

Learning Goals

and

Unit Objectives

## Learning Goals and Objectives

### Part I: Learning Goals

#### Learning Goals

- Apply transformations and use symmetry to analyze mathematical situations
- The students will explore the different types of transformations to develop the formula for reflection translation and rotation on the coordinate plane

The students will demonstrate their knowledge about rigid transformations through an application

### Part II: Unit Objectives

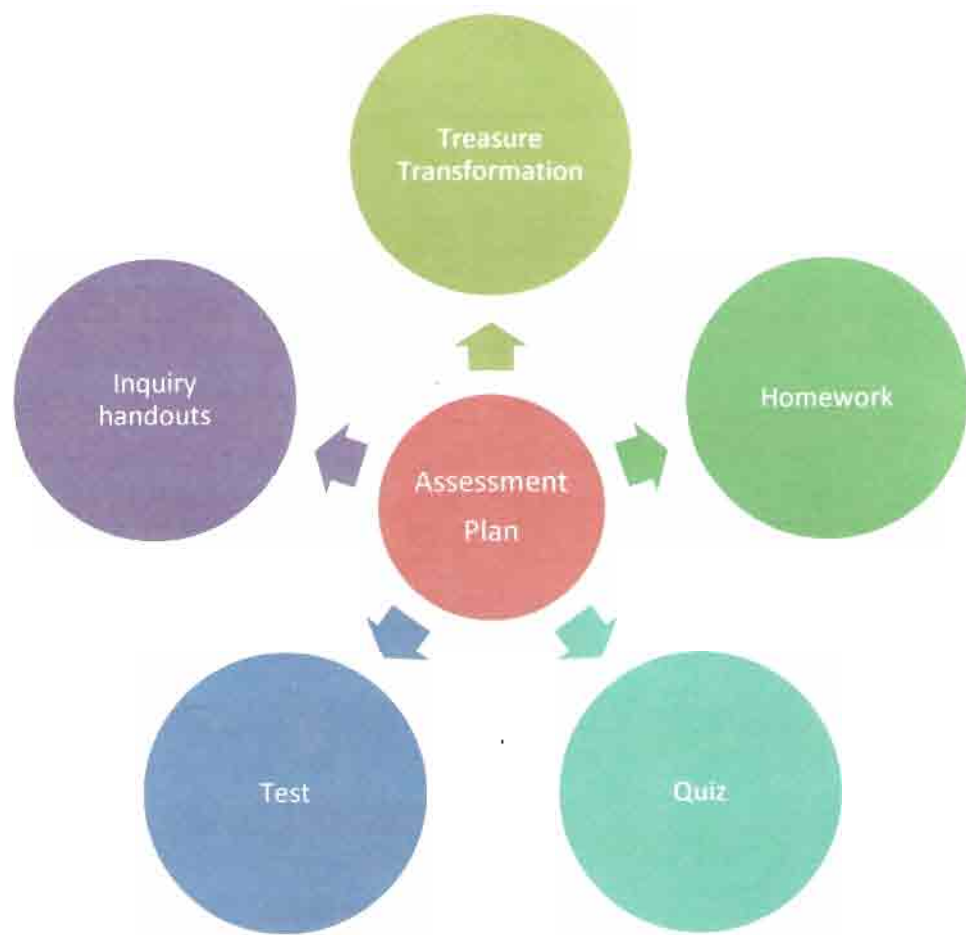
	Rhode Island Grade Span Expectations	NCTM standards	Depth of Knowledge Levels
Objective 1: Students will accurately perform rigid transformation on and off the coordinate plane across context.	M(G&M)–10–4 Applies the concepts of congruency by solving problems on or off a coordinate plane involving reflections, translations, or rotations; or solves problems using congruency involving problems within mathematics or across disciplines or contexts. (State)	Students should be able to understand and represent translations, reflections, rotations, and objects in the plane by using sketches and coordinates.	Level 2
Objective 2: The students will be able to determine what types of transformation occur within a given problem with an explanation.	M(G&M)–10–4 Applies the concepts of congruency by solving problems on or off a coordinate plane involving reflections, translations, or rotations; or solves problems using congruency involving problems within mathematics or across disciplines or contexts. (State)	Students should be able to use various representations to help understand the effects of simple transformations and their compositions.	Level 3

