertices T(2, 1), W(6, 3), I(5, 5), and N(1, 3).

4. Graph rectangle $TWIN$.
5. Find the coordinates of the vertices after a 90° counterclockwise rotation. Graph the rotation.
6. Find the coordinates of the vertices after a 180° rotation. Graph the rotation.



Transformation Rules

Transformation	Rule	Example
Translation		
Dilation		
Reflection x-axis		
y-axis		
Rotation 180 degrees		
90 degrees clockwise		
90 degrees counter-clockwise		

Day 5

Eastern Mennonite University: Middle/Secondary School Lesson Design

Pre-Service Teacher: Date: 2/11/13

Course/Subject: Pre-Algebra Grade: 7th

Title of Unit: Angles and Polygons Title of Lesson: Transformations

VA SOL(s): SOL 8.8 – The student will apply transformations to plane figures and identify applications of transformations.

Materials:
For Teacher: Geometer's Sketchpad Assignment and Rubric (attached in different document)
Book Computer Lab
For Students: Pencil
Rules worksheet

Instructional Objectives: Write 3 observable/measurable instructional objectives (one for every 30 minutes of instruction) using the ABCD format (**a**udience, **b**ehavior, **c**onditions & **d**egree of expectation).

1. The student will be able to write down an explanation of all four of the transformations that we covered in class in their own words.

Task Analysis:

Prerequisite	Essential	Desired/Enrichment
The students must have a background of each of the four transformations and know the basics of the rules.	The student will be able to write down an explanation of all four of the transformations that we covered in class in their own words.	The students will be able to apply any of the four transformations correctly.

Assessment
Objective 1
1. The student will be able to write down an explanation of all four of the transformations that we covered in class in their own words.

2. The homework that I gave over the weekend is an assessment that I will use to see what the students know about transformations. I want them to talk with others in the room about their answers so that I can see who is able to 'teach' their rules that they wrote and who needs to gain a bit more understanding.

We are going to be doing an activity in the computer lab which will have the students explore the transformations in detail and answer questions about them. I will collect the questions and grade them based on their responses.

3. Some of the students are not going to have solid answers for the rules. This is why we are going to go over the homework together after they talked with each other about it. I want to make sure that all of the students have correct definitions and examples so that they have something good to study from for their quiz.

Some of the students are going to have trouble with the activity because of understanding. I will walk around as they complete the activity and will check to make sure that they all understand the directions and what they are supposed to be doing. Some of the students have extreme difficulty writing in complete sentences. I will not penalize the students as harshly for the non-complete sentences as long as the mathematical understanding is there.

Lesson Body:

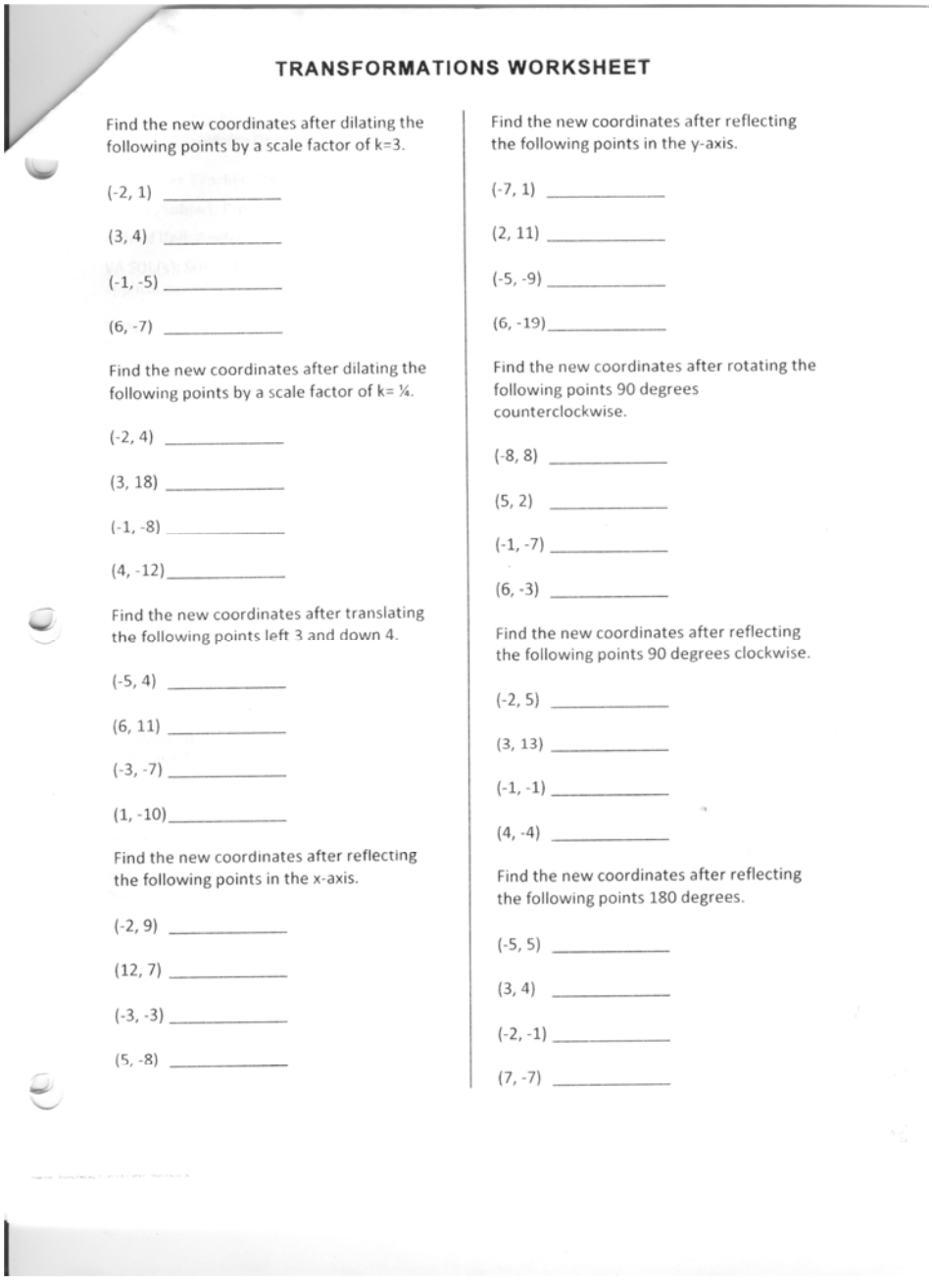
Anticipatory Set: "You need to talk with three different people in the class and compare your answers from the homework. You must discuss your explanations of the rules that you came up with over the weekend. I will time you for 1 minute and then we will switch partners."

