Name:_____

Date:_____

Sharing Equally

Things that Can Be Shared

List as many things you can think of that can be shared.

Pick something from the list above. Use words and pictures to describe how you would share it.

***Be sure to include*:**

- How many people you could share it with.
- What strategy you would use to make sure the sharing was fair.
- What are some things you can do if you can't give everyone equal parts.

Equal Split Game

Goal: Use division to score points

Rules:

1. Partner 1 grabs a handful of cubes.
2. Partner 2 rolls the die.
3. The goal is to split all of the cubes into the number of equal groups shown on the die. If you are able to, you get a point. For example, if you grabbed 20 cubes and you rolled a 4, you would try to split 20 cubes into 4 equal groups.
4. Repeat steps 2-3. Use the chart below to keep score. Continue playing until the entire chart is filled.

# of Cubes	Dice Roll	Equal Groups?	Points
		Equal groups ☐ Yes ☐ No	
		Equal groups ☐ Yes ☐ No	
		Equal groups ☐ Yes ☐ No	
		Equal groups ☐ Yes ☐ No	
		Equal groups ☐ Yes ☐ No	
		Equal groups ☐ Yes ☐ No	
		Equal groups ☐ Yes ☐ No	

Were there numbers that you could roll that were more likely to end up with equal groups? Why?

Patterns!

Choose any numbers you want and see if they can be equally divided by the numbers 2 through 10. Keep choosing different numbers and keep an eye out for patterns!

# of Groups (the number you are dividing by)	**Numbers that DO divide equally**	**Numbers that DON'T divide equally**	**Anything you notice?**
2			
3			
4			
5			
6			
7			
8			
9			
10			

Hundreds Chart

1	2	3	4	5	6	7	8	9	10
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

Did you find any patterns in your Hundreds Chart? Explain.

The Leftovers

Have you ever been in a situation where you couldn't share something equally?

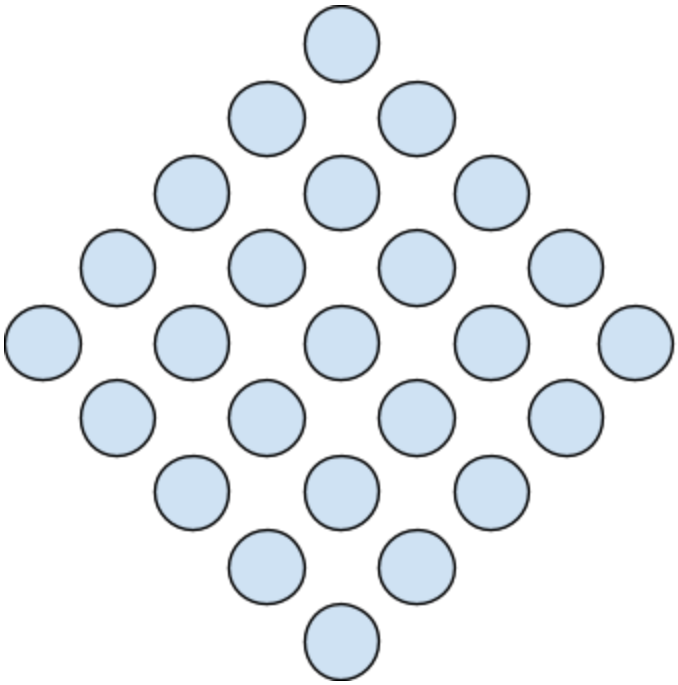
- What do these situations have in common?
- How can you use division to know when there will be leftovers?