### Part III: Rational/Purpose

The purpose of this unit is to provide the students with to the skill they needed not only to pass NECAP assessment on Transformation that is a requirement of the system, but the skill to excel in other math courses as well. The students are expected to be able to accurately perform rigid transformation on and off the coordinate plane. The students will also be expected to be able to determine what types of transformation occur within a given problem with an explanation. Furthermore, the NCTM standards expected 9-12 graders to be able to understand and represent translations, reflections, rotations, and objects in the plane by using sketches and coordinates. They are also expected to be able to use various representations to help understand the effects of simple transformations and their composition. All these expectations will be required of the students when they move on to Algebra2 and Pre-calculus when they have to determine the transformations of functions as they relate to their parent function with explanation or by graphing. In Pre-calculus they use the concepts of rotation clockwise and counterclockwise to find conterminal angles.

# Assessment

## Plan



## Assessment Plan

Unit Objectives	Assessments	Justification for Assessment Methods	Adaptations
<p>1. Students will accurately perform rigid transformation on and off the coordinate plane.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Pre- Assessment</b> <ul style="list-style-type: none"> <li>• Chapter 9 Transformations Pretest</li> </ul> </li> <li><input type="checkbox"/> <b>Formative Assessment</b> <ul style="list-style-type: none"> <li><b>Reflection Assessment</b> <ul style="list-style-type: none"> <li>• Reflection on a Grid Activity</li> <li>• Reflection on the Coordinate Plan</li> <li>• 9-1 Reflection Worksheet</li> <li>• Reflection Quiz</li> </ul> </li> <li><b>Translation Assessment</b> <ul style="list-style-type: none"> <li>• Creating a Translation Riddle</li> <li>• Solving Transformation Riddle</li> <li>• Homework: Glencoe page 467 to 468 # 15-26 all, 27-37 odd</li> <li>• Exit Quiz: Translation</li> </ul> </li> <li><b>Rotation Assessment</b> <ul style="list-style-type: none"> <li>• Rotation on the Coordinate Plane</li> <li>• Homework: Glencoe page 479 # 13-15, 22-24, 27-32, and 35</li> </ul> </li> </ul> </li> <li><input type="checkbox"/> <b>Post Assessment</b> <ul style="list-style-type: none"> <li>• Treasure Hunt</li> <li>• Ch 9 Transformation Post Test</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>To assess what the students know about transformation before being taught.</b></li> <li><input type="checkbox"/> <b>Formative assessment is use to ensure the students have enough practice and understanding of transformation.</b> <ul style="list-style-type: none"> <li><b>Reflection Assessment:</b> <ul style="list-style-type: none"> <li>• Consists of problems on and off the coordinate plane and assessed the students' abilities to solve problem on and off the coordinate plan dealing with reflection.</li> </ul> </li> <li><b>Translation Assessment:</b> <ul style="list-style-type: none"> <li>• Consists of problems on and off the coordinate plane and assessed the students' abilities to solve problem on and off the coordinate plan dealing with translation.</li> </ul> </li> <li><b>Rotation Assessment:</b> <ul style="list-style-type: none"> <li>• Consists of problems on and off the coordinate plane and assessed the students' abilities to solve problem on and off the coordinate plan dealing with rotation.</li> </ul> </li> </ul> </li> <li><input type="checkbox"/> <b>Post Assessment is used to measure the students' progress from the beginning to the end.</b> <ul style="list-style-type: none"> <li>• Treasure Hunt is used to assess the students' knowledge on Rigid transformations as they perform a task on the coordinate plane.</li> <li>• The Ch 9 Transformation Post Test assesses the students' knowledge about rigid transformation in a formal assessment.</li> </ul> </li> </ul>	<p>Christopher R. has ADHD so the handouts and assessment must be organized in a step by step fashion. He also must be extra time on any assessments if needed.</p> <p>Cassie S. needs oral instruction and demonstration. If possible will grouped with Joe S. who is patient and understanding. If he is absent she will be grouped with Lisa H. and Alexandria C.</p> <p>Crystal prefers to work alone so she has to be grouped with one of the smart students who can help her understand better.</p> <p>The rest of the class has the option will work in groups to understand the materials better. Most of the class work assessments are done groups of two or three. Formal assessments done Individually.</p>

