

# Air- Why We Should Care

(Cover Sheet)

## Introduction

The following lesson is meant to be used as an introduction to the study of gases. Learning is contextualized by workers at a wastewater treatment plant who, through video, discuss the role of oxygen in the treatment process, and how they generate, monitor, and control the oxygen. Lesson components have students investigate the composition of Earth's atmosphere, analyze how the atmosphere changes as pressure and temperature change, and engage in an hands-on investigation into how much oxygen is in air.

## Intended Audience

The lesson is intended for a high school general chemistry class, or modified for use in an Integrated Science, or Earth Science course.

## Prior Knowledge and Skills

To be successful with the lesson, students should be familiar with the Periodic Table, constructing and interpreting graphs, and the use of percentages.

## Materials:

- Our Air- Why We Should Care (Do Now/JumpStart/pre-test)
- Composition of Air Handout
- How the Atmosphere Changes Handout
- How Much is Oxygen? Lab Activity Handout
- Checking for Understanding Exit Ticket
- Projector connected to internet

**Estimated Timeframe:** 100 minutes (2 50 minute periods)

## Common Core Standards:

**NGSS HS PS1-1** Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

**NGSS HS PS1-5** Apply scientific principles and evidence to provide an explanation about the effect of changing temperature or concentration of the reacting particles on the rate at which a reaction occurs.

**CCSS.MATH.HS.N-Q-1:** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays

## Lesson Sequence

- I. Do Now/Warm-up
- II. Read Aloud Lesson Introduction
  - a. Pair-share- "So, what do you know about air, and why should you care?"
  - b. Share out selected responses or Whiparound
- III. Read Aloud Composition of Air
  - a. Review Composition of Air Data Table

- b. Review w/ students formulas, atom v. molecule
  - c. Student/table partners complete data table
  - d. Construct pie chart
- IV. Watch Video- <http://baywork.org>
- a. discussion Qs based on video
- V. How the Atmosphere Changes- Using Atmospheric Data
- a. Construct graphs
  - b. Answer Questions
- VI. How Much Oxygen? Lab Activity
- VII. Exit Ticket

### **Accommodations/Modifications**

1. ELL students should be taught vocabulary in context- vocabulary rating sheet.
2. Use sentence starters and sentence frames to scaffold using vocabulary.
3. ELL students should work in groups when possible.
4. Modify graphs for students with IEPs.