Instruction:

(Step-by-step procedures include teacher notes on content, teaching strategies, questions written out verbatim, guided practice, independent practice activities, and time allotments for each procedure.)	**Differentiation, Support Learning, & Adaptations** What modifications, accommodations, and adaptations will you make to meet the needs of your students?
1. Anticipatory set and check homework (10 mins)	The students are going to talk with each other about the rules that they came up with over the weekend. I want them to talk with different people in the class so that they can hear different perspectives and explain their own.
2. Go over the homework (5 mins)	I want to go over the homework together so that the students have good definitions so that they can study for the quiz on Wednesday.
3. Directions for the Computer Lab Activity and travel to the lab *- You are going to follow the directions listed in the activity* *- The ONLY way you are going to benefit from this activity is if you take your time and do EVERYTHING that it asks you to do.* *- When it asks you to PREDICT, you must predict* *- You will fill out the question sheet and use complete sentences* *-You have plenty of time to work on this so PLEASE TAKE YOUR TIME!* *-You must answer the questions right after complete the transformation* (10 mins)	I am giving very explicit directions to the students so they know what is expected. I especially want to make clear that this is not a race and they should take their time. I know some students are going to rush through this and I want to make sure they know that it is not acceptable to do so.
4. Have students begin working on the computer lab activity	I will walk around the lab as the students work on the project so that I can help the

(30 mins) 5. Log out and pack up materials (5 mins)	students who are struggling with either the directions or the material.

Closure: "We will finish the activity in the computer lab on Tuesday. Be sure to study your transformations rules worksheet.



TRANSFORMATIONS WORKSHEET

Find the new coordinates after dilating the following points by a scale factor of k=3.

(-2, 1) _____

(3, 4) _____

(-1, -5) _____

(6, -7) _____

Find the new coordinates after dilating the following points by a scale factor of k= ¼.

(-2, 4) _____

(3, 18) _____

(-1, -8) _____

(4, -12) _____

Find the new coordinates after translating the following points left 3 and down 4.

(-5, 4) _____

(6, 11) _____

(-3, -7) _____

(1, -10) _____

Find the new coordinates after reflecting the following points in the x-axis.

(-2, 9) _____

(12, 7) _____

(-3, -3) _____

(5, -8) _____

Find the new coordinates after reflecting the following points in the y-axis.

(-7, 1) _____

(2, 11) _____

(-5, -9) _____

(6, -19) _____

Find the new coordinates after rotating the following points 90 degrees counterclockwise.

(-8, 8) _____

(5, 2) _____

(-1, -7) _____

(6, -3) _____

Find the new coordinates after reflecting the following points 90 degrees clockwise.

(-2, 5) _____

(3, 13) _____

(-1, -1) _____

(4, -4) _____

Find the new coordinates after reflecting the following points 180 degrees.

(-5, 5) _____

(3, 4) _____

(-2, -1) _____

(7, -7) _____

Day 6

Eastern Mennonite University: Middle/Secondary School Lesson Design

Pre-Service Teacher: Date: 2/12/13

Course/Subject: Pre-Algebra Grade: 7th

Title of Unit: Angles and Polygons Title of Lesson: Transformations (Finish Activity)

VA SOL(s): SOL 8.8 – The student will apply transformations to plane figures and identify applications of transformations.

Materials:
For Teacher: Geometer's Sketchpad Assignment and Rubric (attached in different document)
Book the Computer Lab
For Students: Pencil
Rules worksheet

Instructional Objectives: Write 3 observable/measurable instructional objectives (one for every 30 minutes of instruction) using the ABCD format (**a**udience, **b**ehavior, **c**onditions & **d**egree of expectation).

1. The student will be able to write down an explanation of all four of the transformations that we covered in class in their own words.

Task Analysis:

Prerequisite	Essential	Desired/Enrichment
The students must have a background of each of the four transformations and know the basics of the rules.	The student will be able to write down an explanation of all four of the transformations that we covered in class in their own words.	The students will be able to apply any of the four transformations correctly.

Assessment
Objective 1
1. The student will be able to write down an explanation of all four of the transformations that we covered in class in their own words.

2. The homework that I gave over the weekend is an assessment that I will use to see what the students know about transformations. I am giving them the answers to the worksheet so that they can check them on their own before the quiz on Wednesday.

We are going to be doing an activity in the computer lab which will have the students explore the transformations in detail and answer questions about them. I will collect the questions and grade them based on their responses.

3. Some of the students are going to struggle with the homework from the previous day. I am giving them the answers on a worksheet so they know how they did and what they need to study for their quiz on Wednesday.

Some of the students are going to have trouble with the activity because of understanding. I will walk around as they complete the activity and will check to make sure that they all understand the directions and what they are supposed to be doing. Some of the students have extreme difficulty writing in complete sentences. I will not penalize the students as harshly for the non-complete sentences as long as the mathematical understanding is there.

Lesson Body:

Anticipatory Set: "We are walking quietly to the computer lab to finish the activity. Once we get there, log in and continue working on the activity."

Instruction:

(Step-by-step procedures include teacher notes on content, teaching strategies, questions written out verbatim, guided practice, independent practice activities, and time allotments for each procedure.)	**Differentiation, Support Learning, & Adaptations** What modifications, accommodations, and adaptations will you make to meet the needs of your students?
1. Hand out homework answers and go to the computer lab (2mins)	Some of the students are going to not do well on the homework. I am giving them the answers so that they can go back tonight and study what they need to. They will be able to ask me questions before/after school before their quiz.
2. Finish Computer Lab Activity <u>Questions to guide the students</u> **"What happens to the triangles as you move the vector?"** ***"See what is going to happen if the triangle is on the reflection axis. What happens to the points? Is that what you predicted?"*** ***"How did the actual results relate to your prediction that you made?"*** (45 mins)	I will walk around the lab as the students work on the project so that I can help the students who are struggling with either the directions or the material.
3. When the students are done with the activity, they can do the following things. 1. Turn in worksheet 2. Check homework 3. Work on pg. 231 and 232 odds to study for the quiz	Many of the students are going to finish early. For these students, I want them to have something productive to do so I am giving them ways to study for their quiz tomorrow.

Closure: "Check your answers to the homework and make sure to study for your quiz!"

