Number Theory

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Math Class is 1.5 hours daily

Executive Summary:
The following units were created to help students develop problem solving and critical thinking skills. As 2nd and 3rd grade teachers we use manipulatives to foster exploration and understanding of various problems. Unifex cubes become hot and cold cubes to explore temperature and positive and negative numbers, as well as cubes with a value of one to explore and discover balancing equations. In the lessons students will explore concepts of temperature, place value, balancing equations and fractions both concretely with manipulatives in groups and individually. With every new discovery students will be given the chance to share with classmates and the class as a whole their thinking and process to coming to a conclusion. These lessons will supplement the 2nd and 3rd grade Everyday Math curriculum. Our math instruction time is an hour and a half five days a week, so we will on most occasions be using the lessons in groups of two. We have included assessments to continue to analyze and reflect

on our teaching throughout the units. After teaching the lessons we will analyze, reflect and modify as necessary.

Unit Thermometer (positive and negative integers) {2nd Grade Unit 5} [3rd Grade Unit 4]

The Thermometer Unit below takes about 4 lessons. This unit is introducing and comparing positive and negative numbers.

Unit Place Value (100,000's,10,000's,1,000's, 100's, 10's and 1's) {2nd Grade Unit 4,6} [3rd Grade standards supplemented into the curriculum]

The Place Value Unit below takes about 12 lessons. In this unit students will explore and establish an understanding for place value up to the 100,000's place.

Unit Balanced Equations {2nd Grade Unit } [3rd Grade Unit 3]

The Balanced Equations Unit below takes about 4 lessons. In this unit students will explore and establish an understanding of the equal sign and balancing equations involving the commutative property, associative property and the order of operations.

Unit Fractions {2nd Grade - Supplementary introduction} [3rd Grade Unit 5-7}

The Fractions Unit below takes about 4 days. In this unit students will explore fractions relating to a whole and equivalent fractions.

Here are some MCA test questions examples:

17. An equation is shown.

$$3 \times 7 = \_\_\_\_ + 7$$

What number makes the number sentence true?

Ⓐ 3
Ⓑ 14
Ⓒ 21
Ⓓ 28

lace?

2. There are 23,650 people in a stadium.

The stadium can hold 1,000 more people.

How many people can the stadium hold?

Ⓐ 22,650
Ⓑ 23,750
Ⓒ 24,650
Ⓓ 33,650

14. Ellen has a vase of flowers.

- $\frac{1}{8}$ are red.
- $\frac{1}{3}$ are blue.
- $\frac{1}{6}$ are purple.
- $\frac{1}{4}$ are yellow.

Which is the greatest fraction?

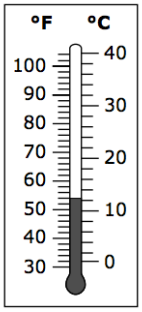
Ⓐ $\frac{1}{8}$

Ⓑ $\frac{1}{3}$

Ⓒ $\frac{1}{6}$

Ⓓ $\frac{1}{4}$

23. A thermometer is shown.



What temperature is shown on the thermometer?

Ⓐ 11°C

Ⓑ 12°F

Ⓒ 54°C

Ⓓ 54°F

Table of Contents:

Temperature (Positive and Negative Integers)

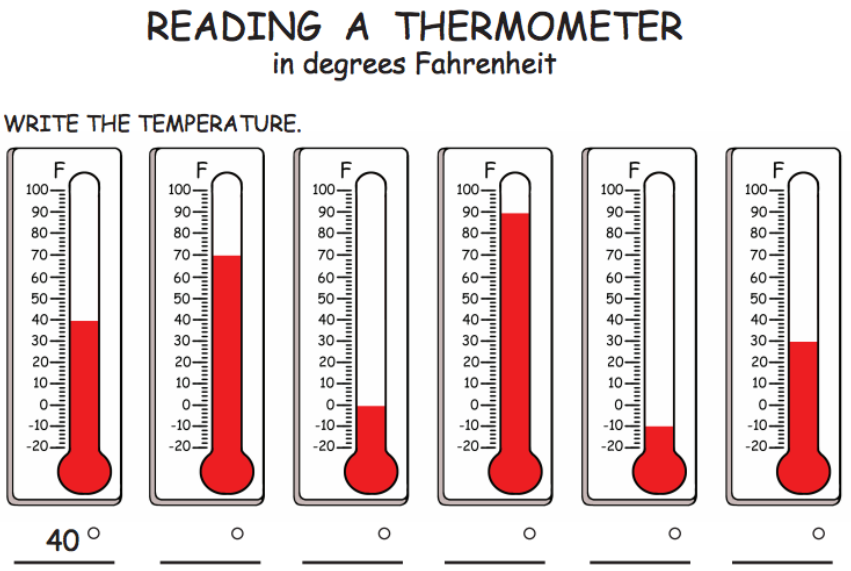
{2nd Grade Unit 5} [3rd Grade Unit 4]
2nd Grade Standards- 2.1.2.5 Solve real-world and mathematical addition and subtraction problems involving whole numbers with up to 2 digits. (Unit
3rd grade Standards- 3.3.3.4 Use an analog thermometer to determine temperature to the nearest degree in Fahrenheit and Celsius. (Unit 4)

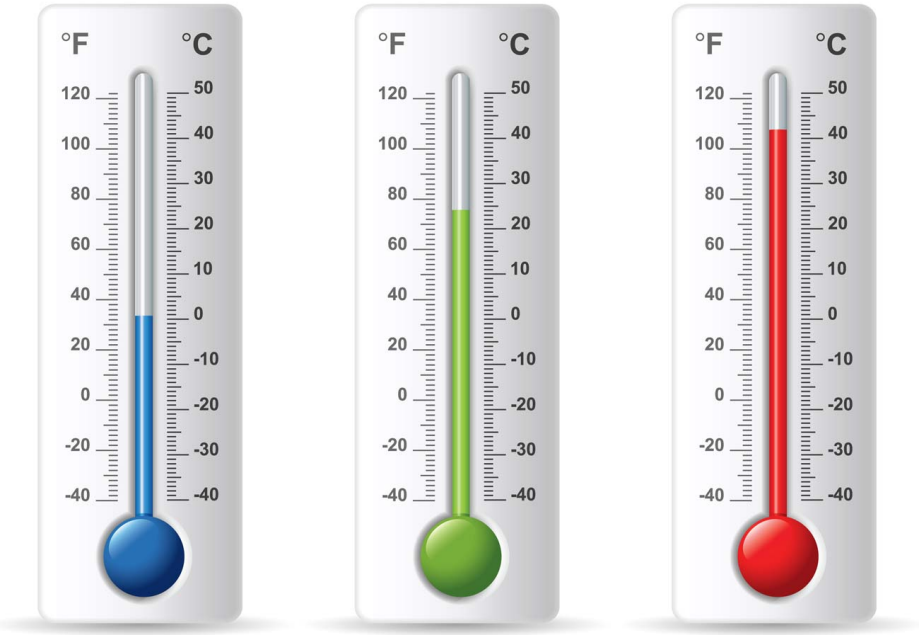
Lesson 1/2:
Launch:
(2nd Grade) Who likes summer when it's hot out? How about winter? I hate to be cold I would love it if it was hot all year around. Do we know what a hot temperature looks like?

As a whole class we will track the temperature of Crookston and one other place in Minnesota that the class chooses. We will have a thermometer outside our classroom window to collect the data.

(3rd Grade - extension)
In groups students will choose 3 places around the world where they will collect temperature or a given time period. The students will be given the best website to collect the temperature from and will be expected to collect the data each day for two weeks After the collection is complete they will create displays of their data in frequency tables, line plots and other graphs.

Pre-assessment: This would be done after the launch so I as the teacher will be able to see if the students will be able to accurately read temperature on a thermometer. (3rd I would find an example with Fahrenheit and Celsius.





Explore:
I will have thermometers set up around the room and have students walk around and see different temperatures.
We would then come back to the carpet and discuss what they have seen.

Whole Group Explore:
Use unifix cubes to represent hot and cold. In groups students will figure out the difference from the warmer temperature to the colder temperature. The students would also have a ruler that would show where the zero value is.

Share:
What discoveries did you make about temperature?

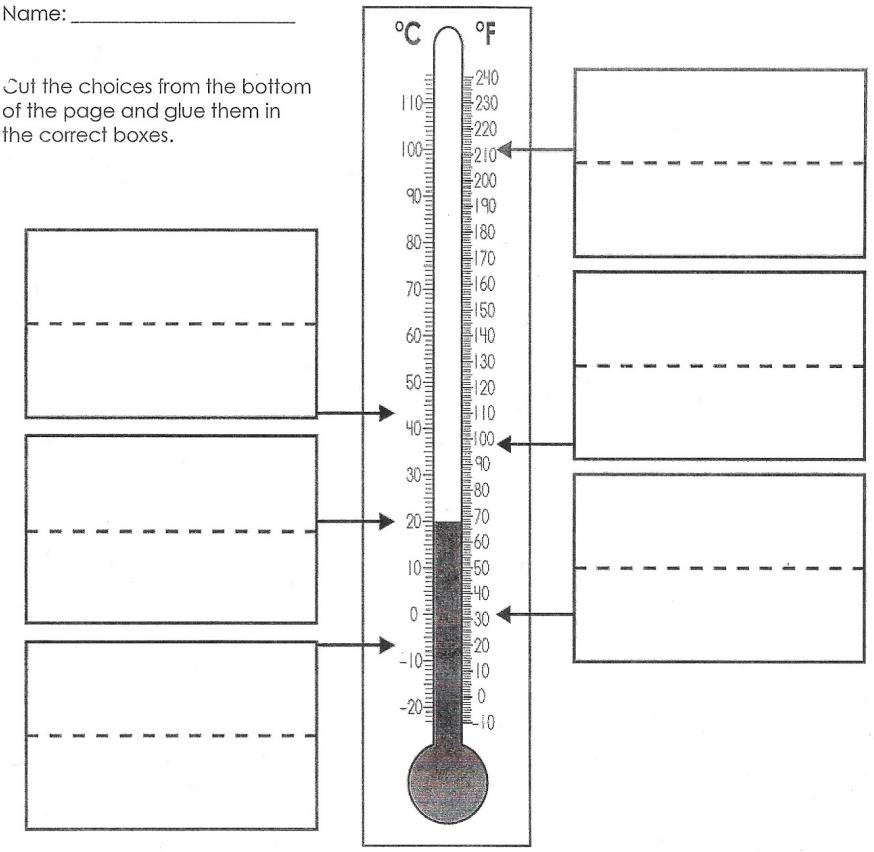
Summarize:
I would make sure that students saw distinct differences between positive and negative temperatures.

Lesson 3:
Launch:
We have been talking about temperature just in terms of weather. What other places do temperature affect?

Explore:
This would be done whole group in 2nd grade and in groups of 4 in 3rd grade.

Name: _____

Cut the choices from the bottom of the page and glue them in the correct boxes.



Human Body Temperature	Snowy Day Temperature	Indoor Room Temperature	Water Freezing Temperature
110° F 43° C	32° F 0° C	98.6° F 37° C	212° F 100° C
Water Boiling Temperature	68° F 20° C	Bath Water Temperature	20° F -7° C

Share:

Students would describe how the decided where the information pieces needed to be placed on the thermometer. There would be a number of different steps in a process to all get to the same end results.

Summarize:

Temperature is important in many different situations. We have now found some ways temperature affects places.

Lesson 4:

Launch:

Remember how we went outside for the last week and made a table of the temperatures for each day. Well today you are going to find the difference in temperature between Minneapolis and Crookston.

Explore:

Students will be using the temperatures that have been collected in the classroom for the previous week. I will have them use the unifix cubes like the previous lesson but they would be doing the problems with manipulatives on their own. Once a problem is solved, they would draw a picture of what their answers.

