

NAME: _____

Math 7.1

Mr. Rogove

Date: _____

LEARNING OBJECTIVE:

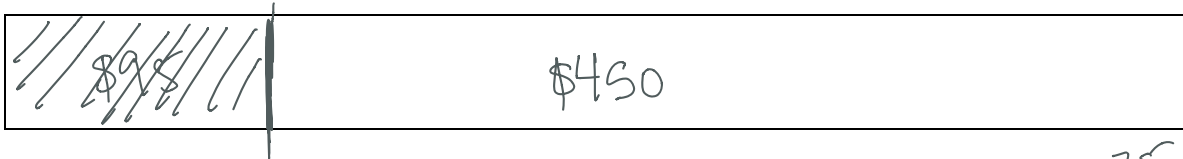
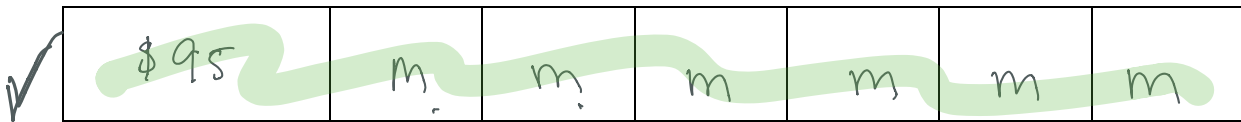
We will compare tape diagram solutions to algebraic solutions (G7M2L14)

CONCEPT DEVELOPMENT:

Tape Diagrams can be used to solve equations.

Examples:

1. Molly signed up for gymnastics lessons at California Sports Center. Her registration fee was \$95. If the total amount that she paid was \$545 after 6 months of tumbling and cartwheeling, how much does it cost each month to take lessons?



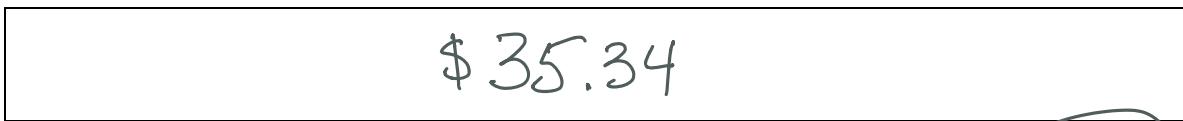
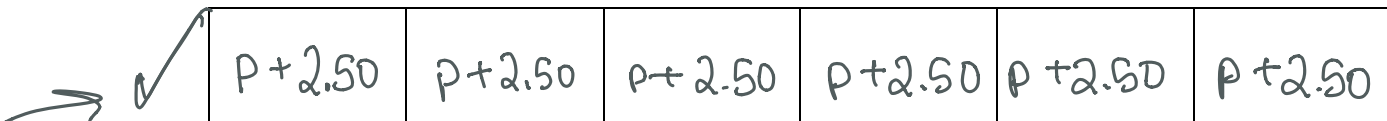
$$\begin{array}{r} 545 \\ - 95 \\ \hline 450 \end{array}$$

$$6m + 95 = 545$$

$$\begin{array}{r} 75 \\ 6 \overline{) 450} \end{array}$$

Gymnastics lessons cost \$75 each month

2. Heather, Joanne, Meg, Linda, Justiana, and Brianna went to the mall for lunch. Soda cost \$2.50. They each got a soda and a slice of cheese pizza. The total bill was \$35.34. How much was each slice of pizza?



Handwritten calculations for problem 2:

$$\begin{array}{r} 2.50 \leftarrow \text{cost of soda} \\ \times \quad \leftarrow \text{\# of girls} \\ \hline 15.00 \leftarrow \text{total cost of soda} \end{array}$$

$$\begin{array}{r} 35.34 \leftarrow \text{total cost} \\ - 15.00 \leftarrow \text{total cost of soda} \\ \hline 20.34 \leftarrow \text{total cost of pizza} \end{array}$$

$$\begin{array}{r} 3.39 \leftarrow \text{each slice} \\ 6 \overline{) 20.34} \end{array}$$

$$\begin{aligned} 6(p + 2.50) &= 35.34 \\ 6p + 15 &= 35.34 \\ -15 &- 15.00 \\ \hline 6p &= 20.34 \quad p = 3.39 \\ \hline 6 & \end{aligned}$$

