#NCSIP2022

2022 NCSIP NETWORK CONFERENCE

PEOPLE | PURPOSE | PASSION

THE PATHWAY TO SUCCESS

North Carolina Department of PUBLIC INSTRUCTION

NC SIP

What's Essential in Math Intervention?

PEOPLE | PURPOSE | PASSION
THE PATHWAY TO SUCCESS

#NCSIP2022

Sarah R. Powell, Ph.D.

Associate Professor
The University of Texas at Austin

www.sarahpowellphd.com

srpowell@utexas.edu

@sarahpowellphd

Introduce yourself.

Describe your role as an educator.

Describe the mathematics you support.

Share fun things from today and tag @sarahpowellphd!

Instructional Platform

INSTRUCTIONAL DELIVERY

- Explicit instruction
- Precise language
- Multiple representations

INSTRUCTIONAL STRATEGIES

- Fluency building
- Problem solving instruction

MODELING

Step-by-step explanation

Planned examples

PRACTICE

Guided practice

Independent practice

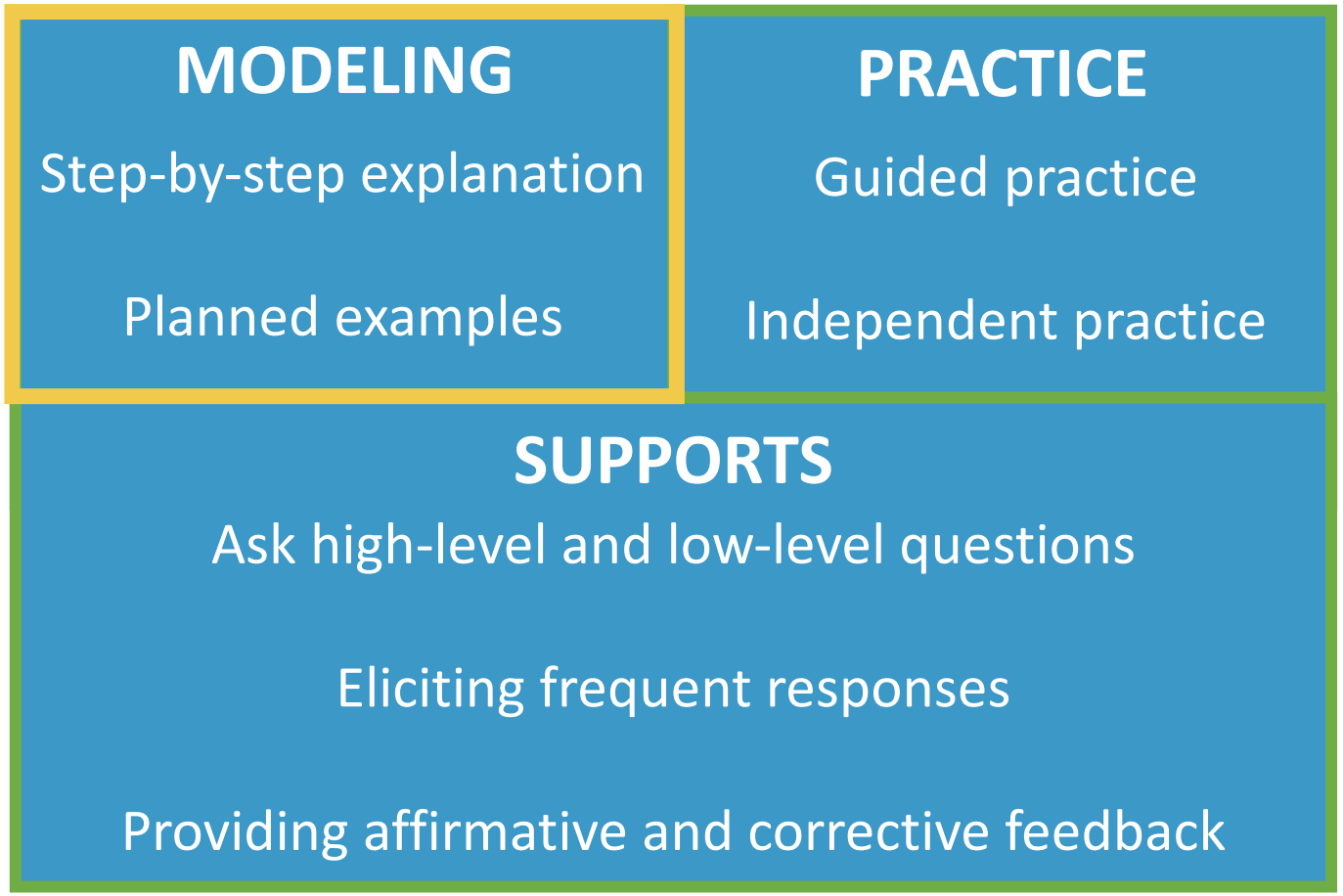
SUPPORTS

Ask high-level and low-level questions

Eliciting frequent responses

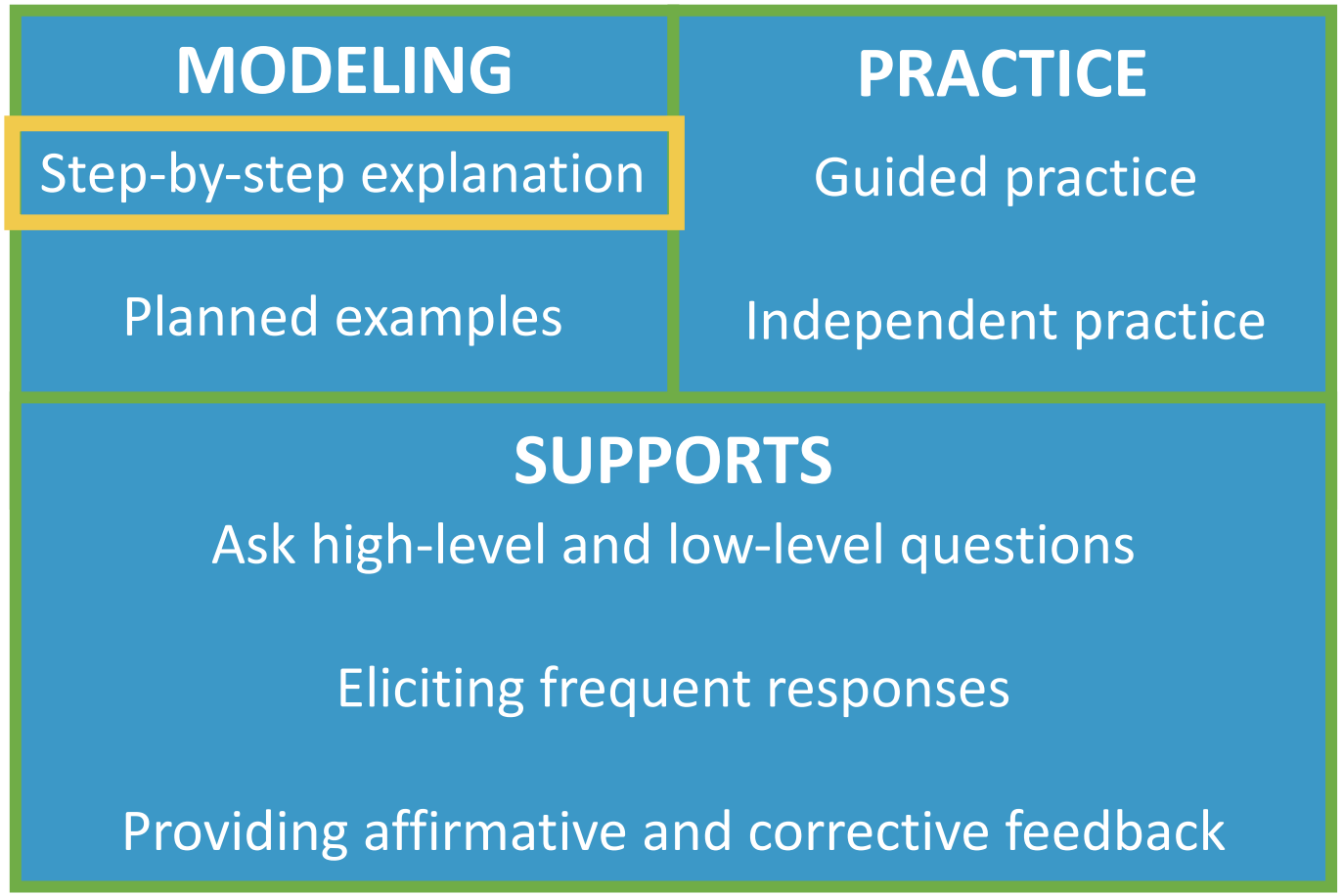
Providing affirmative and corrective feedback

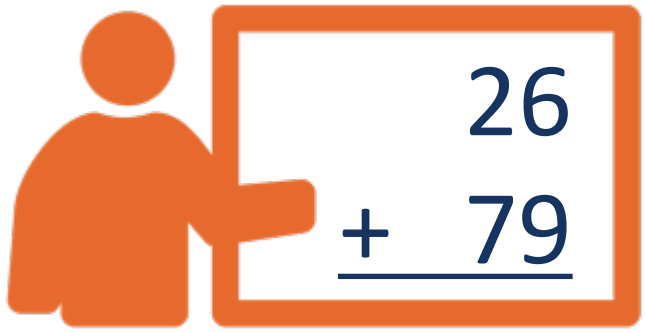
Modeling is a dialogue between the teacher and students.



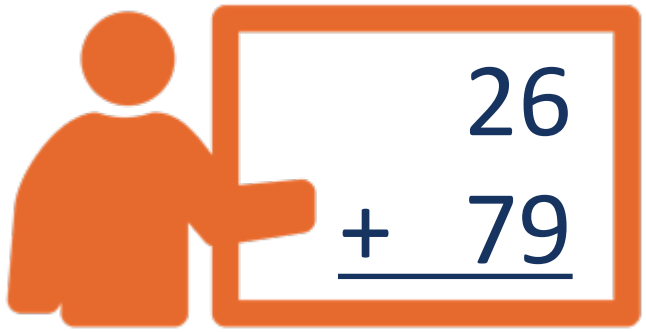
Modeling includes a step-by-step explanation of how to do a mathematical problem.

A teacher may do 1 modeled problem or several.





“Today, we are learning about addition. This is important because sometimes you have different amounts – like money – and you want to know how much money you have altogether.”



"Let's solve this problem. What's the problem?"

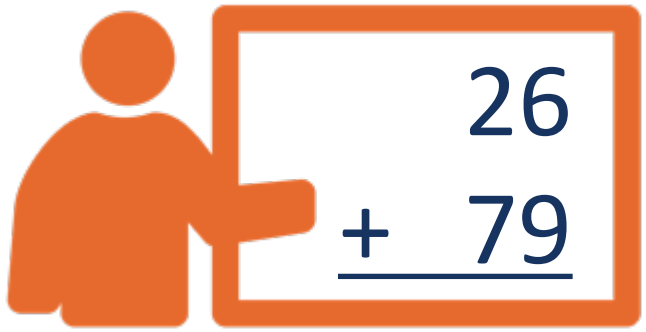
"26 plus 79."

"To solve 26 plus 79, first decide about the operation. Should we add, subtract, multiply, or divide?"

"Add."

"How did you know we want to add?"

"There's a plus sign."



"The plus sign tells us we want to add. To add, let's use the partial sums strategy. What strategy?"

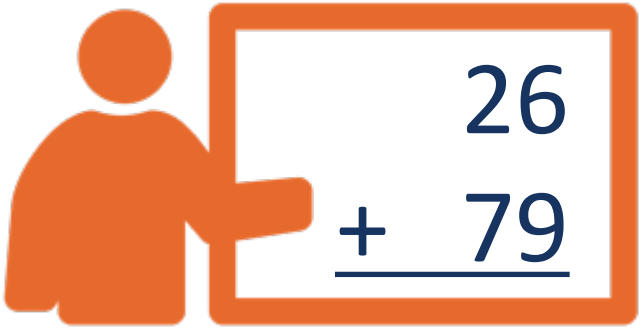
"Partial sums."

"With the partial sums strategy, we start adding in the greatest place value. What's the greatest place value in this problem?"

"The tens."

"So, let's add the tens. What's 20 plus 70?"

"90."



"20 plus 70 equals 90. Let's write 90 right here below the equal line. What will we write?"

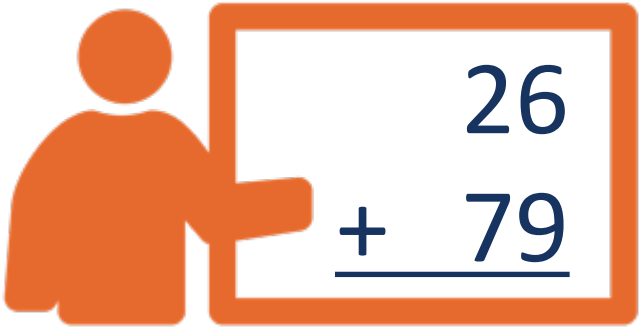
"90."

"90 is the partial sum when you add the tens. What does 90 represent?"

"It's the partial sum of adding 20 plus 70."

"Now, let's add the ones. What should we add?"

"6 plus 9."



"6 plus 9 equals what?"

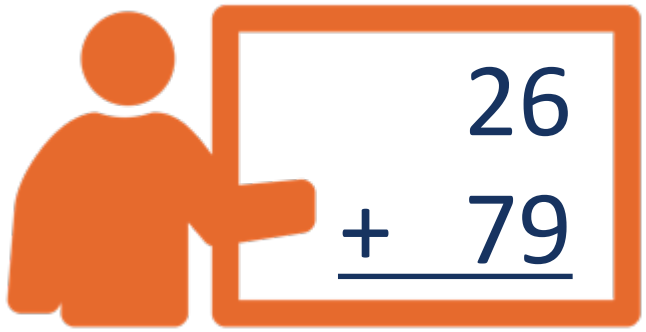
"15."

"Let's write 15 below the 90. Where do we write the 15?"

"Below the 90."

"15 is the partial sum when you add the ones. Now, let's add the partial sums together. What will we add?"

"90 plus 15."



"What's 90 plus 15?"

"How did you add those numbers?"

"So, when you add 26 plus 79, the sum is 105. Who can share how we solved this problem?"

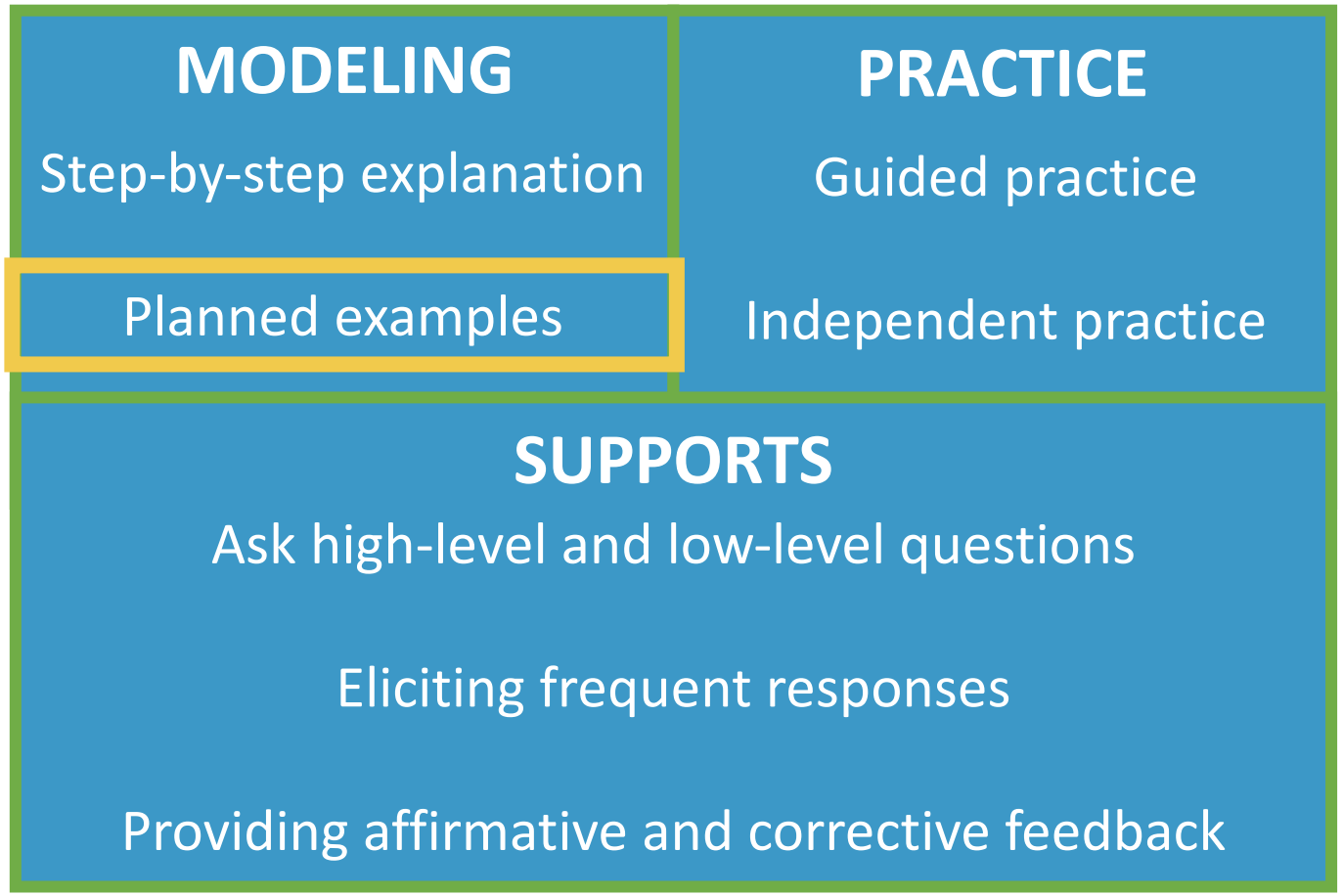
"105."

"I added 90 plus 10 then added 5 more."

"We used the partial sums strategy. We added the tens then added the ones. Then we added the partial sums."

Modeling needs to include planned examples.

These examples should be sequenced so easier skills lead to more difficult skills.



Talk about your modeling.

What math do you model?

How do you model?

MODELING

Step-by-step explanation

Planned examples

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Ask high-level and low-level questions

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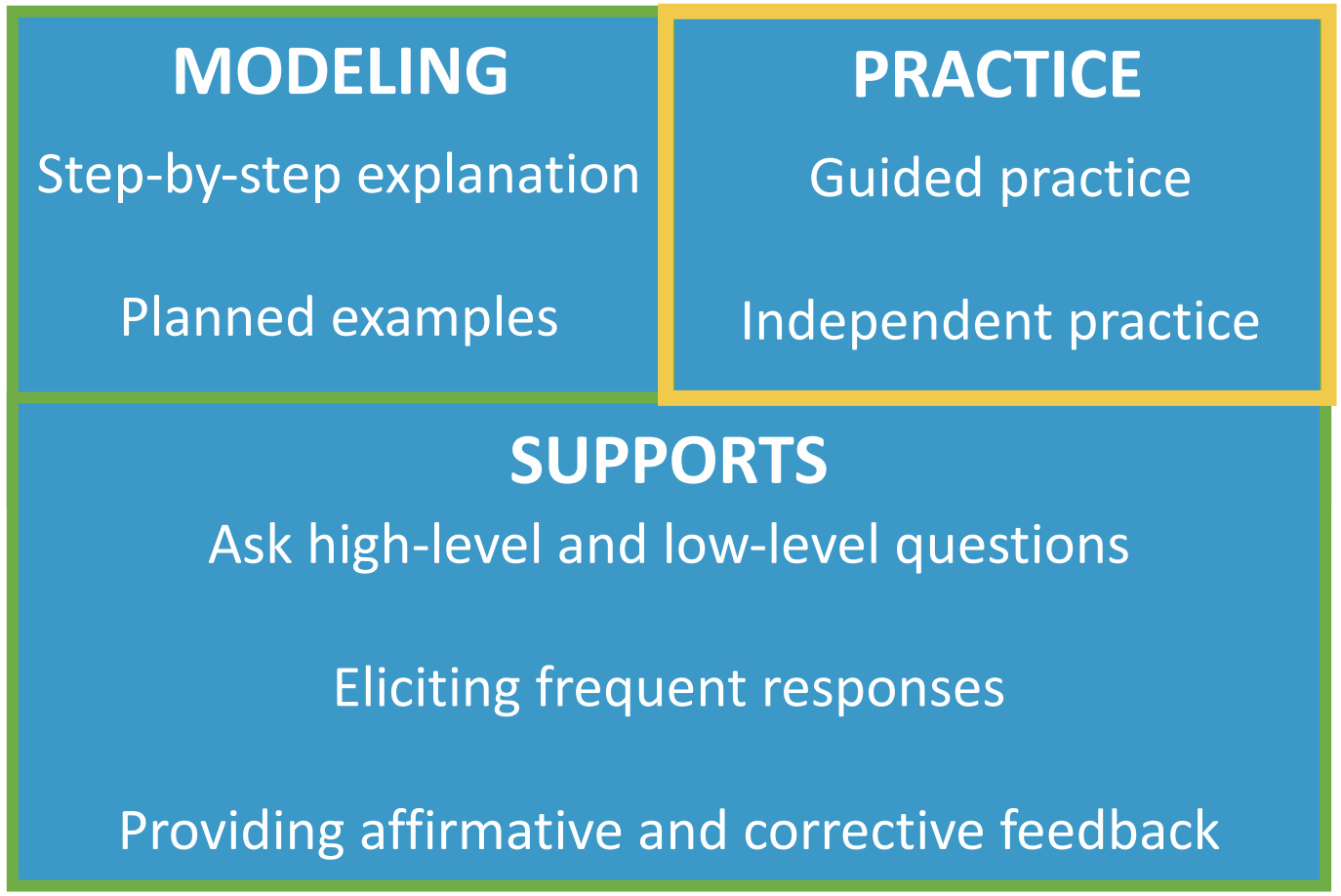

Practice continues as a dialogue between the teacher and students.

MODELING	PRACTICE
Step-by-step explanation	Guided practice
Planned examples	Independent practice

SUPPORTS

Ask high-level and low-level questions

Eliciting frequent responses

Providing affirmative and corrective feedback

Guided practice is practice in which the teacher and students practice problems together.

"Let's work on a problem together."

MODELING

Step-by-step explanation

Planned examples

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Independent practice is practice in which the students practice independently with teacher support.

"Now, you'll practice a problem on your own. Use your attack strategy!"

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Step-by-step explanation

Planned examples

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Ask high-level and low-level questions

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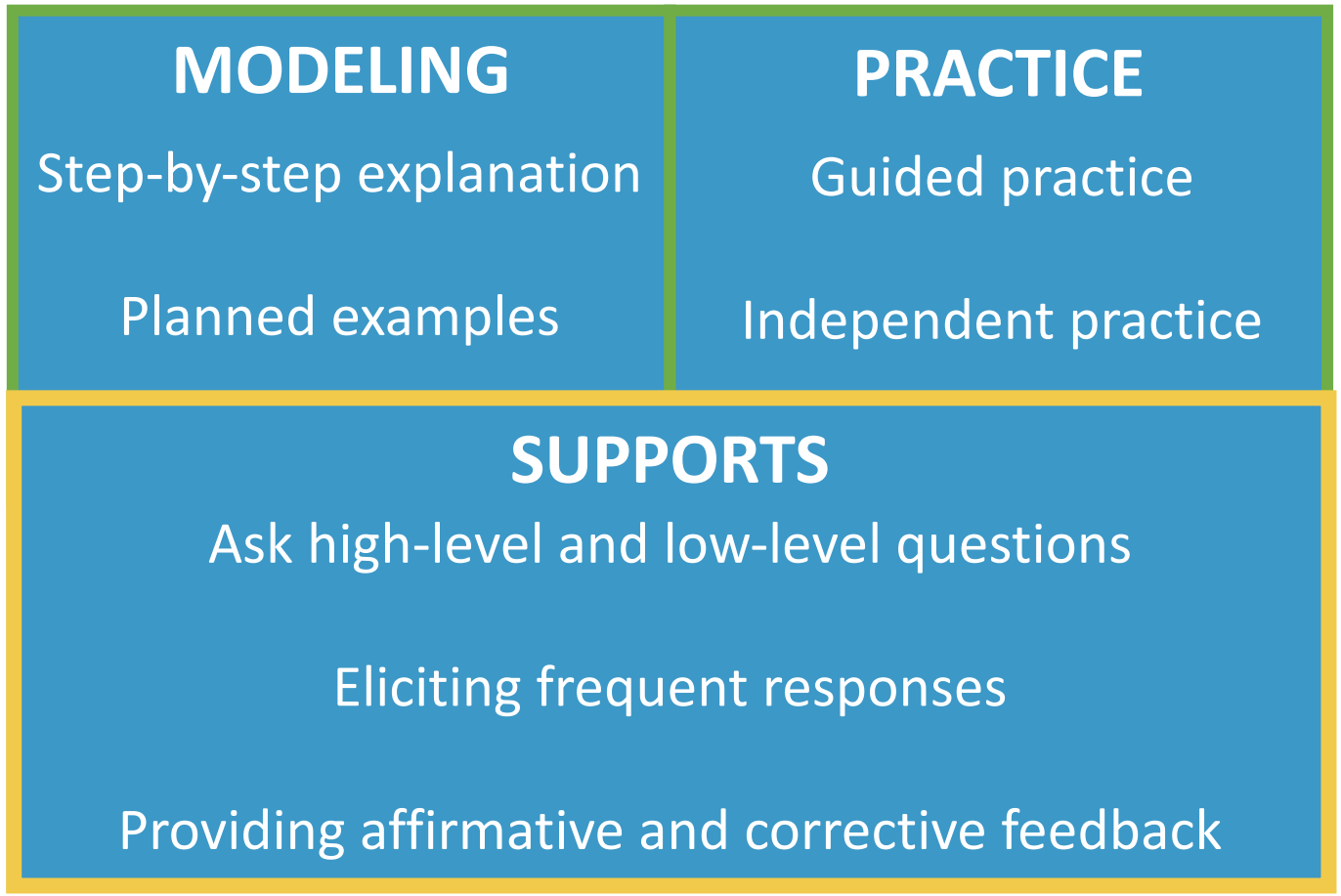
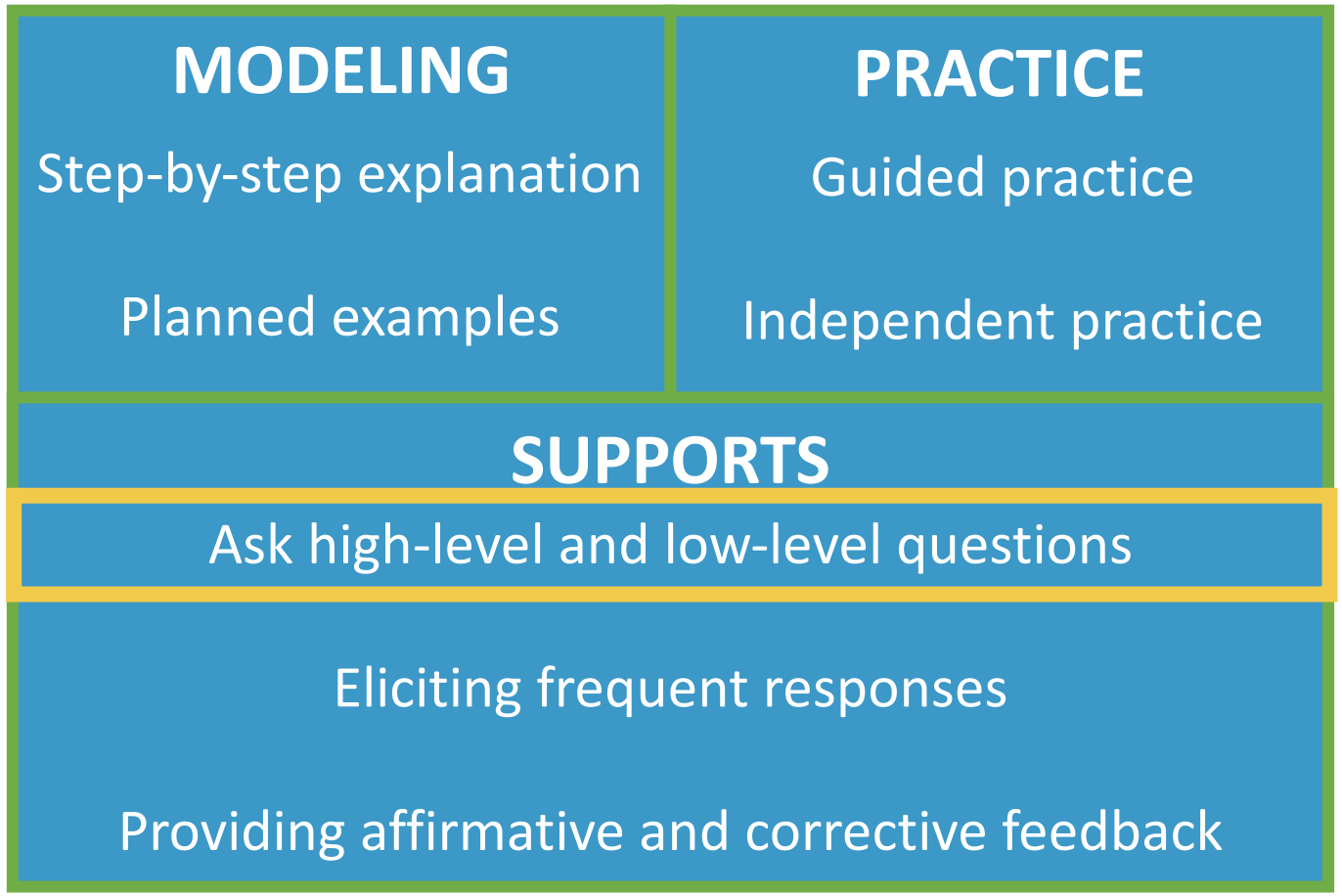
How do you engage your students in guided practice?



These **Supports** should be used in both **Modeling** and **Practice.**

During **Modeling** and **Practice**, it is essential to engage students and check for understanding.



During **Modeling** and **Practice**, it is essential to engage students and check for understanding.

MODELING	PRACTICE
Step-by-step explanation	Guided practice
Planned examples	Independent practice

SUPPORTS

Ask high-level and low-level questions

Eliciting frequent responses

Providing affirmative and corrective feedback

Ask a combination of high-level and low-level questions.

"What is 7 times 9?"

"63."

During **Modeling** and **Practice**, it is essential to engage students and check for understanding.

MODELING	PRACTICE
Step-by-step explanation	Guided practice
Planned examples	Independent practice

SUPPORTS

Ask high-level and low-level questions

Eliciting frequent responses

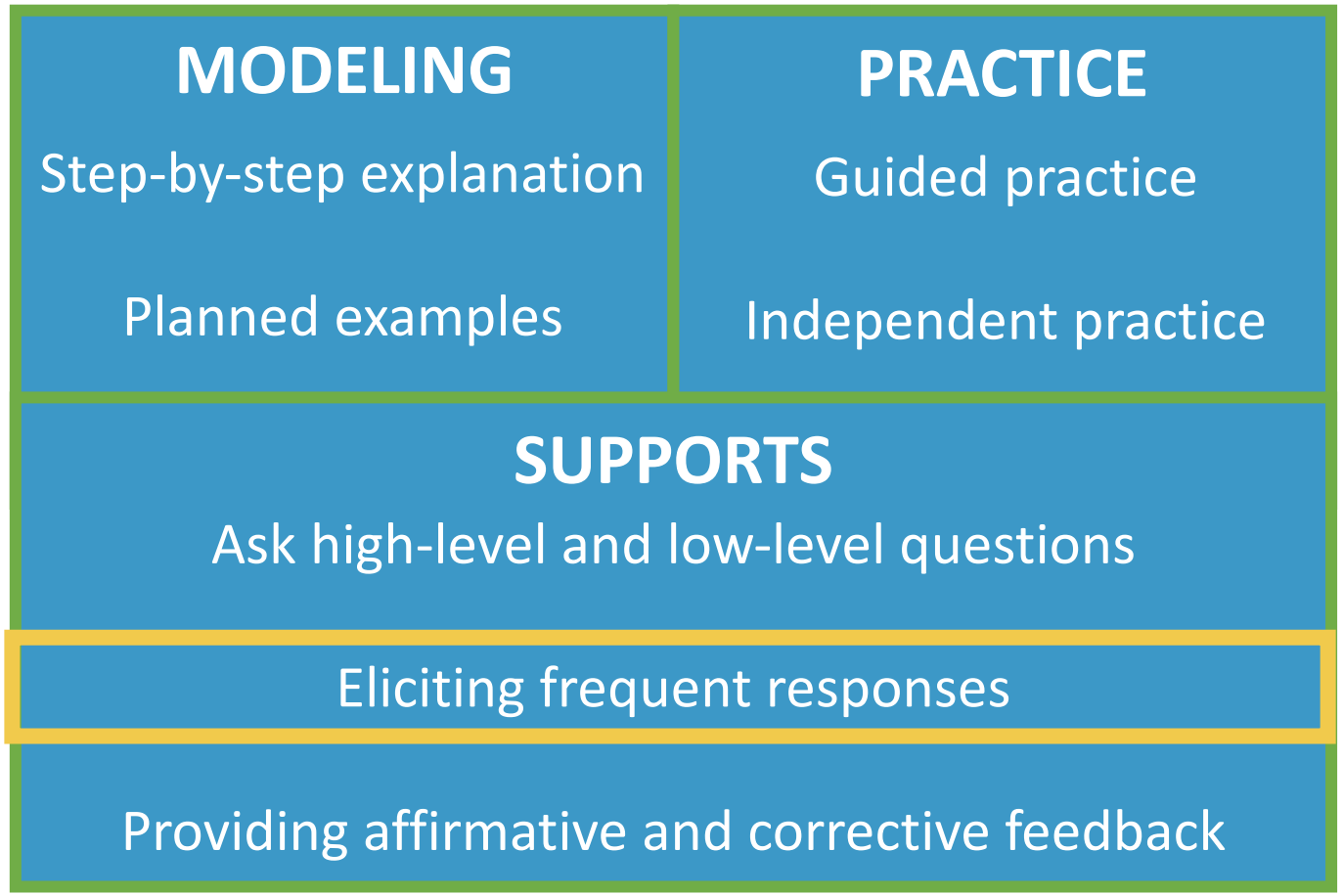
Providing affirmative and corrective feedback

Ask a combination of high-level and low-level questions.