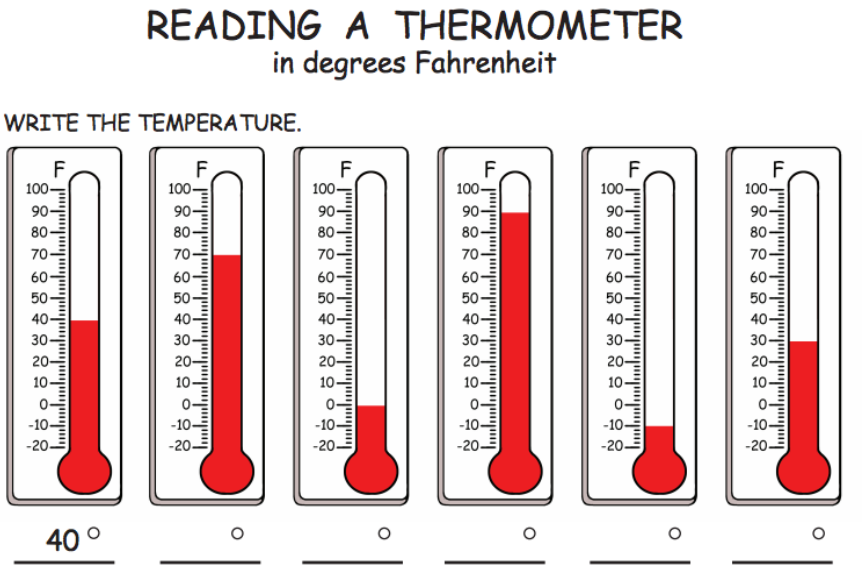
Share:

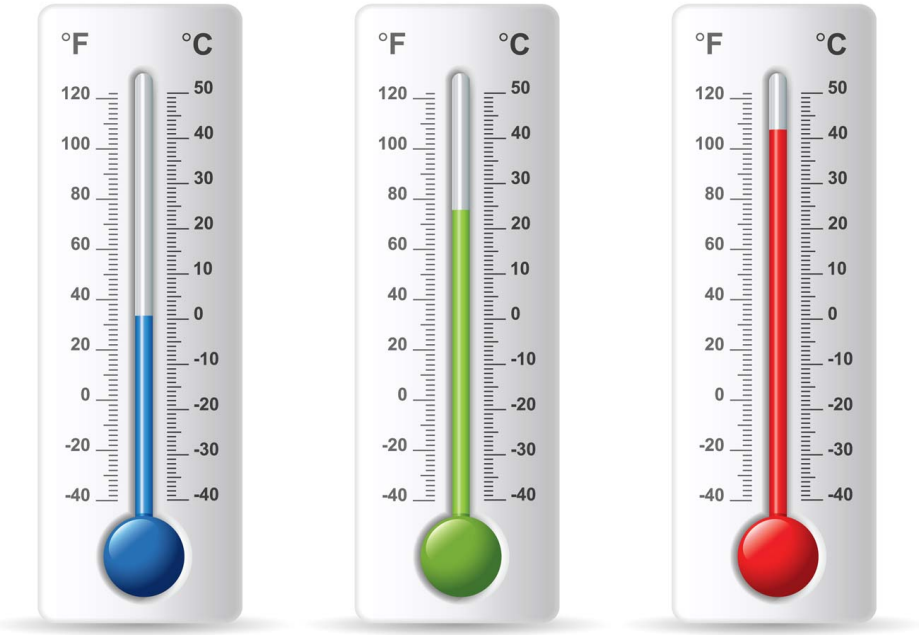
Students would volunteer to come up to the board and show the way they found one of their answers. By having the students explain to the rest of the class, they are cementing their own understanding and helping other students hear another way of explaining the answer.

Summarize:

As a whole group, I would be able to clarify and put all the information that was shared yesterday into focus their understandings. Students would be the ones up at the information they found and I would put the information together in a neat presentation.

Post Assessment:





Place Value

{2nd Grade Unit 4, 6} [3rd Grade standards supplemented into the curriculum]

2nd Grade Standards

2.2.1.2 - Use place value to describe whole numbers between 10 and 1000 in terms of hundreds, tens and ones. Know that 100 is 10 tens, and 1000 is 10 hundreds.

2.1.1.3 Find 10 more or 10 less than a given three-digit number. Find 100 more or 100 less than a given three-digit number.

2.1.2.4 Use mental strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers. Strategies may include decomposition, expanded notation, and partial sums and differences.

3rd Grade Standards

3.1.1.1 Read, write and represent whole numbers up to 100,000. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives such as bundles of sticks and base 10 blocks.

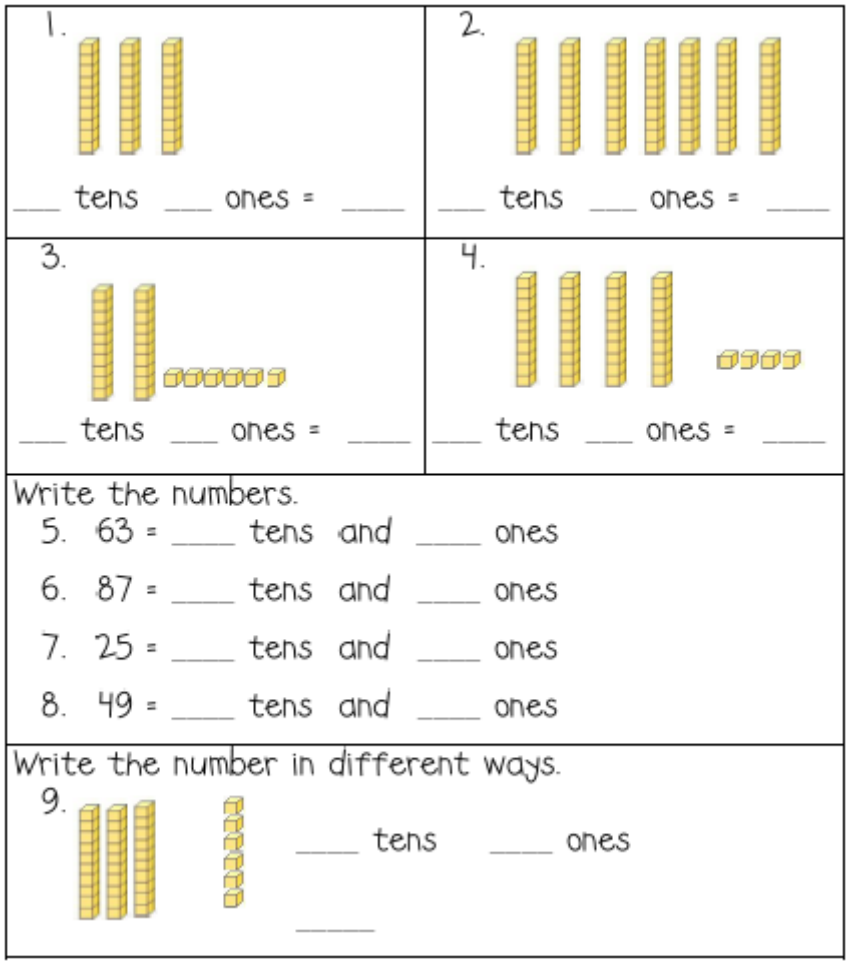
3.1.1.2 Use place value to describe whole numbers between 1000 and 100,000 in terms of ten thousands, thousands, hundreds, tens and ones.

3.1.1.3 Find 10,000 more or 10,000 less than a given five-digit number. Find 1000 more or 1000 less than a given four- or five-digit. Find 100 more or 100 less than a given four- or five-digit number. (Not represented in the Everyday Math Curriculum so we supplement this in September)

Note Standard form and expanded form have been taught previously to this lesson.

Lesson 1:

Pre-assessment:



1. Build 75

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ = _____

4. Write the number in standard form _____

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1. Build 40

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ = _____

4. Write the number in standard form _____

1. Build 606

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ + _____ = _____

4. Write the number in standard form _____

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1. Build 316

2. Draw a picture of the blocks

3. Expand each number using digits

_____ = _____ + _____ + _____

4. Write the number in standard form _____

Launch:
https://www.youtube.com/watch?v=21l3Jg5_MCg
I would show this short video to peak the interest of the students with place value. It states the place values of: ones, tens, hundreds and thousands.

Share:
Students need to show that they understand the order of place value before you go any further.

Explore:
Students will bring their whiteboards, markers and erasers to the carpet. I will be putting a number on the board. Ex. 156 - I will ask students to please underline the ones place, circle the digit in the hundreds place, and put an x over the number in the tens place. In third grade you would expand into 1,000s, 10,000s, and 100,000s. By doing a number of examples of this, we are able to see which students are struggling.

Share:
Numbers would be placed on the board. Volunteers would come up to the board and follow the directions of underlining, circling and x out the different place values.

Summarize:
Do we now know the place of each digit? When we read out our number, do we say some of our place values?

Lesson 2/3:
Launch:
I found a box of marbles in the basement of my new house. There were 9 large bags of marbles, each bag had 100 marbles. Then there were some medium bags that held 10 marbles in it. There were 6 medium bags. Finally in the bottom of the box, I found 2 small bags with only one marble in each bag. Please show me on your boards how many marbles I found

Explore:
In groups of 4 students will use the place-value mats, dry erase boards, and base ten blocks to create numbers written on a index card with their base ten blocks.

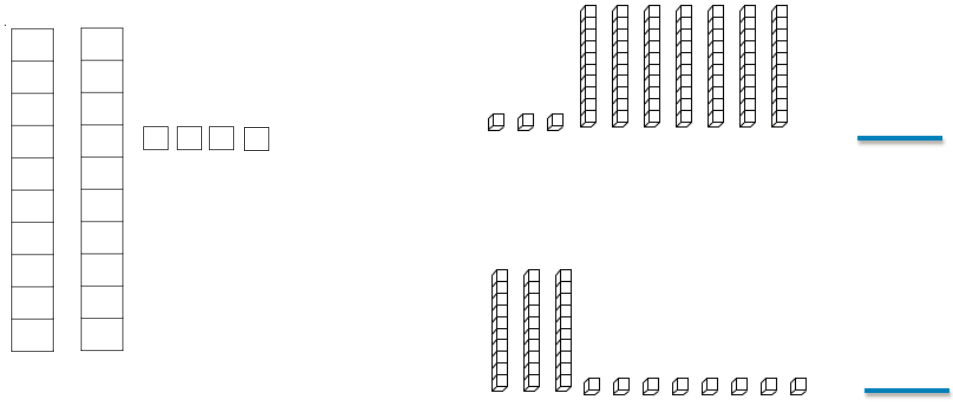
Share:
We will be using Ones, Tens, Hundreds

What place-value model is shown?

What number is shown?

What is the expanded form of that number?

What number is shown?_____



Summarize:
After students have had a chance to use their base ten blocks to explore and share with partners the different numbers. We will come back together as a whole class and discuss our conclusions.

Lesson 4/5:
Launch:
Do you like to play games? I love to play games, I especially love it when I win! Today we get to play a card game, and the best part we are all going to be winners. Go over the directions for playing Making 100's!

Explore:
Making 100's! In groups of two, start with the Math Card deck (take out the double digit cards, use 0-9). Flip three cards over. The person who flips the cards over will read the number cards and the person's partner will create the number with base ten blocks, and write the number in standard form. For the next turn the students will change jobs.

Share:
As a class we will share some of the conclusions we can make from playing the game. While we are really practicing writing and reading the place values of ones, tens, and hundreds we will discuss some patterns the students may see (the largest digit in any place is 9).

Summarize:
We will gather and quickly review the place values before the students complete the partial post test to assess the understanding after the five lessons.

Partial Post Test

Complete each place value chart. Then write the word name for the number.

1.

standard form	hundreds	tens	ones
514			

_____

2.

standard form	hundreds	tens	ones
367			

_____

3.

standard form	hundreds	tens	ones
903			

_____

Lesson 6:

Launch:

https://www.youtube.com/watch?v=NwHwsPq7DVY This song goes up to hundred millions which is past 2nd and 3rd grade standards but it will help them to see where they are going. This song is expanding what they already learned from the previous lessons.

Explore:

In groups of two we will now add thousands, ten-thousands and hundred thousands are added to the mix.