Day 7

Quiz (Included is 7 of the 14 questions that deal with the unit)

February 12, 2013

Pre-Algebra Quiz
5.1-5.5

Grade: «grade»
Subject: «subject»
Date: «date»

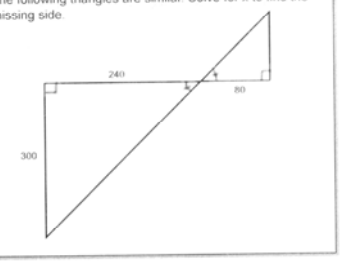
1 Translate the point (3,-4) 2 units to the left and 6 units up. What are the coordinates of the new point?

2 Dilate the point (4,2) by a scale factor of k=1/2. What are the coordinates of the new point?

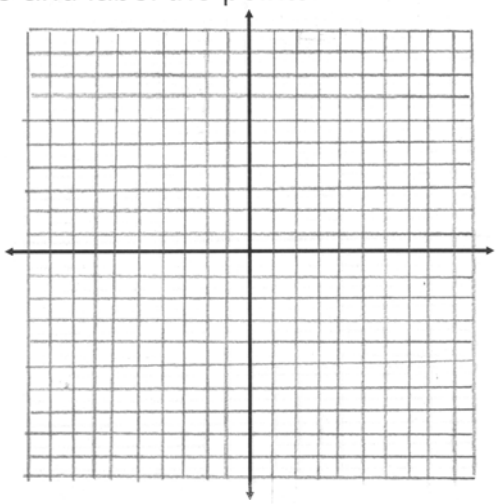
3 Reflect the point (5,-3) across the x-axis. What are the coordinates of the new point?

4 Rotate the point (-5,-9) 180 degrees. What are the coordinates of the new point?

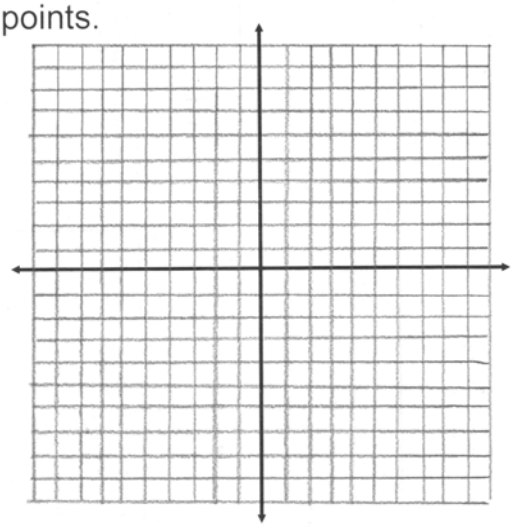
5 The following triangles are similar. Solve for x to find the missing side.



13. The vertices of a pentagon are V(-4,-5), W(-4,-1), X(-2,-1), Y(-1,-3), and Z(-2,-5). Reflect the pentagon across the y-axis. Plot both the original pentagon and the image and label the points.



14. The vertices of a triangle are S(2,-3), T(2,1), and U(-3,0). Translate the triangle 2 units right and 6 units up. Plot both the original triangle and the image and label the points.



15

Day 8

Group Quiz

(Same quiz, just open notes and open book and can work in groups)

Following Days…

*I finished the chapter and then gave a two-part test, the second part being on transformations and the other section of the chapter (included is 8 of the 12 questions that deal directly with this unit)

Name: _____ Class: _____ Date: _____ ID: A

Chapter 5 Test Part 2

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Translate the trapezoid T(-4,-2) V(-3,-2) W(-2,-5) X(-5,-5) 2 units right and 4 units up.

a. $T'(-2, 2)$, $V'(-1, 2)$, $W'(0, -1)$, $X'(-3, -1)$
b. $T'(-2, -6)$, $V'(-1, -6)$, $W'(0, -9)$, $X'(-3, -9)$
c. $T'(0, 0)$, $V'(1, 0)$, $W'(2, -3)$, $X'(-1, -3)$
d. $T'(-6, 2)$, $V'(-5, 2)$, $W'(-4, -1)$, $X'(-7, -1)$

____ 2. Reflect the triangle F(-5,0) T(-6,3) V(0,3) across the y-axis.

a. $R'(5, 0)$, $T'(6, -3)$, $V'(0, -3)$
b. $R'(-5, 0)$, $T'(-6, 3)$, $V'(0, 3)$
c. $R'(-5, 0)$, $T'(-6, -3)$, $V'(0, -3)$
d. $R'(5, 0)$, $T'(6, 3)$, $V'(0, 3)$

____ 3. Reflect the following triangle R(1,4) T(5,6) V(4,5) across the x-axis.

a. $R'(-1, -4)$, $T'(-5, -6)$, $V'(-4, -5)$
b. $R'(-1, 4)$, $T'(-5, 6)$, $V'(-4, 5)$
c. $R'(1, -4)$, $T'(5, -6)$, $V'(4, -5)$
d. $R'(1, 4)$, $T'(5, 6)$, $V'(4, 5)$

____ 4. Rotate the quadrilateral E(2,4) F(5,4) G(4,1) H(1,1) 90° clockwise about the origin.

a. $E'(-4, 2)$, $F'(-4, 5)$, $G'(-1, 4)$, $H'(-1, 1)$
b. $E'(-2, -4)$, $F'(-5, -4)$, $G'(-4, -1)$, $H'(-1, -1)$
c. $E'(4, -2)$, $F'(4, -5)$, $G'(1, -4)$, $H'(1, -1)$
d. $E'(-4, -2)$, $F'(-4, -5)$, $G'(-1, -4)$, $H'(-1, -1)$

Name: _____ ID: A

_____ 5. Rotate the quadrilateral M(-4,1) N(-6,6) P(-3,6) Q(-1,1) 90° counterclockwise about the origin.

a. $M'(-1, 4), N'(-6, 6), P'(-6, 3), Q'(-1, 1)$
b. $M'(-1, -4), N'(-6, -6), P'(-6, -3), Q'(-1, -1)$
c. $M'(1, 4), N'(6, 6), P'(6, 3), Q'(1, 1)$
d. $M'(4, 1), N'(6, 6), P'(3, 6), Q'(1, 1)$

_____ 6. Rotate the quadrilateral D(-4,3) E(-5,5) F(-3,5) G(-2,3) 180° about the origin.

a. $D'(4, -3), E'(5, -5), F'(3, -5), G'(2, -3)$
b. $D'(-3, -4), E'(-5, -5), F'(-5, -3), G'(-3, -2)$
c. $D'(3, 4), E'(5, 5), F'(5, 3), G'(3, 2)$
d. $D'(-3, 4), E'(-5, 5), F'(-5, 3), G'(-3, 2)$

