

Lesson: Blowing Bubbles

Teacher:	Kaylan Duthie
Unit Theme/Course:	Human Respiration – 7 th Grade Life Science
Date:	November 19 th
Timing:	1 Day

Rationale/Goal:

- Students will discover that heat is a product of cellular respiration, similar to combustion in a candle
- Students will define oxidation and learn the equation for combustion
- Investigative Question: What do our cells produce during cellular respiration?

Overview:

In the previous lab, students performed an experiment to learn about oxidation (combustion) in a burning candle. They lit the candle in a beaker with an indicator solution, and then covered the beaker. The oxygen was used up, leaving carbon dioxide, and the indicator changed colors, showing that carbon dioxide is a product of combustion. The students also gave heat and light as products of combustion. In this lab, students will be breathing through a straw into a test tube and measuring the temperature, to discover that heat is a product of human oxidation (cellular respiration).

Learning Objectives [cognitive, academic, language, socio-cultural]	Assessment Criteria
Students will list 2 forms of oxidation	Students will identify combustion and cellular respiration as two forms of oxidation in the pre-lab.
Students will identify the products and ingredients of combustion	Students will write down the equation for combustion, and label which side is ingredients and which side is products in the pre-lab.
Students will explain that heat is a product of cellular respiration	Students will explain that heat is a product of cellular respiration, and provide the evidence that the water heated up when they breathed into it.

Standard/EALR:

6-8 INQB Investigate	Different kinds of questions suggest different kinds of scientific investigations.	Plan and conduct a scientific investigation (e.g., field study, systematic observation, controlled experiment, model, or simulation) that is appropriate for the question being asked. Propose a hypothesis, give a reason for the hypothesis. Work collaboratively with other students to carry out the investigations.
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6-8 LS1A	All <i>organisms</i> are composed of cells, which carry on the many <i>functions</i> needed to sustain life.	<i>Describe</i> the <i>functions</i> performed by cells to sustain a living <i>organism</i> (e.g., division to produce more cells, taking in <i>nutrients</i> , releasing waste, using energy to do work, and producing materials the <i>organism</i> needs).
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Preparation Time:

- 30 minutes to gather materials and make copies

Materials:

- 8 tubs, each with
 - Beaker
 - Straw (fresh for each period)
 - Thermometer
 - Graduated cylinder

Instructional Sequence:

1. Start with group discussion about lab

*What is oxidation?
Do you have any examples of oxidation?
What is produced during combustion?
What are products of breathing (respiration)?*

- a.
2. Hand out the lab sheet
 - a. Write on stamp sheet and begin entry
 - b. Have students complete the pre-lab
 - i. Read p. 98-99 in the book
 - ii. Answer the questions in the background information section of the lab
 - iii. Have them at least try the equation
 3. Have a quick discussion about the lab

*What type of oxidation occurs when burning a candle?
What are the ingredients for combustion in a candle?
What are the products of combustion?
What should the recipe for combustion look like?*
Oxygen + Fuel → Carbon Dioxide + Heat + Light

- a.
4. Start the lab entry in journal
 - a. Have a student read the problem aloud to the class
 - b. Have each student write down a prediction
 - c. Have a few students read their predictions out loud
 5. Have students complete the procedure as written in the book for collecting data
 6. Have students work on the conclusion section of the lab report
 7. Once students have had a chance to do this, have a discussion about the lab

*What happened to the water when you breathed into it?
Why did this happen?
What is cellular respiration?
What do you think the waste product is of cellular respiration? How do you know?*

- a.
- b. Go over the combustion triangle:
 - i.
- c. Go over the combustion equation
 - i. $O_2 + Fuel \rightarrow CO_2 + Heat + Light$
 1. Ingredients
 2. Products

*This is the equation for the combustion type of oxidation.
What do you think the equation would look like for cellular respiration?*

ii.

Assessment

- Grade Lab Handout

Welcome to Science Class! Friday 11/19

Not So Random Question: What is oxidation called when it is in your cells?



- 1) Please sit in your Regular Flavored Seats with nothing out but a colored pencil.
- 2) Grade the Respiratory Quiz
- 3) Review Entry #26: The Candle Model
- 4) Complete Entry #27: Blowing Bubbles
- 5) Work on completing Candle Model, then Trachea Transplant

