

# Tues/Wed, October 16/17, 2018

Your Learning Goal: At the end of the lesson, SWBAT explain/demonstrate the Law of Conservation of Mass

Key Terms: reactants, products, chemical reaction, mass, open system, isolated system

Table of Contents: Conservation of Mass 13L+R

Prediction: What will happen when you mix baking soda with vinegar? (Be specific- what will happen to the mass)



## Homework:

Watch “Bing Bang”  
Video at home for Page  
10R&10L (Cornell Notes)

## Agenda

1. Pre-Write
2. Pre Lab Activity
3. Lab Activity/ Discussion
4. Video
5. True/ False Activity
6. Reflection Questions

# Table of Contents

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10/17/18

Catalyst:

What do you think the word "conservation" means?  
OR Where have you heard of the word "conservation"?  
(2-3 sentences in total)

**13L**

10/17/18

Conservation of Mass

**13R**

# Pre-lab Activity

- What data can I collect from the popcorn bag?
- Microwave popcorn for about 3 minutes.
- What measurements will change after the popcorn is popped?
- Is the popcorn considered a closed system or open system??

10/17/18

Pre-Write:

What do you think the word "conservation" means?  
OR Where have you heard of the word "conservation"?  
(2-3 sentences in total)

13L

10/17/18

Conservation of Mass

Prelab (Popcorn Activity):

	length (cm)	width (cm)	height (cm)	volume (cm <sup>3</sup> )	mass (g)
Initial Popcorn Bag					
Final Popcorn Bag					

13R

# Data Table (Top of 13R)

	Length (cm)	Width (cm)	Height (cm)	Volume (cm <sup>3</sup> )	Mass (g)
Initial Popcorn Bag					
Popcorn (after being Popped)					

**Q: What happened to the mass of the popcorn after being popped? Did it increase, decrease, or stay the same? WHY? Please explain in your own words! (2-3 sentences)**

**13R**

10/16/18

Catalyst:

What do you think the word "conservation" means?  
OR Where have you heard of the word "conservation"?  
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13L

10/16/18

Conservation of Mass

Prelab (Popcorn Activity):

	length (cm)	width (cm)	height (cm)	volume (cm <sup>3</sup> )	mass (g)
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Final Popcorn Bag					

Q: What happened to the mass of the popcorn after being popped? Did it increase, decrease, or stay the same? WHY? Please explain in your own words! (2-3 sentences)

13R

# What Happens When You Mix **Baking Soda** & **Vinegar??**



 alamy stock photo

AW9JAY  
www.alamy.com



# Pre-Lab Questions

- Is popped popcorn an open or closed system??
- **PLEASE ANSWER VOID OF I AD  
QUESTIC**



# **Trial 1: (Steps 1-7)**

1. **Set the balance to 0**
2. **Fill a plastic cup with 20mL of vinegar (use your graduated cylinder)**
3. **Measure the mass of your cup with vinegar**
4. **Measure the mass of your cup with baking soda – 2.1g (empty small cup)**
5. **Record your starting mass (3 + 4) in the data table**
6. **Dump the baking soda into the big cup. Do not stir.**
7. **Record the ending mass of the cup in the data table**

# Trial 1- Cont': (Step 8)

- 8. Calculate the amount of mass changed.



# Data Table #1

	Starting Mass (g)	Ending Mass (g)	Amount Changed (g)
Trial 1 (Open System)	Cup 1 + Cup 2 – 2.1 g	Cup 1 (Combined Baking Soda & Vinegar)	Ending Mass- Starting Mass

# **Trial 2: (Steps 1-9)**

1. Fill a clean cup plastic with **20mL of vinegar**.
2. Add **one spoonful of baking soda** into a clean plastic bag.
3. Gently **place the cup with vinegar in the plastic bag**. **DO NOT** spill the vinegar.
4. Try to push all air out of the bag.
5. **Seal the bag & place it on the balance** without spilling the vinegar. Record the starting mass.
6. Without opening the bag, tip the plastic cup, **mixing the vinegar with the baking soda**.

# **Trial 2-Cont':(Steps 14-16)**

7. Still without opening the bag, **record the ending mass of the contents of the plastic bag.**

8. **Calculate the amount of mass** changed.

9. **Clean up the area. Put the materials back into the plastic bin for the next class.**



# Data Table #2

	Starting Mass (g)	Ending Mass (g)	Amount Changed (g)
Trial 2 (Closed System)	Cup 1 + Cup 2 in the Zip-Loc Bag (before mixing)	Cup 1 + Cup 2 in the Zip-Loc Bag (after mixing baking soda & vinegar)	Ending Mass - Starting Mass

# Conservation of Mass

## NOTES:

- The law of conservation of mass tells us that mass is not created or destroyed when chemical and physical changes occur.
- Another way of looking at it is that the mass of the reactants will equal the mass of the products.
- What is the chemical equation for our activity?

