

Part A: Task Research Template

Name: Andrea Smith

Grade: 8	Task Title: Is it a function? Source: http://www.mathworksheets4kids.com/function.html	
Domain & Cluster	Content Standard(s)	Mathematical Practice(s)
Domain: Functions Cluster: 8.F.A. Define, evaluate, and compare functions.	8.F.A.1. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.*	<ol style="list-style-type: none"> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. <li style="background-color: yellow;">3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics 5. Use appropriate tools strategically. <li style="background-color: yellow;">6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning

Shifts of the Common Core State Standards		
Focus Find your grade here .	Coherence Wiring Document Learning Trajectories http://www.corestandards.org/	Rigor <i>Select all that apply</i>
<b style="background-color: yellow;">Major Supporting Additional	Builds from ...6.EE.9 Connects to ...8.F.4, 8.F.5 Builds up to ...IF.1	<b style="background-color: yellow;">Conceptual Understanding <ul style="list-style-type: none"> • Key words to look for in standards: <i>Understand, Interpret, Recognize, Describe, Explain</i> Procedural Fluency <ul style="list-style-type: none"> • Key word to look for in the standards: <i>Fluently</i> Application <ul style="list-style-type: none"> • Key words to look for in standards: <i>Solve real-world and mathematical problems, Apply</i>

Part B: Task Analysis Template

Task Analysis		
Criteria of Worthwhile Task	Rating	Notes on how to enhance or improve the task
1. Mathematics is grade-level appropriate	1 2 3 4	
2. Makes connections between concept and procedures	1 2 3 4	Connect the graphs to a real world or mathematical context to support making the connection between the definition of a function and strategies for determining functional relationships Add a component to address the common misconception if 2 outputs have the same input, then the relationship is not a function
3. Makes connections between different mathematical topics	1 2 3 4	Possibly incorporate 8.F.4 and/or 8.F.5
4. Requires reasoning (nonalgorithmic thinking)	1 2 3 4	Incorporate components that require students to reason about why given real-world situations, tables, ordered pairs, graphs, and equations do or do not represent a functional relationship
5. Connects to real situations that are familiar and relevant to them	1 2 3 4	Include real world examples and non-examples of functional relationships (as well as real world situations that could and could not be a function depending on interpretation like snack machine)
6. Is appropriately challenging and accessible (engages students' interests and intellect)	1 2 3 4	Add a real-world context to support and engage students in reasoning about functional relationships Incorporate a possible extension requiring students give examples and non-examples of functional relationships
7. Provides multiple ways to demonstrate understanding of the mathematics concepts and procedures	1 2 3 4	Incorporate directions that instruct students to explain their thinking using multiple representations
8. Requires students to illustrate or explain mathematical ideas	1 2 3 4	Add a component requiring students to critique the reasoning of others about why or why not a given table, graph, or set of ordered pairs does or does not represent a function.

Adapted from Bay-Williams, J.M. McGatha, M., Kobbet, B., & Wray, J. (2014). *Mathematics Coaching: Resources and Tools for Coaches and Leaders, K-12*. Boston: Pearson.

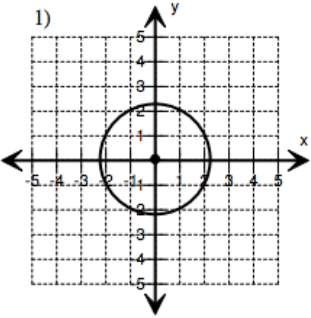
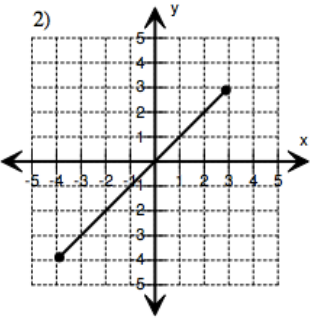
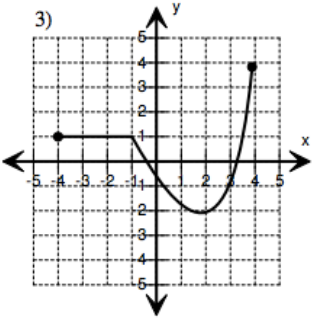
1 = No evidence of the quality in the task, or it is not possible to address this quality with the task

2 = The quality is evident in minor ways, or incorporating it is possible.

3 = The quality is evident in the task

4 = The quality is central to the task and is important to the success of the lesson

Part C: Task Rewrite Template

Created by:	Andrea Smith
Task Title	"Is it a function?" / "America Car Sales"
Grade:	8
Standard:	8.F.1
Original Task:	http://www.mathworksheets4kids.com/function.html
	<p>Decide if each graph below represents a function. Explain why you think each graph does or does not represent a function.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1)</p>  <p><input type="checkbox"/> Function <input type="checkbox"/> Not a Function</p> </div> <div style="text-align: center;"> <p>2)</p>  <p><input type="checkbox"/> Function <input type="checkbox"/> Not a Function</p> </div> <div style="text-align: center;"> <p>3)</p>  <p><input type="checkbox"/> Function <input type="checkbox"/> Not a Function</p> </div> </div>