What place-value model is shown? (Standard Form)

What place-value model shows (Have pictures of blocks or actual blocks)

What number is shown? (Have pictures of blocks or actual blocks)

What is expanded form of this number?

Lesson 7

Launch:

I have $15.00 and my friend has $10.00 more than me? How much does she have? If I get my allowance and now have $25.00 and my friend has $10.00 less than me how much does she have?

Explore:

Individually students will use the base ten blocks to model a number that is 10 more than a given number. We will start with two-digit numbers and work up to three-digit numbers.

Share:
Students share with a partner what they got as a answer for.

Explore:
Individually students will continue with the base ten blocks and model 10 less than a number.

Share:
Students share with partners their findings.

Summarize:
Come back together as a whole class and discuss ten more than and ten less than a number. So today we have been working with ten more than and ten less than a number. So back at the beginning today I had $15.00 and my friend had $10.00 more than me, you told me that $10.00 more than $15.00 is $25.00 and $10.00 less than $25.00 is $15.00, Do you still think that is correct? What is I had $12.00, what would $10.00 more and less than that be?

Lesson 8
Launch:
Remember yesterday we were talking about money in the tens place? Today we are rich! We have money in the hundreds. I have $345.00 and Mrs. Marsyla has a hundred less then me (she's a third grade teacher so she is older). How much money does Mrs. Marsyla have today? Yesterday she had a hundred dollars less than I did because she likes to spend money. How much money did she have yesterday?

Explore:
Individuals will use base ten blocks to show a hundred more than a given number.

Share:
Today we will share our thoughts and findings with the whole class.

Explore:
Individuals with the base ten blocks students will show a hundred less than a given number.
Share:

We will come back together as a class and share our findings.

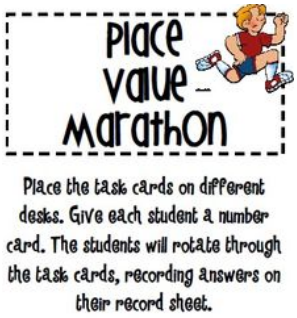
Summarize:
What have we all found when we add or subtract 100 from any number? I can see that you have found out that the only place value that changes when adding 100 or subtracting 100 only the digit in the hundreds place change.

Lesson 9: (3rd Grade, 2nd Grade Extension)
Launch:
The past couple of days we have been working with ten and hundred more and less than numbers. Today I would love it if you could help me with this problem. My brother wanted to buy my dad a birthday present that was $45,000, but he only had $35,000. How much money do you think he asked me for?

Explore/Share/Summarize:
Repeat lesson 8 using thousands, ten-thousands, and hundred-thousands.

Lesson 10:
Launch:
Who knows what a marathon is? A marathon is working for a long time to complete the task at hand. We are going to do this today except we are not running but finding as many place values that we can.

Explore:
Place Value Marathon. Individual students will be given a number and asked to complete a number of task cards in regards to their number. Tasks include: Identifying the number in a given place, the value of a number in a given place, rounding a number, writing the number in expanded form and in word form.



Click on picture for the link to Teachers Pay Teachers.

Share:

Who can tell me about what they found when running your marathon? Students would be coming up to show the class what they did and how they were able to follow along with the marathon of directions.

Lesson 11/12:

Launch:

So we have been working so much with place value I bet you are thinking that all we do is write numbers and play with blocks. While that happens to be lots of fun I want to show you something else we can do with place value today. You still get to use your blocks but today we get to use them to add.

Explore:

Individuals will start by making numbers with their base ten blocks (two digit).

Share:

Have partners share their models and check the other person's model to make sure they have it correct. Have two sets of pairs get together to check each other.

Summarize:

Bring the class together and review modeling two digit numbers.

Explore:

Give pairs of students two two digit numbers to model and add together. As a teacher you should be walking between the groups to see how the pairs are doing.

Share:

Have students share with you the thought process they have when trying to add the two digit numbers.

Explore:

Have groups of students explore with multiple examples all written on the board so the groups can work at their own pace. Have the students come up with multiple ways students can write the addition problem that will make it a simpler problem to solve.

Share:

Come together as a class to discuss how to write and solve the two digit addition problems.

Summarize:

Restate how helpful base ten blocks can be in solving two digit addition problems.

Post Assessment:

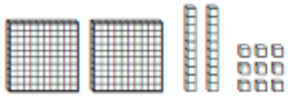
Write the number that is shown by the models.

1  How many hundreds?_____How many tens?_____

How many ones? _____ What is the number? _____

2  How many hundreds?_____How many tens?_____

How many ones?_____ What is the number? _____

3  How many hundreds?_____How many tens?_____

How many ones? _____What is the number? _____

1. Build 500

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ + _____ = _____

4. Write the number in standard form _____

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1. Build 2,148

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ + _____ + _____ = _____

4. Write the number in standard form _____

Name _____

Place Value Skill Check

Write the number in standard form:

1. forty-seven thousand, nine hundred twelve _____

2. five hundred forty-six thousand, three _____

Write the number in word form:

3. 7,068 _____

4. 992 _____

Write the number in expanded form:

5. 3,728

6. 400,305

Write the number in standard form:

7. 40,000 + 2,000 + 20 _____

8. 800,000 + 60,000 + 3,000 + 200 + 4 _____

Balanced Equations

2nd Grade Standards 2.1.2.4 Use mental strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers. Strategies may include decomposition, expanded notation, and partial sums and differences.

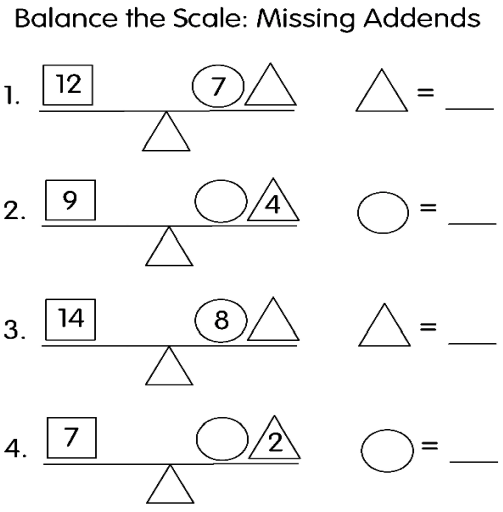
3rd Grade Standards 3.1.2.5 Use strategies and algorithms based on knowledge of place value, equality and properties of addition and multiplication to multiply a two- or three-digit number by a one-digit number. Strategies may include mental strategies, partial products, the standard algorithm, and the commutative, associative, and distributive properties.

Lesson 1

Launch:

Do you like candy? I love candy!!! Well as you know I have a little brother and when we were growing up we would always have to share our Halloween candy. My brother always tried to take more candy than me, and I would get so mad. Have you ever had that happen to you? When I share I want to get the same amount as the other person. Do you know what that is called?

*Pre Assessment



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Lesson 2:

Explore:

As a whole class start with a Pan balance scale and ask the students how we might show the following problem. If I have three pieces of candy on this side how many pieces of candy need to go on the other side for my brother?

Share:

Students will share their thoughts of the amount of candy and how they may get that answer.

Explore:

Work in groups with blocks to explore different ways to make numbers.

Share:

Share with the class the different ways the groups got different numbers. Summarize in groups what the conclusions can be drawn.

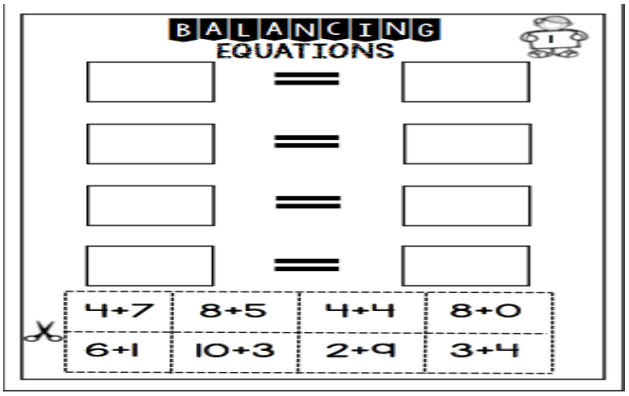
Explore:

Individuals create flowers for numbers with equations balanced. (ex. 12 in the center-each petal is a different way to get to twelve).

Share:

Have students share with partners how they chose what the petals were going to be for their given number. Then have groups share with the class their different flowers and create a flower garden bulletin board. Titled “Our flowers are all balanced”

Summarize: Teacher summarizes the class understanding by restating what they have said and give a couple more examples to work through and share thoughts to show understanding.



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Lesson 3:

Launch:

I went into the kitchen to find some fruit to eat as a snack. I put five strawberries on a plate, three cherries and two kiwi's. I want to make a plate for my friend with the same fruit. First I put three cherries and two kiwi's. Who can help me figure out what else I need to put on my plate to make both of them the same. (5+3)+2= _____ + (3+2).

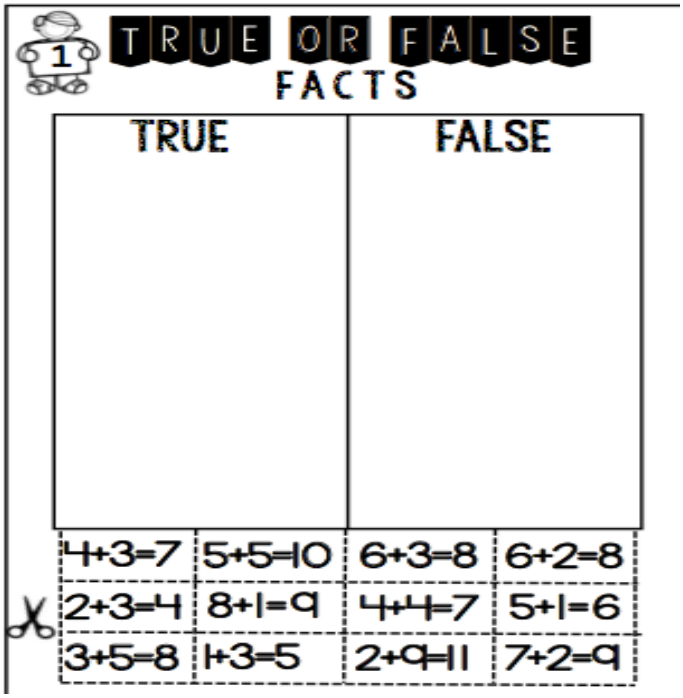
Explore: Do a couple similar examples as the whole class and then as small groups. Eventually students will do examples on their own.

Share: I would have students come up to the board with an equation that they found and explain what they did to make sure that the two equations were equal.

Lesson 4:

Explore:

Practice with balancing equations. True/False worksheet.



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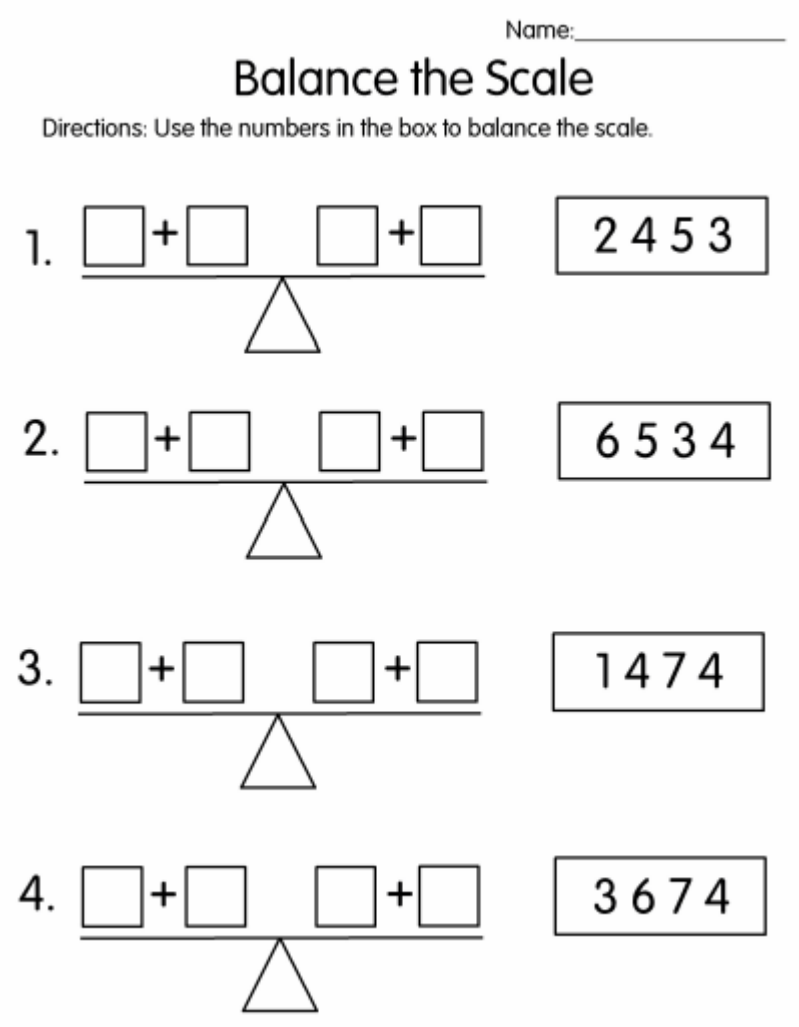
Share:

Students would then need to justify where they put the equations. By explaining where the equations, the students will show they are understanding the process of balancing equations.

