|  |
| --- |
| **Addition and Subtraction and Rounding** |
| **Enrichment Investigation #1** |
| Common Core State Standard(s):3.NBT.2 | Standard(s) for Mathematical Practice:1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the mathematical thinking of others.
4. Model with mathematics

6. Attend to precision8. Look for and express regularity in  repeated reasoning  |
| Materials Needed:* Blackline Masters:
	+ *Sunny Addition*
	+ *The Difference in the Stars*
	+ *Out of this World Addition & Subtraction*
	+ *Out of this World Thinking Continued*
* Game Cards (Page M25 in Math Expressions Teacher’s Resource Book)
 |
| Instructions:Students will practice addition and subtraction of whole numbers through puzzles and questions.1. Students may work independently or in pairs.
2. Provide student(s) with the needed materials. Be sure to copy page M25 from the Teacher’s Resource Book.
3. Have students decide on an appropriate time for completion and then communicate their plan with you.
4. Decide on a way to share information with teacher, group, and/or class.
 |
| Sources:* Adapted from Marcy Cook *Super Addition Tiles* & *Super Take-Away Tiles*
* Adapted from Math Expressions *Use Only Once!* Differentiated Instruction Card
 |

![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\SAFVPY2P\MC900440405[1].png]()**Sunny Addition**

Using each of the digits (0-9) only once, complete the following pair of problems. Write the missing numbers in the suns below. Show any regrouping.

 2 6 8 4

+ 2 + 3\_

 8 6 3 1

Explain the strategy you used to solve the problems above.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Create your own pair of addition problems with missing digits (0-9). Be sure to use each digit only once. You can swap problems with a partner when finished.

**![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\AEWB4DK7\MC900441382[1].png]()The Difference in the Stars**

Using each of the digits (0-9) only once, complete the following pair of problems. Write the missing numbers in the blanks below. Show any ungrouping.

 3 5 2 8 4 1

- 5\_\_\_\_ - 3 6\_\_\_\_\_\_\_\_

 6 9 1 6

Explain the strategy you used to solve the problems above.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Create your own pair of subtraction problems with missing digits (0-9). Be sure to use each digit only once. You swap problems with a partner when finished.

![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\3A573FTN\MC900241087[1].wmf]()**Out of this World Addition & Subtraction**

Use the Game Cards (M25) to make addition and subtraction problems as shown below. Use each digit card only once in a problem. For example, you can only use the digit 2 once in the addition problem and once in the subtraction problem.

-

+

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\WMR6FMQV\MC900082965[1].wmf]()Out of this World Thinking!**

1. What is the smallest sum you can make? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How do know this is the smallest sum you can make with the digits? Explain your thinking using numbers and words.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Out of this World Thinking! Continued…** **![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\AEWB4DK7\MC900383690[1].wmf]()**

1. What is the greatest sum you can make? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How do know this is the greatest sum you can make with the digits? Explain your thinking using numbers and words.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the smallest difference you can make? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How do know this is the smallest difference you can make with the digits? Explain your thinking using numbers and words.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the greatest difference you can make? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How do know this is the greatest difference you can make with the digits? Explain your thinking using numbers and words.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Place Value & Multi-Digit Addition and Subtraction

Investigation #1 Answer Key

Sunny Addition: Answers may vary. One possible answer is shown above.

 2 6 8 4

8

7

3

5

1

9

4

+ 2 + 3\_

 8 6 3 1

6

0

2

Difference in the stars:

0

2

 3 5 2 8 4 1

5

8

3

6

- 5\_\_\_\_ - 3 6\_\_\_\_\_\_\_\_

7

4

9

1

 6 9 1 6

Out of This World Addition and Subtraction:

 + \_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Addition and Subtraction and Rounding** |
| **Enrichment Investigation # 2** |
| Common Core State Standard(s):3.NBT.1 | Standard(s) for Mathematical Practice:1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and

critique the reasoning of others. 1. Model with mathematics

6. Attend to precision 7. Look for and make use of  structure.  |
| Materials Needed:* Blackline Masters:
	+ *New School Playground* (Handout)
	+ *Playground Equipment Rubric*
 |
| Instructions:1. Students may work independently or in pairs.
2. Provide student(s) with the needed materials.
3. Have student(s) decide on an appropriate time for completion and then communicate their plan with you.
4. Decide on a way to share information with teacher, group, and/or class.
5. Make sure students include the playground ground covering in their pricing.
6. Optional: Students can type up the letters.
 |
| Sources: |

