Sticky Situations ~

Investigating and Understanding the Common Computation Situations Tables

NCTM Annual Conference 2018

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By the time students leave 2nd grade they need to be familiar with all the subtypes of the Common Addition and Subtraction Situations AND be able to understand and solve two-step problems.

Common Addition and Subtraction Situations Subtype Sort

Common Addition and Subtraction Situations (pg 88 in CCSS)

Shading taken from OA progression

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
Taken from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3

	Total Unknown	Addend Unknown	Both Addends Unknown[1]
Put Together/ Take Apart[2]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare[3]	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("How many fewer?" version): ...two apples. ...	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 3 + 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

	Result Unknown	Change Unknown	Start Unknown
to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3

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	("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 – 2 = ?	(Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

There are 32 students in Ying's class eating lunch. Then, more students joined Ying's class.

Since the first day of school, 4 students have left Sam's class.

Molly's class has 3 fewer students than Sam's class.

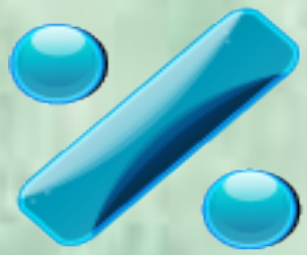
There are 16 girls in Mrs.

David's book has 26 more pages than Elam's book. There are 48 pages in David's book. Choose two equations that you can use to find the number of pages in Elam's book.

