Tulare County
Office of Education

Jim Vidak, County Superintendent of Schools

Addition and Subtraction: What's the Difference?

Tools for Modeling Subtraction Problems

Presented by Shelah Feldstein

Intro

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Session Agenda

Addition & Subtraction: What's the Difference?

Subtraction Contexts

Subtraction Strategies Common in Early Elementary

Tools for Modeling Subtraction Situations

Formative Assessment

Promote and Deepen Academic Discourse

EXPECTATIONS IN CALIFORNIA

Fact Families

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 - 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

2.NBT.5 Fluently add and subtract within100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Fact Families

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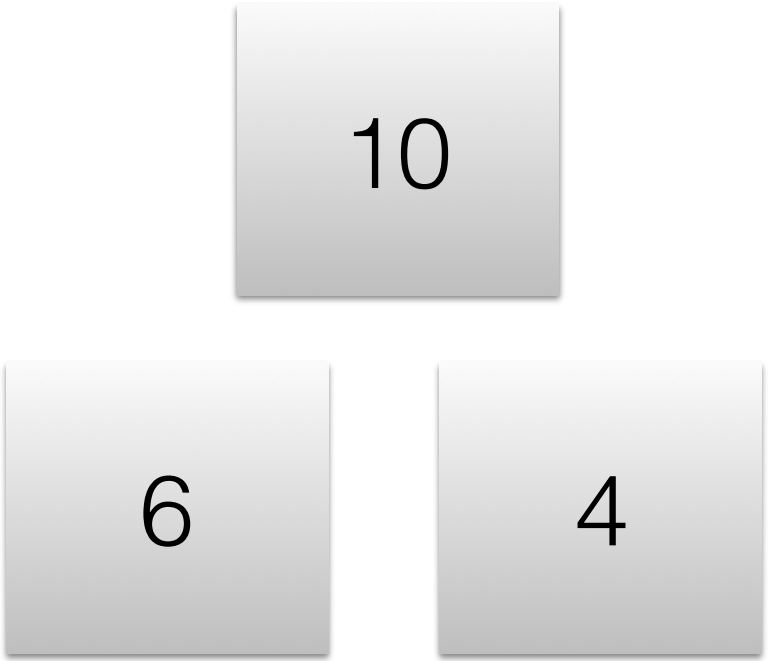
3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

