



Notes to Teachers

Museum Exhibit Association: *'What's In a Maritime Painting?'*

Module: Science

Weather is extremely important for transportation especially at sea. There is no marine painting without weather of one kind or another. Wind and sea state can be categorized. Although weather is still not completely understood, scientists have made great strides in the last 150 years, categorizing and predicting weather patterns. Because weather prediction was so important to seafaring, the British Admiralty set about the study of wind and sea state in the early 1800s. Francis Beaufort, joined the hydrology section of the British navy and in the first decade of the 19th century created a standardized matrix defining wind, sea state and a ship's ability to sail. It is known as the Beaufort Scale and is still used today. Download the Beaufort Scale pdf file to learn how Sir Francis divided weather between Calm (Force 0) and a Hurricane (Force 12).

Over the years refinements and symbols have been adopted to go with Beaufort's original scale. Along with wind force, weather maps define wind direction and speed with 'wind arrows' with barbs and/or pennants. A straight line defines direction. Like a wind vane, the arrow points in the direction from which the wind is coming. The length of the barb defines the wind speed. A full-length barb denotes a 10-knot wind speed, a half barb a 5-knot wind speed and a triangular pennant a 50-knot wind speed. Download the Wind Arrows pdf file to see exactly how wind barbs and pennants are drawn. *NOTE: In nautical usage knot is a unit of speed, not of distance, and has the built-in meaning of "nautical miles (6,080 feet) per hour." Therefore, the wind would strictly be said to travel at fifty knots (not fifty knots per hour). To convert to statute miles per hour multiply knots by 1.151.*

Using the Beaufort Scale, wind arrows, wind barbs and pennants, define and describe the weather, the wind direction and wind speed in this module's Activity (separate Activity pdf file). The five paintings presented in the accompanying Activity plan represent BF 0 through BF 12. All but one can be described with a wind arrow. Calm is represented by a circle within a circle (See Wind Arrows 2 pdf).

For this activity assume the viewer of the painting is facing north.

Supplementary information

Fujita Tornado Scale

In the 1950s meteorologist Tetsuya (Ted) Fujita created a hierarchy to classify tornadoes. The matrix defines the type of damage that occurs within a range of wind speed from F0 to F6. For example, Category F1 (winds 73-112 miles per hour [mph]) can overturn automobiles, destroy carports and uproot trees while an F6 tornado represents winds in excess of 317 mph and can turn an automobile into a missile.

Saffir-Simpson Hurricane Scale

In 1969 two scientists joined expertise to create a scale from 1-5 that categorized hurricanes by wind speed and flooding damage. A category 1 hurricane represents winds between 74-95 mph and has an average storm surge of 4-5 ft above normal and can uproot trees but a category 5 hurricane represents winds in excess of 156 mph and storm surge of over 19 ft. A Category 5 often completely destroys structures.

Vocabulary List

Hydrology

Sea

Beaufort Scale

Ship Captains

Mariners

Naval

Wind Arrows

Symbol

Meteorologist

Ocean

Activity Answers:

Always assume the viewer of the painting is facing North.



BF 0 – Calm

No wind arrow (circle within a circle)

British Clipper in Chinese Waters

Nam Cheong (Attr.)



BF 4 - Moderate Breeze

Wind from SW/1.5 barbs

Sir David Scott in the Straits of Sunda

William John Huggins



BF 5 - Moderate breeze
Wind from E/1.5 barbs
Clipper Ship *Samuel Russell*
Unknown artist



BF 9 - Strong Gale
Wind from W/4.5 barbs
Staffordshire Off Cape Horn
Henry Scott



BF 12 - Hurricane/Typhoon
Wind from SW/1 flag + at least 1.5 barbs
U.S.S. *Mississippi* in a Typhoon
Unknown artist