The New School Playground

Your school decided to host a fundraiser using lottery tickets to help pay for new playground equipment. The playground structures that are currently at the school are starting to fall apart and kids are getting hurt on the bad equipment. Your principal has come to each classroom and proposed a contest and the winning classroom will be the first to use the new playground! The classroom will also have a pizza lunch and ice cream treats! You love both pizza and ice cream so you cannot wait to hear the contest rules and figure out how to win. The principal leaves a contest sheet in every room for the teachers and students to read.

Wake Pond Elementary School is hosting a playground design contest. Enter in a playground that would fit all our needs and stay within our budget. The classroom with the winning design will be the first to play on the equipment and receive a pizza/ice cream party.

![C:\Documents and Settings\awood\Local Settings\Temporary Internet Files\Content.IE5\IOEPF0T0\MC900356437[1].wmf]()

**Guidelines:**

Contains at least 5 pieces of equipment on the playground (can use one piece of equipment two times), one piece must be a slide, clear drawing and table to explain cost, and it must not cost more than $3,500. Remember, you will have to buy ground covering also which will cost $259.

 Wow!! You are thrilled and know your drawing and proposed playground will be the winning entry. You set off to quickly do some research on possible pieces of equipment. Here are some of the prices and information you have found:

A playground equipment company in the area asked 3,500 students what was their favorite thing to play on in the area. Here is a chart of what the students choose.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Equipment Type | Number of Children |  |  |  |  |  |
| Swing Set | 367 |  | C:\Documents and Settings\awood\Local Settings\Temporary Internet Files\Content.IE5\IYJGJ6NQ\MC900001287[1].wmf |  |  |  |
| Slide | 265 |  |  |  |  |  |
| Sandbox | 199 |  |  |  |  |  |
| Monkey Bars | 288 |  |  |  |  |  |
| Climbing Wall | 324 |  |  |  |  |  |
| See Saw | 270 |  |  |  |  |  |
| Swings | 479 |  |  |  |  |  |
| Tube Slide | 406 |  |  |  |  |  |
| Dual Slide | 388 |  |  |  |  |  |
| Triple Slide | 514 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| \*Dual Slide- Has 2 slides next to each other so 2 students can go down at the same time |
| \*Triple Slide- Has 3 slides next to each other so 3 students can go down at the same time |

Here is the same information in a bar graph:

After you discovered some of the students’ favorite pieces of equipment, you had to find prices:

|  |  |
| --- | --- |
| Equipment Type | Price |
| Swing Set | $680  |
| Slide | C:\Documents and Settings\awood\Local Settings\Temporary Internet Files\Content.IE5\25W4CSHM\MC900001295[1].wmf$344  |
| Sandbox | $75  |
| Monkey Bars | $278  |
| Climbing Wall | $715  |
| See Saw | $325  |
| Swings | $998  |
| Tube Slide | $769  |
| Dual Slide | $618  |
| Triple Slide | $1,000  |

Now that you have collected all your information, you can start designing your playground. Your teacher requires everyone to have a clear drawing of the playground with a key on the side of where each piece of equipment is located. In addition, you need to have a chart listing the prices of each piece and the total price. Last, you need to include a detailed letter to the principal of what should be chosen and why.

