

LESSON TITLE: WAHOO WIGWAMS

GRADE/AUDIENCE:

- 9th – 12th grade Geometry, Algebra 2, or Pre-calculus students.

STATE STANDARDS:

- Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
- Derive the equation of a parabola given a focus and directrix.
- Represent constraints by equations or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
- Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.
- Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.
- Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
- Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

LESSON OBJECTIVES:

- Visit the Mashantucket Pequot Museum & Research Center or an equivalent, this could be individual research.
- Create a scaled wigwam based on the field trip and/or research.
- Create a story based on the student's individual wigwam with historical and mathematical facts.
- Create equations of various shapes from the scaled drawing.
- To apply the mathematical knowledge and skills to a real world situation.

LESSON OBJECTIVES FOR YOUR STUDENTS:

- Students will create a scaled drawing from their field trip to the Museum and Research Center and/or from their own research.
- Students will create functions from their scaled drawing (linear, piecewise, quadratic, etc).
- Students will analyze the wigwam in terms of mathematical figures and historical facts.

- Students will create a story about their wigwam and how math relates to that wigwam and family living there (everyday life, objects in or around the wigwam, etc).
- Students will apply their prior knowledge to creating an accurate mathematical drawing of a wigwam and its contents.

COMPELLING / GUIDING QUESTIONS:

- Why do you think the Pequot's built the wigwams like they did? (Shape, contents, placement of beds, etc)
- Do you think the Pequot's understood the mathematical concepts that we know when they made the wigwam's shape?

DESCRIPTION OF LEARNING TASKS / ACTIVITIES:

1. Students will visit the Mashantucket Pequot Museum & Research Center and study the shape, dimensions, and contents of the wigwams. If a student is not able to attend the field trip, they may visit the museum with their family or complete their own research.
2. Students will create a scaled drawing of the wigwam replica on graph paper from the Museum or the research.
3. In the wigwam, there will be objects that the Pequot's used in their everyday life; this could include furniture, weapons, or any other objects they could have used. See the rubric for the specifics.
4. Students will write a one page paper analyzing the wigwam and its contents that they created, discussing how the Pequot's used the wigwam and objects in the drawing. Be sure to tie in how the Pequot's could have used these objects in their everyday life, citing your sources. You may use any sources on <http://www.pequotmuseum.org/Default.aspx> or any other sources you found, including your trip to the Museum and Research Center.

TIME NEEDED FOR LESSON: Two 45 minute classes with students doing homework.

MATERIALS, RESOURCES, TECHNOLOGY NEEDED:

- Calculators, rulers, computers or an equivalent, pens/pencils, graph paper.

PRIMARY OR SECONDARY RESOURCES (WORKS CITED):

- Mashantucket Pequot Museum & Research Center resources. Accessed at:
<http://www.pequotmuseum.org/Default.aspx>
- <https://www.facebook.com/pequotmuseum/timeline>
- <http://yipp.commons.yale.edu/2013/06/22/inside-a-connecticut-indian-wigwam/>

PRIOR LEARNING, CONNECTIONS, STUDENT NEEDS OR INTERESTS, COMMON MISCONCEPTIONS:

Prior learning:

- Finding the equations of various functions including but not limited to linear, quadratic, circles, parabolas, ellipses, etc.
- Creating functions with restrictions on the domain and/or range.
- An introduction to scaled drawings.
- Introduction of Pequot Indians.

Student needs or interests:

- Students may individual instruction to help get them started or throughout the project to answer any misunderstandings.
- Students may be paired up by the teacher or pick their own groups.
- Students that are interested in the History of the United States, specifically New England will be engaged and interested in this project.
- Students that are interested in specific culture's objects and what they mean to their civilization will be interested.

Common Misconceptions:

- Students may have to estimate the functions and their equations.
- Students may have to estimate the size or shape of objects.
- Students may misunderstand the meaning of objects to the Pequot.

SUGGESTED DIFFERENTIATIONS:

For struggling students:

- One-on-one instruction.
- Reteaching.
- Lessen the requirements. For example, only the equation of 5 objects instead of all 10.

- Write a half page paper instead of a full page.
- The students may choose to include less detail in their drawing.

For enriched learning:

- The students must show as least three of the proportions from their drawing to the actual wigwam or object.
- Create a diorama of the scaled drawing.

CROSS-DISCIPLINARY CONNECTIONS:

- Early American History
- Science
- English

FORMATIVE ASSESSMENT PROCESSES (INCLUDING STUDENT SELF-ASSESSMENT):

- The rubric that the teacher will use, as well as the students grading themselves.

Wahoo Wigwams Rubric			
Name:			Date:
			Period:
	Possible Points	Points Earned	Comments
Creates an accurately scaled drawing of a wigwam and at least ten objects	20		
States the equations of at least ten objects from the drawing (use the graph paper and lightly sketch a coordinate plane for reference). Show all work!!!	25		
States the restriction of the domain and/or range from your created equations	10		
Fully analyzes the drawing and provides historical evidence as to why the object is in the drawing	15		
Explains how and why the Pequots used the objects in the scaled drawing and wigwam	10		
Explains how the Pequot tribe could have used these objects including the wigwam in their everyday life	10		
Paper includes properly cited historical facts in reference to your drawing	10		
			Total Points: /100