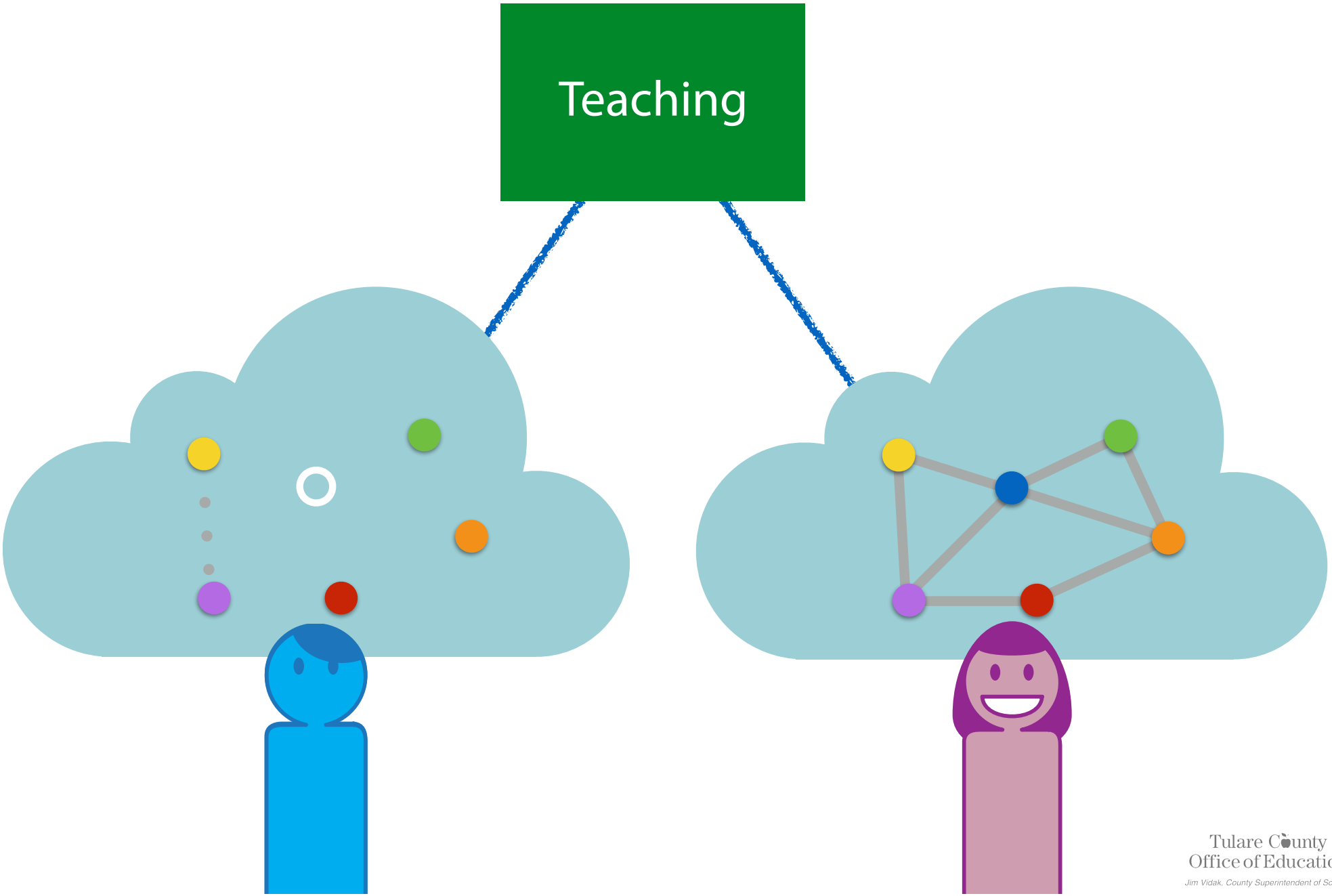
Fact Families



Why are these facts related for addition and subtraction?

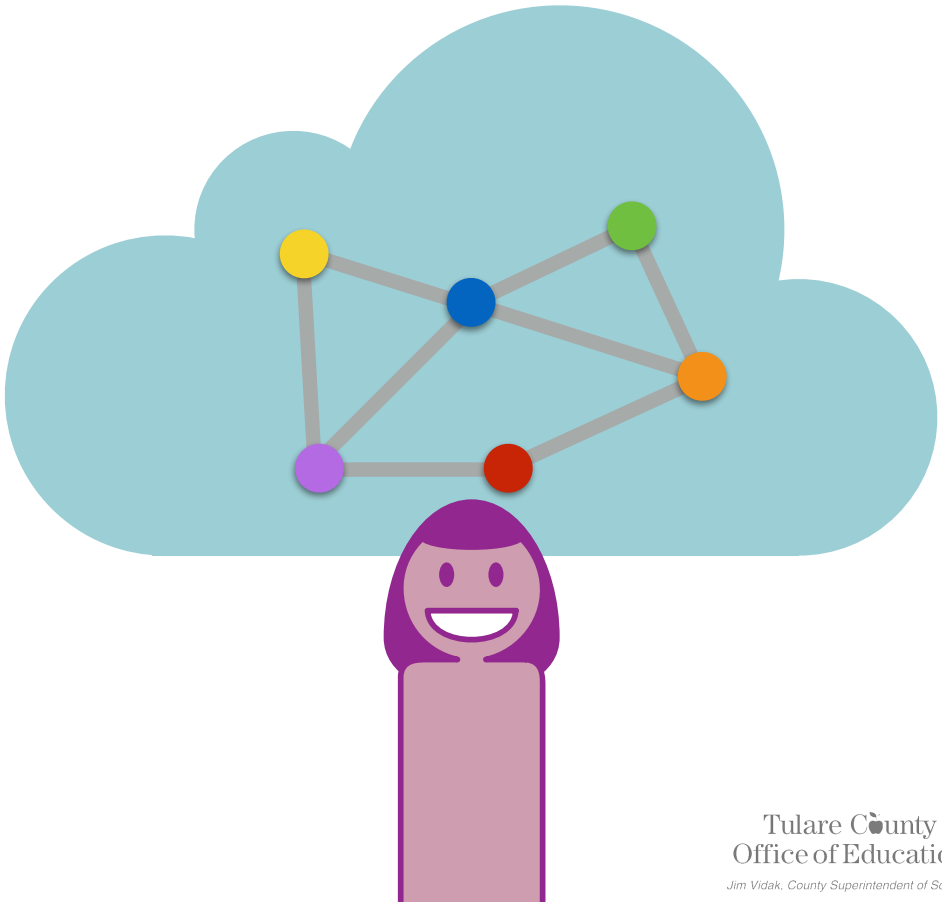
Represent your explanation as many ways as possible.

Where Does our Teaching Lead?



Where Does our Teaching Lead?