GUIDED PRACTICE:**Steps for Finding Solutions Using Tape Diagrams**

1. Read the problem carefully and identify the quantity you are trying to figure out (this is your variable).
2. Create a series of tape diagrams that model the problem. Pay attention to things that are repeated (i.e. paying the same amount for each month or everyone eating the same thing) and things that occur once (registration fee, different price for the first hour and a steady price after that).
3. Use the tape diagrams to determine your unknown quantity (variable).

The first time I made a wooden birdfeeder, it took me exactly 120 minutes. After that, it only took me 45 minutes to make a birdfeeder. If I spent 390 minutes on Saturday making birdfeeders, how many birdfeeders did I make?



$$\begin{array}{r}
 390 \leftarrow \text{total \# of minutes} \\
 -120 \leftarrow \text{time taken for 1st birdfeeder} \\
 \hline
 270 \\
 \quad 6 \\
 \hline
 45 \overline{)270} \\
 \quad 6 \text{ birdfeeders in } 270 \text{ minutes.}
 \end{array}$$

7 BIRDFEEDERS

The cost of babysitting service is \$10 for the first hour, and \$12 for each hour after that. If the total cost of babysitting Brookelynn was \$58, how many hours was she at the babysitter?



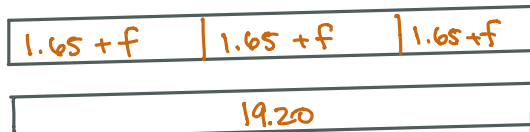
$$\begin{array}{r}
 58 \leftarrow \text{total babysitting} \\
 -10 \leftarrow \text{1st hour} \\
 \hline
 48 \leftarrow \text{rest of night} \\
 \quad 4 \\
 \hline
 12 \overline{)48}
 \end{array}$$

5 hours

Steps for Finding Solutions Using Tape Diagrams

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3 friends at Starbucks bought frappuccinos and bagels. The bagels cost \$1.65 each. The total for everyone's breakfast was \$19.20. How much was each frappuccino?



$$3(f + 1.65) = 19.20$$

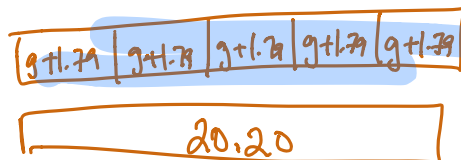
$$\begin{array}{r} 3f + 4.95 = 19.20 \\ - 4.95 \quad - 4.95 \\ \hline 14.25 \end{array}$$

$$\frac{3f}{3} = \frac{14.25}{3}$$

Each frappuccino
is \$4.75

$$\begin{array}{r} 1.65 \\ 3 \\ \hline 4.95 \\ 4.75 \\ 3 \overline{) 14.25} \\ \underline{12} \\ 2.25 \\ \underline{2.10} \\ .15 \end{array}$$

On your way to the library after school, 5 boys decided to stop at 7-11 for snacks. Each of them bought Gatorade and a big (king size) package of Skittles. The skittles each cost \$1.79, and the total for all five guys was \$20.20. How much did each bottle of Gatorade cost?



$$5(g + 1.79) = 20.20$$

$$\begin{array}{r} 5g + 8.95 = 20.20 \\ - 8.95 \quad - 8.95 \\ \hline 11.25 \end{array}$$



$$\frac{5g}{5} = \frac{11.25}{5}$$

Gatorade cost \$2.25

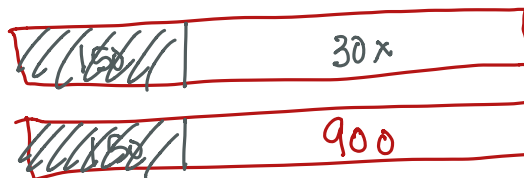
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3. Use the tape diagrams to determine your unknown quantity (variable).