|  |  |
| --- | --- |
| Playground Equipment Rubric (3.NBT.2)Student Name:     \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |  |  |  |
| CATEGORY | 4 | 3 | 2 | 1 |
| Mathematical Concepts | Explanation shows complete understanding of the mathematical concepts used to solve the problem(s). | Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s). | Explanation shows some understanding of the mathematical concepts needed to solve the problem(s). | Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written. |
| Mathematical Reasoning | Uses complex and refined mathematical reasoning. | Uses effective mathematical reasoning | Some evidence of mathematical reasoning. | Little evidence of mathematical reasoning. |
| Explanation | Explanation is detailed and clear. | Explanation is clear. | Explanation is a little difficult to understand, but includes critical components. | Explanation is difficult to understand and is missing several components OR was not included. |
| Neatness and Organization | The work is presented in a neat, clear, organized fashion that is easy to read. | The work is presented in a neat and organized fashion that is usually easy to read. | The work is presented in an organized fashion but may be hard to read at times. | The work appears sloppy and unorganized. It is hard to know what information goes together. |
| Diagrams and Sketches | Diagrams and/or sketches are clear and greatly add to the reader\'s understanding of the procedure(s). | Diagrams and/or sketches are clear and easy to understand. | Diagrams and/or sketches are somewhat difficult to understand. | Diagrams and/or sketches are difficult to understand or are not used. |
| Mathematical Errors | 90-100% of the steps and solutions have no mathematical errors. | Almost all (85-89%) of the steps and solutions have no mathematical errors. | Most (75-84%) of the steps and solutions have no mathematical errors. | More than 75% of the steps and solutions have mathematical errors. |
|  |  |  |  |  |

Comments:

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| **Unit I: Addition and Subtraction and Rounding** |
| **Enrichment Investigation # 3** |
| Common Core State Standard(s):3.NBT.2 | Standard(s) for Mathematical Practice:1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and

critique the reasoning of others.  6. Attend to precision7. Look for and make use of  structure.  |
| Materials Needed:* Blackline Masters:
	+ *The New Playground Needs Money*
 |
| Instructions:This activity is a continuation of the Enrichment Investigation #2 but can be used as a standalone activity. It can be completed in pairs or independently. 1. Provide students with the needed handout.
2. Have students decide on an appropriate time for completion and then communicate their plan with you.
 |
| Sources:* Challenge activity is adapted from: <http://math.rice.edu/~lanius/pro/rich.html>
 |

The New Playground Needs Money!

CONGRATULATIONS!! Your playground was chosen among all the students that entered the contest! Your class is very excited to have a pizza lunch with an ice cream treat after they get to play on the equipment first. However, there is a small detail that is very important. The principal needs to figure out how to pay for the new equipment and the prize lunch/treat. Everyone brainstorms ideas and the principal decides to sell lottery tickets to raise the money. Your job is to help determine how much money is needed, how many lottery tickets to sell, and what the prize should be for the winner.

You determine that the school will need money for these:

1. ![C:\Documents and Settings\awood\Local Settings\Temporary Internet Files\Content.IE5\25W4CSHM\MC900356437[1].wmf]()You know that the playground will cost $3,500 (your design might have been a little less but the principal wants to make sure there is exactly this amount raised for it).
2. It will cost $428 to install the playground
3. The trash cans will each cost $18 and there needs to be 2.
4. It will cost $8 for each trash can to be installed.
5. Pizza lunch and ice cream treat will cost $4 for each student and there are 30 students in your class.

First, determine how much the pizza and ice cream treat will cost WITHOUT using multiplication. Show in numbers and/or diagrams. Briefly write a description of your method.

How much money will the school need to raise for the playground? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Next you need to determine how many lottery tickets should be sold.

Local companies donated prizes for the winners in the lottery prize drawing. There are 520 students in the school. If each ticket is $5, how many tickets should be sold? Without using multiplication or division, determine the best way to figure out the amount of tickets and explain using numbers **and** words.

Challenge:

The lottery was so successful and raised plenty of money for the playground! The principal was so excited that a second contest was announced. The winning lottery ticket for this contest would be offered 2 different prizes to choose from:

1. Your prize is to get $0.01 on the first day, double that amount on the second day, on the third day receive double the amount from the second day, fourth day receive double the amount from the third day, and continued this pattern for thirty days.
2. Or get $1,000,000 on the winning day

Wow! Everyone is so excited for this contest. Lottery tickets are sold and the winner is announced. You won!! What a lucky student you are! The principal gives you one hour to decide which prize you will pick. Before you choose, you decide you better work out the math for the first option. It doesn’t sound like you would earn as much money but you better double check.