Post Assessment:



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Fractions

2nd Grade Standards:

No standards at 2nd grade level. All 2nd grade instruction is exposure to the thoughts of halves and quarters.

3rd Grade Standards:

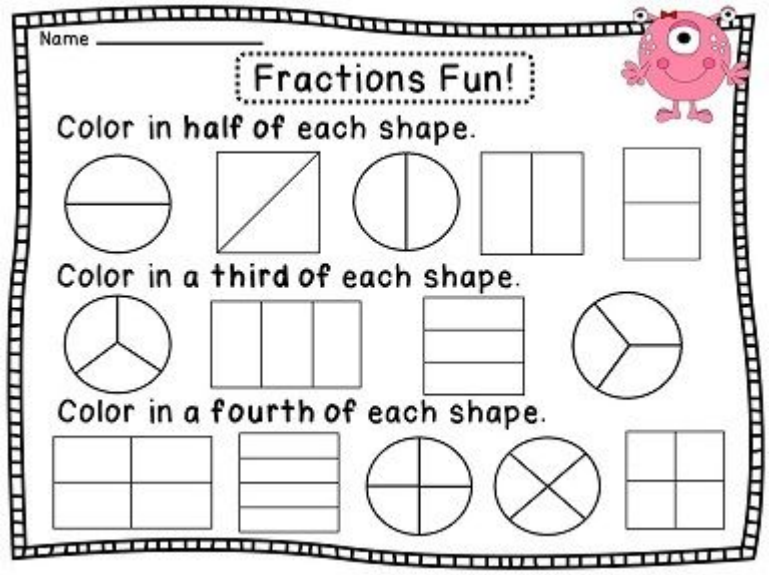
3.1.3.1 Read and write fractions with words and symbols. Recognize that fractions can be used to represent parts of a whole, parts of a set, points on a number line, or distances on a number line.

3.1.3.2 Understand that the size of a fractional part is relative to the size of the whole.

3.1.3.3. Order and compare unit fractions and fractions with like denominators by using models and an understanding of the concept of numerator and denominator.

(Unit 5, 7)

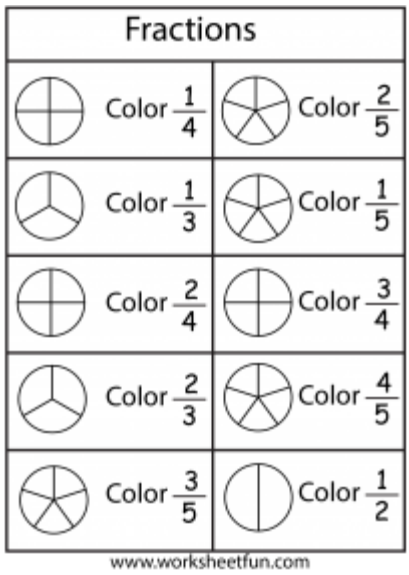
Pre Assessment:



*2nd Grade Pre-assessment

Cite:

https://www.google.com/search?q=fraction+sort&biw=1167&bih=589&tbm=isch&imgil=EScQcz-AKYoWXM%253A%253BXppr1ZVM3nZ_dM%253Bhttp%25253A%25252F%25252Fkidspressmagazine.com%25252Fcool-math%25252Fworksheets%25252Ffractions-2%25252Ffraction-sort.html&source=iu&pf=m&fir=EScQcz-AKYoWXM%253A%252CXppr1ZVM3nZ_dM%252C_&usg=__S6riIFt3QnUPSap5DyKyIpA_qgA%3D&ved=0ahUKEwiA_oaq7svNAhVk0YMKHcwIDQ8QyjcIKA&ei=dAZzV4D0KOSijwTMkbR4#imgdii=QKcHzXFIKJ0fvM%3A%3BQKcHzXFIKJ0fvM%3A%3B--Qk-QilixBdqM%3A&imgrc=QKcHzXFIKJ0fvM%3A



*3rd Grade pre-assessment

Lesson 1:

Launch:

Ms. Hurner and I got together for dinner last night and we shared a pizza. Well I don't know about you but when I share I want to make sure we have the same amount, I don't want Ms. Hurner to get more than me. If our whole pizza has 8 slices, how many slices should Ms. Hurner and I each get.

Explore:

We will begin as a whole class. What shape is a pizza? What shape our our pieces? How many pieces do we have? How can we fit 8 triangles into a circle? Students will draw on their whiteboards their thoughts?

3rd Grade would use their fraction circle manipulatives.

Share:

After a few minutes students will come back together and discuss what they found and if they were able to get 8 triangles to fit into a circle.

Summarize:

Is there any other way that you are able to cut the pizza into 8 pieces? Why would we not be able to divide the pizza into 8 pieces any other way? So when you make 8 pieces in a different way is it fair and equal for all the people who are getting slices of pizza?

Lesson 2/3:

Launch: Refresh the class of the our problem yesterday about two people sharing a pizza. How many pieces should both of us have gotten if we were sharing the pizza equally? Well let me tell you Ms. Hurner and I only had 2 slices each last night so how much of the pizza did each of us eat? How much did we eat together? How much of the pizza did we have left over?

This is a great fraction song that can be used.https://www.youtube.com/watch?v=DnFrOetuUKg

Explore:

As a class we will create the following poster that will hang in our class for the rest of the unit. So now let's take a look a different ways to show fractions. Start with our whole (red circle) and what would show 2 pieces of the whole? How would we write what one pink piece represents (one-half) in words? Is there another way to write one half? Complete the whole poster as a class by having the students find the different fraction circle pieces.

Share:

Students will share with a partner some conclusions they can make about all of the pieces. What might they all make?

Summarize:

Summarize that all of the individual colors when put together with as one color equal a red piece (whole).

Lesson 4:

Launch:

Remember yesterday how we made our poster. You did such a nice job helping me make that, I could not have done it one my own. Thanks! At the end of Math yesterday you had made a discovery. You had discovered that all of the pieces equal a red piece (whole circle). I think that is pretty awesome that you were able to figure that out on your own. Today I want to see if we can discover more equal fractions. I hope you are up for the challenge!

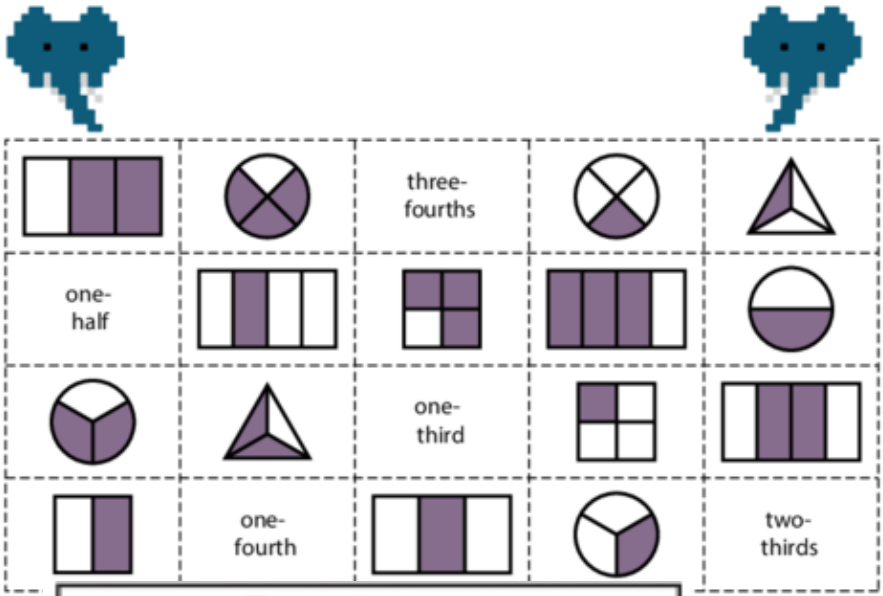
Explore:

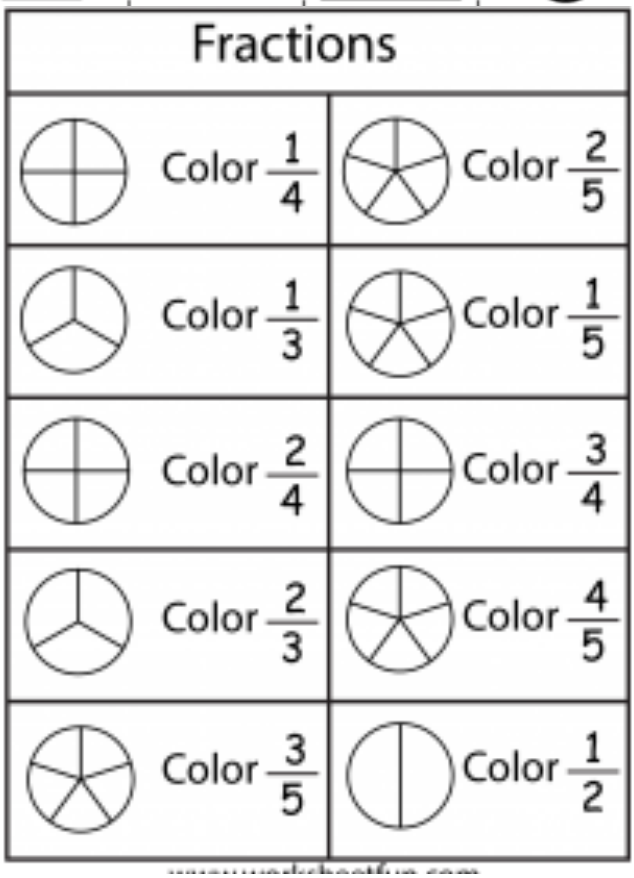
Equivalent Fractions: 2nd grade would work as a whole class to discuss equivalent fractions. In 3rd grade we will start by getting our fraction circles all out and in complete circles. In groups of

three or four students will start to move around the pieces to find what other circles are equal. If individual groups seem to be struggling the teacher can give them an example using the halves (pink) circle, but don't start the class with this example see what they can find on their own when given the challenge to discover something.

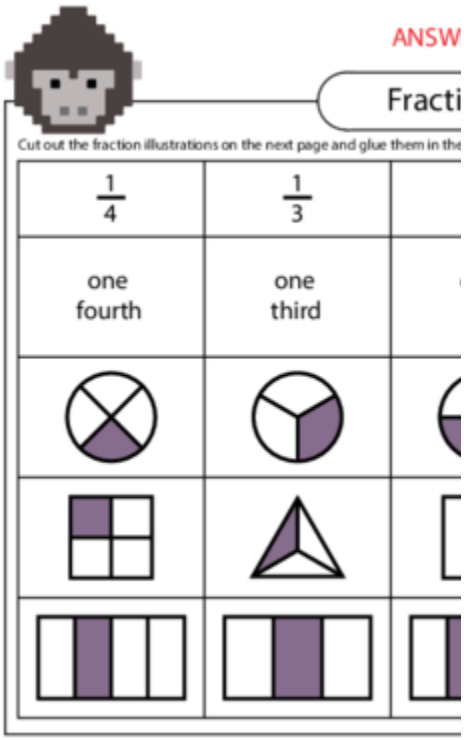
Share:

Groups will have one person come to the board and draw examples of equivalent fractions.





