New Jersey Center for Teaching and Learning

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4th Grade

Number Sense & Algebraic Concepts

2014-08-28

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Vocabulary words are identified with a dotted underline.

Sometimes when you subtract the fractions, you find that you can't because the first numerator is smaller than the second! When this happens, you need to regroup from the whole number.

(Click on the dotted underline.)

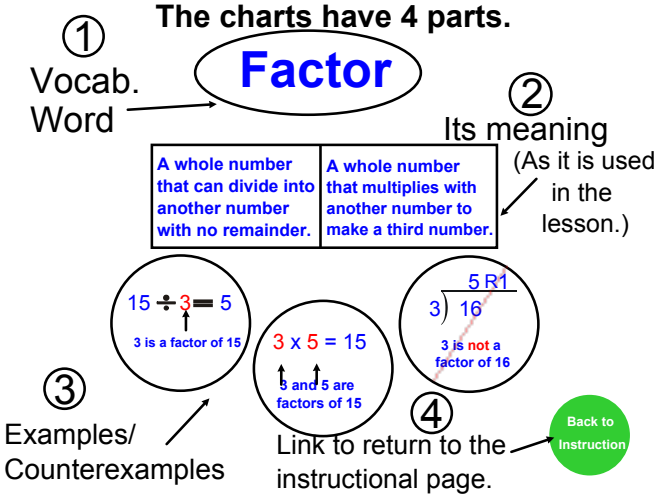
How many thirds are in 1 whole?

How many fifths are in 1 whole?

How many ninths are in 1 whole?

The underline is linked to the page in the presentation's glossary containing the vocab chart.

The charts have 4 parts.



Algebraic Equations/ Number Sentences

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What is an equation/number sentence?

Brainstorm the important parts of an equation and record results below:

Click for Definition

Teacher Notes / Answers

Slide 7 (Answer) / 310

What is an equation/number sentence?

ainstorm in partners/small
eady know about equations/
entences.

are out and list important
ms on the slide.

ssion to definition given on
) and on the answer tab.

hat may come up:

number variable
mbol digit letters
left side
right side
balanced

parts of an equation and record results below:

Click for Definition

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6 + y = 10

equals sign (relation symbol)

To understand equations, we also need to know what operations are.

Use the green box on the left to list the ideas you brainstormed.

Click for answers

Definition of OPERATION:

Teacher Notes

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6 + y = 10

equals sign (relation symbol)

To understand equations, we also need to know what operations are.

ideas you brainstormed.

Click for answers

Defin

The 4 basic operation signs/symbols (+, - , X, ÷) will be background knowledge for most students. Creating a definition and explaining what these operators do will be more difficult.

A good basic definition for all operations would be the following:

"A symbol that tells you a certain rule or process must be completed. This mathematical process/procedure or action produces a NEW value given one or more starting values."

Teacher Notes

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Let's review some vocabulary.

Use this equation to help you define the important terms: 6 + y = 10

First, without using the word 'equal', what does the equal sign mean?

Use the red box below to list the ideas you brainstormed.

Click for answers

Definition of the EQUAL sign:

Teacher Notes

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Let's review some vocabulary.

s sign is the most important
quation. It's where the word
uation gets its name.

brainstorm what they think the
neans in words and list these
rases in the top red box.

s has brainstormed, check the
ox to see if student answers
he words/phrases listed there.
ate a definition for the word
'EQUALS'

nts that an equals sign is a type
mbol (like < and >) that shows
t side is related to the right.

lo you define the important terms: 6 + y = 10

word 'equal', what does the equal sign mean?

below to list the ideas you brainstormed.

Click for answers

UAL sign:

operation 6 + y = 10 equals sign (relation symbol)

Finally, let's brainstorm what we know about a variable.

Use the gray box on the left to list the ideas you brainstormed.

Click for answers

Teacher Notes

Definition of VARIABLE:

operation 6 + y = 10 equals sign (relation symbol)

w about a variable.

s you brainstormed.

Click for answers

Teacher Notes

Variable means "change" as it can be a quantity that changes/has more than one value that will make the number sentence true. Inequalities with < or > are not the focus until later grades.

So, for now, only ONE number can be substituted for a variable to make an equation true (for equations with only 1 variable).

A good basic definition for the term variable would be the following:

"A symbol (usually a letter) that is used to represent an unknown number/value. For an equation with one variable, only one number can be substituted for the variable to make the equation true."

Definition of VARIABLE:

Let's review the equation we've been studying.

What is this symbol? 6 + y = 10 What is the name of this symbol?

Identify this symbol.

This type of equation is called an algebraic equation.

Algebraic Equation: An equation that includes one or more variables.

Why are equations/number sentences important?

Let me introduce you to QUIGLEE the equation!

Please click inside the oval.

QUIGLEE will tell us why equations (number sentences) are so important and review some important vocabulary.

Please click the microphone on Quiglee's mouth.

Knowing how to create sentences by correctly organizing words helps you understand and learn a language.

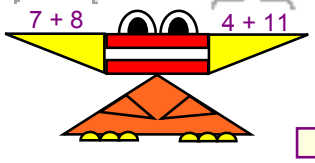
Equations are a way to organize numbers to help you understand math and learn how to problem solve.

An EXPRESSION in math is like a phrase/sentence fragment. It can contain numbers, operators, and variables. It is a part of an equation.

An EQUATION in math is like a sentence. It is a mathematical sentence in which two things are the same and are joined by an equal sign. It can only be true or false.

Expression 7 + 8

Expression 4 + 11



Equation 7 + 8 = 4 + 11

Is QUIGLEE's equation true or false?

Click for Answer

How do you know?

Click for Answer

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

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1 Which choice best explains what a variable is?

- A A symbol that tells you to add.
- B It is a sign that tells you two items are the same.
- C It replaces a number in an equation.
- D It can be also called a relation symbol.

Answer

Slide 15 (Answer) / 310

1 Which choice best ex

- A A symbol that te
- B It is a sign that
- C It replaces a num
- D It can be also calle

Answer

C

Slide 16 / 310

2 Choose the algebraic equation below.

- A 8 + 2 = 10
- B 6 - h = 4
- C 18 = 9 x 2
- D 78 + y

Answer

Slide 16 (Answer) / 310

2 Choose the algebraic eq

- A 8 + 2 = 10
- B 6 - h = 4
- C 18 = 9 x 2
- D 78 + y

Answer

B

Slide 17 / 310

3 Which of the following are expressions?

- ☐ 8 - b
- ☐ m + 4 = 9
- ☐ 4 + y = 7 + 6
- ☐ 2y + 7
- ☐ 2 x 3

Answer

Slide 17 (Answer) / 310

3 Which of the following are expressions?

- ☐ 8 - b
- ☐ m + 4 =
- ☐ 4 + y = 7
- ☐ 2y + 7
- ☐ 2 x 3

Answer

A, D, and E

Going Deeper:

A and D are algebraic expressions.

E is an expression (no variable).

4 What would be needed to make the expression below a complete equation.

- ❑ a variable
- ❑ an equals sign
- ❑ an operation symbol
- ❑ a solution

7 - p

Answer

4 What would be needed to make the expression below a complete equation.

- ❑ a variable
- ❑ an equals sign
- ❑ an operation sy
- ❑ a solution

Answer

B and D

Example:

7 - p = 4

5 Is the equation below true or false?

- ○ True
- ○ False

8 - 6 = 2 x 2

Answer

5 Is the equation below true or false?

- ○ True
- ○ False

8 -

Answer

False

Explanation:

$2 \neq 4$

left side $\neq$ right side

equation not balanced

Determining the Solutions to Algebraic Equations

A solution/answer to an algebraic equation is a number that makes the equation true.

In order to determine if a number is a solution, replace the variable with the number and evaluate/solve the equation.

If the number makes the equation true, it is a solution.
If the number makes the equation false, it is not a solution.

Determining the Solutions to Algebraic Equations

The algebraic equation is TRUE if the two expressions (left side and right side) are balanced with an equal sign.

Algebraic Equation or Open Number Sentence

7 + 8 = v + 6

What number would replace the variable and make this algebraic equation TRUE (Balanced)?

Answer

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Determining the Solutions to Algebraic Equations

The algebraic equation is
(left side and right side) ar

Algebraic Equation or
Open Number Sentence

7 + 8 = v + 6

Answer

V = 9

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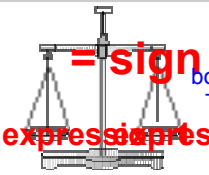
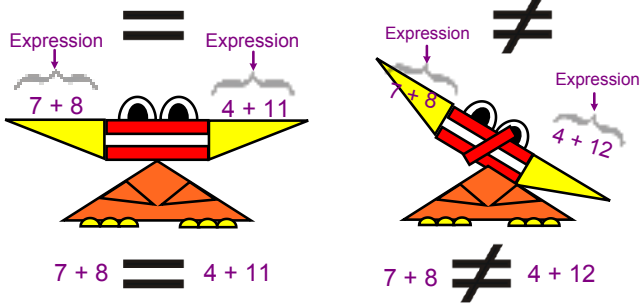


=sign

expression expression 2

For an equation to be TRUE
both sides of the equation must be the SAME.
This means that both sides of the equation must be BALANCED.



7 + 8 = 4 + 11

7 + 8 ≠ 4 + 12

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Evaluate the following expression and balance the algebraic equation. Use QUIGLEE'S Magic Mirror to check your answer.

1. Evaluate the expression:

(14 - n) for n = 8

Solution: 22 6 148

2. Balance the algebric equation:

17 + y = 2 x 10

The variable y is: 37 20 3

Click for strategy for #2

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6 Choose the equation below that is balanced.

- A 7 + 3 = 5 x 2
- B 5 x 2 = 7 + 2
- C 8 - 5 = 15 - 10
- D 3 + 2 + 4 = 10

Answer

Slide 24 (Answer) / 310

6 Choose the equation below that is balanced.

- A 7 + 3 = 5 x 2
- B 5 x 2 = 7 + 2
- C 8 - 5 = 15 - 10
- D 3 + 2 + 4 = 10

Answer

A

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7 Evaluate the expression below when t = 5.

3 x t

Answer

7 **Evaluate the expression below when t = 5**

3 x t

Answer

Solution: 15

8 **In order for the algebraic equation below to be true, what whole number must replace the variable w?**

9 + w = 12 + 9

Answer

8 **In order for the algebraic equation below to be true, what whole number**

9 +

Answer

w = 12

Going Deeper:

This is an example of the commutative property of addition.

9 **Choose the answers that would make the algebraic equation false.**

- ❑ **p = 3**
- ❑ **p = 18**
- ❑ **p = 6**
- ❑ **p = 9**

3 x p = 9 + 9

Answer

9 **Choose the answers that would make the algebraic equation false.**

- ❑ **p = 3**
- ❑ **p = 18**
- ❑ **p = 6**
- ❑ **p = 9**

Answer

A, B, D

Going Deeper:

What's another way to write the equation 3 x 6 = 9 + 9 ?

3 x 6 = 9 x 2

10 **Choose the algebraic equations that are true when g = 3.**

- ❑ **6 x g = 9**
- ❑ **4 + g = 6 + 1**
- ❑ **g + g = 9**
- ❑ **8 - g = 5**
- ❑ **20 - g = 18**

Answer

10 Choose the algebraic equations that are true when g = 3.

- ☐ 6 x g = 9
- ☐ 4 + g = 6 + 1
- ☐ g + g = 9
- ☐ 8 - g = 5
- ☐ 20 - g = 18

Answer

B and D

11 What value of k would make the algebraic equation below true?

$$5 + k = 3 \times 3$$

Answer

11 What value of k would make the algebraic equation below true?

$$5 + k = 3 \times 3$$

Answer

4

Problem Solving

Fluency

Click to return to the table of contents.

Fluency

Please refer to the file below:

FLUENCY FILE

This file contains SPRINTS (Fluency Practice) taken from EngageNY.

These Fluency Sprints may be used to help your class with fluency practice for old and new concepts.

