

Lesson 15: A Synthesis of Representations of Equivalent Ratio Collections

Classwork

Exploratory Challenge

At the end of this morning's news segment, the local television station highlighted area pets that need to be adopted. The station posted a specific website on the screen for viewers to find more information on the pets shown and the adoption process. The station producer checked the website two hours after the end of the broadcast and saw that the website had 24 views. One hour after that, the website had 36 views.

Exercise 1

Create a table to determine how many views the website probably had one hour after the end of the broadcast based on how many views it had two and three hours after the end of the broadcast. Using this relationship, predict how many views the website will have 4, 5, and 6 hours after the end of the broadcast.

Hours	Views
1	12
START 2	24
3	36
4	48
5	60
6	72

Exercise 2

What is the constant number, c , that makes these ratios equivalent?

$$\text{Constant} = 12$$

Using an equation, represent the relationship between the number of views, v , the website received and the number of hours, h , after this morning's news broadcast.

$$v = 12h$$

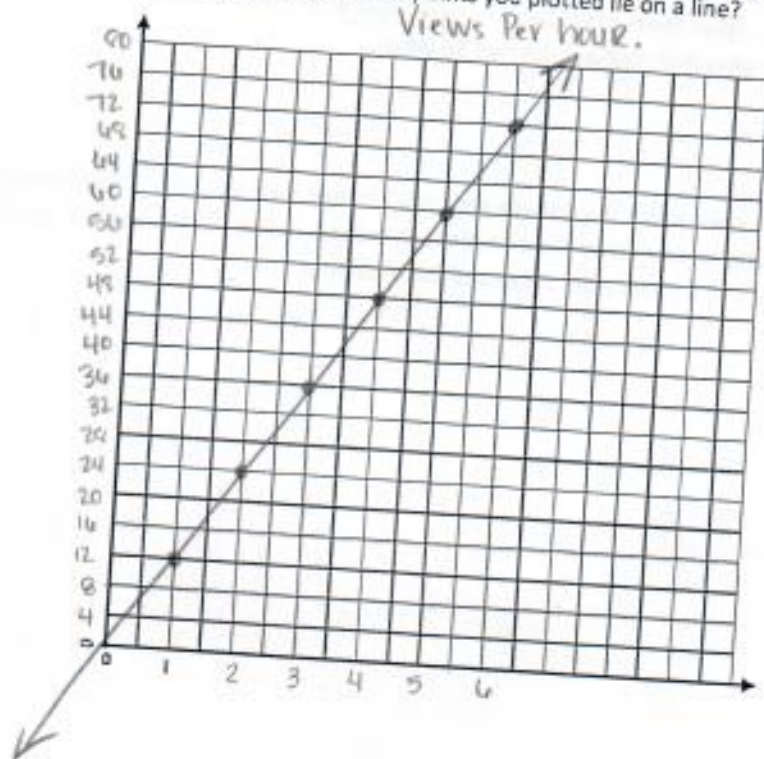
Exercise 3

Use the table created in Exercise 1 to identify sets of ordered pairs that can be graphed.

$(1, 12)$ $(2, 24)$ $(3, 36)$ $(4, 48)$ $(5, 60)$ $(6, 72)$

Exercise 4

Use the ordered pairs you created to depict the relationship between hours and number of views on a coordinate plane. Label your axes and create a title for the graph. Do the points you plotted lie on a line?



Exercise 5

Predict how many views the website will have after twelve hours. Use at least two representations (e.g., tape diagram, table, double number line diagram) to justify your answer.