At the beginning of the school year, there were 81 white board markers in room 35. If Mr. Rogove brought 15, and each of the 33 students in class brought the same amount of markers into the class, how many did each student bring with them in the beginning of the year?

$$81 = 33m + 15 \rightarrow \begin{array}{l} \text{\# of markers} \\ \text{Rogove brought} \end{array}$$

total # of markers → 81
 ↑
 $33m$ → *\# of students in class*

At the very beginning of the school year, Graham had 5 computer carts with 30 chrome books in each. We now have 900 chrome books on campus. If each chrome book is in a cart with 30 computers, how many NEW computer carts did we get since the beginning of the year?



$$\begin{array}{r} 900 \\ - 150 \\ \hline 750 \end{array}$$

$$\begin{array}{r} 30x = 750 \\ \hline 30 \quad 30 \\ \hline x = 25 \end{array}$$

We bought 25 more computer carts.

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Expenses on Family Vacation: Kailen and Zoe are summarizing some of the expenses of their family vacation for themselves and their 3 children, Elliott, Kyva, and Kalista. Create a model (tape diagram) to determine how much each item will cost, using all of the given information:

Expenses:

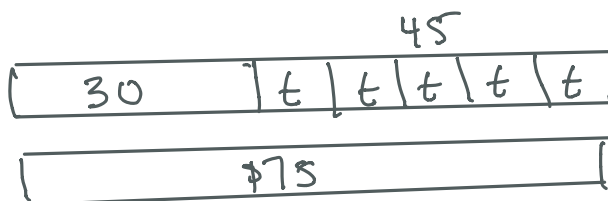
Car and Insurance fees \$400	Airfare and Insurance Fees \$875	Motel and Tax \$400
Baseball Game and Hats \$103.83	Movies for One Day \$75	Soda and Pizza \$37.95
	Sandals and T-Shirts \$120	

Students: Alison, Caterina, Madison F., Paula, Jessica V.

Scenario 1: During one rainy day on the vacation, the entire family decided to go watch a matinee movie in the morning and a drive-in the evening. The price for the matinee in the morning is different than the cost of the drive-in movie in the evening. The tickets for the matinee cost \$6 each. How much did each person spend that day on movie tickets if the ticket cost for each family member was the same? What was the cost for a ticket for the drive in movie in the evening?

$$5 \times 6 = \$30$$

$$\begin{array}{r}
 75 \\
 -30 \\
 \hline
 45 \div 5 = 9 \text{ for drive-in}
 \end{array}$$



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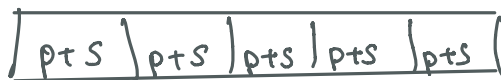
Students: Gus, Max, Esther, Mo, Daniela

Scenario 2: For dinner one night, the family went to the local pizza parlor. The cost of a soda was \$3. If each member of the family had a soda and one slice of pizza, how much did one slice of pizza cost?

$$3 \times 5 = 15$$

$$\begin{array}{r} 37.95 \\ - 15.00 \\ \hline 22.95 \end{array}$$

$$\begin{array}{r} 4.59 \\ 5 \overline{)22.95} \end{array}$$



$$\$4.59$$

$$\begin{array}{r} 7.59 \\ 5 \overline{)37.95} \end{array}$$

$$5(p + s) = 37.95$$

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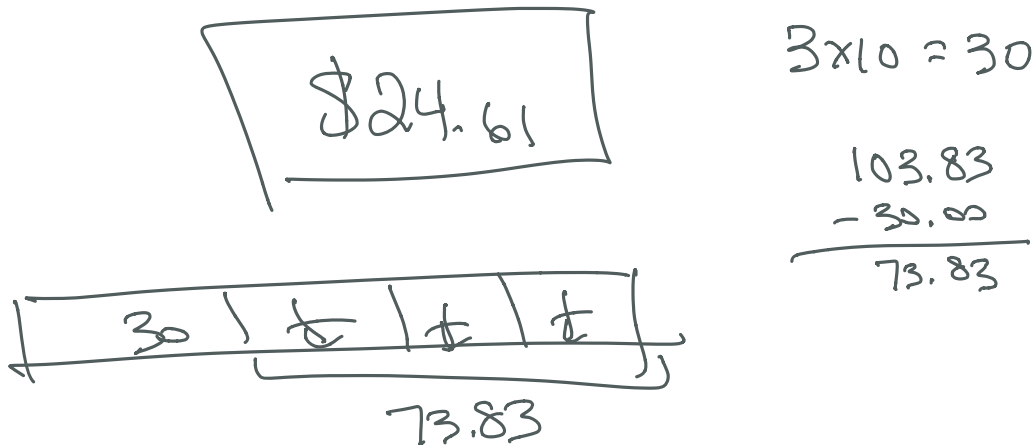
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Baseball Game and Hats \$103.83	Movies for One Day \$75	Soda and Pizza \$37.95
	Sandals and T-Shirts \$120	