The Fluency Sprints recommended for the beginning of this 4th grade unit are
SPRINTS 1A and 1B
Multiplication and Division Practice

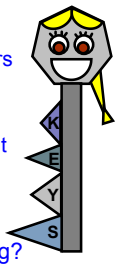
Click to return to the table of contents.

K.E.Y.S to Problem Solving

Throughout this unit and beyond you will apply the skills you are learning (plus the skills you already know) to solve problems. These application problems are known as word problems.

There are important (key) things that great problem solvers always do when they see an application/word problem.

KAYLEE the Key will help guide you through the important parts of problem solving.



Are you ready to learn the K.E.Y.S. to problem solving?

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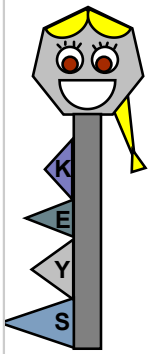

The K.E.Y.S. to Problem Solving

K: Know the important information in the problem.
Read the problem (more than once) and first find the main idea.
(MAIN IDEA = What is the problem asking you to find?)
Find all the important information that supports the main idea.

E: Equation (or equations) is created to plan your strategy and organize the important information.
Use equations to develop a strategy (i.e. algorithm, diagram).
Strategy must be organized and easy to follow.

Y: Yes, I have checked over my strategy and my answer is reasonable (makes sense).
Use an estimate to check if your answer is reasonable.

S: Solution is written in a complete sentence with the correct label.

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K: Know the important information in the problem.

Let's practice the first part of the problem solving acronym. This is the first thing you do when looking at an application/word problem like the one below.

KAYLEE wants to figure out how many word problems she solved this week. Last week, she solved 16 problems. This week, she solved 7 problems on Monday, 5 problems on Wednesday, and 9 problems on Friday. How many problems did she solve this week?

What do you need to do to complete the first step (K) of K.E.Y.S.?

Teacher Notes / Answers

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E: Equation (or equations) is created to plan your strategy and organize the important information.

Next, let's organize the important information to create an equation

IMPORTANT INFORMATION
Main Idea of problem: How many problems did KAYLEE solve THIS week?
7 problems *5 problems* *9 problems*

When solving a problem we are usually asked to answer a question.
The part of the problem we are trying to find is not known at first.
This unknown part of the problem is a mystery we have to solve.
When writing an algebraic equation, the unknown part is called the...

Click for Answer

Teacher Notes / Answers

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E: Equation

For this problem, let's use the variable p since we are trying to find out how many PROBLEMS KAYLEE solved this week.

The parts of the algebraic equation we have so far are shown in the box below.

7 5 9 p

What pieces of the algebraic equation are missing?

Click for Answer

Click for Answer

What operation (or operations) do we use for this problem?

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E: Equation

When figuring out what operation to use, you can look for key words in the problem to help you.

On the next slide, look at the bank of words and phrases below. Each word or phrase is a clue as to what operation you should perform. Sort the words/phrases by the four operations.

Teacher Notes / Answers

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addition (+)	subtraction (-)	multiplication (x)	division (÷)

WORD BANK

total, sum, half, in all, remainingby, divided, quotient, altogether, combined, product, decrease, difference, split evenly, per...in all, fewer than, increased by, each....in all, per, how many, more, plus, less than, left over, doubled, each, minus, times

E: Equation

Underline the word that means "equals". Then, drag and drop the algebraic equation below that represents the words.

Words	Equation
① 10 is the same value as a number plus 6.	
② 8 is 5 less than a number.	
③ three times a number is 15.	
④ A number divided by 2 gives you 6.	

3 x n = 15 | n/2 = 6 | 8 = n - 5 | 8 - 5 = n

3 x 15 = n | 10 = n + 6 | 10 + 6 = n | 6/2 = n

Teacher Notes

E: Equation

This can be a whole class discussion or students can work in pairs/small groups.

CHALLENGE: Students can create the algebraic equations on their own for each of the 4 problems.

ANSWERS

① 10 is the same value as a number plus 6.	10 = n + 6
② 8 is 5 less than a number.	8 = n - 5
③ three times a number is 15.	3 x n = 15
④ A number divided by 2 gives you 6.	n/2 = 6

3 x n = 15 | n/2 = 6 | 8 = n - 5 | 8 - 5 = n

3 x 15 = n | 10 = n + 6 | 10 + 6 = n | 6/2 = n

Teacher Notes

E: Equation

It's time to get back to the problem we started with (shown below):

KAYLEE wants to figure out how many word problems she solved this week. Last week, she solved 16 problems. This week, she solved 7 problems on Monday, 5 problems on Wednesday, and 9 problems on Friday. How many problems did she solve this week?

The parts of the algebraic equation we have so far are shown in the box below.

7 5 9 p =

Teacher Notes / Answers

E: Equation

The only thing we are missing to create an algebraic equation is an operation or operations (operators).

What key words (clues) do you see?

KAYLEE wants to figure out how many word problems she solved this week. Last week, she solved 16 problems. This week, she solved 7 problems on Monday, 5 problems on Wednesday, and 9 problems on Friday. How many problems did she solve this week?

Click for key words and explanation

IMPORTANT REMINDER:

The exact key words are not always found in a word/application problem. Sometimes you have to figure out what the problem is asking and fill in the key words yourself.

In this problem, the key words TOTAL, IN ALL, ALTOGETHER, or COMBINED were not in the problem.

By understanding the main idea of the problem we know that we are trying to find "How many problems did she solve this week?".

Therefore, we have to COMBINE the problems from Monday, Wednesday, and Friday to find the TOTAL problems (how many problems IN ALL or ALTOGETHER.)

E: Equation

Let's put it all together

7 5 9 p = +

Drag the digits, relation symbol, and operation(s) in the box above to create an algebraic equation that we can use to plan our strategy.

algebraic equation

click to reveal

Teacher Notes / Answers

12 The algebraic equation below could be used to solve the following problem: QUIGLEE solved 9 equations and KAYLEE solved 4. How many more equations did QUIGLEE solve?

- True
- False

9 + 4 = E

Answer

12 The algebraic equation below could be used to solve the following prob...ions and KAYLEE solv...s did QUIGLEE solv...

- True
- False

Answer

False

Correct equation:

9 - 4 = E

or 4 + E = 9

13 Which algebraic equation would correctly organize the information in the application problem below.

- A 5 + 3 = h
- B 3 + h = 5
- C 5 x 3 = h
- D 3 + 5 = h

QUIGLEE did homework for 5 hours last weekend. He worked on his homework for 3 hours on Saturday. How many hours of homework did he do on Sunday?

Answer

13 Which algebraic equation would correctly organize the information in the application problem below.

- A 5 + 3 = h
- B 3 + h = 5
- C 5 x 3 = h
- D 3 + 5 = h

Answer

B

Going Deeper:

Another way to write the equation would be 5 - 3 = h

or 5 - h = 3

14 Choose the algebraic equations that would correctly solve the problem below.

- ☐ 5 + 12 = p
- ☐ 12 + 12 + 12 + 12 +12 = p
- ☐ 5 + p = 12
- ☐ 12 - 5 = p
- ☐ 5 x 12 = p

QUIGLEE bought 5 packs of pencils for school. Each pack contains 12 pencils. How many pencils did QUIGLEE buy?

Answer

14 Choose the algebr...correctly solve the proble...

- ☐ 5 + 12 = p
- ☐ 12 + 12 + 12...
- ☐ 5 + p = 12
- ☐ 12 - 5 = p
- ☐ 5 x 12 = p

Answer

B and E

Going Deeper:

Pose to students the question "Which algebraic equation would take longer to solve?" and "Are there any other algebraic equations that would work?"

15 Which algebraic expression would you use to show half of 24?

- A 24 ÷ 2
- B 24 + 2
- C 24 x 2
- D 2 + 4

Answer

15 Which algebraic expression would you use to show half of 24?

- A 24 ÷ 2
- B 24 + 2
- C 24 x 2
- D 2 + 4

Answer

A

Going Deeper:
You can find half of any number by dividing it by 2. Dividing by two is just like sharing the number equally into 2 groups.

16 Solve (balance) the algebraic equation below. p = ?

$$7 + 5 + 9 = p$$

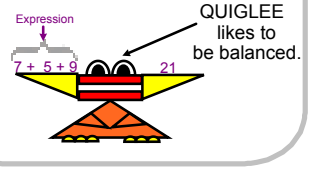
Answer

16 Solve (balance) the algebraic equation below. p = ?

Answer

21

Going Deeper:
Left side = Right Side



$$7 + 5 + 9 = p$$

Possible Strategies (slide screen shade from left to right)

1. Add up all digits at the same time.

9
7
+ 5
21

2. Add up two of the digits first and then add the third.

9 + 7 = 16
16
+ 5
21

3. Make a friendly group of 10 first using the 9.

9 + 7 + 5
take one from the 7 and add it to 9 to make 10
10 + 6 + 5
take 4 from the 5 and add it to 6 to make 10
10 + 10 + 1
20 + 1 = 21

Y: Yes, I have checked over my strategy and my answer is reasonable (makes sense).

Use an estimate to check if your answer is reasonable.

$$7 + 5 + 9 = \boxed{21}$$

Is my answer reasonable (does it make sense)?

This is a VERY important question to ask yourself every time you finish your strategy (or strategies) and get an answer.

If your answer was less than 9, you would know that your answer is not reasonable because KAYLEE solved 9 problems if you just count Friday by itself. What about Monday and Wednesday?

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Y: Yes, I have checked over my strategy and my answer is reasonable (makes sense).

ESTIMATION is a great way to check your answer.

Round the numbers in your equation to make them "friendly" (easier to use and figure out in your head).

EXACT: 7 + 5 + 9 = 21

ESTIMATE: 10 + 5 + 10 = 25

If your estimate is close to your exact answer, then your answer is reasonable.

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S: Solution is written in a complete sentence with the correct label.

The last step when problem solving is to make sure your solution/ answer is labeled and can be easily understood.

7 + 5 + 9 = p

7 + 5 + 9 = 21

Remember that our variable (p) was chosen to help us remember our label (problems solved). Therefore, a complete answer with a label would be:

KAYLEE solved a total of 21 problems this week.

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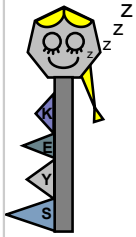
Let's use our problem solving acronym (K.E.Y.S.) to solve the word problem below:



KALEE sleeps 8 hours a night. She works 9 hours a day. How many hours does she sleep in one week?

We want to find out how many hours KALEE sleeps in one week. 8 hours a night is important! What else is important? How many nights are in 1 week? _____

Click space above for answer.

What type of equation do we create to plan our problem?

Teacher Notes

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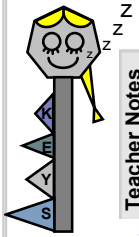
Let's use our problem solving acronym (K.E.Y.S.) to solve the word problem



Go through each letter of the acronym with the class to review the major components of problem solving. The following SMART Response questions all refer to this problem. Please NOTE the following before beginning the clicker questions:

K: Not all information is important. "She works 9 days a day." Some important information is not found in the problem. (There are 7 days/nights in 1 week.) This is background information.

E: Students can work in pairs to create an equation for this problem.

Teacher Notes

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17 Choose all the important pieces of this problem that you need to use to solve it.

- ☐ **7 nights**
- ☐ **9 hours**
- ☐ **8 hours**
- ☐ **How many hours will she sleep in one week?**

KALEE sleeps 8 hours a night. She words 9 hours a day. How many hours does she sleep in one week?

Answer

Slide 53 (Answer) / 310

17 Choose all the important pieces of this problem that you need to use to solve it.

- ☐ **7 nights**
- ☐ **9 hours**
- ☐ **8 hours**
- ☐ **How many hours**

A, C, and D

Answer

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18 What algebraic equation would be best to solve this problem?

- A 7 + 8 + 9 = h
- B 7 x 8 = h
- C 7 + 8 = h
- D 8 + 8 + 8 + 8 + 8 + 8 + 8 = h
- E 7 x 9 = h

KALEE sleeps 8 hours a night. She words 9 hours a day. How many hours does she sleep in one week?