Keyword Trap

https://www.youtube.com/watch?v=A82qR0980e0

What words represent the following symbols …

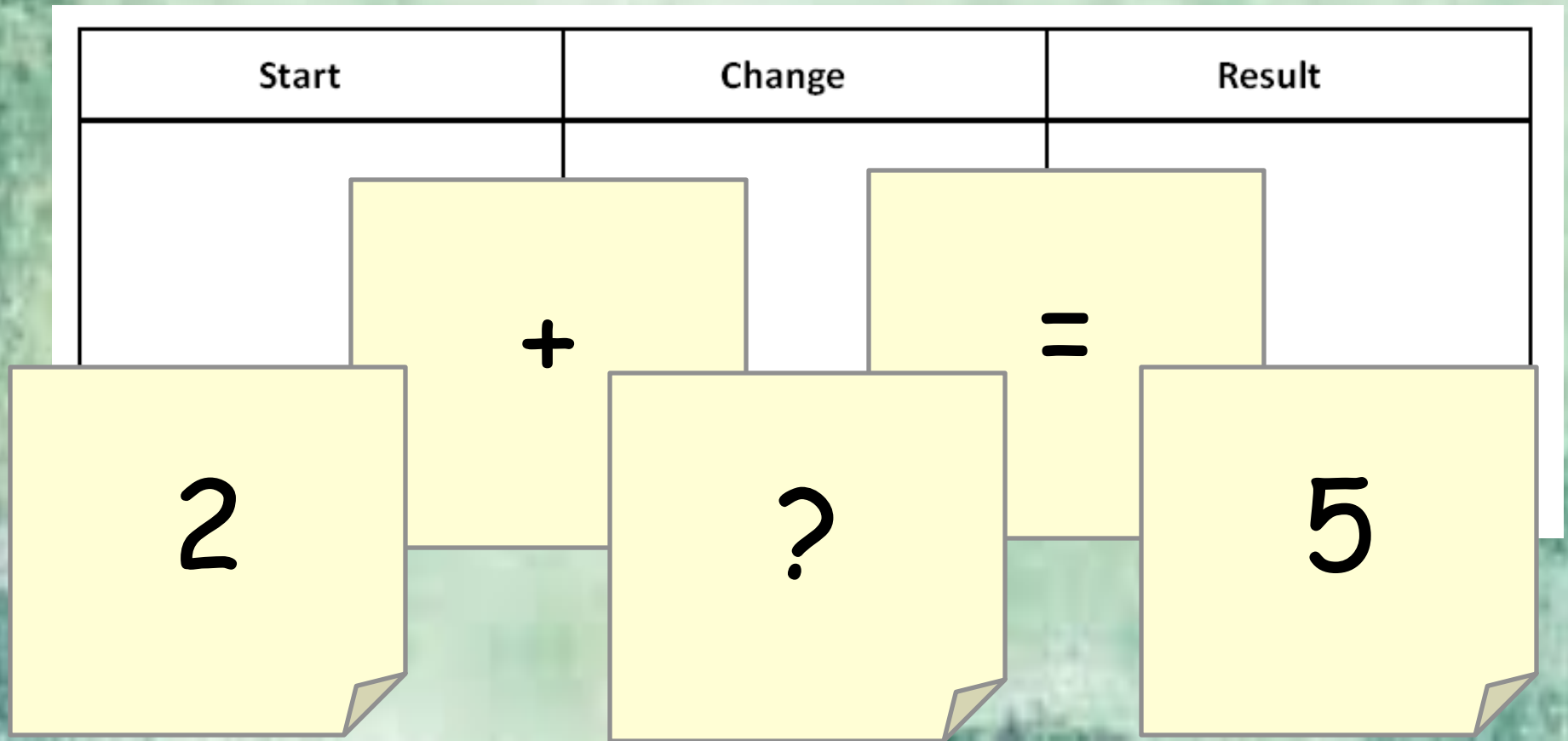


Math Practice 4

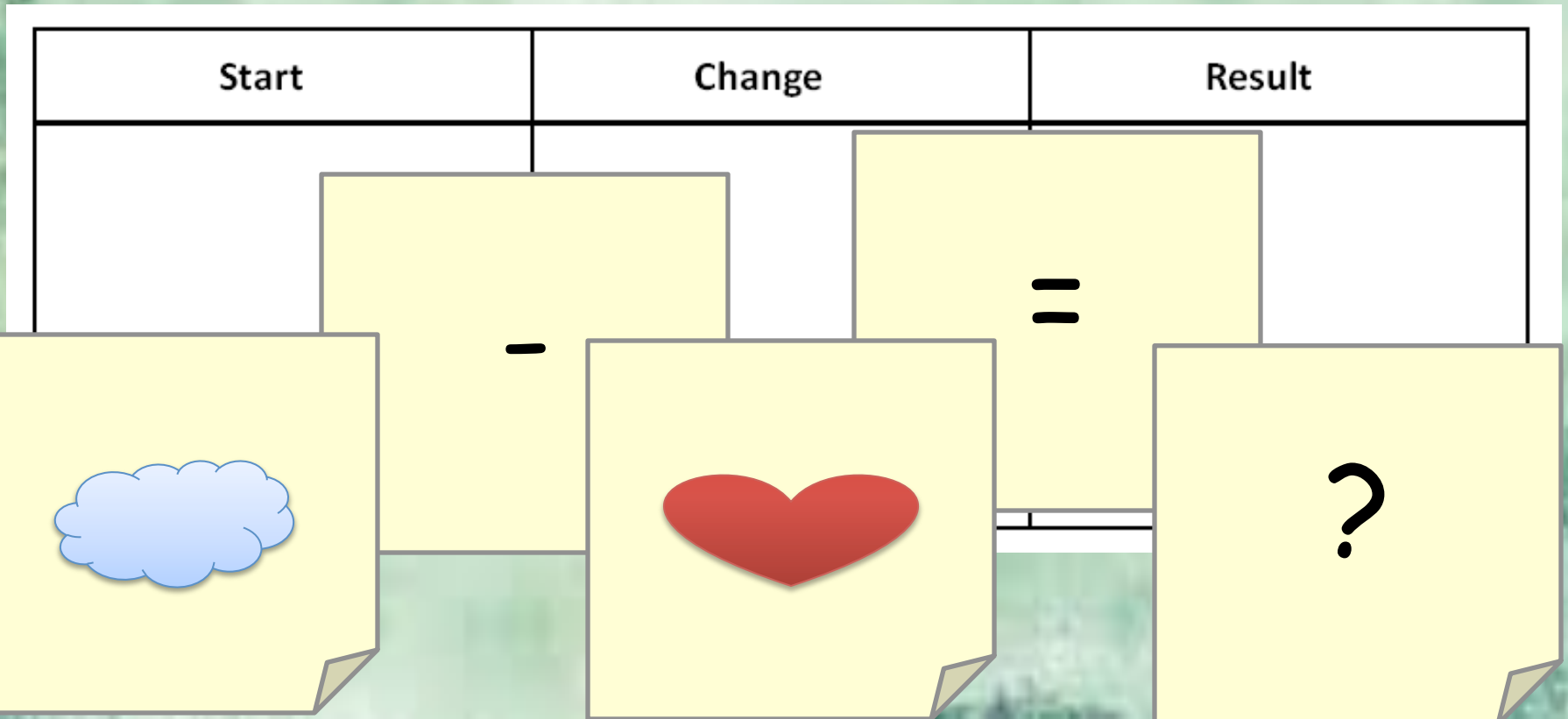
What is the unknown?

Start	Change	Result
		

Two dogs were drinking from the pond. Some other dogs ran to the water. Now there are five dogs. How many dogs ran over to the first two?