_____ 7. Dilate the triangle P(2,1) Q(2,3) R(4,1) with a scale factor of 3.

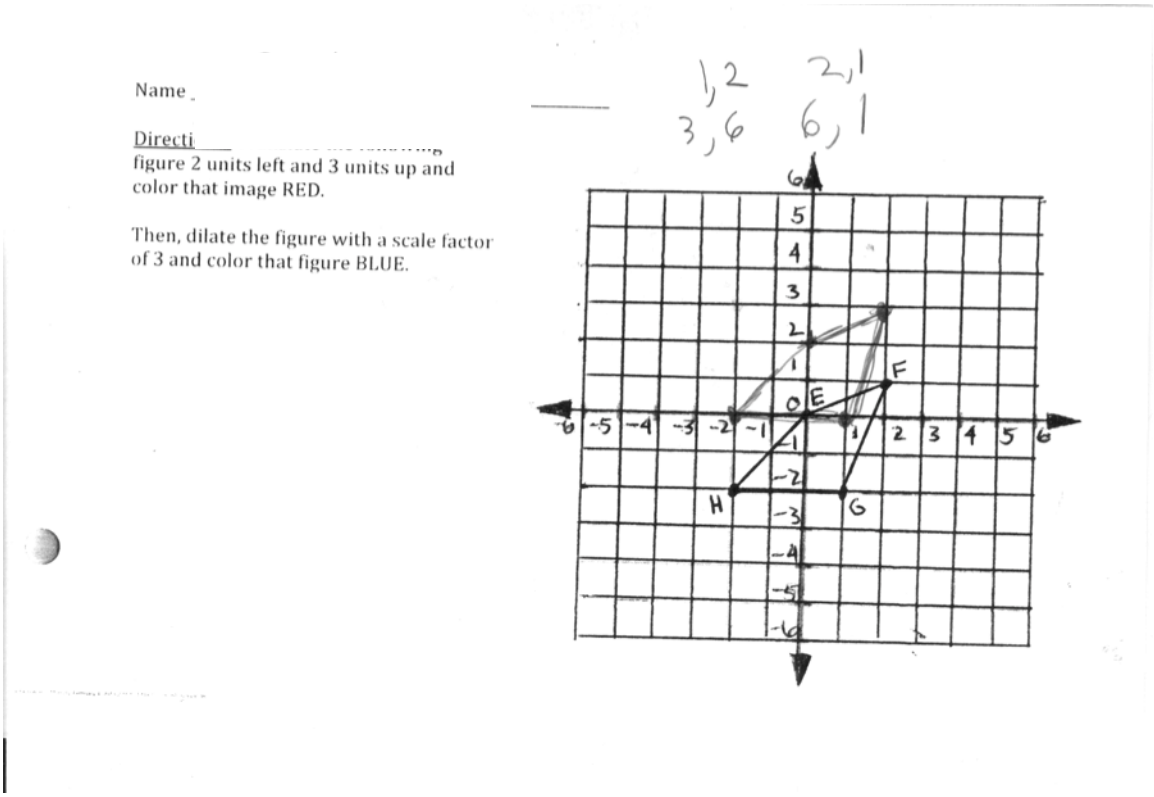
a. $P'(\frac{2}{3}, \frac{1}{3}), Q'(\frac{2}{3}, 1), R'(\frac{4}{3}, \frac{1}{3})$
b. $P'(6, 3), Q'(6, 9), R'(12, 3)$
c. $P'(6, 1), Q'(6, 3), R'(12, 1)$
d. $P'(2, 1), Q'(2, 3), R'(4,1)$

_____ 8. Dilate the triangle R(3,6) T(3,12) V(9,6) with a scale factor of 1/2.

a. R'(3/2,6) T'(3/2,12)V'(9/2,6)
b. R'(3/2,3) T'(3/2,6)V'(9/2,3)
c. R'(6,12) T'(6,24)V'(18,12)
d. R'(3,6) T'(3,12)V'(9,6)

Examples of Student Work

The first examples of student work come after the first lesson on translations and dilations. The following are examples from the exit ticket.

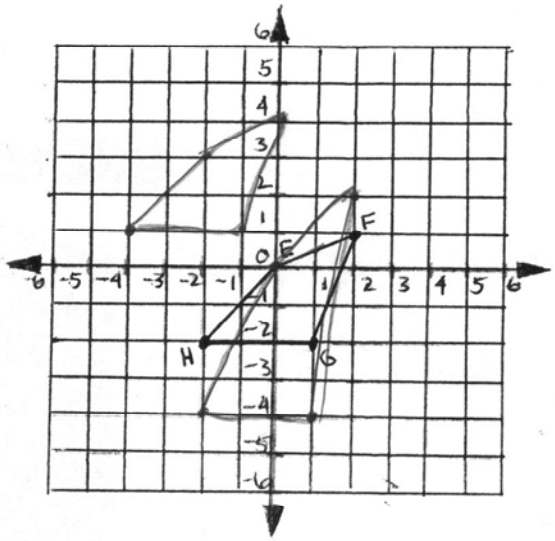


*low achieving student

Name _____

Directions: Translate the following figure 2 units left and 3 units up and color that image RED.

Then, dilate the figure with a scale factor of 3 and color that figure BLUE.



*middle achieving student

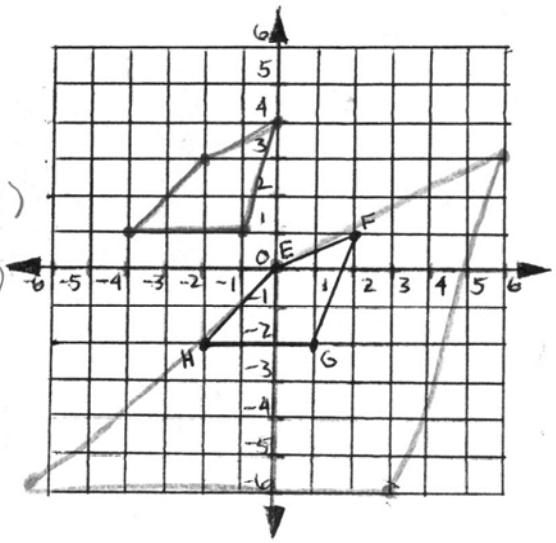
Name C

Directions: Translate the following figure 2 units left and 3 units up and color that image RED.

Then, dilate the figure with a scale factor of 3 and color that figure BLUE.