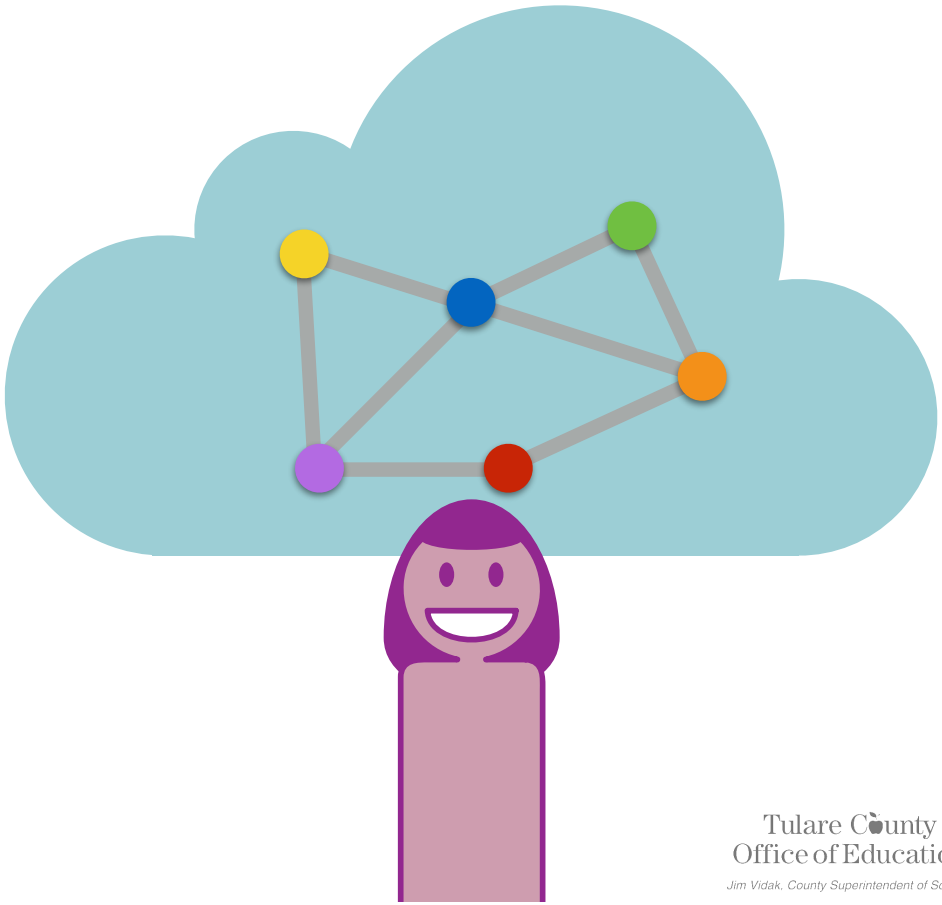
Mathematical understanding is about our experiences, not our ability.



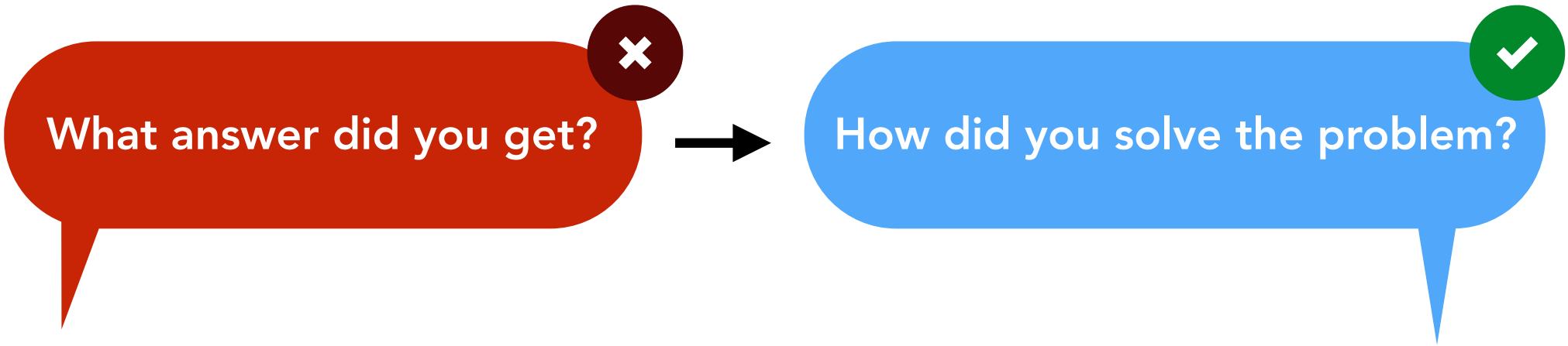
Where Does our Teaching Lead?