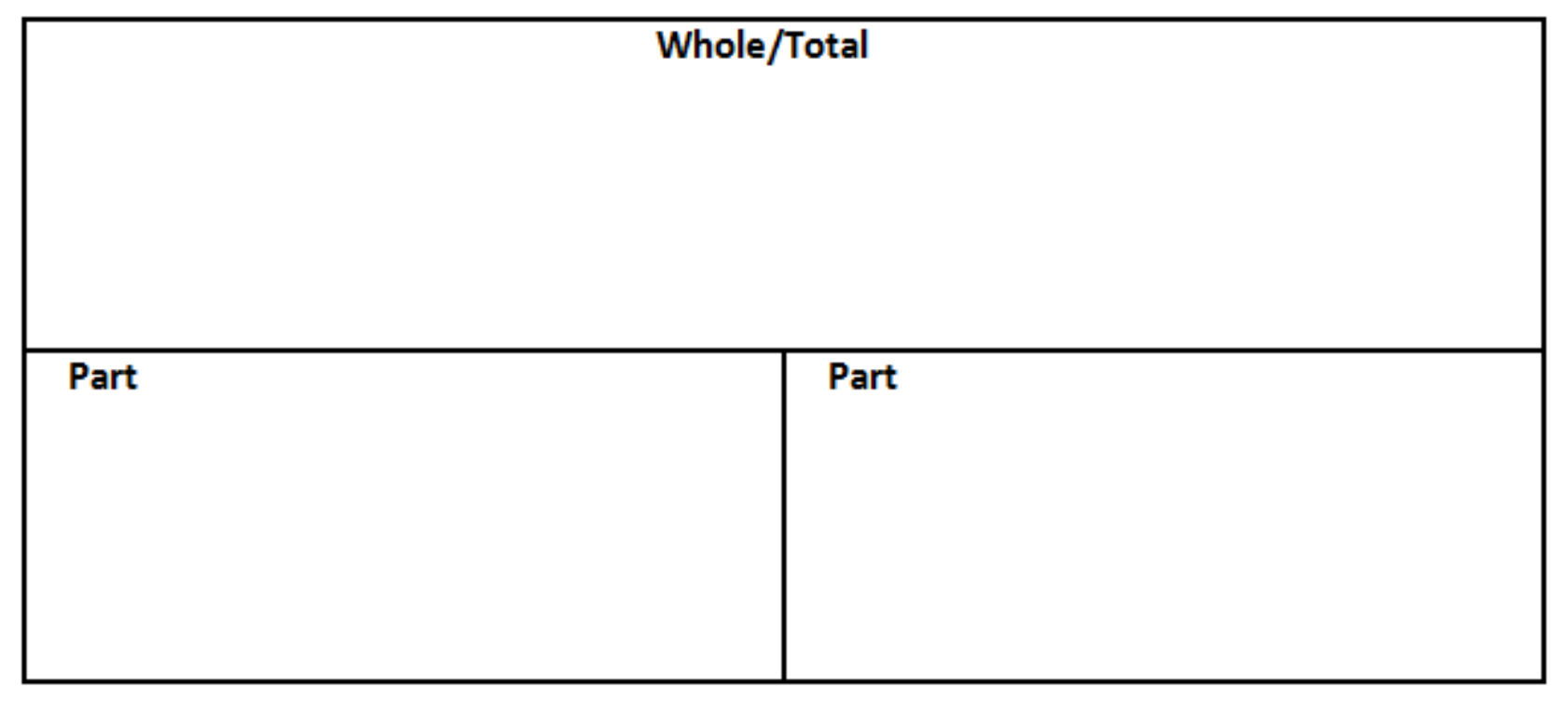
A clown gave me balloons at a party. [illegible] of them blew out of my hand. I am now holding [illegible] balloons. How many did the clown give me?



