WonderHere

Matter

Unit Study

Mad Scientist

MATH PROJECT

Primary (K-1st) Math Benchmarks Covered

- Focus on solving everyday problems
- Develop a concept of numeracy through play
- Skip counting by 2s, 5s, 10s, and 100s
- Basic addition and subtraction 0-20
- Decomposition of numbers 0-10

Post-Primary (2nd-3rd) Math Benchmarks Covered

- Decompose Numbers from 1-10
- Practice basic addition and subtraction algorithms from 0-20
- Practice basic addition and subtraction algorithms from 0-100
- Practice mental arithmetic
- Practice operations in versatile situations
- Use the commutative and associative properties of addition
- Understand the connection between multiplication and division
- Solve equations by reasoning and experimentation

Comprehensive (4th-6th) Math Benchmarks Covered

- Basic mental arithmetic operations
- Addition and subtraction algorithms
- Properties of operations and the connection between them
- Practice all operations in versatile situations using necessary tools
- Solve equations by reasoning and experimentation
- Solving equations by reasoning and experimentation

My Mad Scientist Name:

If I were a mad scientist,
this is what I would look like:

Primary: **TASK 1**

Scientific Tools

Scientists use lots of tools to measure while doing experiments. Some of these tools include: beakers, graduated cylinders, thermometers, and scales.

Match the beakers in Column A to the beakers in Column B so that, together, they equal an amount of 10 milliliters (abbreviated as ml, a unit of measurement for liquids).

Column A

2ml

4 ml

9ml

7ml

Column B

6ml

3ml

1ml

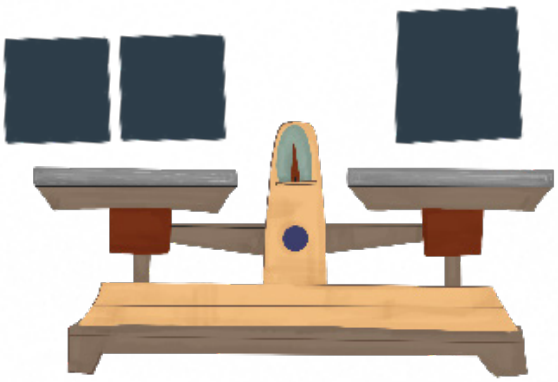
8ml

Primary: TASK 1

Scientific Tools

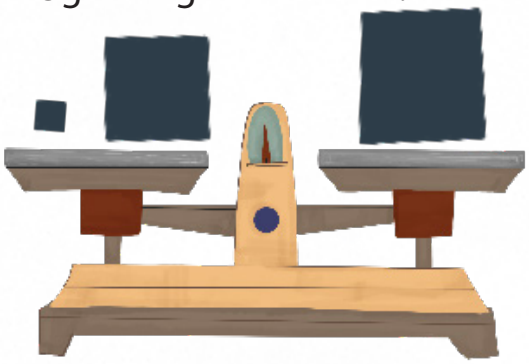
Using your scientific balance scale, write the value of the missing weight needed to balance the scale on the line. Measurement is in grams (g), a unit of measurement for solids.

10g ? 20g



10 + _____ = 20

3g 12g ?



3 + 12 = _____

6g 13g ?

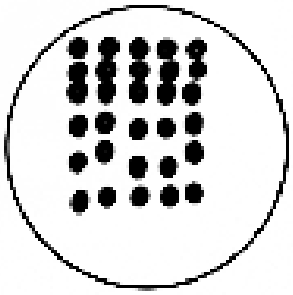
6 + 13 = _____

Primary: TASK 2

The Basics

As a mad scientist, you know that there are three states of matter: solid, liquid, and gas. Take a look under your microscope to observe some chemicals in each state. Estimate the number of molecules in each sample. Next, circle groups of molecules to make them easier to count. Once you've circled same number groups, skip count and write the total on the line.

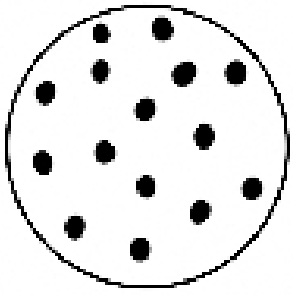
SOLID



Estimate: _____

Total: _____

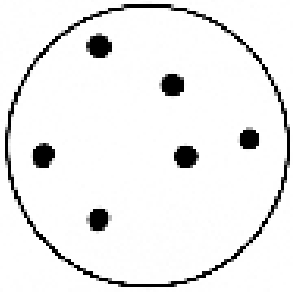
LIQUID



Estimate: _____

Total: _____

GAS



Estimate: _____

Total: _____

How many more liquid molecules are there than gas molecules?