As good as we might be, experience is a better teacher.

Create experiences for your students.

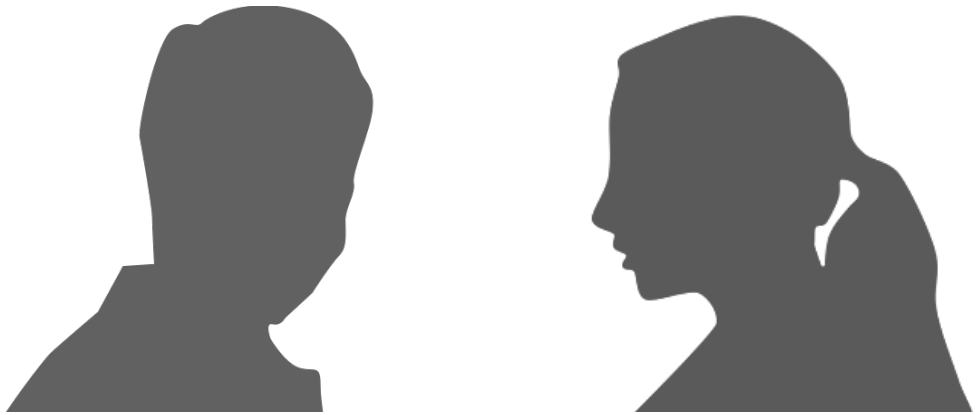


Shift



Discuss

Why do students tend to struggle with the concept of subtraction?



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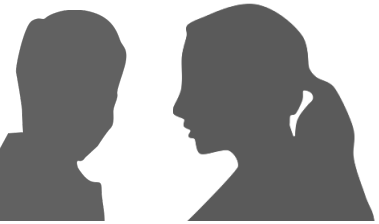
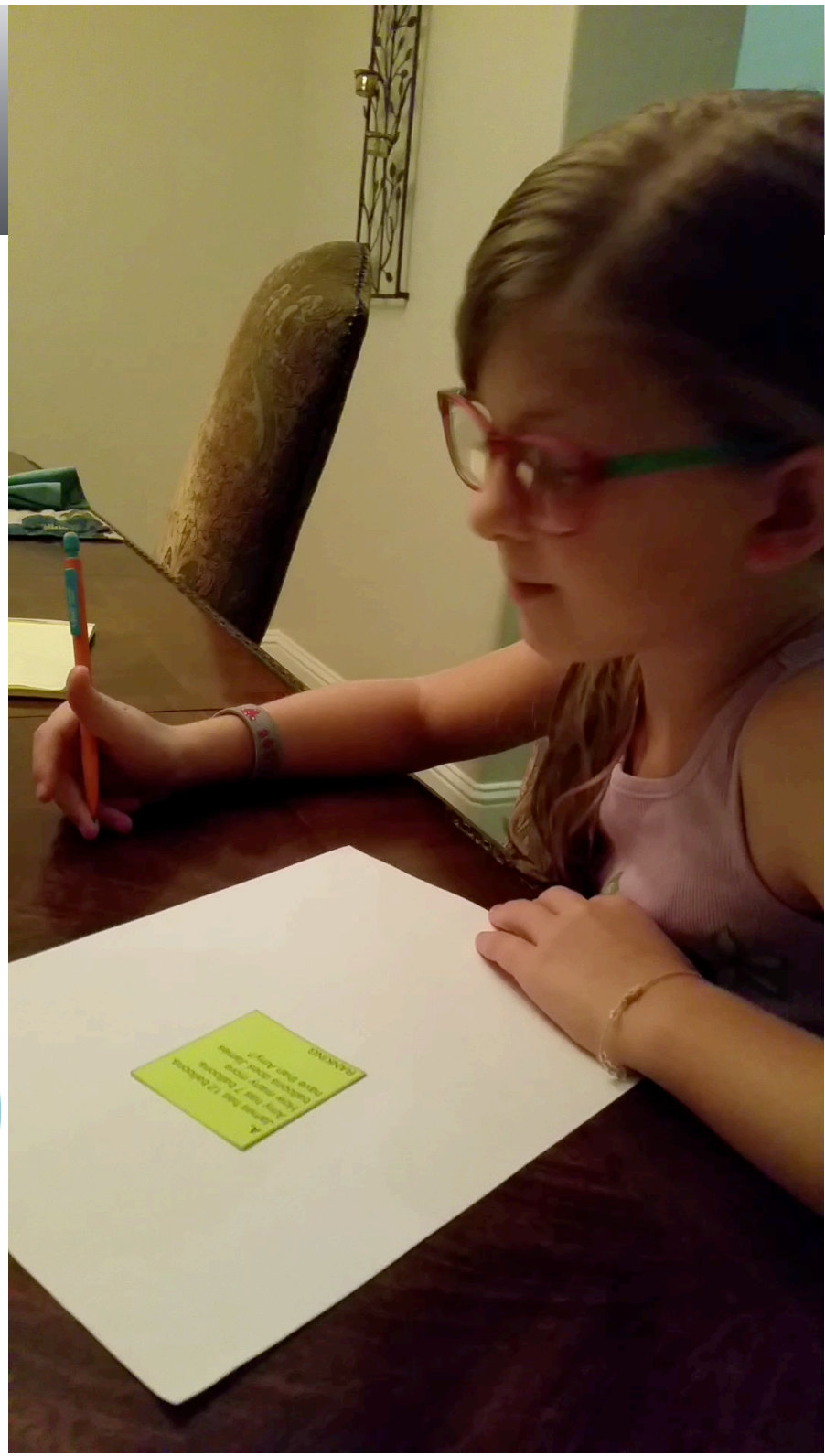
CONTEXT

