

Weather Lesson

INTRODUCTION

The Weather Lesson will show the student how dangerous weather is formed and what affects it has on the surface and sub surface of the oceans.

OBJECTIVES

By the end of this lesson, the student will be able to do the following:

- Define what a nor'easter is and how it forms.
- Discuss the two main components to a nor'easter.
- Contrast the two types of nor'easters.
- Examine how high and low air pressure systems can help predict the weather.
- Describe and summarize the basic characteristics of the following terms as they relate to the weather.
 - Hurricanes
 - Coriolis Effect
 - Trade winds
 - Doldrums
- Describe what sea states are and how they are measured.
- Describe what a swell is and how it forms.
- Identify careers that are associated with weather.

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1. Nor'easters

- a) Nor'easters occur in the eastern United States between October and April, when there is more moisture in the air and it is colder.
- b) They are named for the winds that come in from the northeast and bring the storm up the east coast along the Gulf Stream (a current of warm water that moves northward up the Atlantic coast)
- c) They can produce heavy amounts of rain and snow. Hurricane-force winds can develop which can cause high surfs that lead to beach erosion and coastal flooding.

2. Two main components of a Nor'easter

- a) Gulf Stream low-pressure system.
 - 1. Counter-clockwise winds.
 - 2. These form off the coast of Florida, the Gulf Stream warms and brings about a low-pressure system, which circulates off the southeastern U.S. coast. This causes warm air to gather along with moisture from the Atlantic. Strong northeasterly winds at the edge of the storm bring it up the east coast.
- b) Arctic high-pressure system.
 - 1. Clockwise winds.
 - 2. While the strong northeasterly winds pull the storm up the east coast, it meets with Arctic air blowing down from Canada. When the two systems meet, it produces a mix of precipitation.

3. Two types of Nor'easters

- a) Offshore forming.
- b) Onshore forming.

4. High Pressure System

- a) Air slowly sinks, preventing clouds from forming, which is why highs are usually clear.
- b) High pressure usually brings about clear weather days.
- c) Is larger and moves slower than low pressure systems.
- d) Move clockwise.

5. Low Pressure System

- a) Air rises.
- b) As air rises, it cools, if there is enough water vapor, this will cause clouds and rain to form.

6. Hurricanes

- a) Large tropical storms with heavy winds in excess of 74 MPH.
- b) The ocean temperature has to be above 79 degrees F for a hurricane to develop.
- c) Has a peaceful center called the eye, which is normally 10-30 miles wide and contains calm winds, warm temperatures and clear skies.

7. Coriolis Effect

- a) The acceleration of a moving body on or near the Earth as a result of the Earth's rotation.
- b) Alters the paths of projectiles (airplanes to boats to bowling balls) on Earth.

8. Trade winds

- a)

9. Doldrums

- a) Also called Equatorial Belt of Calms.
- b) Hurricanes can start in this area.
- c) The doldrums are also noted for calm periods when the winds disappear and can trap sailing vessels for long periods of time.

10. Sea States

- a) Sea States describe and categorize wave height in the ocean developed by the wind within a particular area.
- b) The height of the waves depends on how long the wind has been blowing in a certain direction, the distance the waves have traveled, currents and strength of the wind. They are measured within the limits set by the Beaufort Scale from 0 to 9.

11. Swells

- a) Strong winds from weather and storms blow on the surface of the water, creating ocean swells.
- b) The swells can travel long distances until they strike the shallow coastline and become strong, breaking waves.