Answer

Slide 54 (Answer) / 310

18 What algebraic equation would be best to solve this problem?

- A 7 + 8 + 9 = h
- B 7 x 8 = h
- C 7 + 8 = h
- D 8 + 8 + 8 +
- E 7 x 9 = h

KALEE sleeps 8 hours a night. How

Answer

B

Going Deeper:
Choice D would also work, especially for those students who do not know their x facts yet. So, for those students, D would be best. For those who know both + and x, choice B saves time.

TAKE AWAY: Study your facts!

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19 Evaluate the algebraic expression you used for the last question and find the solution for this problem.

KALEE sleeps 8 hours a night. She words 9 hours a day. How many hours does she sleep in one week?

Answer

Slide 55 (Answer) / 310

19 Evaluate the algebraic expression you used for the last question and find t

KALEE sle
She words
many ho
one wee

Answer

Solution = 56

Going Deeper:

7 x 8 = 56

or

8 + 8 + 8 + 8 + 8 + 8 + 8 = 56

Slide 56 / 310

20 What is the best label that you could use so your solution is clearly understood?

- A weeks
- B hours worked in one week
- C hours
- D hours of sleep in one week
- E total hours for work and sleep

KALEE sleeps 8 hours a night. She words 9 hours a day. How many hours does she sleep in one week?

Answer

Slide 56 (Answer) / 310

20 What is the best label t
solution is clearly u

- A weeks
- B hours worked i
- C hours
- D hours of sleep in
- E total hours for work

Answer

D

21 What are the important things all problem solvers should do when solving a word/application problem?

- ❑ Check over work to see if it makes sense.
- ❑ Create algebraic equation(s) with important information.
- ❑ Know all important information in the problem.
- ❑ Use a clear label for the solution.
- ❑ Understand the main idea of the problem.

Answer

21 What are the important things all problem solvers should do when solving [illegible]?

- ❑ Check over work [illegible]
- ❑ Create algebraic [illegible] information.
- ❑ Know all important [illegible]
- ❑ Use a clear label [illegible]
- ❑ Understand the main [illegible]

Answer

A,B,C,D, and E

Going Deeper:

In the order of K.E.Y.S.

C,E,B,A,D

Place Value / Number Sense through the Millions

Fluency

Click to return to the table of contents

Plac[illegible]Sense [illegible]s

Fluency

Please refer to the file below:

FLUENCY FILE

This file contains SPRINTS (Fluency Practice) taken from EngageNY.

These Fluency Sprints may be used to help your class with fluency practice for old and new concepts.

The Fluency Sprints recommended for this point of the 4th grade unit are
SPRINTS 3A and 3B
Multiplication

Click to return to the table of contents

PLACE VALUE / NUMBER SENSE REVIEW

Number Sense : A person's ability to use and understand numbers.

First, we will focus on whole numbers. Once we have mastered number sense and place value with whole numbers, we can move on to fractions and decimals.

Whole numbers : The numbers 0, 1, 2, 3, 4, 5, 6, 7 . . . . . .
These are known as counting numbers and do not include decimals or fractions (the numbers between whole numbers).

Even and Odd Numbers

One of the first things we learned about whole numbers is whether a given whole number is even or odd.

We have a choice to memorize the numbers that are even and odd or we can make sense of numbers and figure out what makes a number even or odd.

Even :   **Even numbers make pairs.**

Odd:   **Odd numbers have one left over.**

Single-digit even and odd numbers can be remembered as follows:

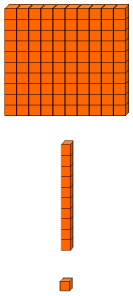
Even Numbers: 0, 2, 4, 6, and 8
Odd Numbers: 1, 3, 5, 7, and 9

Slide 61 / 310

In third grade you learned place value through the hundreds using base ten blocks as visual models. Let's review.

How many blocks do you need?

Hundreds	Tens	Ones
4	3	7

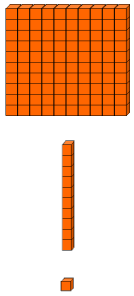


Is the number 437 even or odd?

Teacher Notes

Slide 61 (Answer) / 310

In third grade you learned place value through the hundreds using base ten blocks as visual models. Let's review.



Each base ten block is infinitely cloned. Have students come to board to show the correct blocks for the number.

The next three pages provide an in-depth lesson on identifying multi-digit numbers as even or odd using place value.

NOTE: See LAB "Place Value (ones and tens) and Odd/Even Review

Teacher Notes

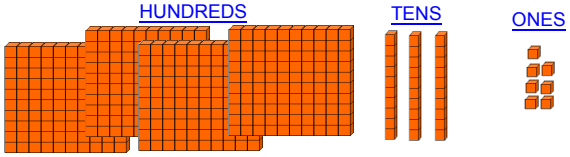
Slide 62 / 310

Identifying Multi-Digit Numbers as Even or Odd

We definitely don't want to take 437 objects and see if we can make pairs without any objects left over (that would be an even number).

Let's make sense of this number by looking at each place value.

HUNDREDS TENS ONES



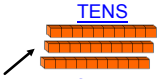
Start with the ones. We have 7 ones and we cannot make pairs with the 7 base-10 blocks. One block is left over without any other blocks to pair it with. Therefore, the 7 ones are odd. Remember on the previous page we reviewed that the single-digits 1, 3, 5, 7, and 9 are always odd?

Slide 63 / 310

Look at the tens place. We have 3 base-tens blocks in the tens place. Does this mean that the tens place is an odd number?

At first, it looks like the 3 objects are odd, but look closely at each base-10 block to make sense of what this model represents. This is the tens place.
Each of these "sticks or longs" represents 10 ones.

TENS



10 x 3 = 30

Each group of 10 is even, so no matter how many 10s you have, the tens place will always be EVEN.

10 = 5 pairs (5 x 2) which proves it is EVEN

Teacher Notes

Slide 63 (Answer) / 310

Look at the tens place. We have 3 base-tens blocks in the tens place. Does this mean that [illegible]?

At first, it looks [illegible] closely at each [illegible] this model represents. This is the tens place.
Each of these [illegible]

TENS

Each group of 10 is even, so no matter how many 10s you have, the tens place will always be EVEN.

10 = 5 pairs (5 x 2) which proves it is EVEN

Teacher Notes

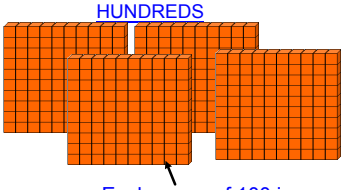
NOTE:

If a number can be divided by 2 without a leftover (remainder) it is even.

Slide 64 / 310

This same idea works for the hundreds place also.
How many hundreds are in 437?

HUNDREDS



100 x 4 = 400

Each group of 100 is even, so no matter how many 100s you have, the hundreds place will always be EVEN.

100 = 50 pairs (50 x 2) which proves it is EVEN

This same pattern repeats for the thousands, ten thousands and beyond. So the only place value you need to look at to see if a number is odd or even is the ONES PLACE !

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

Money can also be used to represent place values.

Two-digit numbers can be represented with one dollar bills and ten dollar bills

3 tens + 5 ones = 35 dollars

30 + 5 $35 or $35.00

4 tens represents 40 **6 ones represents 6**

40 + 6 = 46 dollars ($46 or $46.00)

22 There are only 4 groups of 10 in the number 54.

A Yes

B No

Answer

22 There are only 4 groups of 10 in the number 54.

A Yes

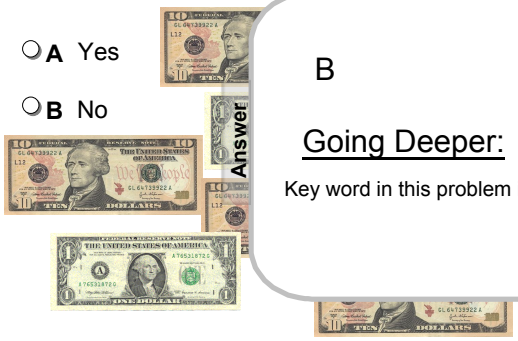
B No

Answer

B

Going Deeper:

Key word in this problem is "only".



23 Which explanation is correct for the number 72?

A 6 tens and 12 ones

B 2 ones and 7 tens

C 7 ones and 2 tens

Answer

Slide 69 (Answer) / 310

23 Which explana... 72?

- A 6 tens and
- B 2 ones a
- C 7 ones a

Answer

B

Going Deeper:

Some students may notice A is also correct. It is important for students to understand there are many combinations of tens and ones that can create 72. This concept can be best demonstrated with money. B would only be correct if question asked which explanation is correct for the place value of 72.

Slide 70 / 310

24 Which explanation is correct for the number 35?

- A 5 tens and 3 ones
- B 5 ones and 3 tens
- C 3 ones and 5 tens

Answer

Slide 70 (Answer) / 310

24 Which explanation is ...

- A 5 tens and 3 ones
- B 5 ones and 3 tens
- C 3 ones and 5 tens

Answer

B

Slide 71 / 310

25 The number 749 would have 7 hundreds, 9 ones, and 4 tens.

- True
- False

Answer

Slide 71 (Answer) / 310

25 The number 749 would have 7 hundreds, 9 ones, and 4 tens.

- True
- False

Answer

True

Slide 72 / 310

26 The number 259 has 5 groups of _____.

- A ones
- B tens
- C hundreds

Answer

Slide 72 (Answer) / 310

26 The number 259 has 5 groups of

- A ones
- B tens
- C hundreds

Answer

B

Slide 73 / 310

27 Enter the correct number (in standard form) for 5 tens and 6 ones.

Answer

Slide 73 (Answer) / 310

27 Enter the correct numb... for 5 tens and 6 ones.

Answer

56

Slide 74 / 310

28 Write 4 hundreds and 3 tens in standard form.

Answer

Slide 74 (Answer) / 310

28 Write 4 hundreds and 3 tens in standard form.

Answer

430

Going Deeper:

If no place value is mentioned, then a zero goes in that place value. There are no groups of that place value. In this problem there are no (zero) groups of ones.

Slide 75 / 310

29 Enter the number in standard form for 7 ones and 5 tens.

Answer

29 Enter the number in standard form for 7 ones and 5 tens.

Answer

57

30 Enter the correct number in standard form for 3 ones and 4 hundreds.

Answer

30 Enter the correct number in standard form for 3 ones and 4 hundreds.

Answer

403

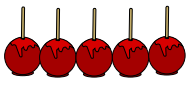
31 If you had 15 pencils, would you have an even number to share with a friend?

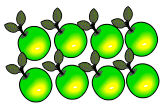
- Yes
- No

Teacher Notes / Answers

32 Is the number represented below even or odd?

- A Even
- B Odd





Answer

32 Is the number rep

- A Even
- B Odd

Answer

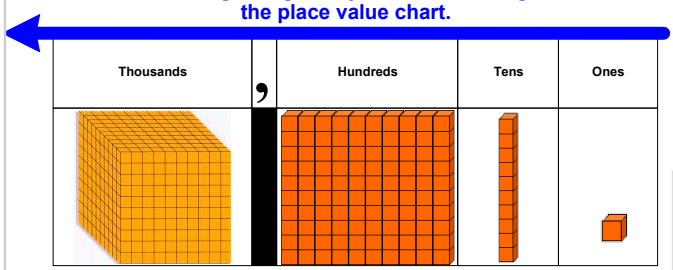
Even

Going Deeper:

Remember from the earlier lesson that the ones place is the only place value you need to look at to determine if a multi-digit number is even or odd.

Slide 79 / 310

You now need to know place value up to the millions and beyond!
Base ten blocks get larger as you move from right to left on the place value chart.

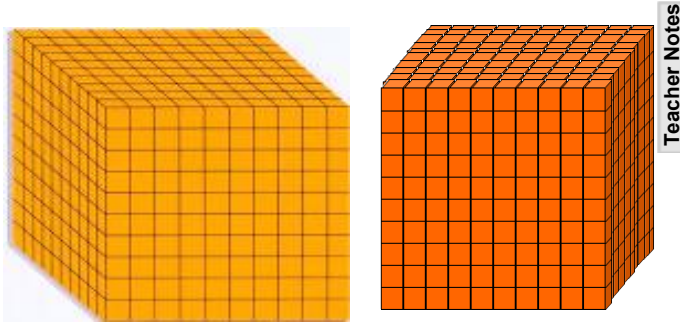


Teacher Notes

It would be hard to draw a base ten block to represent thousands. What do you think it would look like?