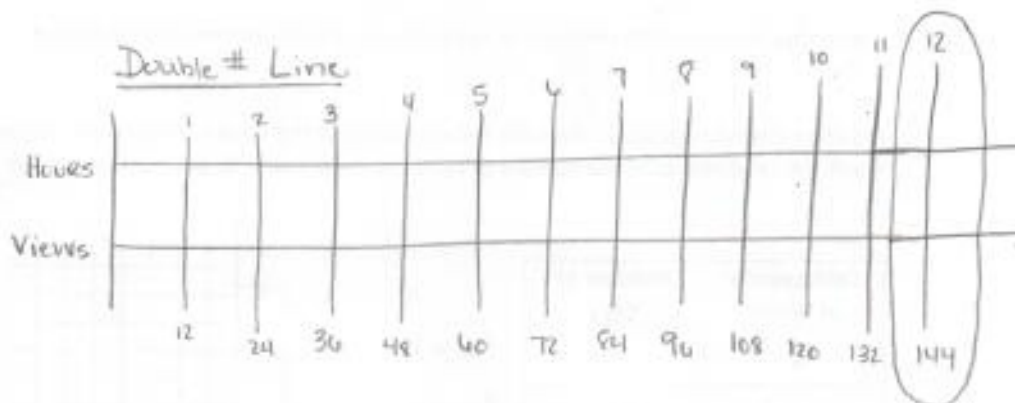
TABLE

Hours	views
1	12
2	24
3	36
4	48
5	60
6	72
7	84
8	96
9	108
10	120
11	132
12	144

Tape Diagram

Hours $\square \leftarrow 12$ Views $\boxed{12} \boxed{12} \boxed{12} \boxed{12} \boxed{12} \boxed{12} \boxed{12} \boxed{12} \boxed{12} \boxed{12} \boxed{12} \boxed{12}$

Double # Line



Exercise 6

Also on the news broadcast, a chef from a local Italian restaurant demonstrated how he makes fresh pasta daily for his restaurant. The recipe for his pasta is below:

3 eggs, beaten

1 teaspoon salt

2 cups all-purpose flour

2 tablespoons water

2 tablespoons vegetable oil

Determine the ratio of the number of tablespoons of water to the number of eggs. $\frac{2}{3}$ or 2:3 or 2 to 3

Provided the information in the table below, complete the table to determine ordered pairs. Use the ordered pairs to graph the relationship of the number of tablespoons of water to the number of eggs.

Tablespoons of Water	Number of Eggs
2	3
4	6
6	9
8	12
10	15
12	18

(2, 3)

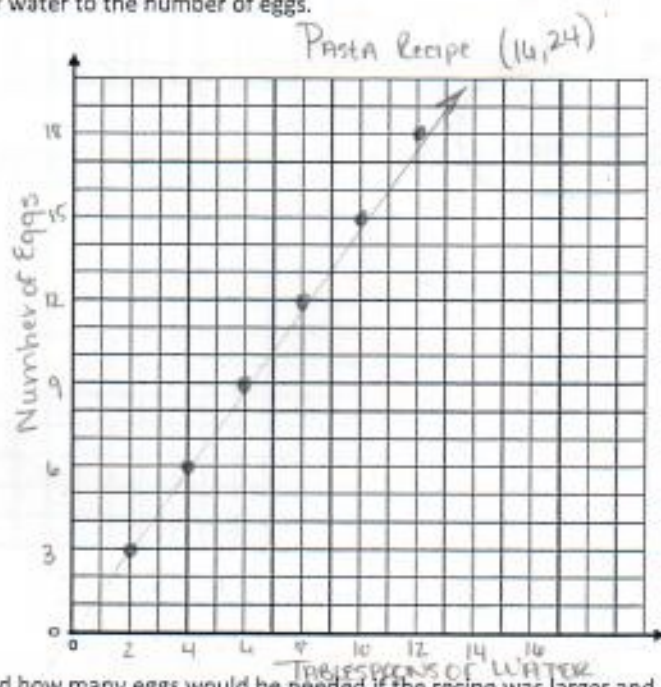
(4, 6)

(6, 9)

(8, 12)

(10, 15)

(12, 18)



What would you have to do to the graph in order to find how many eggs would be needed if the recipe was larger and called for 16 tablespoons of water?

Extend the graph

Demonstrate on your graph.

How many eggs would be needed if the recipe called for 16 tablespoons of water?

Exercise 7

Determine how many tablespoons of water will be needed if the chef is making a large batch of pasta and the recipe increases to 36 eggs. Support your reasoning using at least one diagram you find applies best to the situation, and explain why that tool is the best to use.

Tablespoons of water	Number of Eggs
2	3
4	6
6	9
8	12
10	15
12	18
14	21
16	24
18	27
20	30
22	33
24	36

Table Diagram

Water $\boxed{12} \boxed{12} = 24$

Eggs $\boxed{12} \boxed{12} \boxed{12} = 36$ ← Given

First $\frac{36}{3} = 12$

Double Line Diagram:

