



The activities in this teacher’s guide were created by the Center for Inquiry-Based Learning (CIBL) to accompany the materials in the Atmosphere STEM kit. The Atmosphere STEM kit was specifically designed to meet the North Carolina Essential Science Standards for grade 7 earth science. These materials and activities are available only with prior professional development. The goal is to help students deepen their understanding of underlying concepts through concrete experiences.

This pilot version is under development, and CIBL welcomes any feedback you are willing to provide. We may be contacted through the CIBL web site on the “contact us” tab at <http://ciblearning.org>. If you have questions, feel free to call 919 294-9881.

This teacher’s guide is available online at: <http://ciblearning.org/teacher-resources/lesson-materials/> password: atm2017

## Contents

Weather Log .....	3
Layers of the Atmosphere .....	6
Cycling of Water .....	12
Convection and wind .....	20
Land and Sea Breezes .....	27
Properties of Air .....	34
Weather Maps .....	39
Getting Particular .....	80

Correlation to the NC  
Essential  
Science Standard

- 7.E.1 Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth’s atmosphere, weather and climate and the effects of the atmosphere on humans.
  - 7.E.1.1 Compare the composition, properties and structure of Earth’s atmosphere to include mixtures of gases and differences in temperature and pressure within layers.
  - 7.E.1.2 Explain how the cycling of water in and out of the atmosphere and atmospheric conditions relate to the weather patterns on earth.



- 7.E.1.3 Explain the relationship between the movement of air masses, high and low pressure systems, and frontal boundaries to storms (including thunderstorms, hurricanes, and tornadoes) and other weather conditions that may result.
- 7.E.1.4 Predict weather conditions and patterns based on information obtained from:
- Weather data collected from direct observations and measurement (wind speed and direction, air temperature, humidity and air pressure)
  - Weather maps, satellites and radar
  - Cloud shapes and types and associated elevation
- 7.E.1.5 Explain the influence of convection, global winds and the jet stream on weather and climatic conditions.
- 7.E.1.6 Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship.

**READ CAREFULLY BEFORE USING THE ATMOSPHERE STEM KIT.**

ANY USER OF THE ATMOSPHERE STEM KIT PERMANENTLY RELEASES ALL CLAIMS OF ANY TYPE OR NATURE IN ANY WAY ASSOCIATED WITH ITS USE.

As a condition of using the Atmosphere STEM kit and Teacher's Guide, the user assumes any and all risks attendant to these activities and materials, including claims resulting from uses in any way resulting from or associated with the activities or materials therein. The user is responsible for all issues of safety, health and welfare during activities. The user of the Atmosphere STEM kit and Teacher's Guide waives any and all claims that may result from its use, and re-leases and holds harmless The Center for Inquiry-Based Learning, agents and employees from any and all claims, demands, causes of action or damages which may accrue on account of bodily or personal injury, property damage, or death arising from the use of the Atmosphere STEM kit and Teacher's Guide.