"Why do you use zero pairs?"

"Because a positive 1 and a negative 1 equal 0. I use the zero pair to help me subtract."

During **Modeling** and **Practice**, students should frequently respond. The frequent responses keeps student attention and keeps student learning active.



During **Modeling** and **Practice**, students should frequently respond. The frequent responses keeps student attention and keeps student learning active.

MODELING

Step-by-step explanation

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Independent practice

SUPPORTS

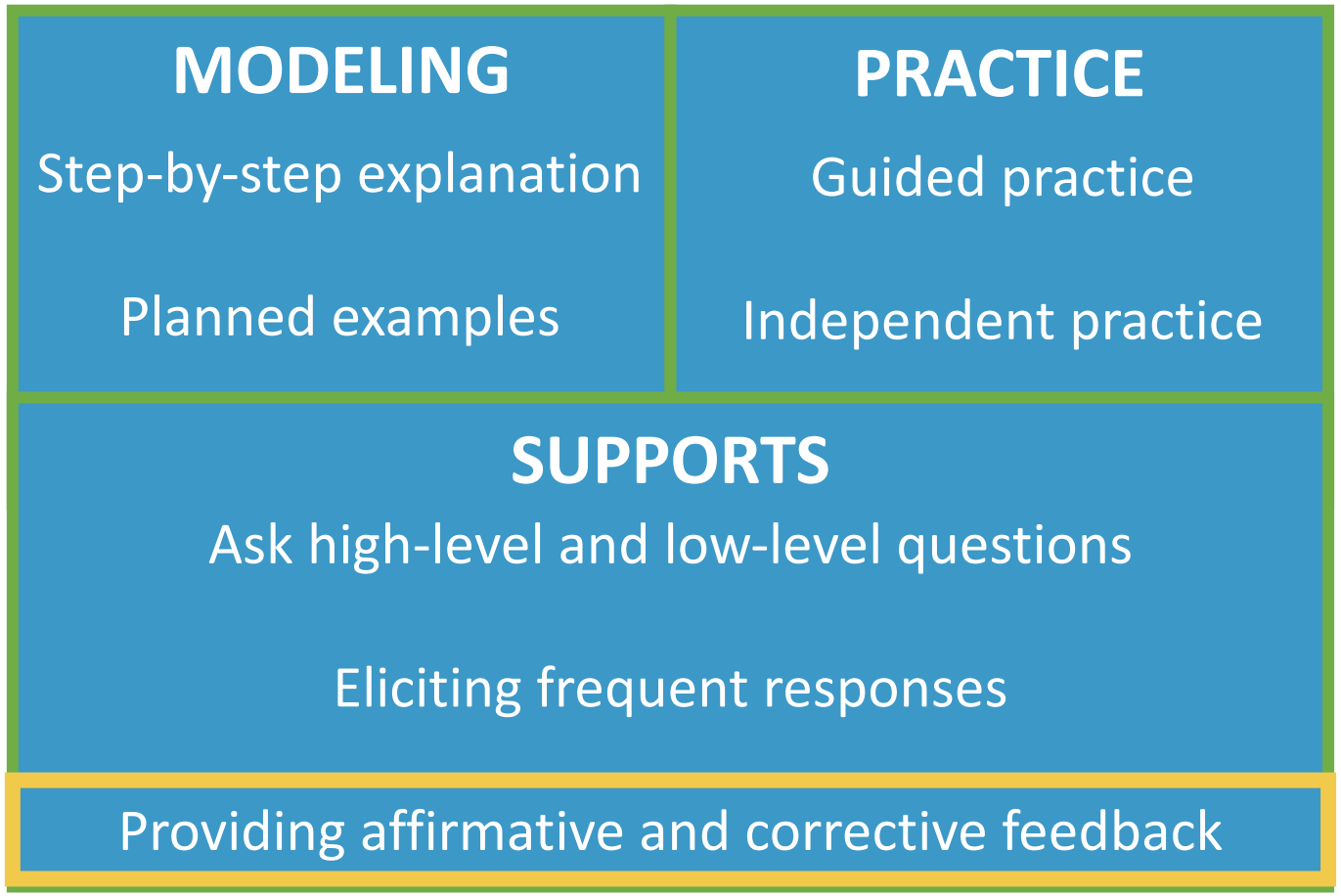
Ask high-level and low-level questions

Eliciting frequent responses

Providing affirmative and corrective feedback

- Oral
- Written
- With manipulatives
- With drawings
- With gestures

During **Modeling** and **Practice**, students should receive immediate feedback on their responses.



Students should receive affirmative and (when necessary) corrective feedback.

During **Modeling** and **Practice**, students should receive immediate feedback on their responses.

MODELING

Step-by-step explanation

Planned examples

PRACTICE

Guided practice

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SUPPORTS

Ask high-level and low-level questions

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"Nice work using your word problem attack strategy."

During **Modeling** and **Practice**, students should receive immediate feedback on their responses.

MODELING

Step-by-step explanation

Planned examples

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Ask high-level and low-level questions

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"Let's look at that again. Tell me how you added in the hundreds column."

MODELING

Step-by-step explanation

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Which of these supports do you use most often?

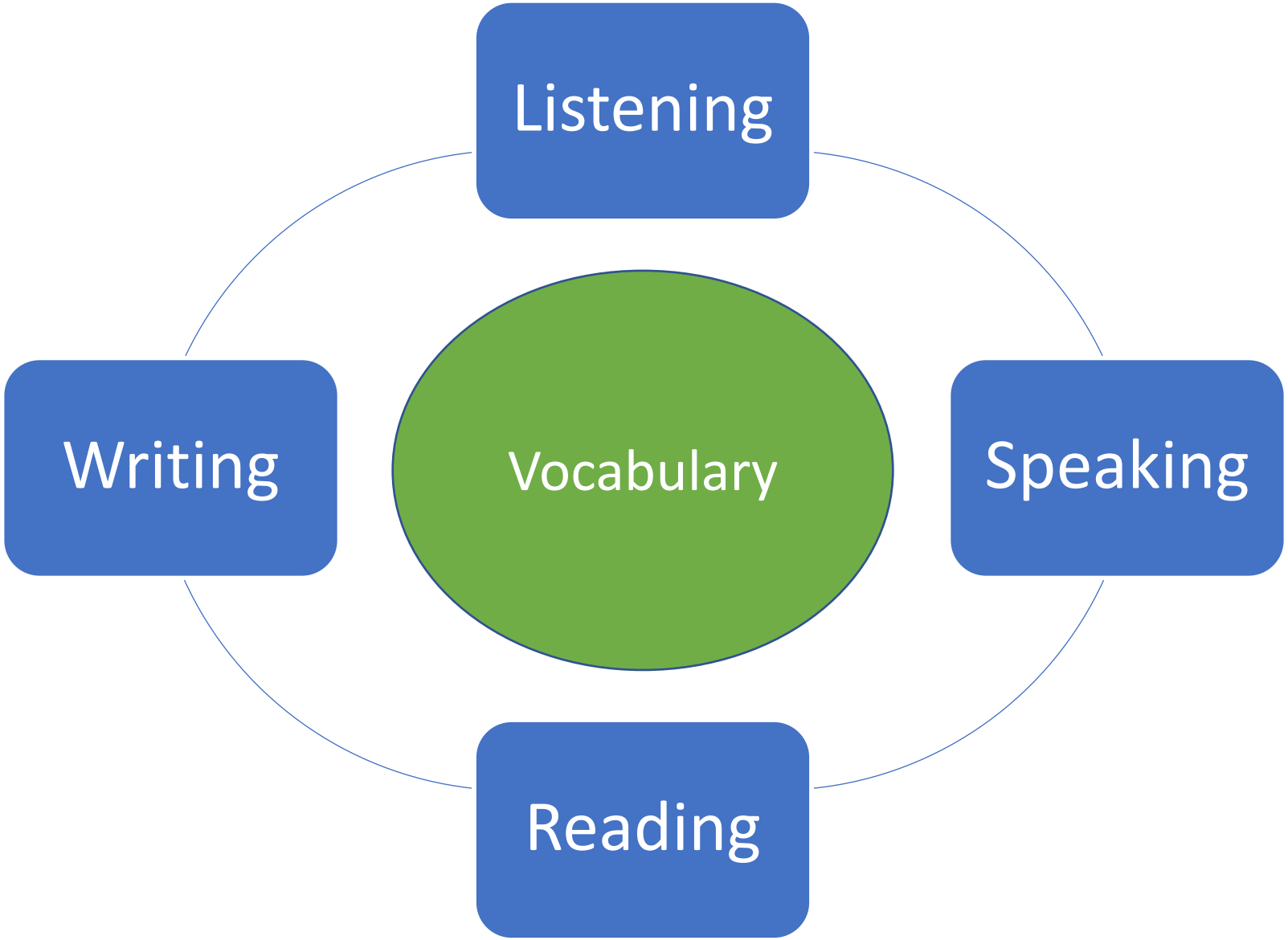
Instructional Platform

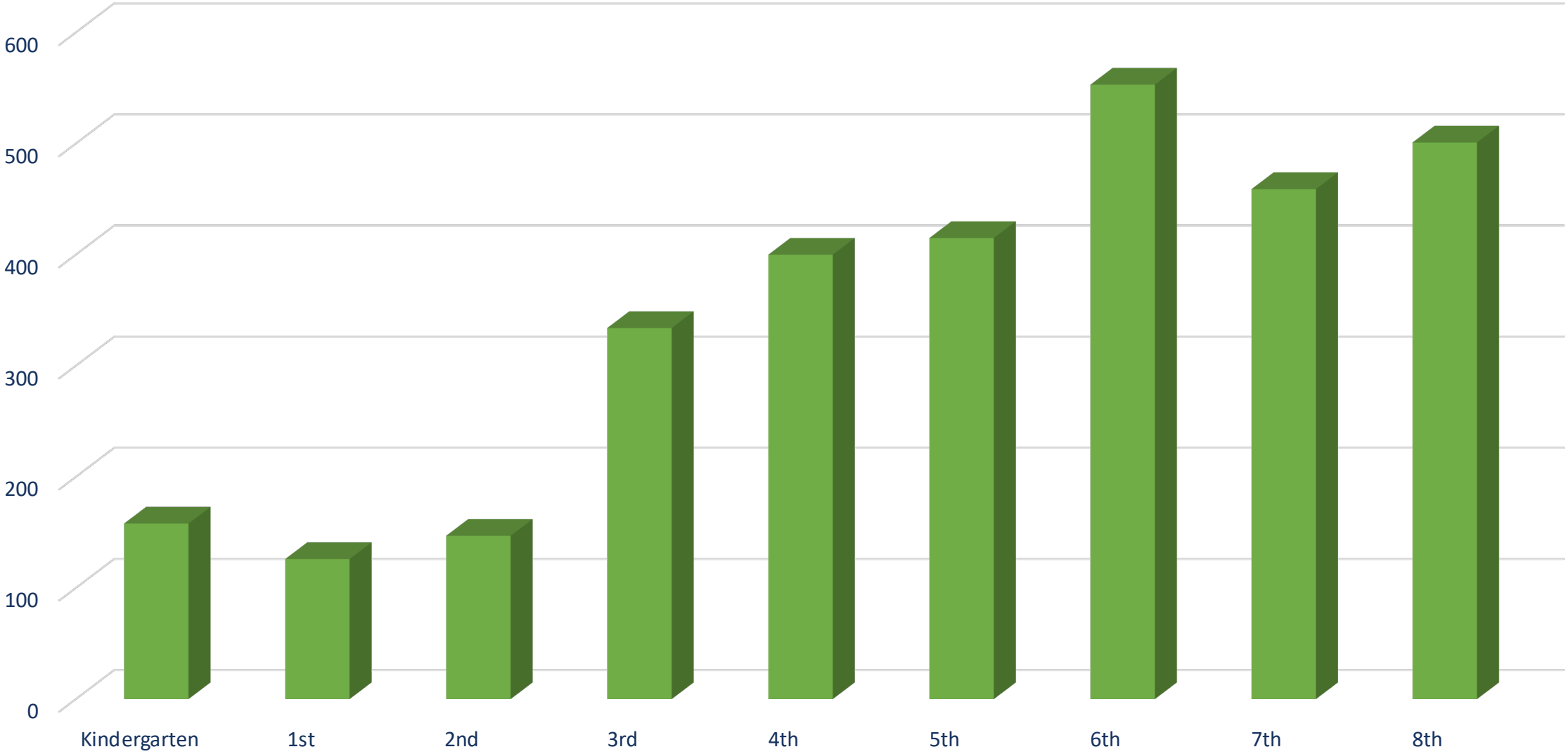
INSTRUCTIONAL DELIVERY

Explicit instruction

Precise language

INSTRUCTIONAL STRATEGIES


Listening
Writing
Vocabulary
Speaking
Reading



Powell, Bos, & Lin (2019)

1. Some math terms are shared with English but have different meanings

base

right

degree

Rubenstein & Thompson (2002)

1. Some math terms are shared with English but have different meanings

2. Some math words are shared with English with similar meanings (but a more precise math meaning)

difference

even

Rubenstein & Thompson (2002)

1. Some math terms are shared with English but have different meanings

2. Some math words are shared with English with similar meanings
(but a more precise math meaning)

3. Some math terms are only used in math

trapezoid

numerator

parallelogram

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5. Some math terms are similar to other content-area terms with different meanings

variable vs.
variably cloudy

divide vs.
Continental
Divide

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6. Some math terms are homographs

- eight vs. ate
- sum vs. some
- rows vs. rose
- base vs. bass

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7. Some math terms are related but have distinct meanings

factor vs. multiple

hundreds vs. hundredths

numerators vs. denominator

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7. Some math terms are related but have distinct meanings

8. An English math term may translate into another language with different meanings

mesa vs. tabla

9. English spelling and usage may have irregularities

10. Some math concepts are verbalized in more than one way

11. Informal terms may be used for formal math terms

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four vs. forty

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skip count vs. multiples

one-fourth vs. one quarter

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rhombus vs. diamond

vertex vs. corner

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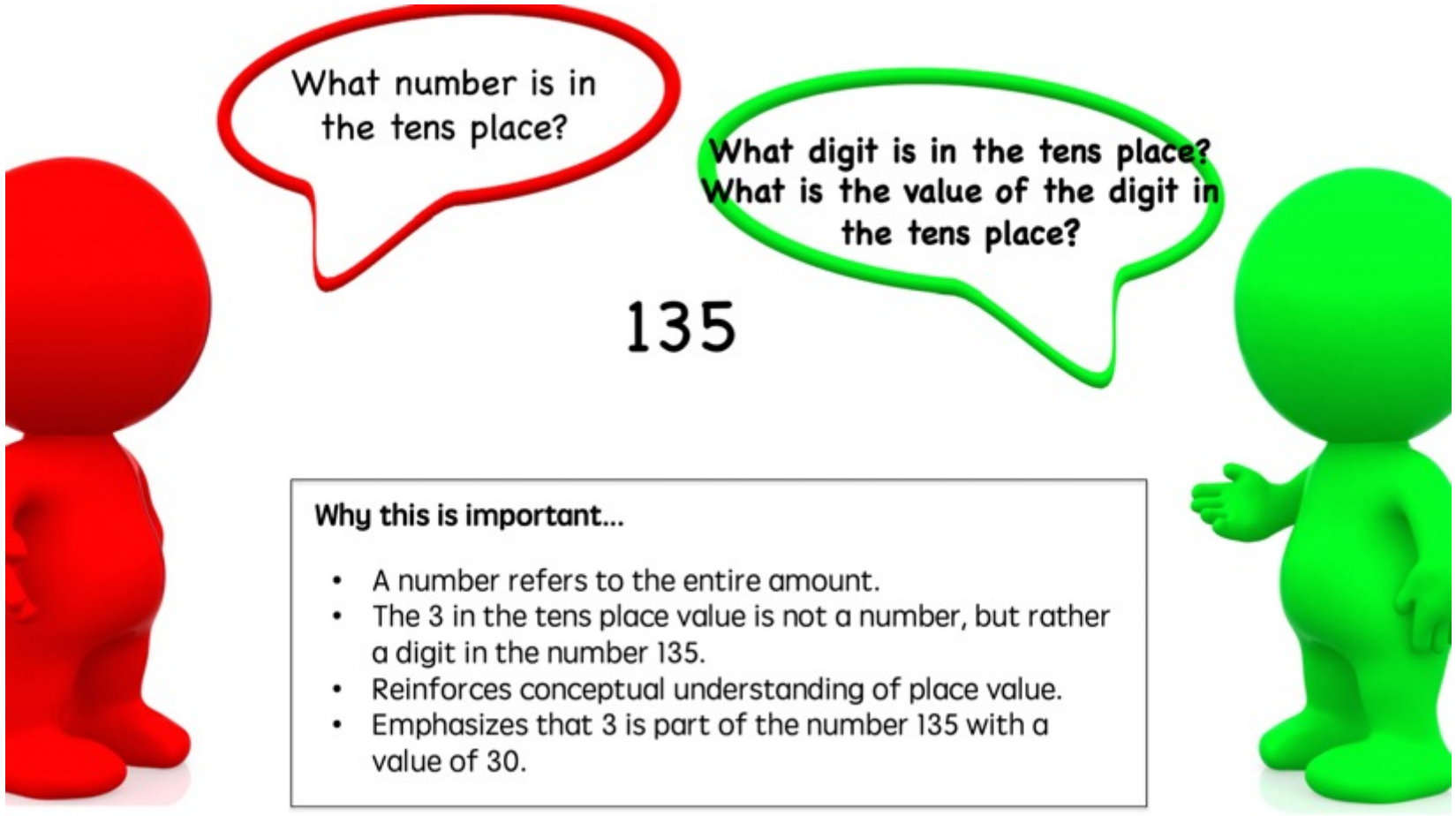
Which of these cause difficulty for your students?

Rubenstein & Thompson (2002)

Use formal math language

Use terms precisely

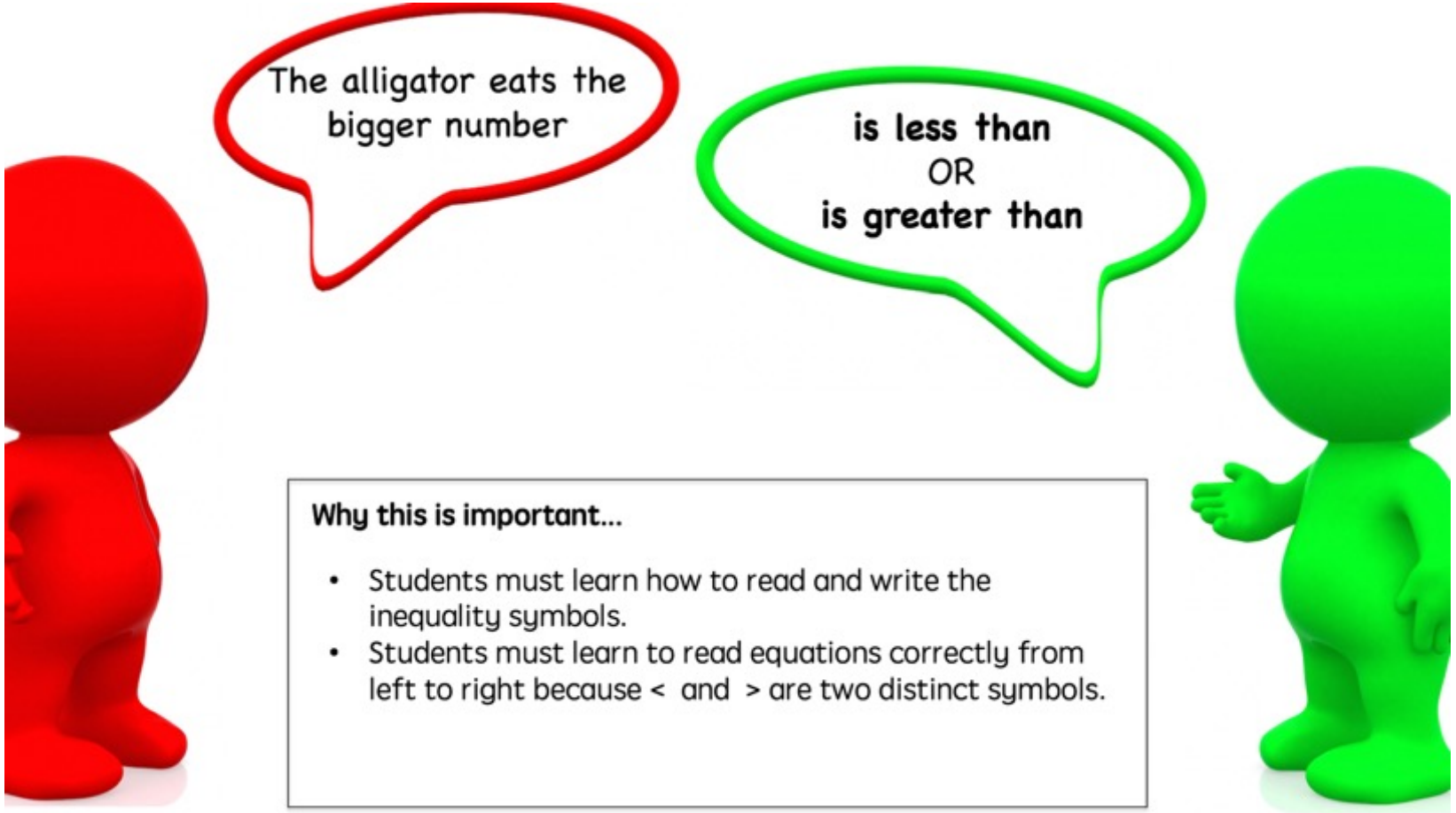
Use formal math language



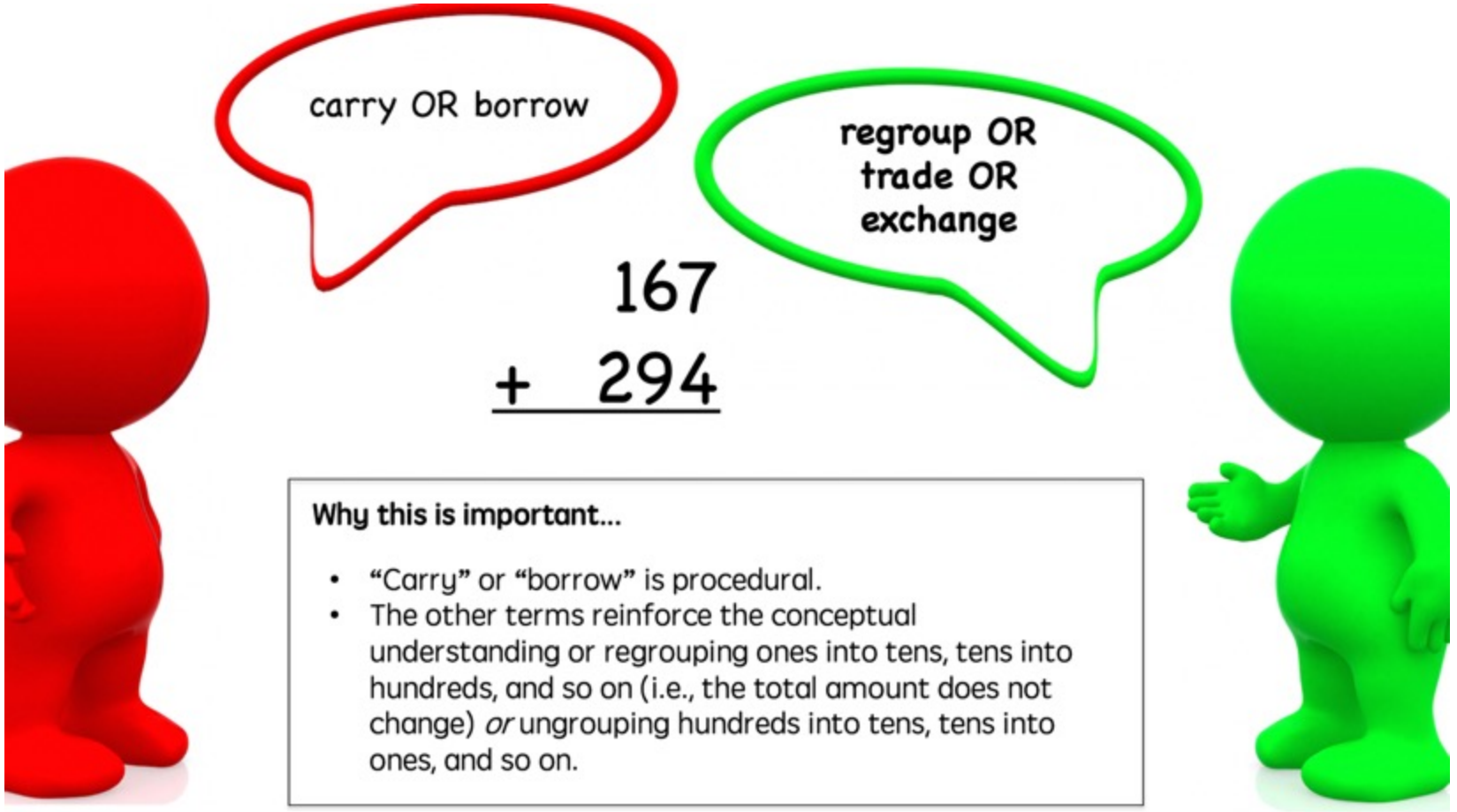
Why this is important...

- A number refers to the entire amount.
- The 3 in the tens place value is not a number, but rather a digit in the number 135.
- Reinforces conceptual understanding of place value.
- Emphasizes that 3 is part of the number 135 with a value of 30.

Use formal math language



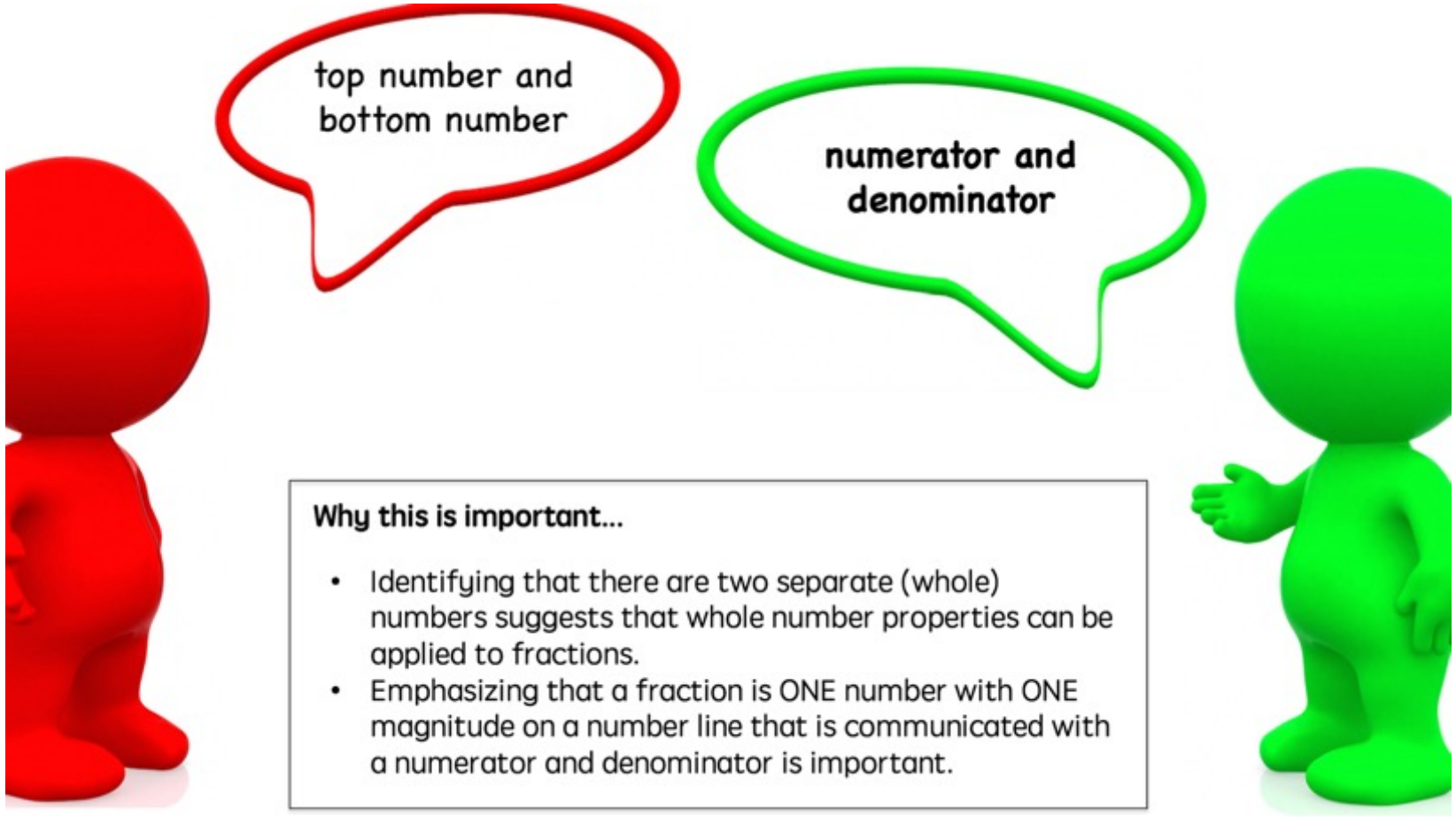
Use formal math language



Why this is important…

- "Carry" or "borrow" is procedural.
- The other terms reinforce the conceptual understanding or regrouping ones into tens, tens into hundreds, and so on (i.e., the total amount does not change) *or* ungrouping hundreds into tens, tens into ones, and so on.