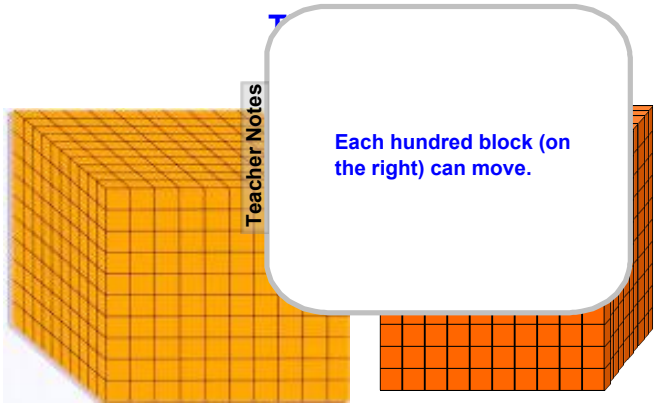
Slide 80 / 310

Thousands



Teacher Notes

Slide 80 (Answer) / 310

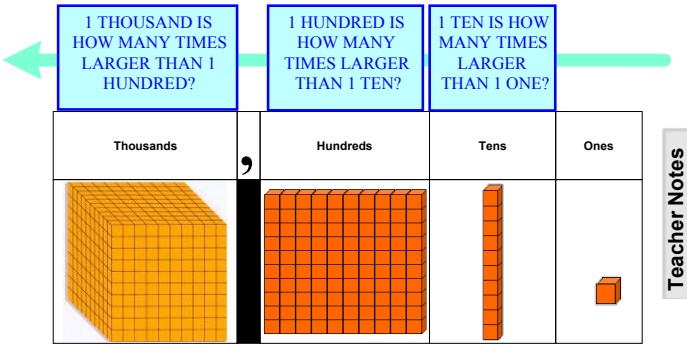


Teacher Notes

Each hundred block (on the right) can move.

Slide 81 / 310

Look at the base 10 blocks to see how each place value is related!



Teacher Notes

Slide 82 / 310

Let's use equations to represent this pattern.

10 ones make 1 ten → 10 times 1 is 1 ten or 10 ones
10 x 1 = 10

We say 1 ten is 10 times as many as one

10 tens make 1 hundred → 10 times 10 is 1 hundred or 10 tens
10 x 10 = 100

We say 1 hundred is 10 times as many as ten

Slide 83 / 310

Therefore, each place value is related as follows:

Every time we get 10, we bundle and make it a bigger unit.

We copy a unit 10 times to make the next larger unit.

If we take any of the place value units, the next unit on the left is ten times as many.

1 ten = 10 x 1 one (1 ten is 10 times as much as 1 one)

1 hundred = 10 x 1 ten

1 thousand = 10 x 1 hundred

Slide 84 / 310

Look at the place value chart to the millions below. What other patterns do you notice?

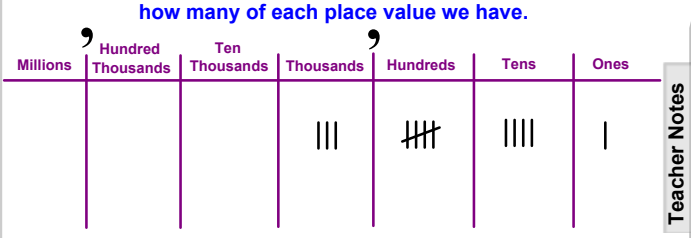
Millions	,	Hundred Thousands	Ten Thousands	Thousands	,	Hundreds	Tens	Ones

Teacher Notes

What place values would come after (to the left) of the Millions place?

Slide 85 / 310

Instead of base ten blocks, let's use tally marks to represent how many of each place value we have.



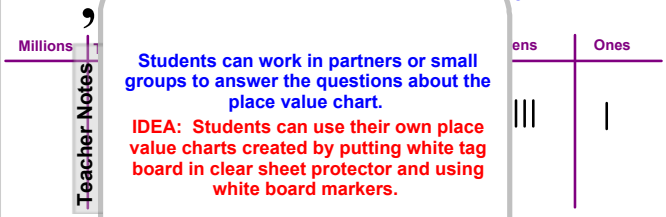
Teacher Notes

1. What is this number in standard or numeric form? click _____

2. If you have 9 more ones, the new number will be? click _____
   Use a place value chart to show your work.

Slide 85 (Answer) / 310

Instead of base ten blocks, let's use tally marks to represent how many of each place value we have.



Teacher Notes

Students can work in partners or small groups to answer the questions about the place value chart.

IDEA: Students can use their own place value charts created by putting white tag board in clear sheet protector and using white board markers.

1. W n? click _____

2. If you will be? click _____
   Use a place value chart to show your work.

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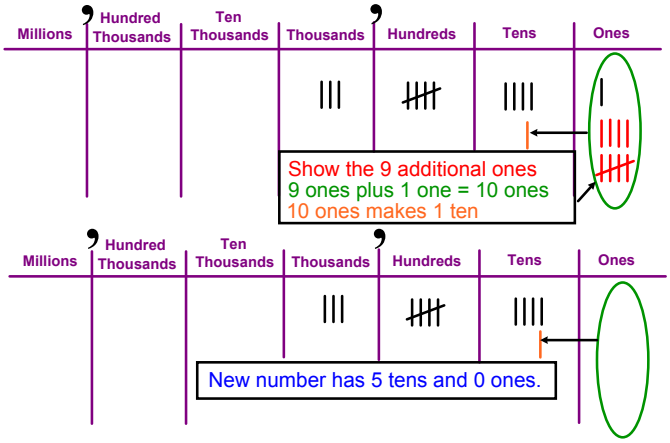

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Additional Questions:

(Problems derived from engage^ny)

Explain this number sentence to your partner using your model.

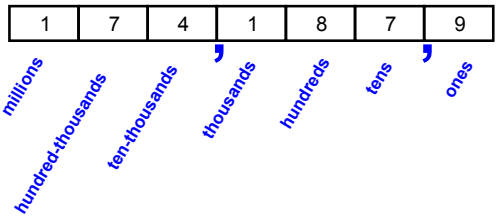
10 x 3 ones = 30 ones = 3 tens

Repeat this process with 10 times as many as 5 tens.

10 x 5 tens = 50 tens = 5 hundreds

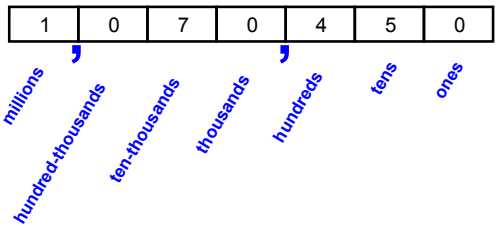
Slide 88 / 310

Place Value of Large Numbers



Teacher Notes

Read the number. Be careful of the zeros!



33 In the number 4632, six is in the hundreds place.

- True
- False

Answer

33 In the number 4632, s

- True
- False

Answer

True

34 The five is in what place value in the number 5,002?

- A ones
- B tens
- C hundreds
- D thousands

Answer

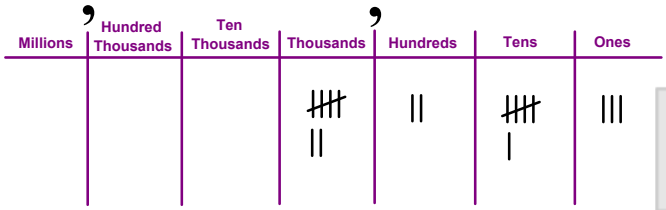
34 The five is in what place value in the number 5,002?

- A ones
- B tens
- C hundreds
- D thousands

Answer

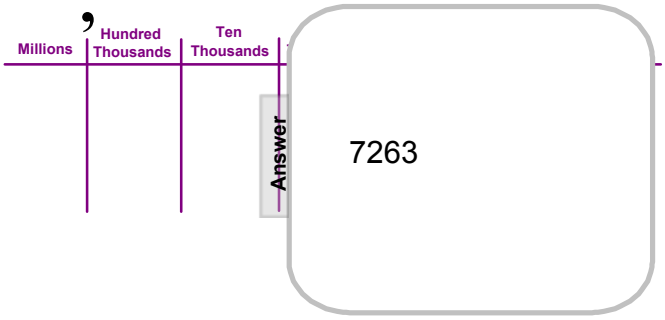
D

35 The place value chart and tally marks below represents what number in standard form?



Answer

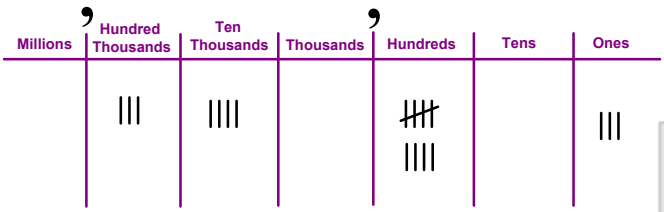
35 The place value chart and tally marks below represents what number in standard form?



Answer

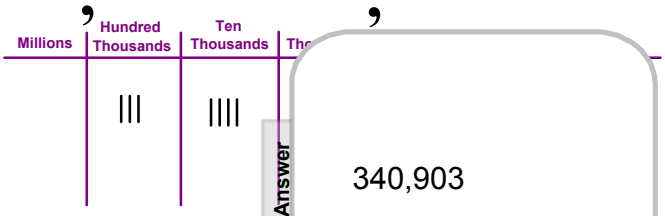
7263

36 The place value chart and tally marks below represents what number in standard form?



Answer

36 The place value chart and tally marks below represents what number in standard form?



Answer

340,903

37 The number 10,010 is written in standard form. Which choice below shows this number correctly written in word form?

- A one thousand ten
- B one thousand one
- C ten thousand one
- D ten thousand ten

Answer

37 The number 10,010 is written in standard form. Which choice below shows this number correctly written in word form?

- A one thousand ten
- B one thousand one
- C ten thousand one
- D ten thousand ten

Answer

D

Read & Represent Multi-Digit Numbers

Fluency

Click to return to the table of contents

Please refer to the file below:

FLUENCY FILE

This file contains SPRINTS (Fluency Practice) taken from EngageNY.

These Fluency Sprints may be used to help your class with fluency practice for old and new concepts.

The Fluency Sprints recommended for this point in the 4th grade unit are
SPRINTS 5A and 5B
Multiplication

Fluency

Click to return to the table of contents

Write 46 in words

Step 1 **Ask** yourself questions about the number.

How many groups of tens are in **46** ?

How many ones are in **46** ?

Step 2 **Write** the numbers as groups of tens and ones.

46 equals **4** groups of ten and **6** ones.

ANSWER 46 = 4

Word Form

	Response	Erase to Check
98		
52		
64		
29		
125		

Read the following numbers.

43,201	**1,000,281**
673,503	**53,600**
7,007	**1,800,003**
60,492	**84,905**

38 **In the following number, which digit is in the millions place?**

1,450,382

Answer

39 **In the following number, which digit is in the thousands place?**

1,265,309

Answer

Slide 101 / 310

40 In the following number, which digit is in the ten-thousands place?

841,032

Answer

Slide 102 / 310

41 In the following number, which digit is in the hundreds place?

43,791

Answer

Slide 103 / 310

42 In the following number, which digit is in the hundred-thousands place?

1,034,762

Answer

Slide 104 / 310

Drag the place value digits to the right to make a 4 digit number.

8000 + 400 + 20 + 7

6000 + 500 + 0 + 1

Slide 105 / 310

Drag each digit to the left to see the expanded form.

_____ + _____ + _____ + _____ 3780

_____ + _____ + _____ + _____ 1639

Slide 106 / 310

Writing a Number in Expanded Form

In order to represent a number in expanded form show the values as addition.

1236 = 1000 + 200 + 30 + 6

TRY THIS Write the value in expanded form.

