**Lesson Plan Template**

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| **Name:** | **409**  |  | **Course:** | Earth Science |  | **Grade:** | 8 |
| **Unit:** | Climate and Weather |
| **Big Idea (Key concept):** | Air has mass. |
| **Literacy Strategy(s):** | Small Group Discussion, Claims and Evidence, and Journal |
| **Lesson:** | Properties of Air |  | **Date Taught:** | 1/25/2010 |
| **Learning Objective(s):** |
|  |  Students will be able to | Describe/demonstrate how they know that air has mass. |
|  | Students will be able to | Describe the properties of air. |
| **Idaho Standards (or National Standards if no Idaho Standards exist):** |
| Goal 4.1, Objective 3 Show how interactions among the solid earth, oceans, atmosphere, and organisms have changed the earth system over time. |

**Lesson in Context:**

Students have had the opportunity to begin by exploring the composition of the atmosphere/air around them and are beginning to collect weather data. This lesson is helping to build the foundation for a discussion of weather and climate.

**Instructional Materials, Resources:**

Student notebooks, “Does Air Have Mass?” handout, materials around the classroom for students to use to create demonstrations.

**Procedures:**

In this section write a detailed explanation of each step of your lesson using the guidelines and components below. The lesson may span multiple days.

* **Engage/Introduction:** *(approximate time: 5 min )*
* I tell them that today they are going to need to decide whether or not they think air has mass. Usually, the class will call out answers immediately and about ½ the kids think it does and ½ do not. I ask them how mass is measured so that they can remember the property we are talking about and, ultimately, link that knowledge back to whatever their demonstration will be.
* **Explore/Learning Activities:** *(approximate time: 40 min )*
* Students will work in pairs. They are given a handout that clearly explains the activity. I tell them they may use whatever resources are available in the room (books and computers, but not me) to determine the answer to the question “Does air have mass?” During their research, they must take notes on their findings in their notebooks. They must also be able to describe density and pressure in relationship to air. After they have a satisfactory answer in their notebook, they need to create a demonstration that supports their findings regarding whether air has mass or not (obviously, all of the students find out that air does have mass).
* **Explanation/Closure:** *(approximate time: 10 )*

After students have created their demonstrations, they share them, along with their explanation of how it supports their claim that air has mass, with the class. Students are to choose one student demonstration to evaluate in their notebook. They must decide if the demonstration clearly showed the relationship between air and mass and, if so, how and, if not, why not.

Finally, students will write a paragraph and draw a picture or diagram in their notebooks that summarizes what they learned about the properties of air during this activity.

**Elements of effective instruction:** (Describe how the lesson addresses each of the following. If not applicable, explain.)

1. Describe how the lesson fosters intrinsic motivation to learn.

Students have an interesting, science-based question that they are motivated to find the answer to and then create a demonstration to support what they discover.

1. Describe how the lesson elicits students’ prior knowledge.

Students all have an opinion about the topic before we start – as soon as the question is asked, they start thinking about it. Then we also talk about how mass is measured (using a balance scale) which they already know so they are now thinking about the property of mass, also.

1. Describe how the lesson intellectually engages the students in making meaning of the targeted math/science content.

Students are intellectually engaged in making meaning because they are given a question that they need to find the answer to themselves, and then create a demonstration that shows what they find out. They work in pairs so they are able to discuss how to find a solution to the problem they need to solve.

1. Describe how students:
* *Science*: Use evidence to support and/or critique claims.
* *Math*: Explain and justify their reasoning.

They use evidence to support their claim because they need to create a physical demonstration that they can explain which supports their claim.

1. Describe how the students engage in making sense of the material covered in the lesson.

They engage in making sense by finding their own solution to a question and creating a way to explain what they find out. Because they will have to demonstrate their findings for the class, they are committed to being able to clearly explain what they find out. During the demonstration, I will ask guiding questions about anything that seems unclear so they know and I know that they understood their explanation.

**Student Work:**

Include samples of student work from the lesson (include and clearly label examples of high, medium, and low quality).

I don’t have samples of student work for this lesson because the student work created was a demonstration.

**Reflection:**

Complete the Lesson Reflection Form on the following page. Spend time to include details of how the strategy worked and what you may have done differently. This is the portion which will most help your colleagues in implementing their own version of your lesson.**LIMSST Project Literacy Lesson Reflection Form**

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| --- | --- | --- | --- | --- |
| **Name:** | **409** |  | **Date lesson was taught:** | **1/24/2010** |
| **Lesson Title/Topic Area(s):** |
| **Climate and Weather: Does Air Have Mass?** |

**Literacy Emphasis:**

(Please discuss the literacy strategy(s) you embedded in this lesson. How do the strategies support **student** thinking and meaning making? Be specific and use as much detail as possible.)

Inquiry-based activity, small group discussion, claims and evidence.

**Student Response to the Lesson:**

(Describe the nature of student engagement in the math/science content presented in the lesson. How effective was the strategy at supporting student reasoning? Describe evidence that the students were making sense of the content presented.)

All levels of students were very engaged in this activity. They had an opinion about the question from the very beginning and we curious about being “right” or “wrong” about their answer. They sought appropriate information from appropriate sources and then explored ideas for demonstrating that air has mass through its other properties or through the property of mass itself.

**Lesson Reflection:**

(What worked well with this lesson? What challenges did you encounter in this lesson? How would you change certain aspects of the lesson or the questions that you asked? How does this influence future lesson planning?)

This was a very good lesson. The only challenge was guiding each student group, when they got to the point of creating their demonstration, to come up with their own idea rather than just “stealing” one they heard another group discussing (or just using the one from the lab in their textbook!). In the end, all groups were able to come up with a unique idea for demonstrating that air has mass, and a good explanation supporting their demonstration.

**Relationship to Previous Instruction:**

(Have you taught this lesson/topic prior to the LIMSST project? If so, how did your teaching of this lesson differ from what you taught before? How did students’ reactions to this lesson differ?)

I have not this topic before (I had a student teacher last year who taught this topic). But I will definitely use this lesson again.

**Does air have mass?**

Q.O.D. - How do we measure mass?

Working in groups of two or three - Use the resources in the classroom to develop a group understanding of the properties of air – mass, density and pressure. Make sure everyone in your group understands these concepts clearly (hint: Use research, discussion and questioning).

Take notes in your notebook about the information you find and where you find it (On the top of page 5).

*All individuals in your group must be working or you will receive a written assignment.*

Create a demonstration to support your claim about whether air has mass or not. You may use any materials in the classroom to create your demonstration but you MAY NOT mis-use them! You will do this demonstration for us tomorrow; it must be serious and scientific.

Create one more question about motion that your study led you, as an individual or group, to ask. Add this to your notes.

Working individually - Write one paragraph and draw one picture that clearly reflects your claim as to weather air has mass and the evidence you offered in support of your claim. (on page 6).

Respond to one other group's demonstration: Did it clearly reflect their claim and evidence regarding air and mass? Explain.

This activity is worth 20 points IF all parts are completed in two days and all class time is used efficiently.