Unit Objectives	Assessments	Justification for Assessment Methods	Adaptations
<p>2. The students will be able to determine what types of transformation occur within a given problem with an explanation.</p>	<ul style="list-style-type: none"> <li>☐ <b>Pre- Assessment</b> <ul style="list-style-type: none"> <li>• Chapter 9 Transformations Pretest</li> </ul> </li> <li>☐ <b>Formative Assessment</b></li> <li><b>Reflection Assessment</b> <ul style="list-style-type: none"> <li>• Reflection Quiz</li> </ul> </li> <li><b>Translation Assessment</b> <ul style="list-style-type: none"> <li>• Creating a Translation Riddle</li> <li>• Solving Transformation Riddle</li> <li>• Homework: Glencoe page 467 to 468 # 15-26 all, 27-37 odd</li> <li>• Exit Quiz: Translation</li> </ul> </li> <li><b>Rotation Assessment</b> <ul style="list-style-type: none"> <li>• Rotation on the Coordinate Plane</li> <li>• Homework: Glencoe page 479 # 13-15, 22-24, 27-32, and 35</li> </ul> </li> <li>☐ Post Assessment <ul style="list-style-type: none"> <li>• Treasure Hunt</li> </ul> </li> <li>☐ Ch 9 Transformation Post Test</li> </ul>	<ul style="list-style-type: none"> <li>☐ To assess what the students know about transformation before being taught.</li> <li>☐ Formative assessment is use to ensure the students have enough practice and understanding of transformation. <ul style="list-style-type: none"> <li><b>Reflection Assessment:</b> <ul style="list-style-type: none"> <li>• Consists of problems on and off the coordinate plane and assessed the students' abilities to solve problem on and off the coordinate plan dealing with reflection.</li> </ul> </li> <li><b>Translation Assessment:</b> <ul style="list-style-type: none"> <li>• Consists of problems on and off the coordinate plane and assessed the students' abilities to solve problem on and off the coordinate plan dealing with translation.</li> </ul> </li> <li><b>Rotation Assessment:</b> <ul style="list-style-type: none"> <li>• Consists of problems on and off the coordinate plane and assessed the students' abilities to solve problem on and off the coordinate plan dealing with rotation.</li> </ul> </li> </ul> </li> <li>☐ Post Assessment is used to measure the students' progress from the beginning to the end. <ul style="list-style-type: none"> <li>• Treasure Hunt is used to assess the students' knowledge on Rigid transformations as they perform a task on the coordinate plane.</li> </ul> </li> <li>☐ The Ch 9 Transformation Post Test assesses the students' knowledge about rigid transformation in a formal assessment.</li> </ul>	<p>Christopher R. has ADHD so the handouts and assessment must be organized in a step by step fashion. He also must be extra time on any assessments if needed.</p> <p>Cassie S. needs oral instruction and demonstration. If possible will grouped with Joe S. who is patient and understanding. If he is absent she will be grouped with Lisa H. and Alexandria C.</p> <p>Crystal prefers to work alone so she has to be grouped with one of the smart students who can help her understand better.</p> <p>The rest of the class has the option will work in groups to understand the materials better. Most of the class work assessments are done groups of two or three. Formal assessments done Individually.</p>

## Part 2:

The formative assessments in the visual organizer are used to assess the students on going knowledge about Rigid Transformation. This allows the teacher to re-teach whenever it is necessary. These assessments consist of the Reflection, Translation and Rotation Assessment.