Context

James has 12 balloons. Amy has 7 balloons. How many more balloons does James have than Amy?

She got the right answer…
So what's the problem?





Take from VS Compare

	Take From	Compare
Context	One quantity is decreasing.	Two different quantities- comparing the differences.
	"There are 10 frogs on the log. 6 frogs jump in the water. How many frogs are still on the log?"	"There are 10 green frogs and 6 brown toads. How many more frogs are there than toads?"

STRATEGY

Take From VS Compare

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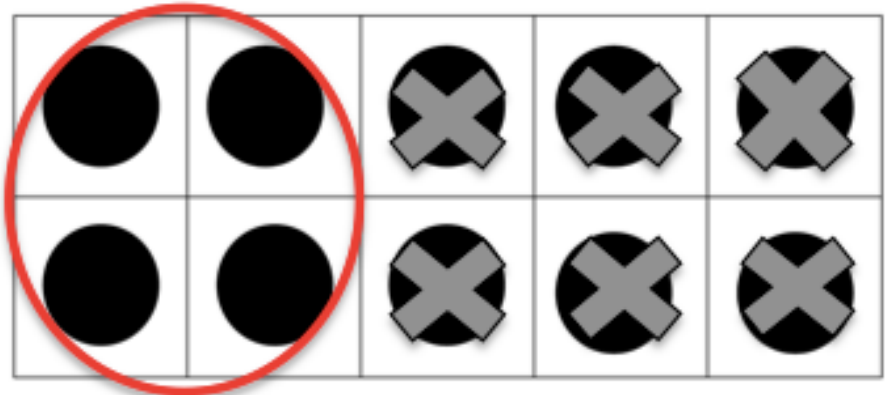

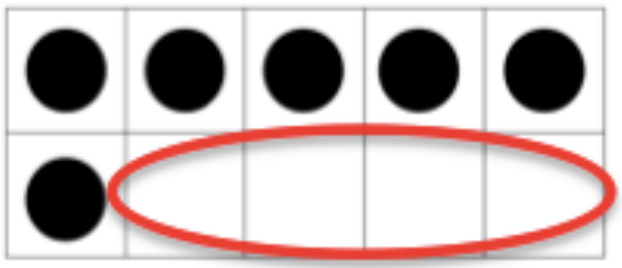

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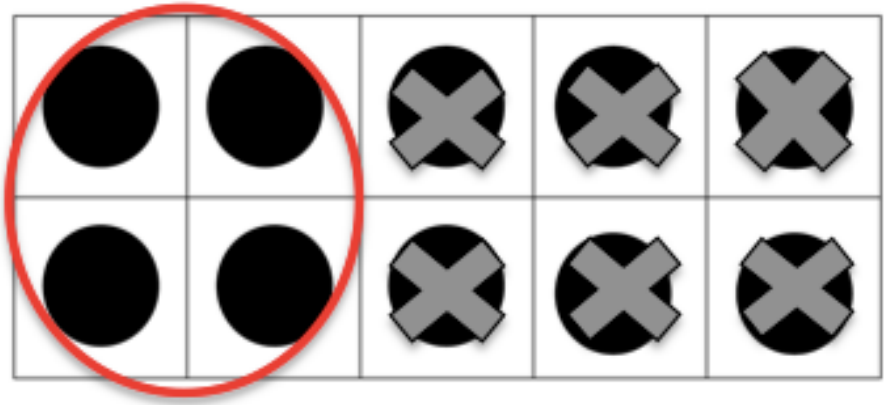
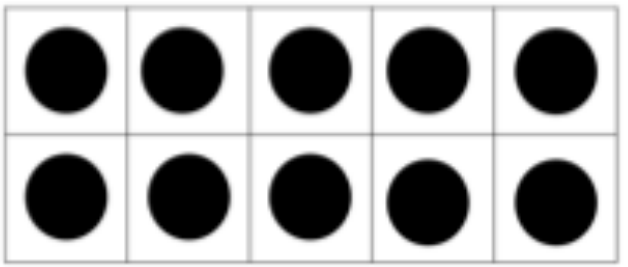
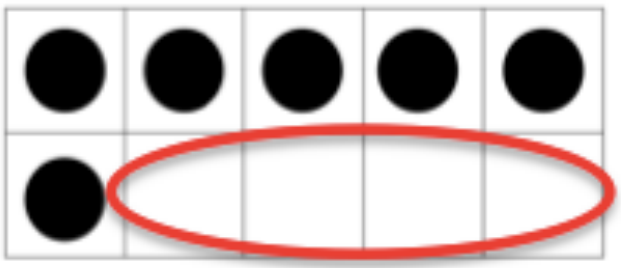
Take From VS Compare