Number sentence: _____

How many more solid molecules are there than liquid molecules?

Number sentence: _____

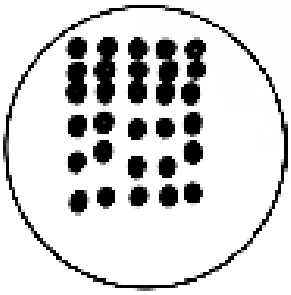
How many more solid molecules are there than gas molecules?

Number sentence: _____

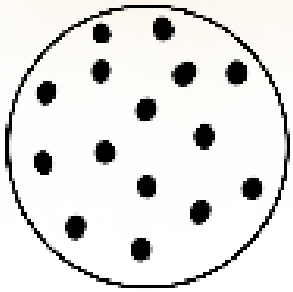
Primary: TASK 2

The Basics

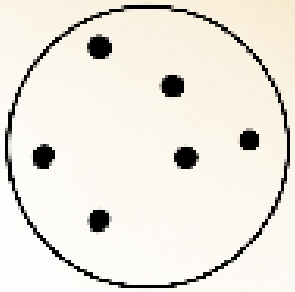
SOLID



LIQUID



GAS



How many liquid molecules and gas molecules are there combined?

Number sentence: _____

How many solid molecules and gas molecules are there combined?

Number sentence: _____

How many molecules are there altogether?

Number sentence: _____

Primary: TASK 3

Potion Motion

It's time to get into the lab to mix up some crazy concoctions! Using the grids below, find the locations of the ingredients needed for your potion recipe. Write your answer in the following format: letter, number (example: A,1).

Recipe Number One: Double Bubble Potion

	1	2	3
A	Vinegar	Corn Starch	Water
B	Dish Soap	Food Coloring	Baking Soda

Primary: TASK 3

Potion Motion

Ingredients:	Location in the Table
10 ml water	**Example: A,3**
5 drops dish soap	
10 ml vinegar	
3 drops food coloring	
2 Tablespoons baking soda	

Looking at the list of ingredients, how many milliliters of liquid do you need, in all, for this recipe?

_____

How many more drops of dish soap do you need than food coloring?

_____

R

	1	2
A	Vinegar	Food Coloring
B	Dish Soap	Baking Soda
C	Cornstarch	Water

Ingredients:	Location in the Table:
9 Tablespoons Cornstarch	
4 ml Water	
5 Drops Food Coloring	

Primary: TASK 3

Potion Motion

Looking at both potion recipes, how many ml of water do you need in all?

_____

Looking at both recipes, how many drops of food coloring do you need in all?

_____

Looking at both recipes, how many more tablespoons of cornstarch do you need than baking soda?

_____

Your turn! Create your own Mad Scientist Potion below.

The name of my potion is: _____

These are the ingredients in my potion: _____

_____

_____

This is what my potion does when you mix them all together: _____

_____

Post-Primary: **TASK 1**

Scientific Tools

Scientists use lots of tools to measure while doing experiments. Some of these tools include: beakers, graduated cylinders, thermometers, and scales.

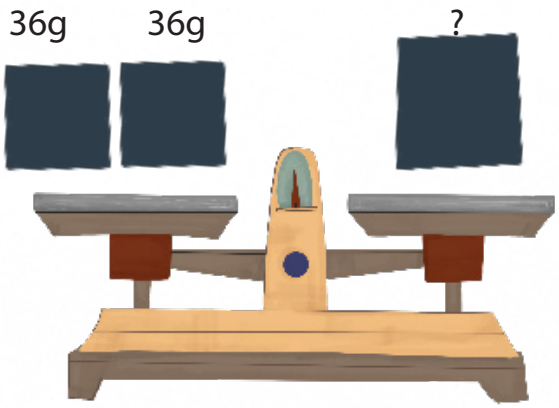
Add the beakers in Column A to the beakers in Column B to determine how many milliliters each beaker holds when combined (abbreviated as ml, a unit of measurement for liquids).