Post Assessment: 3rd grade post assessment is on the next page.



3rd Grade Post Assessment

Debi Christensen,
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Erin Marsyla

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Special Education, 2nd Grade, 3rd Grade

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Math Class is 1.5 hours daily

Executive Summary:

The following units were created to help students develop problem solving and critical thinking skills. As 2nd and 3rd grade teachers we use manipulatives to foster exploration and understanding of various problems. Unifex cubes become hot and cold cubes to explore temperature and positive and negative numbers, as well as cubes with a value of one to explore and discover balancing equations. In the lessons students will explore concepts of temperature, place value, balancing equations and fractions both concretely with manipulatives in groups and individually. With every new discovery students will be given the chance to share with classmates and the class as a whole their thinking and process to coming to a conclusion. These lessons will supplement the 2nd and 3rd grade Everyday Math curriculum. Our math instruction time is an hour and a half five days a week, so we will on most occasions be using the lessons in groups of two. We have included assessments to continue to analyze and reflect on our teaching throughout the units. After teaching the lessons we will analyze, reflect and modify as necessary.

Unit Thermometer (positive and negative integers) {2nd Grade Unit 5} [3rd Grade Unit 4]

The Thermometer Unit below takes about 4 lessons. This unit is introducing and comparing positive and negative numbers.

Unit Place Value (100,000's,10,000's,1,000's, 100's, 10's and 1's) {2nd Grade Unit 4,6} [3rd Grade standards supplemented into the curriculum]

The Place Value Unit below takes about 12 lessons. In this unit students will explore and establish an understanding for place value up to the 100,000's place.

Unit Balanced Equations {2nd Grade Unit } [3rd Grade Unit 3]

The Balanced Equations Unit below takes about 4 lessons. In this unit students will explore and establish an understanding of the equal sign and balancing equations involving the commutative property, associative property and the order of operations.

Unit Fractions {2nd Grade - Supplementary introduction} [3rd Grade Unit 5-7}

The Fractions Unit below takes about 4 days. In this unit students will explore fractions relating to a whole and equivalent fractions.

Here are some MCA test questions examples:

9. Which number has a 5 in the ten thousands place?

Ⓐ 104,352
Ⓑ 365,971
Ⓒ 582,607
Ⓓ 951,480

© 21

14. Ellen has a vase of flowers.

- $\frac{1}{8}$ are red.
- $\frac{1}{3}$ are blue.
- $\frac{1}{6}$ are purple.
- $\frac{1}{4}$ are yellow.

Which is the greatest fraction?

Ⓐ $\frac{1}{8}$
Ⓑ $\frac{1}{3}$
Ⓒ $\frac{1}{6}$
Ⓓ $\frac{1}{4}$

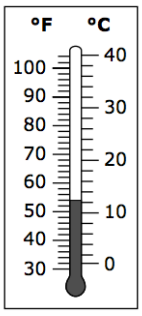
2. There are 23,650 people in a stadium.

The stadium can hold 1,000 more people.

How many people can the stadium hold?

Ⓐ 22,650
Ⓑ 23,750
Ⓒ 24,650
Ⓓ 33,650

23. A thermometer is shown.



What temperature is shown on the thermometer?

Ⓐ 11°C
Ⓑ 12°F
Ⓒ 54°C
Ⓓ 54°F

Table of Contents:

Temperature (Positive and Negative Integers)

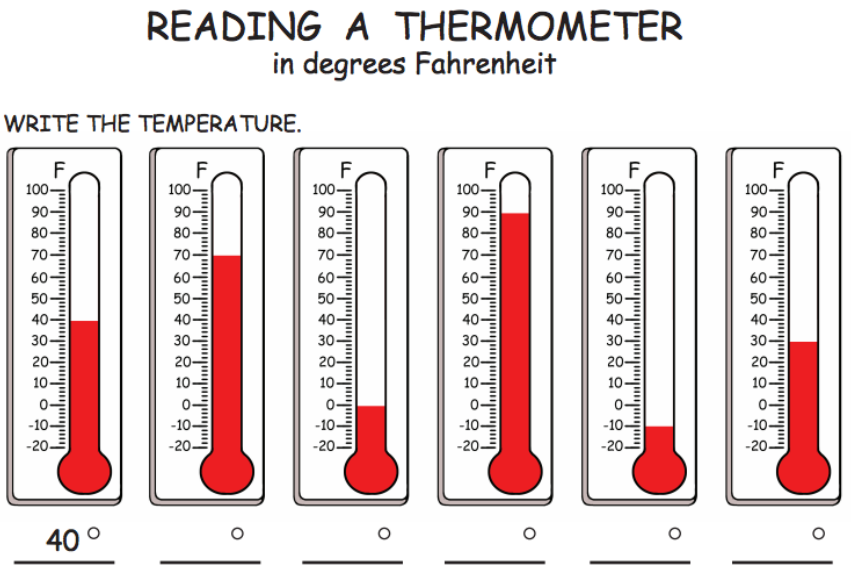
{2nd Grade Unit 5} [3rd Grade Unit 4]
2nd Grade Standards- 2.1.2.5 Solve real-world and mathematical addition and subtraction problems involving whole numbers with up to 2 digits. (Unit
3rd grade Standards- 3.3.3.4 Use an analog thermometer to determine temperature to the nearest degree in Fahrenheit and Celsius. (Unit 4)

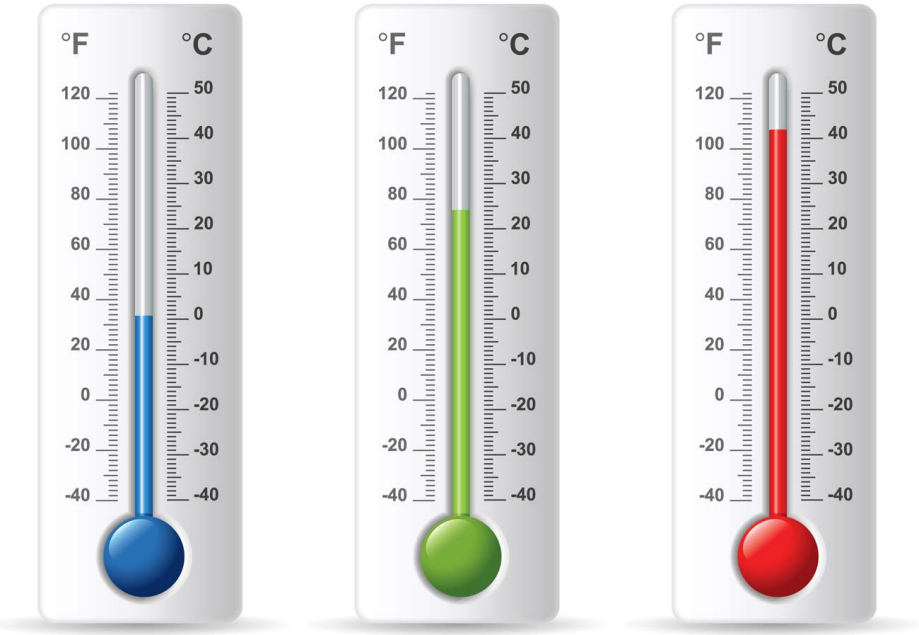
Lesson 1/2:
Launch:
(2nd Grade) Who likes summer when it's hot out? How about winter? I hate to be cold I would love it if it was hot all year around. Do we know what a hot temperature looks like?

As a whole class we will track the temperature of Crookston and one other place in Minnesota that the class chooses. We will have a thermometer outside our classroom window to collect the data.

(3rd Grade - extension)
In groups students will choose 3 places around the world where they will collect temperature or a given time period. The students will be given the best website to collect the temperature from and will be expected to collect the data each day for two weeks After the collection is complete they will create displays of their data in frequency tables, line plots and other graphs.

Pre-assessment: This would be done after the launch so I as the teacher will be able to see if the students will be able to accurately read temperature on a thermometer. (3rd I would find an example with Fahrenheit and Celsius.





Explore:
I will have thermometers set up around the room and have students walk around and see different temperatures.
We would then come back to the carpet and discuss what they have seen.

Whole Group Explore:
Use unifix cubes to represent hot and cold. In groups students will figure out the difference from the warmer temperature to the colder temperature. The students would also have a ruler that would show where the zero value is.

Share:
What discoveries did you make about temperature?

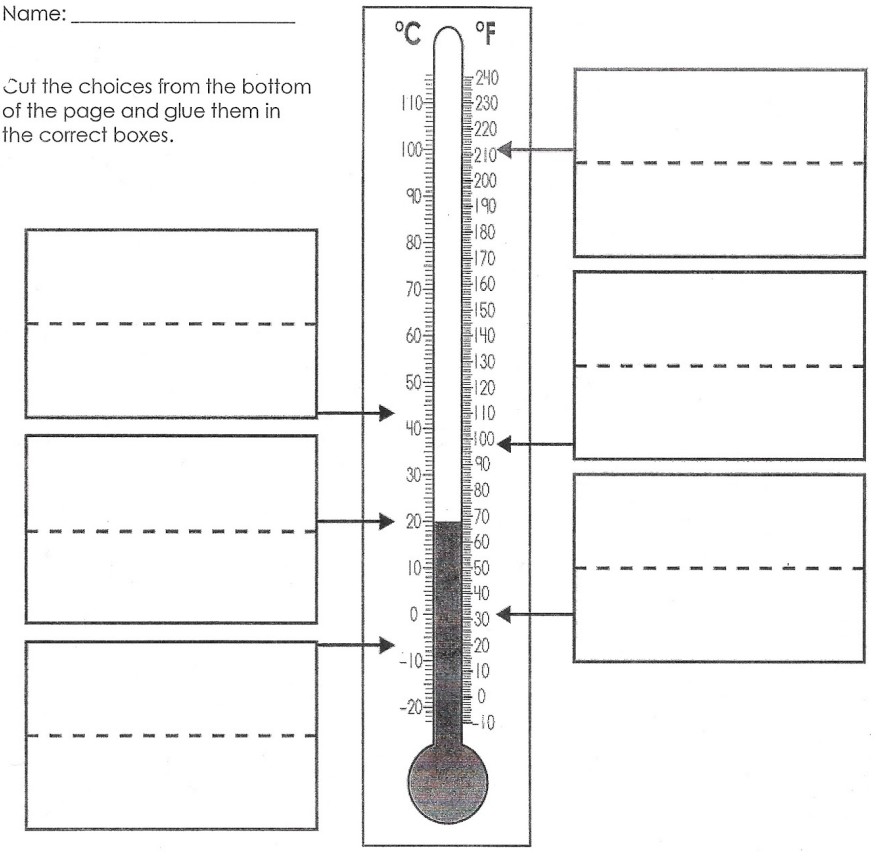
Summarize:
I would make sure that students saw distinct differences between positive and negative temperatures.

Lesson 3:
Launch:
We have been talking about temperature just in terms of weather. What other places do temperature affect?

Explore:
This would be done whole group in 2nd grade and in groups of 4 in 3rd grade.

Name: _____

Cut the choices from the bottom of the page and glue them in the correct boxes.



Human Body Temperature	Snowy Day Temperature	Indoor Room Temperature	Water Freezing Temperature
110° F 43° C	32° F 0° C	98.6° F 37° C	212° F 100° C
Water Boiling Temperature	68° F 20° C	Bath Water Temperature	20° F -7° C

Share:

Students would describe how the decided where the information pieces needed to be placed on the thermometer. There would be a number of different steps in a process to all get to the same end results.

Summarize:

Temperature is important in many different situations. We have now found some ways temperature affects places.