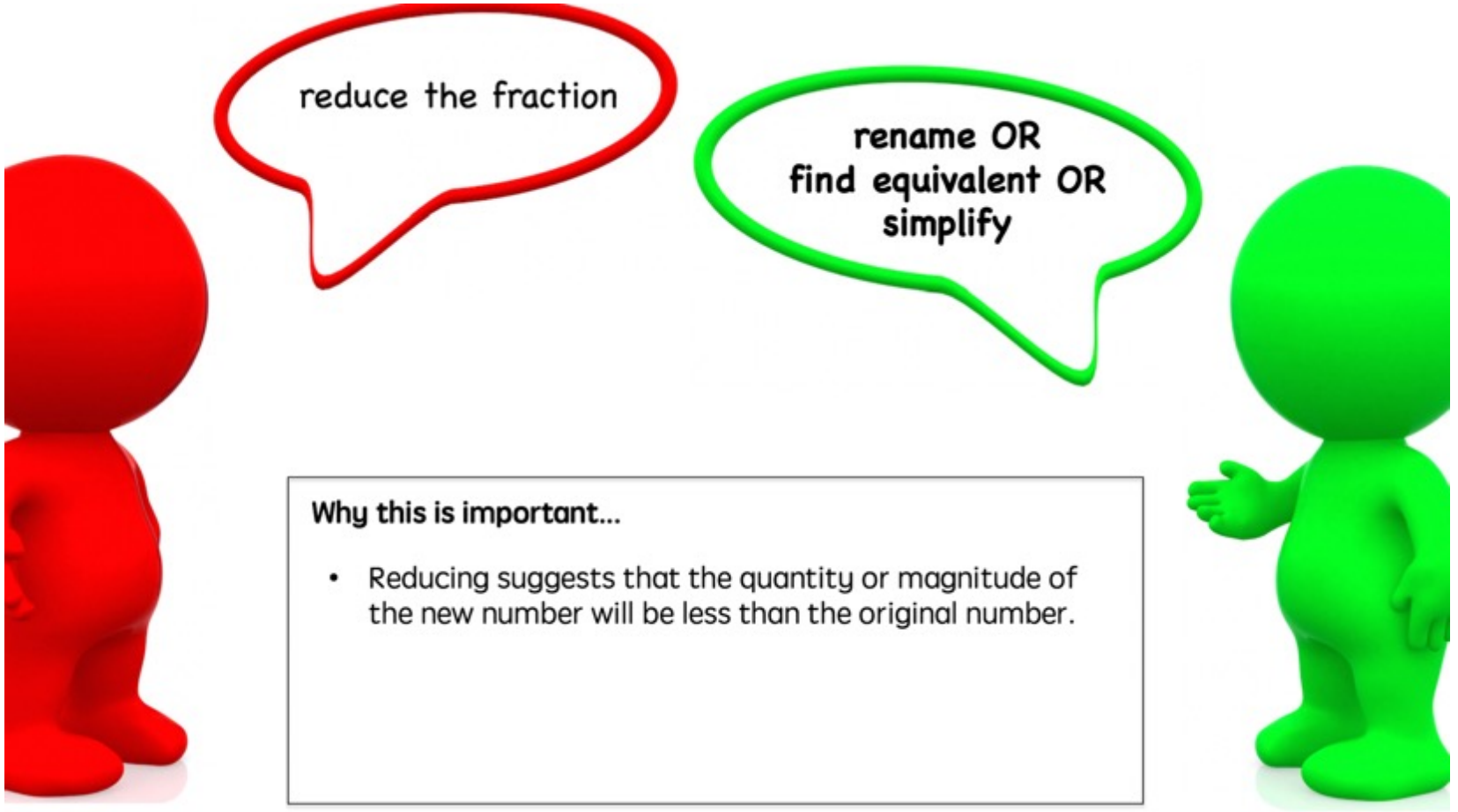
Use formal math language



Why this is important...

- Identifying that there are two separate (whole) numbers suggests that whole number properties can be applied to fractions.
- Emphasizing that a fraction is ONE number with ONE magnitude on a number line that is communicated with a numerator and denominator is important.

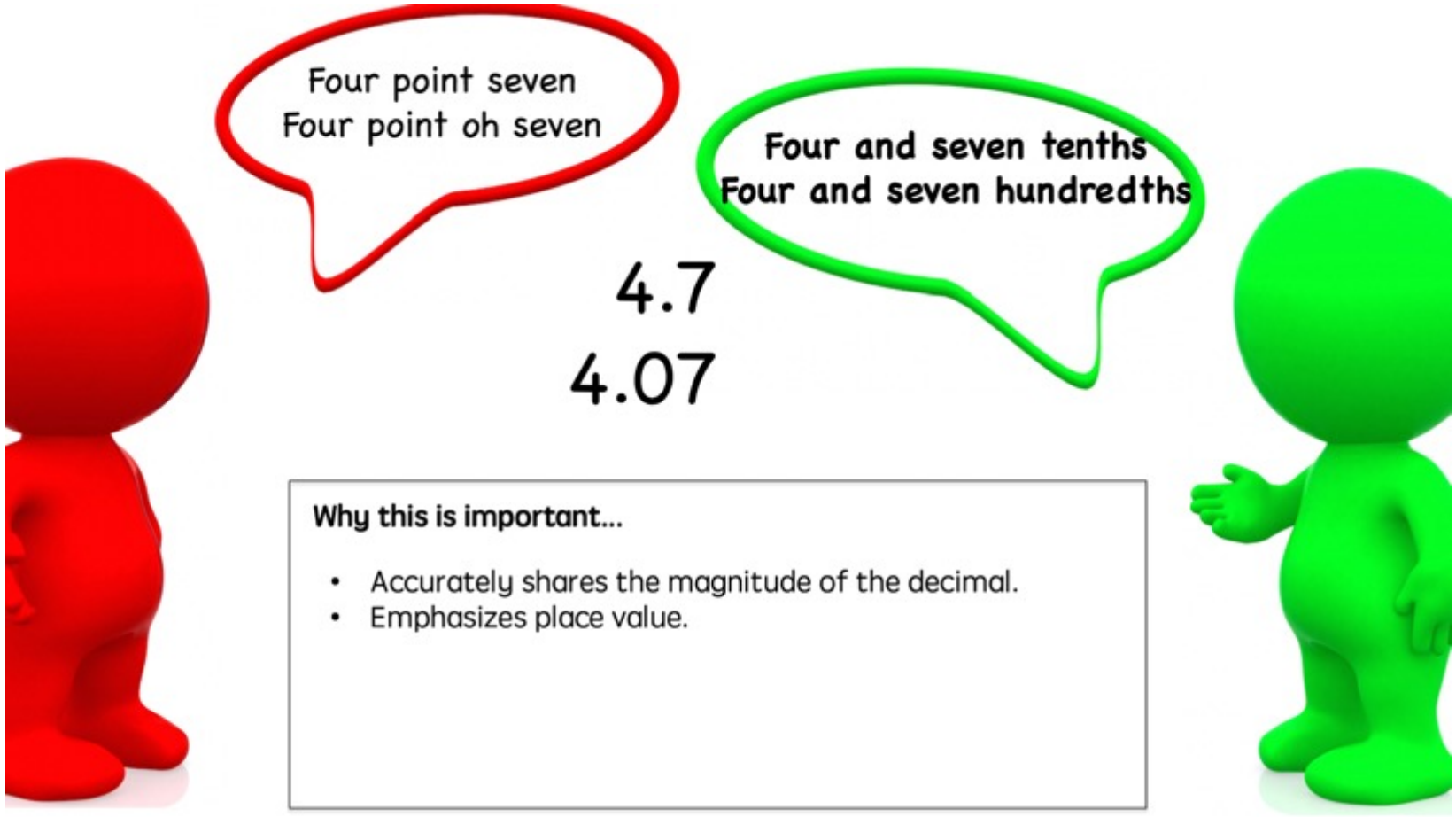
Use formal math language



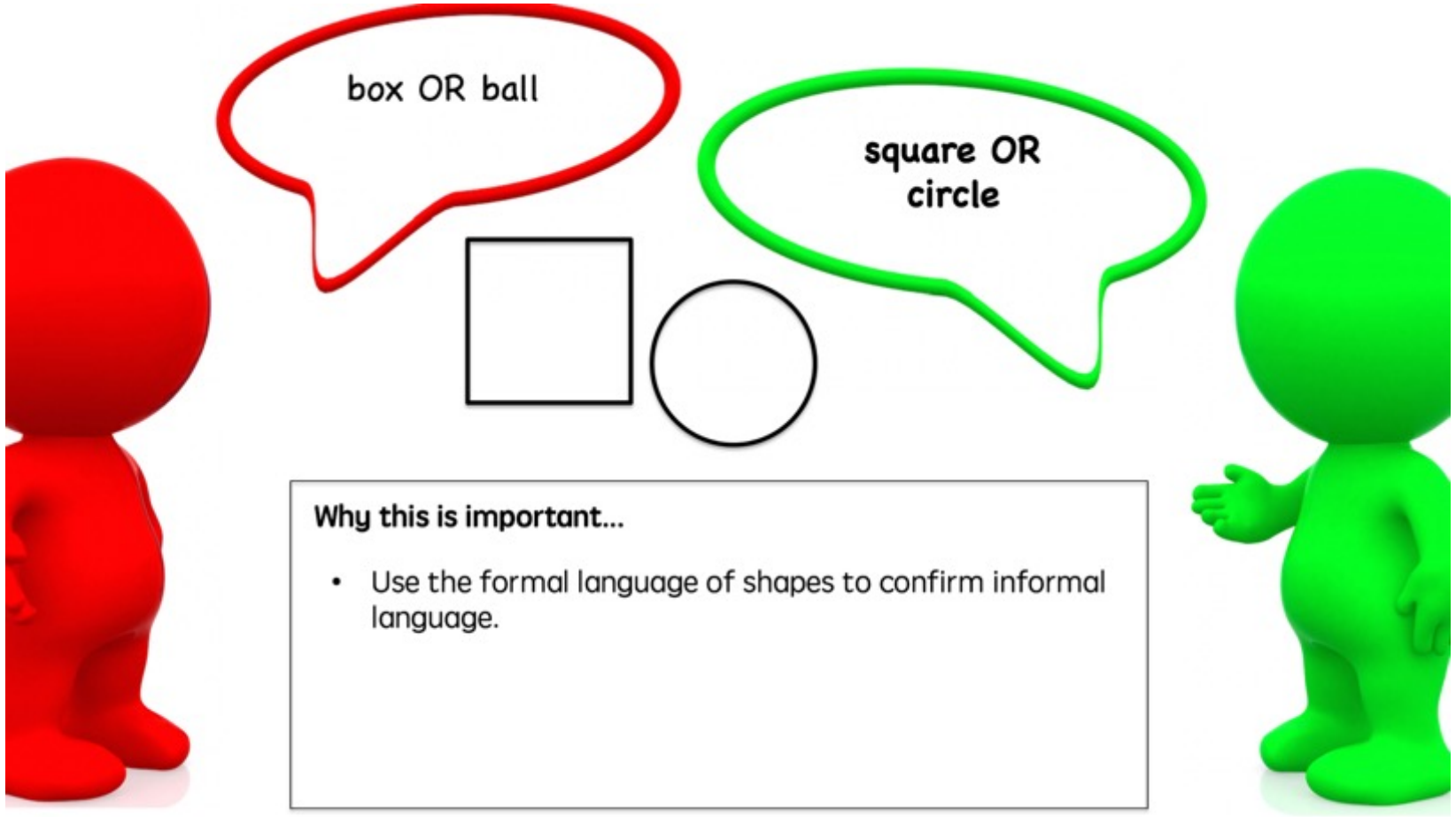
Why this is important...

- Reducing suggests that the quantity or magnitude of the new number will be less than the original number.

Use formal math language



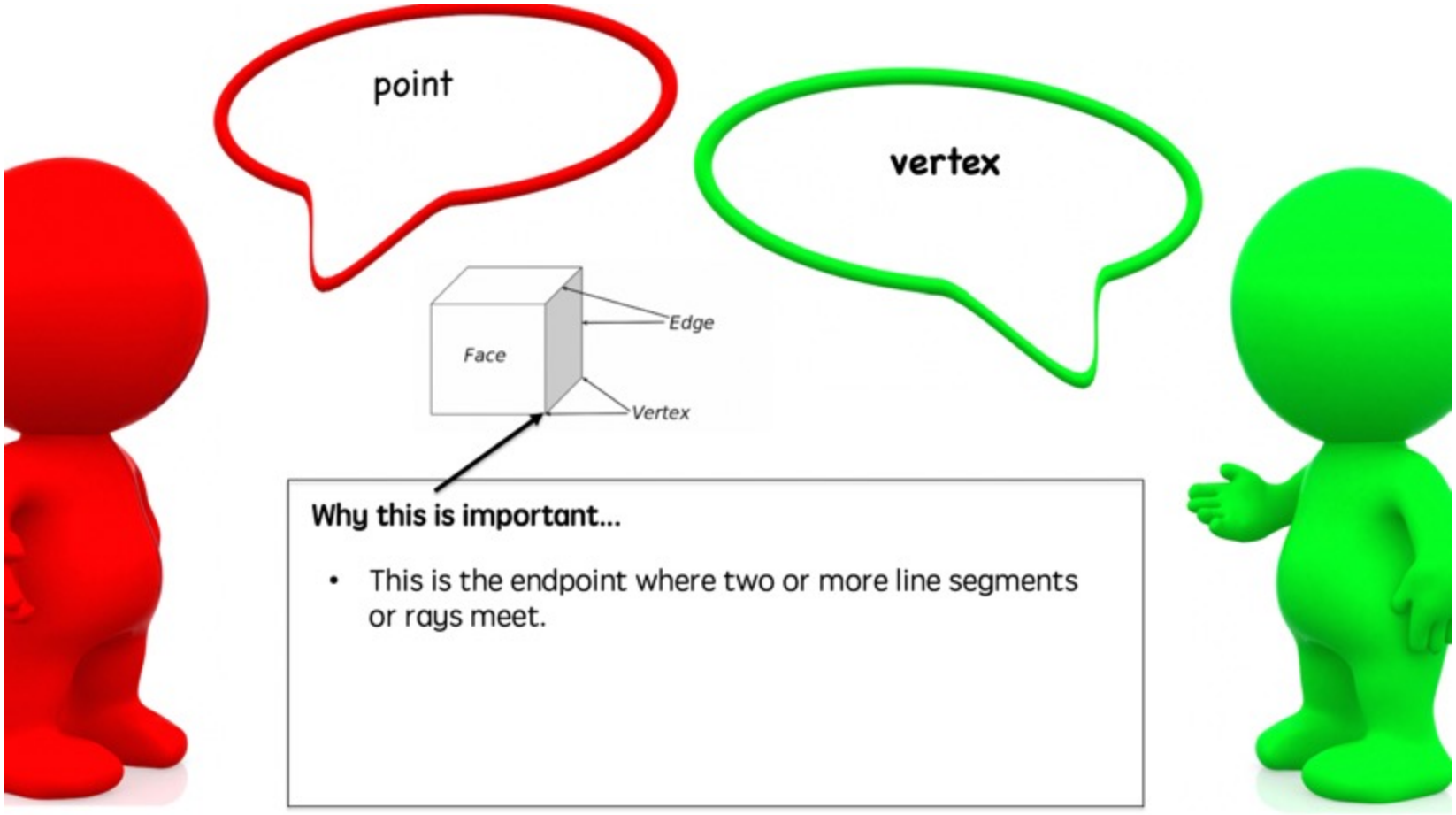
Use formal math language



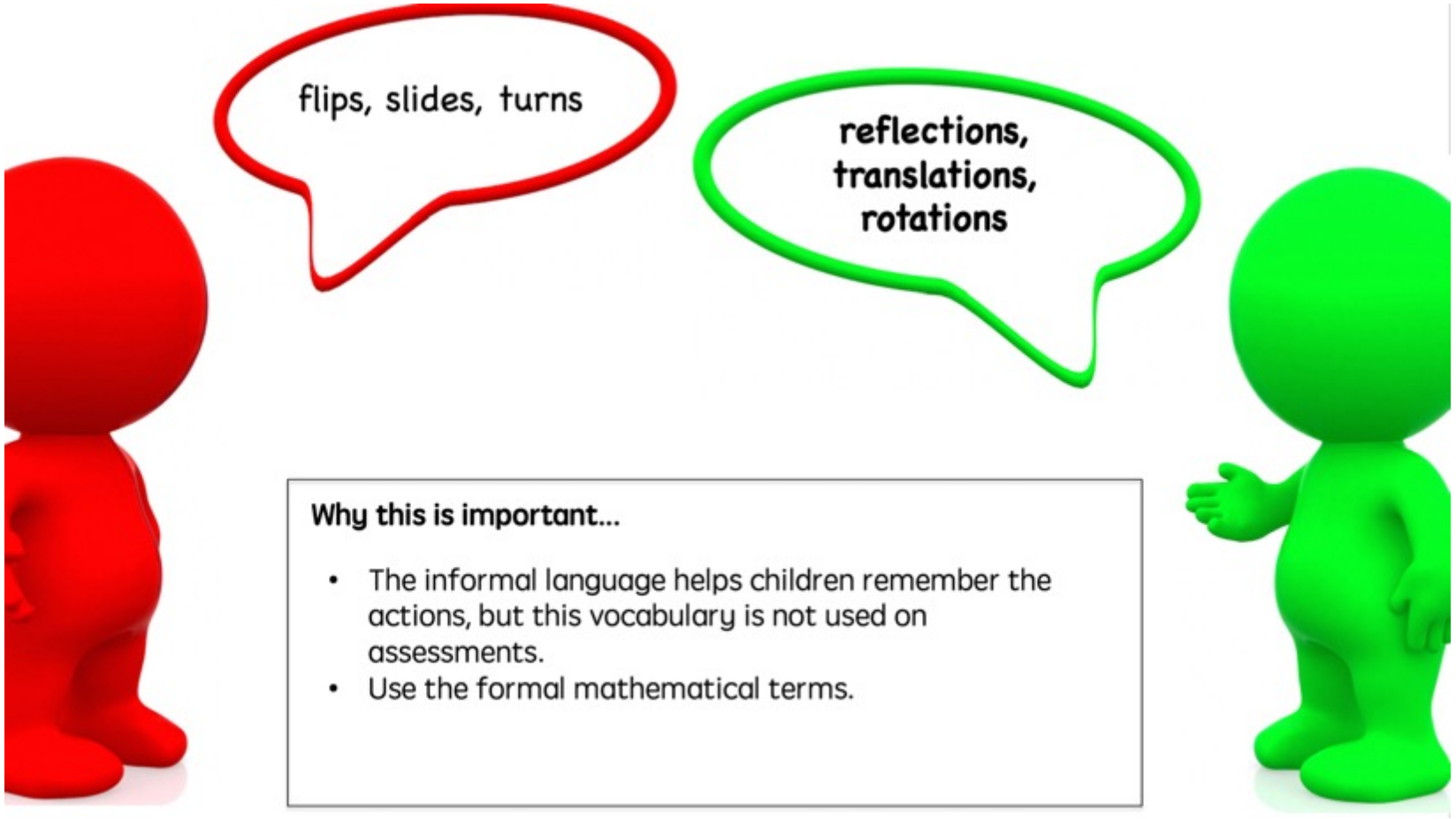
Why this is important...

- Use the formal language of shapes to confirm informal language.

Use formal math language



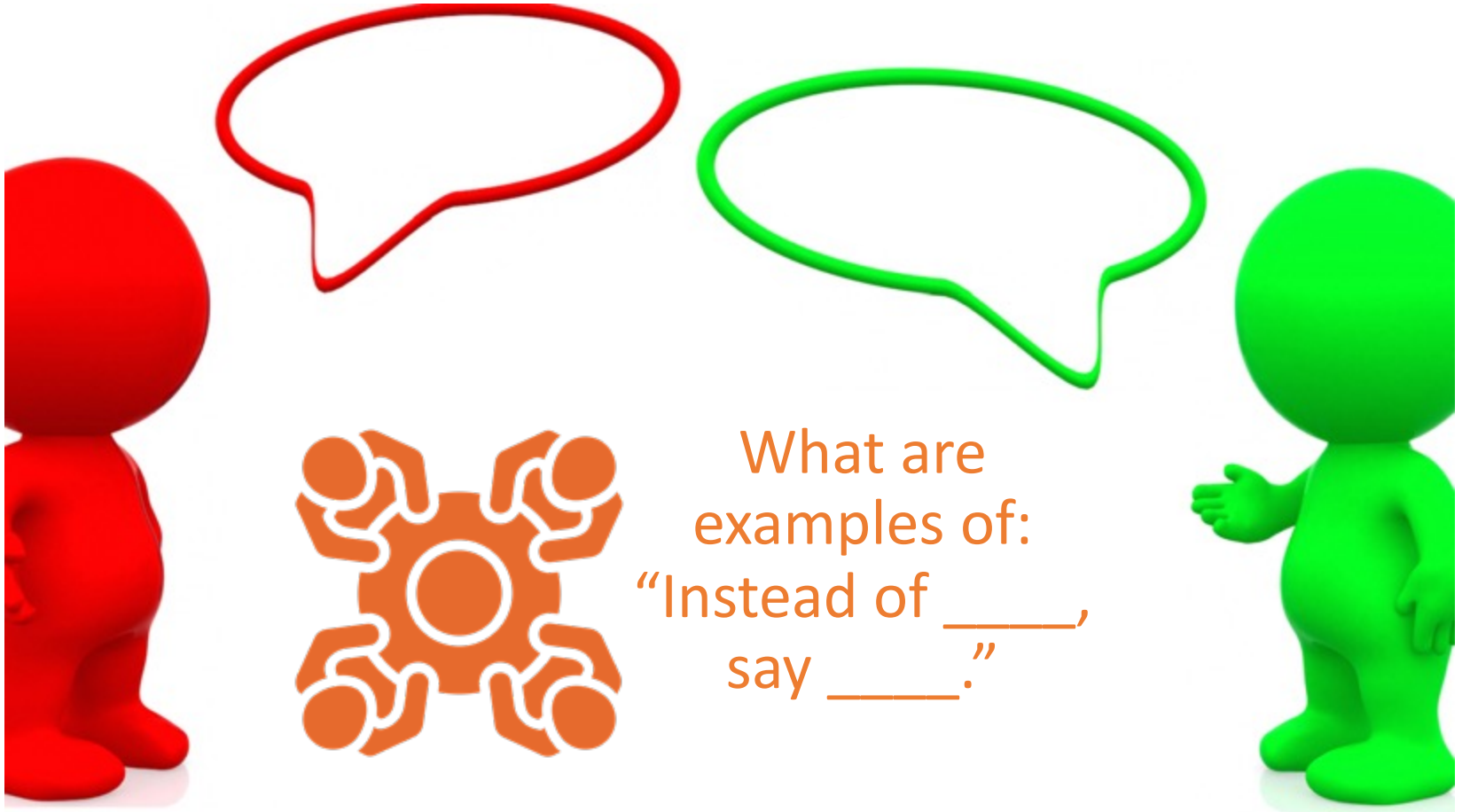
Use formal math language



Why this is important...

- The informal language helps children remember the actions, but this vocabulary is not used on assessments.
- Use the formal mathematical terms.

Use formal math language

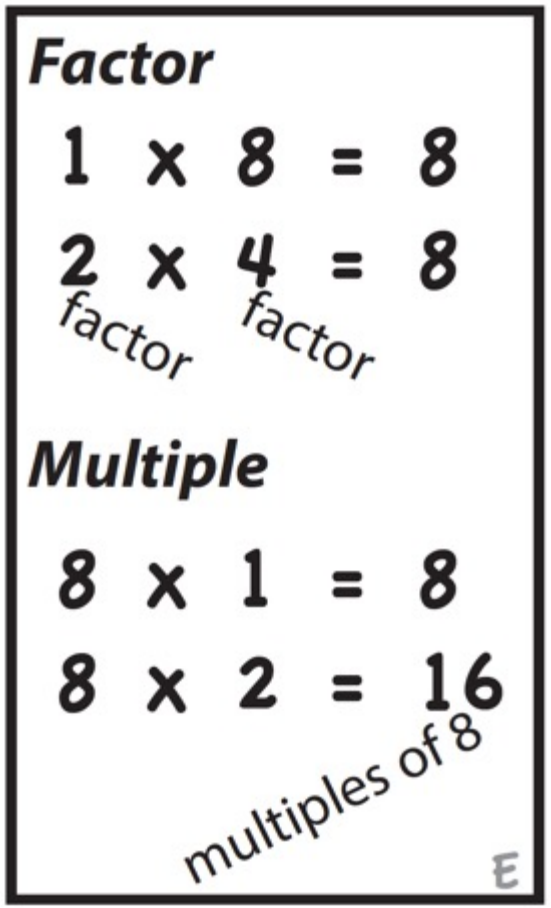


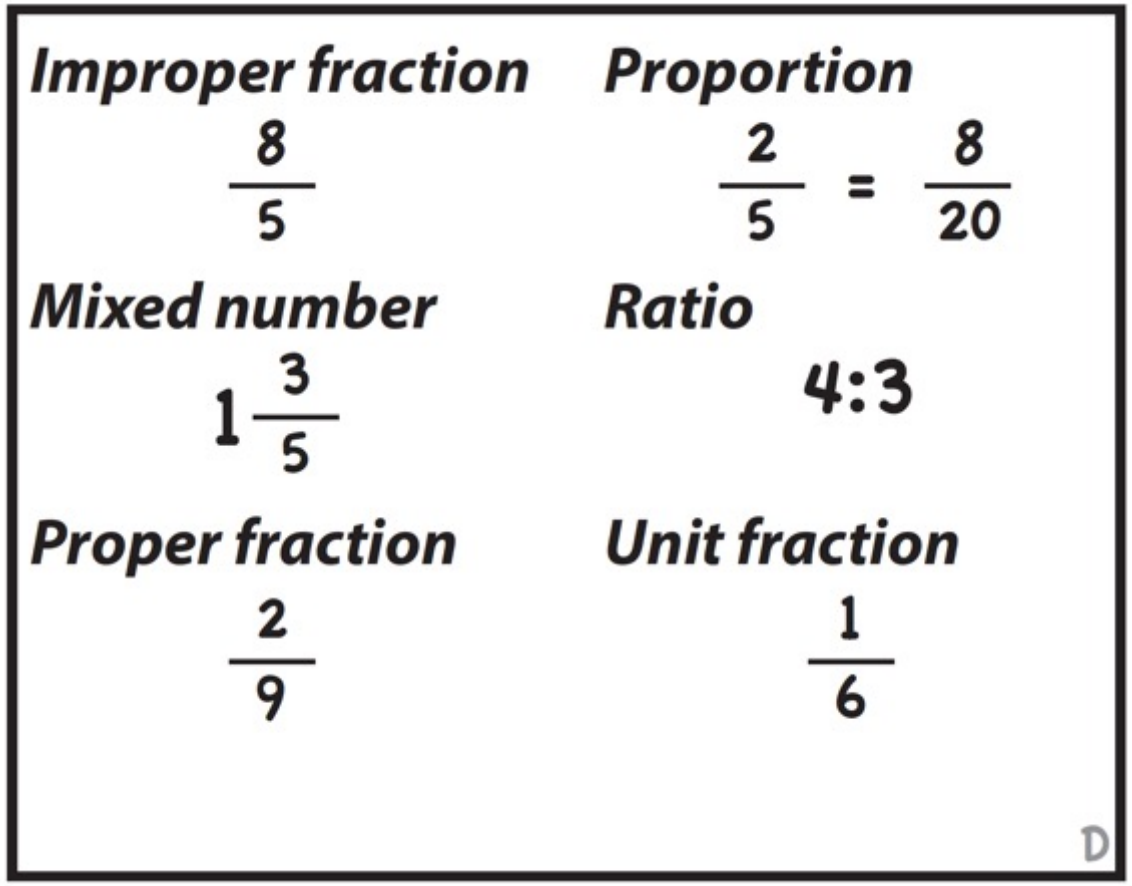
What are examples of: "Instead of ____, say ____."

Use formal math language

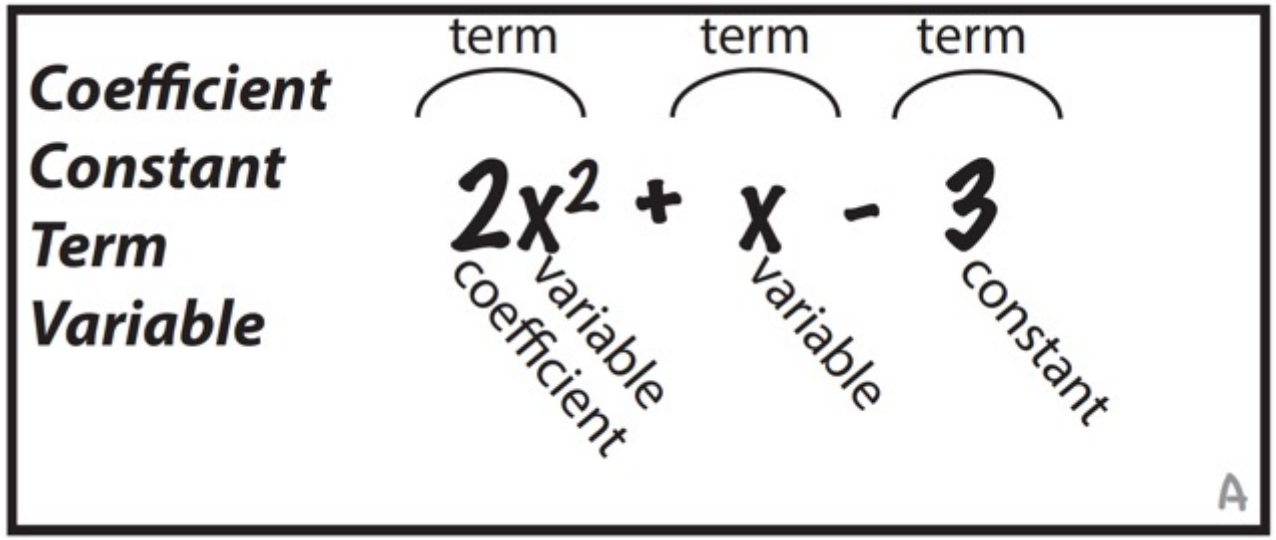
Use terms precisely

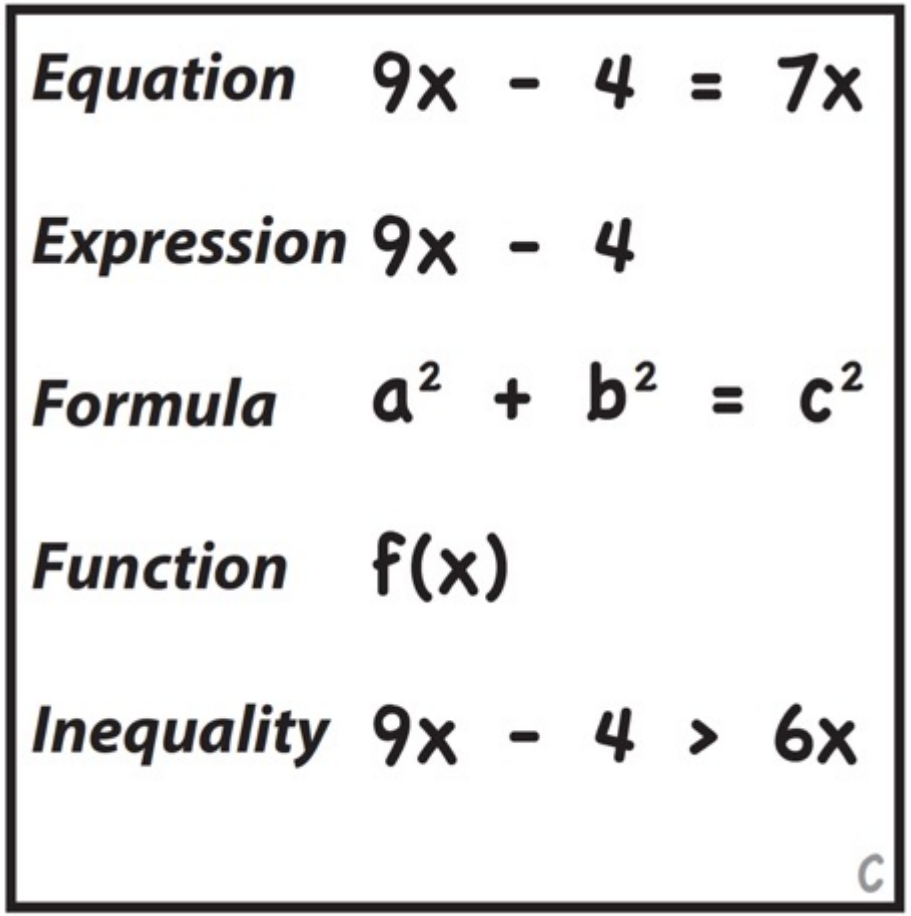
Use terms precisely





Use terms precisely





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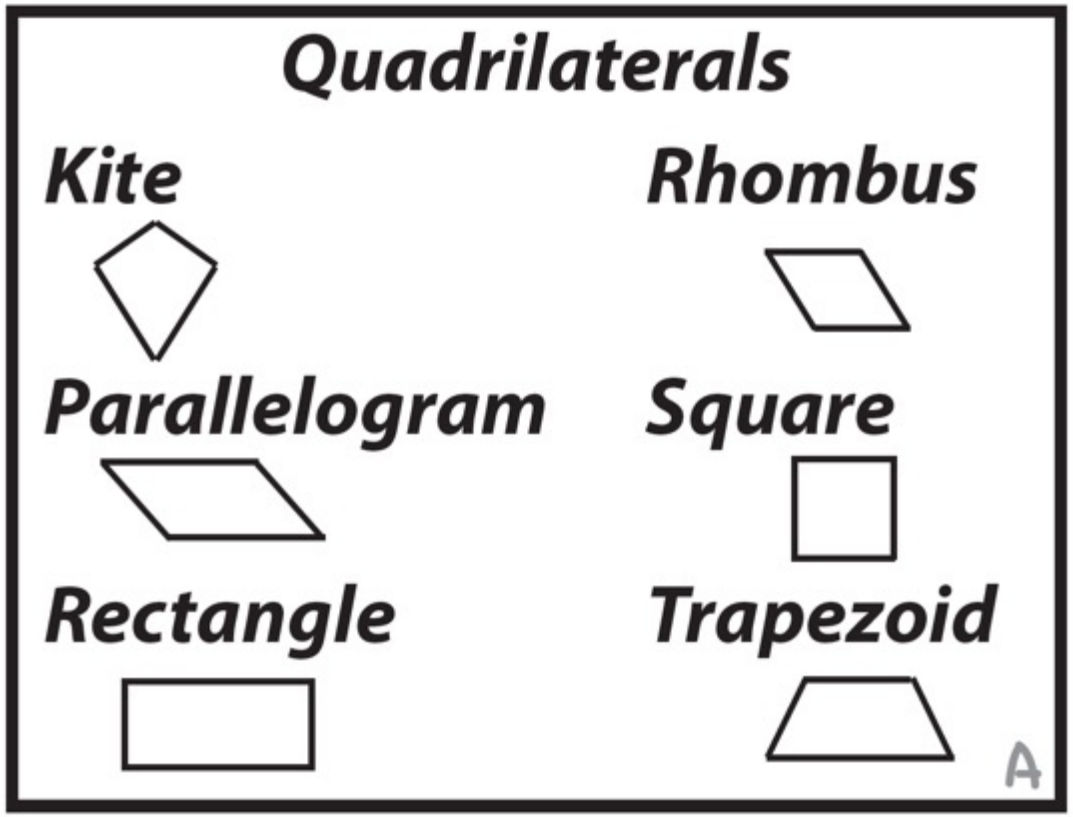

