

Science
Environmental Geoscience
Unit 4: The Atmosphere

Essential Understandings	<ul style="list-style-type: none"> ▪ Causation: Nothing “just happens”. Everything is caused. ▪ Interrelatedness: Everything in the universe is connected to everything else in the universe. ▪ Dynamism: Everything is changing in some way all the time. ▪ Uniformitarianism: The way the universe works today is the way it worked yesterday and the way it will work tomorrow.
Essential Questions	<ul style="list-style-type: none"> ▪ How does our atmosphere influence Earth? ▪ What is the structure and composition of the atmosphere? ▪ What causes small- and large-scale weather events to occur? ▪ How is the world’s population affected by weather and climate change? ▪ What political and economic controversies exist related to the atmosphere?
Essential Knowledge	<ul style="list-style-type: none"> ▪ Hadley cell circulation and the Coriolis Effect are responsible for largely predictable atmospheric circulation patterns. ▪ Weather occurs when two air masses meet, creating a front. ▪ Climate change is a natural phenomenon, but is likely being accelerated by anthropogenic influences.
Vocabulary	<ul style="list-style-type: none"> ▪ <u>Terms:</u> <ul style="list-style-type: none"> ○ atmosphere, evaporation, condensation, precipitation ○ density ○ climate ○ isobar, isotherm, weather map ○ station model and data ○ cyclone and anticyclone ○ Hadley cell ○ Coriolis Effect ○ hurricane, typhoon, tornado ○ low pressure and high pressure system, front, squall line ○ up- and down-drafts ○ stratus, cumulus, cirrus clouds and sub-types
Essential Skills	<ul style="list-style-type: none"> ▪ Explain the interactions among the biosphere, atmosphere, hydrosphere and lithosphere. ▪ Explain the interactions of basic air masses and the fronts and weather associated with those interactions. ▪ Read and interpret a weather map. ▪ Explain a political and/or economic controversy related to the hydrosphere and give ideas for resolving that controversy.
Related Maine Learning Results	<p><u>Science and Technology</u></p> <p>A. Unifying Themes</p> <p>A2. Models</p> <p>Students evaluate the effectiveness of a model by comparing its predictions to actual observations from the physical setting, the living environment, and the technological world.</p>

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<p style="text-align: center;">Related Maine Learning Results</p>	<p>C3. Science, Technology, and Society Students describe the role of science and technology in creating and solving contemporary issues and challenges.</p> <ol style="list-style-type: none"> a. Explain how science and technology influence the carrying capacity and sustainability of the planet. b. Explain how ethical, societal, political, economic, and cultural factors influence personal health, safety, and the quality of the environment. c. Explain how ethical, societal, political, economic, religious, and cultural factors influence the development and use of science and technology. <p>D. The Physical Setting D2. Earth Students describe and analyze the biological, physical, energy, and human influences that shape and alter Earth Systems.</p> <ol style="list-style-type: none"> a. Describe and analyze the effect of solar radiation, ocean currents, and atmospheric conditions on the Earth’s surface and the habitability of Earth. b. Describe Earth’s internal energy sources and their role in plate tectonics. c. Describe and analyze the effects of biological and geophysical influences on the origin and changing nature of Earth Systems. d. Describe and analyze the effects of human influences on Earth Systems.
<p style="text-align: center;">Sample Lessons And Activities</p>	<ul style="list-style-type: none"> ▪ Identify cloud types and the associated frontal systems ▪ Read a weather map and predict the weather ▪ Library Research Project (Topic: A historical storm: why it occurred, what impact it had on a human population, and could it occur again?)
<p style="text-align: center;">Sample Classroom Assessment Methods</p>	<ul style="list-style-type: none"> ▪ Quizzes on class lectures ▪ Laboratory and project grades ▪ Examination at the end of unit
<p style="text-align: center;">Sample Resources</p>	<ul style="list-style-type: none"> ▪ <u>Publications:</u> <ul style="list-style-type: none"> ○ <u>Modern Earth Science</u>, William L. Ramsey et al., Holt, Rinehart and Winston, Inc., Austin: 1989. ▪ <u>Other Resources:</u> <ul style="list-style-type: none"> ○ Science Resource Center (Library online database)