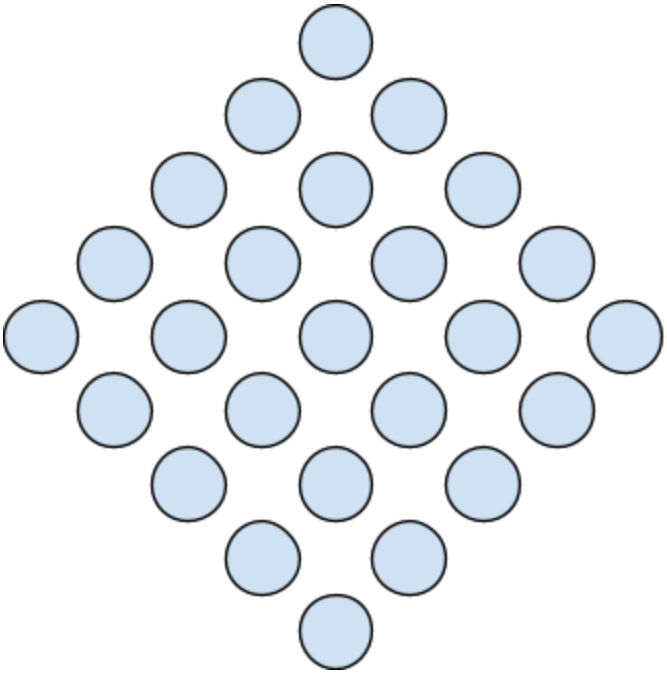
Use pictures and words in the space below to show some things that can't be shared equally.

Imagine you and your two friends are sorting your Halloween candy so that everyone gets the same amount of each type. The number of Reese's Pumpkins are below. How can you make sure that everyone gets the same amount? Be creative and try and come up with as many different possibilities.

Creative Splitting

Below are two designs. Try splitting one into groups with NO leftovers. Try splitting the other into groups with the LEAST number of leftovers.





Equal Split Game (with Leftovers!)

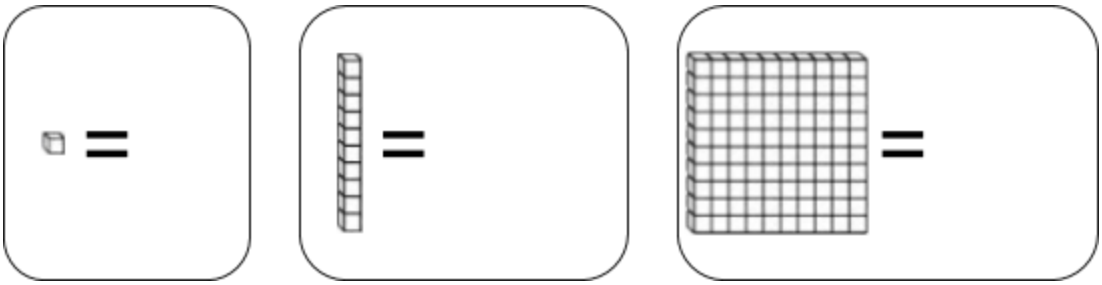
Goal: To score points by accurately predicting the number of leftovers.
Rules:

1. Partner one grabs a handful of cubes.
2. Partner two rolls a die.
3. As a team, predict the number of leftovers you will have after the cubes are divided by the number on the die.
4. Write down your prediction and then figure out the actual leftovers. Were you correct? If so, your team gets a point!
5. Repeat steps 1-4. Use the chart below to keep score.

Round #	Number of cubes picked	Die roll	Prediction of Leftovers	Actual Leftovers?	Points
Round 1					
Round 2					
Round 3					
Round 4					
Round 5					

Group Discussion
Are there better or worse numbers to roll? Support your claim with evidence.

Building with Base Ten



Base ten blocks are tools mathematicians use to show place value. Show the number **396** using base ten blocks. Draw it out below after you create it.

Try splitting 396 into **three groups** using the base ten blocks. Show what you did below.

Now try splitting 396 into **six groups** using the base ten blocks. Show what you did below.

Think Deeply: Do you see any patterns? Do you think there are any other number of groups you can split into without leftovers?

Investigating Division

Investigating Division continued

What is a three digit number that you think is easy to split into 3 groups?_____

Support your thinking with words and/or pictures below.

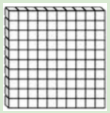
What is a number that is harder to split into 3 groups?_____

Support your thinking with words and/or pictures below.

Equal Split Game (Base Ten Edition)

Goal: To determine the number of leftovers.
Rules:

1. Partner 1 randomly grabs 100s, 10s, and 1s. Grab a maximum of 9 of each.
2. Partner 2 rolls a die.
3. Your group goal is to divide your three digit number and represent that division (including the leftover, if there is one) using your blocks.
4. Repeat steps 2-3 for ten rounds .