(0,0) (2,1) (1,-2) (-2,-2)

(0,0) (6,3) (3,-6) (-6,-6)



*high achieving student

The next examples of student work come from the transformation tour activity

Name: _____ Due: February 13, 2013

Transformation Tour

Geometry Standards

7.8 The student, given a polygon in the coordinate plane, will represent transformations (reflections, dilations, rotations, and translations) by graphing in the coordinate plane.

Rubric

This activity requires you to 'play' with each of the different types of transformations in order to understand how they each work. You will be assessed based on your written responses.

Written Responses to the questions (_____ out of 72 points)

- A correct response is provided for each of the 24 questions
- All responses are written using ***complete sentences*** and correct grammar.

Use of Time (_____ out of 28 points)

- Good use of time and stays on task
- Does not "speed through" the activity but takes time to look thoroughly at assignment

Final Grade (_____ out of 100 points)

Translation

1.) The vector is the slide that describes the New coordinates

2.) It slides it over to the amount selected

3.) That the Translation will be lower then the original one.

Reflection: x-axis

1.) You multiply the y-coordinates by -1.

2.) the y numbers signs have changed

3.) AS the red triangle goes farther away the Blue triangle does too.
As the red triangle comes closer the Blue triangle does the same.

4.) The ~~reflection~~ of the blue one will go right

Reflection: **y-axis**

1.) you change the sign's on the x- coordinates

2.) the X Coordinate change their signs

3.) They start to intersect

4.) The greenone goes to the other side of y-axis

Rotation

90 degree counterclockwise rotation

1.) Switch coordinates then multiply 2nd by -1

2.)

3.)

4.)

90 degree clockwise rotation

1.)

2.)

3.)

4.)

---

*low achieving student (did not complete final page)

Name _____ Due: February 13, 2013

Transformation Tour

Geometry Standards

7.8 The student, given a polygon in the coordinate plane, will represent transformations (reflections, dilations, rotations, and translations) by graphing in the coordinate plane.

Rubric

This activity requires you to 'play' with each of the different types of transformations in order to understand how they each work. You will be assessed based on your written responses.

Written Responses to the questions (_____ out of 72 points)
- A correct response is provided for each of the 24 questions
- All responses are written using ***complete sentences*** and correct grammar.

Use of Time (_____ out of 28 points)
- Good use of time and stays on task
- Does not "speed through" the activity but takes time to look thoroughly at assignment

Final Grade (_____ out of 100 points)

Translation

1.) It's like $\frac{\text{rise}}{\text{run}}$ you run right if positive and left if negative then you rise or go down

2.) The vector just moves the figure some where else but it stays the same

3.) Instead of going right you go left but the figure stays the same.

Reflection: x-axis

1.) change sign in y-coordinate

2.) If the second one is negative and it becomes positive and if it's positive it becomes negative

3.) They both are the same on both sides and if further they go the opposite way

4.) (-6, -3) (2, -4) (5, -2)

Reflection: **y-axis**

1.) change sign in x-coordinate

2.) change both coordinates

3.) It moves with the red △ and if further it still follows it

4.) (7,-2) (4,7) (3,2)

Rotation

90 degree counterclockwise rotation

1.) Switch coordinates the multiply^ by -1 1st

2.) the second # changes from positive to negative or negative to positive

3.) The blue one moves a different way

4.) (-2,-6) (-7,-4) (-1,-2) I switched them and multiplied 1st by -1 2nd

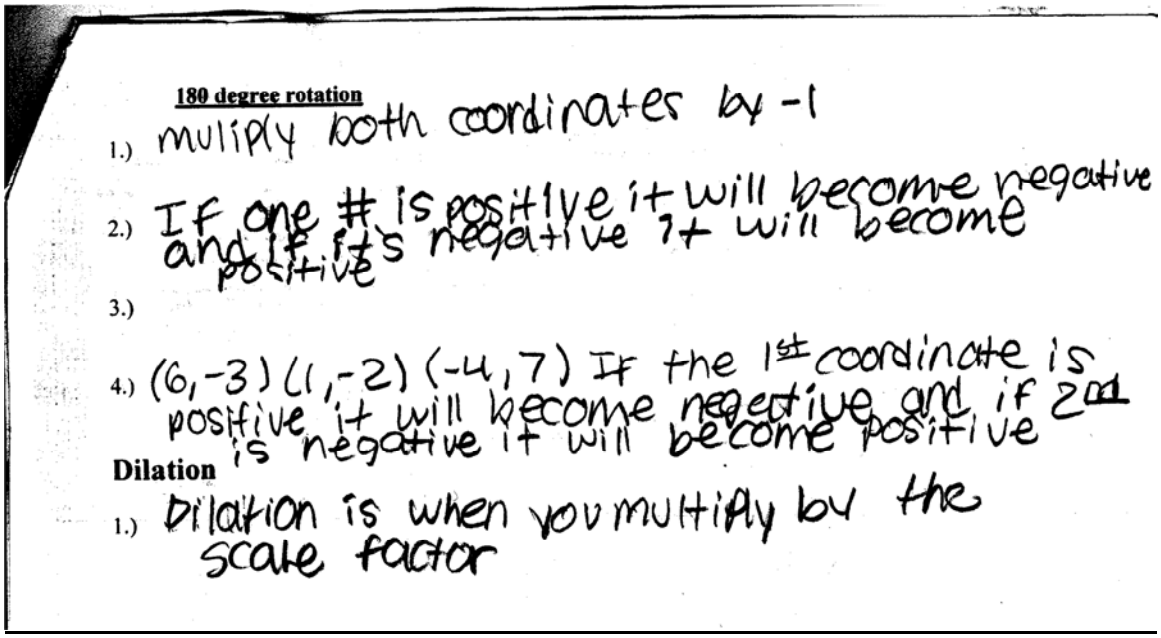
90 degree clockwise rotation

1.) switch coordinates then multiply^ by -1

2.) The coordinates switch sides and change to either positive or negative

3.) It goes the oppisite way

4.) (2,6) (7,4) (1,2) I switched them and multiplied 2nd by -1



180 degree rotation

1.) multiply both coordinates by -1

2.) If one # is positive it will become negative and if it's negative it will become positive

3.)

4.) (6,-3) (1,-2) (-4,7) If the 1st coordinate is positive it will become negative and if 2nd is negative it will become positive

Dilation

1.) Dilation is when you multiply by the scale factor

*middle achieving student

Name:_____ Due: February 13, 2013

Transformation Tour

Geometry Standards

7.8 The student, given a polygon in the coordinate plane, will represent transformations (reflections, dilations, rotations, and translations) by graphing in the coordinate plane.