3649 = ☐ + ☐ + ☐ + ☐

4216 = ☐ + ☐ + ☐ + ☐

9834 = ☐ + ☐ + ☐ + ☐

6203 = ☐ + ☐ + ☐ + ☐

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

43 **Which is the correct way to express 9,231 in expanded form?**

- A **9 hundreds, 2 thousands, 3 tens, 1 one**
- B **9 thousands, 2 hundreds, 3 tens, 1 one**
- C **9 hundreds, 23 tens, 1 one**

Answer

44 **Which is the correct way to express 73,040 in expanded form?**

- A **700 + 30 + 4**
- B **70,000 + 3,000 + 400**
- C **70,000 + 3,000 + 40**

Answer

45 **Enter this number in standard form.**

7000 + 300 + 20 + 7

Answer

46 **Enter this number in standard form.**

50,000 + 3,000 + 200 + 50 + 7

Answer

47 **Enter this number in standard form.**

60,000 + 500 + 20 + 1

Answer

48 **Enter this number in standard form.**

400,000 + 6,000 + 300 + 30 + 1

Answer

49 **Enter this number in standard form.**

9,000 + 300 + 5

Answer

Analyze Number Lines Using Number Sense

Fluency

Click to return to the table of contents

Fluency

Please refer to the file below:

FLUENCY FILE

This file contains SPRINTS (Fluency Practice) taken from EngageNY.

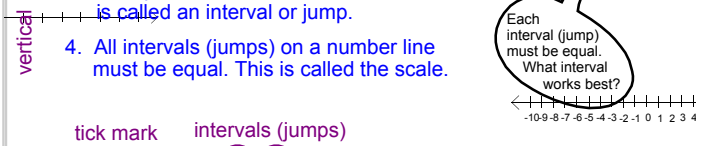
These Fluency Sprints may be used to help your class with fluency practice for old and new concepts.

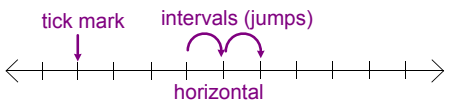
The Fluency Sprints recommended for this point in the 4th grade unit are
SPRINTS 8A and 8B
Finding the Midpoint

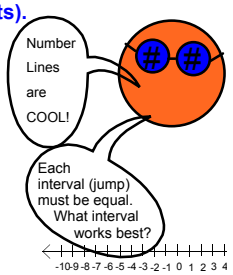
Click to return to the table of contents

Before using number lines, Mr. Number Line will review the important components (parts).

1. A line goes on forever in both directions.
2. Each tick mark on a number line represents a number.
3. The space between each tick mark is called an interval or jump.
4. All intervals (jumps) on a number line must be equal. This is called the scale.



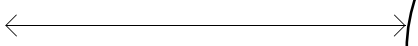




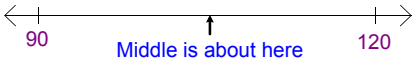
To best understand number lines it helps to practice creating one. Mr. Number Line will guide you!

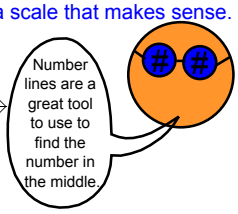
Use a number line to find the number exactly halfway between 90 and 120. Create a neat number line with a scale that makes sense.

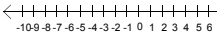
1. First draw a line without any numbers.

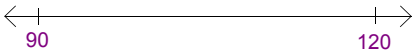


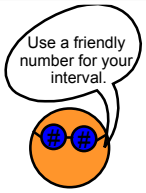
2. Then put in the minimum and maximum numbers from the problem on opposite ends of the line.



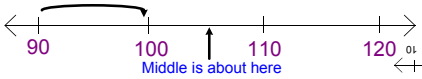


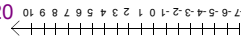






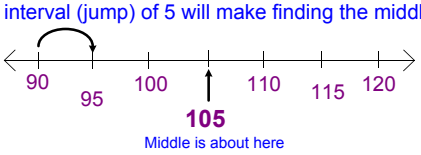
3. Next figure out a scale that would help you create easy-to-use (friendly) jumps (intervals) between tick marks.
   - You could jump by 1s, 2s, 5s, 10s, 20s.....
   - If you jumped by 1s or 2s, you'd have to make a lot of tick marks.
   - Let's try an interval (jump) of 10.





4. Once you choose a scale and create tick marks, you may decide to change your scale to make it easier.

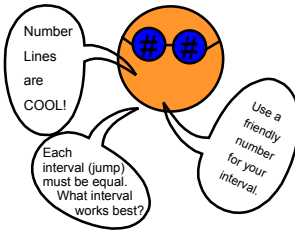
5. An interval (jump) of 5 will make finding the middle easier.

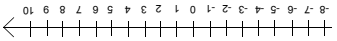


The number 105 is halfway between 90 and 120.

Try creating a number line to solve the problem below.

Use a number line to find the number exactly halfway between 200 and 340. Create a neat number line with a scale that makes sense.



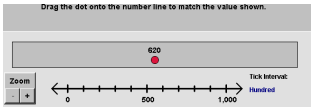


Place Value Number Line

National Library of Virtual Manipulatives

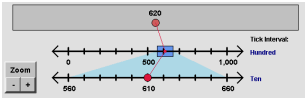
Click for web site

Step 1

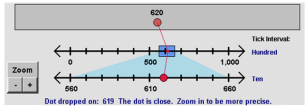


Note: The place value can be changed at the bottom of the web page.

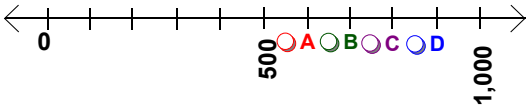
Step 2



Step 3



50 **Where does 600 go on the number line?**



Answer

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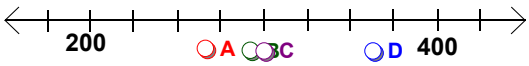
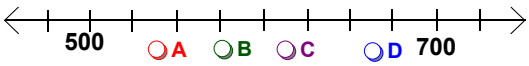
51 Where does 310 go on the number line?



Answer

Slide 125 / 310

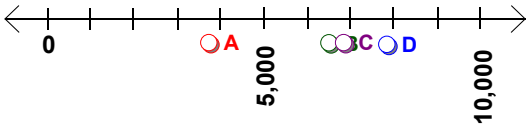
52 Where does 625 go on the number line?



Answer

Slide 126 / 310

53 Where does 7,300 go on the number line?



Answer

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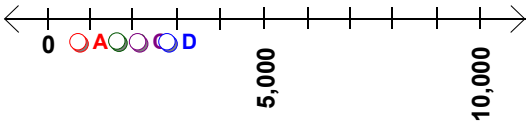
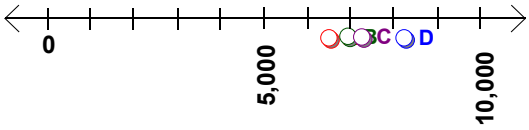
54 Where does 2,100 go on the number line?



Answer

Slide 128 / 310

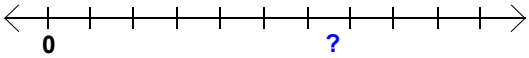
55 Where does 7,800 go on the number line?



Answer

Slide 129 / 310

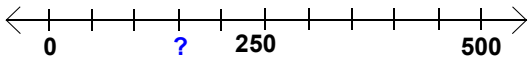
56 What number does the "?" on the number line represent? The "?" is halfway between the tick marks.



Answer

Slide 130 / 310

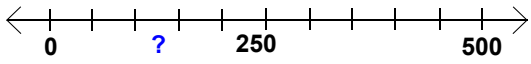
57 What number does the "?" on the number line represent?



Answer

Slide 131 / 310

58 What number does the "?" on the number line represent? The "?" is halfway between the tick marks.



Answer

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More Practice

Slide 133 / 310

59 Even numbers can be divided into equal groups with nothing left over.

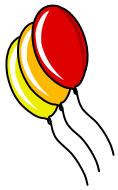
- True
- False

Answer

Slide 134 / 310

60 If you have 30 balloons you can....

- A put them in 3 groups of ten
- B put them in 4 groups of 5
- C put them in 2 groups 25



Answer

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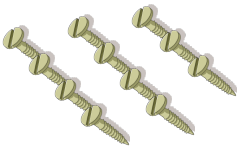
61 The number 11 is even?

- True
- False



Answer

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62 If you have
5 hundreds, 4 tens, and zero ones
you have what number?

Answer

Slide 137 / 310

63 Cindi has 7 dimes and 8 pennies. How much does Cindi have?

- A 87 cents
- B 7.80 cents
- C 78 cents

Answer

Slide 138 / 310

64 When writing 978 in expanded form, the number ____ would be in the ones position.

_____hundreds + _____tens + ____ ones

Answer

Slide 139 / 310

65 4 thousands + 8 hundreds + 5 ones =

_____

Answer

Slide 140 / 310

66 In the number 6,014 the number zero is in what place value?

- A thousands
- B hundreds
- C tens

Answer

Slide 141 / 310

67 What number is represented below?

4000 + 300 + 10 + 9

Answer

68 Which numbers are represented in standard form? (You can pick more than one.)

❑ A 4,031
❑ B 4,000 + 30 + 1
❑ C 60,009
❑ D 60,000 + 9

Answer

Compare Numbers

Click to return to the table of contents

There are two symbols we use to compare numbers.

> (greater than)

< (less than)

One number goes on the left of the symbol and another number goes on the right of the symbol.

The number on the left of the ">" shows the larger number.
For example: 2 > 1

The number on the left of the "<" shows the smaller number.
For example: 1 < 2

Symbols

Remember, one number goes on the left of the symbol and another number goes on the right of the symbol.

The number on the left of the ">" shows the larger number.
For example: 2 > 1
This means that "2 is greater than 1"

The number on the left of the "<" shows the smaller number.
For example: 1 < 2
This means that "2 is less than 1"

Symbols and Words

to remember when comparing numbers

SYMBOL	WORDS
>	greater than/largest
<	less than/ smallest
=	equal

SYMBOL	MEANING	EXAMPLES IN SYMBOLS	EXAMPLES IN WORDS
>	Greater than More than Bigger than Larger than	8 > 3	8 is greater than 3 8 is more than 3 8 is bigger than 3 8 is larger than 3
<	Less than Fewer than Smaller than	3 < 8	3 is less than 8 3 has fewer than 8 3 is smaller than 8
=	Equal to Same as	8 = 8	8 is equal to 8 8 is the same as 8

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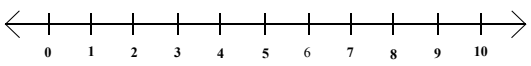
Way 1 to compare numbers is by a number line.

The number farthest to the right is the greatest.

The number farthest to the left is the least.



Move numbers to their place on the number line 8 2 3

Fill in the blanks using the symbols ____ > ____ > ____

Teacher Notes

Slide 148 (Answer) / 310

Way 1 to compare numbers is by a number line.

The number farthest to the righ

The number farthest to the lef

Move numbers to their place o

Fill in the blanks using the symb

Teacher Notes

Ask for other ways the numbers can be compared.