Using an organized list or chart, determine how much money you would earn in the first prize choice.

What are you going to tell your principal? Which option? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Answer Key:

Pizza lunch/ice cream treat: $120- explanations vary

School needs to raise $4,000

Lottery Tickets: The amount of students is irrelevant in this problem. The school should sell at least 800 tickets.

Challenge:

|  |
| --- |
| **Pay with First Option - Week 1** |
| **Day No.** | **Pay for that Day** | **Total Pay (In Dollars)** |
| 1 | .01 | .01 |
| 2 | .02 | .03 |
| 3 | .04 | .07 |
| 4 | .08 | .15 |
| 5 | .16 | .31 |
| 6 | .32 | .63 |
| 7 | .64 | 1.27 |

|  |
| --- |
| **Pay with First Option - Week 2** |
| **Day No.** | **Pay for that Day** | **Total Pay (In Dollars)** |
| 8 | 1.28 | 2.55 |
| 9 | 2.56 | 5.11 |
| 10 | 5.12 | 10.23 |
| 11 | 10.24 | 20.47 |
| 12 | 20.48 | 40.95 |
| 13 | 40.96 | 81.91 |
| 14 | 81.92 | 163.83 |

|  |
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| **Pay with First Option - Week 3** |
| **Day No.** | **Pay for that Day** | **Total Pay (In Dollars)** |
| 15 | 163.84 | 327.67 |
| 16 | 327.68 | 655.35 |
| 17 | 655.36 | 1310.71 |
| 18 | 1 310.72 | 2 621.43 |
| 19 | 2 621.44 | 5 242.87 |
| 20 | 5 242.88 | 10 485.75 |
| 21 | 10 485.76 | 20 971.51 |

|  |
| --- |
| **Pay with First Option - Week 4** |
| **Day No.** | **Pay for that Day** | **Total Pay (In Dollars)** |
| 22 | 20 971.51 | 41 943.03 |
| 23 | 41 943.04 | 83 886.07 |
| 24 | 83 886.08 | 167 772.15 |
| 25 | 167 772.16 | 335 544.31 |
| 26 | 335 544.32 | 671 088.63 |
| 27 | 671 088.64 | 1 342 177.27 |
| 28 | 1 342 177.28 | 2 684 354.55 |

|  |
| --- |
| **Pay with First Option**  |
| **Day No.** | **Pay for that Day** | **Total Pay (In Dollars)** |
| 29 | 2 684 354.56 | 5 368 709.11 |
| 30 | 5 368 709.12 | 10 737 418.23 |

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| **Addition and Subtraction and Rounding** |
| **Enrichment Investigation #4** |
| Common Core State Standard(s):3.NBT.2 | Standard(s) for Mathematical Practice:* Make sense of problems and persevere in solving them.
* Reason abstractly and quantitatively
1. Attend to precision

8. Look for and express regularity in  repeated reasoning. |
| Materials Needed:* Blackline Masters:
	+ *Calorie Counting Kids handout*
	+ *Weekly Calorie Count table and question set.*
	+ *Nutritional Information for Meal Options* (optional)
* Nutrition labels (if not using the last handout above)
 |
| Instructions:1. Students may work independently or in pairs.
2. Provide student(s) with the needed materials.
3. Have students decide on an appropriate time for completion and then communicate their plan with you.
4. Decide on a way to share information with teacher, group, and/or class.
 |
| Sources:* Nutritional information adapted from [www.myfitnesspal.com](http://www.myfitnesspal.com)
 |

***![C:\Users\Lori\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\3JWPSUQ2\MP900409550[1].jpg]()Calorie Counting Kids!***

What are people talking about when they talk about the calories in food? A calorie is a unit of measurement — but it doesn't measure weight or length. A calorie is a unit of energy. When something contains 100 calories, it's a way of describing the amount of energy your body could get from eating or drinking it.