	Three- digit number	 Die roll	 per group	 per group	 per group	# of leftovers (if any)
Round 1						
Round 2						
Round 3						
Round 4						
Round 5						
Round 6						
Round 7						
Round 8						
Round 9						
Round 10						

Making Predictions

Consider the problem **416 ÷ 4**

Without solving it, do you think the answer is more than or less than 100? Support your claim below.

Create some more division problems that fit in each category:

Answer is greater than 100	Answer is less than 100

What about division problems with answers greater than 200?

Answer is greater than 200

Group Guess Game

Goal: To predict the answer as accurately as possible.

Rules:

1. Partner 1 randomly grabs 100s, 10s, and 1s. Grab a maximum of 9 of each.
2. Partner 2 rolls a die.
3. Make a team guess about what the answer will be.
4. Check your team's guess using your calculator or base 10 blocks.
5. Find the difference between your guess and the real answer.
6. Repeat steps 2-6 for ten rounds.
7. Add up the differences to find your team total.
8. The goal of the game is to keep your team total as low as you can!

	Three- digit number	 Die roll	Team Guess	Real Answer	Difference
Round 1					
Round 2					
Round 3					
Round 4					
Round 5					
Round 6					
Round 7					
Round 8					
Round 9					
Round 10					
				Total:	

School Set Up

You are going to use information from our school to create a display on a topic of your choice. First, let's gather some information about our school.

Number of classes in our grade: _____

Number of students in our class: _____

Number of students in our grade: _____

Number of students in our school: _____

With your partner, you will decide which project you will do.

Option 1: Group Work

Option 2: Creating a Gym

Option 3: Lunch Time

Option 4: Field Trip

My partner will be _____ and we chose _____.

Option 1: Group Work

Our school encourages collaborative learning and is wondering what tables and chairs to get for each classroom. *The tables and chairs below are examples.*

Design

In our grade, the principal wants the same number of students in each class. Is it possible? How many students would be in each class? Design each classroom for our grade with tables and chairs so that the number of students are equal, or as equal as possible in each class. How many tables will there be in each class? How many seats at each table?

Proposal

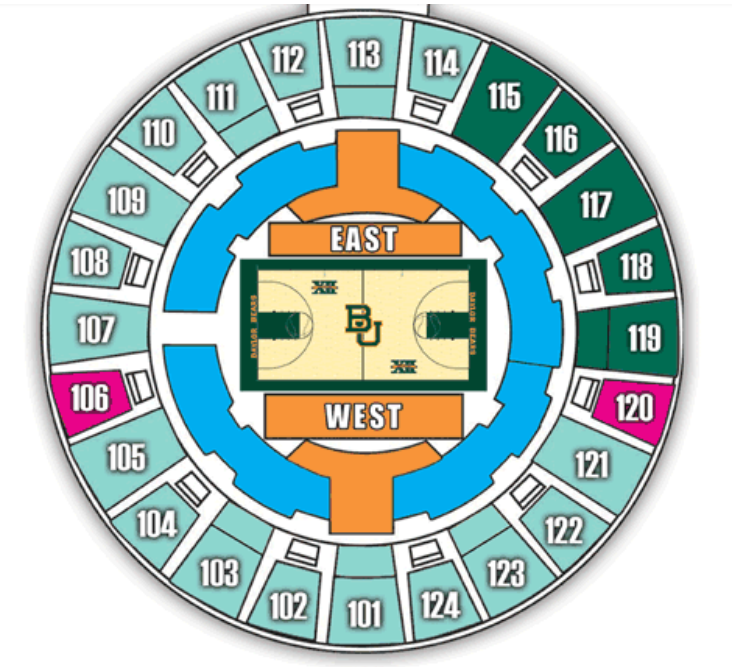
In your proposal, explain why you designed each class the way you did. Walk us through your thought process and reasoning.