Lesson 4:

Launch:

Remember how we went outside for the last week and made a table of the temperatures for each day. Well today you are going to find the difference in temperature between Minneapolis and Crookston.

Explore:

Students will be using the temperatures that have been collected in the classroom for the previous week. I will have them use the unifix cubes like the previous lesson but they would be doing the problems with manipulatives on their own. Once a problem is solved, they would draw a picture of what their answers.

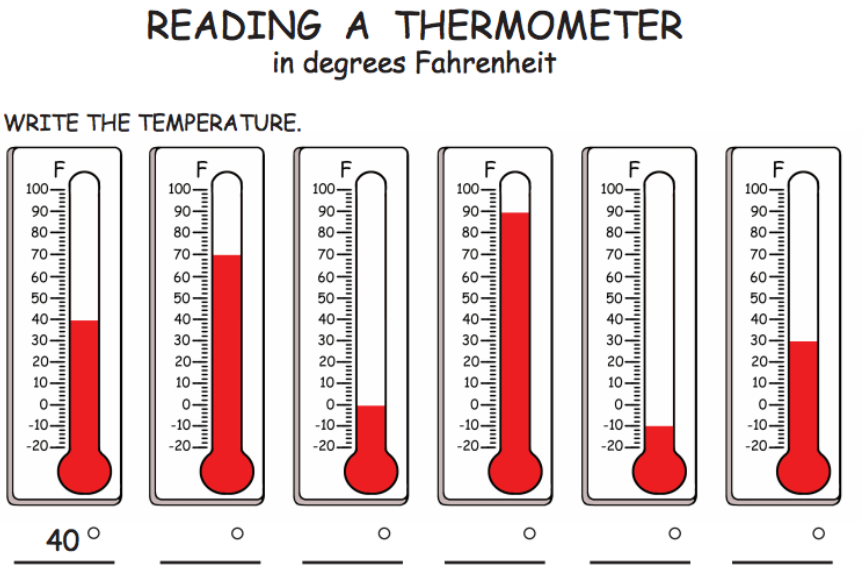
Share:

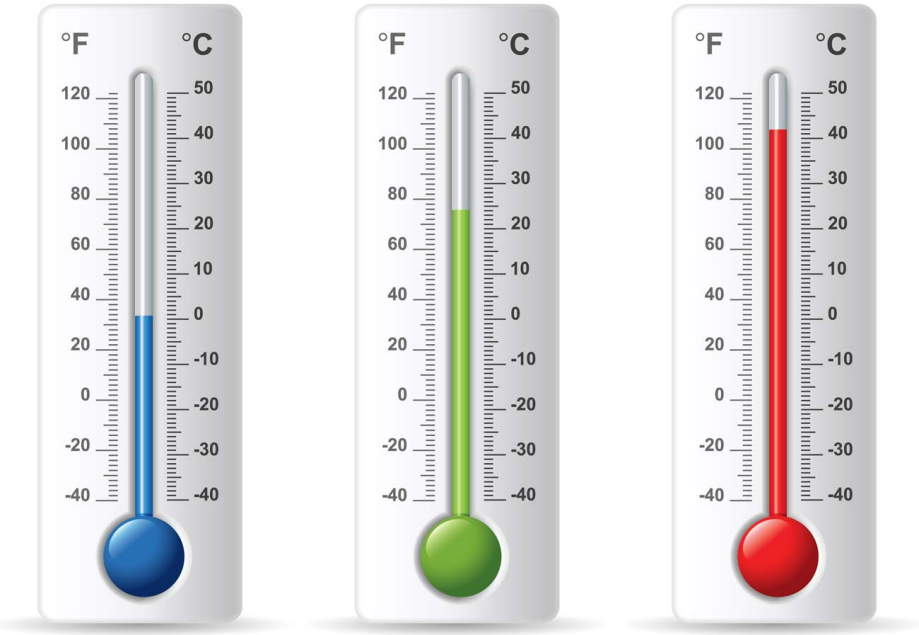
Students would volunteer to come up to the board and show the way they found one of their answers. By having the students explain to the rest of the class, they are cementing their own understanding and helping other students hear another way of explaining the answer.

Summarize:

As a whole group, I would be able to clarify and put all the information that was shared yesterday into focus their understandings. Students would be the ones up at the information they found and I would put the information together in a neat presentation.

Post Assessment:





Place Value

{2nd Grade Unit 4, 6} [3rd Grade standards supplemented into the curriculum]

2nd Grade Standards

2.2.1.2 - Use place value to describe whole numbers between 10 and 1000 in terms of hundreds, tens and ones. Know that 100 is 10 tens, and 1000 is 10 hundreds.

2.1.1.3 Find 10 more or 10 less than a given three-digit number. Find 100 more or 100 less than a given three-digit number.

2.1.2.4 Use mental strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers. Strategies may include decomposition, expanded notation, and partial sums and differences.

3rd Grade Standards

3.1.1.1 Read, write and represent whole numbers up to 100,000. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives such as bundles of sticks and base 10 blocks.

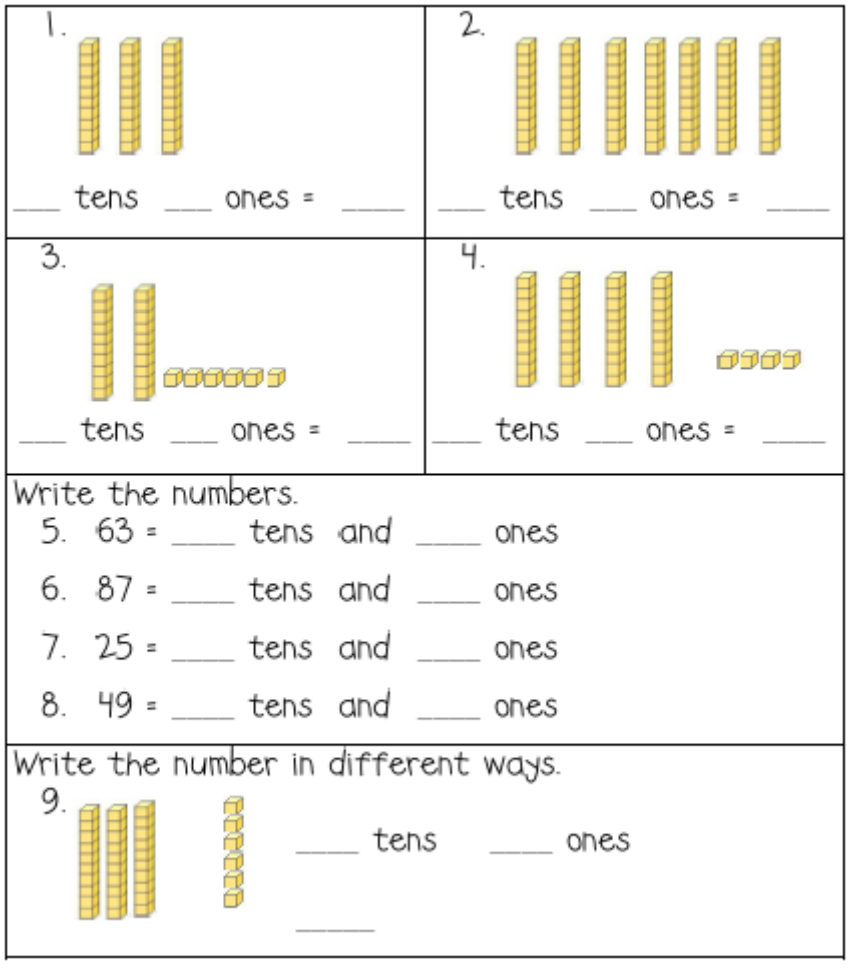
3.1.1.2 Use place value to describe whole numbers between 1000 and 100,000 in terms of ten thousands, thousands, hundreds, tens and ones.

3.1.1.3 Find 10,000 more or 10,000 less than a given five-digit number. Find 1000 more or 1000 less than a given four- or five-digit. Find 100 more or 100 less than a given four- or five-digit number. (Not represented in the Everyday Math Curriculum so we supplement this in September)

Note Standard form and expanded form have been taught previously to this lesson.

Lesson 1:

Pre-assessment:



1. Build 75

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ = _____

4. Write the number in standard form _____

---

1. Build 40

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ = _____

4. Write the number in standard form _____

1. Build 606

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ + _____ = _____

4. Write the number in standard form _____

---

1. Build 316

2. Draw a picture of the blocks

3. Expand each number using digits

_____ = _____ + _____ + _____

4. Write the number in standard form _____

Launch:
https://www.youtube.com/watch?v=21l3Jg5_MCg
I would show this short video to peak the interest of the students with place value. It states the place values of: ones, tens, hundreds and thousands.

Share:
Students need to show that they understand the order of place value before you go any further.

Explore:
Students will bring their whiteboards, markers and erasers to the carpet. I will be putting a number on the board. Ex. 156 - I will ask students to please underline the ones place, circle the digit in the hundreds place, and put an x over the number in the tens place. In third grade you would expand into 1,000s, 10,000s, and 100,000s. By doing a number of examples of this, we are able to see which students are struggling.

Share:
Numbers would be placed on the board. Volunteers would come up to the board and follow the directions of underlining, circling and x out the different place values.

Summarize:
Do we now know the place of each digit? When we read out our number, do we say some of our place values?

Lesson 2/3:
Launch:
I found a box of marbles in the basement of my new house. There were 9 large bags of marbles, each bag had 100 marbles. Then there were some medium bags that held 10 marbles in it. There were 6 medium bags. Finally in the bottom of the box, I found 2 small bags with only one marble in each bag. Please show me on your boards how many marbles I found

Explore:
In groups of 4 students will use the place-value mats, dry erase boards, and base ten blocks to create numbers written on a index card with their base ten blocks.

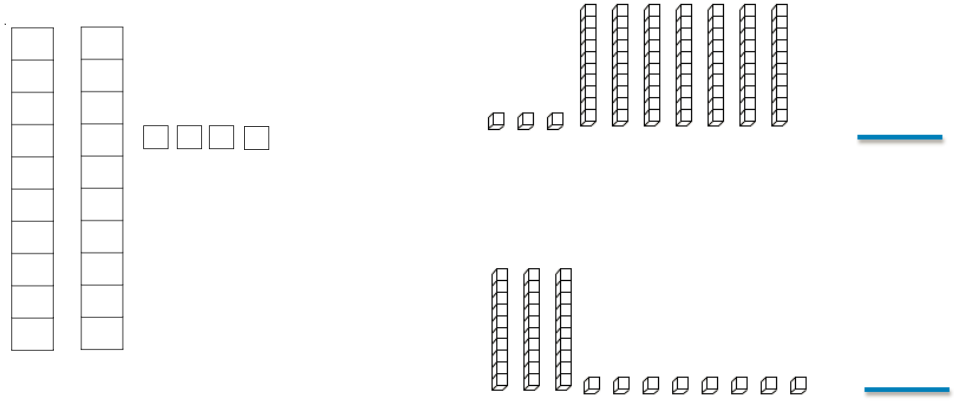
Share:
We will be using Ones, Tens, Hundreds

What place-value model is shown?

What number is shown?

What is the expanded form of that number?

What number is shown?_____



Summarize:
After students have had a chance to use their base ten blocks to explore and share with partners the different numbers. We will come back together as a whole class and discuss our conclusions.

Lesson 4/5:
Launch:
Do you like to play games? I love to play games, I especially love it when I win! Today we get to play a card game, and the best part we are all going to be winners. Go over the directions for playing Making 100's!

Explore:
Making 100's! In groups of two, start with the Math Card deck (take out the double digit cards, use 0-9). Flip three cards over. The person who flips the cards over will read the number cards and the person's partner will create the number with base ten blocks, and write the number in standard form. For the next turn the students will change jobs.

Share:
As a class we will share some of the conclusions we can make from playing the game. While we are really practicing writing and reading the place values of ones, tens, and hundreds we will discuss some patterns the students may see (the largest digit in any place is 9).

Summarize:
We will gather and quickly review the place values before the students complete the partial post test to assess the understanding after the five lessons.

Partial Post Test

Complete each place value chart. Then write the word name for the number.