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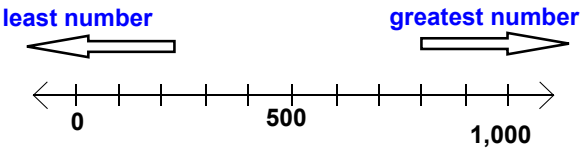

625

350

____ > ____

Teacher Notes / Answers

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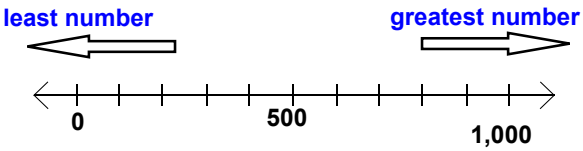

213

401

____ < ____

Teacher Notes / Answers

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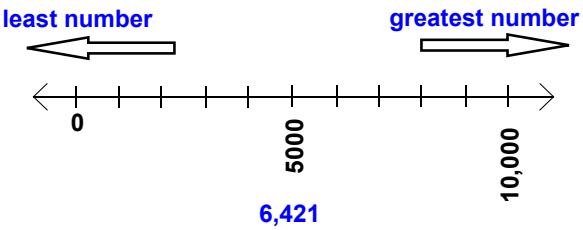

6,421

3,509

____ < ____

Teacher Notes / Answers

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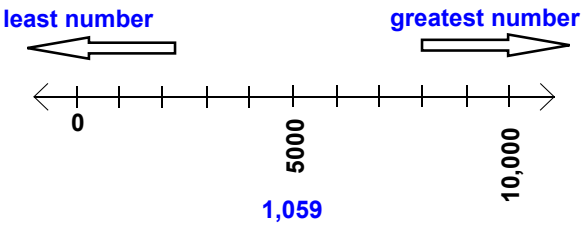

1,059

7,995

____ > ____

Teacher Notes / Answers

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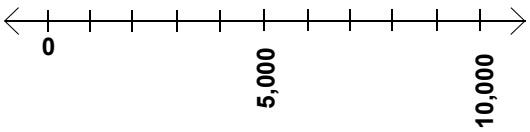
69 Use the number line to help determine which symbol to use.

A >
B <
C =

4,031 ☐ 2,500



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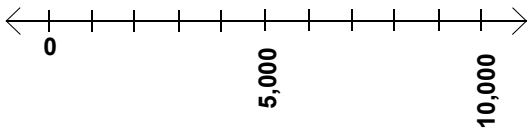
70 Use the number line to help determine which symbol to use.

A >
B <
C =

8,300 ☐ 830



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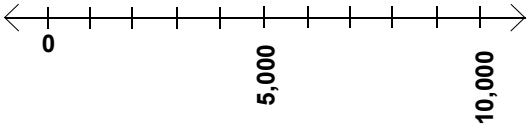
71 Use the number line to help determine which symbol to use.

A >
B <
C =

7,250 ☐ 7,900



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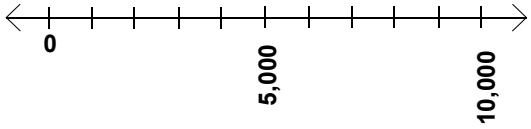
72 Use the number line to help determine which symbol to use.

A >
B <
C =

3,040 ☐ 6,030



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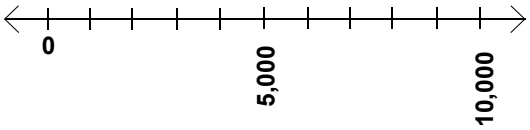
73 Use the number line to help determine which symbol to use.

A >
B <
C =

9,500 ☐ 9,500



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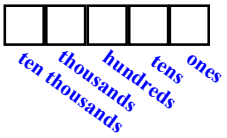
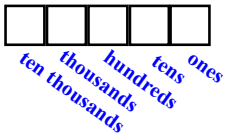
Way 2 **Place Value**



4,372

Take the number
Place each digit in the proper place value box



4,398

Start with the greatest place value and move right to where the numbers are different. The bigger of the two numbers is 4,398

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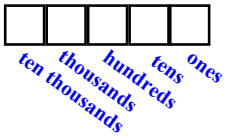
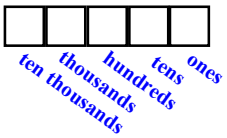


8,297



8,289

_____ > _____

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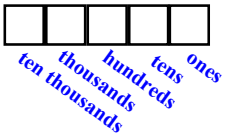
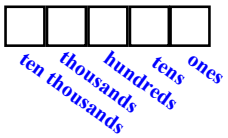


25,361



25,371

_____ > _____

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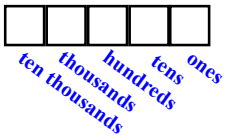
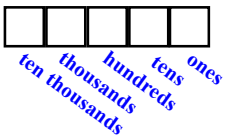


71,826



71,901

_____ < _____

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74 **The number 765 is smaller than 769?**

- **True**
- **False**

Slide 163 / 310

75 **Which number is the largest?**

- **A 325**
- **B 335**
- **C 343**

Slide 164 / 310

76 **Of these four numbers, which is the smallest?**

888, 898, 878, 899

Slide 165 / 310

77 Compare the numbers using the correct symbol.

○ A >
○ B <
○ C =

5,429 ☐ 5,409

Slide 166 / 310

78 Compare the numbers using the correct symbol.

○ A >
○ B <
○ C =

32,461 ☐ 32,086

Slide 167 / 310

79 Compare the numbers using the correct symbol.

○ A >
○ B <
○ C =

8,730 ☐ 87,300

Slide 168 / 310

80 Compare the numbers using the correct symbol.

○ A >
○ B <
○ C =

540,389 ☐ 540,389

Slide 169 / 310

81 Compare the numbers using the correct symbol.

○ A >
○ B <
○ C =

9,049 ☐ 9,051

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82 Kyle has $15.25, Harry has $13.50, and Leon has $17. Which of the following correctly compares the amount of money each person has?

○ A 17 > 15.25 > 13.50
○ B 15.25 > 13.5 < 17
○ C 17 < 13.50 < 15.25

Teacher Notes / Answers

83 Sam is 54 inches tall, Tatiana is 52 inches tall and Ariana is 49 inches tall. Which of the following correctly compares their heights?

Answer

A 54 < 52 > 49

B 49 < 52 < 54

C 49 < 52 > 54

Order Numbers

Click to return to the table of contents

· To order a group of numbers, you need to compare the digits.

· If the numbers all have the same number of digits, look left to right to see the which one is greatest or smallest.

Order these numbers least to greatest.

1,791
2,871
1,732
1,489
1,491

Order these numbers least to greatest.

1,791
2,871
1,732
1,489
1,491

Step 1 look at the farthest left digit.
2 is greater than 1, so this is the greatest number.

Order these numbers least to greatest.

1,791
1,732
1,489
1,491

2,871

least greatest

Step 2 - Look at the next digit (hundreds place) 4 is less than 7, so 1,489 and 1,491 are less.

Slide 177 / 310

Order these numbers least to greatest.

1,791
1,732
1,489
1,491

_____ 2,871
least greatest

Step 3 - 8 is less than 9, so this is the smallest number

Slide 178 / 310

Order these numbers least to greatest.

1,791
1,732

1,489 1,491 2,871
least greatest

Step 4 - 3 is less than 9, so 1,732 is less than 1,791

Slide 179 / 310

Order these numbers least to greatest.

1,489 1,491 1,732 1,791 2,871
least greatest

Slide 180 / 310

Move the numbers to order them least to greatest.

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

Slide 181 / 310

Move the numbers to order them greatest to least.

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

Slide 182 / 310

84 **Which of the following shows the numbers in least to greatest order?**

A **2516, 2561, 2615, 2651**

B **2651, 2615, 2561, 2516**

C **2561, 2516, 2651, 2615**

Slide 183 / 310

85 Which of the following shows the numbers in greatest to least order?

A 4508, 4502, 3281, 3287

B 3281, 3287, 4502, 4508

C 4508, 4502, 3287, 3281

Slide 184 / 310

86 Which number can go in the blank to make the numbers be ordered least to greatest?

A 6,491 B 6,509 C 6,541

6,474 6,539 ? 6,597

Slide 185 / 310

87 Which number can go in the blank to make the numbers be ordered least to greatest?

A 3,309 B 3,294 C 3,280

3,289 ? 3,300 3,481

Slide 186 / 310

88 Which number can go in the blank to make the numbers be ordered greatest to least?

A 15,811 B 15,711 C 15,750

15,861 15,809 ? 15,721

Slide 187 / 310

Take these numbers and order them greatest to least.

(numbers will move into boxes)

10,315 823 819 5643 4329

5 digits
4 digits
3 digits

When looking at multi-digit numbers it is easiest to group the numbers by the number of digits. Then move right to where the numbers are different.

Since 1 click only number that has five digits, it makes sense that it is the largest number.

Both 823 and 819 have three digits but when moving right the digit 2 is bigger than 1, therefore 819 click

Slide 188 / 310

Order the numbers least to greatest

499 625 1,390 1,399 32,961 674 216,712 32,768

3 digits	4 digits	5 digits	6 digits

Order the numbers greatest to least

405 16,300 741 450

879,043 8,761

8,768 679,043 16,099

6 digits	5 digits	4 digits	3 digits

Move the numbers to order them least to greatest.

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

Move the numbers to order them greatest to least.

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

89 Which of the following shows the numbers in least to greatest order?

A 1653, 16539, 15789, 15809

B 16539, 1653, 15809, 15789

C 1653, 15789, 15809, 16539

90 Which of the following shows the numbers in greatest to least order?

A 671, 659, 5783, 5780

B 5783, 5780, 671, 659

C 659, 671, 5780, 5783

91 Which of the following shows the numbers in least to greatest order?

A 33, 3003, 303, 30003

B 30003, 3003, 303, 33

C 33, 303, 3003, 30003

92 Which number can go in the blank to make the numbers be ordered least to greatest?

A 1,201 B 129 C 1,099

134 140 ____? 1,142 1,204 10,503

93 Which number can go in the blank to make the numbers be ordered greatest to least?

A 8,893 B 9,500 C 794

45,381 40,619 9,321 ____? 7,905

Round Numbers

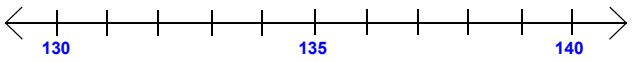
Click to return to the table of contents

Rounding

Rounding makes numbers that are easier to work with in your head.

- Rounded numbers are only approximate.
- An exact answer generally can not be obtained using rounded numbers.
- Use rounding to get an answer that is close but that does not have to be exact.

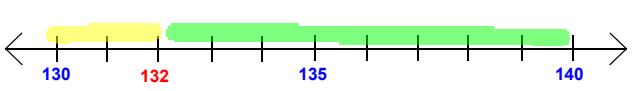
The number line is useful to help when rounding numbers.



Step 1: Find 132 on the number line and label it.

Step 2: Is 132 closer to 130 or 140? _____

Step 3: What is 132 rounded to the nearest ten? _____

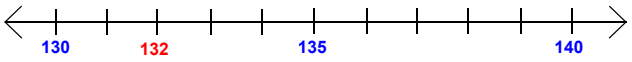


Step 1: Find 132 on the number line and label it.

Step 2: Is 132 closer to 130 or 140? _____

Step 3: What is 132 rounded to the nearest ten? _____

Slide 201 / 310

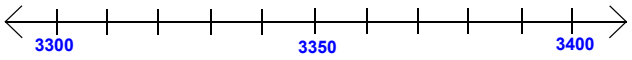


Step 1: Find 132 on the number line and label it.

Step 2: Is 132 closer to 130 or 140? _____

Step 3: What is 132 rounded to the nearest ten? _____

Slide 202 / 310



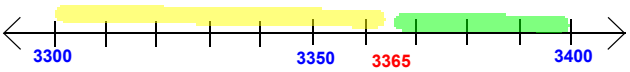
Step 1: Find 3365 on the number line and label it.

Step 2: Is 3365 closer to 3300 or 3400? _____

Step 3: What is 3365 rounded to the nearest hundred?

_____

Slide 203 / 310



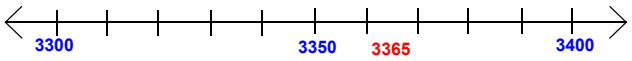
Step 1: Find 3365 on the number line and label it.

Step 2: Is 3365 closer to 3300 or 3400? _____

Step 3: What is 3365 rounded to the nearest hundred?

_____

Slide 204 / 310



Step 1: Find 3365 on the number line and label it.

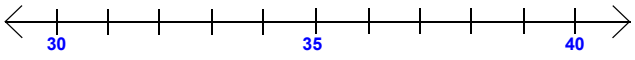
Step 2: Is 3365 closer to 3200 or 3300? _____

Step 3: What is 3365 rounded to the nearest hundred?

