

Unit 7.1 - Chemical Reactions & Matter

2024/25

Driving Question

- How can we make something new that was not there before?

Focus Questions

1. What happens when a bath bomb is added to water (and what causes it to happen)?
2. Where is the gas coming from?
3. What's in a bath bomb that is producing the gas?
4. Which combinations of the substances in a bath bomb produce a gas?
5. What gas(es) could be coming from the bath bomb?
6. How can we revise our model to represent the differences in the matter that goes into and comes out of the bath bomb system?
7. How can particles of a new substance be formed out of the particles of an old substance?



What we figured out...	What we <i>did</i> to figure it out...
<p>C PERIOD</p> <ul style="list-style-type: none"> Some parts of a bath bomb are a crystal-like substance. We saw the following colors: pink, green, white/clear, a little orange/yellow. They made a 'crunchy' noise when moved with the tool. It reminds us of grains of sand. <p>D PERIOD</p> <ul style="list-style-type: none"> <p>H PERIOD</p> <ul style="list-style-type: none"> 	<p><u>WEEK 03</u></p> <ol style="list-style-type: none"> We observed and drew a sample of a (crushed) bath bomb with stereo microscopes using 20x and 40x magnification. We photographed what we saw with the microscope to improve the realism/accuracy of our drawings. We also added water drops to the sample to observe and document what happens when the water and powdered bath bomb combine.

Word Wall

B PERIOD

NOTE: For definitions of Word Wall words, please visit the [SCIENCEsEDiment Glossary](#)

B PERIOD

QUESTIONS WE HAVE...

- What is *air*?
- What is a *bubble*?
- What is an *air bubble*?
- How does air *get into* something?
- Can air be created by a **mixture of two different substances**?

OUR IDEAS FOR INVESTIGATION...

INV #	IDEA	MODEL FEATURE WE CAN IMPROVE...
	What happens when we combine citric acid with water?	
	What happens when we combine baking soda with water?	
	Evaporate the water from the leftover bath bomb water and then test the recovered powder that remains? Does it create bubbles?	
	Put a bath bomb in old bath bomb water .	
	Put a bath bomb in other liquids .	
	What is the gas that is produced by the bath bomb and the water?	

C PERIOD

QUESTIONS WE HAVE...

- What is the difference between “air” and “carbon dioxide gas”?

OUR IDEAS FOR INVESTIGATION...

INV #	IDEA	MODEL FEATURE WE CAN IMPROVE...
2	Let's make our own bath bombs so we can figure out a more accurate proportion of colored circles to draw when we draw a particle-based model of a solid bath bomb.	Drawing A
1	Let's collect the gas coming from the bath bomb reaction and send it through a special liquid that will tell us (e.g., changes color or becomes cloudy) if the gas contains carbon dioxide as one of its main ingredients.	Drawing D

H PERIOD

QUESTIONS WE HAVE...

- Are the gas bubbles produced by the water + bath bomb already inside the water or the bath bomb just waiting to be released OR are the gas bubbles from a reaction that happens when the materials in the bath bomb meet with the water?
- What are the types of gases found in the gas bubbles that appeared when the bath bomb and water came together?
- Are there any other substances besides gases created during this event? Any new solids (at the bottom of the leftover liquid?) or liquids?

OUR IDEAS FOR INVESTIGATION...

INV #	IDEA	MODEL FEATURE WE CAN IMPROVE...
	<p>Let's force the gas produced by a bath bomb + water through rubber tubing and into a glass test tube filled with a special indicator liquid called <i>limewater</i>. If the limewater, which is normally clear, turns cloudy, then we know the gas contains carbon dioxide.</p> <ul style="list-style-type: none">• We could also use BTB (Bromothymol Blue) which goes from yellow > green > blue.	
	<p>Let's force the gas produced by a bath bomb + water through rubber tubing and into a glass test tube turned upside down. If a still-glowing candle wick (or a still-glowing wooden splint) ignites and becomes a flame when inserted into the inverted test tube, then we know the gas contains oxygen gas (O₂).</p>	
	<p>Let's force the gas produced by a bath bomb + water through rubber tubing and into a glass test tube turned upside down. If a lighted wooden splint creates a small explosion (a forceful 'Pop!') when inserted into the inverted test tube, then we know the gas contains hydrogen gas (H₂).</p>	

	<p>How will we figure out if there is sodium citrate created during the bath bomb + water event?</p> <ul style="list-style-type: none"> • We think we know it's like salt, is a crystal, is small, feels sandy? 	