Topic: PAC-MAN Translation

Teacher: Trivedi, Keith, Cherri
Genre: Math   **Unit: 4**
Grade Level: 8   **Duration: 60-90 minutes**

Essential Question
(Domain 1: Planning and Preparation-Component 1c: Designing Coherent Instruction)4
- EQ1. How can the coordinate plane help me understand properties of translations?   - EQ2. How can I tell if two figures are similar?

Background Knowledge

Background Summary:
Prior to this lesson, students will have already been introduced to the following: **A1. Write the ordered pair of the original figure when the image is given or vice versa.**   **A2. Add and subtract integers on a number line**   **A3. Identify the x and y-axis on a coordinate plane as horizontal and vertical lines**   **Lesson Objective:**   - SWBAT identify the properties of translations on a coordinate plane

Standards
(Domain 1: Planning and Preparation- Component 1a:Demonstrating Knowledge of Content and Pedagogy)

CCSS.MATH.CONTENT.8.G.A.1
Verify experimentally the properties of rotations, reflections, and translations:
CCSS.MATH.CONTENT.8.G.A.2
Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
CCSS.MATH.CONTENT.8.G.A.3
Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
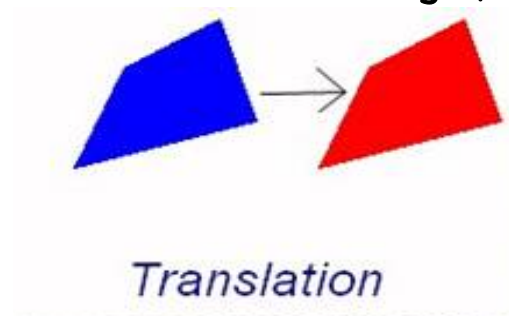CCSS.MATH.CONTENT.8.G.A.4
Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

Vocabulary (Domain I: Planning and Preparation - Component 1e: Demonstrating Knowledge of Students.)	Prep Work/Materials (Domain 1 Planning and Instruction- Component 1e: Designing Coherent Instruction, Domain 3 Instruction-Component 3c: Instruction Engaging Students in Learning)	Cross Curricular Connection (Domain I: Planning and Preparation - Component 1a: Demonstrating Knowledge of Content and Pedagogy, Component 1b: Demonstrating Knowledge of Students.)
Transformations Translation Pre-Image Image Prime: '	Worksheet Lego Mindstorm Kit (ideally 1 for each group of 3) Pencil/Marker attachment for Lego Mindstorm Big/small graph papers, Notebooks Pencils	Math Technology Science ELA Art Social Studies/History

Differentiation
(Domain I Planning and Preparation-Component 1e: Designing Coherent Instruction, Domain 3: Instruction - Component 3b: Using Question and Discussion techniques Domain 3: Instruction - Component 3c: Engaging Students in Learning)
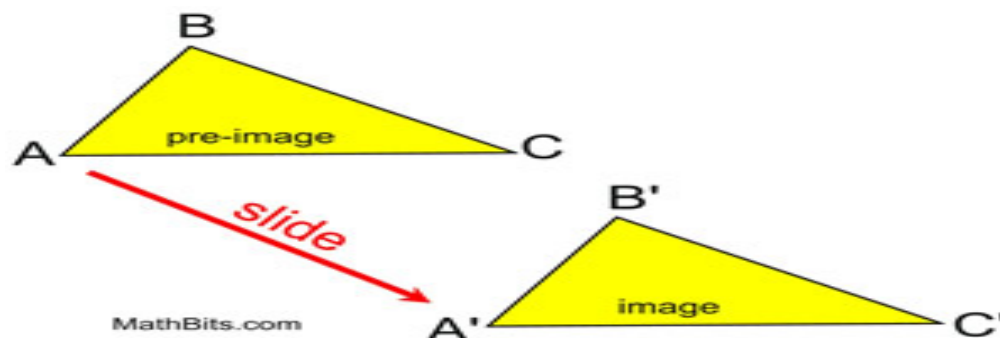
- Groupings on Assignments
- Station Learning
- Visual Aids such as
  -coordinate Plane Graph shown on desk, worksheet, chart paper and classroom floor
  -visual demonstrations of all transformations

A translation is when a figure slides to a different location. The shape and size does not change (congruent).

Translation

Coordinate plane rules: (x, y) (x ± h, y ± k) where h and k are the horizontal and vertical shifts.

Note: If movement is left, then h is negative. If movement is down, then k is negative.

Pre-image
the original figure

Image or '
The figure that has been transformed

● Multiple Entry Points/ Scaffolding on Transformations	
Procedure **(Domain I Planning and Preparation-Component 1e: Designing Coherent Instruction, Domain 3: Instruction - Component 3b: Using Question and Discussion techniques Domain 3: Instruction - Component 3c: Engaging Students in Learning)**	**Student Engagement** **(Teacher Assessment)**
● Teacher introduces the scenario in worksheet form. Scenario: ● You are trying to beat your friend's score….. http://robertkaplinsky.com/work/ms-pac-man/	● **Opportunities for students to initiate higher-order questions & extend/enrich the discussion.** ● **Open-ended questions with multiple correct answers.** ● **Fully aligned with instructional outcomes.** ● **Permits student choice.** ● **Appropriately paced to allow time needed to intellectually engage with and reflect upon learning.** ● **Students serve as resources for one another.** ● **Student led cooperative peer group work**
Assessment *(Formative or Summative)* **(Domain 1 Planning and Instruction- Component 1e: Designing Coherent Instruction, Domain 3 Instruction- Component 3c: Engaging Students in Learning, Domain 3 Instruction- Component 3d: Using Assessment in Instruction)**	**Student Engagement** **(Teacher Assessment)**

Based on the pacing and accomplishment of each lesson ,Worksheets will be provided to complete. Students are also required to finish the Exit slip at the end of the lesson.	● Integrated into instruction. ● Students contribute to assessment criteria. ● Students self-assess & are aware of characteristics of high-quality work. ● Specific & timely feedback. ● Set child-friendly goals with students.

Additional Resources

ENGAGE NY
Go Math
Pearson
Hoffman
Princeton Review
IXL and Iready
Kahn Academy
Mathletics
Math Coach Book

Next Steps:
- Properties of Reflections
- Properties of Rotations
- Properties of Dilation
- Combination of Transformations
- Later on relating to shapes: Pythagorean Theorem and Similar triangles