learning focus:

✓ identify functions and classify as linear or non-linear

✓ write, compare and interpret functions

✓ analyze functions and graphs, including distance vs time graphs

FUNCTIONS UNIT
8 DAY CCSS-ALIGNED UNIT

8th GRADE

FUNCTIONS UNIT
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FUNCTIONS UNIT PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Identifying Functions	Linear vs. Non-Linear Functions	Writing Equations of Linear Functions	Functions Quiz	Applying Linear Functions

DAY 6	DAY 7	DAY 8		
Analyzing Functions and Graphs	Functions Study Guide	Functions Study Guide		
Student Handout 1 Homework 1	Student Handout 2 Homework 2	Student Handout 3 Homework 3		

LINEAR VS. NON-LINEAR FUNCTIONS

A MANEUVERING THE MIDDLE ® RESOURCE

FUNCTIONS

an 8 day CCSS-aligned unit
CCSS: 8.F.1, 8.F.2, 8.F.3, 8.F.4, 8.F.5

8th GRADE

ready-to-go, scaffolded student materials

FUNCTIONS UNIT
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FUNCTIONS

8th GRADE

student friendly + real-world application

scaffolded concepts

Unit: Functions
Student Handout 1

Name _____
Date _____ Pd _____

IDENTIFYING FUNCTIONS

A donut shop has a small vending machine with the items shown.

a. If Nate inputs B2, what will he receive?
b. If Mia inputs A2, what will she receive?
c. If 5 people in a row input B1, what sho each receive?

	A	B
1	MILK	CHOC. MILK
2	ORANGE JUICE	APPLE JUICE

FUNCTIONS
• A function is a relati
_____. Each
• A graph that is a fu
_____ line

• Would a vending machine like the one s

• A customer chose A3 and received fru milk, would the vending machine repres

Determine if each representation shows y
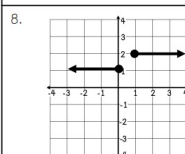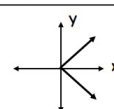
1.
| x | -2 | -1 | 0 | 1 |
| y | 7 | 1 | -1 | 1 |

3.
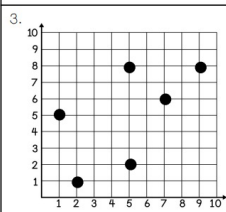
Determine if each representation is a function by writing "yes" or "no." Justify your answers.

5.
{(3, 7), (4, 7), (5, 7), (6, 7)}

6.
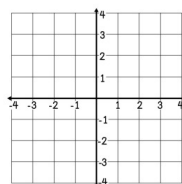| x | -7 | -5 | -7 | 5 |
| y | 1 | 3 | -1 | 13 |

7.

8.

10. The set of ordered pairs shown is

{(9, -1

a. Give an example of an x-value that
b. Give an example of an x-value that

Create your own examples and non-ex

EXAMPLES

{(___ , ___) (___ , ___) (___ ,
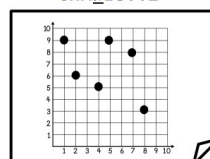
| x | | | |
| y | | | |

Summarize today's lesson:

Unit: Functions
Homework 1

Name _____
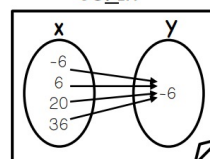Date _____ Pd _____

IDENTIFYING FUNCTIONS

Students were asked to create a representation of y as a function of x. Circle the names of the students who correctly completed the task. Then, unscramble the underlined letters of the circled names to answer the question at the bottom.
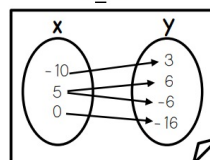
CHARLOTTE

SOFIA
x → y
-6
6 → -6
20
36

DESHAUN
{(-6, 7), (-1, 4), (2, 9), (-6, 11)}

JACE
x → y
-10 → 3
6
5 → -6
0 → -16

NATHAN
| x | -4 | 0 | 5 | 11 |
| y | -8 | -13 | -4 | 14 |

COLBY
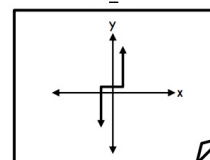
ABBY
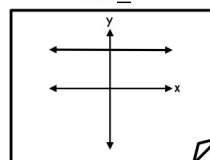
ORLANDO
{(9,-2), (7, 5), (4,-3), (-9, 6)}

STEPHANIE
| x | -4 | 0 | 7 | -4 |
| y | 6 | 0 | -2 | -6 |

WHAT IS THE ONLY NUMBER WHOSE LETTERS ARE IN ALPHABETICAL ORDER?

