

## INSPIRE GK12 Lesson Plan



<b>Lesson Title</b>	Chemistry of Weather
<b>Length of Lesson</b>	1 day (50 minutes)
<b>Created By</b>	Hannah Box
<b>Subject</b>	Earth Science
<b>Grade Level</b>	8 <sup>th</sup>
<b>State Standards</b>	Eighth Grade: 4c
<b>DOK Level</b>	DOK 2
<b>DOK Application</b>	Relate, Distinguish, Show, Construct
<b>National Standards</b>	5-8: D: Earth and Space Science Science
<b>Graduate Research Element</b>	Basic Principles: gas laws, temperature, pressure, etc.

### **Student Learning Goal:**

#### State Standards:

4c: Examine weather forecasting and describe how meteorologists use atmospheric features and technology to predict the weather. (DOK 2)

#### National Standards:

5-8: D: Earth and Space Science: Global patterns of atmospheric movement influence local weather. Oceans have a major effect on climate, because water in the oceans holds a large amount of heat.

### **Materials Needed (supplies, hand-outs, resources):**

One bottle for each student, food coloring, glitter, confetti, electrical tape, water, red bull, 1-liter glass bottle, large stir bar, stir plate, black light

### **Lesson Performance Task/Assessment:**

Students will make a bottle tornado and identify the characteristics of tornado by examining their tornado.

### **Lesson Relevance to Performance Task and Students:**

Students will learn about storms and weather and using what they learned from the lecture and saw in the videos, they will see the characteristics of a tornado.



**Anticipatory Set/Capture Interest:**

Video of hurricane Katrina and the aftermath will be shown followed by video of the April 17, 2011 tornado that went through Tuscaloosa Alabama. Videos can be found on YouTube.

**Guided Practice:**

The students will first see the videos of storms and weather that have affected local communities. Once they have watched the videos, the students will be separated into groups and play a game where they are expected to match weather terms to their appropriate definitions. Terms should have been covered previous day or year. Pictures that correspond to each definition will be printed and taped to the wall on one side of the room. The teacher will select groups of three or four students to go stand at the opposite side of the room from the pictures. When the teacher has finished reading the definition the students will race to slap the picture that corresponds on the opposite side of the room. Another group of students will be selected and the process will be repeated until all terms are covered. Once the game has been completed, students will return to their seats and the teacher will cover the chemistry that is related to storms and weather. To finish the lesson, each student will make a bottled tornado to take home.

To make the bottle tornado each student will place two drops of dish soap at the bottom of their bottle and then fill the bottle with water. At this point the students can place glitter, food coloring, confetti, etc. to personalize the tornado. The cap will be placed on the bottle and taped closed with electrical tape.

If time remains in the class period, the teacher can perform a short demo. The teacher will fill a 1-liter glass bottle with red bull, place a large magnetic stir bar at the bottom, and place on a magnetic stir plate. Turn the stir plate as high as it will go and watch the tornado form. Ask a student to turn off the lights and once the lights are off turn on a black light next to the bottle. The liquid will fluoresce. Ask the students what they think is in the bottle. They should guess that it contains chemical compounds other than water. Ask them if they would put chemicals like that into their body. Once they discuss what chemical it may be and decide that it would not be good to drink the solution then tell them that it is a red bull. Use this demo as a tool to show them that energy drinks are harmful.

**Independent Practice:**

Students will identify common weather terms by their definitions.

Students will construct a bottle tornado demonstrating the characteristics that they just identified.



**Remediation and/or Enrichment:**

Remediation: Individual IEP. Instead of having students race across the room in the game, split the class into groups and play a matching game. Creating a crossword puzzle would also work well.

Enrichment: Provide students with other examples of famous weather incidents and ask them to explain (using what they learned about the chemistry in weather) what chemistry may have caused the storm/weather.

**Check(s) for Understanding:**

Students will be asked to match pictures with appropriate definition.

What other labs/activities have we done this year that tie into this concept?

**Closure:**

Students will be make a bottle tornado and be asked to list real world example. (Toilet...)

**Possible Alternate Subject Integrations:**

Meteorology: Types of weather and patterns

**Teacher Notes:**

For chemistry ties visit this website:

[http://teachers.yale.edu/curriculum/search/viewer.php?id=initiative\\_11.05.06\\_u&q=On%20Common%20Ground&skin=h](http://teachers.yale.edu/curriculum/search/viewer.php?id=initiative_11.05.06_u&q=On%20Common%20Ground&skin=h)