The Reflection on the Grid Activity assesses the students' understanding of Transformation with respect to reflection as they reflect objects over a horizontal, vertical or diagonal line. The Reflection on the Coordinate Plane worksheet assesses the students' understanding of Transformation in respect to reflection as they reflect objects on a coordinate plane over the x-axis, y-axis and the origin to produce a formula for each of these line of reflection. In this assessment the students will be grouped together for better understanding of the concepts being taught. 9-1 Reflection Worksheet gives students further practice on the reflection concepts and assesses their understanding of these concepts as homework. The reflection quiz assesses whether the students are prepared to move on into translation.

The Translation Riddle Activity assesses the students understanding of transformation in respect to translation and reflection as the students work together to perform a task where they have to write a riddle for the transformation they created with respect to translation and reflection. Solving Transformation Riddle assesses the students understanding of transformation as they decide what type of transformation was indicated within a riddle as well as its new location. The Exit Quiz: Translation is an exit slip used to assess the students understanding of transformation with respect to translation as they solve problems. The Homework: Glencoe page 467 to 468 # 15-26 all, 27-37 odd assesses the students understanding of transformation in respect to translation as the students solves the problem at home.



Rotation on Coordinate Plane handout assesses the students understanding of transformation in respect to rotation as the students rotate a triangle a certain degree counterclockwise or clockwise about the origin. The students were allowed to work together for this assessment. Homework: Glencoe page 479 # 13-15, 22-24, 27-32, and 35 assesses the students understanding of transformation in respect to rotation as they solve problems at home.

The treasure hunt assesses how well the students can apply their knowledge of transformation within a given situation. They are expected to use transformation and answer questions to reach the treasure. They also have to fill in a chart to indicate the new coordinates and what type of transformation was used.

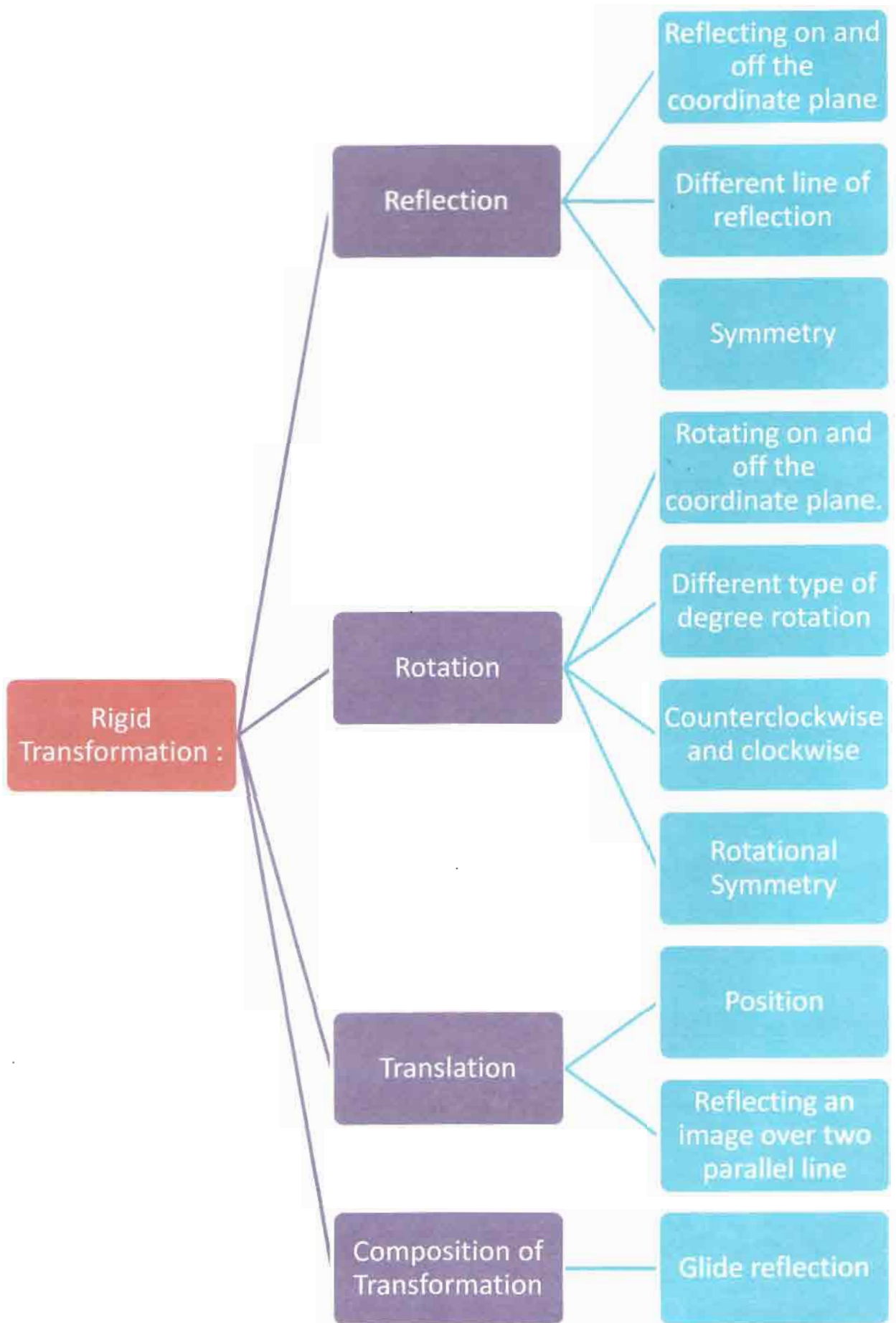
The homework will be graded base on a 3 2 1 0 rubric. A student gets a 3 if the homework is completed. He/she gets a 2 if he/she is missing 2 to 4 problems. He/she gets 1 if he/she is missing 5 to 7 problems. He/she gets 0 if he/she is missing half over more of the problems.

