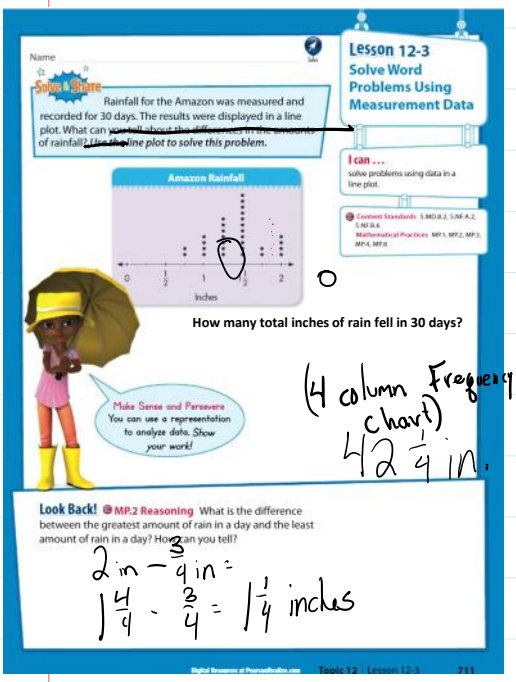
Lesson 12-3

Monday, April 13, 2020 9:01 AM



Name

Lesson 12-3
Solve Word Problems Using Measurement Data

Solve & Share
Rainfall for the Amazon was measured and recorded for 30 days. The results were displayed in a line plot. What can you tell about the different sets of the amounts of rainfall? *Use the line plot to solve this problem.*

I can ...
solve problems using data in a line plot.

Content Standards 5.MD.B.2, 5.NF.A.2, 5.NF.B.6
Mathematical Practices MP.1, MP.2, MP.3, MP.4, MP.8

Amazon Rainfall

Inches

How many total inches of rain fell in 30 days?

Make Sense and Persevere
You can use a representation to analyze data. Show your work!

(4 column Frequency chart)
$42\frac{1}{4}$ in.

Look Back! MP.2 Reasoning What is the difference between the greatest amount of rain in a day and the least amount of rain in a day? How can you tell?

$2 \text{ in} - \frac{3}{4} \text{ in} =$
$1\frac{4}{4} - \frac{3}{4} = 1\frac{1}{4}$ inches

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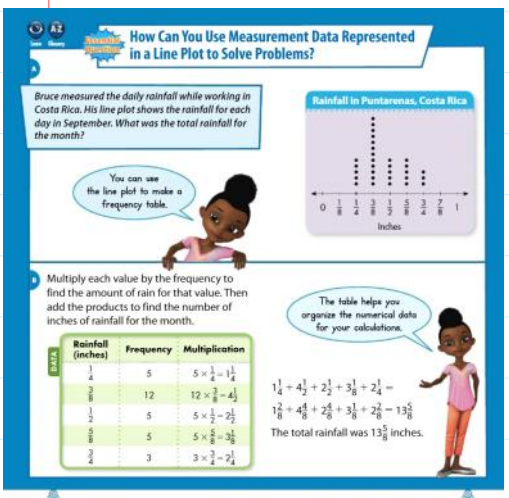
Rainfall (in)	Frequency	Multiplication	Total
$\frac{3}{4}$	2	$\frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = 1\frac{2}{4}$	$1\frac{2}{4}$
1	4	$1 \times 4 = 4$	4
$1\frac{1}{4}$	7	$\frac{5}{4} \times \frac{7}{1} = \frac{35}{4} = 8\frac{3}{4}$	$8\frac{3}{4}$
$1\frac{1}{2}$	11	$\frac{3}{2} \times \frac{11}{1} = \frac{33}{2} = 16\frac{1}{2}$	$16\frac{2}{4}$
$1\frac{3}{4}$	2	$\frac{7}{4} \times \frac{2}{1} = \frac{14}{4} = 3\frac{2}{4}$	$3\frac{2}{4}$
2	4	$2 \times 4 = 8$	8

$40\frac{9}{4} = 42\frac{1}{4}$

$2\frac{1}{4}$



How Can You Use Measurement Data Represented in a Line Plot to Solve Problems?

Bruce measured the daily rainfall while working in Costa Rica. His line plot shows the rainfall for each day in September. What was the total rainfall for the month?

Rainfall in Puntarenas, Costa Rica

Inches

You can use the line plot to make a frequency table.

Multiply each value by the frequency to find the amount of rain for that value. Then add the products to find the number of inches of rainfall for the month.

Rainfall (inches)	Frequency	Multiplication
$\frac{1}{4}$	5	$5 \times \frac{1}{4} = 1\frac{1}{4}$
$\frac{3}{8}$	12	$12 \times \frac{3}{8} = 4\frac{1}{2}$
$\frac{1}{2}$	5	$5 \times \frac{1}{2} = 2\frac{1}{2}$
$\frac{5}{8}$	5	$5 \times \frac{5}{8} = 3\frac{1}{8}$
$\frac{3}{4}$	3	$3 \times \frac{3}{4} = 2\frac{1}{4}$

The table helps you organize the numerical data for your calculations.

$1\frac{1}{4} + 4\frac{1}{2} + 2\frac{1}{2} + 3\frac{1}{8} + 2\frac{1}{4} =$
$1\frac{2}{8} + 4\frac{4}{8} + 2\frac{4}{8} + 3\frac{1}{8} + 2\frac{2}{8} = 13\frac{5}{8}$
The total rainfall was $13\frac{5}{8}$ inches.

Convince Me! MP.3 Critique Reasoning Rosie says she can find the total rainfall in the example above without multiplying. Do you agree? Explain.

