LSU Team: Emily Nauck, Mary Margaret Sanford, Lauren Metrailer	**Mentor Teacher**: -	**Course:Algebra 2**
Date to be Taught: -	**School:-**	**Classroom Number:-**
Time to be Taught: -	**Grade Level**:11th	**Lesson Topic**: functions

Title of Lesson:

Creative function writing

Source of Lesson:

none

Description of Concepts to be Taught (include a brief summary of why the lesson is important to students):

Students will be using creative writing to model a story of a function in real life. from these stories, students need to be able to identify: domain, range, increasing, decreasing, extrema and degree of function.

NCTM/NSES Standards:

A2:F-IF.B.4: For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship

A2:F-IF.B.6: Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

A2:F-IF.C.7: Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

A2:F-IF.C.9: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, determine which has the larger maximum.

A2:F-BF.B.3: Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using

technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them

Student Learning Objectives:
SWBAT: graph a polynomial function
SWBAT: identify zeros, critical point, extremas, points of inflections
SWBAT: describe end behavior of functions
SWBAT: identify symmetry of graphs of functions
SWBAT: model a function in real life

Safety Precautions:

none

Advanced Preparations:

Teachers will need to create the airplane scenario on a google slide to share. Teachers will need to pick up poster paper.

ENGAGEMENT		**Approximate Time:**
What the Teacher Will Do	**Eliciting Questions and Student Responses**	**What the Students Will Do**
start of a new day: to review last class give students a "journal entry bell ringer": have students take five mins to draw and describe an airplane ride in terms of from New Olreans, Louisiana to Dallas, Texas. The flight ascends to 35,000 ft. There is some turbulence so 20 miles into the flight it descends 150 ft. After 30 miles of the entire flight the airplane ascends 140 ft. due to flying around a storm. When descending to land the altitude decreases how many feet?	Think about what we talked about yesterday, what is the domain of this flight? What about the range? - Domain: (0,450mi) - Range: (0, 35,000 ft) Where is the graph increasing? Decreasing? - The graph is increasing on the interval (0, 35,00 ft) and on the interval from (34,850 ft. , 34,990 ft.) for the entire flight. - The graph is decreasing from (35,000 ft. , 34, 850 ft.) and on the interval from (34,990 ft. , 0 ft.)	Directions for the students: "Think about where the plane is increasing and decreasing." Students should graph this on a sheet of paper with the domain being the distance between New Orleans and Dallas.
Have students pair with a partner for two mins what they described. have students share with the class what the pairs discussed.	Look at the drawings you made for the flight. This flight represents a function. What do you think the slope of the function is at the point right before each descent? Why do you think this?	Students will partner with shoulder partner to share what they thought of the airplane scenario. Students will discuss the components of the airplane path function.

	- 0 because the plane is neither increasing nor decreasing	

TRANSITION

Pass out a sheet of paper for student pairs to create a scenario similar to the airplane scenario.

EXPLORATION

Approximate Time:

What the Teacher Will Do	Eliciting Questions and Student Responses	What the Students Will Do
Teachers will have students create a story similar to airplane scenario and answer guided questions.	Create your own scenario and identify characteristics of the function you create. Where are the intervals of increasing/ decreasing? - Student answers will vary. What is the domain and range of the function? - Student answers will vary. What are the zeros of your function? - Student answers will vary.	Students will create a story similar to the airplane scenario and answer guided questions.

TRANSITION

Poster paper will be passed out.

EXPLANATION

Approximate Time:

What the Teacher Will Do	Eliciting Questions and Student Responses	What the Students Will Do
Teachers will pass out poster paper for students to write their scenarios on the poster. Teachers will then have students come to the front of the classroom and present their scenario.	What parts of your story are essential to find the various components of the function you created? - answers may vary. ex: the time interval in which the function took place, the starting point, the maximum height, the ending point, the minimum height, when the function ascends, etc.	Students will write their scenario on poster paper to stick around the class. Then, students will read aloud their story to class.

TRANSITION

Teacher will have students get out a sheet of paper to answer the other groups stories.

ELABORATION		Approximate Time:
What the Teacher Will Do	**Eliciting Questions and Student Responses**	**What the Students Will Do**
The teachers will have students solve each others stories for the various components of the function. (domain, range, extrema, increasing/ decreasing intervals etc)	What key words help you find the various components? - answers may vary. ex: I know the function increases on this particular interval because this pair said it is ascending from this time until this time.	The students will solve the stories the other pairs in the class created. The students will identify the domain and range, increasing and decreasing intervals, and the absolute and relative max and mins.
TRANSITION		
Have students pass up the answers to the function stories and their own stories with the answers.		
EVALUATION		**Approximate Time:**
What the Teacher Will Do	**Eliciting Questions and Student Responses**	**What the Students Will Do**
Teacher will collect the stories for a formative assessment.		Students will turn in their stories.

Louisiana State University
Instructional Models

LSU Team: Mentor Teacher: Lesson Topic:

Date to be Taught: School/Room:

Time to be Taught: Grade Level:

DATE Requested for Pick-up: DATE to be returned:

TIME Requested for Pick-up: TIME to be returned:

Items Requested	# Requested	# Returned
poster paper	10	
poster markers	10	

Collected by _____ Date_____

Returned by _____ Date_____