Unit 1: Transformations

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

UNIT RATIONALE

The purpose of this unit is to extend student knowledge of coordinate graphing and apply transformations to figures on the coordinate plane to increase spatial awareness and build critical thinking skills.

ESSENTIAL QUESTIONS

-How do we use transformations on the coordinate grid to understand a figure's movement?

-What algebraic rules help us to apply transformations?

-How can we use the idea of similar figures and dilations to indirectly measure lengths and angles?

STANDARDS

NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

New Jersey (NJSLS) - Grade 8 - Mathematics (2020)

MA.8.G	Geometry
MA.8.G.A	Understand congruence and similarity using physical models, transparencies, or geometry software.
MA.8.G.A.1	Verify experimentally the properties of rotations, reflections, and translations:
MA.8.G.A.1a	Lines are transformed to lines, and line segments to line segments of the same length.
MA.8.G.A.1b	Angles are transformed to angles of the same measure.
MA.8.G.A.1c	Parallel lines are transformed to parallel lines.
MA.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.

MA.8.G.A.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
MA.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.

New Jersey (NJSLS) - K-12 - Math Practice Standards (2020)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.

NEW JERSEY STUDENT LEARNING STANDARDS: CAREER READINESS, LIFE LITERACIES AND KEY SKILLS

TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.
TECH.9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.

NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

CS.6-8.8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.

PRE-ASSESSMENTS

A good pre-assessment is on operations with integers as these will be used frequently while doing transformations. Also a good idea to review the coordinate plane.

REFLECTIONS

Overall this was a successful unit. Students seemed to do very well with the topic, most likely because of the visual component to it.

INSTRUCTIONAL PLAN

MODULE 1

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to locate and plot points on coordinate plane so that we can perform geometr transformations on the coordinate plane using rul for coordinates.
Student Learning Strategies	-Peardeck Lesson on The Coordinate Plane -IXL Lessons P.1 through P.3
Success Criteria	I can identify the components of the coordinate pl with the correct vocabulary (origin, axes, quadrar etc.) I can locate points on the coordinate plane using ordered pairs. I can plot points in the coordinate plane given ordered pairs.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Battleship Game.
Suggested Modifications	Students can work in groups.

Battleship_Game.pdf

The Coordinate Plane

MODULE 2

Student Learning Intentions (SLI) WALT: (We	We are learning how to identify various types of

are learning to…)	transformations so that we can visually see what these transformations look like and find real-world examples of these transformations.
Student Learning Strategies	-Peardeck Lesson on Types of Transformations -IXL Lessons R.4 and R.5
Success Criteria	I can identify the type of transformation performed o[n] a figure given the pre-image and the image. I can describe the sequence of transformations needed to map one figure to its image.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 3

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to translate figures on the coordinate plane so that we can mathematically describe the effect of these translations and appl[y] to real-world situations.
Student Learning Strategies	-Peardeck Lesson on Translations -IXL Lessons R.6 through R.8
Success Criteria	I can graph a translation on the coordinate plane given a verbal description or algebraic rule. I can describe the translation performed on a figu[re] both verbally and algebraically given the pre-ima[ge] and the image of the figure. I can give real-world examples of translations.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems.

	-Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Translations](#)

MODULE 4

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to reflect figures on the coordinate plane so that we can mathematically describe the effect of these reflections and apply real-world situations.
Student Learning Strategies	-Peardeck Lesson on Reflections -IXL Lessons R.9 through R.12
Success Criteria	I can graph a reflection on the coordinate plane given a verbal description or algebraic rule. I can describe the reflection performed on a figure both verbally and algebraically given the pre-image and the image of the figure. I can give real-world examples of reflections.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Reflections](#)

MODULE 5

Student Learning Intentions (SLI) WALT: (We	We are learning how to rotate figures on the

are learning to…)	coordinate plane so that we can mathematically describe the effect of these rotations and apply it real-world situations.
Student Learning Strategies	-Peardeck Lesson on Rotations -IXL Lessons R.13 through R.15
Success Criteria	I can graph a rotation on the coordinate plane giv a verbal description or algebraic rule. I can describe the rotation performed on a figure both verbally and algebraically given the pre-imag and the image of the figure. I can give real-world examples of rotations.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Rotations](#)

MODULE 6

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning about similarity and scale factors sc that we can find unknown lengths and determine the effect of scale factors in enlarging and shrinking objects.
Student Learning Strategies	-Peardeck Lesson on Similar Figures -IXL Lessons S.1, S.5 through S.9
Success Criteria	I can determine if two figures are congruent or similar. I can determine the scale factor of a pair of similar figures. I can determine if a given scale factor will yield an enlargement or reduction in size. I can determine the length of an unknown side in a

	pair of similar figures.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 7

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to dilate figures on the coordinate plane so that we can mathematically describe the effect of these dilations and apply it real-world situations.
Student Learning Strategies	-Peardeck Lesson on Dilations -IXL Lessons S.2 through S.4
Success Criteria	I can graph a dilation on the coordinate plane giv a verbal description or algebraic rule. I can describe the dilation performed on a figure verbally and algebraically given the pre-image an the image of the figure. I can determine whether a given scale factor will yield an enlargement or reduction in size of the figure. I can give examples of real-world rotations.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

Dilations

INTERDISCIPLINARY CONNECTIONS: NEW JERSEY STUDENT LEARNING STANDARDS FOR ELA, SOCIAL STUDIES, SCIENCE AND/OR MATHEMATICS

ELA.L.KL.8.2.A	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases.