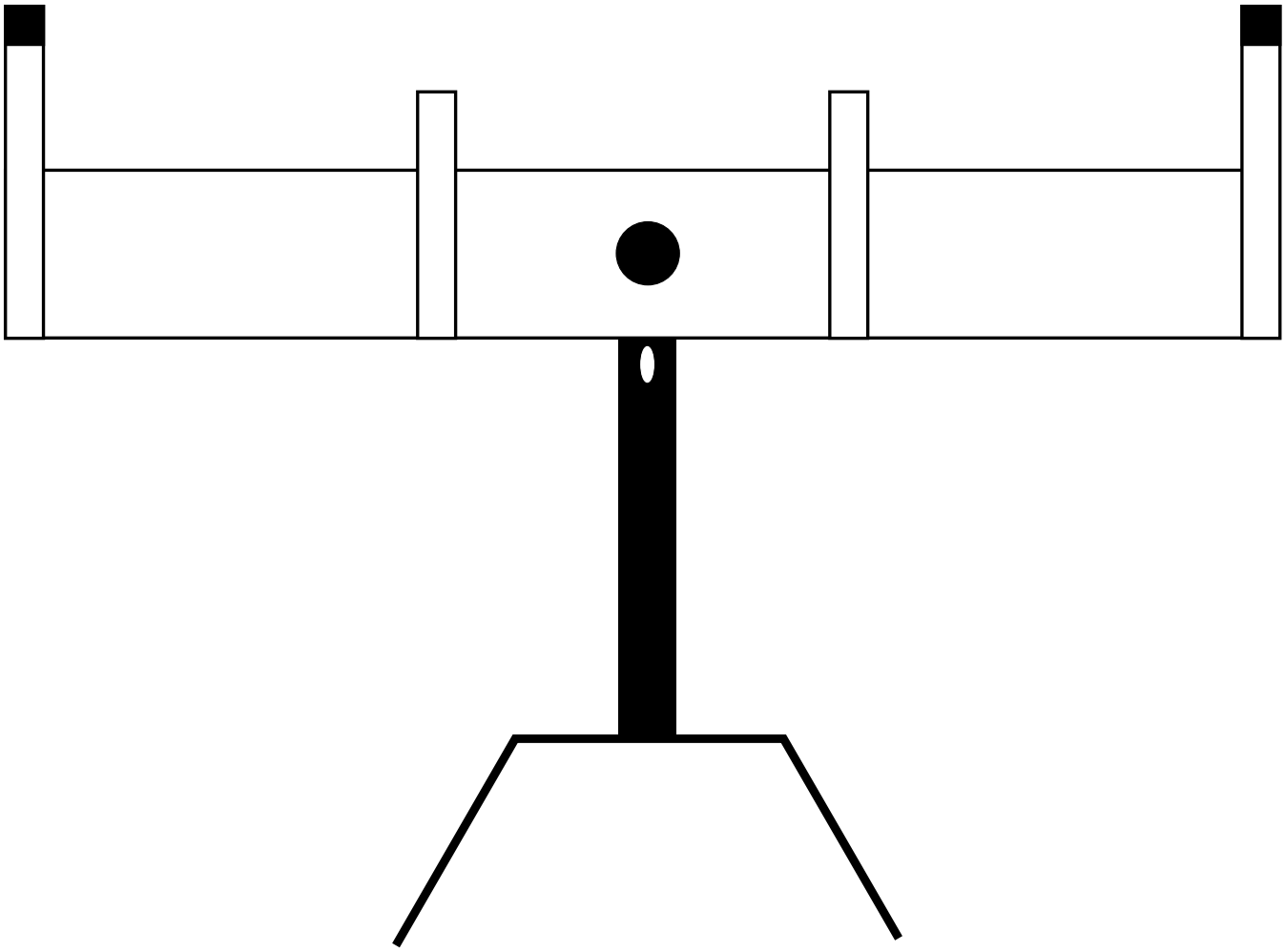
Let's Do Some Math Notice and Wonder	

Standards Unpacking		
Key	**Standard**	**Prerequisites/Vocabulary**
Put a box around the conceptual component of the standard. Underline the procedural/fluency component of the standard. Put a cloud around the application component of the standard.	**6.EE.5 -** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?
	6.EE.6 - Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?

Put a box around the conceptual component of the standard. Underline the procedural/fluency component of the standard. Put a cloud around the application component of the standard.	**6.EE.7 -** Solve real-world and mathematical problems by writing and solving equations and inequalities of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers. Inequalities will include <, >, ≤, and ≥.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?
	6.EE.8 - Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x <$ c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?
	6.EE.9 - Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*	What prior knowledge should my students have? What vocabulary/ notation should students know for this standard?



Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Maria's mother is planning to help her buy a new pair of jeans. They are on sale. The total cost of the jeans, including tax, is $17.00. Her mother gave her $14.50. How much more money does Maria need to purchase the jeans?

S Underline the question.
This problem is asking me to find _____.

Directions: Complete this page with your teacher and partner.

Addition Equations

1. $c + 2 = 3$

Model:	Check:
Pictorial Check:	Solve the equation Check:

Directions: Complete this page with your teacher and partner.

2. $c + 4 = 6$ Model	Check:
Pictorial Check:	Solve the equation Check:
3. $c + 3 = 7$ Model	Check:
Pictorial Check:	Solve the equation Check:

Directions: Complete this page with your teacher and partner.

Subtraction Equations: We do not model subtraction equations at the concrete level (with counters and cups), but we do use pictorial models.

1. $c - 3 = 5$ Pictorial Model:	Solve the equation	Check:
2. $x - 2 = 4$ Pictorial Model:	Solve the equation	Check:
3. $p - 4 = 6$ Pictorial Model:	Solve the equation	Check:
4. $r - 2 = 7$ Pictorial Model:	Solve the equation	Check:
5. $c - 1 = 8$ Pictorial Model:	Solve the equation	Check:

Understanding Reasoning Questions Use this sheet as a reflection tool to support the understanding of the reasoning questions. After you engage/learn about the questions, use the tool to make notes around your take aways, implementation ideas, and ways to incorporate the rubric		
	Takeaways About the Questions	**Reflections on Implementation Ideas and the Rubric**
Takeaways About the Questions		
Understanding of How They Are Scored		
Reflections on Implementation Ideas and the Rubric		

Reasoning Question – 6.C.7

Used from: NJ Released Questions – 6.C.1 – Expressions and Equations – 2019 – VF643078

Expression 1: $5(2x + 3y)$

Expression 2: $3x + 6y + x + 3(2x + 3y)$

Are the expressions shown equivalent? Show or explain all of the steps you used to determine your answer. Use properties of operations to justify each step.

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Tomeka collects stamps. She has 56 stamps, which she has divided into groups of 14. She wants to share the stamps with some friends. How many groups of stamps does Tomeka have?

S Underline the question.
This problem is asking me to find _____
_____.

Directions: Complete this page with your teacher and partner.

Multiplication Equations

1. $3c = 6$ Model	Model Check:
Pictorial Pictorial Check:	Solve the equation Check:

Directions: Complete this page with your teacher and partner.

2. $2c = 8$ Model	Model Check:
Pictorial Pictorial Check:	Solve the equation Check:
3. $5c = 15$ Model	Model Check:
Pictorial Pictorial Check:	Solve the equation Check:

Directions: Complete this page with your teacher and partner.

Division: Division equations are not modeled at the concrete level or pictorial level. However, the same steps are followed for finding the value of the variable in the equation. First isolate the variable and then balance the equation by performing the same operation on both sides.

1. $\frac{c}{3} = 6$	Check:
2. $\frac{c}{7} = 9$	Check:
3. $\frac{s}{4} = 12$	Check:
4. $\frac{x}{10} = 8$	Check:

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Jennie helps her grandmother every week one day after school. Her grandmother gives her $15 every week. Write an equation that can be used to represent the relationship between the total she earns (y) and the number of weeks worked (x). Create a table to model the relationship for 4 weeks, 8 weeks, 12 weeks, and 16 weeks and graph the relationship on a coordinate plane.

S Underline the question.
This problem is asking me to find _____
_____
_____.

Directions: Complete this page with your teacher and partner.

Variables:

When we write and evaluate expressions that have unknown values we can use a _____ to represent the unknown value. A variable is a _____ that we can use to represent any number. We use the term variable because the value _____ based on the expression.

Example: Brian mows two lawns every day. How many total lawns will he mow during summer vacation?

What information do we know?

- _____.

What information do we not know?

- _____
- _____

We can represent the relationship between the two values by using _____. Although we can use any letter or symbol to represent unknown values, the most commonly used letters are x and y.

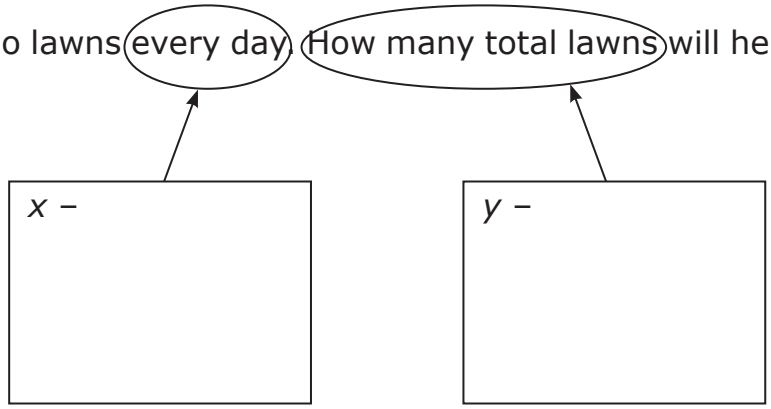
Let's look at what this means for our problem.

What is the relationship between the number of days and the number of lawns?

Brian mows _ lawns for every _ day.

Directions: Complete this page with your teacher and partner.

Brian mows two lawns every day. How many total lawns will he mow during summer vacation?



One of the variables (x) changes and is called the _____ _____.

The other variable (y) is affected by the change in the first variable. This is called the _____ _____ because its value _____ based on the value of the independent variable.

This means that the _____ _____ of lawns mowed is determined by _____ _____ _____ he mows.

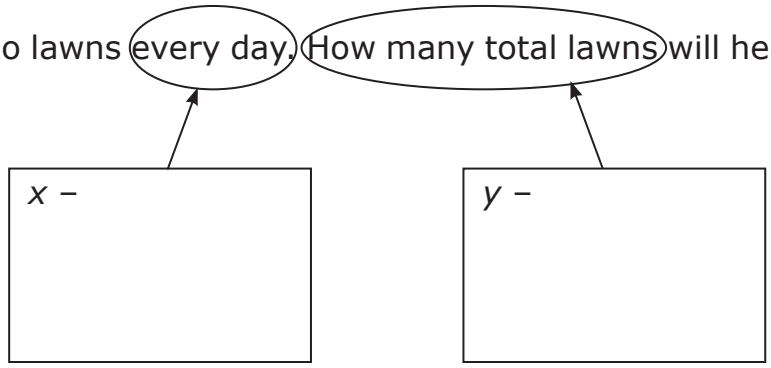
Practice with Variables:

Situation	Relationship between the two variables	The independent variable (x)	The dependent variable (y)
1. The school store sells packs of pencils with 4 pencils in each pack.			
2. There are 12 tomato plants in each row in the garden.			
3. There are 3 feet in a yard.			

Directions: Complete this page with your teacher and partner.

Identifying Variables in a Table:

Brian mows two lawns every day. How many total lawns will he mow during summer vacation?



Let's look at the relationship between the two variables.

Days Brian mows	Total lawns mowed
1	2
2	
3	
4	
x	

1. How many lawns will Brian mow in 1 day? _____

2. How many lawns will Brian mow in 2 days? _____

3. How many lawns will Brian mow in 3 days? _____

4. How many lawns will Brian mow in 4 days? _____

5. How many lawns will Brian mow in *x* days? __ Explain your answer. _____
_____
_____.

6. How could we write an equation to represent the relationship? _____

Division: Complete this page with your partner.

Practice with Identifying Variables in a Table:

1. The school store sells packs of pencils with 4 pencils in each pack.

Packs of pencils (x)	**Total pencils** (y)
1	4
2	
3	
4	
x	

2. Twelve tomato plants are planted in each row.

Rows (x)	**Total Plants** (y)
1	12
2	
5	
10	
x	

3. There are three feet in a yard.

Yards (x)	**Feet** (y)
1	3
2	
3	
4	
x	

Directions: Complete this page with your teacher and partner.

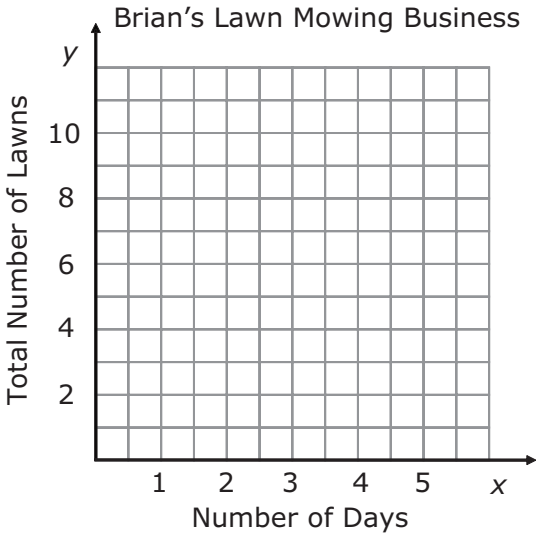
Identifying Variables in a Graph

Brian mows two lawns every day. How many total lawns will he mow during summer vacation?

x – number of days Brian mows

y – total lawns mowed

Days Brian mows (*x*)	Total lawns mowed (*y*)	Ordered Pair (*x, y*)
1	2	(1, 2)
2		
3		
4		



1. Write the ordered pair for each set of coordinates.

2. Plot the coordinates on the graph.

3. Explain the relationship between the number of days and the number of lawns mowed. As the number of days _____ increases by __ the number of lawns _____ increases by _____.

4. Write an equation that can be used to represent this relationship. _____

5. Is there a relationship between the number of days and the number of lines? ___ Can we connect the coordinate points with a line? ___ What is the starting point of the line? Explain your answer. _____ _____.

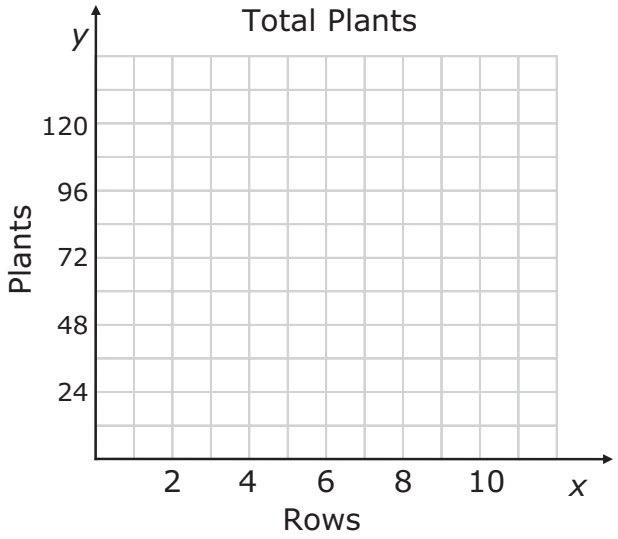
6. Is it possible to interpret data on the graph between the points? ___ This is an example of _____ _____. Can we make a prediction about how many lawns Brian would mow in 30 days? Explain your answer.

Directions: Complete this page with your partner.

Practice with Identifying Variables in a Graph

Situation A: 12 tomato plants in a row

Rows (*x*)	**Total plants (*y*)**	**Ordered Pair (*x*, *y*)**
1	12	(1, 12)
2		
5		
10		



1. Write the ordered pair for each set of coordinates.

2. Plot the coordinates on the graph.

3. Explain the relationship between the number of rows and the total plants.
_____
_____.

4. Write an equation that can be used to represent this relationship. _____

5. Is it appropriate to connect the points on the coordinate graph with a line? Explain your thinking. _____
_____.

6. Can we make a prediction about how many total plants there would be in 25 rows? Explain your answer. _____
_____.

Understanding Modeling Questions Use this sheet as a reflection tool to support the understanding of the modeling questions. After you engage/learn about the questions, use the tool to make notes around your take aways, implementation ideas, and ways to incorporate the rubric		
	Takeaways About the Questions	**Reflections on Implementation Ideas and the Rubric**
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Think Quantities!	**Think Structure!**	**Think Repetition!**
What can I count? **What can I measure?** **How are the quantities related?** **How can I represent the quantities so I can see relationships?**	**How is this situation behaving?** **What kind of problem is this?** **Does the problem remind me of another I've solved?** **Will changing the form help?** **How can I chunk this expressions/number/visual?**	**Is there a process that keeps repeating?** **Am I counting /building/drawing in the same way each time?** **Do I keep repeating the same calculations?** **How can I use repetition to write a rule?**

Modeling Question – D.1

Used from: NJ Released Questions – D.1 – Expressions and Equations – VF643084

The students in a club are selling flowerpots to raise money. Each flowerpot sells for $15.

Part A

Write an expression that represents the total amount of money, in dollars, the students raise from selling x flowerpots.

Part B

The goal of the students in the club was to raise $500. They sold 43 flowerpots. By what amount did the students exceed their goal of raising $500? Show or explain all your work.

Training Reflection			
What are your takeaways?			
Reasoning	**Modeling**	**Context**	**Precision**
What are your next steps as a result of this training?			