Rubric

This activity requires you to 'play' with each of the different types of transformations in order to understand how they each work. You will be assessed based on your written responses.

Written Responses to the questions (_____ out of 72 points)

- A correct response is provided for each of the 24 questions
- All responses are written using ***complete sentences*** and correct grammar.

Use of Time (_____ out of 28 points)

- Good use of time and stays on task
- Does not "speed through" the activity but takes time to look thoroughly at assignment

Final Grade (_____ out of 100 points)

Translation

1.) The vector is the number of units that the shape moves in the translation.

2.) You add the vector to the coordinates to get the coordinates for the original.

3.) You can subtract from the original rather than add.

Reflection: x-axis

1.) The image is just a mirror image of the original across the x-axis

2.) The y-coordinate times 2 is the distance from the original point to the opposite point.

3.) It moves closer to the x-axis, or it moves farther away.

4.) A' and B' will be below and C' is below

Reflection: **y-axis**

1.) The image is just the same as the original except it is refleted over the y-axis.
2.) The x-coordinate 2x is the distance from the point to its mirror image point.
3.) The points move closer to the y-axis and if the red points go over so do the green points.
4.) A' and B' will be on the right and C' will be on the left.

Rotation

90 degree counterclockwise rotation

1.) The image is always 90° counterclockwise of the original.
2.) The coordinates are switched and the first ones sign is switched.
3.) The blue points are moved when you move the red points 90° counterclockwise.
4.) The quadrant counterclockwise to the one your original is in.

90 degree clockwise rotation

1.) The image is 90° clockwise to the original image.
2.) The coordinates are switched and the second ones sign is switched.
3.) The brown points are moved along with the red points.
4.) The quadrant is clockwise to the original quadrant.

180 degree rotation

1.) The image is rotated directly opposite to the original.
2.) They both switch signs.
3.) On this one it is moved directly across, so you don't need to switch the coordinates.
4.) The quadrant directly opposite the one your original image is in.

Dilation

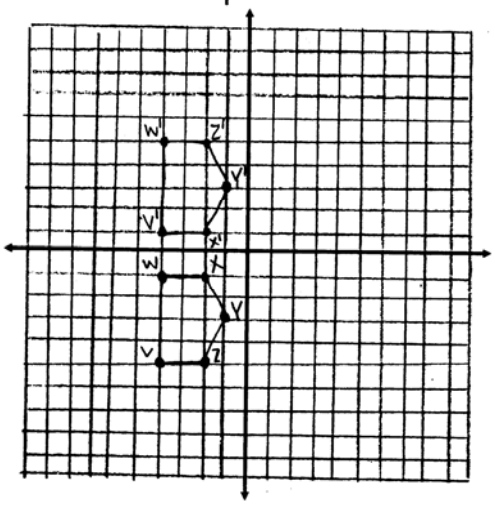
1.) You just multiply the scale factor by the coordinates.
- The ratio is the scale factor.
- That is the focal point for the dilation

*high achieving student

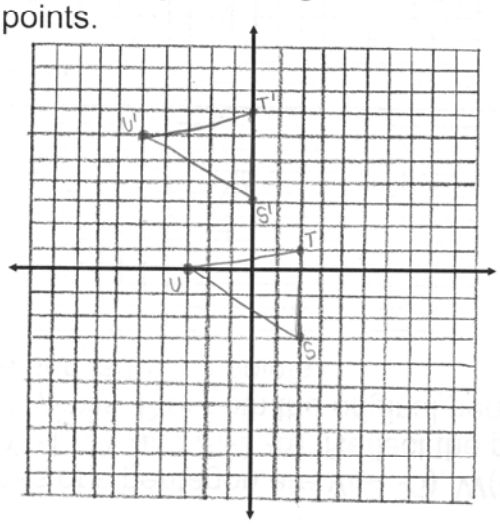
The next example of student work came from the quiz (the final questions of the quiz) that they completed individually

+ ½

13. The vertices of a pentagon are V(-4,-5), W(-4,-1), X(-2,-1), Y(-1,-3), and Z(-2,-5). Reflect the pentagon across the y-axis. Plot both the original pentagon and the image and label the points.



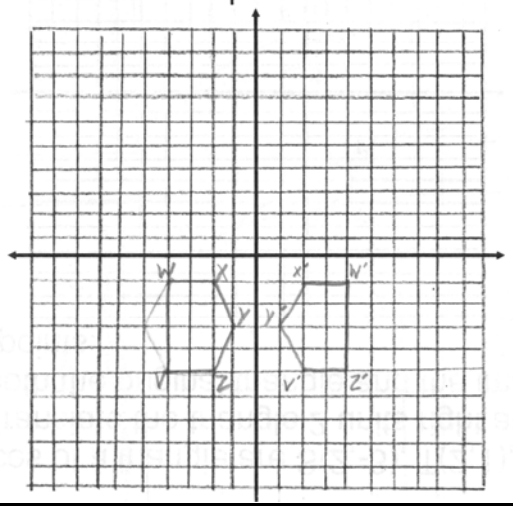
14. The vertices of a triangle are S(2,-3), T(2,1), and U(-3,0). Translate the triangle 2 units right and 6 units up. Plot both the original triangle and the image and label the points.



*low achieving student

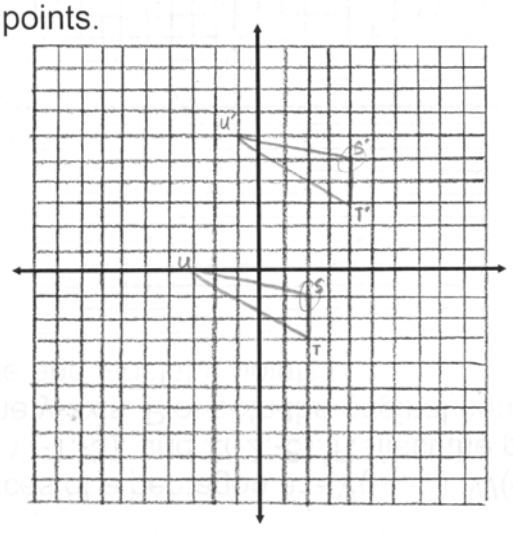
+1

13. The vertices of a pentagon are V(-4,-5), W(-4,-1), X(-2,-1), Y(-1,-3), and Z(-2,-5). Reflect the pentagon across the y-axis. Plot both the original pentagon and the image and label the points.