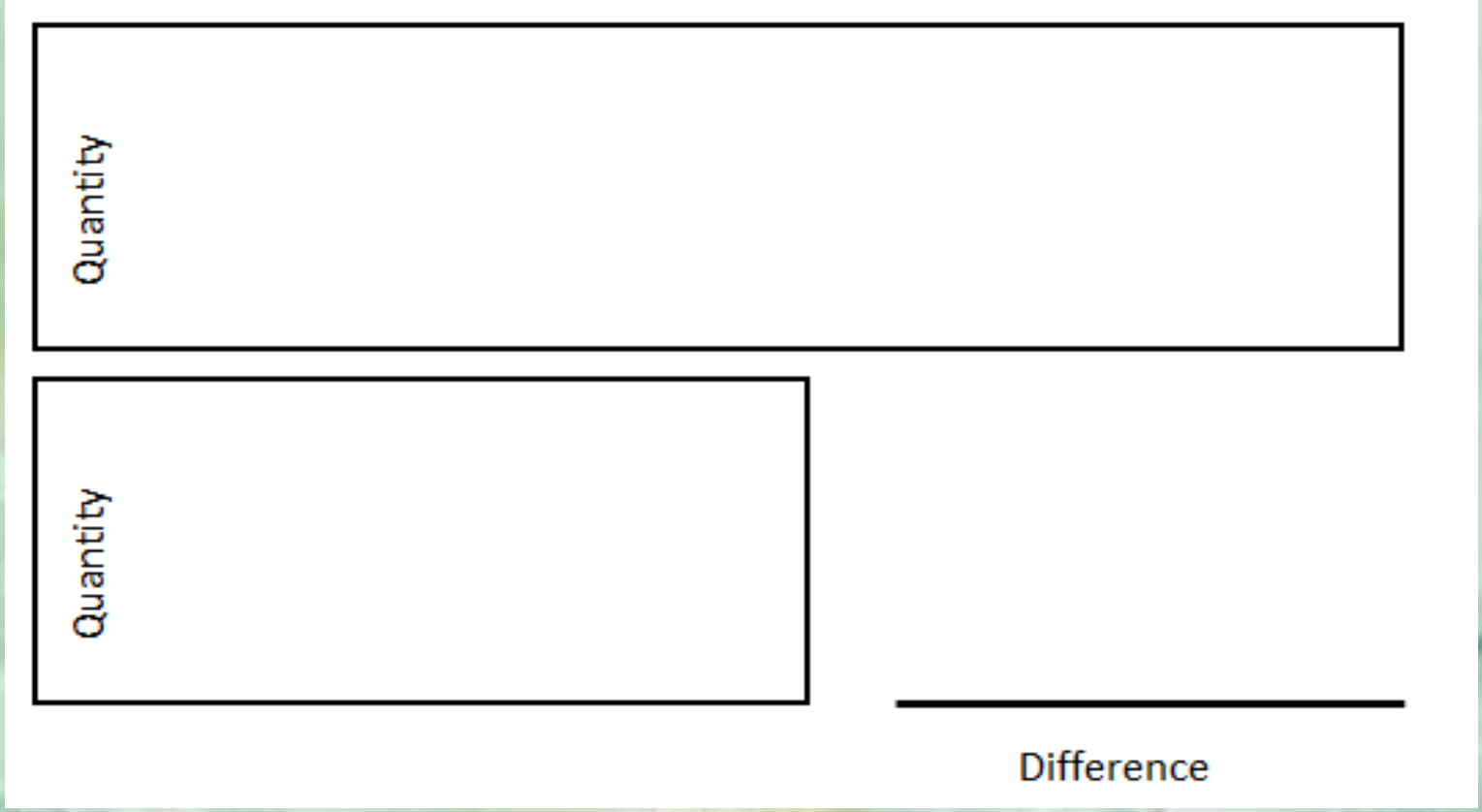
Think of the clown problem we just completed.

Where would it be on table 1?

There are twelve purple grapes and green grapes in the bowl. I counted seven purple grapes. How many green grapes are there?



You have six pencils. Your partner has four pencils. How many fewer pencils does your partner have?



The Situation

On her birthday Maria had $10 from her mom and dad and then got $15 from her grandma. Her brother bragged that he has $5 more than she has. How much money does her brother have?

What do we know about the situation?

Joining?

Taking Away?

Comparing?

Part/Part/Whole?

