



Developing Math Talent in Elementary Students

Confratute 2024

Days 1 and 2

Advanced Activities

Number and Operations, Place Value and Measurement

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Awesome Advanced Activities



Level 4-5

- Notable Numbers
- Fantastic Fractions
- Sensational Shapes
- Flag Design Project



What's On My Back?



- Two-Digit Number
- Only Yes or No Questions
- NO Less than, Greater Than, or In-Between Questions
- Use Fewest Number of Questions Possible



Student Mathematics: _____ Date: _____

What's on My Back? Recording Sheet

Your Question	The Answer
1.	
2.	
3.	
4.	
5.	
6.	
7.	

Use the back of this sheet if needed.

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

Project 3: Awesome Advanced Activities For Mastering Mathematical Words 43

Big Mathematical Ideas

- Factors and Multiples
- Even and Odd Numbers
- Prime and Composite Numbers
- Place Value

Making Sense of Numbers and Their Properties...Number Theory

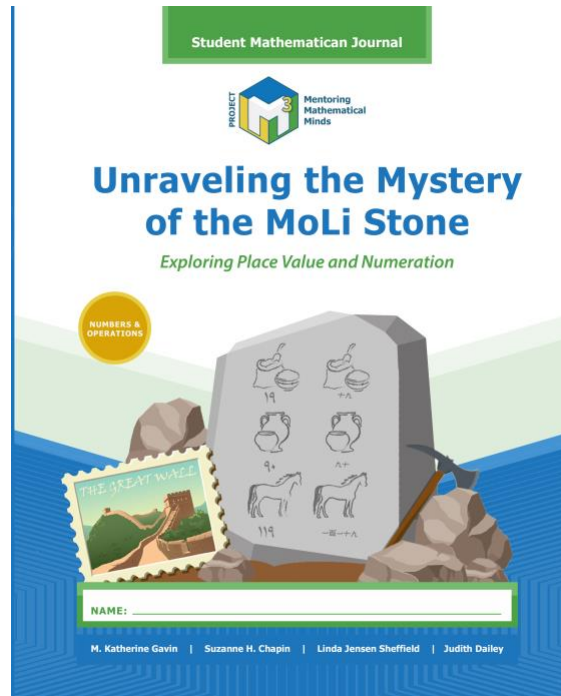
Thinking About What's On My Back?

Wrap It Up

- What do you think is the best first question to ask? Why?
- What are other good questions? Explain why they are good.

Differentiation Strategies

- Our approach: Start with a high level task and provide supports or increased challenges as needed
- Allow less than, greater than and in between
- Use only multiples of 2, 3, 5 and 10
- Assign numbers to specific students based on their math knowledge



Patterns: Card Game Capers

- Create the greatest two-digit number
- Have 10 digits (0-9)
- Draw a total of three digits, one at a time
- Write the digit before the next ones drawn
- Card will not be placed back in the deck

Number

Discard

Student Mathematician: _____ Date: _____

THINK DEEPLY Mathematician's Journal

2. a. How many different two-digit numbers are possible if the two digits cannot be the same and the first digit cannot be 0?

b. How might you figure this out without writing down all the possibilities?

Some Sum

- Make the greatest sum.

+

Some Difference

- Make the **smallest** difference.

-



Some Sum

- Make the Target Sum.

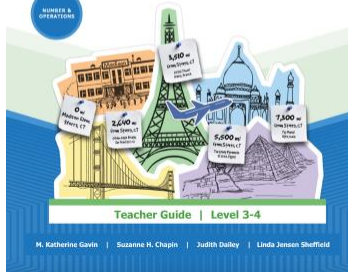
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How Big is Big?