Column A			**Column B**		
	24 ml	+		61 ml	=
	46 ml	+		12 ml	=
	9 ml	+		18 ml	=
	65 ml	+		33 ml	=

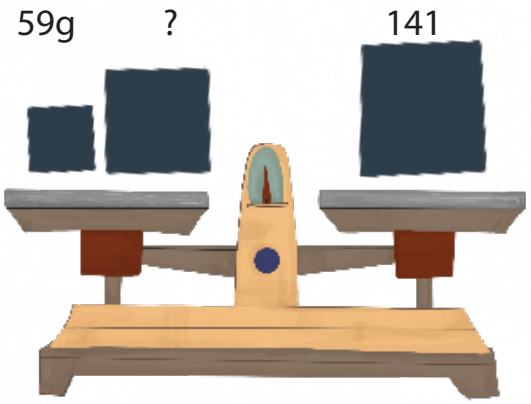
Post-Primary: TASK 1

Scientific Tools

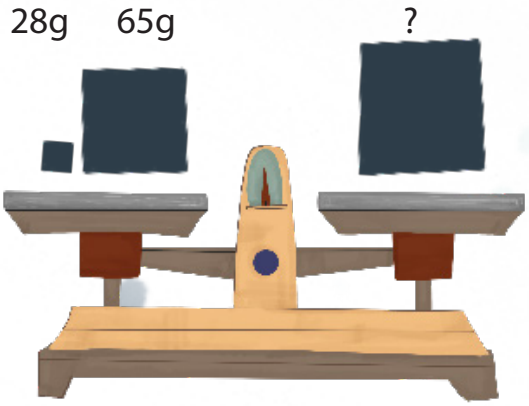
Using your scientific balance scale, write the value of the missing weight needed to balance the scale on the line. Measurement is in grams (g), a unit of measurement for solids.



36 + 36 = _____



59 + _____ = 141



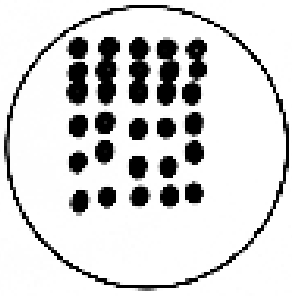
28 + 65 = _____

Post-Primary: TASK 2

The Basics

As a mad scientist, you know that there are three states of matter: solid, liquid, and gas. Take a look under your microscope to observe some chemicals in each state. Estimate the number of molecules in each sample.

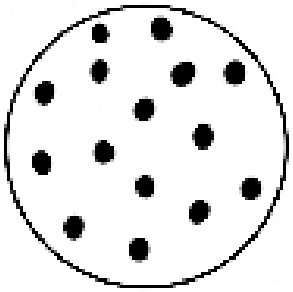
SOLID



Estimate: _____

Total: _____

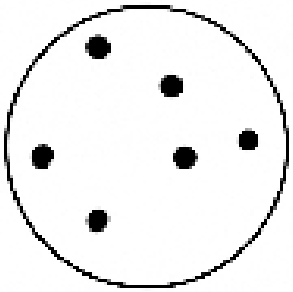
LIQUID



Estimate: _____

Total: _____

GAS



Estimate: _____

Total: _____

How many more solid molecules are there than liquid molecules?

Number sentence: _____

How many more liquid molecules are there than gas molecules?

Number sentence: _____

How many more solid molecules are there than gas molecules?

Number sentence: _____

How many molecules are there altogether?

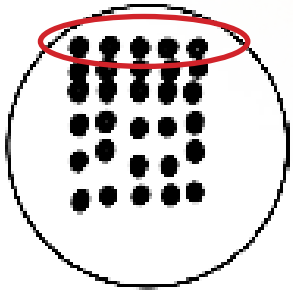
Number sentence: _____

Post-Primary: TASK 2

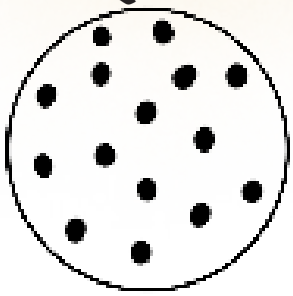
The Basics

Sample 2:

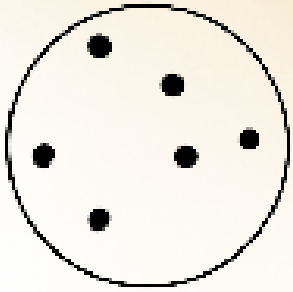
SOLID



LIQUID



GAS



Circle groups of molecules to make them easier to count, and write the repeated addition and multiplication sentence that goes with it. Write two equations per circle (6 equations total). See the example below for circled portion above.

1. 5 + 5 + 5 + 5 + 5 = 30 5 x 6 = 30
2. _____
3. _____
4. _____
5. _____
6. _____

Post-Primary: TASK 3

Potion Motion

It's time to get into the lab to mix up some crazy concoctions! Using the grids below, find the locations of the ingredients needed for your potion recipe. Write your answer in the following format: letter, number (example: A,1).