_____

Slide 205 / 310

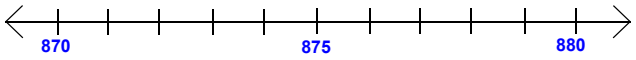
94 **What is 38 rounded to the nearest ten?**



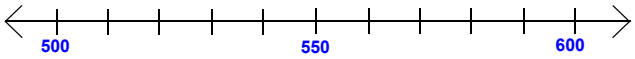
Teacher Notes / Answers

Slide 206 / 310

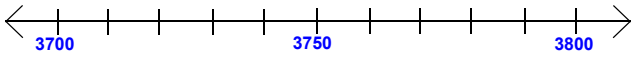
95 **What is 874 rounded to the nearest ten?**



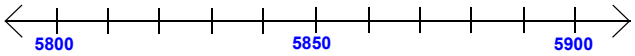
96 What is 527 rounded to the nearest hundred?



97 What is 3,721 rounded to the nearest hundred?



98 What is 5,835 rounded to the nearest hundred?



Round Numbers

Rounding numbers means identifying a given place value and the number (digit) in that place.

Rule One. Determine what your rounding digit is and look to the right side of it. If the digit is 0, 1, 2, 3, or 4 do not change the rounding digit. All digits that are to the right hand side of the requested rounding digit become 0.

Rule Two. Determine what your rounding digit is and look to the right side of it. If the digit is 5, 6, 7, 8, or 9 your rounding digit rounds up by one number. All digits that are to the right side of the requested rounding digit become 0.

Round 641 to the nearest ten.

1. Put your pencil point under the digit in the tens place.
   Look to the right.
2. Is the digit 5 or more?
   Yes OR No
3. What happens to the digit?
   Increases by 1 OR remains the same
4. What happens to everything to the left of the tens place?
   Those digits always remain the same.
5. Write the answer _____

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

Practice - Round to Tens

273 = 544 = 912 =

1232 = 4542 = 7334 =

Teacher Notes

Practice - Round to Tens

273 = 544 =

1232 = 4542 =

Teacher Notes

Use pencil to identify digit in the correct place.

Round 8,702 to the nearest hundred.

1. Put your pencil point under the digit in the hundreds place.
   Look to the right.

2. Is the digit 5 or more?
   Yes OR No

3. What happens to the digit?
   Increases by 1 OR remains the same

4. What happens to everything to the left of the hundreds place?
   Those digits always remain the same.

5. Write the answer _____

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

Practice - Round to Hundreds

939 = 509 = 627 =

3921 = 4644 = 6233 =

99 In the number 5,439 the number 4 is in the_____ place value.

- A tens
- B hundreds
- C thousands

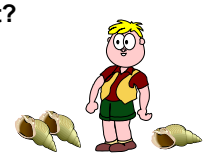
Slide 218 / 310

100 What digit is in the tens place?

9632

Slide 219 / 310

101 Sam has 491 sea shells. He wants to round his collection to the nearest hundred. He says he would then have 400 sea shells. Is he correct?



- True
- False

Slide 220 / 310

102 If you round 863 to the nearest hundred you would get?

- A 800
- B 963
- C 900

Slide 221 / 310

103

Round 739 to the nearest ten.

Slide 222 / 310

104

Round 5,685 to the nearest ten.

Slide 223 / 310

105

Round 5,685 to the nearest hundred.

106

Round 65,380 to the nearest hundred.

107

Round 839 to the nearest ten.

108

Round 541 to the nearest ten.

109

Round 585 to the nearest hundred.

110

Round 3,471 to the nearest hundred.

111

Round 227 to the nearest ten.

Slide 230 / 310

112

Round 227 to the nearest hundred.

Slide 231 / 310

Round 15,821 to the nearest thousand.

1. Put your pencil point under the digit in the thousands place.
   Look to the right.
2. Is the digit 5 or more?
   Yes OR No
3. What happens to the digit?
   Increases by 1 OR remains the same
4. What happens to everything to the left of the thousands place?
   Those digits always remain the same.
5. Write the answer _____

Slide 232 / 310

Round each number to the nearest thousand.

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

Slide 233 / 310

Round 74,891 to the nearest ten-thousand.

1. Put your pencil point under the digit in the ten-thousands place.
   Look to the right.
2. Is the digit 5 or more?
   Yes OR No
3. What happens to the digit?
   Increases by 1 OR remains the same
4. What happens to everything to the left of the ten thousands place?
   Those digits always remain the same.
5. Write the answer _____

Slide 234 / 310

Round each number to the nearest ten-thousand

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

Slide 235 / 310

113 In the number 54,718 the number 5 is in the_____ place value.

- A hundreds
- B thousands
- C ten-thousands

114 **Which digit is in the thousands place?**

83,517

115

Round 3,471 to the nearest thousand.

116

Round 25,512 to the nearest thousand.

117

Round 7,831 to the nearest thousand.

118

Round 27,813 to the nearest ten-thousand.

119

Round 643,712 to the nearest ten-thousand.

120

Round 94,785 to the nearest thousand.

121

Round 743,876 to the nearest ten-thousand.

122

Round 543,802 to the nearest thousand.

Rounding Special Cases

Fluency

Rounding Special Cases

Please refer to the file below:

FLUENCY FILE

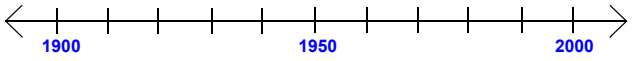
This file contains SPRINTS (Fluency Practice) taken from EngageNY.

These Fluency Sprints may be used to help your class with fluency practice for old and new concepts.

The Fluency Sprints recommended for this point in the 4th grade unit are
SPRINTS 10A and 10B
Round to the Nearest Ten Thousands

Fluency

Round 1955 to the nearest hundred.



Step 1: Find 1955 on the number line and label it.

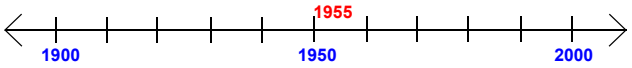
Step 2: Is 1955 closer to 1900 or 2000? _____

Step 3: What is 1955 rounded to the nearest hundred?

_____

Slide 247 / 310

Round 1955 to the nearest hundred.



Step 1: Find 1955 on the number line and label it.

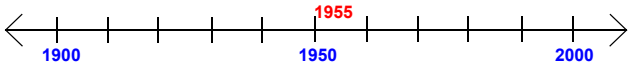
Step 2: Is 1955 closer to 1900 or 2000? _____

Step 3: What is 1955 rounded to the nearest hundred?

_____

Slide 248 / 310

Round 1955 to the nearest hundred.



Step 1: Find 1955 on the number line and label it.

Step 2: Is 1955 closer to 1900 or 2000? _____

Step 3: What is 1955 rounded to the nearest hundred?

_____

Slide 249 / 310

Round 1955 to the nearest hundred.

1. Put your pencil point under the digit in the hundreds place.

Look to the right.

2. Is the digit 5 or more?

Yes OR No

3. What happens to the digit?

Increases by 1 OR remains the same

What happens when the 9 needs to increase by 1?

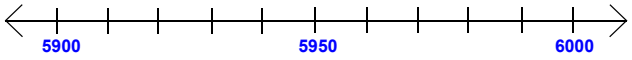
4. What happens to everything to the left of the hundreds place?

Those digits always remain the same.

5. Write the answer _____

Slide 250 / 310

Round 5,995 to the nearest ten.



Step 1: Find 5995 on the number line and label it.

Step 2: Is 5995 closer to 5900 or 6000? _____

Step 3: What is 5995 rounded to the nearest ten?

_____

Slide 251 / 310

Round 5,995 to the nearest ten.

Step 1: Find 5995 on the number line and label it.

Step 2: Is 5995 closer to 5900 or 6000? _____

Step 3: What is 5995 rounded to the nearest ten?

_____

Slide 252 / 310

Round 5,995 to the nearest ten.

Step 1: Find 5995 on the number line and label it.

Step 2: Is 5995 closer to 5900 or 6000? _____

Step 3: What is 5995 rounded to the nearest ten?

_____

Round 5995 to the nearest ten.

1. Put your pencil point under the digit in the hundreds place.

Look to the right.

2. Is the digit 5 or more?

Yes OR No

What happens when the 9 needs to increase by 1?

3. What happens to the digit?

Increases by 1 OR remains the same

4. What happens to everything to the left of the tens place?

Those digits always remain the same.

5. Write the answer _____

Sorry, this element requires Flash, which is not currently supported in PDFs.

Please refer to the original Notebook file.

123

Round 79,621 to the nearest thousand.

124

Round 3,992 to the nearest hundred.

125

Round 97 to the nearest ten.

126

Round 1,499,000 to the nearest ten-thousand.

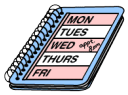
127

Round 19,997 to the nearest hundred.

128

Round 469,971 to the nearest hundred.

129 The middle school has 1,498 students this year. The principal wants to buy student planners for next year. The principal will order by rounding to the nearest ten. How many will be ordered?



130 A large jar has 1,539 marbles in it. What is this number rounded to the nearest thousand?

131 New Jersey is 166 miles in length from the northern most point to the southern most point. What is this number rounded to the nearest hundred?

Patterns

Fluency

Click to return to the table of contents

Fluency

Please refer to the file below:
FLUENCY FILE

This file contains SPRINTS (Fluency Practice) taken from EngageNY.

These Fluency Sprints may be used to help your class with fluency practice for old and new concepts.

The Fluency Sprints recommended for this point in the 4th grade unit are
SPRINTS 16A and 16B
Convert Meters to Centimeters

NOTE: Can use a table to model this conversion pattern.

Click to return to the table of contents

Patterns

A pattern or sequence is either shapes or numbers that continue to repeat in a specific order (pattern).

You can describe a pattern by using a rule to get to the next shape or number.

What would be the rule for the pattern in the quilt?

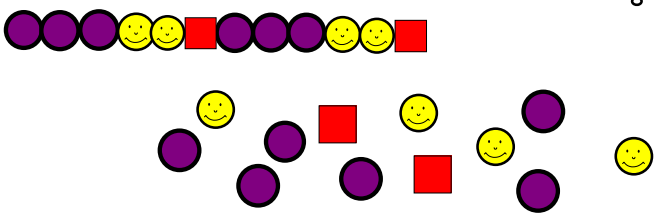
Patterns

Patterns are almost everywhere you look.

Can you identify patterns around the classroom?

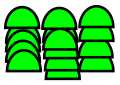
What is the pattern in this example?

Move the shapes to complete pattern



What is the rule?

Create your own geometric pattern using these two shapes.



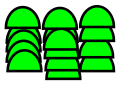
Describe your geometric pattern (write the rule).

Teacher Notes

Have one student move shapes on this slide that is projected on screen while others work at their desks.

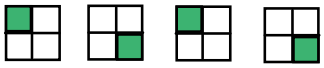
Students at their desks can use pattern blocks, different colored counters.....

ometric pattern
shapes.



Describe your geometric pattern (write the rule).

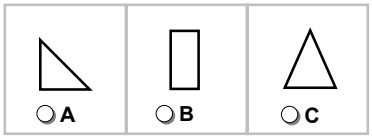
Patterns can also be represented by rotating a shape.



Draw the next shape

132 What would be the tenth shape if this pattern were continued?

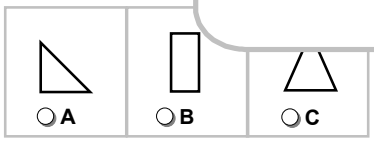
Teacher Notes



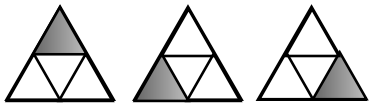
132 What would be the tenth shape if this pattern were continue

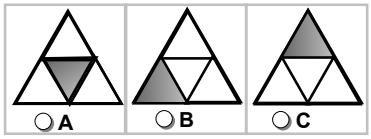
Teacher Notes

Shapes in boxes are infinity cloned to show the pattern continuing after the students answer.



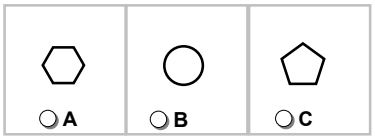
133 Which would be the next shape in this pattern?





