

2023 Weather or Not

Welcome to the 2023 version of Weather Or Not! Again, the exam will be a stationary exam. The main test will be made of two primary sections. The first will consist of projected media of photographs, diagrams, and gifs. There will be 10 separate items with 2 questions per item. Each media piece will be presented for 30 seconds, with a 10 second review after completing the first run through. The second part will consist of approximately 50-60 questions. All question will be single-answer multiple choice, with either 2-, 3-, or 4-possible choices. Each question will be worth 1, 2, or 3 points as determined by the examiner. Total point value of the test will be approximately 140 points. The test this year will emphasize clouds and precipitation, accounting for $\frac{1}{4}$ to $\frac{1}{3}$ of total points.

The first tie breaker will be total number of 3-point questions correct. The second tie breaker will be a short answer question. This will only be used if there is no clear advantage with the first tie-breaker.

Each team will be allowed one 5x8-inch index card (both sides) during the test. It may be designed in any way that is beneficial to the team. The team will need to bring a No. 2 pencil with them (Zip grade form will be provided at the test). No calculators are necessary for this test. Lastly, absolutely **NO** electronic devices will be allowed in the room with the participants. If seen, it will result in disqualification.

The following is a list of items that your students should be comfortable with to perform well on the test. It is the intent of the examiner to make the questions straight forward and understandable.

Atmosphere: layers (troposphere, stratosphere, mesosphere, thermosphere, exosphere); features; characteristics; contents; greenhouse gases

Air masses: types (polar continental, polar maritime, tropical continental, tropical maritime); definition; location; effects on weather

Fronts: types (cold, warm, stationary, occluded); characteristics; weather ahead and behind the front; identify on a weather map

Pressure and weather: characteristics; changes through atmosphere; effect on wind; isobars (identify on a weather map)

Humidity: water vapor content; dew point; relative humidity; heat index; association with temperature

Instruments: Doppler radar, radiosonde, barometer, altimeter, anemometer, thermometer, psychrometer, wind vane; rain gauge, wind sock, hygrometer, satellites (geostationary & polar), ceilometer; know their function and be able to identify them.

Seasons, Equinoxes, & Solstices: Descriptions; why they occur; association with the Earth's orbit.

Water Cycle

Wind: how created; factors that affect it; high and low pressure systems; three-cell model of global winds (Hadley, Ferrel, Polar) and how they affect weather; Coriolis effect (how it affects wind, where does it have greatest affect); jet stream (location, weather effects); sea breezes, land breezes, Beaufort scale; El Nino; haboob; La Niña; Santa Ana winds; chinook wind

Clouds: types (cirrus, cirrocumulus, cirrostratus, altocumulus, altostratus, stratocumulus, stratus, cumulus, nimbostratus, cumulonimbus); layers; composition; precipitation/weather type; know main mechanism of uplift; be able to recognize visually; also recognize and understand mammatus, virga, lenticular clouds, noctilucent clouds

Precipitation: rain, snow, sleet, freezing rain, hail; know the atmospheric conditions that create each

Thunderstorms: stages of development; types (single cell, multicell, supercell); characteristics/severity; squall lines; lightning; risks to safety; derecho

Tornadoes: formations; conditions to create; characteristics; wall clouds; shelf clouds; funnel clouds; Doppler radar characteristics (visual identification); Enhanced Fujita (EF) scale and what it measures; Tornado Alley, Dixie Alley; waterspouts; risks to safety

Hurricanes: formation; characteristics; conditions to create; progression of storm intensity (tropical disturbance, tropical depression, tropical storm, hurricane); Saffir-Simpson scale; weather associated with hurricanes (wind, rain, storm surge, flash floods, tornadoes); risks to safety

Blizzards: definition; characteristics; wind chill

Lake effect snow: characteristics, formation, likely locations and seasonality

Nor'easter: definition, location, characteristics

Optical phenomenon: crepuscular rays; rainbows; aurora borealis, aurora australis; moon dog; sun dog; sun pillar;

Watches and Warnings: Severe Thunderstorm; Tornado; Tropical Storm; Hurricane; Blizzard; Winter Weather Watch, Advisory, & Warning

Weather and Climate: definitions; recognize the difference