**Reactant A** + **Reactant B** → **Product C** + **Product D** + **Product E**

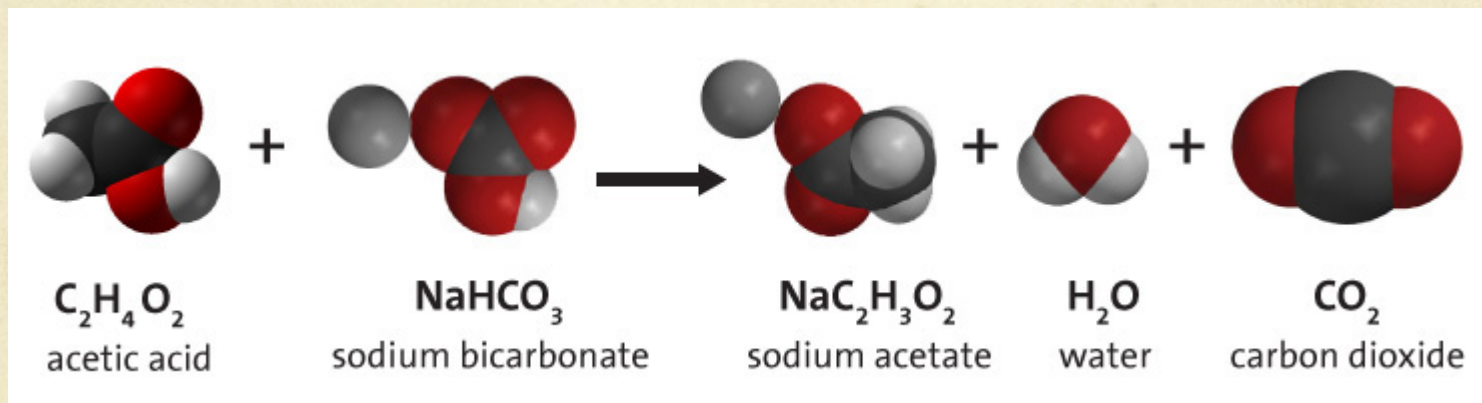
**Baking Soda** + **Vinegar** → **sodium acetate**  
+ **CO<sub>2</sub>** +

- What is the mass before and after?

**Baking Soda** + **Vinegar** → **sodium acetate** + **H<sub>2</sub>O**  
+ **CO<sub>2</sub>**



# Chemical RXN of Vinegar/ Baking Soda



# Let's Watch a Video!

- <https://www.youtube.com/watch?v=3IHHOiTdmK4&frags=pl%2Cwn>
- Any thoughts? I will randomly call on a popsicle stick to share your thoughts regarding the video.

# True/False Cards

- Sort the cards into true and false piles (8 cards total).
- When you're done, raise your hand so that I can check your TRUE cards.
- Write all the true statements into your notebook (**13R**).
- Write the false statements into your notebook AND change them into true statements.

**13R**

PLEASE WRITE THIS ON THE BACK PAGE OF YOUR WORKSHEET!!!!

## Conservation of Mass

\*True Statements:

- 1)
  - 2)
  - 3)
  - 4)
- 

\*False Statements:

- 1) **Incorrect:**  
**Correct:**
- 2) **Incorrect:**  
**Correct:**
- 3) **Incorrect:**  
**Correct:**
- 4) **Incorrect:**  
**Correct:**

PLEASE WRITE THIS ON THE BACK PAGE OF YOUR WORKSHEET!!!!

## Conservation of Mass

\*True Statements:

- 1)
  - 2)
  - 3)
  - 4)
- 

\*False Statements:

- 1) **Incorrect:** Matter can be created and destroyed in a chemical reaction.  
**Correct:** Matter CAN'T be created and destroyed in a chemical reaction.
- 2) **Incorrect:**  
**Correct:**
- 3) **Incorrect:**  
**Correct:**

10/17/18

## Catalyst:

What do you think the word "conservation" means?  
OR Where have you heard of the word "conservation"?  
(2-3 sentences in total)

## Reflection:

1) 4 grams of hydrogen and 32 grams of oxygen will combine to form \_\_\_\_\_ grams of water. *(Show your work and explain!)*

2) In a chemical reaction, 4 grams of sodium must combine with how many grams of chlorine to produce 10 grams of table salt? *(Show your work and explain!)*

**13L**

10/17/18

## Conservation of Mass

### Prelab (Popcorn Activity):

	length (cm)	width (cm)	height (cm)	volume (cm <sup>3</sup> )	mass (g)
Initial Popcorn Bag					
Final Popcorn Bag					

Q: What happened to the mass of the popcorn after being popped? Did it increase, decrease, or stay the same? WHY? Please explain in your own words! (2-3 sentences)

**13R**

# Reflection

1) 4 grams of hydrogen and 32 grams of oxygen will combine to form \_\_\_\_\_ grams of water. *(Show your work and explain!)*

2) In a chemical reaction, 4 grams of sodium must combine with how many grams of chlorine to produce 10 grams of table salt? *(Show your work and explain!)*

**13L**

# Reflection

After a piece of paper burns, very little is left of the original paper (there's not that much ash left over). Knowing about the conservation of mass, where did all the mass go? *Explain* your answer.

After the piece of paper burned, the mass is now in the form of ...



- **Thank You for Participating!!**
- **Don't Forget to Put the Materials Back in the Plastic Bin & Clean Up After Yourselfes!!**
- **You will NOT be DISMISSED until your area is CLEAN!!**