**Are Calories Bad for You?**

Calories aren't bad for you unless you eat too many and don’t burn enough of them by exercising. Your body needs calories for energy. Most foods and drinks contain calories. You can find out how many calories are in a food by looking at the nutrition facts label. The label will also describe the components of the food — how many grams of carbohydrate, [protein](http://kidshealth.org/kid/stay_healthy/body/protein.html), and fat it contains.

Some people watch their calories if they are trying to lose weight. Most kids don't need to do this, but all kids can benefit from eating a healthy, balanced diet that includes the right number of calories — not too many, not too few. But how do you know how many calories you need?

**How Many Calories Do Kids Need?**

Kids come in all sizes and each person's body burns energy (calories) at different rates, so there isn't one perfect number of calories that a kid should eat. But there is a recommended range for most school-age kids: 1,600 to 2,500 per day.

**Your task:**

1. Develop a menu for each day of the week. Be sure to use your estimating skills to choose foods that would provide you with between 1,600 and 2,500 calories *per day*.
2. Use the calories listed on the labels of the real foods you eat, from the food options provided by your teacher, or a combination.
3. Decide on a timeframe for completing your task.
4. Complete the table provided.

 **Lunch/Dinner Meal Options**

**Kid’s Meal Hamburger and Fries**

![C:\Users\Lori\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\04T3SU9H\MP900402804[1].jpg]()Serving Size: 1 meal, Calories: 581, Fat: 17g, Carbs: 54g, Protein: 15g

**Kid’s Coke**

Serving Size: 8 oz, Calories: 103, Fat: 0g, Carbs: 26g, Protein: 0g

**4 Piece Chicken Nugget Kid’s Meal, Fries, and Apples**

Serving Size: 1 meal, Calories: 326, Fat: 17g, Carbs: 33g, Protein: 10g

**Kid’s Meal 2 Count Chicken Strips, Low Fat Chocolate Milk, Small Fry**

Serving Size: 1 meal, Calories 677, Fat: 27g, Carbs: 64g, Protein: 32g

**Triple Cheese Macaroni & Cheese**

Serving Size: 1 cup, Calories: 221, Fat: 4g, Carbs: 39g, Protein: 7g

**Pepperoni Pizza**

Serving Size: 1 slice, Calories: 285, Fat: 11g, Carbs: 32 g, Protein: 14 g

**Kid’s Meal 4’ Turkey and Cheese Sandwich**

Serving Size: 1 Sandwich, Calories: 187, Fat: 2 g, Carbs: 30g, Protein: 10g

**Spaghetti and Meatballs**

Serving Size: 1 cup, Calories: 379, Fat: 36g, Carbs: 98g, Protein: 50g

**Peanut Butter and Jelly Sandwich**

Serving Size: 1 sandwich, Calories: 463, Fat: 11g, Carbs: 25g, Protein: 11g

**Fish Sticks**

![C:\DOCUME~1\MICHEL~1\LOCALS~1\Temp\Temporary Internet Files\Content.IE5\3O5M3NPN\MC900441775[1].PNG]()Serving Size: 6 sticks, Calories: 233, Fat: 14g, Carbs: 16g, Protein: 9g

**Sirloin Steak**

Serving Size: 1 steak (6 oz.), Calories: 254, Fat: 13g, Carbs: 0g, Protein: 37g

**Breakfast Meal Options**

**Bacon, Egg, and Cheese Biscuit**

Serving Size: 1 biscuit, Calories: 424, Fat: 23g, Carbs: 37g, Protein: 15g

**![C:\Users\Lori\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\04T3SU9H\MP900402816[1].jpg]()Cinnamon Pastry**

Serving Size: 1 pastry, Calories: 179, Fat: 3g, Carbs: 35g, Protein: 2g

**Maple & Brown Sugar Oatmeal**

Serving Size: ½ cup, Calories: 168, Fat: 2g, Carbs: 32g, Protein: 4g

**Cereal with 2% Milk**

Serving Size: 1 cup, Calories: 172, Fat: 5g, Carbs: 38g, Protein: 10g

**Buttermilk Pancakes and Syrup**

Serving Size: 2 pancakes/3 oz. syrup, Calories: 632, Fat: 8g, Carbs: 43g, Protein: 6g