134 What would be the eleventh shape in this pattern?

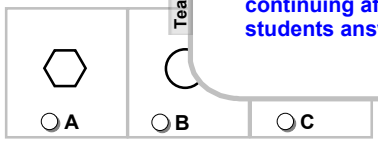
Teacher Notes



134 What would be the eleventh shape in this pattern?

Teacher Notes

Shapes in boxes are infinity cloned to show the pattern continuing after the students answer.



Now we will look at number patterns.

Move the numbers to complete pattern

5, 5, 3, 8, 8, 2, 2, 2, 5,

3 3 3 3 3

5 5 5 5

8 8 8 8

2 2 2 2

Finding a Missing Number in a Pattern or Sequence

Step 1: Determine if the order of numbers is getting larger or smaller.

Step 2: Find the difference between numbers that are next to each other.

Step 3: Use the difference between numbers to find the missing number.

Find the missing number: 15, 13, ___, 9, ___

1. The order is going down (getting smaller).

2. The difference between numbers 15 - 13 = 2

3. Since the order is going down subtract 2 from 13. The missing number is 11.

4. Now that you know the pattern is subtract 2, take the last digit and subtract 2 and you will get 7.

click

Finding a Missing Number in a Pattern or Sequence

1. Determine if the order of numbers is getting larger or smaller in value, which mathematical function is being used (+, -, x, ÷) and how many numbers are involved in the repeating pattern.

2. Find the difference between the numbers that are next to each other.

Find the missing number

5, 10, 8, 16, 14, 28, ___, ___, ___

x 2 - 2 x 2 - 2

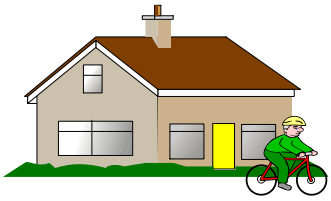
135 **In the pattern 25, 50, 100, 200, the rule would be to keep adding 25.**

- ○ True
- ○ False

136 What is the missing number in this pattern?

16, 20, 24, ___, 32, 36

137 Charles was riding his bicycle down the sidewalk. He was looking at the addresses on each house as he went by. The first four addresses he saw were 2455, 2485, 2515, 2545. What address will Charles see next?

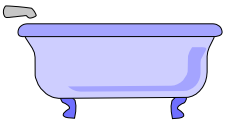


138 Mrs. Hall wrote the following number pattern on the board.
4; 16; 64; 256

What was the rule for this pattern?

- ❍ A Add 12
- ❍ B Multiply by 4
- ❍ C Multiply by 3

139 The water in Sam's full bathtub is 50 gallons deep. He is draining the bathtub and measuring the water depth each minute. The first four measurements were 50 gal., 44 gals., 38 gals., 32 gals. What depth will Sam see next?



140 What are the next two numbers in the pattern?

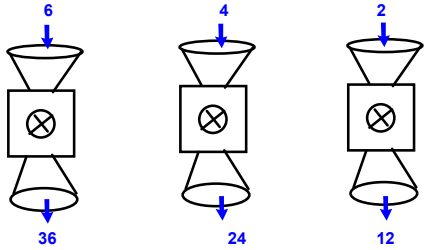
3, 12, 10, 19, 17, 26, ...

- ❍ A 33, 24
- ❍ B 24, 33
- ❍ C 35, 33

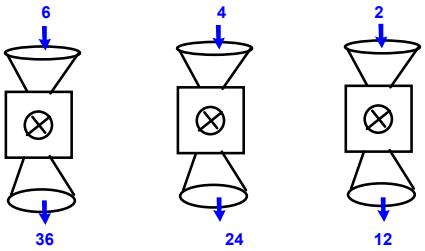
Function Machine

Mr. Block made a function machine that uses a rule to change a number into a different number. He put three numbers through the machine.

What rule did Mr. Block use to make his machine?



Function Machine



Look at each machine.

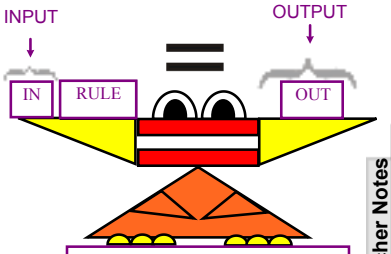
What happens to the input number inside the machine to turn it into the output number?

click

QUIGLEE is back to help us understand how equations can help us solve input / output problems (function machines).

1. The rule includes the operation and a number.
   Mr. Block's rule is multiply by 6.
2. For this type of problem you may have to find the rule, the input, or the output.
3. An equation can help you organize your work.

Example: Using Mr. Block's rule and an output of 42, find the input.



Click for strategy to solve algebraic equation from above.

Teacher Notes

QUIGLEE is back to help us understand how equations can help us solve input / output problems (function machines).

1. The rule includes the operation and a number.
   Mr. Block's rule is multiply b
2. For this type
   may have to
   the input,
3. An equati
   organize y

Example: Us
an output of

INPUT
OUTPUT
OUT

o solve algebraic
m above.

Teacher Notes

Click boxes on QUIGLEE.

Answer - Rule is:

x 8

Use Mr. Block's function machine from the example to answer Numbers 1 through 3

1. Maria chose 12 as her input number. What was output number?

click

2. Jose chose 8 as his input number. What was output number?

click

3. Caleb put a number through the machine, and his output number was 120. What number did Caleb put through the machine?

click

Use the following information to answer Numbers 4 through 6

Ms. Collins made a machine like Mr. Blocks', but she wanted it to work in reverse. When she put in the number 27, the output number was 3. She put in 81, and the output number was 9. She put in 54 and the output number was 6.

4. What is the rule for Ms. Collins machine when it is in reverse?

click

5. Kareem chose 108 as his input number. What was his output number?

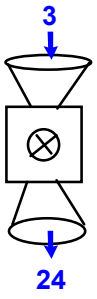
click

6. Carmen chose her output number as 15. What was her input number?

click

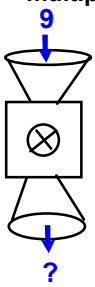
141 **What is the rule for this function machine?**

- A **multiply by 3**
- B **multiply by 8**
- C **divide by 3**



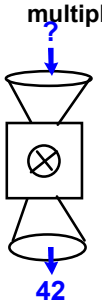
Teacher Notes / Answers

142 **The rule for this function machine is multiply by 5, what is the output?**



Teacher Notes / Answers

143 **The rule for this function machine is multiply by 7, what is the input?**



Patterns in Tables

Sometimes you can find number patterns in tables. A function table is a table of ordered pairs that follow a rule. The rule can be found by going from one column to the other column. Numbers from a function machine can also be put into a table.

Example

What is the rule for the function table going from column x to column y?

x	y
3	9
4	12
5	15
6	18
7	21

Each number in column *y* is 3 times the number in column *x*. The rule going from column *x* to column *y* is multiply by 3.

Multiply 5 by 3 to find the missing value in the function table.

Example

You can also use number patterns in tables to solve real-world math problems.

Sidney ran the same number of laps around the track every day for 6 days. He made the table below to show the total number of laps he had run after each of the six days. What is the total number of laps Sidney had run after six days?

DAY	1	2	3	4	5	6
Number of Laps	6	12	18	24	30	36

Answer

144 **The rule for the table below of attempted passes and completed passes is multply by 7.**

Attemped	21	35	42	49
Completed Passes	3	5	6	7

- ○ True
- ○ False

145 What is the correct rule for this function table going from column x to y?

x	y
3	32
7	36
10	39
17	46

A add 27 B multply by 3 C add 29

146 What is the missing value in the function table?

x	y
225	175
255	205
125	?
97	47

Glossary

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Algebraic Equation

States that two things are the same using mathematical symbols and an equal sign. Has a least one variable.

3 + 2 = y
equals sign: ✓
(relation symbol)
number: ✓
operation: ✓
variable: ✓

Can be either true or false depending on what values are used for the variable.

4x
number: ✓
operation: ✓
variable: ✓
equals sign?

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Equation

Two expressions that are equivalent to each other. Equivalence is shown with an equal sign.

4x2 = 8
equivalent expressions

5+3 = 9-1
equivalent expressions

3^3
no equivalence

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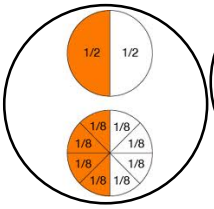
Equivalent

Equal; the same amount or value.



3+3=3x1

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Expression

Numbers, symbols and operations grouped together that show the value of something.

$3 - 2^2 + 1$

An expression is one side of an equation.

~~$2 \times 3 = 6$~~

Expressions DO NOT have equals signs.

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Open Number Sentence

Numbers and operation(s) with a relation symbol (usually an equation) that contains at least one variable.

$3 + 2 = y$

equals sign: ✓

(relation symbol)

number: ✓

operation: ✓

variable: ✓

Can be either true or false depending on what values are used for the variable.

~~$4x$~~

number: ✓

variable: ✓

Operation and equals sign?

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Operation

A calculation by a mathematical process.

$y^3 = y \ y \ y$

exponents are operations too

calculators perform operations

$+ \ - \ \times \ \div$

~~$= \ < \ >$~~

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Solution

A value you can put in place of a variable that would make the statement true.

The answer to a math problem.

$x + 4 = 9$

Solution:

$x = 5$

$3y \geq 6$

Solution:

$y \geq 2$

~~$x + 4 = 9$~~

$x = 6$

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Variable

A letter or symbol that represents a changeable or unknown value.

$4x + 2$

variable

$x = ?$

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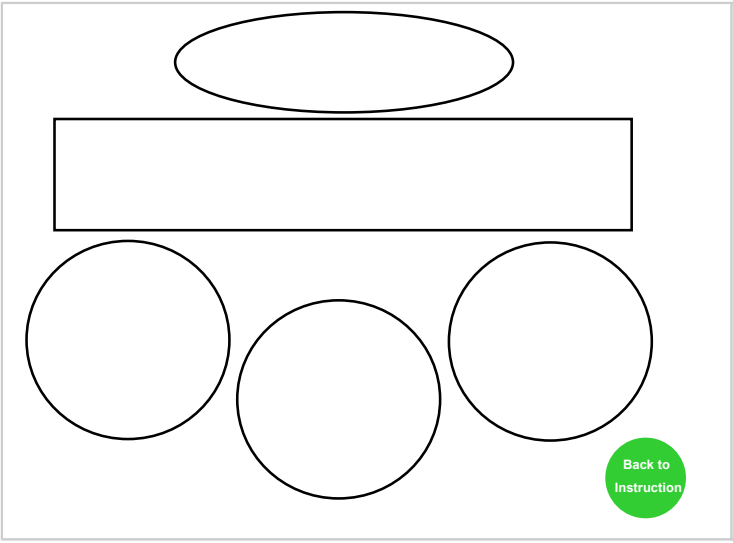

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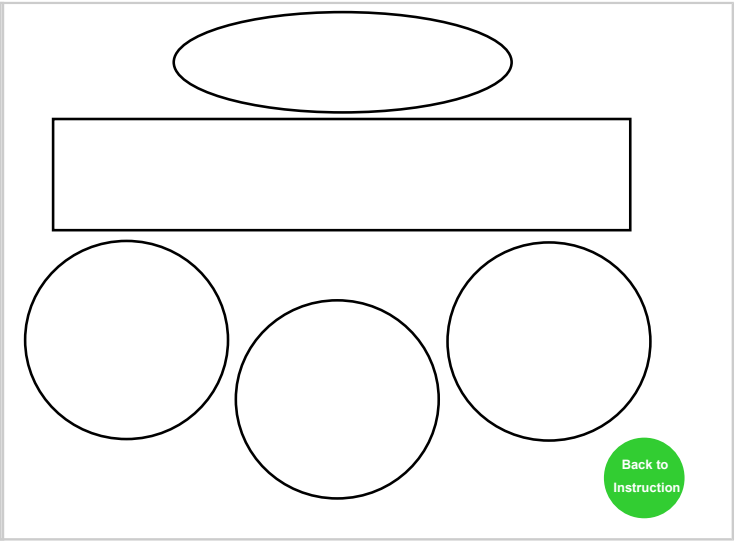

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