Recipe Number One: Double Bubble Potion

	1	2	3
A	vinegar	borax	Dish soap
B	glue	Corn starch	water
C	Baking soda	Food coloring	Shaving cream

Post-Primary: TASK 3

Potion Motion

Ingredients:	Location in the Table
32 ml water	**Example: B,3**
13 drops dish soap	
67 ml vinegar	
8 drops food coloring	
9 Tablespoons baking soda	

Looking at the list of ingredients, how many milliliters of liquid do you need, in all, for this recipe?

_____

How many more drops of dish soap do you need than food coloring?

_____

Recip

	1	2	3
A	Food coloring	Shaving cream	vinegar
B	glue	Baking soda	water
C	Dish soap	borax	bleach
D	Hydrogen peroxide	Corn starch	yeast

Ingredients:	Location in the Table:
31 Tablespoons Cornstarch	
57 ml Water	
5 Drops Food Coloring	

Post-Primary: TASK 3

Potion Motion

Looking at both potion recipes, how many ml of water do you need in all?

_____

Looking at both recipes, how many drops of food coloring do you need in all?

_____

Looking at both recipes, how many more tablespoons of cornstarch do you need than baking soda?

_____

Your turn! Create your own Mad Scientist Potion below.

The name of my potion is: _____

These are the ingredients in my potion: _____

_____

_____

This is what my potion does when you mix them all together: _____

_____

_____

Draw your potion in the box below.

Comprehensive: TASK 1

Scientific Tools

Scientists use lots of tools to measure while doing experiments. Some of these tools include: beakers, graduated cylinders, thermometers, and scales.

Match the beakers in Column A to the beakers in Column B to determine how many milliliters each beaker holds (abbreviated as ml, a unit of measurement for liquids).

Column A

5.53 + 7.02

2 x (6.1 + 4.5)

1/4 + 2/3

27 + 3 - 2

Column B

21.2 ml

11/12 ml

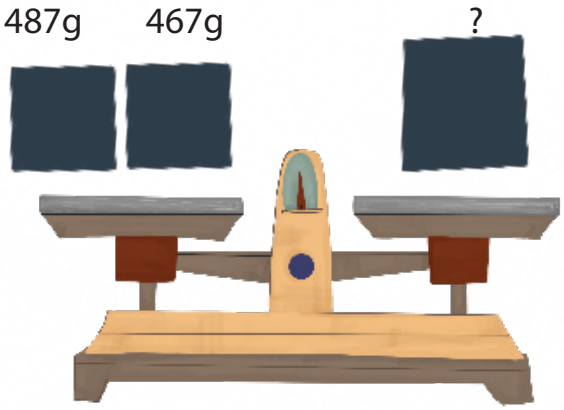
12.55 ml

15 ml

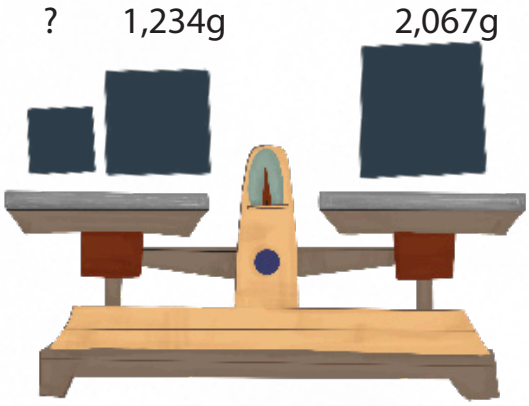
Comprehensive: TASK 1

Scientific Tools

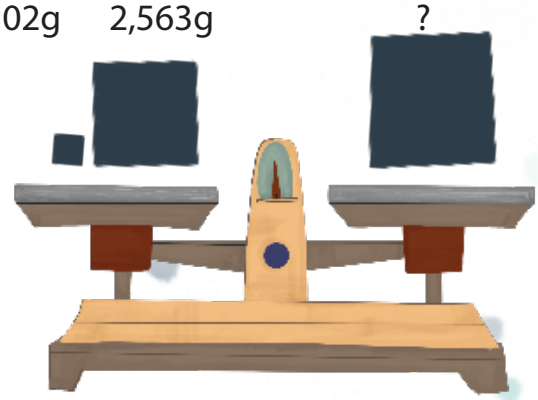
Using your scientific balance scale, write the value of the missing weight needed to balance the scale on the line. Measurement is in grams (g), a unit of measurement for solids.