**Bagel and Cream Cheese**

Serving Size: 1 bagel/1 oz. cream cheese, Calories: 289, Fat: 3g, Carbs: 59g, Protein: 9g

**Grits with butter**

Serving Size: 1 ½ cups, Calories: 222, Fat: 3g, Carbs: 44g, Protein: 5g

**Biscuits and Gravy**

Serving Size: 1 biscuit/4 oz. gravy, Calories: 598, Fat: 40g, Carbs: 43g, Protein: 15g

**Sausage and Egg Croissant**

Serving Size: 1 sandwich, Calories: 293, Fat: 12g, Carbs: 30g, Protein: 17g

**2 Egg Omlet with Cheddar Cheese**

![C:\DOCUME~1\MICHEL~1\LOCALS~1\Temp\Temporary Internet Files\Content.IE5\3O5M3NPN\MC900232980[1].WMF]()Serving Size: 1 omelet, Calories: 285, Fat: 19g, Carbs: 6g, Protein: 20g

**French Toast Sticks**

Serving Size: 5 sticks, Calories: 323, Carbs: 43g, Protein: 5g

**Snack Food Options**

 **Popcorn**

![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\D9UID4T7\MC900250766[1].wmf]() Serving Size: 1 cup, Calories: 55, Fat: 3g, Carbs: 6g, Protein: 1g

**Pretzel Sticks**

 Serving Size: 28 sticks, Calories: 112, Carbs: 23g, Protein: 3g

**Chocolate Granola Bar**

 Serving Size: 1 bar, Calories: 107, Carbs: 23g, Protein 1g

**Applesauce**

 Serving Size: ½ cup, Calories: 99, Carbs: 26g, Protein: 0g

**Carrots & Peanut Butter**

 Serving Size: 2Tbsp. peanut butter , ½ cup carrots, Calories: 225, Carbs: 6g, Protein: 7g

**Potato Chips:**

 Serving Size: 1 snack bag, Calories 143, Carbs: 24g, Protein: 2g

**Chocolate Mini Donuts**

 Serving Size: 4 donuts, Calories: 242, Carbs: 27g, Protein: 2g

**Goldfish Crackers**

 Serving Size: 55 pieces, Calories: 148, Carbs: 20g, Protein: 4g

**Apple**

 Serving Size: 1 medium apple, Calories: 95, Carbs: 25g, Protein: 0.5g

**Banana**

![C:\DOCUME~1\MICHEL~1\LOCALS~1\Temp\Temporary Internet Files\Content.IE5\3O5M3NPN\MC900436911[1].PNG]() Serving Size: 1 medium banana, Calories: 82, Carbs: 23g, Protein: 1g

**Animal Cookies**

 Serving Size: 6 cookies, Calories: 156, Carbs: 20g, Protein: 1g

![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\TCUW1H6A\MC900233362[1].wmf]()Weekly Calorie Count

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Weekly Calorie Count

1. Which day had the highest calorie count for the week?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Which day had the lowest calorie count for the week?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the difference between the highest and lowest calories counts for the week?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When estimating calories, would it be best to estimate your calorie count to the nearest thousand, hundred, or ten? Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- |
| **Addition and Subtraction and Rounding** |
| **Enrichment Investigation # 5** |
| Common Core State Standard(s):3.NBT.1 | Standard(s) for Mathematical Practice:1. Make sense of problems and persevere in solving them.
2. Construct viable arguments and

critique the reasoning of others. 7. Look for and make use of  Structure.  |
| Materials Needed:* Blackline Masters:
	+ *Round and About Rounding Riddles*
	+ *Round and About Rounding Riddles Continued*
	+ *It’s Your Turn*
 |
| Instructions:Students will explore rounding by solving and creating number riddles. 1. Students may work independently or in pairs.
2. Provide student(s) with the needed materials.
3. Have student(s) decide on an appropriate time for completion and then communicate their plan with you.
4. Decide on a way to share information with teacher, group, and/or class.
 |
| Sources:* Adapted from *Go Math!*
 |

Round and About Rounding Riddles![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\D9UID4T7\MC900441930[1].wmf]()