Understanding and Using Large Numbers

NUMBERS &
OPERATIONS



Make It, Say It! Cards

ANSWER SHEET

1. Make the smallest five-digit number. Say it! 10,234	11. Make the number that is one more than the smallest six-digit number. Say it! 102,346
2. Make the largest six-digit number with a 1 in the hundreds place. Say it! 987,165	12. Make the largest four-digit number in which the thousands digit is 3 times the ones digit. Say it! 9,875
3. Make the largest odd six-digit number. Say it! 987,653	13. Make the largest five-digit number in which the middle digit is half the value of the tens digit. Say it! 98,367
4. Make the smallest four-digit number without a zero. Say it! 1,234	14. Make the number that is 22 less than the largest five-digit number. Say it! 98,743
5. Make the largest six-digit multiple of 5. Say it! 987,650	15. Make the smallest even three-digit number. Say it! 102
6. Make the smallest four-digit multiple of 2. Say it! 1,024	16. Make the smallest odd four-digit number with a 3 in the hundreds place. Say it! 1,305
7. Make the largest six-digit number with a 1 in the hundred thousands place. Say it! 198,765	17. Make the smallest number greater than 9,999. Say it! 10,234
8. Make the largest five-digit multiple of 10 with a 3 in the ten thousands place. Say it! 39,870	18. Make the number that is closest to one-half of 1,000. Say it! 501
9. Make the largest five-digit number using digits that are even numbers. Say it! 86,420	19. Make the smallest five-digit number that is a multiple of 10 with a 1 in the tens place. Say it! 23,410
10. Make the smallest six-digit number with a 4 in the hundred thousands place. Say it! 401,235	20. Make the number that is 300 less than the largest six-digit number. Say it! 987,554

Project 3: How Big is Big?

Chapter 1: The Bigger, the Better
Lesson 1: Really Big Numbers 91

Student Mathematician: _____ Date: _____

THINK DEEPLY

1. Janet's little brother thinks 99,999 is bigger than 100,000. He says it has five 9s and 100,000 only has a 1 and some zeros which are a lot smaller than 9! How should Janet respond to him?

MY THOUGHTS AND QUESTIONS

MY RESPONSE

Need more room? Use the next page.

THINK BEYOND

4. Make It, Say It!

Make up direction cards that would have these numbers as answers:

- 31,579
- 8,463
- 968,750

Now make up your own number and write a direction card to add to the game.



Really Big Numbers

Exploring Number Games

Making Sense of Numbers with Imi and Zani



Project M²: Mentoring Young Mathematicians
www.projectm2.org

Big Mathematical Ideas

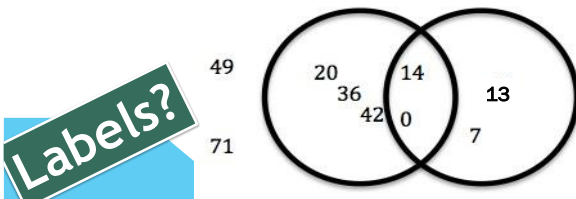
Understanding and classifying numbers by the following properties:

- Even or odd
- Greater than or less than a given number
- Multiples of 2, 5, 10
- One-, two- and three-digit numbers

Number and Label Cards

1	2	5	6			
7	13	14	18	greater than 20	even numbers	odd number in the tens place
20	22	27	28	odd numbers	two-digit numbers	sum of the digits is an even number
31	33	35	36	less than 15	numbers you say when counting by 5s	numbers you say when counting by 10s
40	48	49	50	one-digit numbers	sum of the digits is an odd number	
51	62	63	65			
74	75	86	87			
90	94	99	100			

greater than 20	even numbers	odd number in the tens place
odd numbers	two-digit numbers	sum of the digits is an even number
less than 15	numbers you say when counting by 5s	numbers you say when counting by 10s
one-digit numbers	sum of the digits is an odd number	



THINK DEEPLY Imi told Zani that one of his numbers is in the wrong place. Can you help Zani?

1. Which number is in the wrong place? Put an X on the number.
2. Where should that number go? Write it there.
3. Explain why you moved that number.