Start	Change	Result

$15

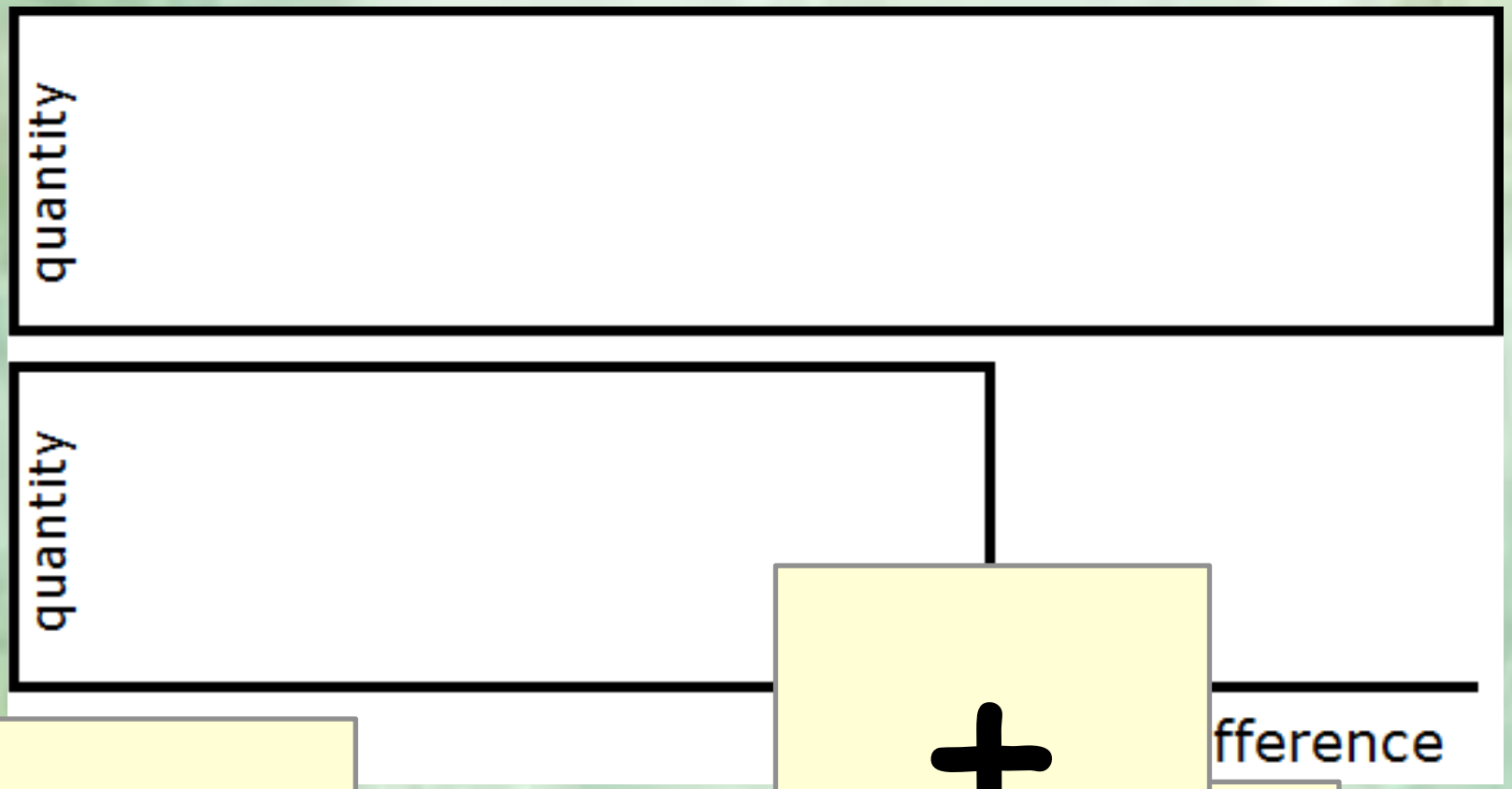
$10 + ? = $15

$10

+

The Situation

On her birthday Maria had $10 from her mom and dad and then got $15 from her grandma. Her brother bragged that he has $5 more than she has. How much money does her brother have?



$25

$25

+

+$5

= ?

The Situation

On her birthday Maria had $10 from her mom and dad and then got $15 from her grandma. Her brother bragged that he has $5 more than she has. How much money does her brother have?

Putting

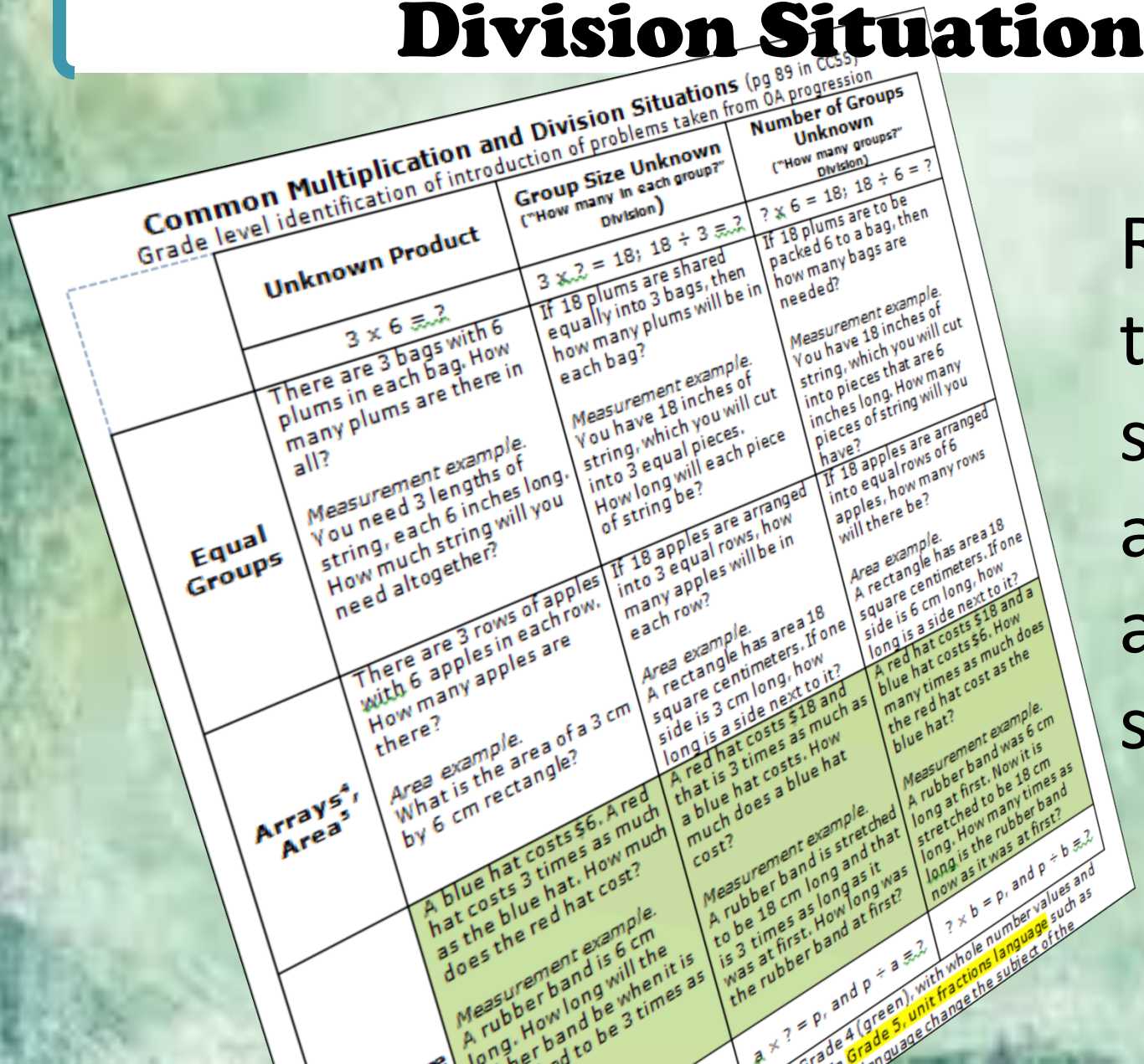
$?