+ ½

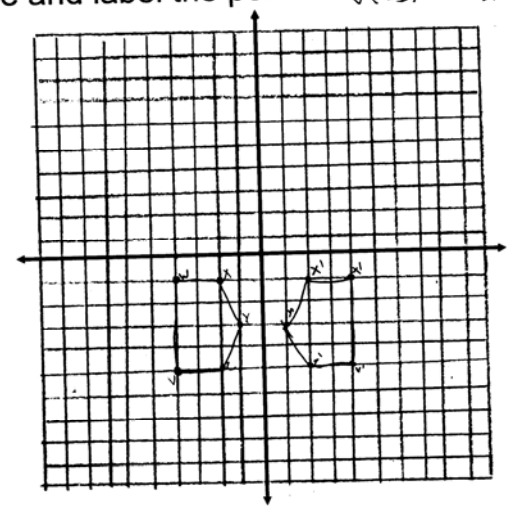
14. The vertices of a triangle are S(2,-3), T(2,1), and U(-3,0). Translate the triangle 2 units right and 6 units up. Plot both the original triangle and the image and label the points.



*middle achieving student

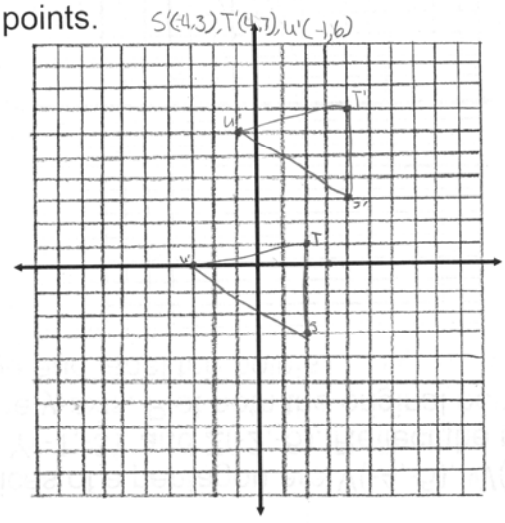
+1

13. The vertices of a pentagon are V(-4,-5), W(-4,-1), X(-2,-1), Y(-1,-3), and Z(-2,-5). Reflect the pentagon across the y-axis. Plot both the original pentagon and the image and label the points. V'(4,-5), W'(4,-1), X'(2,-1), Y'(1,-3) Z(2,-5)



+1

14. The vertices of a triangle are S(2,-3), T(2,1), and U(-3,0). Translate the triangle 2 units right and 6 units up. Plot both the original triangle and the image and label the points. S'(4,3), T'(4,7), U'(-1,6)



*high achieving student

Documentation of Student Learning

Below is a list of the grades that the students in my class received during this unit. Homework was graded on completion. It is blank if they were absent, a 70 if they turned it in to me late, and a 100 if they had it done on time. The class work is a participation grade and if they did it and were on task, they received 100. The first quiz was completed on their own and then the group quiz was the same quiz, just open notes and they could work together. The test was not open note and was individual. The averages for these different assignments are listed in the final row.

Student	Trans and Refl. **HW**	Rotations **HW**	Transf. **HW**	Computer Lab Activity **CW**	Transf. **Quiz**	Transf. Group **Quiz**	Ch.5 Review **CW**	Ch. 5 **Test** Part 2
A	100	100	100	100	68	100	100	75
B	100	100	100	100	96	100	100	100
C	100	100	100	100	96	92	100	100
D	100	100	100	100	79	83	100	100
E	100	100	100	100	86	83		66.7
F	100	0	100	100	82	83	100	91.7
G	100	100	100	100	57	92	100	91.7
H	100	0	100	100	82	100	100	75
I	100	100	100	100	93	83	100	83.3
J	100	100	100	100	79	83	100	
K	100	0	100	100	75	83		58.3

L	0	0	70	100	61	83	100	100
M	100	100	100	100	71	92	100	41.7
N	100	100	100	100	71	83	100	75
O	100		100	100	86	83	100	91.7
P	100	100	100	100	100	100	100	100
Q	100	100	100	100	100	83	100	100
R	100	100	100	100	96	100	100	75
S	100		100	100	78	83	100	75
T	100	100	100	100	57	92	100	100
U	100	100	100	100	79	83	100	100
V	100	100	100	100	71	83	100	75
W	100		100	100	61	83	100	58.3
X	100	0	100	100	78	83	100	75
Y	0	100	100	100	61	83	100	91.7
Avg	92%	100%	99%	100%	79%	88%	100%	84%

I want to look at each individual lesson to analyze the number of students who achieved the learning outcomes for the lesson.

In the first lesson, I wanted the students to be able to graph a translation and a dilation. They must know several things about these two transformations in order to do so. They must know the rules for finding the new points, they must know how to graph the new points, and they have to know what they are supposed to get for a result of the transformation. The exit ticket that I provided in the example of student

work gave me a good idea of which students understood and achieved the outcome and which ones did not. There were 3 examples like the one of the low-achieving student. These students did not have either of the transformations graphed correctly and they did not have any work that shows that they understood the rules they needed to know. There are about ten students who turned in an exit ticket that I would consider comparable to the middle achieving student's work. These students, just like in the example, had one of the transformations correct and the other was lacking in some area. Some of the students had the points correct but did not graph them correctly. Others had some of the points correct but not all of the points.

The remaining students achieved this learning objective. They had both the points and the graphs correct for both of the transformations.

The second lesson initially had two objectives. After the adjustments made from the data collected through my formative assessments, I decided that I needed to slow down and break these two objectives up into two or three days. For one thing, I spent about the first half of class reinforcing what I taught the previous day to ensure that every student had the opportunity to achieve the objectives from yesterday. Then, I used part of the homework to determine that all except five of my students achieved the first objective that was covered in the second half of the class. Those other five students were not low achieving, but they needed some extra examples and explanation (which came the next day when going over the homework).

The next two lessons were all covering rotations. I wanted to make sure that the students had enough practice and time with this objective as it was the most difficult of the four transformations. During the first day of rotations, we dealt with just graphing the rotation. This was done using tracing paper with the idea that I wanted them to be able to see what these rotations were suppoesed to look like. All of the students did okay with this part of the lesson and this was reinforced through the homework.

During the second day of rotations, I had the students discover through the in class worksheet what the rules for the different rotations were. For about half of the class, I knew that they achieved the objective because they discovered the rules from the worksheet. For another five or six students, I knew that they achieved the objective after we went over the worksheet together, because they were providing answers in class and then completed the homework correctly. The other five or six students did not achieve the objective. They had a hard time memorizing and using the rules as they were similar to each other and difficult to keep track of.