Complete the chart by rounding each of the numbers to the nearest hundreds and tens.

|  |  |  |
| --- | --- | --- |
|  | Nearest Hundred | Nearest Ten |
| 628 | About \_\_\_\_\_\_\_\_\_\_\_\_ | About \_\_\_\_\_\_\_\_\_\_\_\_ |
| 704 | About \_\_\_\_\_\_\_\_\_\_\_\_ | About \_\_\_\_\_\_\_\_\_\_\_\_ |
| 58 | About \_\_\_\_\_\_\_\_\_\_\_\_ | About \_\_\_\_\_\_\_\_\_\_\_\_ |

**Explain** why 58 can be rounded to the nearest hundred even though there is not a digit in the hundreds place.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**S t r e t c h** your thinking by writing a number that is the same when rounded to the nearest ten and hundred. Explain your thinking.

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Round and About Rounding Riddles continued…

![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\AEWB4DK7\MC900441902[1].wmf]()

Directions: Solve the following riddle by showing your thinking

 for each of the clues.

Clue 1: I am a number between 440 and 460. List all of the possibilities.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Clue 2: When rounded to the nearest ten, I am 450. Eliminate possibilities and explain your thinking.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Clue 3: When rounded to the nearest hundred, I am 400. Eliminate possibilities and explain your thinking.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Clue 4: My ones digit is an even number, but it is not 8. What number am I? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\3A573FTN\MC900434411[1].wmf]()It’s Your Turn…

Make up your own riddle for a 3-digit number. Write at least four clues to narrow the possibilities down to only one number. When finished, fold the answer over so no one else can see it. Swap clues with a partner and solve each other’s riddle.

Clues:

My Number is… \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\3A573FTN\MC900432526[1].png]()

Round and About Rounding Riddles![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\D9UID4T7\MC900441930[1].wmf]()

Complete the chart by rounding each of the numbers to the nearest hundred and ten.

|  |  |  |
| --- | --- | --- |
|  | Nearest Hundred | Nearest Ten |
| 628 | About 600 | About 630 |
| 704 | About 700 | About 700 |
| 58 | About 100 | About 60 |

**Explain** why 58 can be rounded to the nearest hundred even though there is not a digit in the hundreds place.

Possible Response: When you round to the nearest hundred, you need to look at the tens place. Since 5 is in the tens place, the hundreds place would “round up”. Since 0 is in the hundreds place, it would “round up” to 1; making 58 round to 100.

**S t r e t c h** your thinking by writing a number that is the same when rounded to the nearest ten and hundred. Explain your thinking.

Possible Answer/Response: 203; To round 203 to the nearest hundred, you look at the tens digit which is 0. 0 is less than 5, so 203 rounds to 200. To round 203 to the nearest ten, you look at the ones digit, which is 3. 3 is less than 5, so 203 rounds to 200.

Round and About Rounding Riddles continued…

![C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\AEWB4DK7\MC900441902[1].wmf]()

Directions: Solve the following riddle by showing your thinking

 for each of the clues.

Clue 1: I am a number between 440 and 460. List all of the possibilities.

All whole numbers between 440 and 460 are possibilities.

Clue 2: When rounded to the nearest ten, I am 450. Eliminate possibilities and explain your thinking.

 441, 442, 443, 444, 445, 456, 457, 458, and 459 are not possibilities because they would not round to 450 when rounded to the nearest ten.

446, 447, 448, 449, 451, 452, 453, and 454 are all possibilities because they would round to 450 when rounded to the nearest ten.

Clue 3: When rounded to the nearest hundred, I am 400. Eliminate possibilities and explain your thinking.

 451, 452, 453, and 454 are not possibilities because they would round to 500 when rounded to the nearest hundred.

Clue 4: My ones digit is an even number, but it is not 8. What number am I?

447 and 449 are not possibilities because the digit in the ones place of each number is not an even number. 448 is not a possibility because it is “not 8.”

The number has to be 446. 446 is between 440 and 460. 446, when rounded to the nearest ten, is 450. 446, when rounded to the nearest hundred, is 400. The digit in the ones place is 6, which is not 8, but is even, so the number is 446.