Rewritten or Revised Task

American Car Sales

The following table shows the number of cars (C) sold in America between 2002 and 2012 (t).

y (year)	C (cars in millions)
2002	17.2
2003	16.1
2004	15.3
2005	15.7
2006	16.1
2007	14.5
2008	13.2
2009	10.4
2010	11.5

2011

12.8

2012

14.5

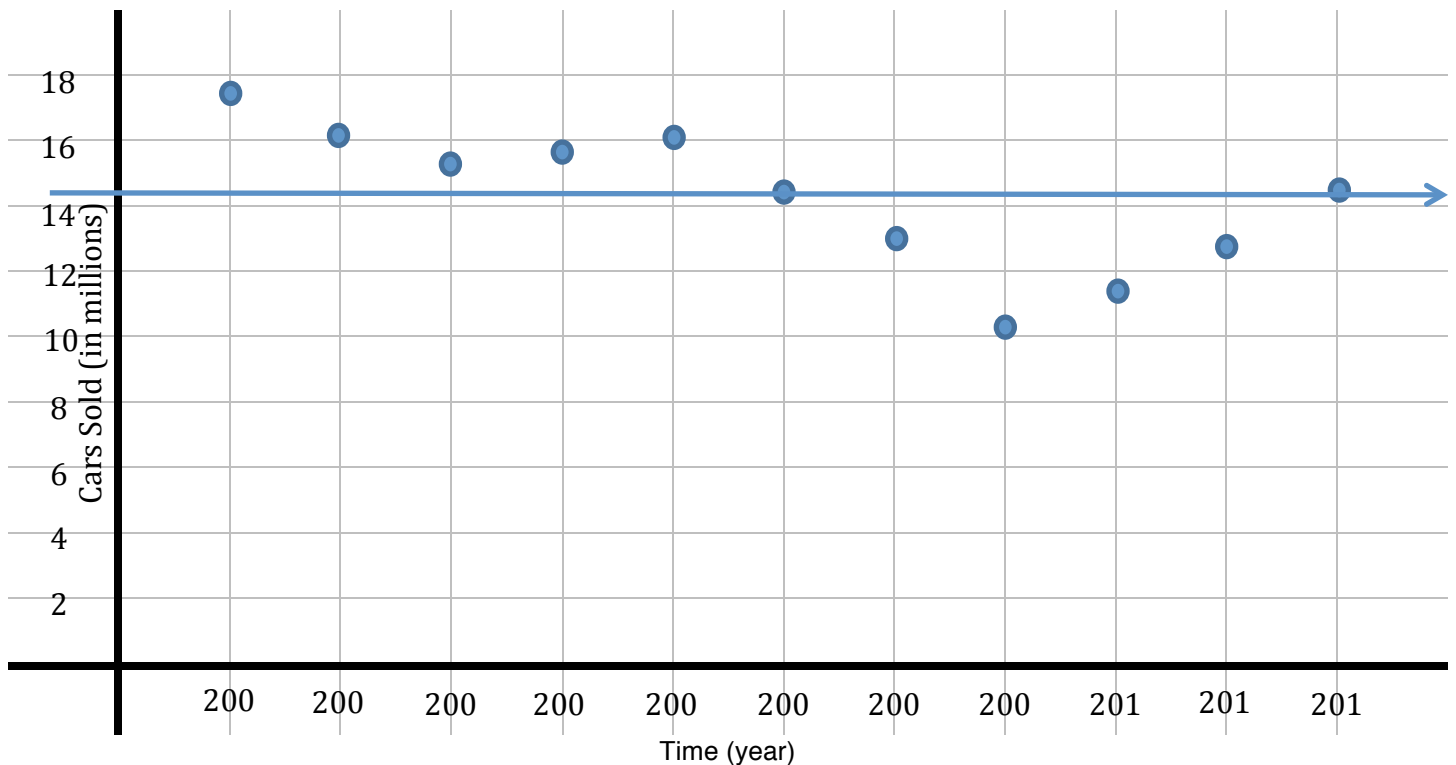
Part 1

- a. Explain how you know this table does or does not represent a function. In your answer make explicit reference to the definition of a function.

Part 2

Three classmates explain their thinking about the problem. Explain why they are right or wrong. If they are wrong, explain how you would help them understand.

- 1) Pete drew a graph from the information in the table (below). He drew a line and explained, "This cannot be a function because the line at 14.5 touches two points. That means there were two years where 14.5 million cars were sold."



2) Susan made her decision if the relation was a function from the table. She explains, "Because each year has only one number of cars sold, this is a function. Every input has exactly one output. Also, it wouldn't make sense to have two different number of cars sold in a year."

3) Jon decided to make ordered pairs from the table (below). He said, "Because the same number of cars was sold in 2007 and 2012, this cannot be a function. If you know how many cars are sold, you cannot predict the year."

(2002, 17.2)

(2003, 16.1)

(2004, 15.3)

(2005, 15.7)

(2006, 16.1)

(2007, 14.5)

(2008, 13.2)

(2009, 10.4)

(2010, 11.5)

(2011, 12.8)

(2012, 14.5)