Design  
For  
Instruction

## Rigid Transformation Unit

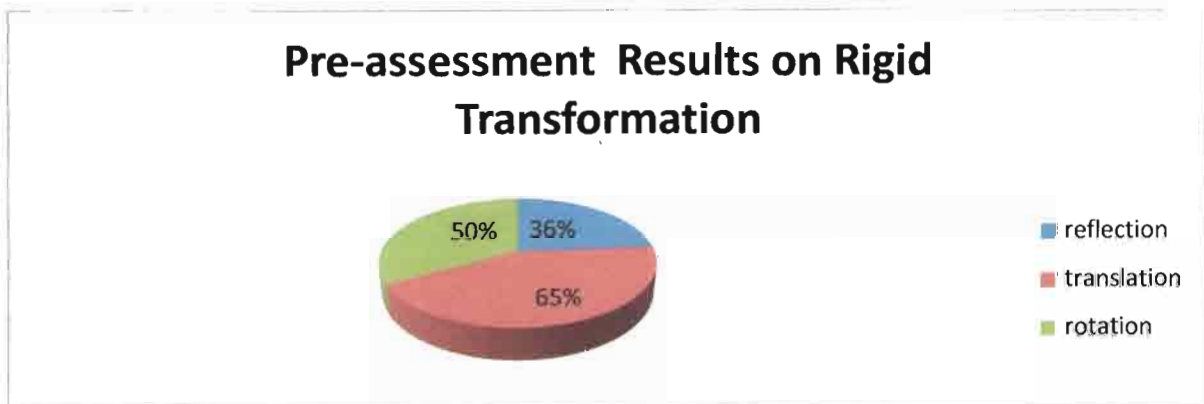
Lesson	Standards	Objectives	Activity	Assessments	Pacing
Reflection	<p>GSE: M(G&amp;M)–10–4 Applies the concepts of congruency by solving problems on or off a coordinate plane involving reflections, translations, or rotations; or solves problems using congruency involving problems within mathematics or across disciplines or contexts. (State)</p> <p>NCTM: Geo Students should be able to understand and represent translations, reflections, rotations, and objects in the plane by using sketches and coordinates.</p>	<p>The students will be able to</p> <ul style="list-style-type: none"> <li>• Draw reflected images.</li> <li>• Come up with the formula of reflection in the y-axis, x-axis, the line <math>y=x</math> and in the origin.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Reflection PowerPoint Notes</li> <li>➤ Reflection Handout</li> <li>➤ Reflectivity Quiz</li> </ul>	<ul style="list-style-type: none"> <li>▪ Handouts</li> <li>▪ Homework</li> <li>▪ Quiz</li> </ul>	<ul style="list-style-type: none"> <li>▪ 2 day</li> </ul>
Translation	<p>GSE: M(G&amp;M)–10–4 Applies the concepts of congruency by solving problems on or off a coordinate plane involving reflections, translations, or rotations; or solves problems using congruency involving problems within mathematics or across disciplines or contexts. (State)</p> <p>NCTM: Students should be able to understand and represent translations, reflections, rotations, and objects in the plane by using sketches and coordinates.</p> <p>NCTM: Students should be able to use various representations to help understand the effects of simple transformations and their compositions.</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Draw translated images using coordinates</li> <li>• Draw translated images by using repeated reflections</li> </ul>	<ul style="list-style-type: none"> <li>➤ Translation PowerPoint Notes</li> <li>➤ Translation Riddle</li> <li>➤ Translation Exit Quiz</li> </ul>	<ul style="list-style-type: none"> <li>▪ Homework</li> <li>➤ Translation Exit Quiz</li> </ul>	<ul style="list-style-type: none"> <li>▪ 1 day</li> </ul>
Rotation	<p>GSE: M(G&amp;M)–10–4 Applies the concepts of congruency by solving problems on or off a coordinate plane involving reflections, translations, or rotations; or solves problems using congruency</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Draw rotates images using the angle of rotation</li> </ul>	<ul style="list-style-type: none"> <li>➤ Rotation PowerPoint Notes</li> <li>➤ Rotation Manipulative</li> <li>➤ Rotation Handout</li> </ul>	<ul style="list-style-type: none"> <li>▪ Rotation Handout</li> <li>▪ Homework</li> </ul>	<ul style="list-style-type: none"> <li>▪ 2 days</li> </ul>

