Teacher	Sengupta	School	Azuela	
Grade Level(s)	8th Grade	Lesson Duration	...	
Subject(s)	Math	Art Form(s)	Visual Arts	
(Math, Science, Social Studies, Language Arts, Other)		(Dance, Visual Arts, Music, Drama/Theatre, Media Arts)		

LESSON TITLE: This can be a working title that can evolve & change during your process.

Transformation: Rotation, Reflection, Translation and Dilation

OBJECTIVE & LESSON GOALS: Describe a general overview of you lesson and outline specific lesson goals.

Main Objective:	Lesson Goals: Students will…
➢ Verify the properties of the transformations ➢ Build understanding and skill with congruence and similarity ➢ Perform transformations including dilations on the coordinate plane ➢ Recognize and visualize transformations of 3D shapes. ➢ Translate, reflect and rotate shapes, and combine these transformations.	➢ Draw a reflected figure and define the line of symmetry. ➢ Draw the image of a figure under a rotation, reflection and a translation ➢ Translate a figure using only the ordered pairs ➢ Organize and develop artistic ideas and work

EDUCATION & FINE ARTS STANDARDS: What standards will you address in BOTH the content area and the arts? **Resources**- Dance, Visual Arts, Music, Drama/Theatre, Media Arts, Reading, Math, Science, Social Studies

Content Standards:	Fine Arts Standards:
➢ Math Standards: ➢ 8.G.1 ➢ Investigate and verify the properties of rotations, reflections and transformations. ➢ 8.G.2 ➢ Demonstrate congruence of two dimensional figures ➢ 8.G.3 ➢ Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates	➢ Fine Arts Standards: ➢ VA:Cr2.1.8 ➢ Demonstrate willingness to experiment, innovate, and take risks to pursue ideas, forms, and meanings that emerge in the process of art making or designing. ➢ VA:Cr2.3.8 ➢ Select, organize, and design images and words to make visually clear and compelling presentations. ➢ VA:Cr3.1.8 ➢ Apply relevant criteria to examine, reflect on, and plan revisions for a work of art or design in progress.

INQUIRY QUESTIONS: What questions do you want to explore with your students?

➢ What are the important properties of reflections and translations?
➢ What are the important properties of rotations?
➢ How can you use transformations to shoe that two figures are congruent?
➢ How does reflecting or translating a figure on the coordinate plane affect the coordinates of the points in the figure?
➢ How does reflecting the figure across the x-axis affects the coordinates?
➢ How does reflecting the figure across the y-axis affects the coordinates?
➢ How do the coordinates of the image vertices compare to the coordinates of the original vertices?
➢ How does translating the figure affects the coordinates?

KEY VOCABULARY & CONCEPTS: What new terminology and concepts will students learn?

- ➢ Geometric transformation
- ➢ Image, Translations
- ➢ Reflection, Center of rotation
- ➢ Angle of rotation, Congruent
- ➢ Coordinate Grid/Coordinate Plane
- ➢ Point, Transformation, Rotation
- ➢ Quadrant, Origin, Clockwise
- ➢ Counterclockwise
- ➢ Isometric Paper

INSPIRATION / RESOURCES: Is there an art piece, theme, project, book or person that has inspired this lesson?

- ➢ Some of our students sometimes have difficulty understanding the transformation geometry. They have difficulties in identifying and naming transformation of rotation, finding the centre, angle of rotation and locating the exact image of a rotated figure after rotation.
- ➢ Our students love exploring Art (in different forms). Therefore, exploring their challenges with their love and interest for Art.

ARTS INTEGRATION: How is your chosen art discipline informing the understanding of your academic content and vice-versa?

Students through Arts integration are able to transfer their understanding smoothly from one concept to another. They are able to visualize, and use the manipulatives to further develop their understanding on the geometric concept on transformation.

CULTURAL / COMMUNITY CONNECTION: Describe how the lesson might connect to a specific cultural or community topic or tradition.

Students make connections with the objects that they see in their surrounds, places and countries.

LESSON ACTIVITY: Provide a bullet point summary of your lesson plan and steps.

- ➢ Review the Objectives
    - o Review the Essential Questions, vocabularies, and all the properties of Transformation
    - o Students and Teacher(s) expectations
- ➢ STEP 1: ON ISOMETRIC PAPER
    - o One Isometric paper/student
    - o Draw a Line of Symmetry (diagonal, horizontal, vertical)
    - o Draw shapes only by connecting the dots
    - o Use different kinds of Transformation to create an artwork
    - o Concentrate on creating a three dimensional shapes
    - o Create bigger shapes
- ➢ STEP 2: TRACING ON THE TRANSPARENCY PAPER
    - o Tape the transparency paper on top of the isometric paper and tape it
    - o Trace your artwork with a BLACK fine marker
    - o Let it DRY
- ➢ STEP 3: COLOUR
    - o Colour your artwork on the transparency paper

MATERIALS NEEDED: List the supplies.

- ➢ Isometric Papers
- ➢ Pencil
- ➢ Eraser
- ➢ Ruler

- ➢ Black Fine Markers
- ➢ Colour Fine Markers
- ➢ Transparencies
- ➢ Tape

DOCUMENTATION: How do you plan to document student learning during and at the end of the lesson?

Process: Students will demonstrate...	Evidence: Artifacts, photographs, video, audio, etc.
➢ ...	➢ ...

ASSESSMENT: How do you plan to assess student learning during and at the end of the lesson?

Formative:	Summative:

➢ Students will be able to explain the important properties of reflections and translations.
➢ Students will be able to use transformations to shoe that two figures are congruent.
➢ Students will be able to reflecting or translating a figure on the coordinate plane affect the coordinates of the points in the figure.
	➢ Choose any topic and explore from within to the outside world
	    ○ Mathematics produces Art
	    ○ Mathematics and Art -- So Many Connections
	    ○ Mathematics generates Art
	    ○ Transformations and symmetry are fundamental concepts in both mathematics and art.
	    ○ Art illuminates Mathematics
	    ○ Mathematics inspires Art