The transformations tour that we did for the next two class periods was something that I gave them a participation grade for but looked at to determine their understanding. There were three students that had low-achieving work similar to the one provided in the example. These students did not complete the assignement and the part that they did complete was very minimal. The student's work for the example that I provided was very basic and did not explore the nature of the transformations.

For the middle achieving student's work, I categorized this as such because some of the answers were very in depth while others were either incorrect or very basic. This showed me that the seven students who had work similar to this understood some of the transformations but not all of them.

The remaining fifteen students had work that showed me that they understood the transformations fully and achieved the objectives. Their answers were complete and they were complete for every one of the transformations.

By simply looking at the three quiz/test average scores, it is clear to me that there was some improvement and greater understanding between the quizzes and tests. This is so evident not only due to a 5% difference in the average score, but it was only 4% less than how they fared on the group quiz. I gave them the test about a week after the quiz, however, we did not do much more instruction. I wanted to mainly give them extra time to get tutoring help if they wanted it as well as time to study their rules for the transformations. Highlighted in yellow in the grade book are students with significant growth in that week and a half. There were six out of the twenty-five students who had at least a 20% difference in their scores.

There are a couple of scenarios that I want to discuss on how I know whether or not my students achieved the unit outcomes. The two unit outcomes were 1.) the student will be able to apply transformations to plane figures in order to graph them correctly. 2.) the student will be able to find the coordinates of a figure after a transformation. Both of these outcomes were addressed fully in the second part of the test. There were 8 questions in the beginning where the students had to find the new coordinates after a transformation, and for these questions, they had to graph

the transformations as well. So, if a student got a 100% on the test, as eight of my students did, I know that they achieved the unit outcomes. For the four students that got a 91.7%, it is safe to say that these students also achieved the unit outcomes, because they only missed one point and simply made a mistake. So I know for sure that 12 out of 25 students achieved the unit outcomes. These students had success for different reasons. Most of these students generally have had success this year in the math class. Many of these students were present and actively participating in each of the lessons. However, some of these students were some that made the most significant progress from the quiz to the test. This is due to their own responsibility and studying efforts either with me or own their own. These students are generally motivated by grades and it took the quiz to get them to see that they had to study for the test if they wanted to do well.

For the eight students who missed either two or three points, I know that they probably did not fully achieve the unit outcomes, as they probably did not know how to do a couple of the transformations. It is possible that they made a couple of mistakes, but after reviewing the tests and student's work, it was pretty clear that most of these students mixed up some of the rules for the transformations. If I were still in this placement, I would follow up with these students just to straighten out the slight kinks that they have.

So that leaves 4 students who I would say have definitely not achieved the unit outcomes. These students missed anywhere from four points to seven points in one case. Student E and student K are in very similar boats. They both missed some days due to absence and were both absent for the review the day before the test.

Neither of these students came to get help in the morning or stayed after school for support. I believe that with some extra one-on-one time spent with them, they would be able to achieve these unit outcomes fairly comfortably.

Student M did not achieve the unit outcomes. This students is one that needs careful attention because if you do not take time to address his needs, he will easily fall through the cracks. This student has social difficulties and does not benefit the way the other students do from group work and collaboration. Something that I would do differently is make sure that I check in with him on a daily basis with formative assessments and specific follow up so that I can gauge where he is at and he can gauge where he is at.

Student W is on of my ELL students. When looking through her tests and homeworks, it is clear that the vocabulary was a stumbling block for her. The rules worksheet that I gave to the students was not very helpful for her as there was a lot of words on the worksheet. This would have been very overwhelming for a student who has not mastered the language. She talked to me about getting help once during the unit and I attempted to use a hand-on way to represent the transformation in quesiton. She needs some extra support and differentiated instruction to break through the language barrier, but ultimately need more time to master the content.

Reflection of you impact on student learning

During each lesson, I was using many formative assessments to determine the level of understanding the students had for the topic. During the first lesson, I was simply walking around and observing the student's work as they did problems.

I concluded that the majority of the students were very comfortable with the objectives that I had for them and continued to progress through the lesson as planned. At the end, they completed an exit ticket where I could see who achieved the two objectives for the day. I found that there were many more students that did not achieve both objectives than I thought there would be from my formative assessments. I realized that I had to do something to supplement the formative assessments that I did in the first lesson. So the next lesson, I tried a thumbs up, thumbs down way to ask the students who understands and who needs more explanation. This proved to be very helpful and I responded to their responses by slowing down during the second lesson and pushing the rotations to the next day. I even found that rotations, as being the most difficult of the transformations, had to be spread out over two days because the students needed extra examples and practices with this transformation.

When we were going over the rules for the rotations, I realized that there is really no good way to know these rules other than to memorize them. I decided as a class that we were going to come up with mnemonics together to help the students remember the rules. I was very pleased to see that on the test, some of the students wrote down these mnemonics (ex. Cici's pizza, x, counter clockwise etc.) on the top of their test. I did not care if the students used them or not but it was good to see the students use them to achieve the objectives.

I tried to make my classes fun because it serves many different purposes. One is that it helps cut down on behavioral problems that I might have had otherwise. Another is that it helps the students feel comfortable with me and helps them have

fun learning the content. I believe that a fun classroom environment is one that encourages learning and often times, the students do not realize they are learning. For example, during this unit, I incorporated "hands up stand up" into my classroom. I wanted to think of a new way to have all of the students engaged in the lesson and hear their voice. So I would often use this when going over homework or practice problems. I would quickly read an answer and if they agreed with my answer, they would as quickly as possible stand up and raise their hand. The first one up was "the winner" and they got to explain why to the class. They had a lot of fun with this and did not even realize that their prize for winning was explaining their work to the class.

Similar to having fun while learning, I wanted to have my student moving as much as possible. I would have the students up at the SMART Board playing and manipulating different things, talking in the table groups, and even up stretching if I had been talking for a while. I believe that this kept the students' attention and broke up the lesson.

Something that I will do differently the next time that I teach this lesson is do the transformations tour activity before the lessons as a way to introduce the lesson. It would need some adjustments but I think that it would be a great way for the students to explore the transformations and have something to think about and visualize when we learn about them later in class. Instead, it was more of a way of review for most of them and for me to check to make sure they learned what they were supposed to have learned.

I would also incorporate more things from outside of class into these lessons. I did this somewhat by having pictures of some examples of transformations and talking about them but I think that it would be really beneficial for the students to bring in or think about transformations that they see outside of the math classroom (ie. Ceiling fan is a rotation, running on a basketball court is a translation, a matchbox car is a dilation, etc.). I think that this would give the students something to relate these topics to and help them remember what the different transformations are.