	<p>involving problems within mathematics or across disciplines or contexts. (State)</p> <p>NCTM: Students should be able to understand and represent translations, reflections, rotations, and objects in the plane by using sketches and coordinates.</p>				
Treasure Hunt	<p>GSE: M(G&amp;M)–10–4 Applies the concepts of congruency by solving problems on or off a coordinate plane involving reflections, translations, or rotations; or solves problems using congruency involving problems within mathematics or across disciplines or contexts. (State)</p> <p>NCTM: Students should be able to understand and represent translations, reflections, rotations, and objects in the plane by using sketches and coordinates.</p> <p>NCTM:</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Draw reflected images.</li> <li>• Come up with the formula of reflection in the y-axis, x-axis, the line <math>y=x</math> and in the origin.</li> <li>• Draw translated images using coordinates</li> <li>• Draw translated images by using repeated reflections</li> <li>• Draw rotates images using the angle of rotation</li> </ul>	<ul style="list-style-type: none"> <li>➤ Warm- Up</li> <li>➤ Treasure Hunt Activity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Warm- Up</li> <li>▪ Treasure Hunt Packet</li> </ul>	<ul style="list-style-type: none"> <li>▪ 1 day</li> </ul>
Review	<p>GSE: M(G&amp;M)–10–4 Applies the concepts of congruency by solving problems on or off a coordinate plane involving reflections, translations, or rotations; or solves problems using congruency involving problems within mathematics or across disciplines or contexts. (State)</p> <p>NCTM: Students should be able to understand and represent translations, reflections, rotations, and objects in the plane by using sketches and coordinates.</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Draw reflected images.</li> <li>• Come up with the formula of reflection in the y-axis, x-axis, the line <math>y=x</math> and in the origin.</li> <li>• Draw translated images using coordinates</li> <li>• Draw translated images by using repeated reflections</li> <li>• Draw rotates images using the angle of rotation</li> </ul>	<ul style="list-style-type: none"> <li>➤ Review/ Practicing of different Kinds of Transformation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Test</li> </ul>	<ul style="list-style-type: none"> <li>• 1 Day</li> </ul>



## Design for Instruction

On the pre –assessment, the student score 42% on objective 1 and 43% on objective 2. This indicates that most of the students guess on the test because many of them said they do not know how to do it. Therefore, the lesson must be design from the basic level up. However, since I cannot go over 8 days, each part of the rigid transformation must be taught separately. Therefore, I would have to teach reflection for two days, translation for 2 days, and rotation for 2 days. Furthermore, I have to create an activity which combines all three. In fact, I created a treasure hunt activity to motivate the boys in classroom to demonstrate their understanding of rigid transformation by finding the location of a treasure because there are more boys than girls in the classroom.



