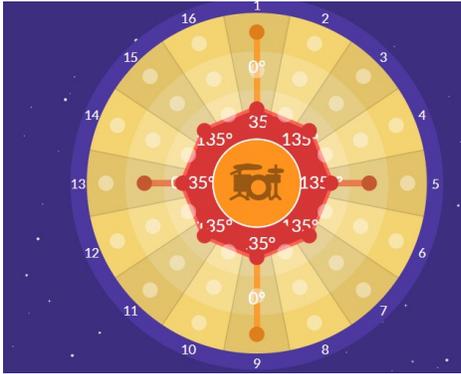


Lesson Description

This lesson is based on the Groove Pizza App

<http://musedlab.org/groovepizza/>

From the Groove Pizza website: “Groove Pizza is a circular rhythm app for creative music making and learning! It’s also a playful tool for creating grooves using math concepts like shapes, angles and patterns.”



The intent of this lesson is to use it as an introductory lesson during the first weeks of school. It will be used to teach the importance of looking for patterns and structure as well as to reinforce key academic vocabulary and properties of basic geometric figures.

How the Arts Standards Enhance the Lesson

The biggest enhancement to this lesson is that students will be able to see that the goals we have in math are not isolated in mathematics, but they are also present in music and other arts. The arts standards emphasize some of the same topics that mathematics does, specifically repetition and pattern. Both the art and math standards also incorporate the importance of using technology tools. One of the most exciting enhancements that the arts standards provide this lesson is that they give students the opportunity to view geometric properties in the context of music! The creativity that students will be able to exhibit with both the mathematical and musical components of this lesson are endless!

Objectives

- Identify and analyze patterns
- Use proper academic vocabulary including but not limited to...
 - Proper classification of regular polygons (pentagon, hexagon...), acute, obtuse, supplementary, complementary, segment, angle
- The difference between regular and irregular polygons
- Properties of Circles

- o How to use the knowledge that a circle has 360 degrees to logically justify other results
- o Central angles
- Properties of interior and exterior angles of both regular and irregular polygons

Standards

Author’s Note – Minnesota has not adopted common core standards. The math and art standards that are presented are those currently used by the state of Minnesota.

MN State Math Standards

9.3.3.2 Know and apply properties of angles, including corresponding, exterior, interior, vertical, complementary and supplementary angles, to solve problems and logically justify results.

9.3.3.7 Use properties of polygons-including quadrilaterals and regular polygons-to define them, classify them, solve problems and logically justify results.

9.3.3.8 Know and apply properties of a circle to solve problems and logically justify results.

MN Arts Standards

Music - 9.1.1.3.2 Evaluate how the elements of music and related concepts such as repetition, pattern, balance and emphasis are used in the creation of, performance of, or response to music.

Music - 9.1.1.3.3 Analyze how the characteristics of a variety of genres and styles contribute to the creation of, performance of, or response to music.

Music – 9.1.2.3.3 Use electronic musical tools to record, mix, play back, accompany, arrange or compose music.

Music – 9.2.1.3.1 Improvise, compose or arrange new musical compositions in a variety of styles and contexts using available technology to preserve the creations.

Visual Arts – 9.1.1.5.2 Evaluate how the principles of visual art such as repetition, pattern, emphasis, contrast and balance are used in the creation of, presentation of, or response to visual artworks.

Procedure

Day 1 – Experiment with the App and Look for patterns

Give students the opportunity to experiment with the pre-made rhythms. What patterns do they notice? What mathematical vocabulary can be used to describe what they see on the screen?

Day 2 – Regular and Irregular Polygons

- Discuss the difference between regular and irregular polygons

- Discover properties about exterior and interior angle measures of regular polygons
- Discuss properties of circles

Day 3 – Compose your own song

Students must compose their own song. They must describe the math involved (polygons used, angle measures, segments, etc.) with correct academic vocabulary.

Day 4 – Analyze the work of a peer

Analyze the work of a classmate. Repeat the description process from Day 3 and then critique your classmate's description.