	Take From	Compare
Strategy	Remove/Count Back	Count up the difference/ Distance



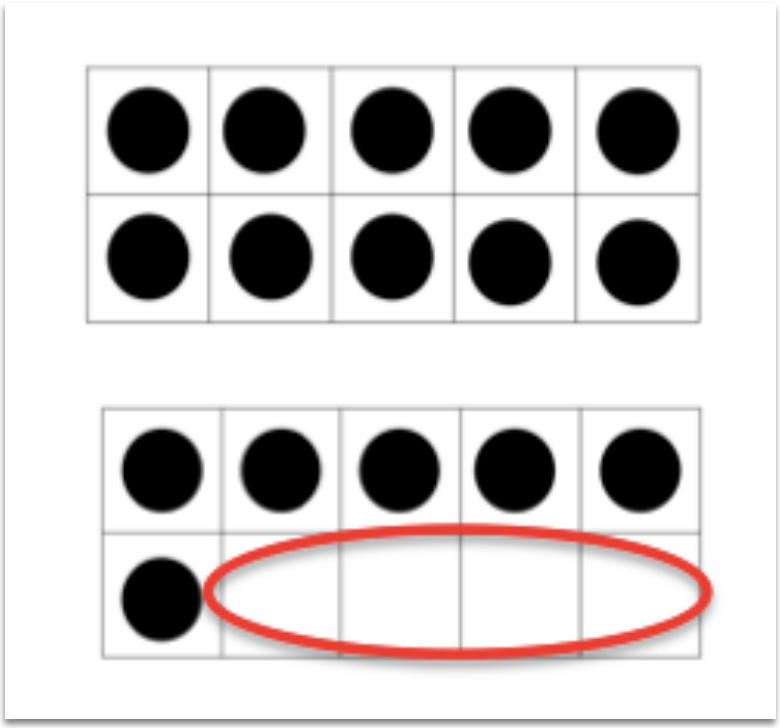


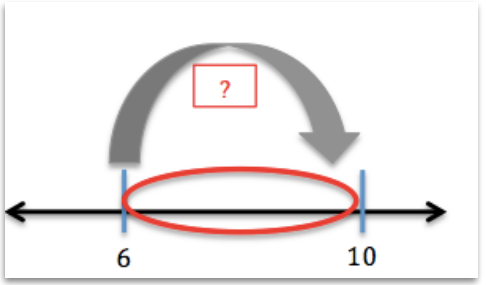


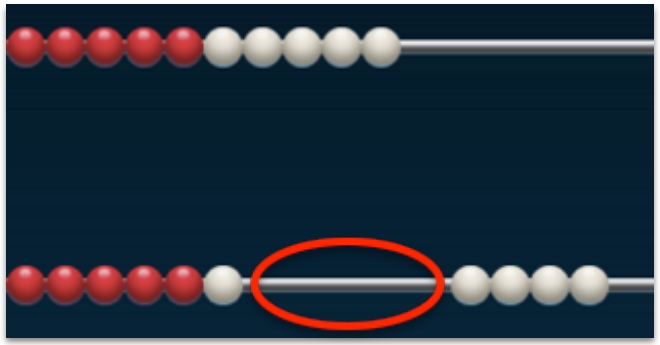
Compare Focus Questions

How many more does 6 need to have the same as 10?

How many less does 10 need to have the same as 6?