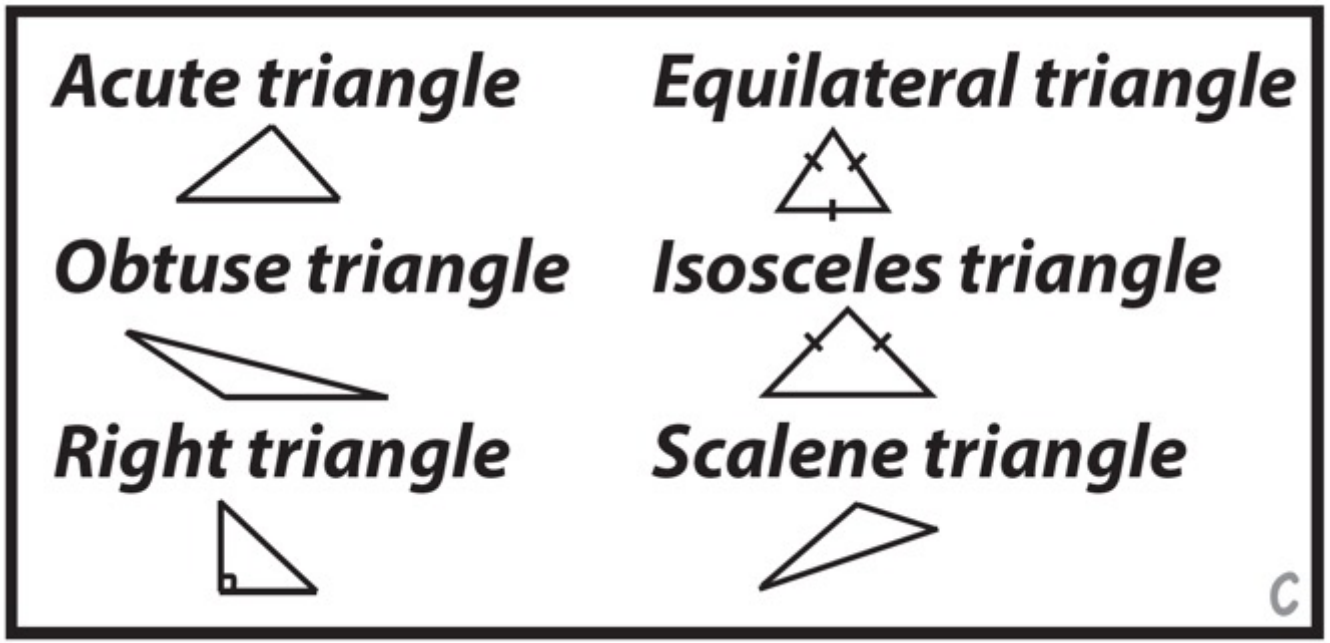

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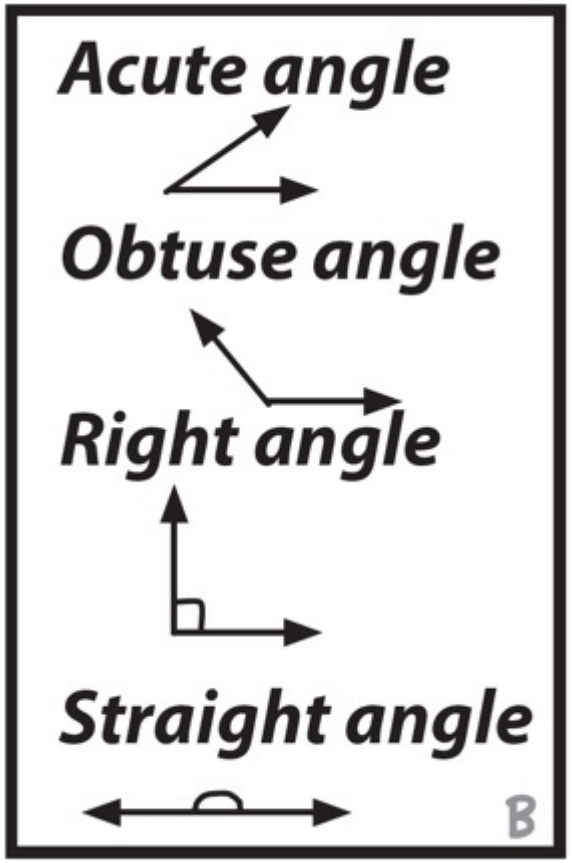
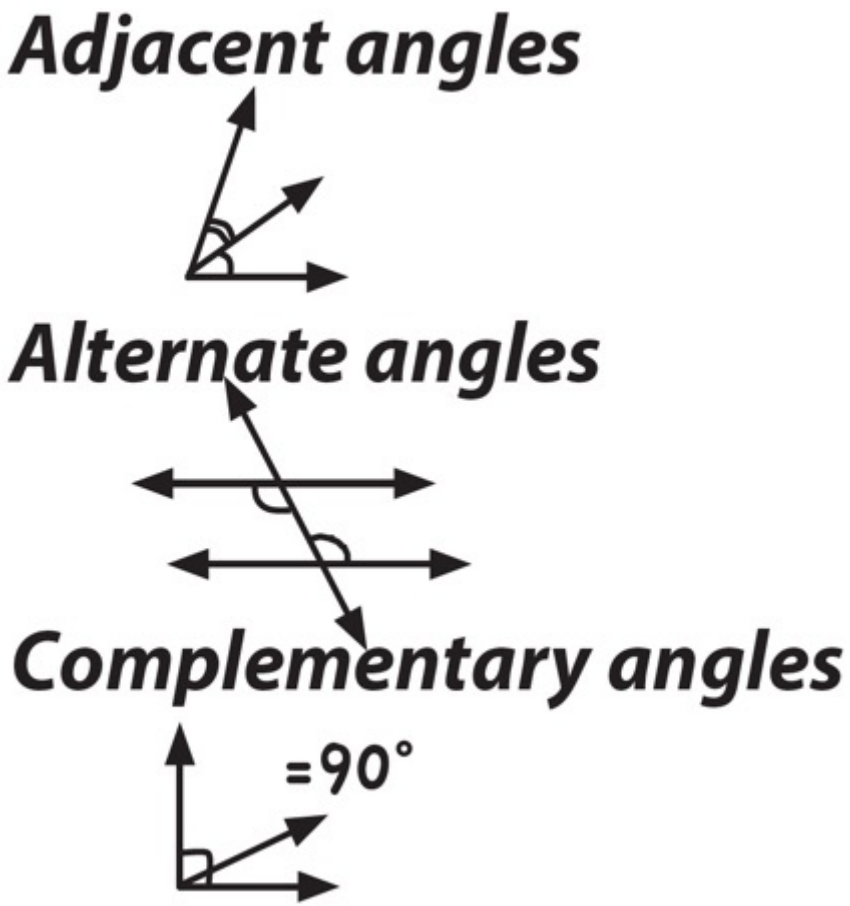
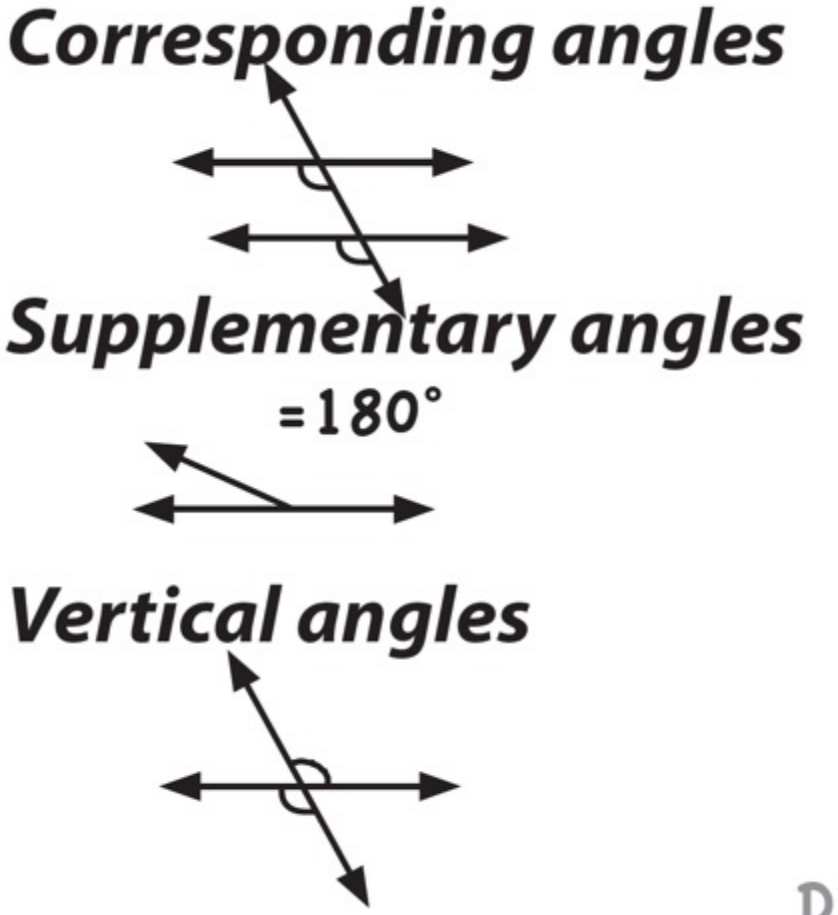
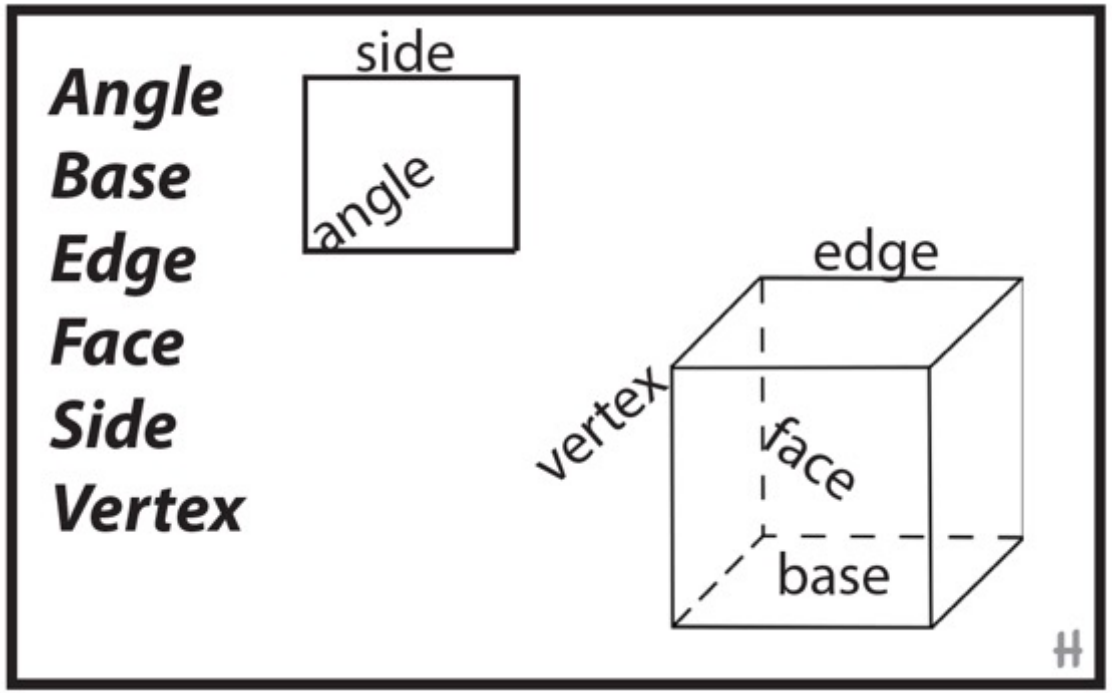
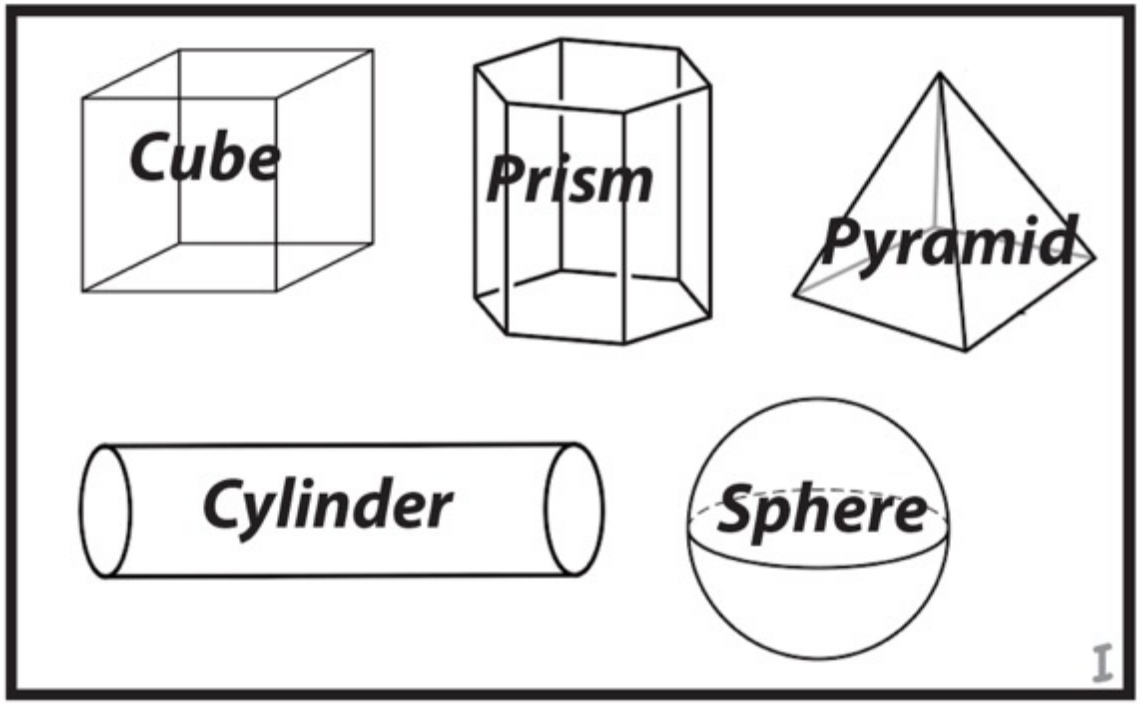






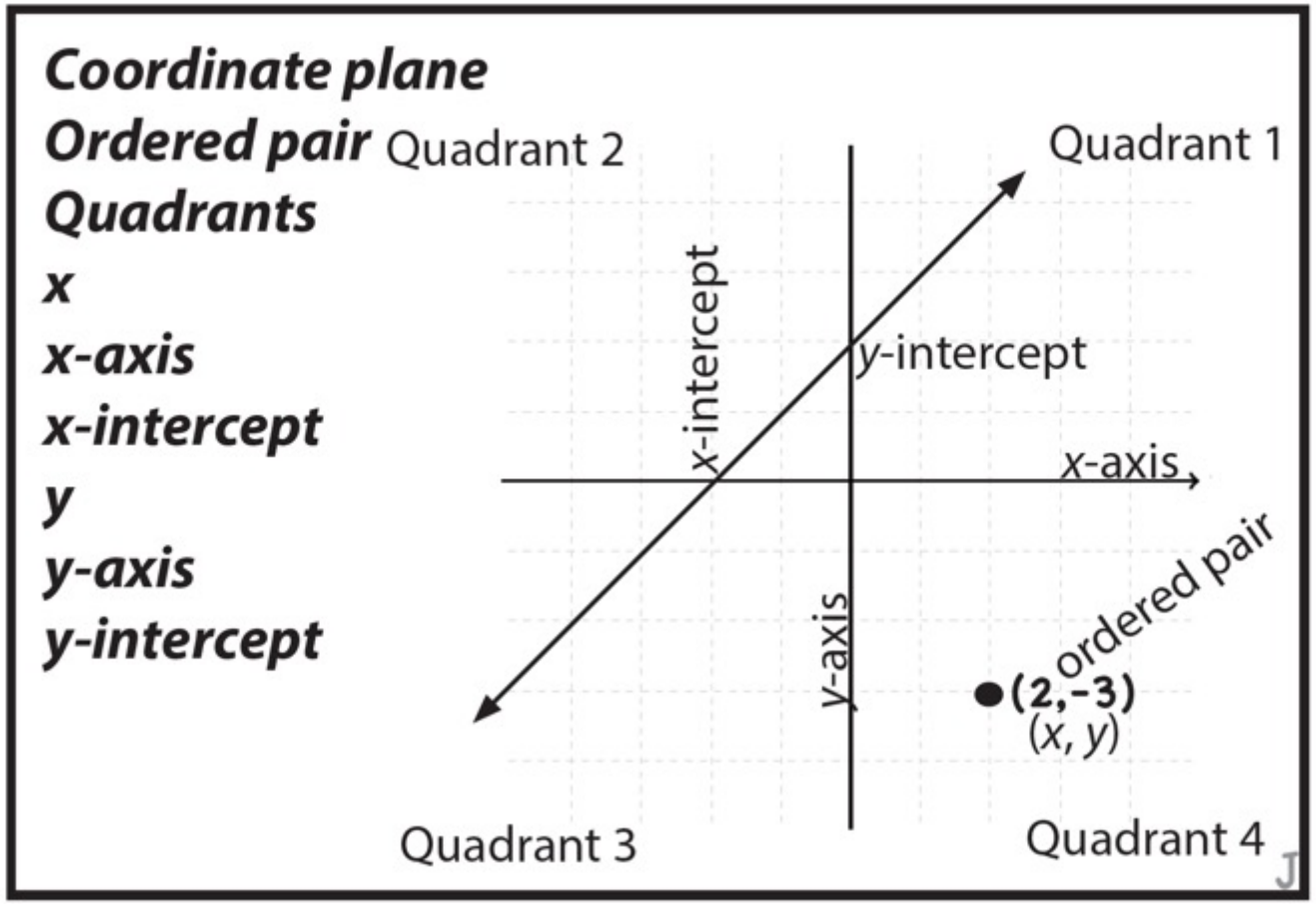
Use terms precisely





Use terms precisely

Coordinate plane
Ordered pair
Quadrants
x
x-axis
x-intercept
y
y-axis
y-intercept



Use terms precisely

What are terms that your students do not use precisely?

Use formal math language

Use terms precisely

Word	Lightbulb Word
Definition	Picture

Dunston & Tyminski (2013)

Integer Definitions

Zero Pairs

A positive and negative cancel one another;

Absolute Value

The distance of a number from zero on a number line; shown as | |

Positive

A number that is greater than zero.

Negative

A number that is less than zero. Identified by a minus sign.

Numerator: how many parts of the whole

- Ex. $\frac{4}{10}$

Odd number: a number not divided evenly by 2

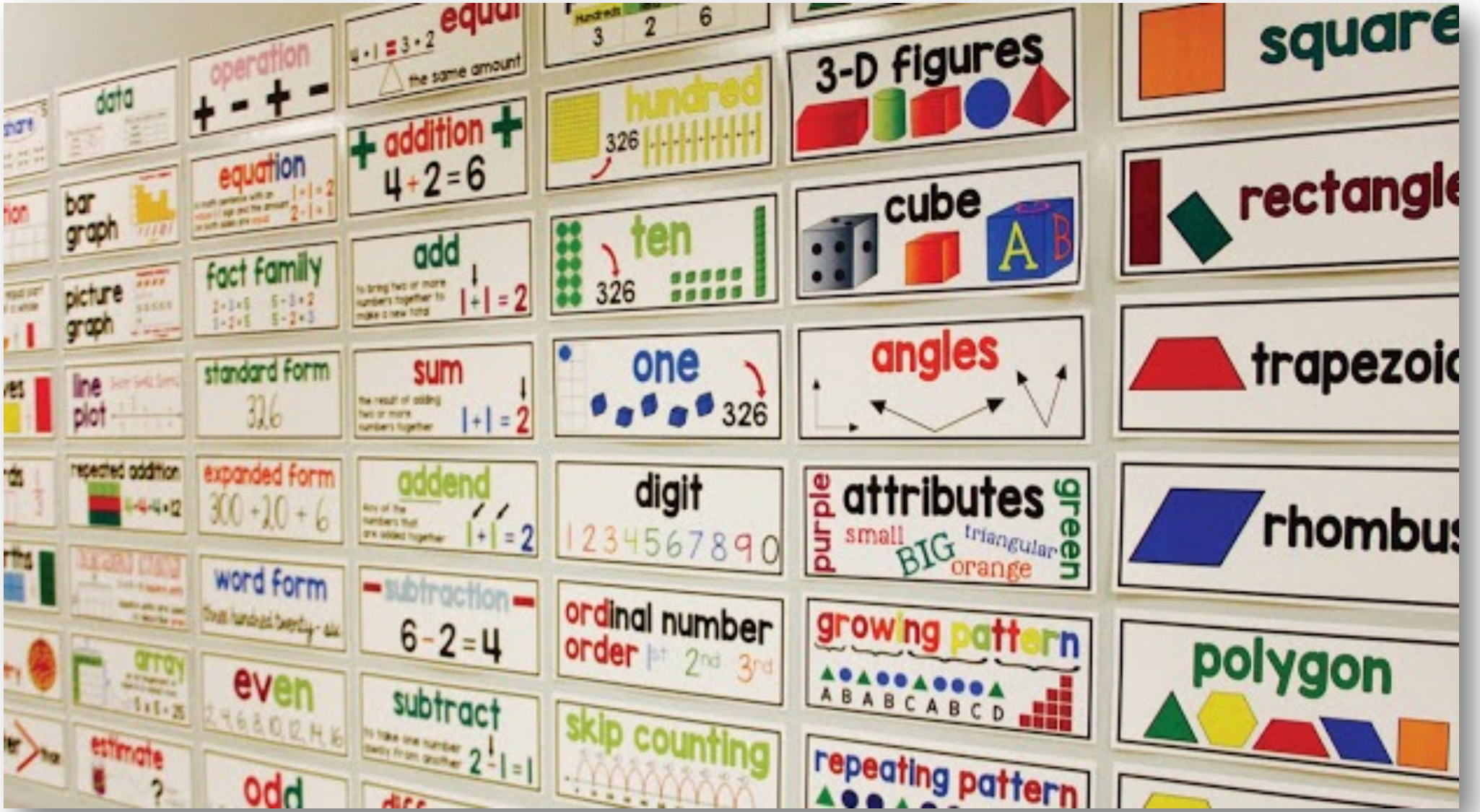
- Ex. 1, 3, 5, 7, 9....

Percent: a specific number in comparison to 100

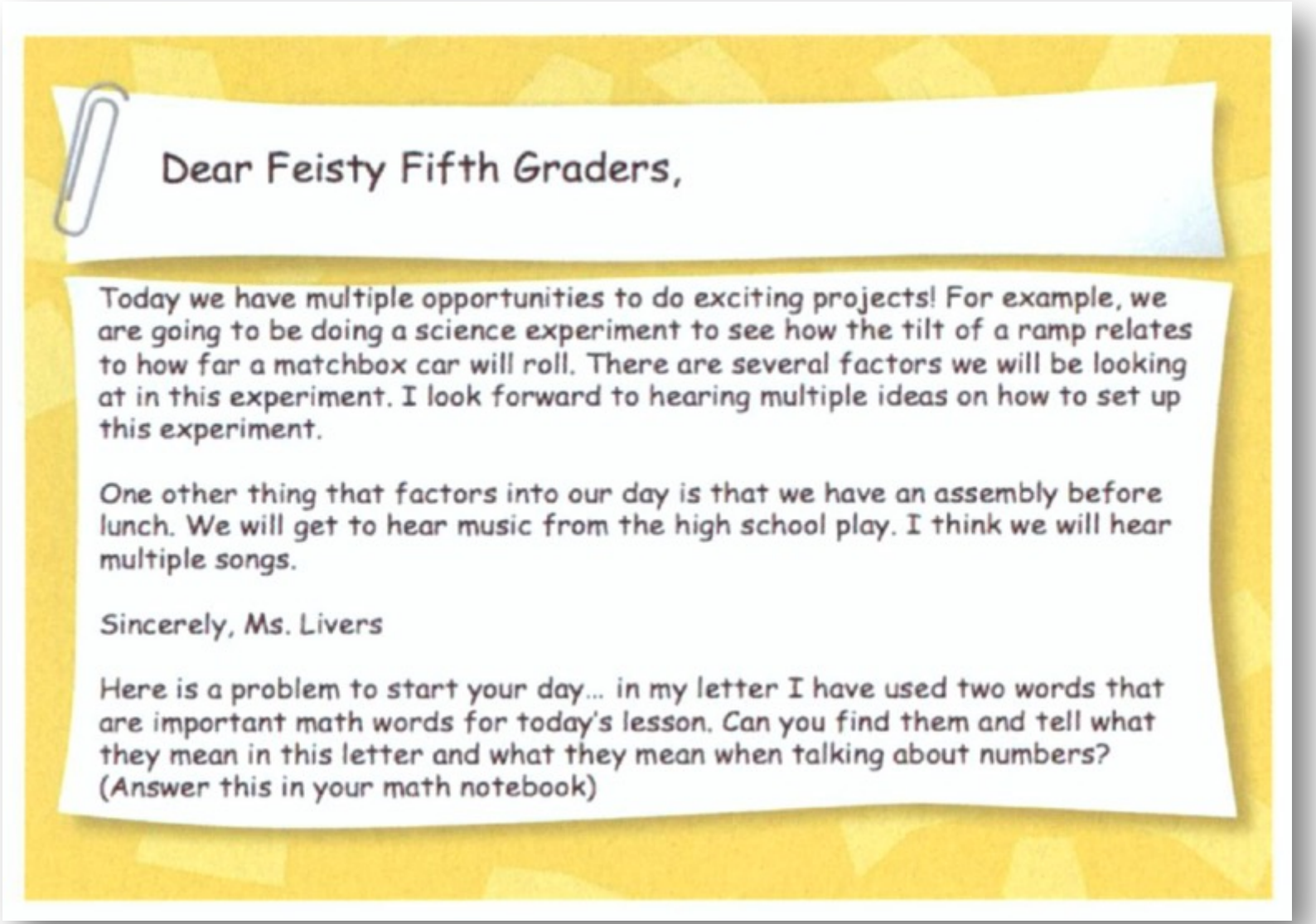
- 74%

Polygon: any enclosed shape that is made up of 3 or more straight lines

- Ex.



https://jillianstarrteaching.com/math-word-walls/



Dear Feisty Fifth Graders,

Today we have multiple opportunities to do exciting projects! For example, we are going to be doing a science experiment to see how the tilt of a ramp relates to how far a matchbox car will roll. There are several factors we will be looking at in this experiment. I look forward to hearing multiple ideas on how to set up this experiment.

One other thing that factors into our day is that we have an assembly before lunch. We will get to hear music from the high school play. I think we will hear multiple songs.

Sincerely, Ms. Livers

Here is a problem to start your day... in my letter I have used two words that are important math words for today's lesson. Can you find them and tell what they mean in this letter and what they mean when talking about numbers? (Answer this in your math notebook)

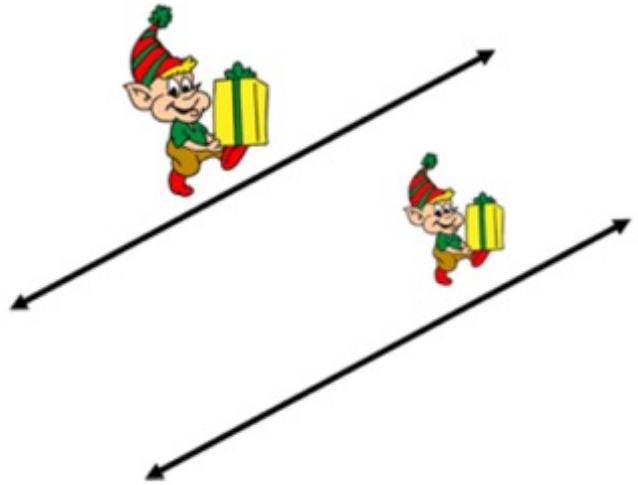
Bay-Williams & Livers (2009)

Rating	Word	Definition	Synonym(s)	Example	Sample Problem
2	expression	a mathematical phrase combining operations, numbers and/or variables.	phrase algebraic expression	6 6n 6+n (no equal sign)	Lucia earns $8 per hour for babysitting and gets a $5 tip. Write an expression to represent the amount she would earn if she worked for x hours.
2	variable	a quantity that can change or take many values. (refers to the letter or symbol representing the quantity)	unknown	x D y T	The variable x represents the number of hours Charlie works in a week. Write an expression to represent his earnings if he earns $9 per hour.
1	product	the result when two or more numbers are multiplied	total answer	3 × 2 = (6) ↑ product	The product of 6 and a number is 24. What is the number?
3	quotient	the result of a division (refers to the number of times the divisor divides the dividend)	answer	18 ÷ 2 = (9) (9) ← quotient 2⟌18	Estimate the quotient when 365 is divided by 12.

Marin (2018)

Parallel Lines (Pair of Elves)

Lines that are the same distance apart and will never intersect



The Pair of Elves are the same distance apart and will never intersect.

The Pair of Elves are on Parallel Lines

Ray (Run Away)

A line that has a starting point but no endpoint

Start here!! Run away and never stop running Ray.

Riccomini et al. (2015)

Math Word Search #6

Number Words 51 to 60

Use the word bank to find the number words in the grid below. Words appear horizontally and vertically.