Yes. Multiplication is repeated addition.

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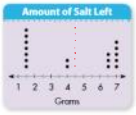
Guided Practice

Do You Understand?

In 1–4, use the line plot showing how many grams of salt were left after liquids in various containers evaporated.



1. **MP.8 Generalize** How could you find the difference between the greatest amount and the least amount of salt left?

Subtracting: 7 grams and taking away $1\frac{1}{2}$ grams to get 5.5 grams.

Do You Know How?

2. Write a problem that can be answered using the line plot.

Salt (g)	Frequency	Multiplication	Total
$1\frac{1}{2}$	2	$3 \times 1 = 3$	$10\frac{1}{2}$
4	3	$4 \times 3 = 12$	8
$6\frac{1}{2}$	5	$13 \times 5 = 65$	$19\frac{1}{2}$
			35

3. **MP.4 Model with Math** Write and solve an equation that represents the total number of grams of salt left.

$(1\frac{1}{2} \times 7) + (4 \times 2) + (6\frac{1}{2} \times 3) + (7 \times 5) = 73$ grams

4. How many grams of salt would be left if two of each container were used?

$73 \times 2 = 146$ grams

$10\frac{1}{2}$
8
$19\frac{1}{2}$
$+35$
$72\frac{2}{2} \rightarrow 73$ grams

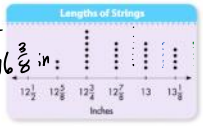
Complete 5&6 w/Table
11 w/Table

Independent Practice

In 5 and 6, use the line plot Allie made to show the lengths of strings she cut for her art project.

5. Write an equation for the total amount of string.

$(12\frac{5}{8} \times 2) + (12\frac{3}{4} \times 7) + (12\frac{7}{8} \times 5) + (13 \times 5) + (13\frac{1}{8} \times 4) = 296\frac{3}{8}$ in.



6. What is the difference in length between the longest and the shortest lengths of string?

$13\frac{1}{8} - 12\frac{5}{8} = 12\frac{9}{8} - 12\frac{5}{8} = \frac{4}{8}$ or $\frac{1}{2}$ in.

*For another example, see Set C on page 726.

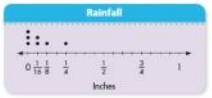
String (in)	Frequency	Multiplication	Total
$12\frac{5}{8}$	2	$\frac{101}{8} \times \frac{2}{1} = \frac{202}{8}$	$25\frac{2}{8}$
$12\frac{3}{4}$	7	$\frac{51}{4} \times \frac{7}{1} = \frac{357}{4}$	$89\frac{1}{4} \rightarrow 89\frac{2}{8}$
$12\frac{7}{8}$	5	$\frac{103}{8} \times \frac{5}{1} = \frac{515}{8}$	$64\frac{3}{8}$
13	5	13×5	65
$13\frac{1}{8}$	4	$\frac{105}{8} \times \frac{4}{1} = \frac{420}{8}$	$52\frac{4}{8}$

$295\frac{11}{8} \rightarrow 296\frac{3}{8}$

Math Practices and Problem Solving

In 7 and 8, use the line plot Susannah made to show the amount of rainfall in one week.

7. **Algebra** Write and solve an equation for the total amount of rainfall, r, Susannah recorded.



8. **Higher Order Thinking** Suppose the same amount of rain fell the following week, but the same amount of rain fell each day. How much rain fell each day?

9. **MP.1 Make Sense and Persevere** The area of a square deck is 81 square feet. How long is each side of the deck?

10. Althea recorded the amount she earned from T-shirt sales each day for 14 days. She made a frequency table to organize the data. Write a problem that can be answered using the frequency table.

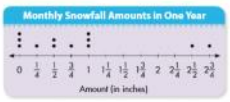
DATA

Amount Earned (in $)	Frequency	Multiplication
7.50	3	$3 \times 7.50 = 22.50$
15.00	4	$4 \times 15.00 = 60.00$
22.50	5	$5 \times 22.50 = 112.50$
30.00	1	$1 \times 30.00 = 30.00$
37.50	1	$1 \times 37.50 = 37.50$

Common Core Assessment

11. Kurt recorded the amount of snowfall in each month for one year. What was the total snowfall that year?

Ⓐ 12 in. Ⓒ $7\frac{3}{4}$ in.
Ⓑ $10\frac{1}{4}$ in. Ⓓ $7\frac{1}{2}$ in.



Snowfall (in)	Frequency	Multiplication	Total
0	3	$0 \times 3 = 0$	0
$\frac{1}{4}$	1	$\frac{1}{4} \times 1 = \frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{2}$	2	$\frac{1}{2} \times \frac{2}{1} = \frac{2}{2} = 1$	1
$\frac{3}{4}$	1	$\frac{3}{4} \times 1 = \frac{3}{4}$	$\frac{3}{4}$
1	3	$1 \times 3 = 3$	3
$2\frac{1}{2}$	1	$2\frac{1}{2} \times 1 = 2\frac{1}{2}$	$2\frac{2}{4}$
$7\frac{3}{4}$	1	$7\frac{3}{4} \times 1 = 7\frac{3}{4}$	$7\frac{3}{4}$

$2\frac{1}{2}$	1	$2\frac{1}{2} \times 1 = 2\frac{1}{2}$	$2\frac{3}{4}$
$2\frac{3}{4}$	1	$2\frac{3}{4} \times 1 = 2\frac{3}{4}$	$2\frac{3}{4}$

$8\frac{9}{4} = 10\frac{1}{4}$ (B)

$8 + 2\frac{1}{4}$