According to the pre-assessment, 36% score well on the reflection. Therefore, the lesson must be gear toward practicing reflecting a point over a line both on and off the coordinate plane. The lessons have to be an inquiry lessons where the students will discover the formula for reflecting a point over a given axes on the coordinate plane. Since 65% score well on the translation, I should only teach this for 1 day. Rotation on the other hand, will require 2 days to teach because 50% of the class fails this section. This part of the lesson will require a quick way to teach the students how to rotate and object on a coordinate plane both 90 degrees clockwise and counter clockwise. In fact, a graphing calculator program for rotation would be perfect. However, due to the lack of calculator, a manipulative has to be created to perform the same task.

Instructional  
Decision - Making

## Instructional Decision - Making

### **Part I:**

There are some students in my classroom that made it longer for me to reach my goal. These students are not critical thinkers. They would need a lot of examples to understand better. They also need to be taught from the basic level up. They have trouble accomplishing an inquiry task by themselves. Therefore, most of my lesson must be taught directly to them.

In addition, these students tend to lengthen my activity time when they require me to spend more time explaining how to solve the home work problems. These students have trouble problem solving. They have a hard time seeing the big picture. They have to be given examples after examples until they can comprehend the concepts.

Another problem that causes my lesson to not go as planned is due to the disruptive the students. They would talk to their friends and not pay attention in class. In fact, Chris whose has Attention Deficit Hyperactive Disorder is among one of them. He would ask the same question as the student that was paying attention about 5 minutes ago when he decided to get back on task. Since Chris wants to learn and has a disability, I have to re-explain the answer to the question.

Furthermore, I have to change my fun treasure Hunt activity form group work to individual work because of these students. In order to teach these off task students a lesson, I made them work individually instead of in groups and count it as a quiz grade. They can ask question and I would answer them with a question that would guide them to the answer. This will help see if each of the students can actually apply, determine, and describe the



transformation of triangle on the grid. Moreover, this activity will measure each student level of understanding of the unit objectives because they will do their best because it a quiz grade.

## **Part II:**

There is a student who sits in the last row and last seat whose has difficulty seeing my PowerPoint presentation. I have to give him my PowerPoint slides printout to copy down the notes. This student feels uncomfortable sitting near others because of his belief of identity. He is afraid that people will look down on him, if they knew. Therefore, I allowed him sit wherever he chose to sit in order to make him like he belong. Unfortunately, when I provide him with the power point slides, he was not able to participate because the answer to the question on the power point was on the slide that I have given him. In fact, sometimes, when I give him my Slides handout, I do not have the handout to tell me what going to happen on the slide, so I would teach them how to solve the problem on the chalk board and then display the same work on the PowerPoint. Therefore, I have skip some PowerPoint slides due to this reason. Next time I would print out an extra copy for this student to use so I do not have to deal with this type of problem when I am teaching.

My Geometry lesson has to accommodate one of my disabilities students. Cassie has Autism. She is a very sensitive student. I cannot skip to the next slide if she does not finish copying. I have to go back to the slide for her or she will create a big commotion. The class cannot ignore her because she is very loud even if she does not mean to. She wants to be treated like other students. In fact, when I gave her my PowerPoint slide, she would refuse it. Due to her behavior, my PowerPoint presentation tends to be longer than usually. It sometimes leads to the very next day. Since the class does not want to hear her commotion they would wait

patiently for her to finish. Furthermore, she has days where she cannot copy in time due her disability. She does has a teacher aide that would copy notes for her but someday due to her mood changes, she preferred not to be dependent on others. In fact, when her mood is good she would take her teacher aide notes.