When does the last equation need to be expected of students?

+ $5 = ?

+ $15) + $5 = ?

Common Multiplication and Division Situations



Common Multiplication and Division Situations (pg 89 in CCSS)
Grade level identification of introduction of problems taken from OA progression

	Unknown Product $3 \times 6 = ?$	Group Size Unknown ("How many in each group?" Division) $3 \times ? = 18;\ 18 \div 3 = ?$	Number of Groups Unknown ("How many groups?" Division) $? \times 6 = 18;\ 18 \div 6 = ?$
Equal Groups	There are 3 bags with 6 plums in each bag. How many plums are there in all? *Measurement example.* You need 3 lengths of string, each 6 inches long. How much string will you need altogether?	If 18 plums are shared equally into 3 bags, then how many plums will be in each bag? *Measurement example.* You have 18 inches of string, which you will cut into 3 equal pieces. How long will each piece of string be?	If 18 plums are to be packed 6 to a bag, then how many bags are needed? *Measurement example.* You have 18 inches of string, which you will cut into pieces that are 6 inches long. How many pieces of string will you have?
Arrays[4], Area[3]	There are 3 rows of apples with 6 apples in each row. How many apples are there? *Area example.* What is the area of a 3 cm by 6 cm rectangle?	If 18 apples are arranged into 3 equal rows, how many apples will be in each row? *Area example.* A rectangle has area 18 square centimeters. If one side is 3 cm long, how long is a side next to it?	If 18 apples are arranged into equal rows of 6 apples, how many rows will there be? *Area example.* A rectangle has area 18 square centimeters. If one side is 6 cm long, how long is a side next to it?
Compare	A blue hat costs $6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost? *Measurement example.* A rubber band is 6 cm long. How long will the rubber band be when it is stretched to be 3 times as	A red hat costs $18 and that is 3 times as much as a blue hat costs. How much does a blue hat cost? *Measurement example.* A rubber band is stretched to be 18 cm long and that is 3 times as long as it was at first. How long was the rubber band at first?	A red hat costs $18 and a blue hat costs $6. How many times as much does the red hat cost as the blue hat? *Measurement example.* A rubber band was 6 cm long at first. Now it is stretched to be 18 cm long. How many times as long is the rubber band now as it was at first?
General	$a \times ? = p$, and $p \div a = ?$		$? \times b = p$, and $p \div b = ?$

Grade 4 (green), with whole number values and
Grade 5, unit fractions language such as
language change the subject of the

Read over these situations and discuss areas of struggle.

Group-Group Size-Total

What type of situations are represented with this mat?

Group(s)	Group Size	Total

There are four highlighters in a package. How many highlighters in three packages?

Group(s)	Group Size	Total

If twelve plums are to be packed four to a bag, then how many bags are needed?

Group(s)	Group Size	Total

Where would the plum problem be on table 2?

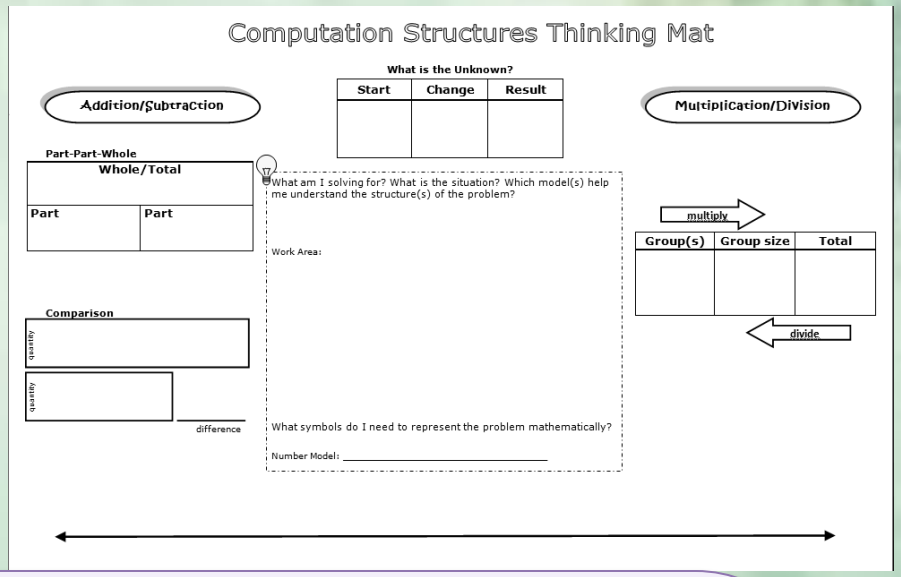
Common Multiplication and Division Situations (pg 89 in CCSS)