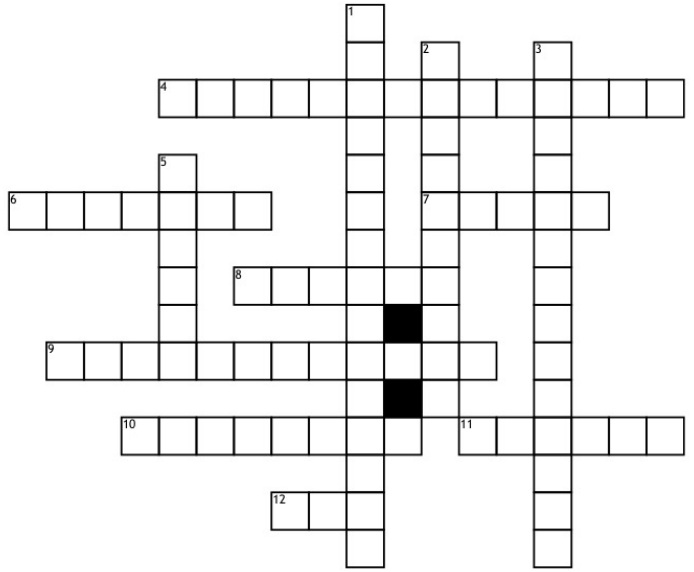
q	r	r	x	i	s	y	t	f	i	f	i
u	i	x	g	k	f	b	e	f	f	i	f
y	t	x	i	s	i	r	e	i	i	x	i
s	b	w	t	f	f	u	r	f	f	h	f
e	h	f	d	d	t	o	h	t	t	y	t
c	x	i	h	n	y	f	t	y	y	b	y
d	w	f	e	s	s	y	y	n	e	j	t
o	y	t	p	d	e	t	t	i	i	r	w
a	p	y	u	i	v	f	f	n	g	j	o
w	q	o	o	y	e	i	i	e	h	a	a
x	n	n	d	m	n	f	f	c	t	y	n
t	p	e	e	v	i	f	y	t	f	i	f

fifty-one
fifty-two
fifty-three
fifty-four
fifty-five
fifty-six
fifty-seven
fifty-eight
fifty-nine
sixty

https://www.learnwithpuzzles.com/

Name: _____ Date: _____

Circles Vocabulary Practice



Across

4. What is an angle whose vertex is on the circle?

6. What is a line that intersects the circle at 1 place?

7. What is a segment whose endpoints are on the circle?

8. What is the point in the middle of the circle?

9. What is an angle whose vertex is the center of the circle?

10. What is a chord that goes through the center of the circle?

11. What is a segment whose endpoints are the center and a point on the circle?

12. What is an unbroken part of a circle?

Down

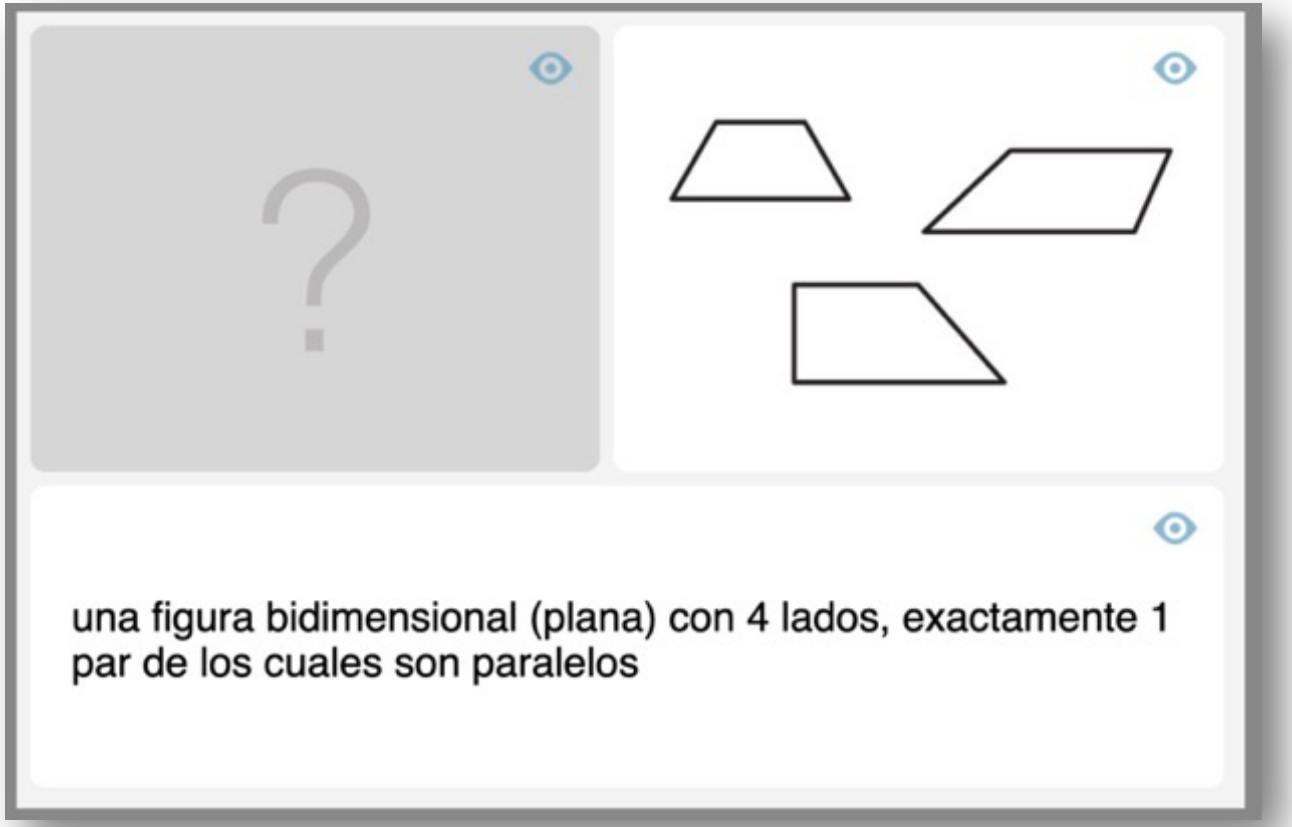
1. What is the name of the point where a tangent intersects the circle?

2. What is an arc whose endpoints are the endpoints of the diameter?

3. What is an arc that is encased on either side by two different segments?

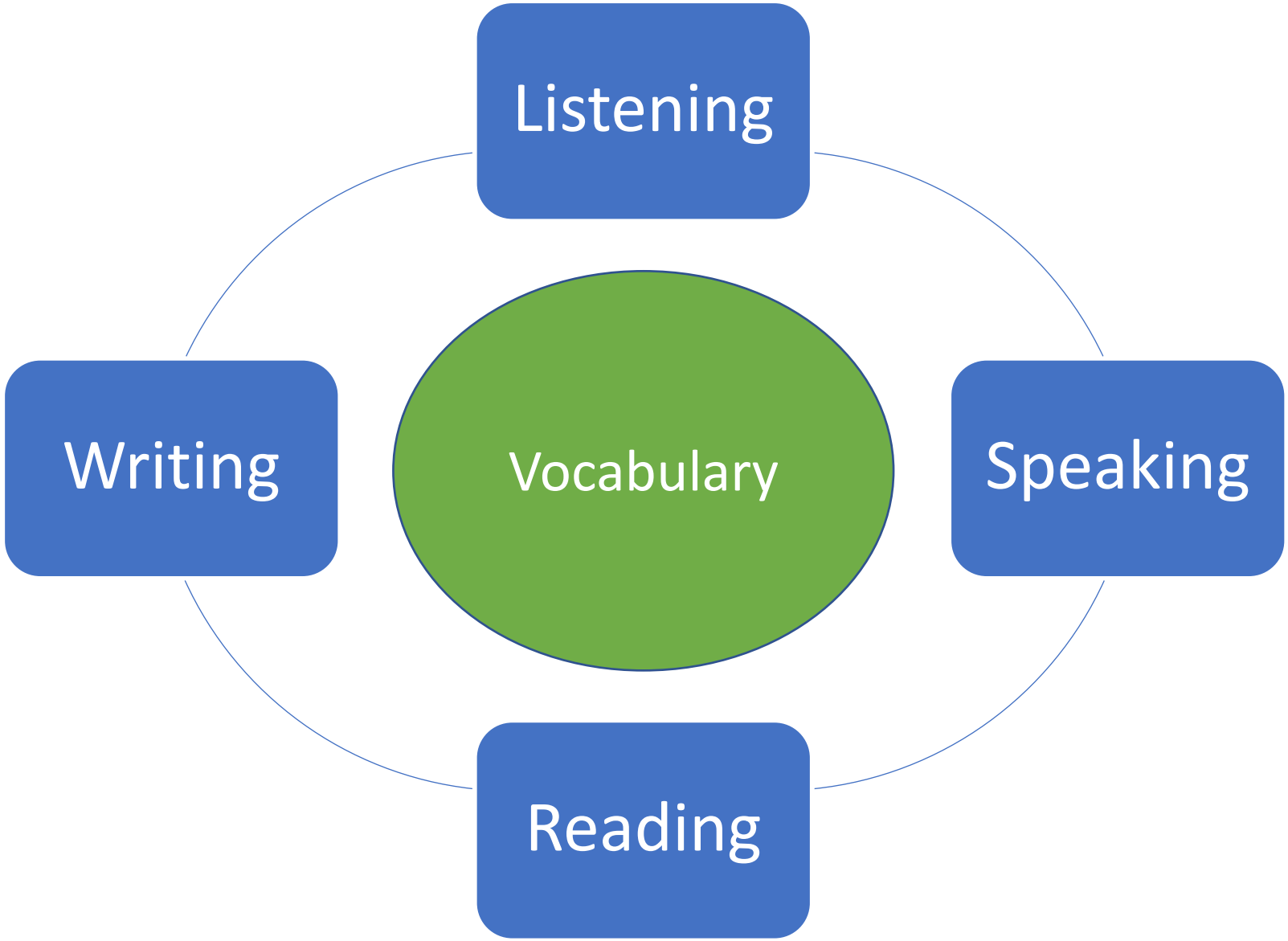
5. What is a line that intersects the circle at 2 places?

https://wordmint.com/public_puzzles/318666



Math Lingo

Math Learning Center



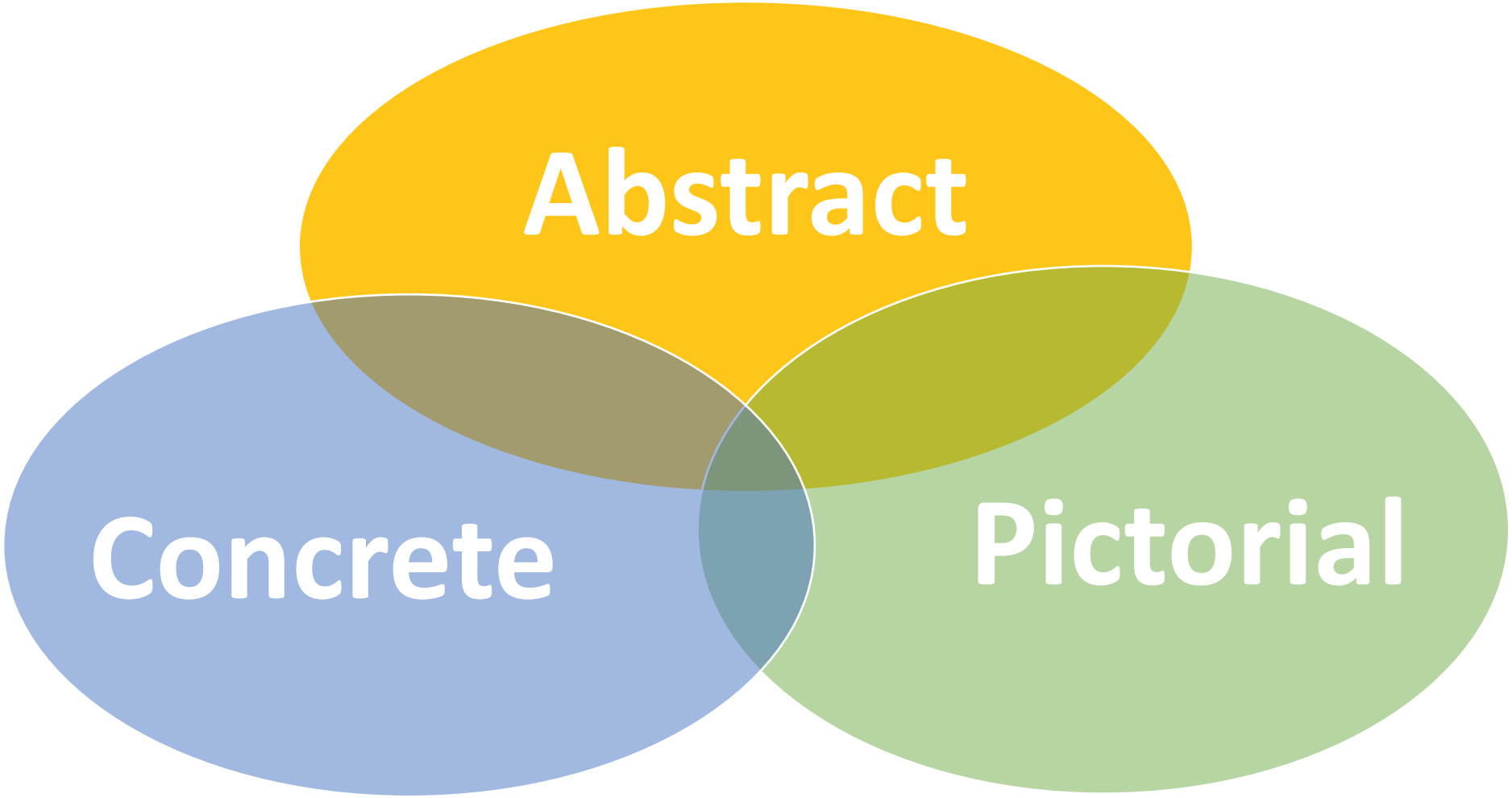
What are ways you support the mathematics vocabulary of your students?

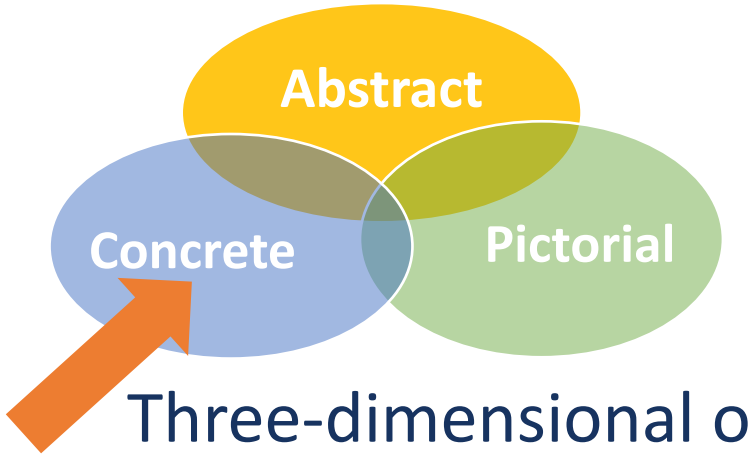
Instructional Platform

INSTRUCTIONAL DELIVERY

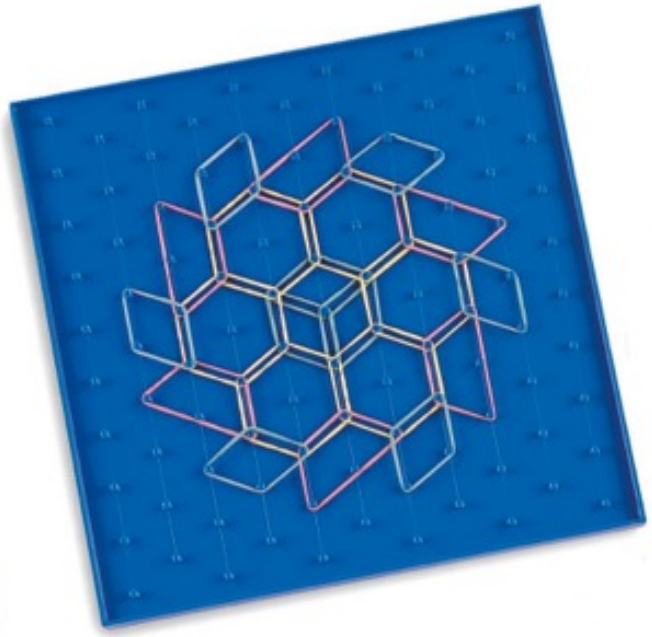
- Explicit instruction
- Precise language
- Multiple representations

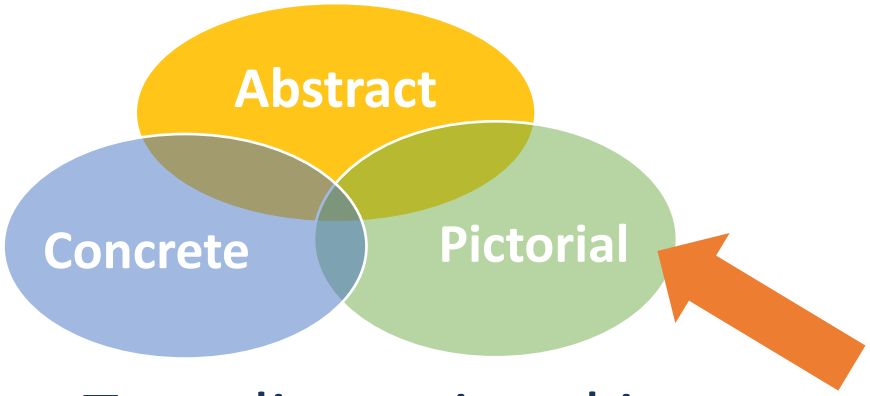
INSTRUCTIONAL STRATEGIES


Abstract
Concrete
Pictorial

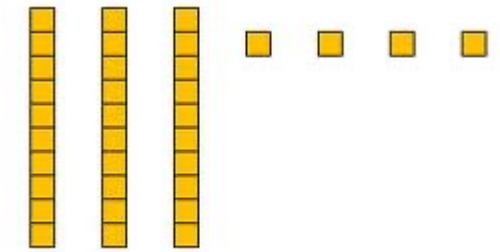


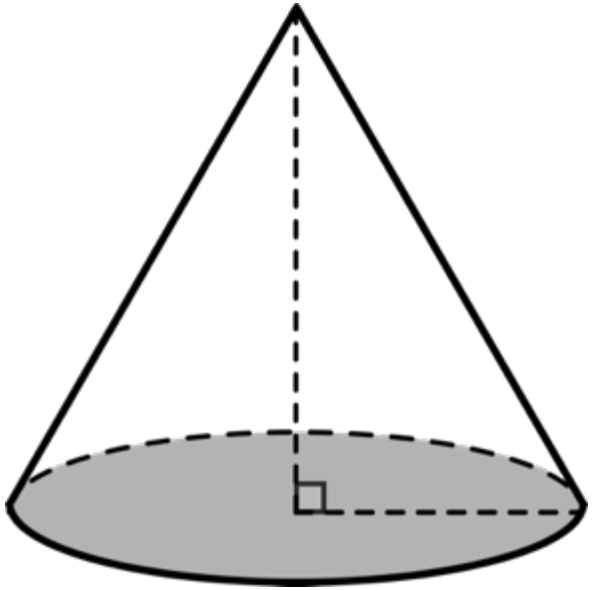
Three-dimensional objects

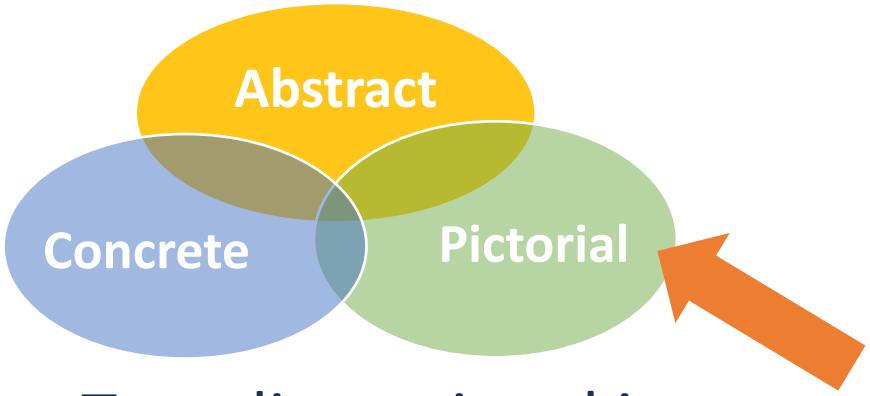




Two-dimensional images







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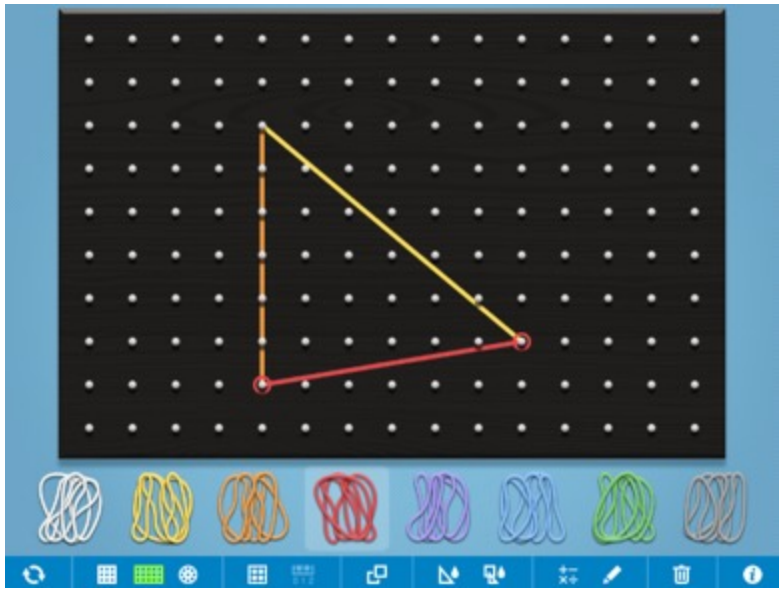
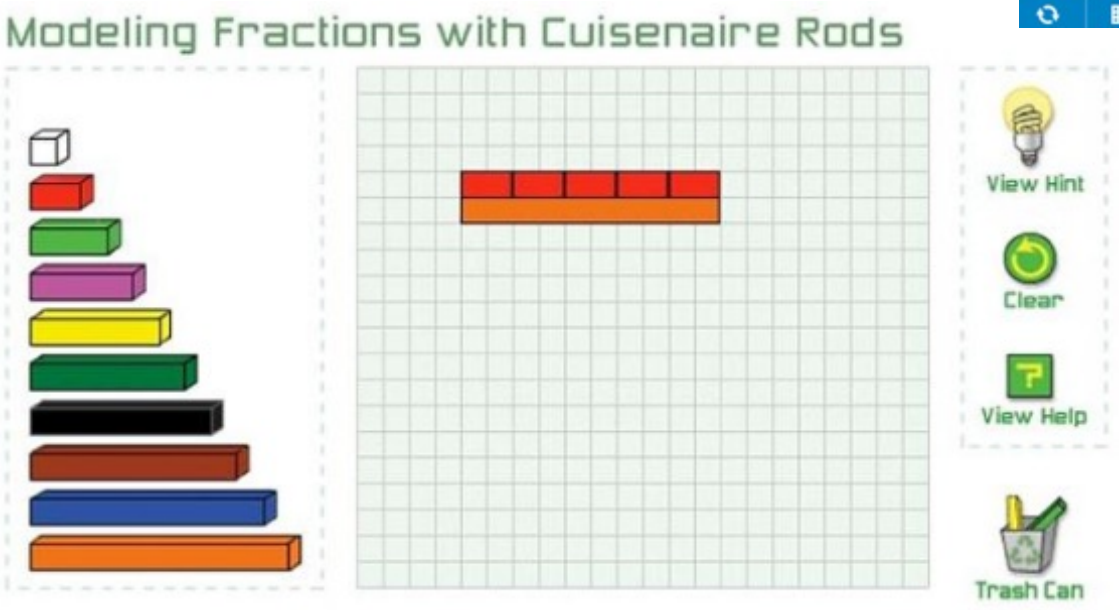
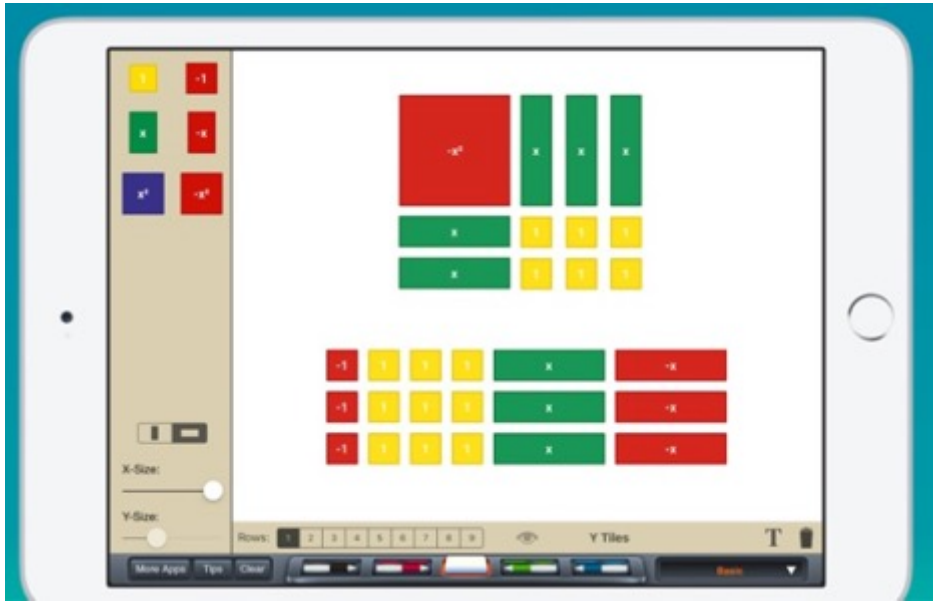
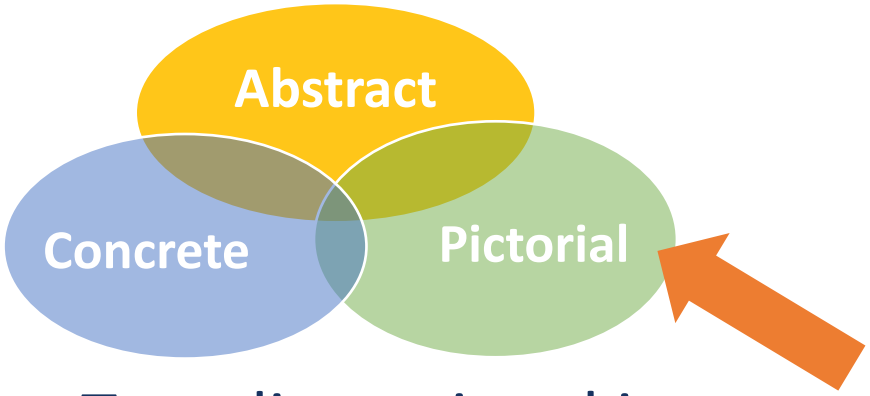
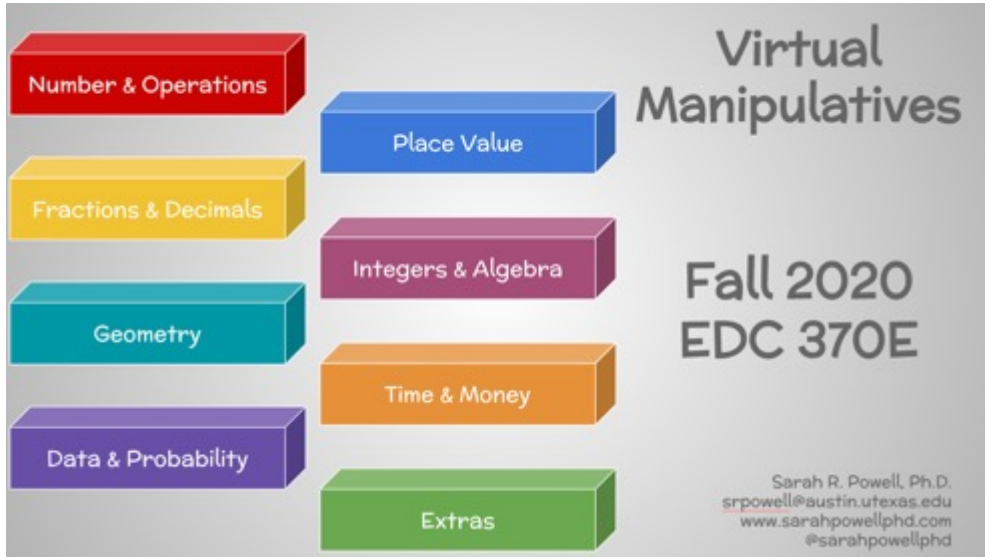


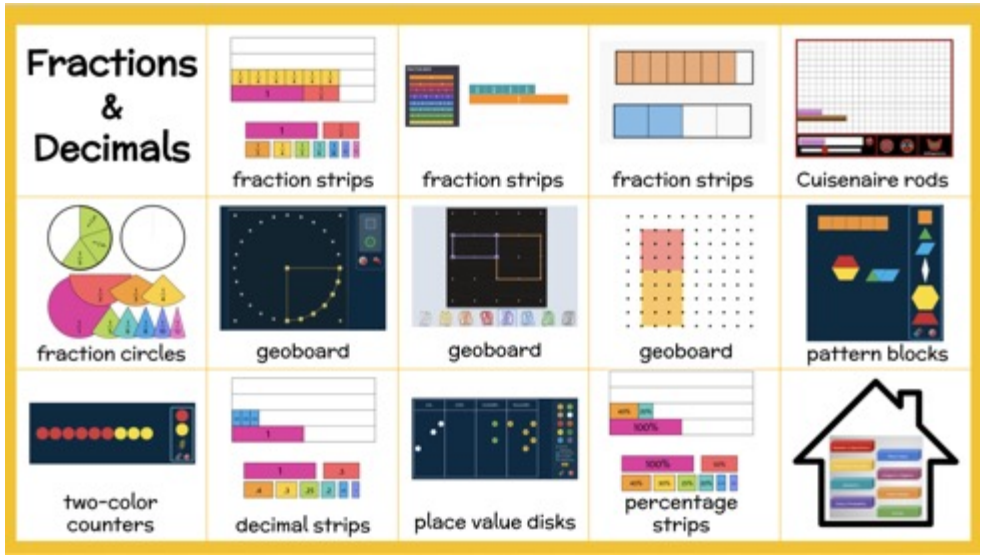


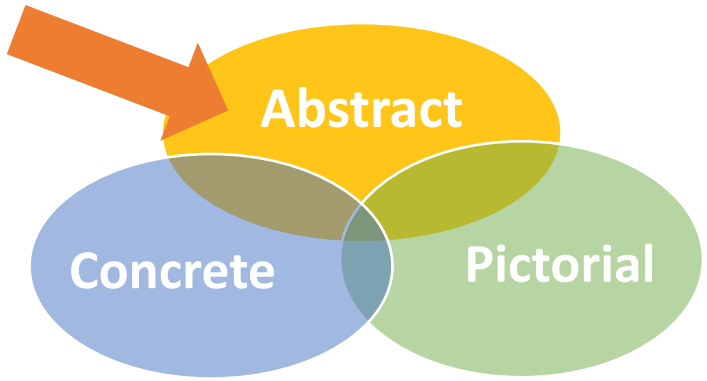




Two-dimensional images







Numerals and symbols and words

$2 + 8 = 10$

34 = 3 tens and 4 ones

$x - 6 = 8$

$$\begin{array}{r} 4{,}179 \\ +\ \ 569 \\ \hline \end{array}$$

If you are left handed:

What's one of your favorite hands-on manipulatives?

If you are right handed:

What's one of your favorite virtual manipulatives?

Instructional Platform

INSTRUCTIONAL DELIVERY

- Explicit instruction
- Precise language
- Multiple representations

INSTRUCTIONAL STRATEGIES

- Fluency building

Addition	Subtraction
Multiplication	Division

Fluency is doing mathematics easily and accurately.

Fluency makes mathematics easier.

Fluency provides less stress on working memory.

Fluency helps students build confidence with mathematics.

Addition	Subtraction
Multiplication	Division

It is essential to emphasize both conceptual and procedural learning.

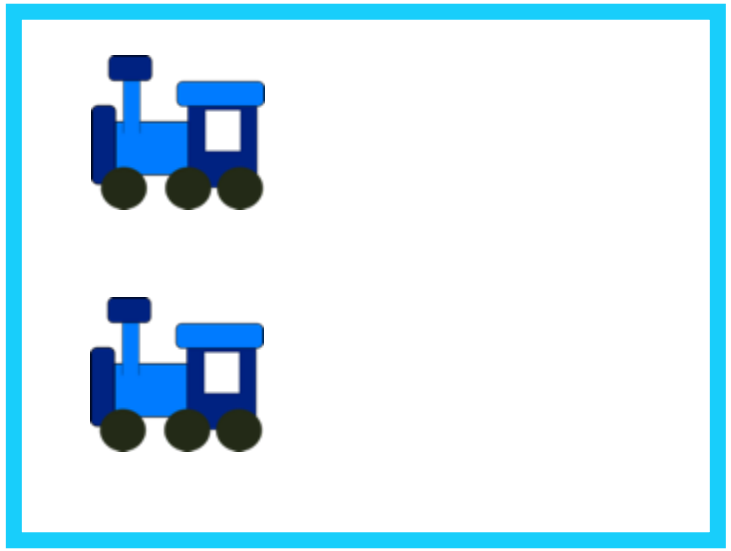
Total (Part-Part-Whole, Combine)

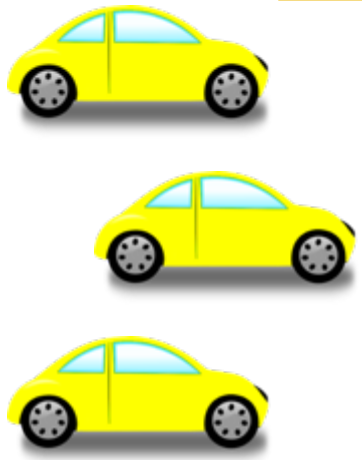
Addition	Subtraction
Multiplication	Division

2 + 3 = 5

Join (Change Increase)

Addition	Subtraction
Multiplication	Division





2 + 3 = 5

Total (Part-Part-Whole, Combine)

Karly saw **4** cardinals and **5** blue jays. How many birds did Karly see?