1.

standard form	hundreds	tens	ones
514			

_____

2.

standard form	hundreds	tens	ones
367			

_____

3.

standard form	hundreds	tens	ones
903			

_____

Lesson 6:

Launch:

https://www.youtube.com/watch?v=NwHwsPq7DVY This song goes up to hundred millions which is past 2nd and 3rd grade standards but it will help them to see where they are going. This song is expanding what they already learned from the previous lessons.

Explore:

In groups of two we will now add thousands, ten-thousands and hundred thousands are added to the mix.

What place-value model is shown? (Standard Form)

What place-value model shows (Have pictures of blocks or actual blocks)

What number is shown? (Have pictures of blocks or actual blocks)

What is expanded form of this number?

Lesson 7

Launch:

I have $15.00 and my friend has $10.00 more than me? How much does she have? If I get my allowance and now have $25.00 and my friend has $10.00 less than me how much does she have?

Explore:

Individually students will use the base ten blocks to model a number that is 10 more than a given number. We will start with two-digit numbers and work up to three-digit numbers.

Share:
Students share with a partner what they got as a answer for.

Explore:
Individually students will continue with the base ten blocks and model 10 less than a number.

Share:
Students share with partners their findings.

Summarize:
Come back together as a whole class and discuss ten more than and ten less than a number. So today we have been working with ten more than and ten less than a number. So back at the beginning today I had $15.00 and my friend had $10.00 more than me, you told me that $10.00 more than $15.00 is $25.00 and $10.00 less than $25.00 is $15.00, Do you still think that is correct? What is I had $12.00, what would $10.00 more and less than that be?

Lesson 8
Launch:
Remember yesterday we were talking about money in the tens place? Today we are rich! We have money in the hundreds. I have $345.00 and Mrs. Marsyla has a hundred less then me (she's a third grade teacher so she is older). How much money does Mrs. Marsyla have today? Yesterday she had a hundred dollars less than I did because she likes to spend money. How much money did she have yesterday?

Explore:
Individuals will use base ten blocks to show a hundred more than a given number.

Share:
Today we will share our thoughts and findings with the whole class.

Explore:
Individuals with the base ten blocks students will show a hundred less than a given number.
Share:

We will come back together as a class and share our findings.

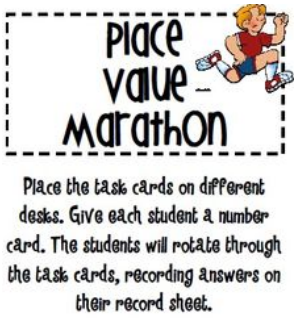
Summarize:
What have we all found when we add or subtract 100 from any number? I can see that you have found out that the only place value that changes when adding 100 or subtracting 100 only the digit in the hundreds place change.

Lesson 9: (3rd Grade, 2nd Grade Extension)
Launch:
The past couple of days we have been working with ten and hundred more and less than numbers. Today I would love it if you could help me with this problem. My brother wanted to buy my dad a birthday present that was $45,000, but he only had $35,000. How much money do you think he asked me for?

Explore/Share/Summarize:
Repeat lesson 8 using thousands, ten-thousands, and hundred-thousands.

Lesson 10:
Launch:
Who knows what a marathon is? A marathon is working for a long time to complete the task at hand. We are going to do this today except we are not running but finding as many place values that we can.

Explore:
Place Value Marathon. Individual students will be given a number and asked to complete a number of task cards in regards to their number. Tasks include: Identifying the number in a given place, the value of a number in a given place, rounding a number, writing the number in expanded form and in word form.



Click on picture for the link to Teachers Pay Teachers.

Share:

Who can tell me about what they found when running your marathon? Students would be coming up to show the class what they did and how they were able to follow along with the marathon of directions.

Lesson 11/12:

Launch:

So we have been working so much with place value I bet you are thinking that all we do is write numbers and play with blocks. While that happens to be lots of fun I want to show you something else we can do with place value today. You still get to use your blocks but today we get to use them to add.

Explore:

Individuals will start by making numbers with their base ten blocks (two digit).

Share:

Have partners share their models and check the other person's model to make sure they have it correct. Have two sets of pairs get together to check each other.

Summarize:

Bring the class together and review modeling two digit numbers.

Explore:

Give pairs of students two two digit numbers to model and add together. As a teacher you should be walking between the groups to see how the pairs are doing.

Share:

Have students share with you the thought process they have when trying to add the two digit numbers.

Explore:

Have groups of students explore with multiple examples all written on the board so the groups can work at their own pace. Have the students come up with multiple ways students can write the addition problem that will make it a simpler problem to solve.

Share:

Come together as a class to discuss how to write and solve the two digit addition problems.

Summarize:

Restate how helpful base ten blocks can be in solving two digit addition problems.

Post Assessment:

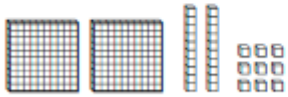
Write the number that is shown by the models.

1  How many hundreds?_____How many tens?_____

How many ones? _____ What is the number? _____

2  How many hundreds?_____How many tens?_____

How many ones?_____ What is the number? _____

3  How many hundreds?_____How many tens?_____

How many ones? _____What is the number? _____

1. Build 500

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ + _____ = _____

4. Write the number in standard form _____

---

1. Build 2,148

2. Draw a picture of the blocks

3. Expand each number using digits

_____ + _____ + _____ + _____ = _____

4. Write the number in standard form _____

Name _____

Place Value Skill Check

Write the number in standard form:

1. forty-seven thousand, nine hundred twelve _____

2. five hundred forty-six thousand, three _____

Write the number in word form:

3. 7,068 _____

4. 992 _____

Write the number in expanded form:

5. 3,728

6. 400,305

Write the number in standard form:

7. 40,000 + 2,000 + 20 _____

8. 800,000 + 60,000 + 3,000 + 200 + 4 _____

Balanced Equations

2nd Grade Standards 2.1.2.4 Use mental strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers. Strategies may include decomposition, expanded notation, and partial sums and differences.

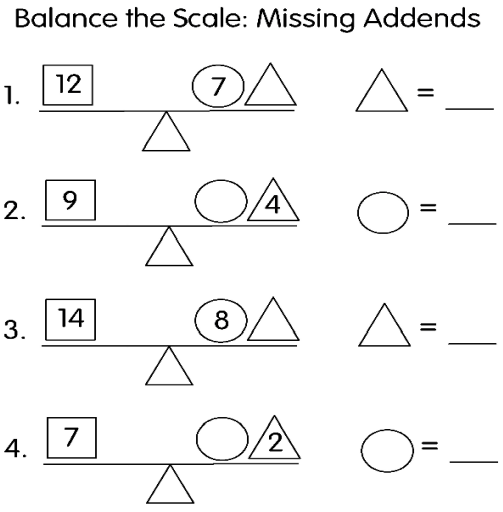
3rd Grade Standards 3.1.2.5 Use strategies and algorithms based on knowledge of place value, equality and properties of addition and multiplication to multiply a two- or three-digit number by a one-digit number. Strategies may include mental strategies, partial products, the standard algorithm, and the commutative, associative, and distributive properties.

Lesson 1

Launch:

Do you like candy? I love candy!!! Well as you know I have a little brother and when we were growing up we would always have to share our Halloween candy. My brother always tried to take more candy than me, and I would get so mad. Have you ever had that happen to you? When I share I want to get the same amount as the other person. Do you know what that is called?

*Pre Assessment



Cite: Pinterest.com

Lesson 2:

Explore:

As a whole class start with a Pan balance scale and ask the students how we might show the following problem. If I have three pieces of candy on this side how many pieces of candy need to go on the other side for my brother?

Share:

Students will share their thoughts of the amount of candy and how they may get that answer.

Explore:

Work in groups with blocks to explore different ways to make numbers.

Share:

Share with the class the different ways the groups got different numbers. Summarize in groups what the conclusions can be drawn.

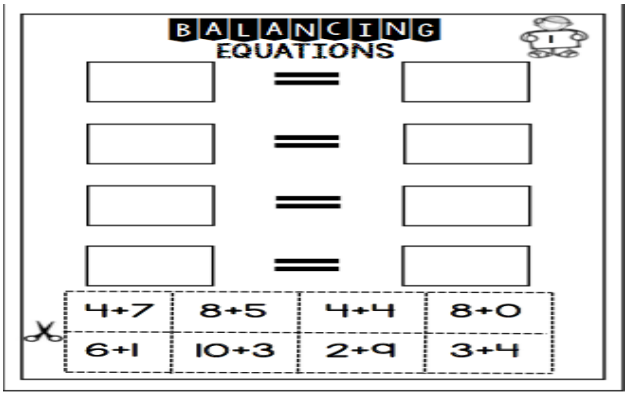
Explore:

Individuals create flowers for numbers with equations balanced. (ex. 12 in the center-each petal is a different way to get to twelve).

Share:

Have students share with partners how they chose what the petals were going to be for their given number. Then have groups share with the class their different flowers and create a flower garden bulletin board. Titled “Our flowers are all balanced”

Summarize: Teacher summarizes the class understanding by restating what they have said and give a couple more examples to work through and share thoughts to show understanding.



Cite: Pinterest.com

Lesson 3:

Launch:

I went into the kitchen to find some fruit to eat as a snack. I put five strawberries on a plate, three cherries and two kiwi's. I want to make a plate for my friend with the same fruit. First I put three cherries and two kiwi's. Who can help me figure out what else I need to put on my plate to make both of them the same. (5+3)+2= _____ + (3+2).

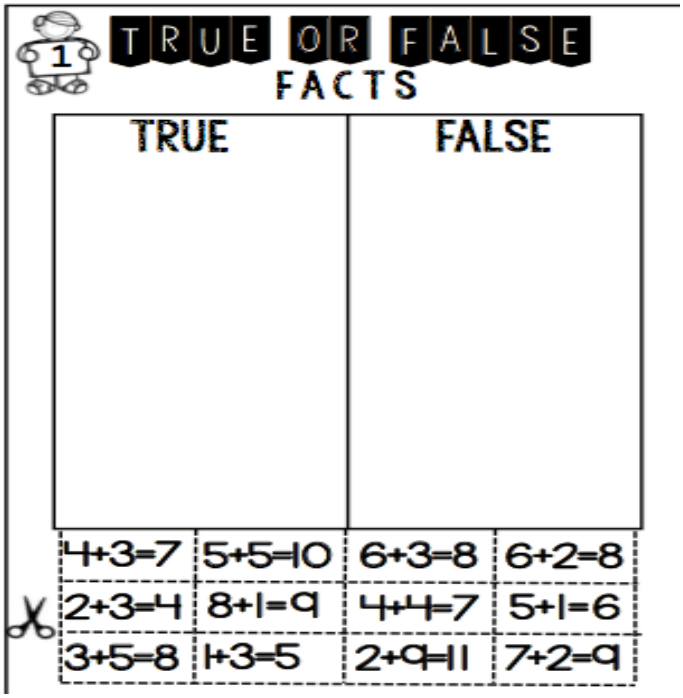
Explore: Do a couple similar examples as the whole class and then as small groups. Eventually students will do examples on their own.

Share: I would have students come up to the board with an equation that they found and explain what they did to make sure that the two equations were equal.

Lesson 4:

Explore:

Practice with balancing equations. True/False worksheet.