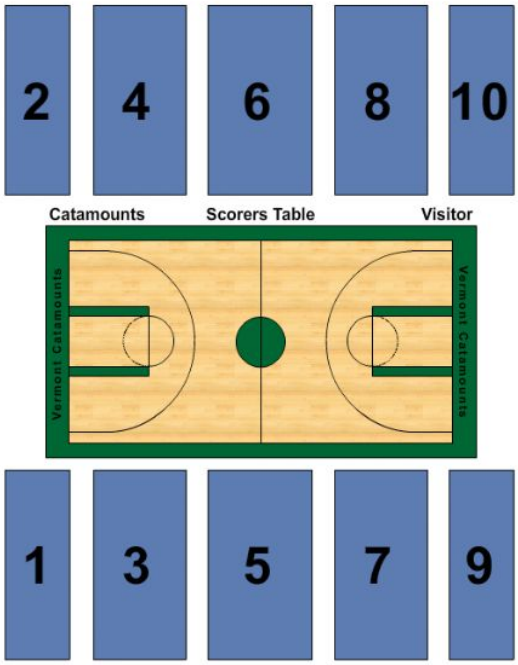
Option 2: Creating a Gym

Our school has decided to create a new gym for our sports teams. The gym has to be divided into equal sections, if possible. *The arena seating charts below are examples from other schools that are much larger.*

Design
Design a gym seating plan that puts the same number of students, or close to the same number of students, in each section. The number of sections you have is up to you!

Proposal
In your proposal, explain why you designed the gym the way you did. Walk us through your thought process and reasoning.





Option 3: Lunch Time

Our school is ordering new tables for the cafeteria and needs your help thinking about what tables to order. *There are some example table types below to gather ideas.*

Design
Create a design for a school lunchroom that you think works best for our school. The school can only buy one kind of table, so the number of students who sit at each table will have to be the same. Be creative about how to use the table you choose!

Proposal
In your proposal, explain why you designed the cafeteria the way you did. Walk us through your thought process and reasoning.






Option 4: Field Trip

Our school is creating a plan for transportation when we go on field trips. Our school is deciding between renting cars, vans, or buses. What would you recommend if just our class is going? The whole grade? The whole school? First, you may have to research how many people fit in a car, van, or bus. We can only use one vehicle type for each situation. *The images below are examples of a car, van, and bus.*

Design
Design a picture that shows what you recommend for the class, grade, and school. Remember, you can only use one vehicle for each situation.

Proposal
In your proposal, explain how you chose the vehicles for each situation and why it is the best plan. Walk us through your thought process and reasoning.

Understanding Division: Bringing it All Together

Note: Please use drawings and base ten blocks to support your answers.

Question 1: Share your seating chart with another group(s). As others share, write down any connections you think of between projects. Also, write down any questions you asked while other projects were shared and any remaining questions you may have.

Connections	Questions

Question 2: A class is preparing to learn the concept of division. How would you explain what division is to a student who has never heard the word division before? Pretend like it is a lesson(s) you are teaching to a group :) Try using words, pictures etc.

Question 3: Explain how division relates to your life and how you can use it to help you. Include examples in your response.

Question 4: Answer the question for the project you chose on the following page:

Group Work: The principal decides that they want less students per class so another teacher is hired. How does the extra class affect your design? Could you think of a way to change your design so this would be possible? Explain your reasoning using words and drawings.

Creating a Gym: The principal would like to increase the size of the gym to account for new students in the future and possibly other community events. How many more seats will you add to your gym? Where will you add them? Will you have to re-design it over again? Explain your reasoning using words and drawings.

Lunch Time: The school decides it wants some options to choose from. For example, all students may not be able to fit in the cafeteria at the same time. Are there other possible designs that you can show to the school? Explain your reasoning using words and drawings.

Field Trip: The school decides that it actually makes more sense to allow more than one vehicle type for field trips. Does that change your design? Is there a better way to choose vehicles now? Explain your reasoning using words and drawings.

Question 4 Continued....

Reflection

Question 1: Now that this task is over, how confident are you that you understand division?

1	2	3	4	5
NOT AT ALL		SOMEWHAT		VERY

Why do you think that is?

Question 2: What was your favorite part of this task? Why was it your favorite?

Question 3: What advice do you have for your teacher the next time they work on this task with a group of students?

Question 4: What did your group do well together? What could you do better together next time?

Question 5: What further questions do you have about division or this task?

Fun Challenge: Can you find numbers that can only be divided by 1 and themselves? How many can you find? An example is 41. It can only be 1 equal group of 41 or 41 equal groups of 1.