Addition	Subtraction
Multiplication	Division

Join (Change Increase)

Pia had $**4**. Then they earned $**5** for cleaning their room. How much money does Pia have now?

3 + 9 = __

If you have brown eyes:

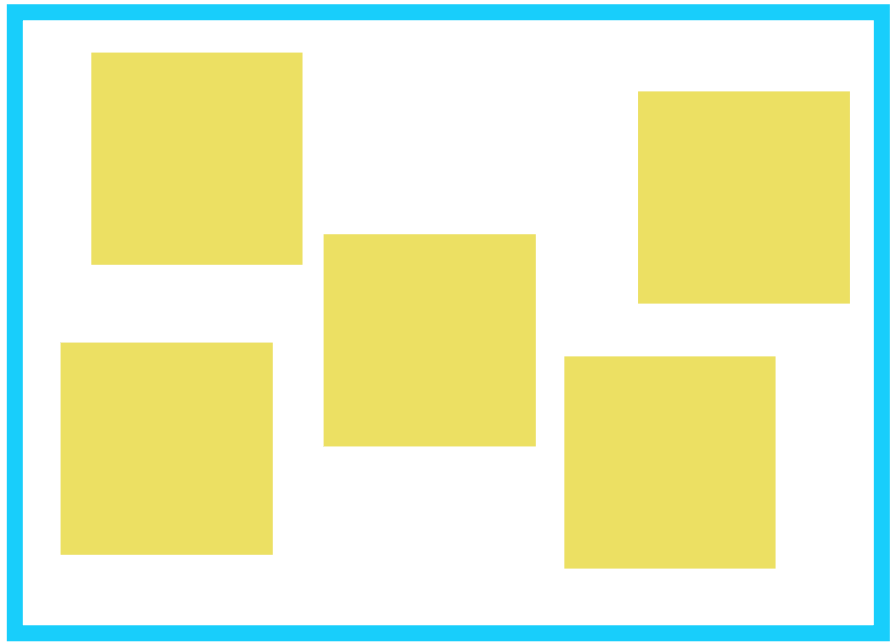
What's a **Total** story to show addition?

If you don't have brown eyes:

What's a **Change/Join** story to show addition?

Separate (Change Decrease)

Addition	**Subtraction**
Multiplication	Division



5 – 3 = 2

Difference (Compare)

Addition	**Subtraction**
Multiplication	Division

5 – 3 = 2

Separate (Change Decrease)

Brady had **9** cookies. Then they ate **2** of the cookies. How many cookies does Brady have now?

Addition	**Subtraction**
Multiplication	Division

Difference (Compare)

Rachel has **9** apples. Jodie has **2** apples. How many more apples does Rachel have? (How many fewer does Jodie have?)

9 – 5 = __

If you were born in North Carolina:

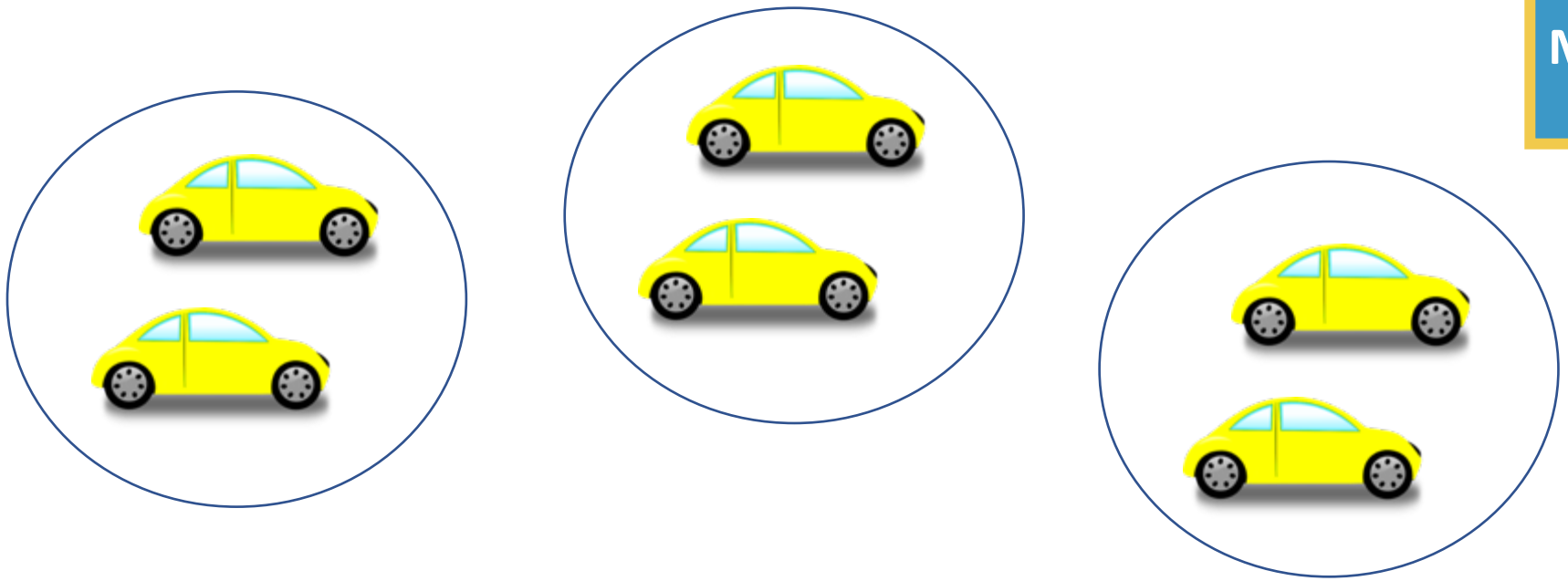
What's a **Change/Separate** story to show subtraction?

If you weren't born in North Carolina:

What's a **Difference** story to show subtraction?

Equal Groups

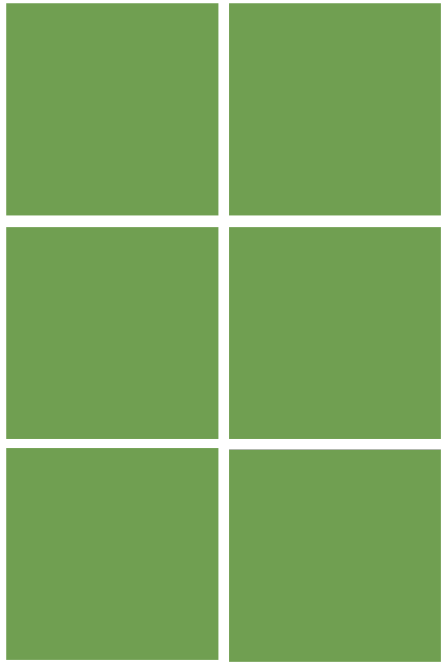
Addition	Subtraction
Multiplication	Division



$$3 \times 2 = 6$$

Equal Groups (Array)

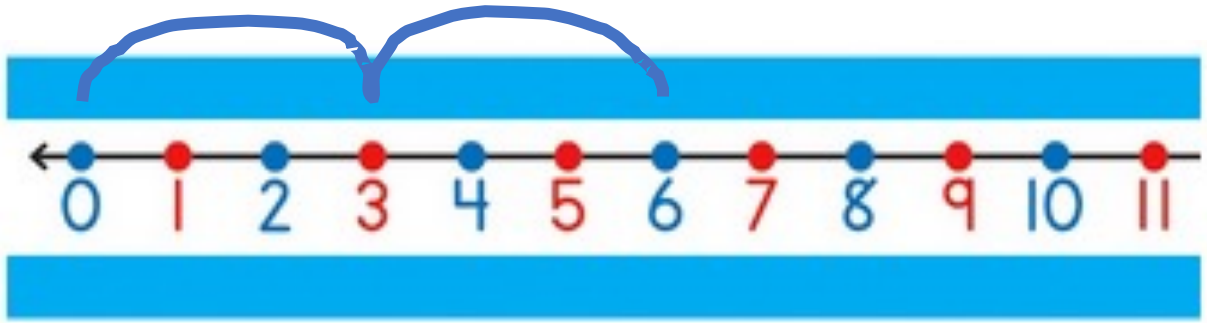
Addition	Subtraction
Multiplication	Division



$3 \times 2 = 6$

Comparison

Addition	Subtraction
Multiplication	Division



$3 \times 2 = 6$

Equal Groups

Diego has **2** boxes of crayons. There are **8** crayons in each box. How many crayons does Diego have altogether?

Addition	Subtraction
Multiplication	Division

Comparison

Vivienne picked **2** apples. Jessica picked **8** times as many apples as Vivienne. How many apples did Jessica pick?

$2 \times 5 = \_\_$

If you aren't wearing glasses:

What's an **Equal Groups** story to show multiplication?

If you are wearing glasses:

What's a **Comparison** story to show multiplication?

Partitive Division

Addition	Subtraction
Multiplication	**Division**

$$8 \div 2 = 4$$

Quotative Division

Addition	Subtraction
Multiplication	**Division**

$$8 \div 2 = 4$$

Partitive

Stefanie has **12** apples. She wants to share them equally among her **2** friends. How many apples will each friend receive?

Addition	Subtraction
Multiplication	**Division**

Quotative

Nicole has **12** apples. She put them into bags containing **2** apples each. How many bags did Nicole use?

12 ÷ 4= __

If you'd watch a comedy show:

What's a **Partitive** story to show division?

If you'd watch a drama how:

What's a **Quotative** story to show division?

Addition	Subtraction
Multiplication	Division

Build fluency with math facts.

- Addition: single-digit addends
- Subtraction: single-digit subtrahend
- Multiplication: single-digit factors
- Division: single-digit divisor

5	9	6	56
+ 8	− 4	× 7	÷ 8

Addition	Subtraction
Multiplication	Division

Build fluency with whole-number computation

$$\begin{array}{r} 15 \\ +\ 28 \\ \hline \end{array} \qquad \begin{array}{r} 1009 \\ -\ 724 \\ \hline \end{array}$$

$$\begin{array}{r} 23 \\ \times\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 7250 \\ \div\ 15 \\ \hline \end{array}$$

Addition	Subtraction
Multiplication	Division

Build fluency with rational-number computation

$$\begin{array}{r} 1.4 \\ +\ 3.9 \\ \hline \end{array} \qquad \begin{array}{r} 7.892 \\ \div\ 0.14 \\ \hline \end{array}$$

$$\frac{2}{3} \times \frac{3}{4} \qquad \frac{9}{4} - \frac{3}{8}$$

Addition	Subtraction
Multiplication	Division

Build fluency with integer computation

$-135 \div 2 =$

$$\begin{array}{r} 6 \\ \times\ -12 \\ \hline \end{array}$$

$-14 - (-7) =$

$$\begin{array}{r} 1.4 \\ +\ -3.9 \\ \hline \end{array}$$

Addition	Subtraction
Multiplication	Division

What type of fluency do your students need to develop?

How will you practice that?

Instructional Platform

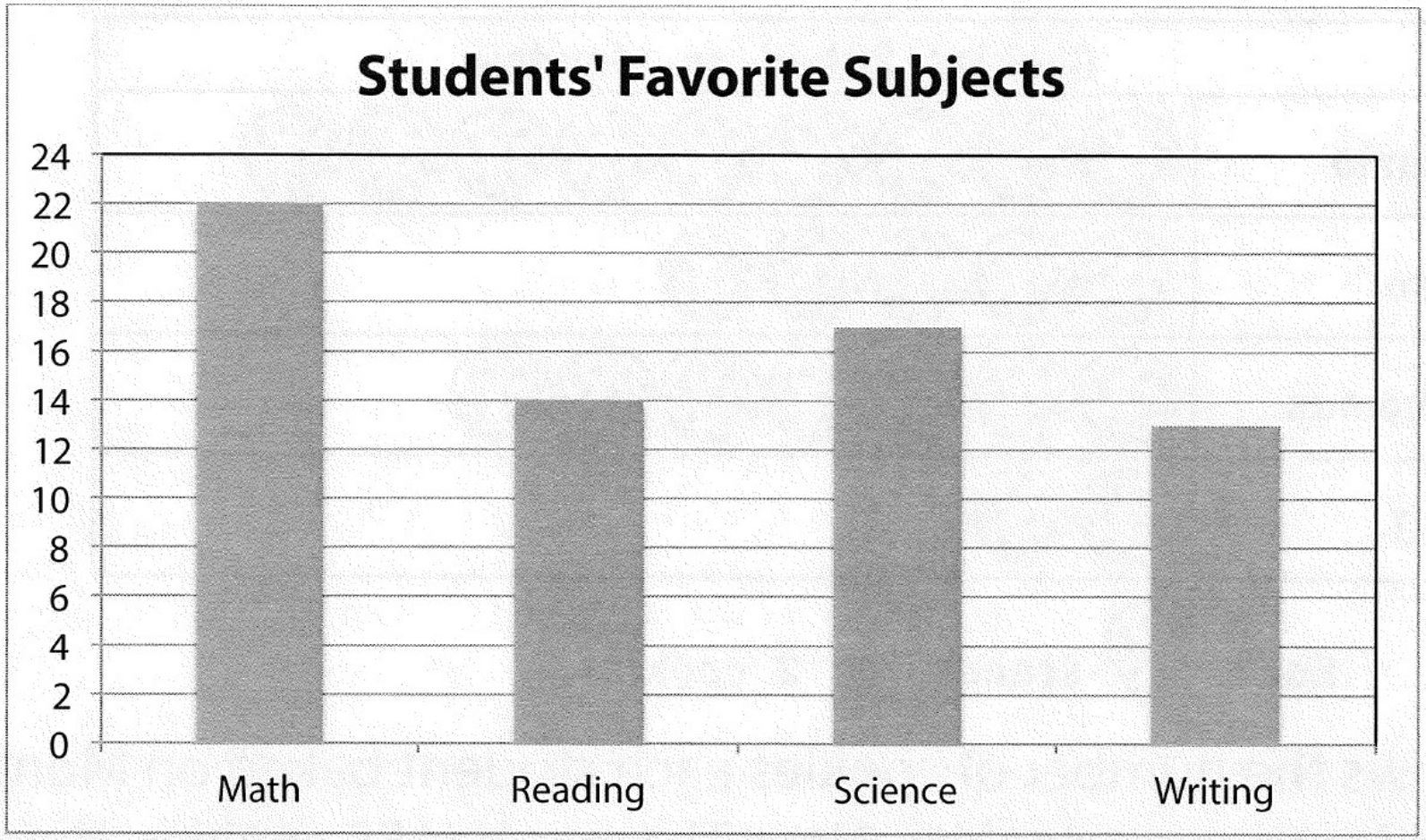
INSTRUCTIONAL DELIVERY

- Explicit instruction
- Precise language
- Multiple representations

INSTRUCTIONAL STRATEGIES

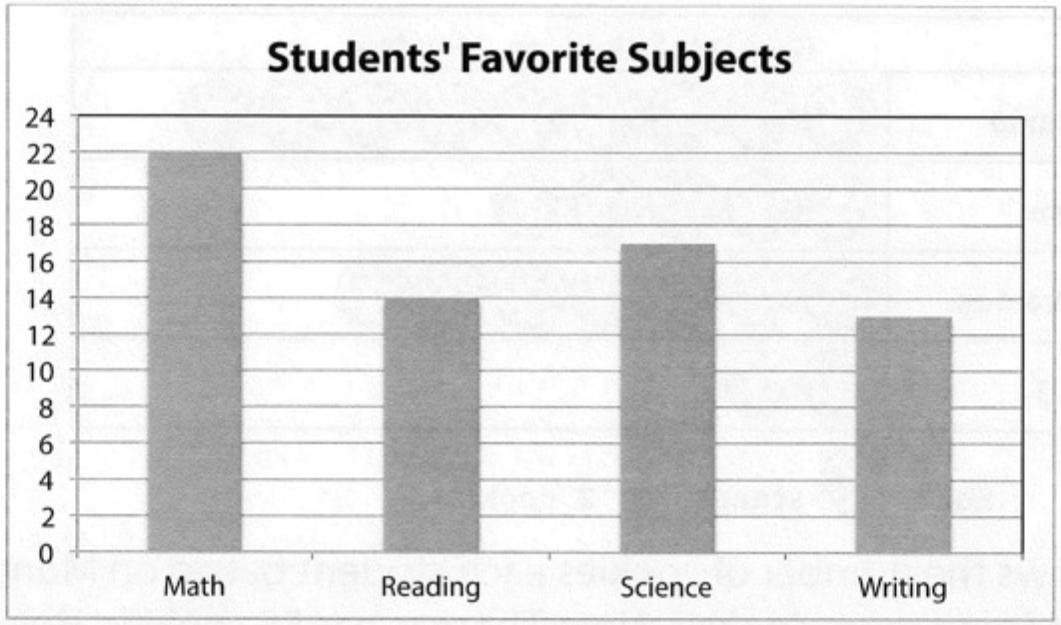
- Fluency building
- Problem solving instruction

J.



The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

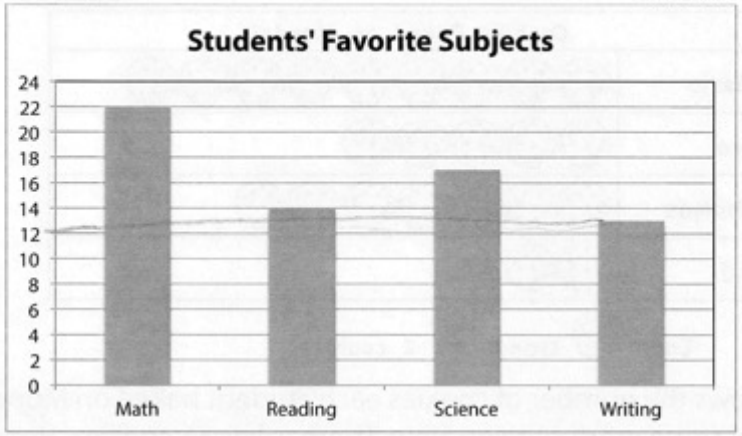
J.



The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

60

J.



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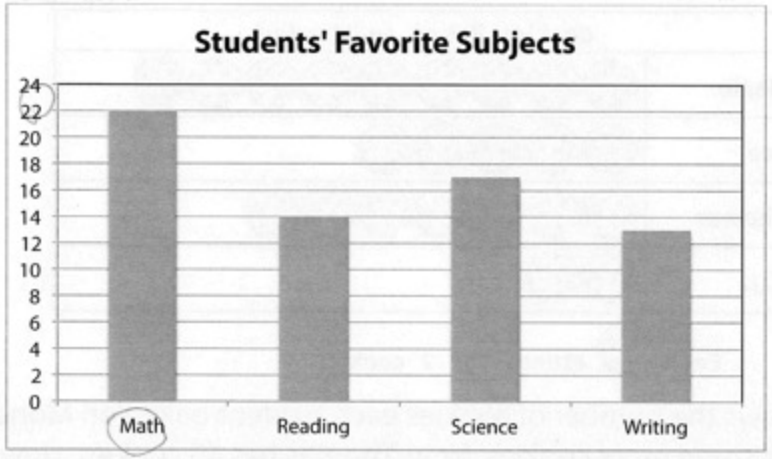
22 math 12 writing

J.



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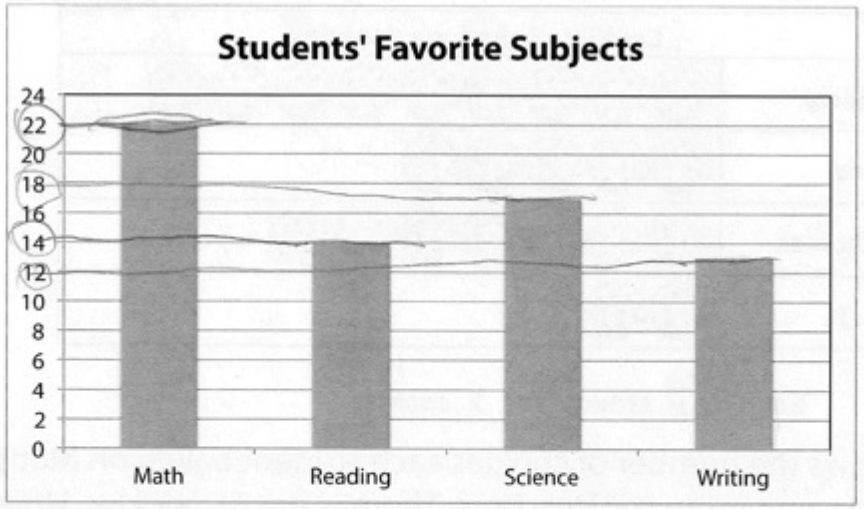
22 math

J.



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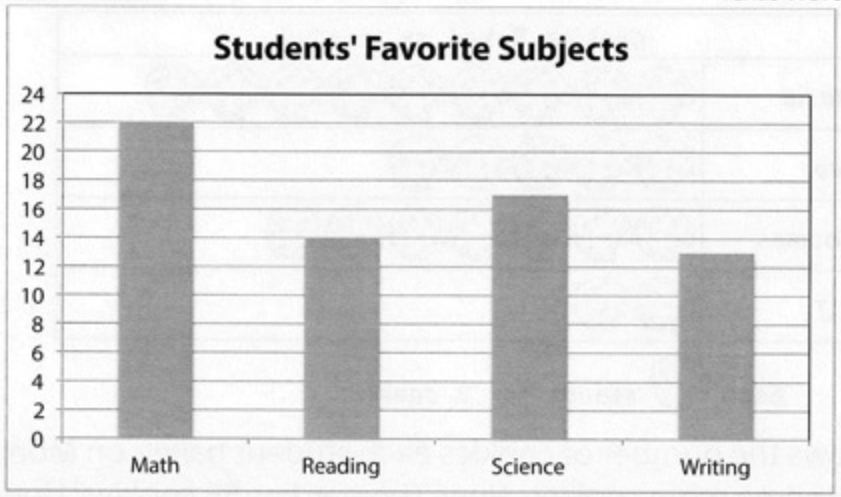
students chose Math than chose Writing?

22 Mhatt

14 writing

J.



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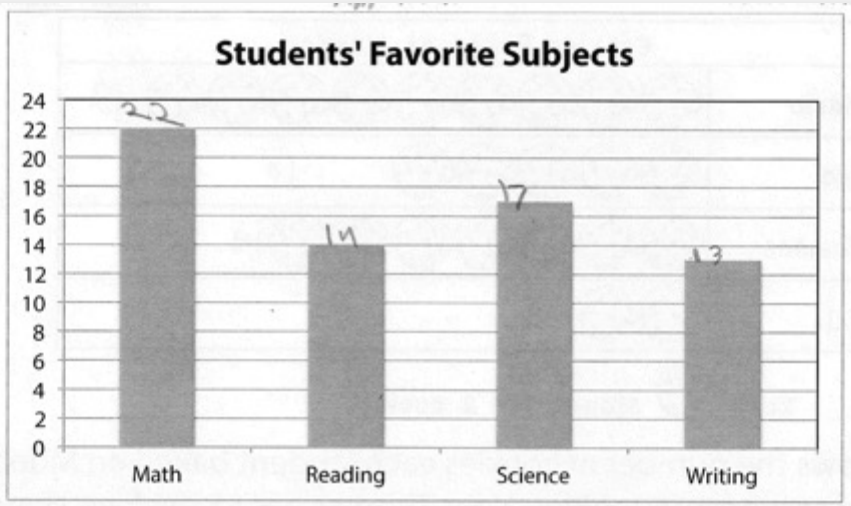
the Students choses they love more Math dicoses & tu 22 Math

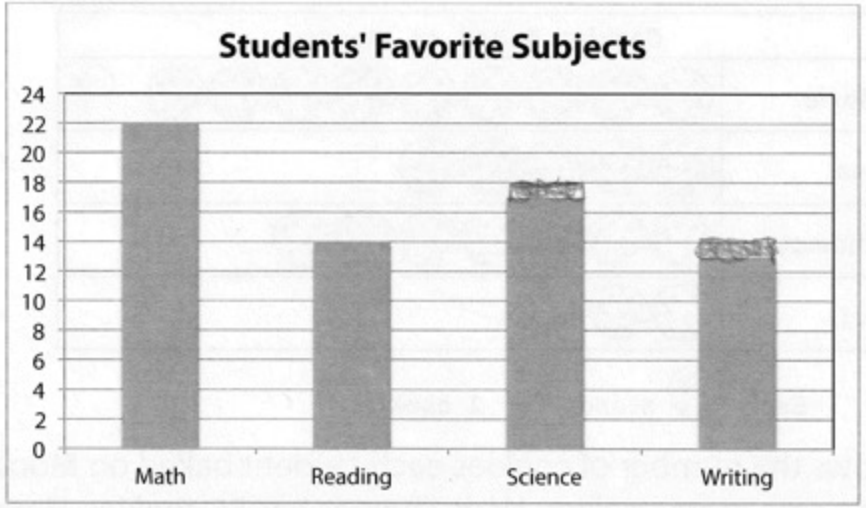
J.



The graph shows the favorite subject of third-grade students. How many m
students chose Math than chose Writing?

22
14
+13
27

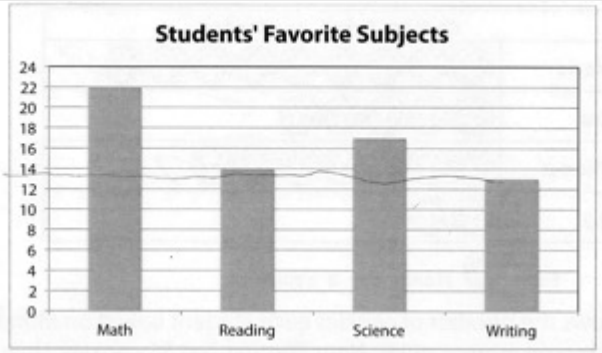
J.



The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

22
14
+ 14
36

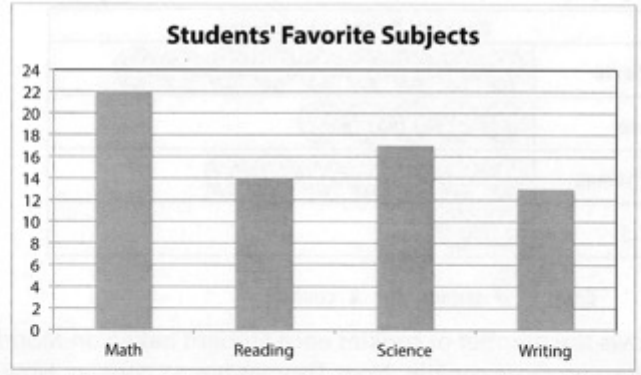
J.



The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

24
+13

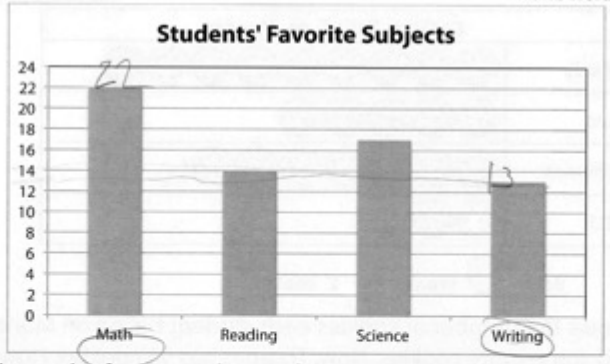
J.



The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

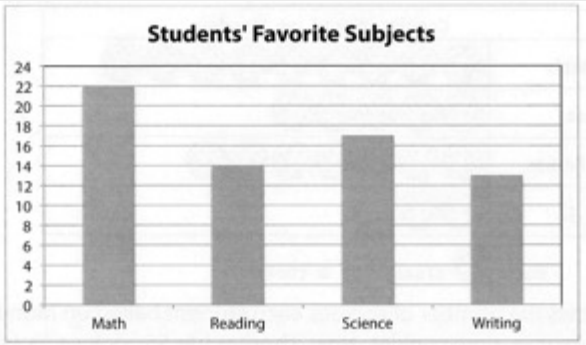
22
+12
34

J.



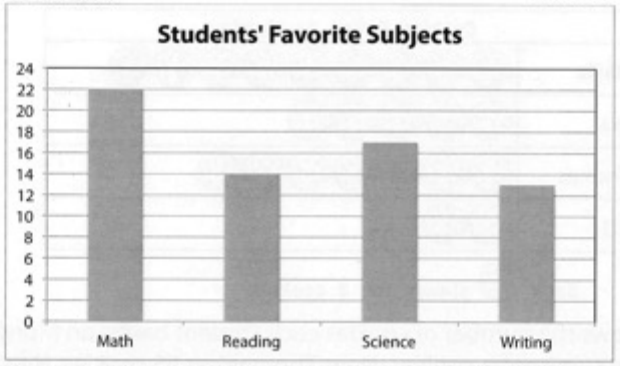
The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

22
+13
35



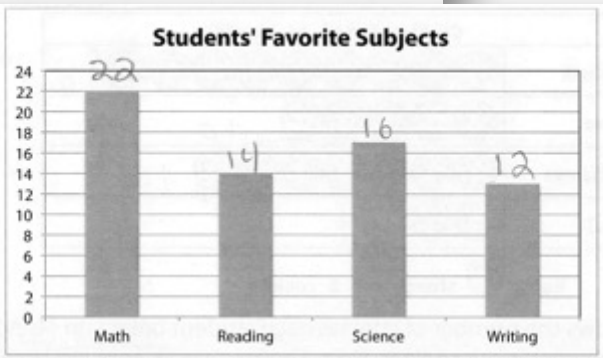
The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

22
-15
7



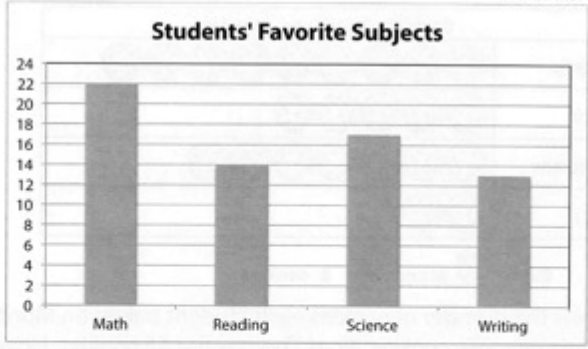
The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

they choose 8% more than reading



The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

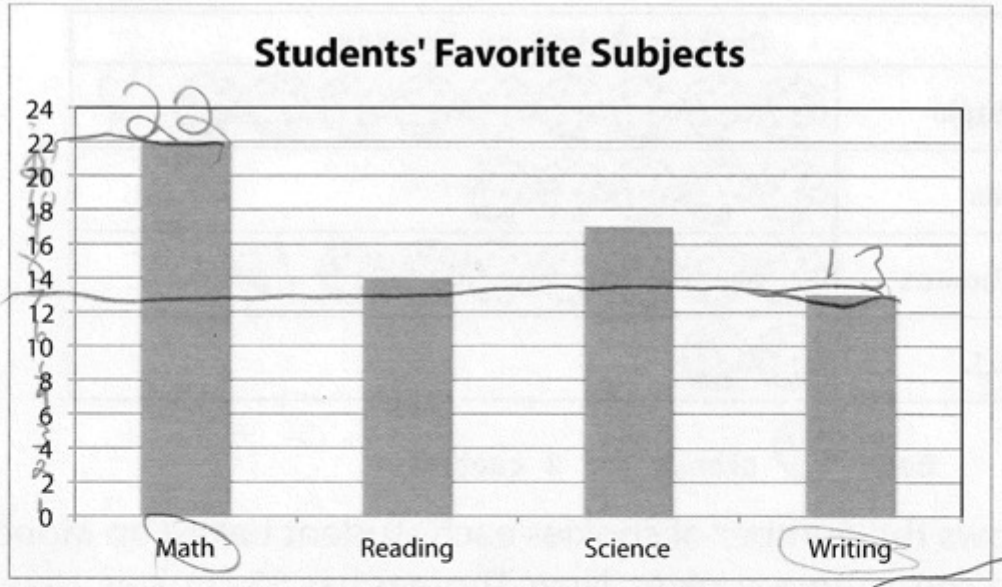
22
-12
10



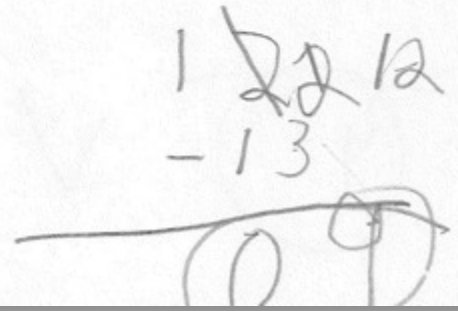
The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?