Grade level identification of introduction of problems taken from OA progression

	Unknown Product	Group Size Unknown ("How many in each group?" Division)	Number of Groups Unknown ("How many groups?" Division)
	3 x 6 = ?	3 x ? = 18; 18 ÷ 3 = ?	? x 6 = 18; 18 ÷ 6 = ?
Equal Groups	There are 3 bags with 6 plums in each bag. How many plums are there in all? *Measurement example.* You need 3 lengths of string, each 6 inches long. How much string will you need altogether?	If 18 plums are shared equally into 3 bags, then how many plums will be in each bag? *Measurement example.* You have 18 inches of string, which you will cut into 3 equal pieces. How long will each piece of string be?	If 18 plums are to be packed 6 to a bag, then how many bags are needed? *Measurement example.* You have 18 inches of string, which you will cut into pieces that are 6 inches long. How many pieces of string will you have?
Arrays[4], Area[5]	There are 3 rows of apples with 6 apples in each row. How many apples are there? *Area example.* What is the area of a 3 cm by 6 cm rectangle?	If 18 apples are arranged into 3 equal rows, how many apples will be in each row? *Area example.* A rectangle has area 18 square centimeters. If one side is 3 cm long, how long is a side next to it?	If 18 apples are arranged into equal rows of 6 apples, how many rows will there be? *Area example.* A rectangle has area 18 square centimeters. If one side is 6 cm long, how long is a side next to it?
Compare	A blue hat costs $6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost? *Measurement example.* A rubber band is 6 cm long. How long will the rubber band be when it is stretched to be 3 times as long?	A red hat costs $18 and that is 3 times as much as a blue hat costs. How much does a blue hat cost? *Measurement example.* A rubber band is stretched to be 18 cm long and that is 3 times as long as it was at first. How long was the rubber band at first?	A red hat costs $18 and a blue hat costs $6. How many times as much does the red hat cost as the blue hat? *Measurement example.* A rubber band was 6 cm long at first. Now it is stretched to be 18 cm long. How many times as long is the rubber band now as it was at first?
General	a × b = ?	a × ? = p, and p ÷ a = ?	? × b = p, and p ÷ b = ?

Multiplicative compare problems appear first in Grade 4 (green), with whole number values and with the "times as much" language from the table. In Grade 5, unit fractions language such as "one third as much" may be used. Multiplying and unit language change the subject of the comparing sentence ("A red hat costs n times as much as the blue hat" results in the same comparison as "A blue hat is 1/n times as much as the red hat" but has a different subject.)

Multiple step problem?