Students: Trevor, Anastasia, Laynie, Sara

Scenario 3: One night, Kailen, Elliott and Kyva went to see the local baseball team play a game. They each bought a ticket to see the game and a hat that cost \$10 each. How much was each ticket to enter the ballpark?



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	Sandals and T-Shirts \$120	

Students: Gem, Eric, Flor, Lizzy, Mari

Scenario 4: While Kailen, Elliott and Kyva were at the baseball game, Zoe took Kalista shopping. They bought a T-shirt for each member of the family and two pairs of sandals that cost \$10 each. How much was each shirt?

\$20

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	Sandals and T-Shirts \$120	

Students: Riley, Winnie, Christian, Maia, Erubiel

Scenario 5: the family was going to fly in an airplane to their vacation destination. Each person needs to have their own ticket for the plane, and they also pay \$25 in insurance fees per person. What is the cost of 1 ticket?

\$150

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Expenses:

Car and Insurance fees \$400	Airfare and Insurance Fees \$875	Motel and Tax \$400
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	Sandals and T-Shirts \$120	

Students: Syd, Cielo, Scott, Ian

Scenario 6: While on vacation, the family rented a car to get them all of the places they wanted to see in five days. The car cost a certain amount each day, plus a one-time insurance fee of \$50. How much was the daily cost of the car (not including the insurance fees)?

\$70/day

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Expenses:

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Baseball Game and Hats \$103.83	Movies for One Day \$75	Soda and Pizza \$37.95
	Sandals and T-Shirts \$120	

Students: Malik, Quincy, Madison C. Atenea, Kaishu

Scenario 7: the family decided to stay in a motel for 4 nights. The motel charges a nightly fee plus \$60 in state taxes (for the entire stay). What is the nightly charge with no taxes included?

\$85 / night.

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After collaborating with all of the groups, summarize the findings in the table below:

Cost of evening movie ticket	
Cost of 1 slice of pizza	
Cost of the admission ticket to baseball game	
Cost of 1 t-shirt	
Cost of 1 airplane ticket	
Daily cost of rental car	
Nightly charge for Motel	

1. What was total cost for a slice of pizza, 1 plane ticket, 2 nights in the motel, and 1 evening movie?

2. What was the total cost for one t-shirt, 1 ticket to the baseball game, and 1 day of the rental car?

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INDEPENDENT PRACTICE:

Use the scenarios from lesson 17 as independent practice

1. Divide first into 7 groups of 4-5 students each. Have them work on one of the scenarios.
2. After this, have 4 groups of 7 and 1 group of 5 explain and help fill in the blanks for all students on back side of their page.

ACTIVATING PRIOR KNOWLEDGE:

We can solve simple 2 step equations:

$\begin{array}{r} 2x - 1 = 7 \\ +1 \quad +1 \\ \hline 2x = 8 \\ \frac{2x}{2} = \frac{8}{2} \\ x = 4 \end{array}$	$\begin{array}{r} 3y + 2 = 11 \\ -2 \quad -2 \\ \hline 3y = 9 \\ \frac{3y}{3} = \frac{9}{3} \\ y = 3 \end{array}$
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CLOSURE:

Engage NY exit ticket.

TEACHER NOTES:

Might need to alter the way Engage NY approaches this for time's sake.

HW is Engage NY Problem set lesson 17