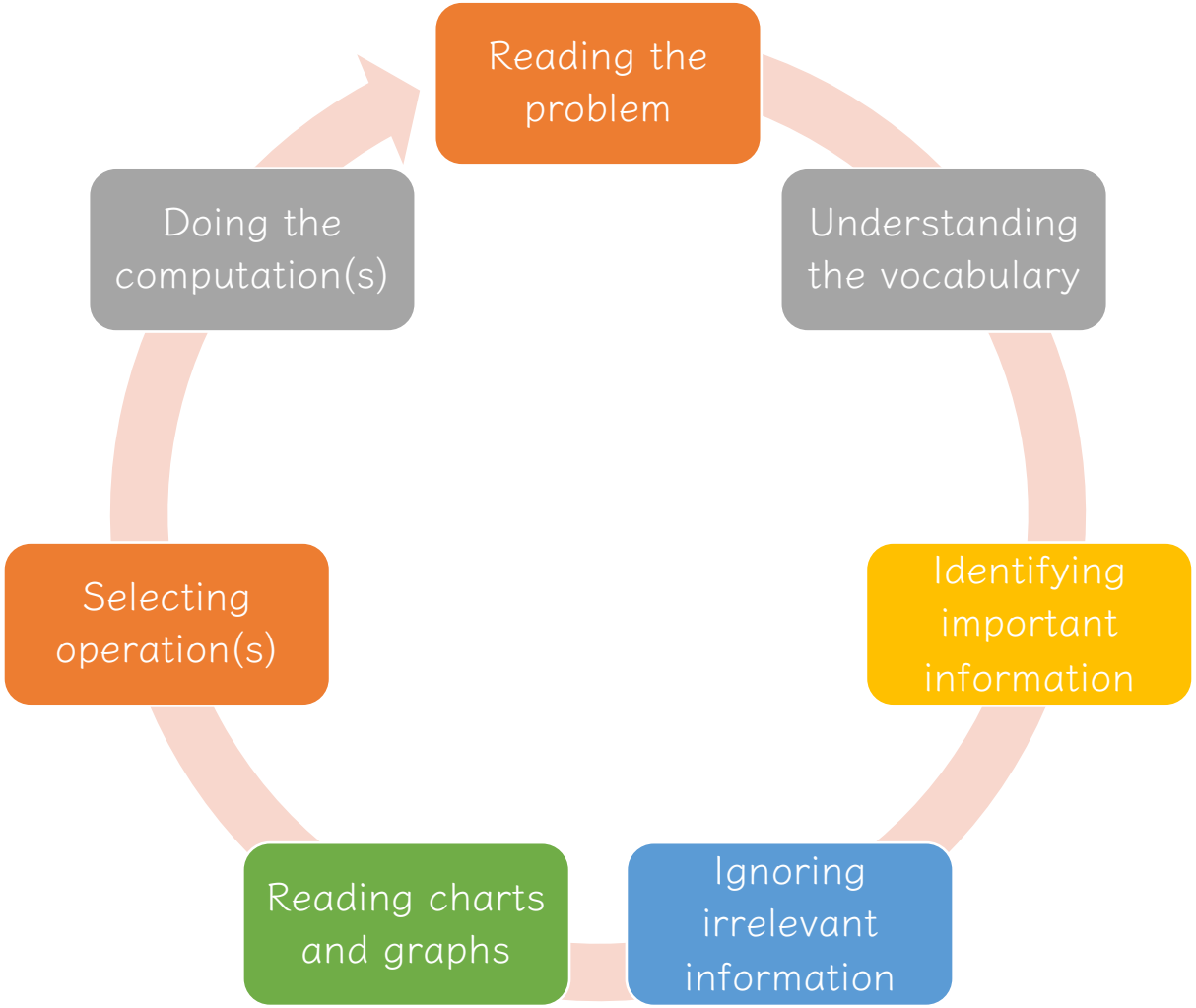
12
-4
8

J.

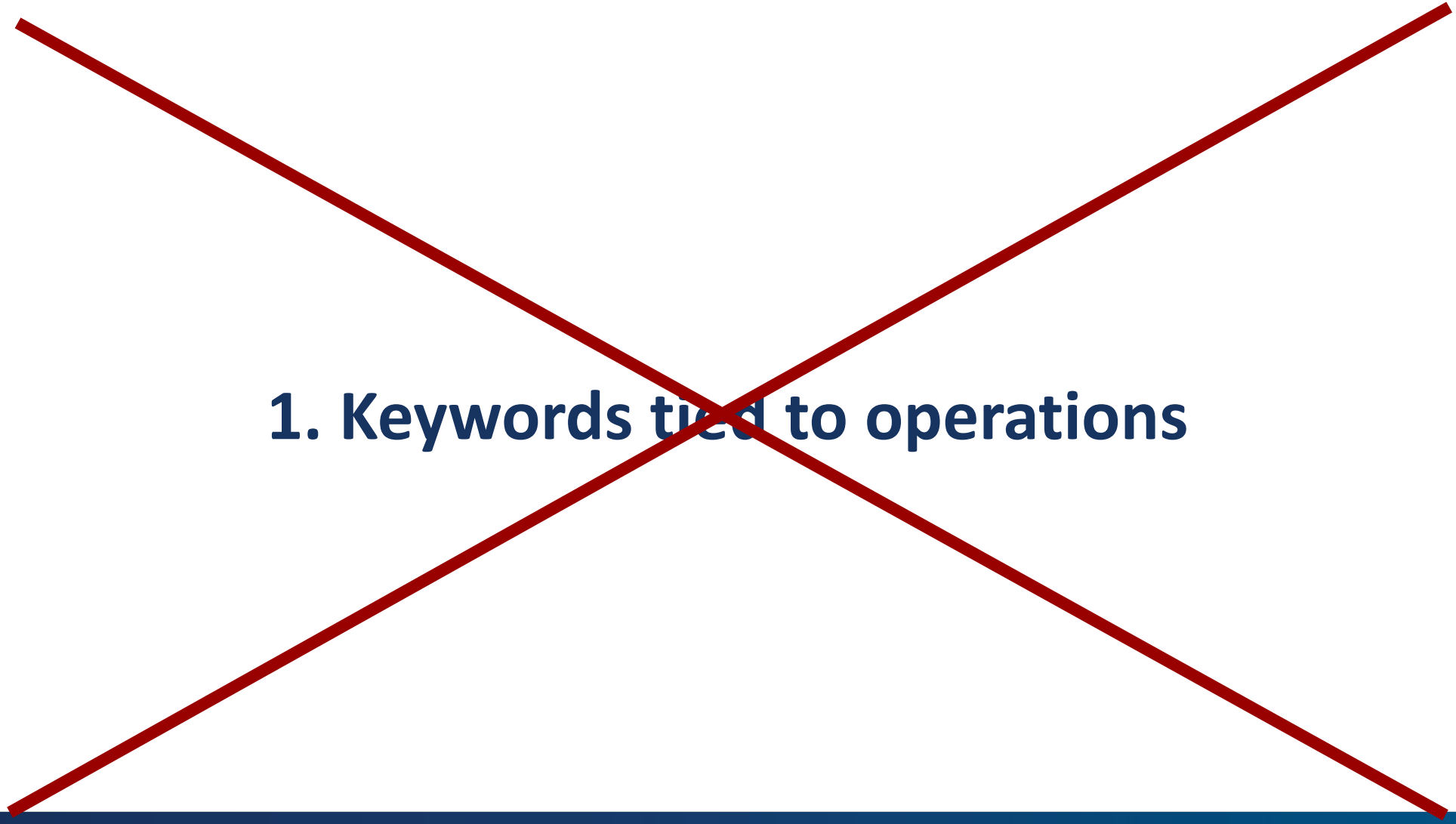


The graph shows the favorite subject of third-grade students. How many more students chose Math than chose Writing?




Reading the problem
Understanding the vocabulary
Identifying important information
Ignoring irrelevant information
Reading charts and graphs
Selecting operation(s)
Doing the computation(s)

1. Keywords tied to operations

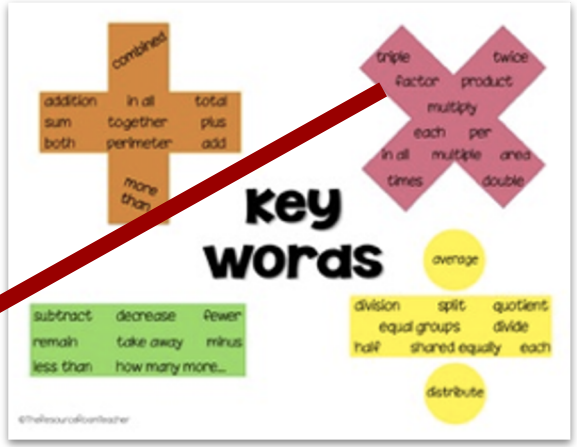


Lincoln had 8 pencils **fewer** than Roscoe. If Roscoe had 18 pencils, how many pencils did Lincoln have?

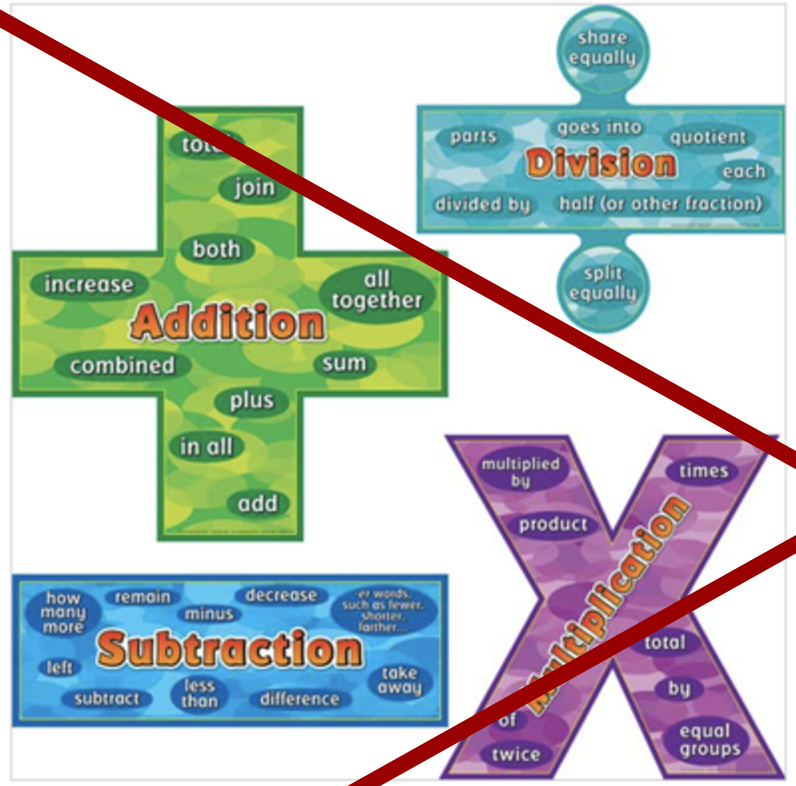
Lincoln had 8 pencils **fewer** than Roscoe. If Lincoln had 18 pencils, how many pencils did Roscoe have?


Key Words Used in Math Word Problems
Addition Words
+ add
+ all together or altogether
+ and
+ both
+ combined
+ how many in all
+ how much
+ in all
+ increased by
+ plus
+ sum
+ together
+ total
Subtraction Words
- change
- decreased by
- difference
- fewer or fewer than
- how many are left (or have left)
- less or less than
- lost
- minus
- need to
- reduce
- remain
- subtract
- take away
Multiplication Words
x by (dimension)
x double
x each group
x every
x factor of
x increased by
x multiplied by
x of
x product
x times
x triple
Division Words
÷ as much
÷ cut up
÷ each group has
÷ equal sharing
÷ half (or other fractions)
÷ how many in each
÷ parts
÷ per
÷ percent
÷ quotient of
÷ ratio of
÷ separated
÷ share something equally


Addition
Subtraction
Sum
Total
Plus
In all
And
Join
Altogether
Perimeter
Together
Fewer
Less than
Exceed
Remain
Are not
Minus
Difference
How many more
Take away
Left over
When they say...
They mean...
Times
Each
Twice
Per
Area
Product
In all
Multiple
Equal groups
Multiplied by
Half
Separate
Split
Quotient
Divisor
Cut up
Dividend
Same
Divided by
Cut up
Multiplication
Division


combined
addition
sum
both
in all
together
perimeter
total
plus
add
more than
triple
twice
factor
product
multiply
each
per
in all
multiple
area
times
double
Key Words
average
subtract
decrease
fewer
remain
take away
minus
less than
how many more...
division
split
quotient
equal groups
divide
half
shared equally
each
distribute


ADDITION
together
add
sum
total
Combined
join
all
increase
SUBTRACTION
difference
remain
left
how many more
fewer
less
take away
subtract
Key Words
MULTIPLICATION
times
twice
product
area
each
double
triple
of
every
DIVISION
goes into
equal share
divided by
quotient
split
share



Word-Problem Words Poster Set

Item #162978

(4.1)

75%

of respondents would recommend this to a friend

7 Reviews

Write a Review

What do you want to know about this product?

Expect an answer in about 48 hours

$12.99

Pay with 3 monthly payments of just $4.33. No fees.

Learn more

1 poster set

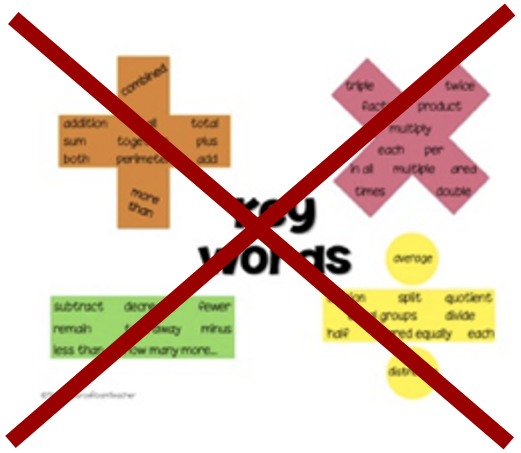
Quantity

– 1 +

Ready to Ship

Add to Cart

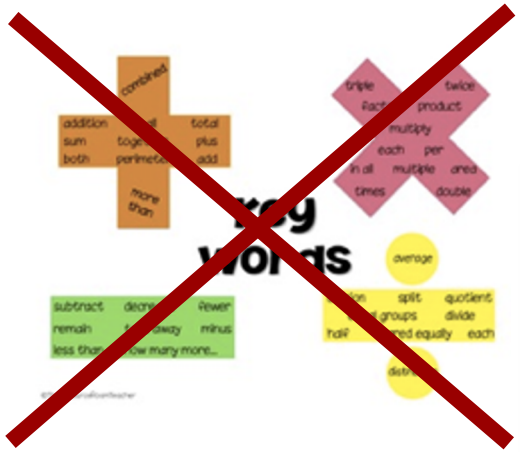
Add to Wish list



Description of Single-Step Word Problems (n = 132)

Schema	Occurrence of schema		Any keyword		Schema-specific keywords[a]		Multiple keywords[a]		Keyword(s) led to correct solution[a]	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Total	27	20.5	26	96.3	23	88.5	5	19.2	21	80.8
Difference	17	12.9	17	100.0	14	82.4	2	11.8	12	70.6
Change	11	8.3	7	63.6	5	71.4	5	71.4	2	28.6
Equal groups	29	22.0	26	89.7	22	84.6	18	69.2	8	30.8
Comparison	10	7.6	9	90.0	9	100.0	4	44.4	5	55.6
Ratios or proportions	29	22.0	23	79.3	9	39.1	9	39.1	6	26.1
Product of measures	9	6.8	9	100.0	8	88.9	1	11.1	5	55.6

[a]When a problem featured a keyword.



Description of Multi-Step Word Problems (n = 84)

	Occurrence of schema[a]		Any keyword		Keyword(s) led to correct solution[b]	
Schema	*n*	%	*n*	%	*n*	%
Total	40	47.6	39	97.5	3	7.7
Difference	11	13.1	11	100.0	1	9.1
Change	21	23.8	19	95.0	1	5.3
Equal groups	49	58.3	48	98.0	1	2.1
Comparison	7	8.3	7	100.0	0	0.0
Ratios or proportions	22	25.0	16	76.2	1	6.3
Product of measures	7	8.3	7	100.0	2	28.6

[a]Sum across schemas does not equal 100 because each word problem featured more than one schema.

[b]When a problem featured a keyword.

Mr. Rivera's taxable income is $20 each hour before taxes are taken out. Mr. Rivera worked a total of 40 hours each week for 50 weeks.

What is the dollar amount, to the nearest dollar, taken out for taxes based on Mr. Rivera's taxable income?

Jessica rented 1 video game and 3 movies for a total of $11.50.

- The video game cost $4.75 to rent.
- The movies cost the same amount each to rent.

What amount, in dollars, did Jessica pay to rent each movie?

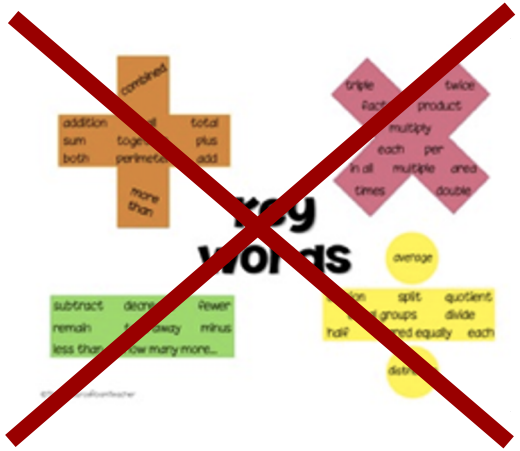
The temperature of a substance decreased by 24°C per minute for 3 minutes. What was the overall change of the temperature of the substance?

Important notes about keywords

Keywords are important to identify and understand

Keywords are the mathematical vocabulary that help an students understand what the story is about and what they need to do

Talk about keywords ("What does *more than* tell you about?")



But, *do not* tie a keyword to a specific operation!

2. Presenting problems by operation

Name: _____ Date: _____

Addition Word Problems

Solve the word problems. Show your work.

1. Noah had 12 books. He got 5 more books. How many books did Noah have in all?

2. Bonnie found 8 rocks on her sidewalk and 7 rocks in her backyard. How many rocks did Bonnie find in all?

3. Edward had 5 toy cars. He got 8 more toy cars. How many toy cars did Edward have in all?

4. Mariela collected 11 feathers. Then she found 3 more feathers. How many feathers did Mariela have in all?

5. LaMonte made 14 cookies. Then he made 5 more cookies. How many cookies did LaMonte have in all?

education.com

4-Digit: S1

Subtraction Word Problems

1) In a botanical garden, there are 5,626 varieties of native and exotic plants. If 2,290 of the plants are exotic, what is the number of native plants?

_____

2) If a restaurant uses 7,984 of the 9,151 eggs they had purchased during the month, how many eggs were left unused?

_____

3) There are 9,376 people watching a soccer game. If 9,174 of them are adults, how many children are present at the game?

_____

4) Matthew scored 3,741 points in a video game while Bryan scored 1,712. How many points more did Matthew score?

_____

5) A food-processing company used 16,835 bags of flour in the first week. During the second week, the number increased to 8,572. How many more bags of flour did they use in the second week?

_____

A clockmaker sold 8,948 clocks in 2013. In 2014, he sold 9,407. How many more clocks were sold in 2014?

_____

LONG DIVISION
WORD PROBLEMS

1. Zookeeper Al wants to give each monkey at the zoo an equal number of bananas. There are 37 monkeys in the zoo and 567 bananas. How many bananas does each monkey get? And How many are left over for him to eat himself?

2. Betty has 427 oranges and needs to pack them up equally in 23 boxes. How many oranges go in each box and how much does she have left over?

3. Miss King has 1376 pages of scrap paper. She wants to make them into scrap paper packets for her 32 students. How many pages will each packet have? How many extra pages will she have left over?

4. Mr. Chong has 1,440 pages of scrap paper. He instead wants to make packets of 40 pages each but forgets to check if that will be enough for his 37 students. Will there be enough packets per student? If not how much more scrap paper does he need?

Teaching Problem Solving

Have an attack strategy

Teach word-problem schemas

Have an attack strategy

RIDE

Read the problem.

Identify the relevant information.

Determine the operation and unit for the answer.

Enter the correct numbers and calculate, then check the answer.

RIDGES

Read the problem.
I know statement.
Draw a picture.
Goal statement.
Equation development.
Solve the equation.

Have an attack strategy

STAR

Stop and read the problem carefully.

Think about your plan and the strategy you will use.

Act. Follow your plan and solve the problem.

Review your answer.

RICE

Read and record the problem.

Illustrate your thinking.

Compute.

Explain your thinking.

Have an attack strategy

SUPER

Slowly read the story problem twice.
Underline the question and circle the numbers you need.
Picture it. Draw the scenario to show what is happening.
Explain the problem with a number sentence.
Rewrite the answer in a sentence.

SHINES

Slowly and carefully read the problem.
Highlight or underline key information.
Identify the question by drawing a circle around it.
Now solve the problem. Show your work.
Examine your work for precision, accuracy, and clarity.
Share your answer by writing a sentence.

Have an attack strategy

SOLVE

Study the problem.

Organize the facts.

Line up the plan.

Verify the plan with computation.

Examine the answer.

R-CUBES

Read the problem.

Circle key numbers.

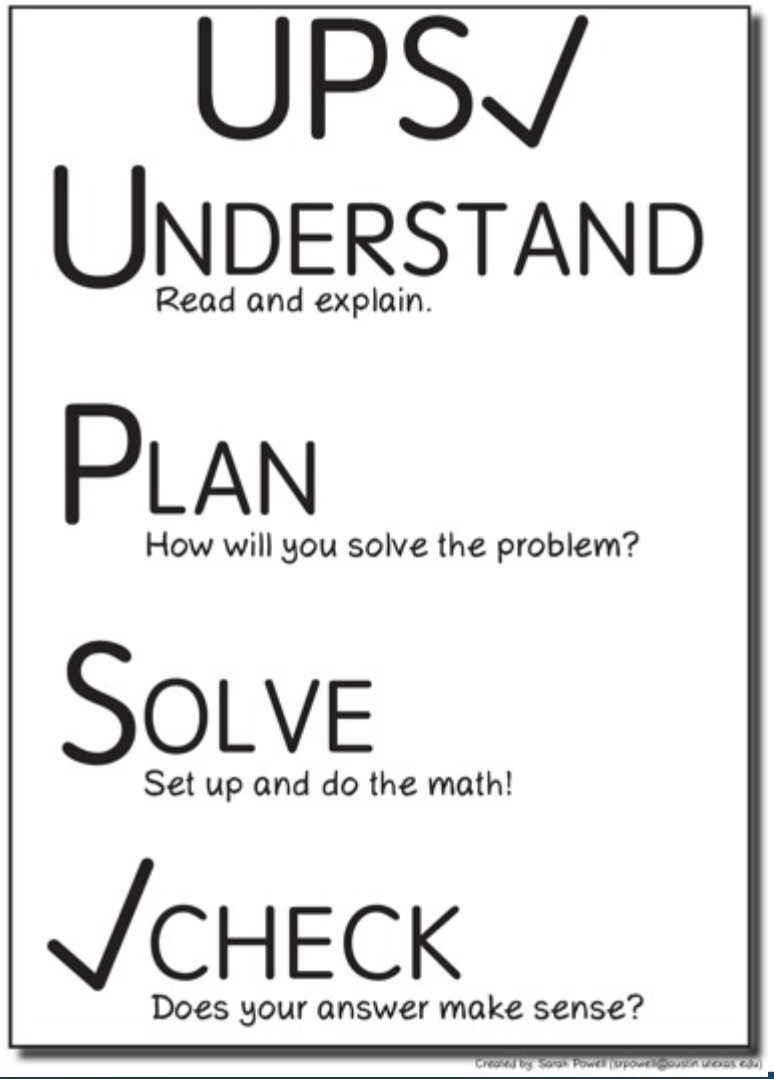
Underline the question.

Box action words.

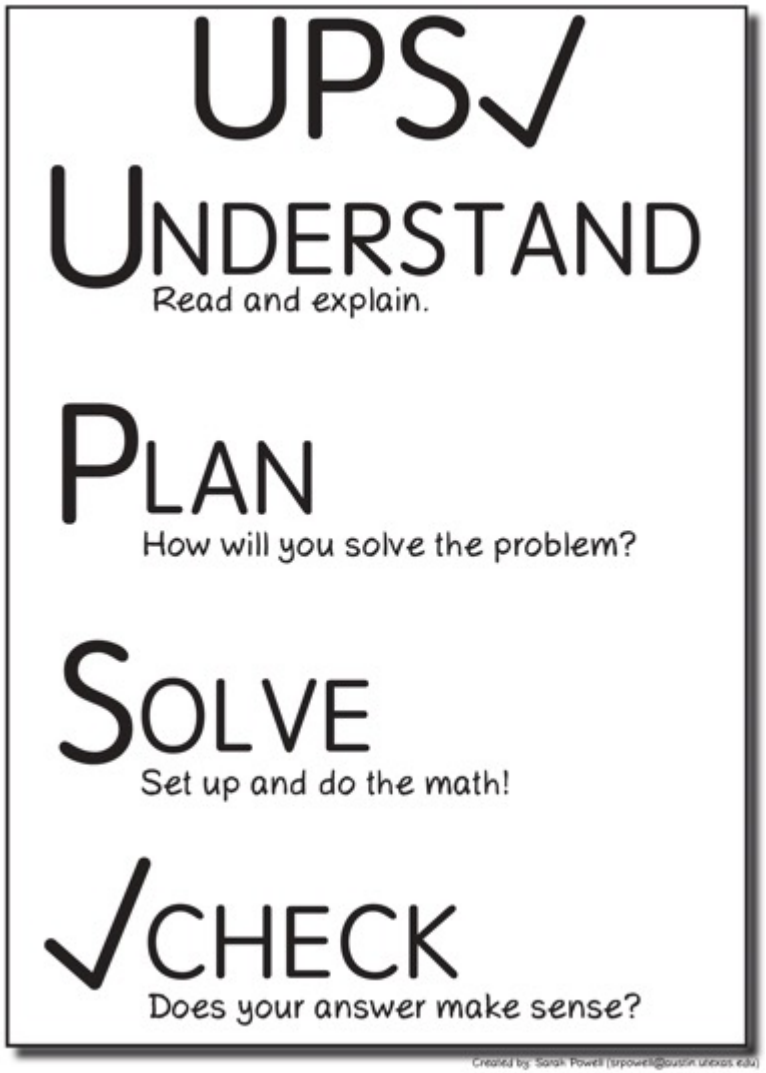
Evaluate steps.

Solve and check.

Have an attack strategy



Have an attack strategy



What's your favorite attack strategy? Why?

Teach word-problem schemas

Total

Difference

Change

Equal Groups

Comparison

Ratios/Proportions

Total

Part-part-whole
Combine

Parts put together into a **total**

Daniela saw **3** canoes and **8** kayaks. How many boats did Daniela see?

Total

Daniela saw **11** boats. If **3** of the boats were canoes, how many were kayaks?

Part

Daniela saw **11** boats. **8** of the boats were kayaks, how many were canoes?

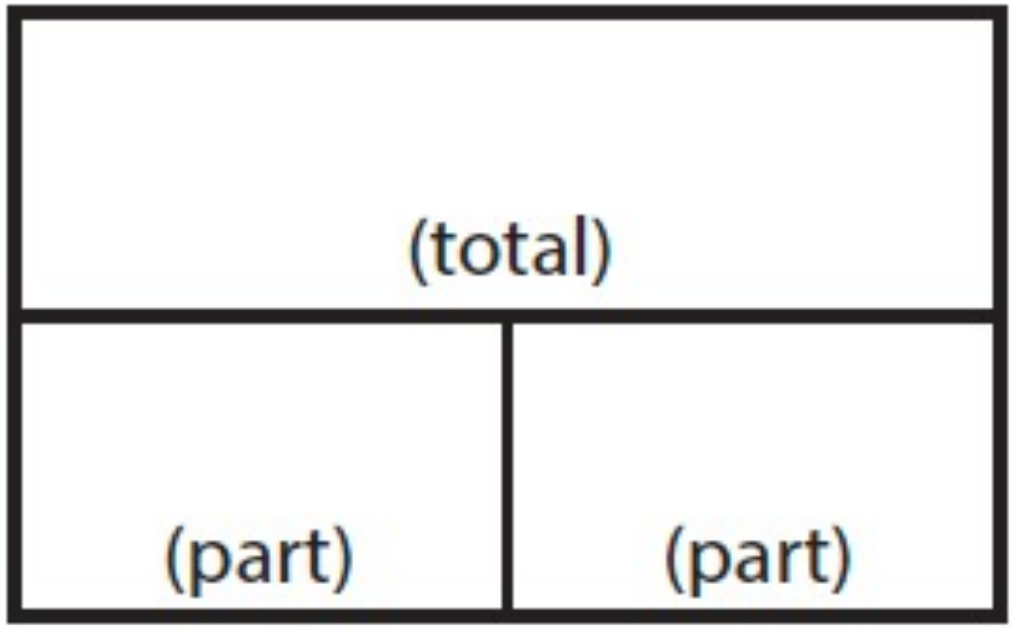
Part

Total

"Are parts put together for a total?"

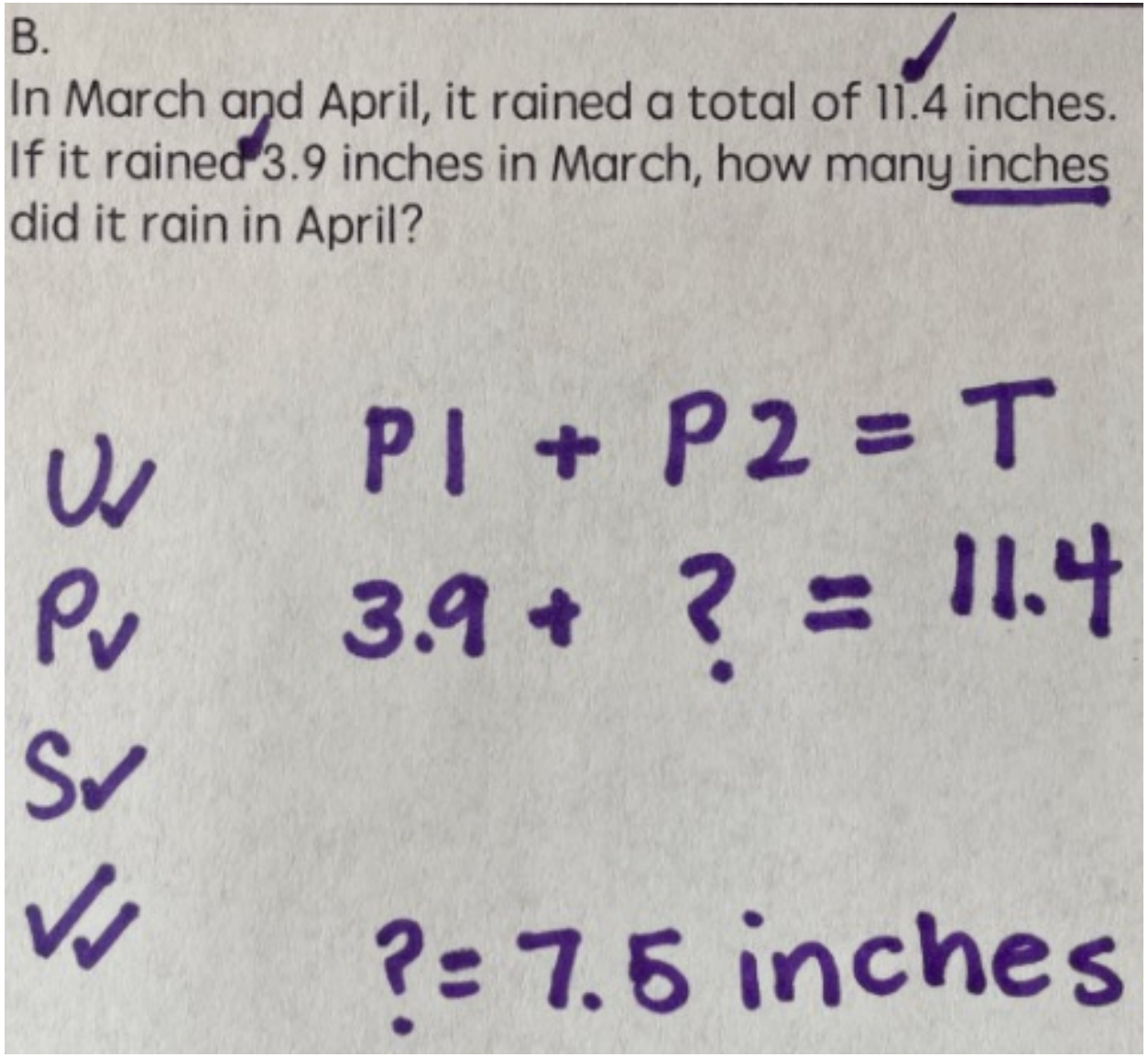
Total

P1 + P2 = T



Fuchs et al. (2008); Griffin & Jitendra (2009)

Total


B.
In March and April, it rained a total of 11.4 inches.
If it rained 3.9 inches in March, how many inches
did it rain in April?
U✓
P1 + P2 = T
P✓
3.9 + ? = 11.4
S✓
✓✓
?= 7.5 inches

Difference

Compare

Greater and **lesser** amounts compared for a **difference**

Adrianna has **10** pencils. Tracy has **4** pencils. How many more pencils does Adrianna have?