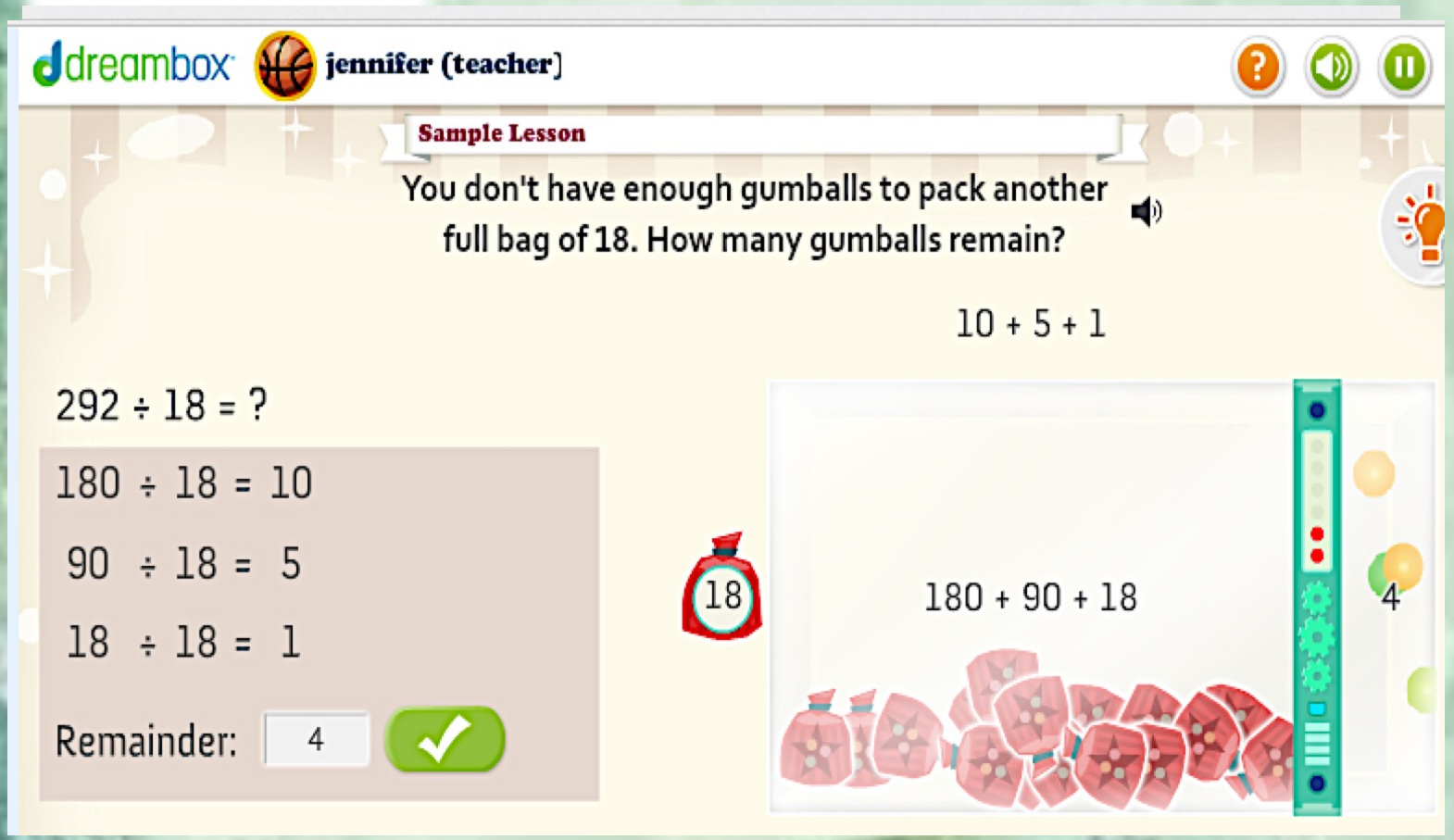


Mom bought two adult tickets for $7 each and three kid tickets for $5 each. How much did Mom spend on the tickets?

Digital Resources

dreambox LEARNING

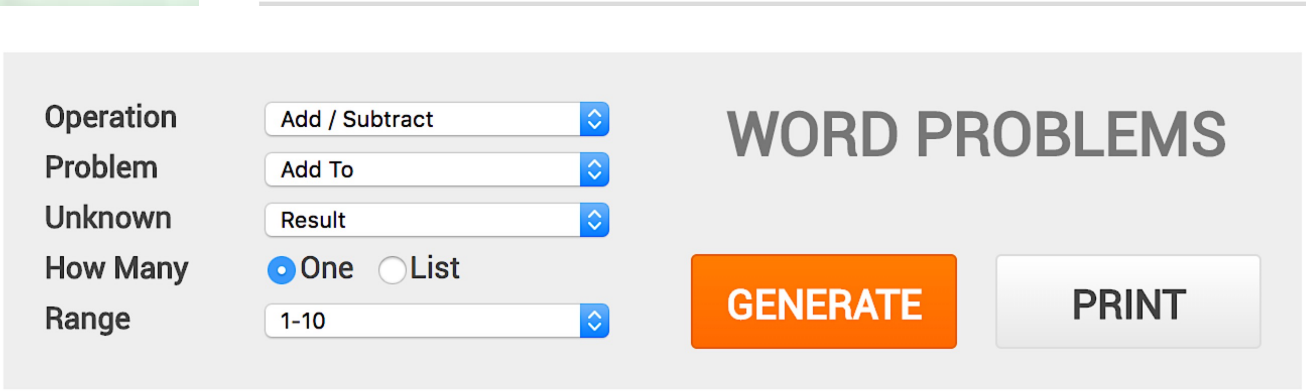
Great adaptive, personalized learning program that develops procedural fluency by building from conceptual understanding.



5.NBT.4

Digital Resources

GregTangMath.com



Directions

1. Select the word problem OPERATION.
2. Select the type of PROBLEM.
3. Choose which variable is UNKNOWN.
4. Choose HOW MANY problems to generate.
5. Specify the largest number's RANGE.
6. Click GENERATE to create your problem!

NCTM | ILLUMINATIONS

Frogs on a Log

Pre-K-2

Students learn their first basic addition facts as they make the connection between counting and finding one more than a number. Students will manipulate frogs on a number line to represent adding 1 to a number.

Get the Picture—Get the Story

3-5

In the following lesson, students act as reporters at the Super Bowl. Students study four pictures of things that they would typically find at a football game: players, a scoreboard, a crowd, and a concession stand. Students are asked to create problem situations that correspond to their interpretation of each of the pictures.

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