

## Regents Chemistry

Ms. Randall

### Lab Activity: Is Air Matter?

#### Background Information:

Matter is something that has volume and has mass, and because air is invisible, it *seems* to have neither. In fact, for many thousands of years, people didn't even know that air existed. By watching and performing simple experiments, students will develop an understanding of the properties of air. Engineers must understand the physical properties of air so they can determine the best way to remove pollutants from contaminated air. They study how quickly air moves and how much pressure it exerts. This knowledge helps them design filtration systems that efficiently move air through a system, while at the same time ensuring that pollutants are removed before the air is released into the atmosphere.

#### Research Question: *Is air matter?*

Pre-lab Questions: (complete in lab notebook and have Ms. Randall check before going to next section)

1. What are the different types of matter?
2. Is heat matter? Explain.

#### Procedure:

1. As a group, make a prediction for the research question.
2. As a group, develop a model/explanatory hypothesis in your notebook that you will test through experimentation to support your claim. Include particle arrangements of each item. Remember to get feedback on your model from other groups and Ms. Randall.
3. In your lab notebook, determine your variables, constants and construct a data table(s) to collect your data (evidence).
4. As a group determine your procedures for your experiment and write that in your notebook. **Have Ms. Randall check your notebooks before conducting your experiment. Every member of the group must have a complete notebook!!!**
5. Conduct your experiment and collect data (evidence) that you will use to support your claim.
6. Using your evidence, make a claim and justify it with scientific reasoning.
7. Present your argument (CER) to the class. Each group will make one positive comment and 1 critique for each group CER.
8. As a group, determine if you need to make any adjustments to your model and or claim based upon the feedback from the class.
9. Complete your lab conclusion which includes a CER summary.

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Lab Conclusion: Is Air Matter?

1. Summary of your experimental claim, evidence and reasoning (6)

Lab Grading Rubric

| Component  | Level  |   |   |
|--|--|---|---|
|  | 0  | 1   | 2   |
| <b>Claim</b> - A conclusion that answers the original question.  | Does not make a claim, or makes an inaccurate claim.   | Makes an accurate but incomplete claim.   | Makes an accurate and complete claim.   |
| <b>Evidence</b> – Scientific data that supports the claim. The data needs to be appropriate and sufficient to support the claim.   | Does not provide evidence, or only provides inappropriate evidence (evidence that does not support the claim). | Provides appropriate but insufficient evidence to support claim. May include some inappropriate evidence.                                     | Provides appropriate and sufficient evidence to support claim.  |
| <b>Reasoning</b> – A justification that links the claim and evidence. It shows why the data count as evidence by using appropriate and sufficient scientific principles. | Does not provide reasoning, or only provides reasoning that does not link evidence to claim                    | Provides reasoning that links the claim and evidence. Repeats the evidence and/or includes some – but not sufficient – scientific principles. | Provides reasoning that links evidence to claim. Includes appropriate and sufficient scientific principles. |

2. What are the properties of air? How would you describe air?

3. What additional ways can you prove that air is matter?