_____

self-checking practice

A MANEUVERING THE MIDDLE® RESOURCE

FUNCTIONS

an 8 day CCSS-aligned unit
CCSS: 8.F.1, 8.F.2, 8.F.3, 8.F.4, 8.F.5

8th GRADE

streamline your planning process with unit overviews

✓ key vocabulary

✓ vertical alignment

FUNCTIONS
OVERVIEW

CCSS

STANDARDS

8.F.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.

8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

8.F.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

BIG IDEAS

- A relationship is a function i
- Functions are either linear o
- Functions can be described

ESSENTIAL QUESTI

- How can you determine if a
- What distinguishes a linear
- What pieces of information
- How can you analyze a grap

sample pacing calendar

FUNCTIONS UNIT
PACING GUIDE

CCSS

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Identifying Functions	Linear vs. Non-Linear Functions	Writing Equations of Linear Functions	Functions Quiz	Applying Linear Functions
Student Handout 1 Homework 1	Student Handout 2 Homework 2			

DAY 6	DAY 7	
Analyzing Functions and Graphs	Functions Study Guide	
Student Handout 5 Homework 5	Review	

FUNCTIONS UNIT
OVERVIEW

CCSS

TOPIC	TEACHING TIPS
Identifying Functions	• An analogy I like to give students is a vending machine. A "functioning" vending machine means that for any button I press, only one item should dispense. There can be more than one button for a particular item, but any chosen button (input) should only dispense one particular item (output).
Comparing Functions	• Visit www.buzzmath.com, and search "Comparing Functions". Click on the Common Core 8th Grade button, and you'll find an activity where students can compare functions and check their answers as they go. (Students can complete the activity as a "guest" and therefore do not have to have an account.)
Linear vs. Non-Linear Functions	• Display a list of equations (linear and non-linear) at the beginning of the lesson, and have students predict which they think are linear functions. Then, have them compare their predictions at the end of the lesson. If time allows, have groups create a table and a graph for each equation to demonstrate whether it is linear or not.
Distance vs. Time Graphs	• Visit http://davidwees.com/graphgame/ for a fun and challenging game where students move a stickman to try and match a distance vs. time graph. The game also keeps score giving you the option of making it a competition among students.

teaching ideas

A MANEUVERING THE MIDDLE® RESOURCE

FUNCTIONS

8th GRADE

unit study guide + assessments

✓ quizzes

✓ editable unit test

Name _____
Date _____ Pd_____

QUIZ: FUNCTIONS

For questions 1-2, determine whether the representation is a function by writing "yes" or "no."

Answers
1. _____
2. _____
3. _____
4. _____

x	-2	-1	1	2
y	4	1	1	4

2.

3. Which is NOT a true statement about a

A. Its graph must pass through the origin

B. It must have a constant rate of change

C. It can be written in the form of y = mx

D. Its graph will be a straight line.

4. The list of ordered pairs below repres
missing ordered pair?

{(12, 6), (3, 1), (

A. (2, 1)   B. (12, 7)

5. The graph of a linear relationship has
the equation of the line in slope-intercept

Name _____
Date _____ Pd _____

FUNCTIONS STUDY GUIDE

Solve each of the problems below. Be sure to ask questions if you need more help with a topic.

I CAN IDENTIFY FUNCTIONS.

1. Does the set of ordered pairs represent a function? Explain.

{(6, -6), (7, -6), (8, -6), (9, -6)}

2. Does the table represent a fur

3. Does the graph represent a

4. Does the graph represent a function? Explain.

5.
a f

I CAN IDENTIFY FUNCTIONS AS LI

7. Does the table below represent a
function? Why or why not?

x	-2	0	2
y	0.2	2	3.8

EIGHTH GRADE CURRICULUM

FUNCTIONS

UNIT FIVE: ANSWER KEY

answer keys included

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