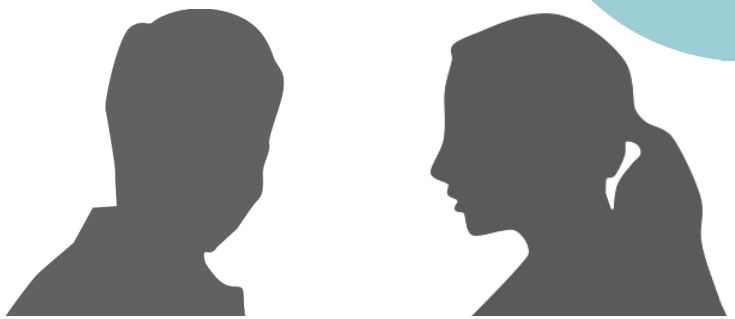




Take From VS Compare

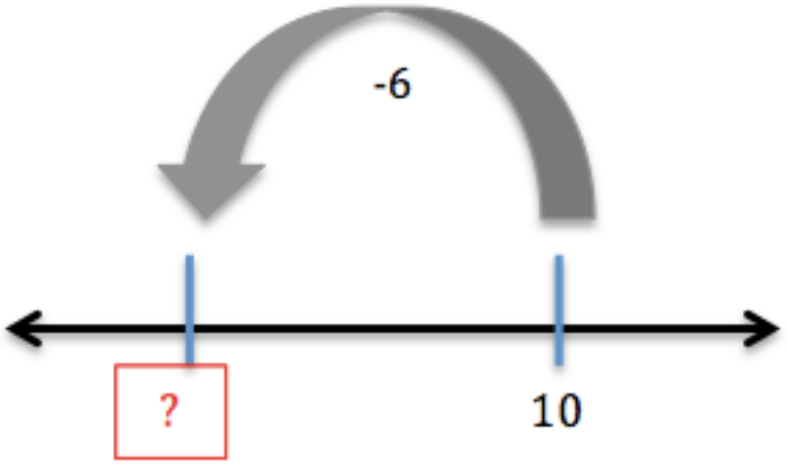
	Take From	Compare
Strategy	Remove/Count Back	Count up the difference/ Distance

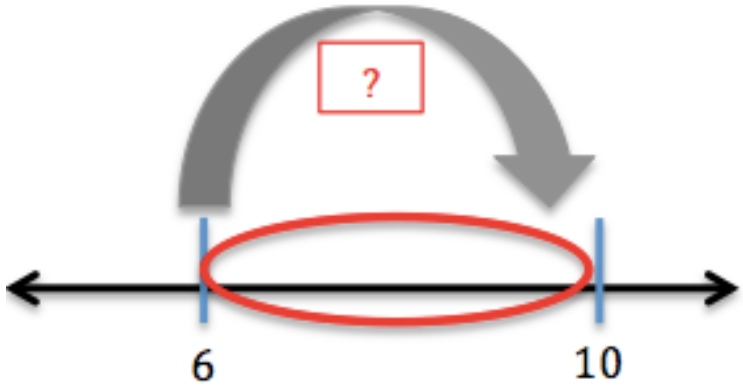
What has been your experience teaching these problem types?



Connections to Number Lines

	Take From	Compare
Strategy	Remove/Count Back	Count up the difference/ Distance



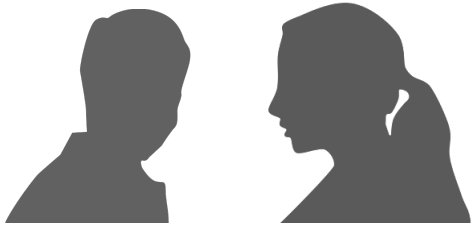


Hundreds Chart

	Take From	Compare
Strategy	Remove/Count Back	Count up the difference/ Distance

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

How can a hundreds chart be used to represent both approaches?