Differentiation Strategies

- Use multiples of 2, 5, 10 and 100 as labels and 3-digit number cards
- Use factors and multiples as labels

1	2	3	4	5	Odd Numbers	Even Numbers	Multiples of 3	Multiples of 2
6	7	8	9	10	Factors of 15	Prime Numbers	Composite Numbers	Factors of 30
12	15	16	18	20	Multiples of 5	Factors of 24	Multiples of 4	Factors of 12
21	24	25	26	27	Multiples of 6	Factors of 10	Square Numbers	
28	30	32	36	40				

Student Mathematics _____ Date _____

Two-Loop Puzzle
Make a puzzle.

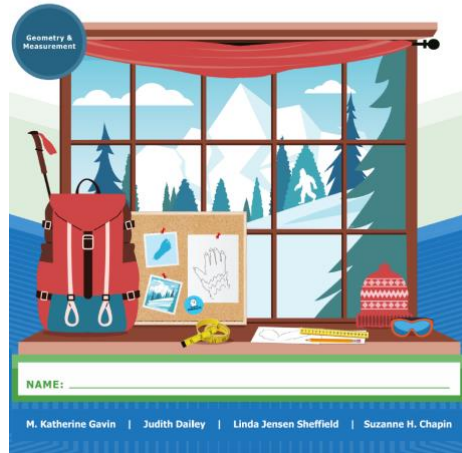
1. Choose two labels. Do not write them down.
2. Write four numbers in each section of the loops that fit your labels.
3. Write four numbers outside the loops that do not fit either of your labels.

Dear Imi and Zani,
Guess our rules. Write them on the labels.

Project M²: Exploring Number Games 68 ©2019 3-Number Loop Game 3-Use and Don't Use Diagram Game

In Search of the Yeti

Measuring Up, Down and All Around



M. Katherine Gavin | Judith Dailey | Linda Jensen Sheffield | Suzanne H. Chapin

THE HIMALAYAN EXPEDITION



You have just joined a new expedition in the Himalayas whose purpose is to search for any real evidence of the Yeti. After several days of trekking in freezing cold, snowy conditions, you make an exciting discovery — footprints — in the shape of a human foot, but much too large to belong to a human. At last, here is what you have been searching for! The Sherpas with you, Raj and Patir, are very excited and confirm that these prints are similar to the photographs they have seen. Now, what do you do?

You first take pictures of the prints, and then as good mathematicians would do, you decide to carefully measure the prints. But, how? Unfortunately you lost all your measurement tools when a backpack fell down a dangerous crevasse that you were crossing in a blinding snowstorm. You have no ruler or any instrument with measurements marked on it. You lay out the items in your pack and discover that you have an unsharpened pencil with you. You left your other writing utensils at base camp. Maybe this could be your measuring tool. You measure the length of the foot and find it is exactly two pencil lengths. This will certainly be easy to remember. Your expedition team returns home after the completion of a successful mission.

Creating the Yeti

Who will we measure?

What tool will we use?

Measurement of our Body Part

What will we measure (length, width, etc.)?

What are these measurements?

Making the Yeti Body Part

What will be the measurements for the Yeti's body part?

How will we make this new part?

THINK BEYOND CARDS

1. Would the Yeti fit through the classroom door without having to duck his head? Why or why not?

• IN SEARCH OF THE YETI •

THINK BEYOND CARDS

2. Estimate the height of a desk that could fit the Yeti comfortably. Now measure your desk and change your estimate if you would like. Explain your answer.

• IN SEARCH OF THE YETI •

THINK BEYOND CARDS

3. Yao Ming is one of the tallest professional basketball players. Find out how tall he is and compare that to your height. About how many times bigger is Yao Ming than you? Draw a sketch of his foot and his hand. Compare it to the Yeti. Is he bigger than the Yeti? Explain your answer.

• IN SEARCH OF THE YETI •

THINK BEYOND CARDS

4. Create the outline of a bed for the Yeti. Give the dimensions for the bed and your reasons for using these dimensions.

• IN SEARCH OF THE YETI •

Attribute

Tool(s)

Method

Attribute	Tool(s)	Method



Student Mathematician:

Date:

Mathematician's Journal

1. a. How did you find the measurement for the body part that you needed to make for the Yeti?
- b. Do you think this was the best method to use? Why or why not?