Adrianna has **6** more pencils than Tracy. If Tracy has **4** pencils, how many does Adrianna have?

Tracy has **6** fewer pencils than Adrianna. Adrianna has **10** pencils. How many pencils does Tracy have?

Difference

Greater amount

Lesser amount

Total

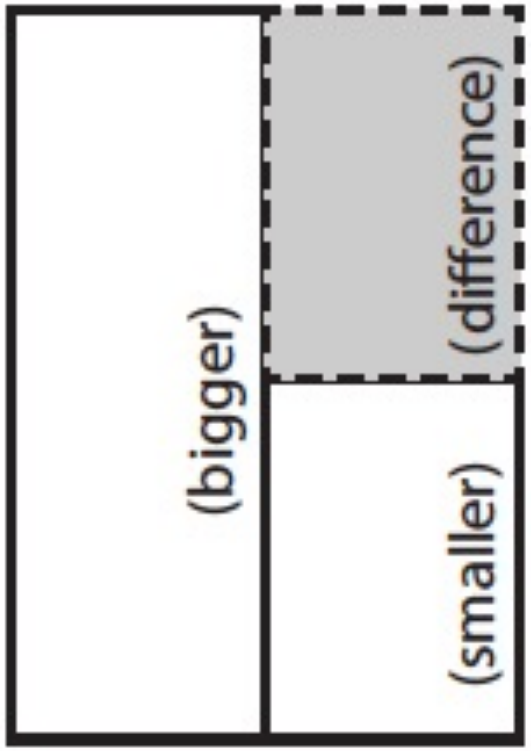
"Are parts put together for a total?"

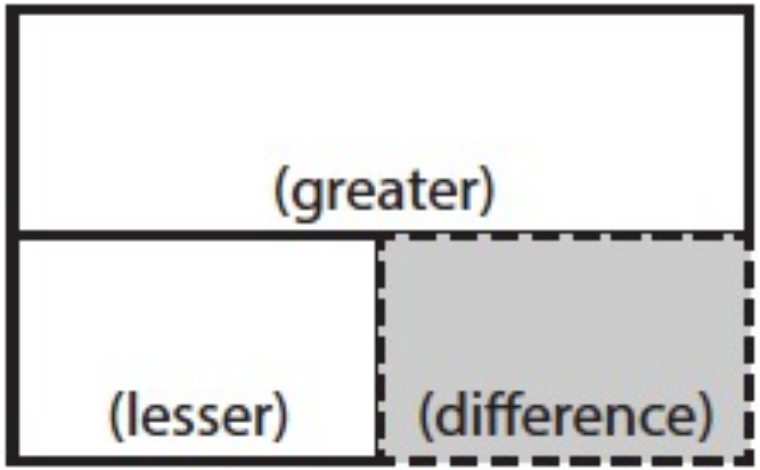
Difference

"Are amounts compared for a difference?"

Difference

G – L = D





Difference

Jana has 107 wooden beads and 68 glass beads. How many more wooden beads than glass beads does Jana have?

Enter your answer in the response box.

U G - L = D

P 107 - 68 = ?

S ?=39 more wooden beads

V

Change

Join

An amount that **increases** or decreases

Nickole had 6 notebooks. Then, she bought 3 notebooks. How many notebooks does Nickole have now?

End amount

Nickole had 6 notebooks. Then, she bought a few more notebooks. Now, Nickole has 9 notebooks. How many notebooks did she buy?

Change amount

Nickole had some notebooks. Then, she bought 3 notebooks. Now, Nickole has 9 notebooks. How many notebooks did she have to start with?

Start amount

Change

Separate

An amount that increases or **decreases**

Samantha baked **20** cookies. Then, she ate **3** of the cookies. How many cookies does Samantha have now?

End amount

Samantha baked **20** cookies. Then, she ate some of the cookies. Now, she has **17** cookies. How many cookies did Samantha eat?

Change amount

Samantha baked some cookies. She ate **3** of the cookies and has **17** cookies left. How many cookies did Samantha bake?

Start amount

Total

"Are parts put together for a total?"

Difference

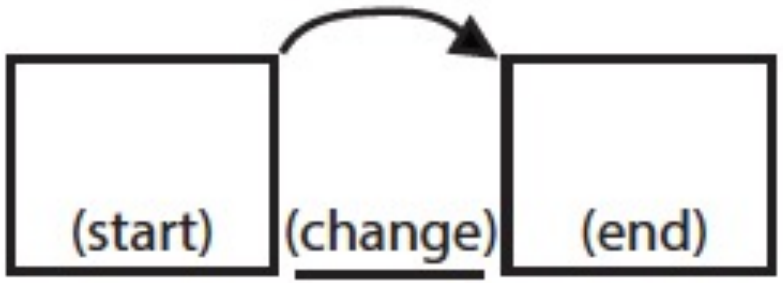
"Are amounts compared for a difference?"

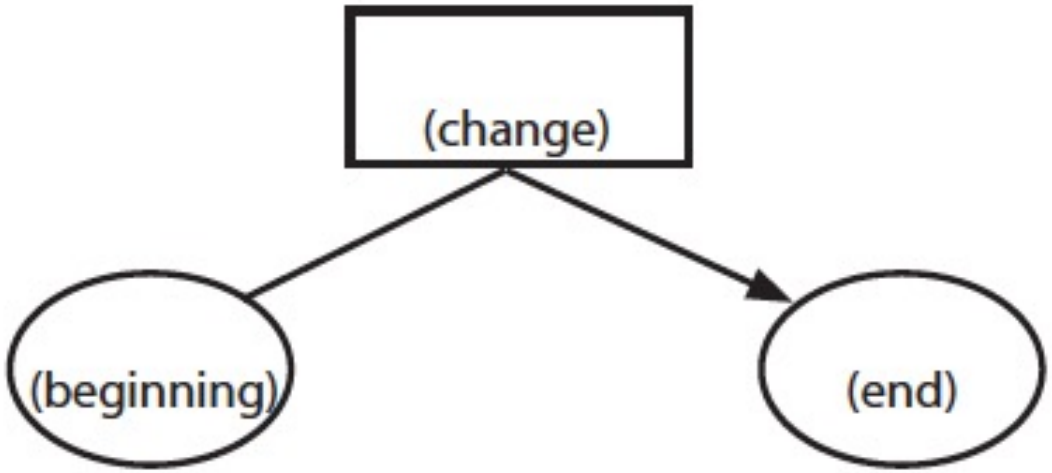
Change

"Does an amount increase or decrease?"

Change

ST +/– C = E

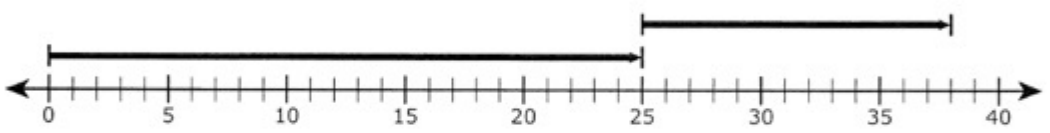




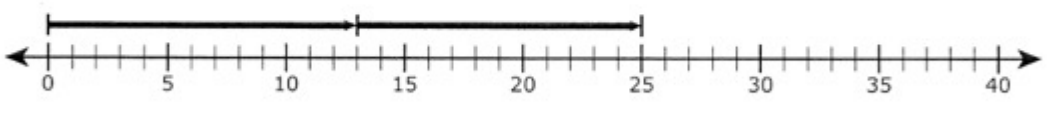
Change

28 There were 25 people in a library. Some people left the library and went home. Then there were 13 people remaining in the library. Which number line represents one way to determine the number of people who left the library?

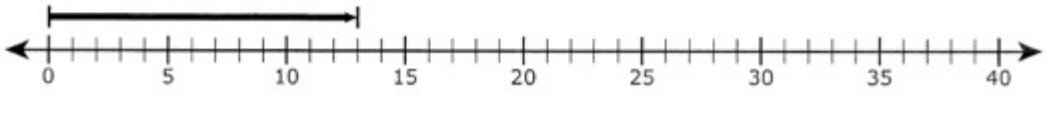
F



G



H



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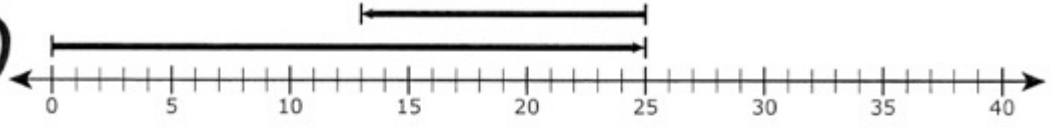


U

P

S

✓

25 - ? 13

? = 12 people left

Equal Groups

Array
Vary

Groups multiplied by **number in each group** for a **product**

Toni has **2** boxes of crayons. There are **12** crayons in each box. How many crayons does Toni have altogether?

Toni has **24** crayons. They want to place them equally into **2** boxes. How many crayons will Toni place in each box?

Toni has **24** crayons. They put them into boxes with **12** crayons each. How many boxes did Toni use?

Groups

Number in each group

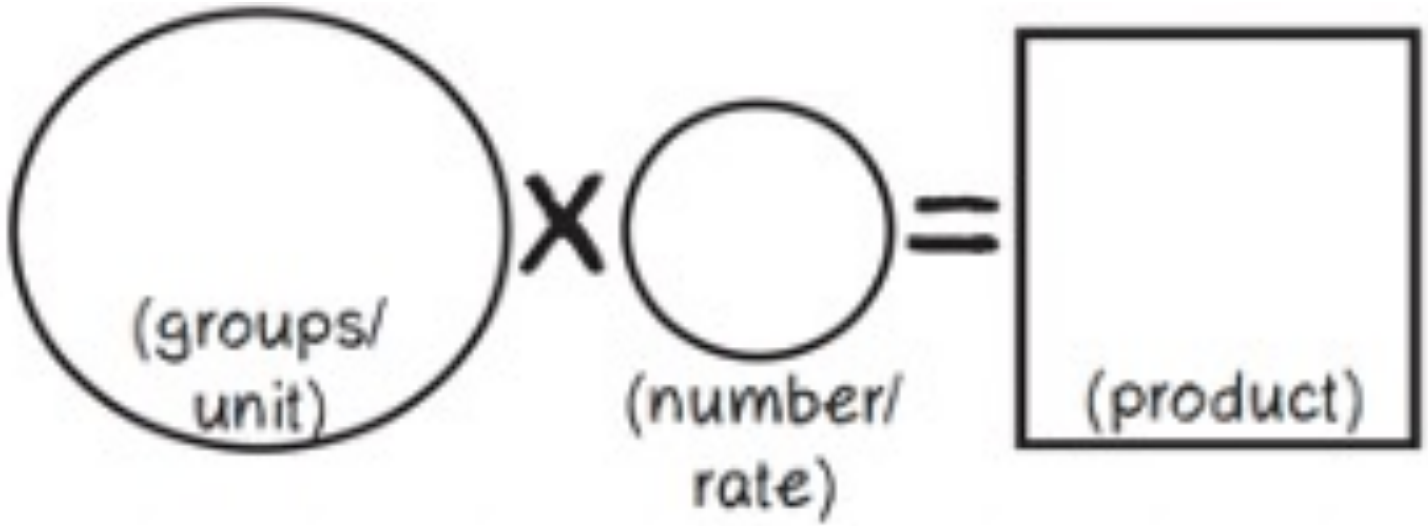
Product

Equal Groups

"Are there groups with an equal number in each group?"

Equal Groups

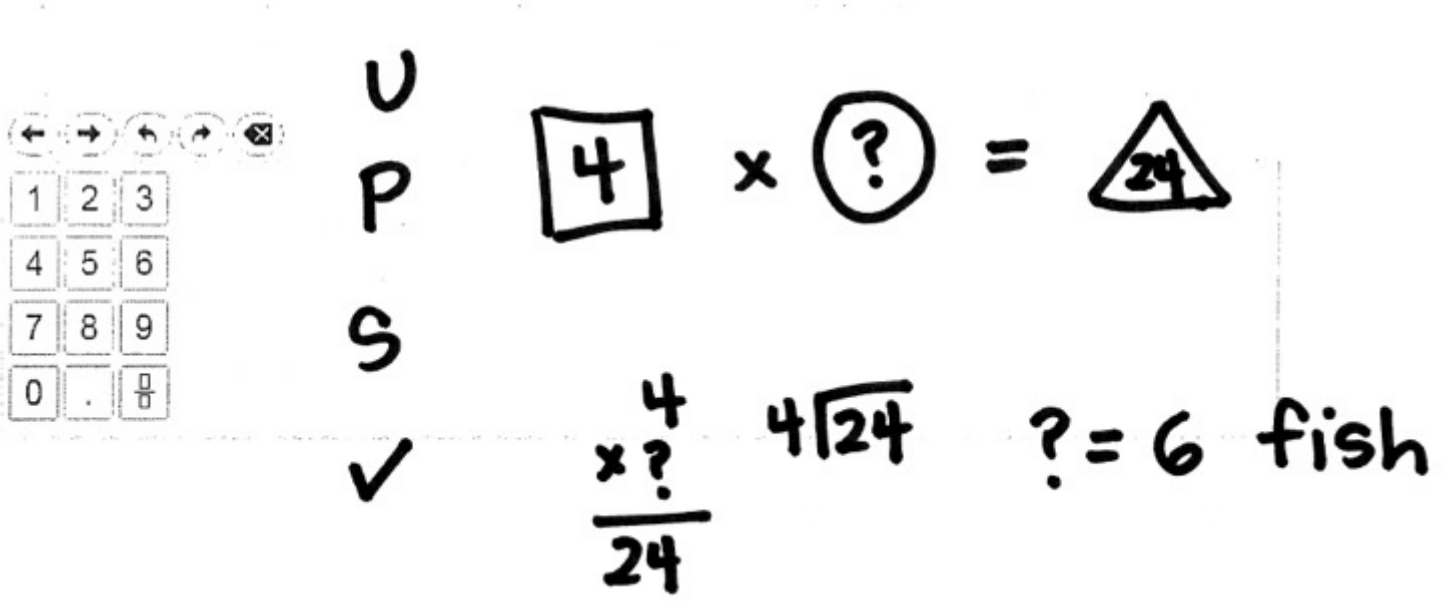
GR × **N** = **P**



Equal Groups

Jack has 24 fish. He puts them into 4 bowls. Each bowl has an equal number of fish.

How many fish are in each bowl?



Comparison

Set multiplied by a number of **times** for a **product**

Brooke ran **6** minutes. Shaleeni ran **4** times longer than Brooke. How many minutes did Shaleeni run?

Set

Number of times

Product

Equal Groups

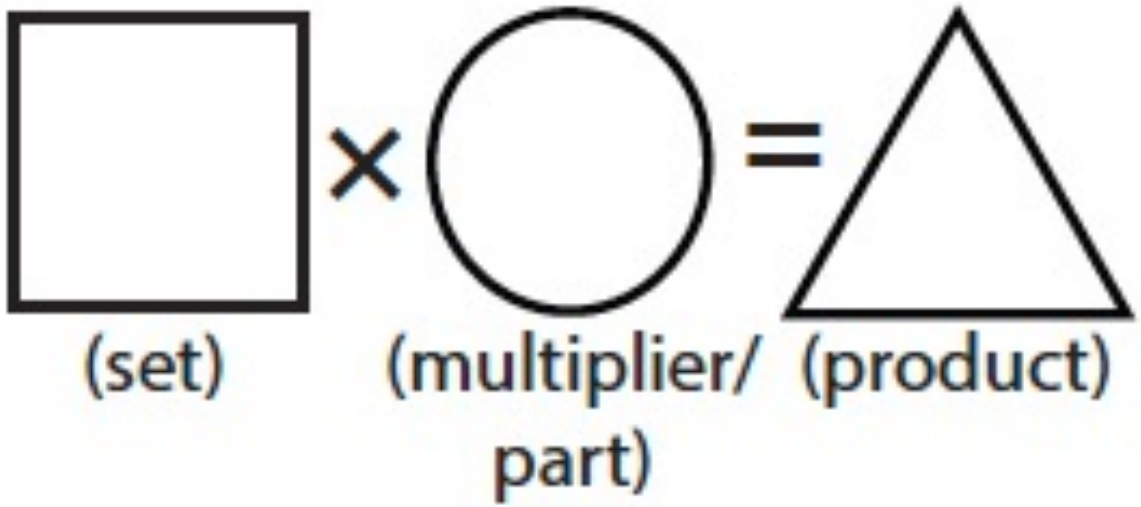
"Are there groups with an equal number in each group?"

Comparison

"Is a set compared a number of times?"

Comparison

S × T = P



Comparison

Susan has 3 times as many books as Mary. Mary has 18 books. Which equation can be solved to figure out how many books Susan has?

A $\square - 3 = 18$

B $3 + 18 = \square$

C $18 \div \square = 3$

D $3 \times 18 = \square$

U

P

S

✓

? = 54 books

Ratios/Proportions

Description of **relationships** among quantities

Emma typed 56 words in 2 minutes. At this rate, how many words could Emma type in 7 minutes?

Melissa baked cookies and brownies. The ratio of cookies to brownies was 3:5. If she baked 25 brownies, how many cookies did she bake?

Equal Groups

"Are there groups with an equal number in each group?"

Comparison

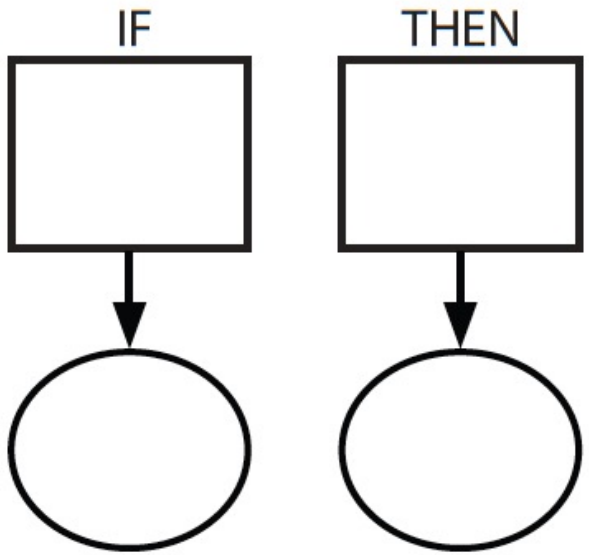
"Is a set compared a number of times?"

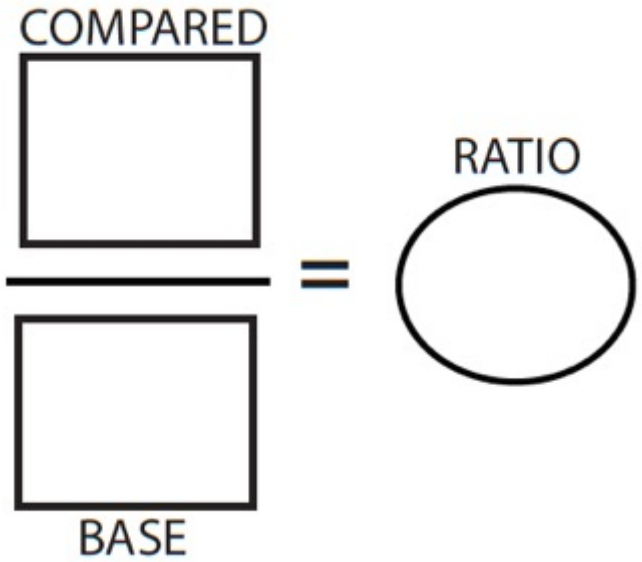
Ratios/Proportions

"Are there relationships among quantities - if this, then this?"

Ratios/Proportions

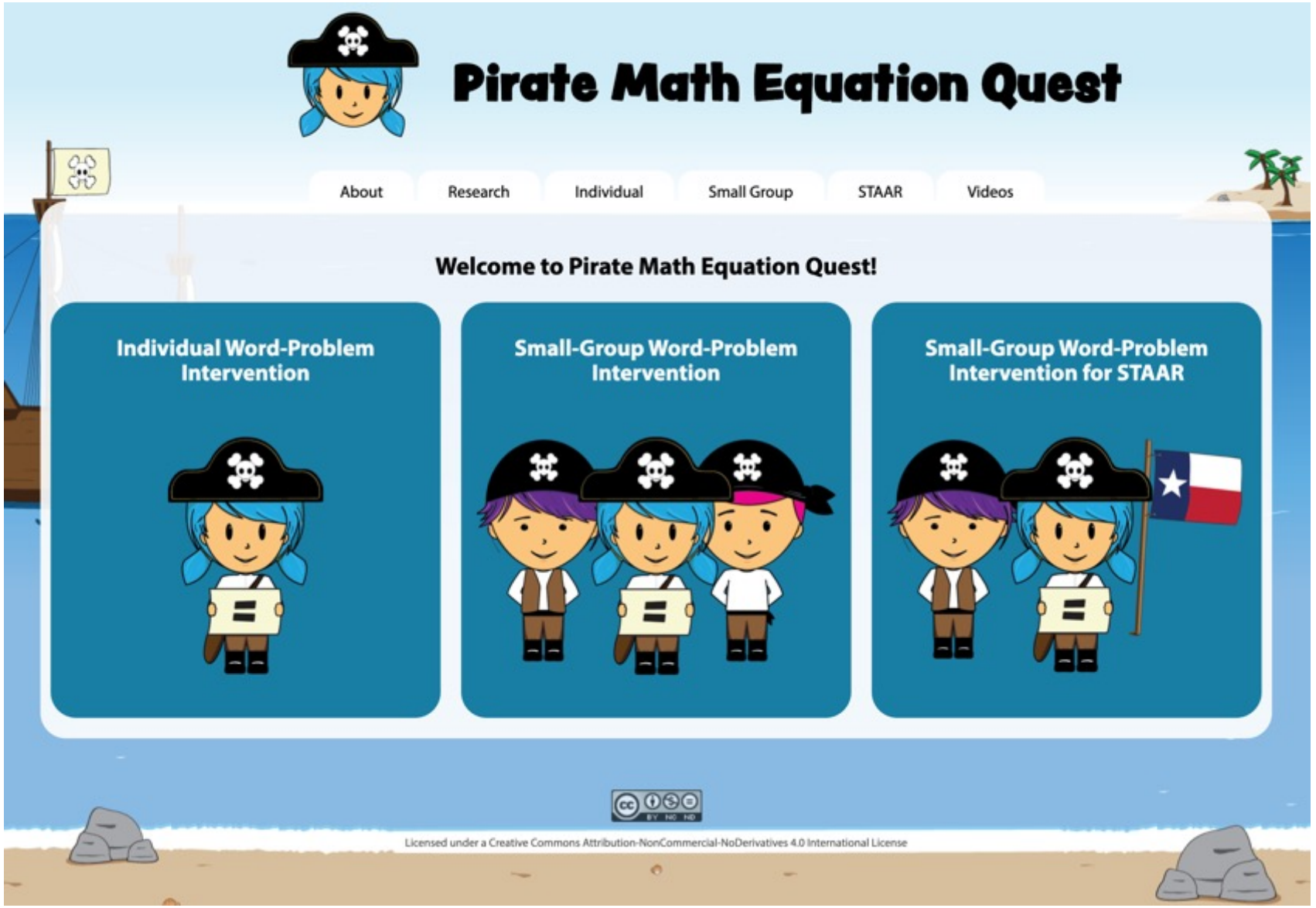
Description of relationships among quantities





Teach word-problem schemas

- Total
- Equal Groups
- Difference
- Comparison
- Change
- Ratios/Proportions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Instructional Platform

INSTRUCTIONAL DELIVERY

- Explicit instruction
- Precise language
- Multiple representations

INSTRUCTIONAL STRATEGIES

- Fluency building
- Problem solving instruction

National Center on
INTENSIVE INTERVENTION
at American Institutes for Research

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Intensive Intervention in Mathematics Course Content

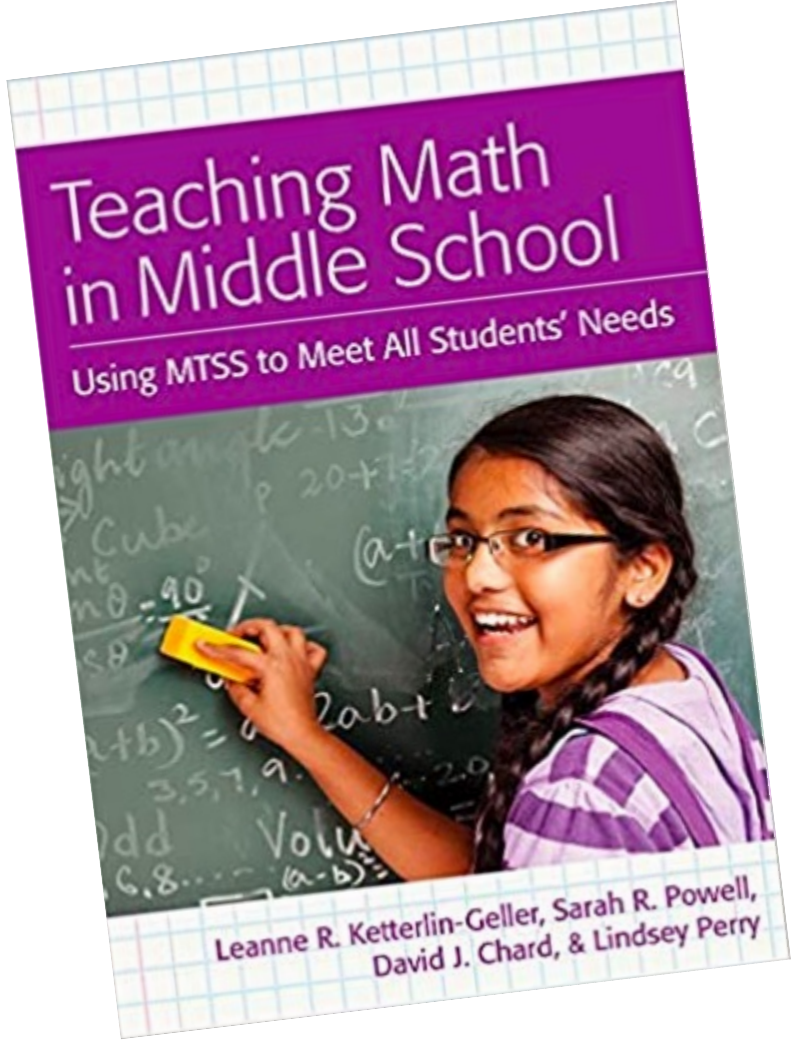
NCII, through a collaboration with the University of Connecticut, developed a set of course content focused on developing educators' skills in designing and delivering intensive mathematics instruction. This content is designed to support faculty and professional development providers with instructing pre-service and in-service educators who are developing and/or refining their implementation of intensive mathematics intervention.

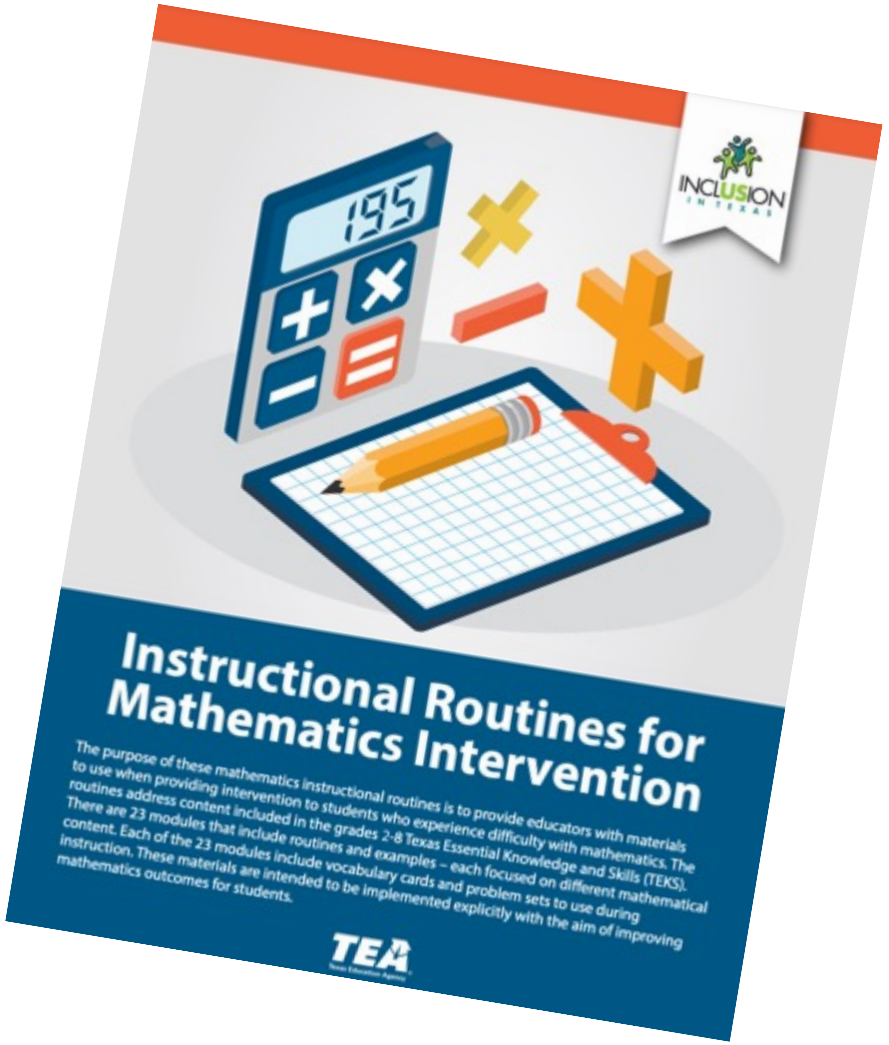
Intensive instruction was recently identified as a high-leverage practice in special education , and DBI is a research based approach to delivering intensive instruction across content areas (NCII, 2013). This course provides learners with an opportunity to extend their understanding of intensive instruction through in-depth exposure to DBI in mathematics, complete with exemplars from actual classroom teachers.

NCII, through a collaboration with the University of Connecticut and the National Center on Leadership in Intensive Intervention and with support from the CEEDAR Center , developed course content focused on enhancing educators' skills in intensive mathematics intervention. The course includes eight modules that can support faculty and professional development providers with instructing pre-service and in-service educators who are learning to implement intensive mathematics intervention through data-based individualization (DBI). The content in this course complements concepts covered in the Features of Explicit Instruction Course and so we suggest that users complete both courses.

MODULE 4: INTENSIVE MATHEMATICS INTERVENTION: INSTRUCTIONAL DELIVERY

MODULE 5: INTENSIVE MATHEMATICS INTERVENTION: INSTRUCTIONAL STRATEGIES





https://www.inclusionintexas.org/apps/pages/index.jsp?uREC_ID=2155039&type=d&pREC_ID=2169859

Sarah R. Powell, Ph.D.

Associate Professor
The University of Texas at Austin

www.sarahpowellphd.com

srpowell@utexas.edu

@sarahpowellphd