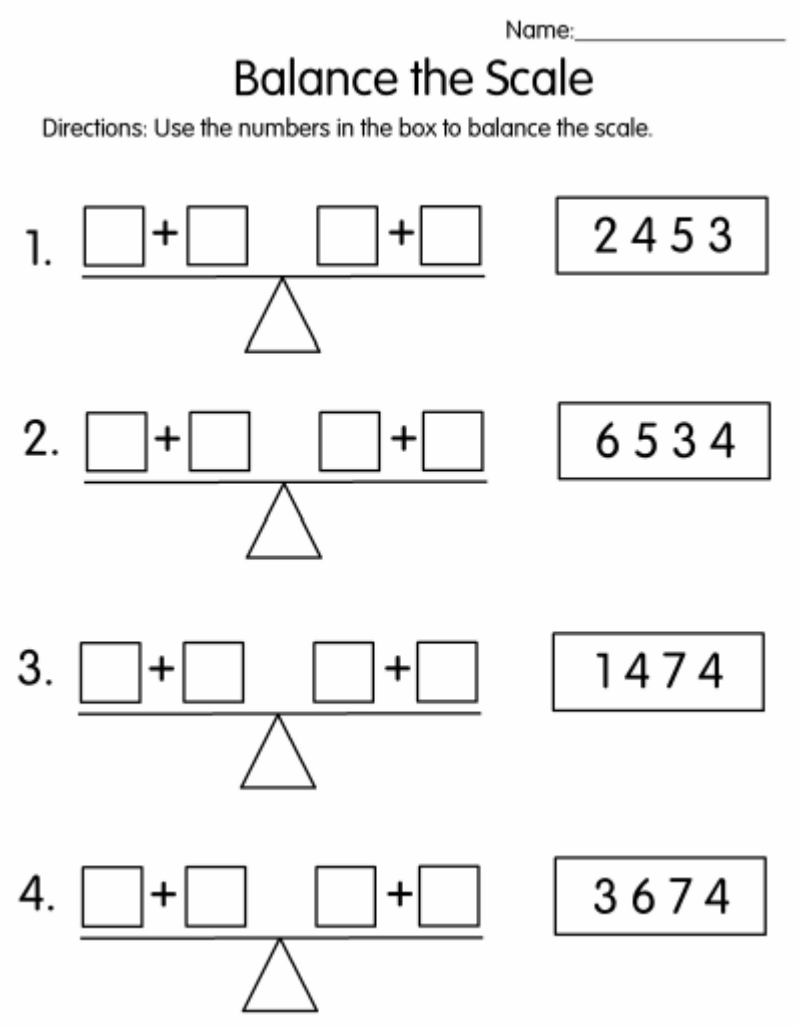


Cite: Pinterest.com

Share:

Students would then need to justify where they put the equations. By explaining where the equations, the students will show they are understanding the process of balancing equations.

Post Assessment:



Cite: Pinterest.com

Fractions

2nd Grade Standards:

No standards at 2nd grade level. All 2nd grade instruction is exposure to the thoughts of halves and quarters.

3rd Grade Standards:

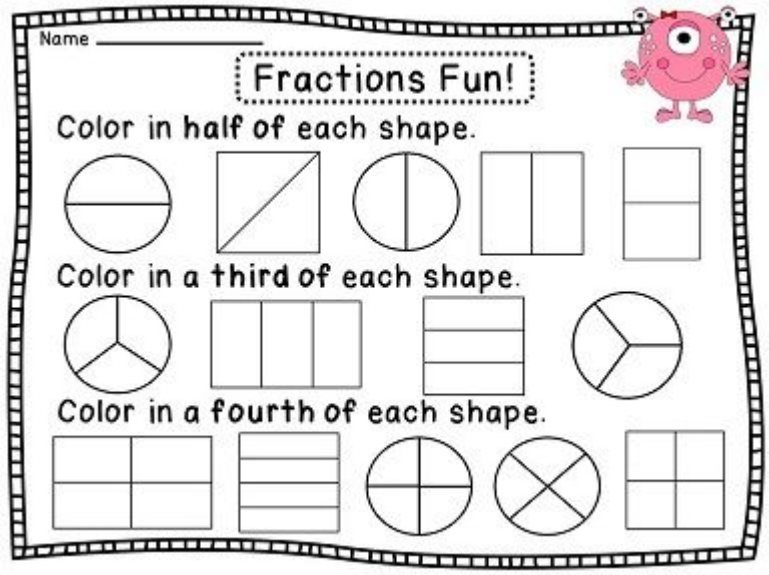
3.1.3.1 Read and write fractions with words and symbols. Recognize that fractions can be used to represent parts of a whole, parts of a set, points on a number line, or distances on a number line.

3.1.3.2 Understand that the size of a fractional part is relative to the size of the whole.

3.1.3.3. Order and compare unit fractions and fractions with like denominators by using models and an understanding of the concept of numerator and denominator.

(Unit 5, 7)

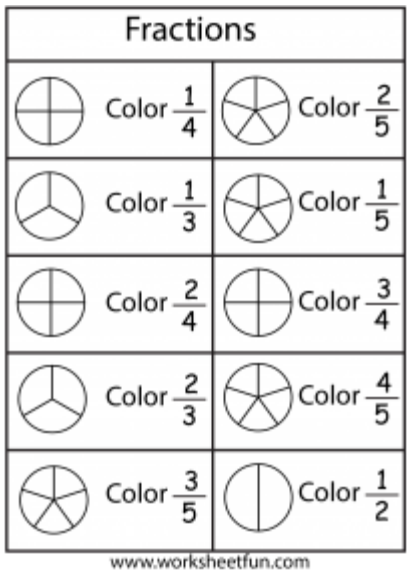
Pre Assessment:



*2nd Grade Pre-assessment

Cite:

https://www.google.com/search?q=fraction+sort&biw=1167&bih=589&tbm=isch&imgil=EScQcz-AKYoWXM%253A%253BXppr1ZVM3nZ_dM%253Bhttp%25253A%25252F%25252Fkidspressmagazine.com%25252Fcool-math%25252Fworksheets%25252Ffractions-2%25252Ffraction-sort.html&source=iu&pf=m&fir=EScQcz-AKYoWXM%253A%252CXppr1ZVM3nZ_dM%252C_&usg=__S6riIFt3QnUPSap5DyKyIpA_qgA%3D&ved=0ahUKEwiA_oaq7svNAhVk0YMKHcwIDQ8QyjcIKA&ei=dAZzV4D0KOSijwTMkbR4#imgdii=QKcHzXFIKJ0fvM%3A%3BQKcHzXFIKJ0fvM%3A%3B--Qk-QilixBdqM%3A&imgrc=QKcHzXFIKJ0fvM%3A



*3rd Grade pre-assessment

Lesson 1:

Launch:

Ms. Hurner and I got together for dinner last night and we shared a pizza. Well I don't know about you but when I share I want to make sure we have the same amount, I don't want Ms. Hurner to get more than me. If our whole pizza has 8 slices, how many slices should Ms. Hurner and I each get.

Explore:

We will begin as a whole class. What shape is a pizza? What shape our our pieces? How many pieces do we have? How can we fit 8 triangles into a circle? Students will draw on their whiteboards their thoughts?

3rd Grade would use their fraction circle manipulatives.

Share:

After a few minutes students will come back together and discuss what they found and if they were able to get 8 triangles to fit into a circle.

Summarize:

Is there any other way that you are able to cut the pizza into 8 pieces? Why would we not be able to divide the pizza into 8 pieces any other way? So when you make 8 pieces in a different way is it fair and equal for all the people who are getting slices of pizza?

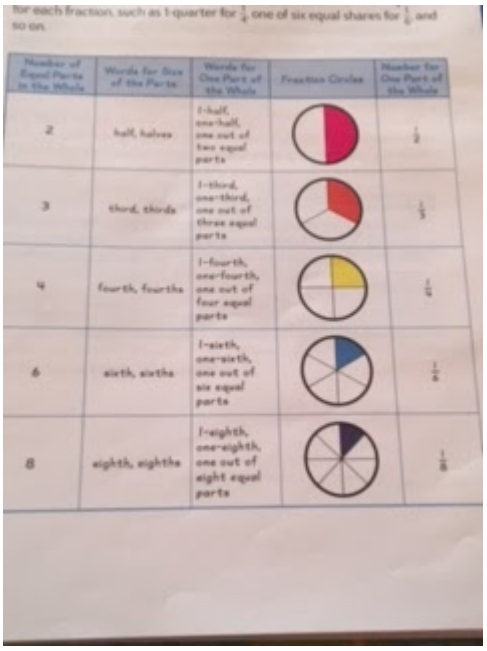
Lesson 2/3:

Launch: Refresh the class of the our problem yesterday about two people sharing a pizza. How many pieces should both of us have gotten if we were sharing the pizza equally? Well let me tell you Ms. Hurner and I only had 2 slices each last night so how much of the pizza did each of us eat? How much did we eat together? How much of the pizza did we have left over?

This is a great fraction song that can be used.https://www.youtube.com/watch?v=DnFrOetuUKg

Explore:

As a class we will create the following poster that will hang in our class for the rest of the unit. So now let's take a look a different ways to show fractions. Start with our whole (red circle) and what would show 2 pieces of the whole? How would we write what one pink piece represents (one-half) in words? Is there another way to write one half? Complete the whole poster as a class by having the students find the different fraction circle pieces.



Share:

Students will share with a partner some conclusions they can make about all of the pieces. What might they all make?

Summarize:

Summarize that all of the individual colors when put together with as one color equal a red piece (whole).

Lesson 4:

Launch:

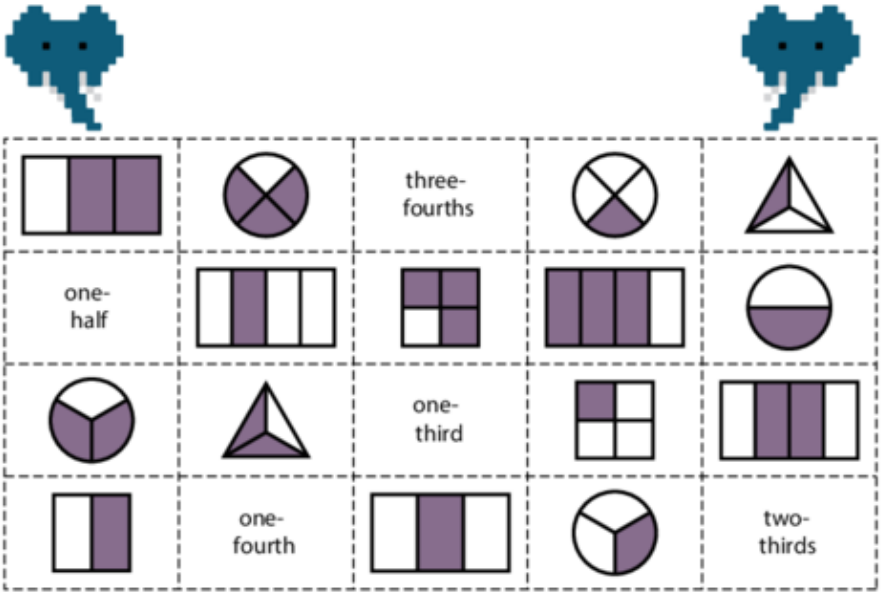
Remember yesterday how we made our poster. You did such a nice job helping me make that, I could not have done it one my own. Thanks! At the end of Math yesterday you had made a discovery. You had discovered that all of the pieces equal a red piece (whole circle). I think that is pretty awesome that you were able to figure that out on your own. Today I want to see if we can discover more equal fractions. I hope you are up for the challenge!

Explore:

Equivalent Fractions: 2nd grade would work as a whole class to discuss equivalent fractions. In 3rd grade we will start by getting our fraction circles all out and in complete circles. In groups of three or four students will start to move around the pieces to find what other circles are equal. If individual groups seem to be struggling the teacher can give them an example using the halves (pink) circle, but don't start the class with this example see what they can find on their own when given the challenge to discover something.

Share:

Groups will have one person come to the board and draw examples of equivalent fractions.

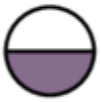


Post Assessment: 3rd grade post assessment is on the next page.

ANSWER KEY

Fraction Sort

Cut out the fraction illustrations on the next page and glue them in the table under the correct fraction.

$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{4}$
one fourth	one third	one half	two thirds	three fourths
				
				
				

3rd Grade Post Assessment

Fractions

 Color $\frac{1}{4}$	 Color $\frac{2}{5}$
 Color $\frac{1}{3}$	 Color $\frac{1}{5}$
 Color $\frac{2}{4}$	 Color $\frac{3}{4}$
 Color $\frac{2}{3}$	 Color $\frac{4}{5}$
 Color $\frac{3}{5}$	 Color $\frac{1}{2}$

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