467g + 467g = _____



_____ + 1,234g = 2,067g



302g + 2,563g = _____

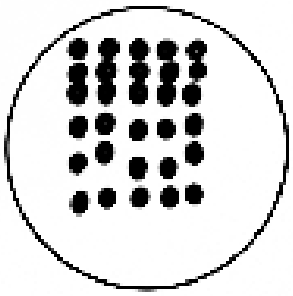
Comprehensive: TASK 2

The Basics

As a mad scientist, you know that there are three states of matter: solid, liquid, and gas. Take a look under your microscope to observe some chemicals in each state. Estimate the number of molecules in each sample.

Then, write an equation for each circle the equals the total number of molecules. Each equation must include a set of parentheses and two different operations.

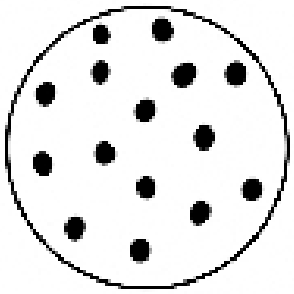
SOLID



Estimate: _____

Total: _____

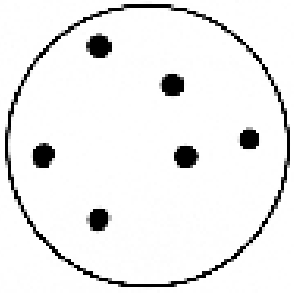
LIQUID



Estimate: _____

Total: _____

GAS



Estimate: _____

Total: _____

If you had three identical samples of the solid, how many molecules would you have in all?

Number sentence: _____

How are the number of molecules in these three samples similar? How are they different?

_____

_____

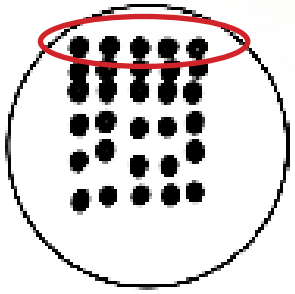
_____

_____

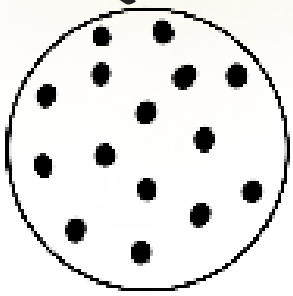
Comprehensive: TASK 2

The Basics

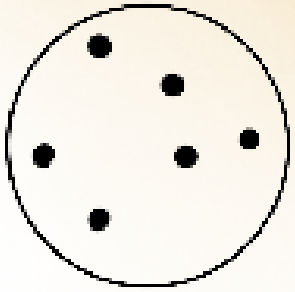
SOLID



LIQUID



GAS



Circle groups of molecules to make them easier to count, and write the repeated addition sentence, multiplication sentence, and division sentence that goes with it. Write three equations per circle (18 equations total). See the example below for circled portion above.

1. 5 + 5 + 5 + 5 + 5 = 30 5 x 6 = 30 30 ÷ 5 = 6
2. _____
3. _____
4. _____
5. _____
6. _____

Comprehensive: TASK 3

Potion Motion

It's time to get into the lab to mix up some crazy concoctions! But wait! There seems to be some important information missing from your mad scientist potion recipes. Use your knowledge of the order of operations to find the amounts of missing ingredients.

Recipe Number One: Double Bubble Potion

Mix the following amounts together so you have a total of 250 ml.

(10ml dish soap + 40ml water) x _____ml vinegar = 250ml

How much vinegar do you need for this recipe?

(Use the workspace on the next page to work out your math.)

Potion Motion

WORK SPACE

That's not the only missing ingredient!

Next, add 5 drops of food coloring to the above mixture. Now it's time to get bubbly, but first you'll have to solve this problem to determine the amount of baking soda you'll need.

The amount of baking soda needed is 5 less than 10 times less than the total amount of milliliters used above.

Equation: _____

WORK SPACE

Potion Motion

Recipe Number Two: Ooey Gooey Oobleck

Solve the following equation to determine how much water is needed for this recipe.

(2 x 37ml cornstarch) + (2 x _____ml water) = 110ml

WORK SPACE

If you wanted to triple this potion recipe, how much of each ingredient would you need?

WORK SPACE

Comprehensive: TASK 3

Potion Motion

Your turn! Create your own Mad Scientist Potion below.

The name of my potion is:_____

These are the ingredients in my potion: _____

_____

_____

_____

_____

Explain what your potion does: _____

_____

_____

_____

_____

_____

Draw your potion in the box below

All Levels: TASK 4

Reflection

Now that you are finished with your project, take some time to reflect by answering the following questions. You may answer verbally (with a parent dictating) or by writing your responses below.

When I worked on this math project, I thought that the work was ...

Something interesting that I discovered, was...

Something I thought was hard was...

I am still wondering...

Overall, I think that the work I did was...