**MATTER AND CHEMISTRY**

*BATH BOMBS LESSON 5*

**INVESTIGATION QUESTION** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**REVIEW**

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| **Question** |
| *Is the gas formed from citric acid, sodium bicarbonate, and water a new substance?* |
| **CLAIM:** |
| **EVIDENCE:** |
| **REASONING:** |

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| **Gas-Related Phenomenon** |
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List any experiences you’ve had with different types of gas. For each example explain the gas’s role in the system.

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| **Properties of Gases Observations** |
| Notice | Wonder/Question |
|  |  |

Record the observations you notice about the common gas properties on the page, and record what you wonder or question.



**Properties of Common Gases**

**PLANNING AN INVESTIGATION #1**

Record your ideas below about the following. Feel free to make a list, draw a picture, and/or write out your ideas.

* How can we test the gas produced by the bath bomb for the properties on the previous page?
* How could we trap the gas to do so?

**Materials:**

Samples of known gases

Bath bomb samples

Water

Flasks

Matches

Rubber stoppers

Identify the following for this investigation:

**Independent variable:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Control group:** \_\_ **Air**\_\_\_

**Dependent variable:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Constants:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Develop a hypothesis to answer the question: *What will happen when we test the flammability of the gas produced by the bath bomb?***

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| **Observations of Gases** |
| **Gas** | **Flammability** |
| *Helium* |  |
| *Air* |  |
| *Oxygen* |  |
| *Gas from Bath Bomb* |  |

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| **Problem/Question** |
| *What are some possible gases produced by the bath bomb?* |
| **CLAIM:** |
| **EVIDENCE:** |
| **REASONING:** |

**SUMMARY/CONCLUSION**

**PLANNING AN INVESTIGATION #2**

Record your ideas below about the following. Feel free to make a list, draw a picture, and/or write out your ideas.

* How can we test the property of density for the gas produced by the bath bomb?

**PREDICTIONS**Use the slide your teacher displays and *Properties of Common Gases* table on page 2to help you complete the two statements below.

1. If the gas from the gas bomb puts out a flame **above it**, that means it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ dense than the room air which has a known range of values between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

I know this because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

If evidence supports this prediction, it tells me that the gas from a bath bomb could be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2.If the gas from the gas bomb puts out a flame **below it,** that means it is \_\_\_\_\_\_\_\_\_\_\_\_\_ dense than the room air which has a known range of values between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

I know this because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

If evidence supports this prediction, it tells me that the gas from a bath bomb could be

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**Materials:**

plastic soda bottle and cap water

8 mini-bath bombs
matches

candle
small aluminum bread pan

**Procedure:**

1. Fill a bottle about 1/10 full with water. Add 8 mini bath bombs to it. Cap it.
2. Light a match. Hold it 1 inch over the bottle as a partner removes the cap.
3. Keep it there for 2 seconds. Make note of whether the match goes out or not.
4. Extinguish the match and cap the bottle. Discard the match in a cup of water.
5. Light a candle in an aluminum bread pan.
6. Lean the edge of the bottle against the pan and remove the cap.
7. Gently squeeze the bottle to push the gas out of it. Make note of whether the candle in the pan goes out or not.

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| **Observations of Gases to Test Density** |
| **Gas** | **Observations**  |
| *Helium* |  |
| *Air* |  |
| *Oxygen* |  |
| *Gas from Bath Bomb* |  |

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| --- |
| **Problem/Question** |
| *What is the gas produced by the bath bomb?* |
| **CLAIM:** |
| **EVIDENCE:** |
| **REASONING:** |

**SUMMARY/CONCLUSION**