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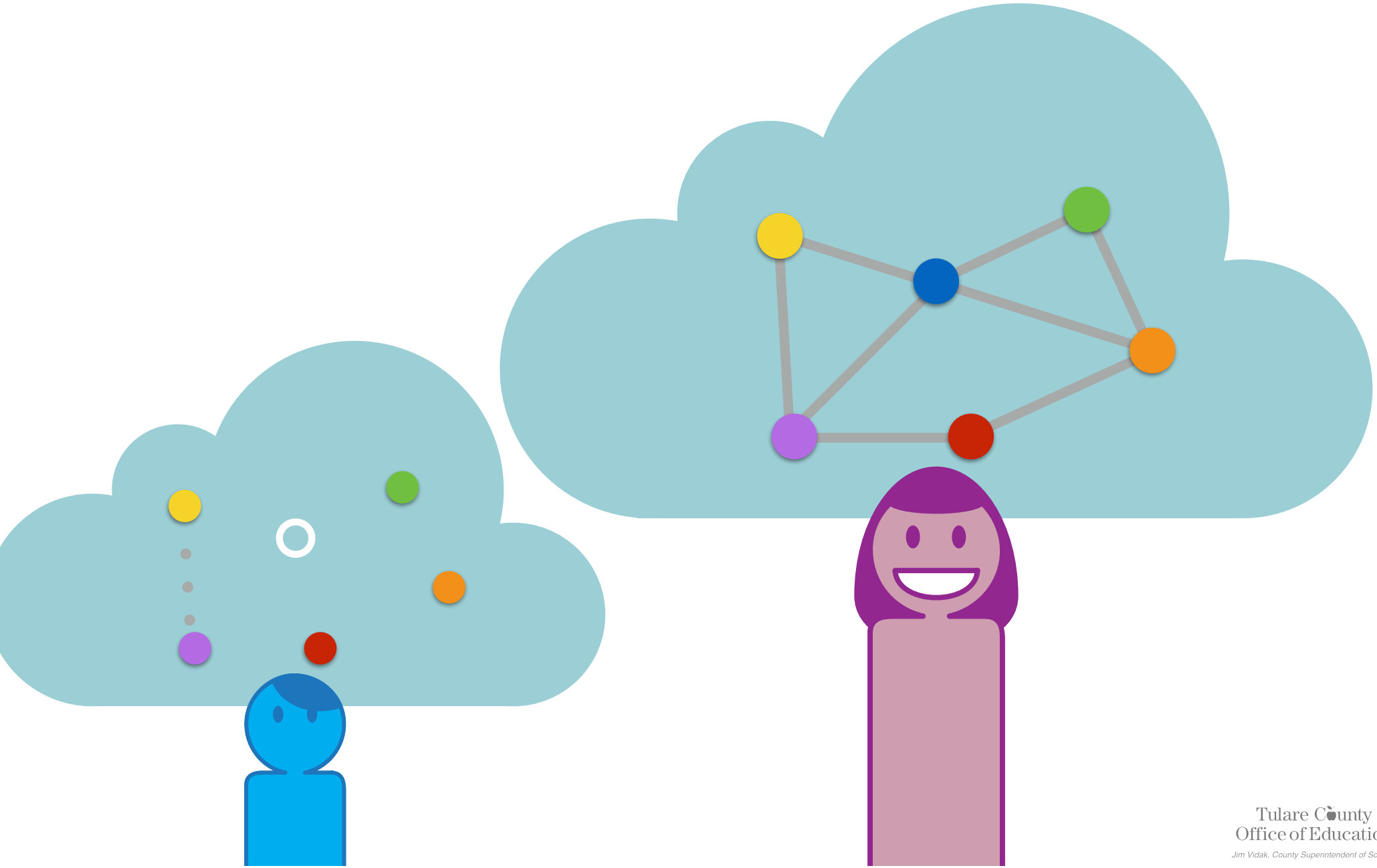
Make Connections



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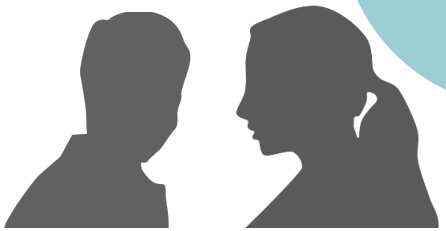
Connect & Share

Partner A: Describe your problem solving on a hundreds chart.

Partner B: Represent your partner's thinking on a number line.

Compare the representations.

What other strategies would have worked? How could you have communicated more precisely?



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Dialogue Frames

I agree with _____ because _____.

I don't understand _____. Can you explain that again?

I disagree with _____ because _____.

How did you decide to _____?

Number Talks, by Sherri Parrish

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FORMATIVE ASSESSMENT

Fluency

The California Mathematics Standards describes **procedural fluency** as, “skill in carrying out procedures flexibly, accurately, efficiently, and appropriately.”

(California Department of Education, 2015)

Fluency

Accuracy What is the answer to 10 - 6? How do you know it is correct? (How might you check it?)	**Efficiency** Which facts do you "just know"? Which facts do you use a strategy to solve?
Flexibility Solve 10 - 6 using one strategy. Now try solving it using another strategy.	**Appropriate Strategy Selection** Emily solved 10 - 6 by changing it in her mind to 6 + ? = 10. What did she do? Is this a good strategy? Tell why or why not.

Next Steps

- What next step will you take?
- Write it down.
- Share your next step with a partner.

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Thank You

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Your feedback is greatly appreciated.

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