

**Transformation Animation STEAM Project Grade 8****Project Objective**

Students will demonstrate their understanding of translating, reflecting and rotating a figure. After they have completed their animation, students will have:

- (1) reviewed and applied their knowledge of transformations (translation, reflection, and rotation) of figures and the various components of each (shift factor, line of symmetry, rotation factors, and vertices)
- (2) developed problem solving and critical thinking skills
- (3) used technology and other resources to create, present, and integrate a creative component into a traditional math lesson
- (4) experienced a real world application of transformations

**Project Essential Question**

What are transformations and how can they be used to create an animation?

**The Standards for Mathematical Practice Addressed**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

**Common Core Standards for Mathematics Addressed**

**Geometry:** Understand congruence and similarity using physical models, transparencies, or geometry software.

- 8.G.1** Verify experimentally the properties of rotations, reflections, and translations:
- a. Lines are taken to lines, and line segments to line segments of the same length.

- b. Angles are taken to angles of the same measure.
- c. Parallel lines are taken to parallel lines.

**8.G.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.

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

### Science Standards Addressed

**MS-PS1-7(MA):** Use a particulate model of matter to explain that density is the amount of matter (mass) in a given volume. Measure the mass and volume and regular and irregular shaped objects and calculate their density

### Language Arts Standards Addressed

**Writing Standards for Literacy in Science and Technical Subjects, 6-12; Standard #2:** Write informative/explanatory texts, including the narration of scientific procedures/experiments, or technical processes

### Technology, Resources, and Suggested Materials

- Graph Paper
- ruler
- compass
- Google Presentation
- (Blank Google Presentation with Grid)

[https://docs.google.com/presentation/d/1btXZhSmyR5XsDpEUJiDcDJuM6bf2Gc17f\\_83-KCLW4g/edit?usp=sharing](https://docs.google.com/presentation/d/1btXZhSmyR5XsDpEUJiDcDJuM6bf2Gc17f_83-KCLW4g/edit?usp=sharing)

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### Key Vocabulary

angle of rotation  
congruent figures  
rotation

center of rotation  
reflection  
transformation

line of reflection  
image  
translation

**Project Procedures****Launch:**

Project will be announce in both Math and Science classes on the same day using the animation sample -

<https://docs.google.com/presentation/d/1EEhQmQ0fT4IAKtCogSTGOC25bDVHrcL4ynIZ3pJQim8/pub?start=true&loop=false&delayms=1000>

**Mathematics Expectations, Resources and Rubric :**

<https://docs.google.com/document/d/1cDPtQ8s-OEFxhKSZDJXd0fzu5vnZH3PvsUMS1vrcSPA/edit?usp=sharing>

**Student Summative Assessment**

Have students complete the

**Differentiation / Accommodations**

This lesson includes several differentiation possibilities for students of varying ability levels and interests. For instance,

**Differentiated End-Products:****Differentiated Process:****References**