Weather Permitting/Meteorology

North Carolina Science Olympiad Coaches Clinic

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Read the Rules

Weather Permitting
Division A

- Team Of Up To: 2
- Bring writing instruments
- **No Other Resources Are Allowed**

Meteorology
Division B

- Team Of Up To: 2
- May bring 2 non-programmable, non-graphing calculators
- May bring 4 Sheets Of Paper (8 ½ x 11) may contain information on both sides in any form and from any source

Scoring

Weather Permitting
Division A

- High Score Wins
- Points awarded for accuracy of responses
- Ties will be broken by the accuracy or quality of responses to pre-selected questions chosen by the event leader

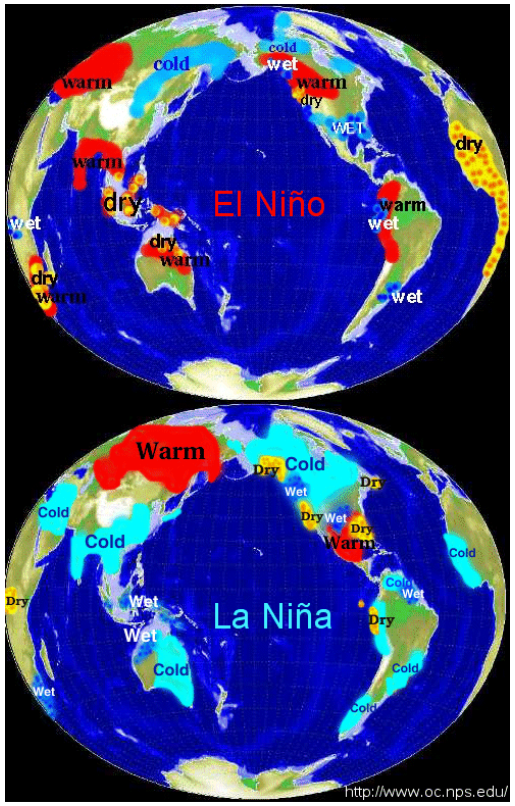
Meteorology
Division B

- High Score Wins
- Points awarded according to quality and accuracy of responses, quality of supporting reasoning, and proper use of scientific terminology
- Selected questions will be used as tiebreakers

Event Description

Weather Permitting
Division A

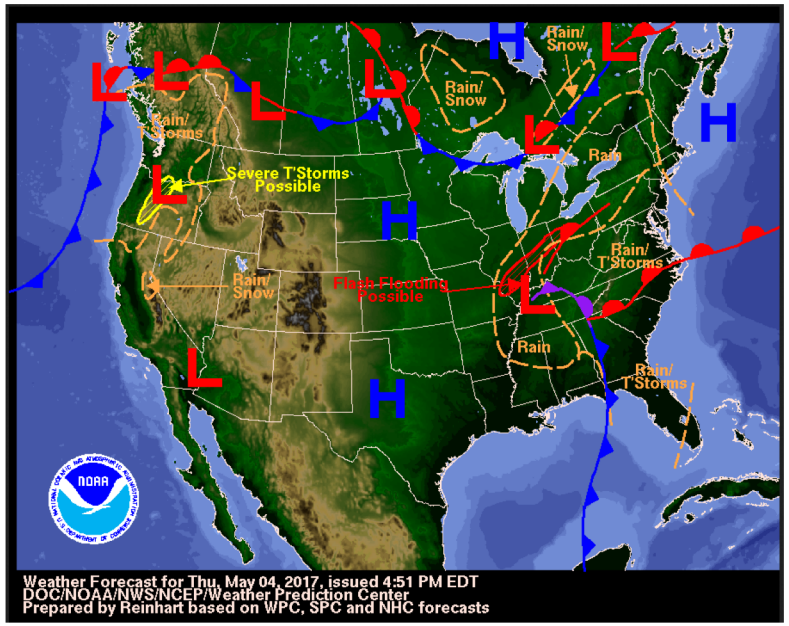
Global Weather Patterns



Meteorology
Division B

Everyday Weather

Meteorological Data, Graphs, Charts & Images



Event Topics

Weather Permitting
Division A

- How the Sun drive the water cycle
- Weather Instruments
- How the jet stream and ocean currents influence local weather
- The factors that affect climate of region
- How the motions of air masses change the weather
- The types of clouds and their relationships to weather conditions

Meteorology
Division B

- Solar Radiation and Seasons
- Water Properties and the effects on Weather
- Weather Instrumentation and Technology
- Modern Atmosphere
- Atmospheric Pressure
- Atmospheric Moisture
- Local Wind & Precipitation
- Air Masses & Fronts
- Common Storms & Other Hazardous Weather
- Surface Weather Station Models and Maps
- Weather Forecasting / Analyze Weather Maps

Weather vs. Climate

Weather

- Condition of the atmosphere in the short-term
- Daily Measurements

Climate

- What we can expect from the atmosphere over a long period of time
- Average over a long-term (30 years)

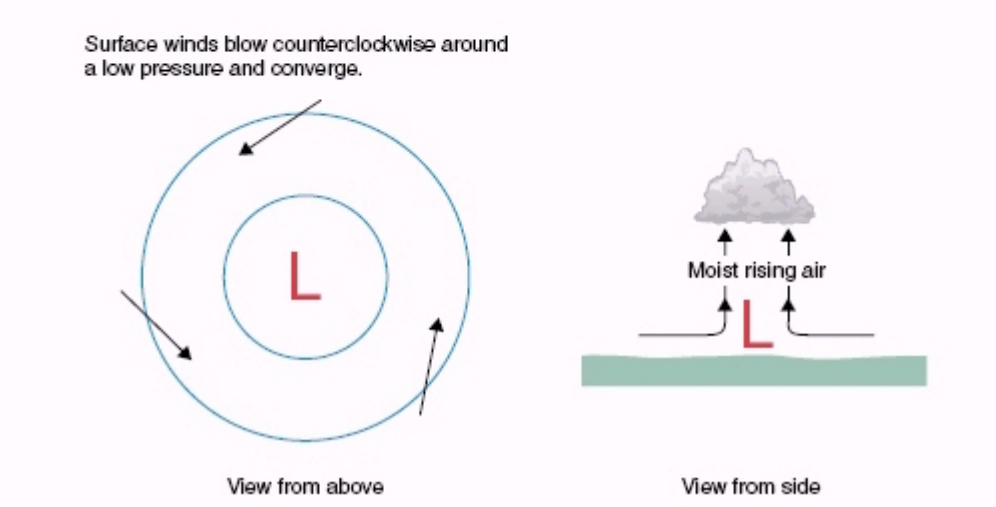
Vocabulary

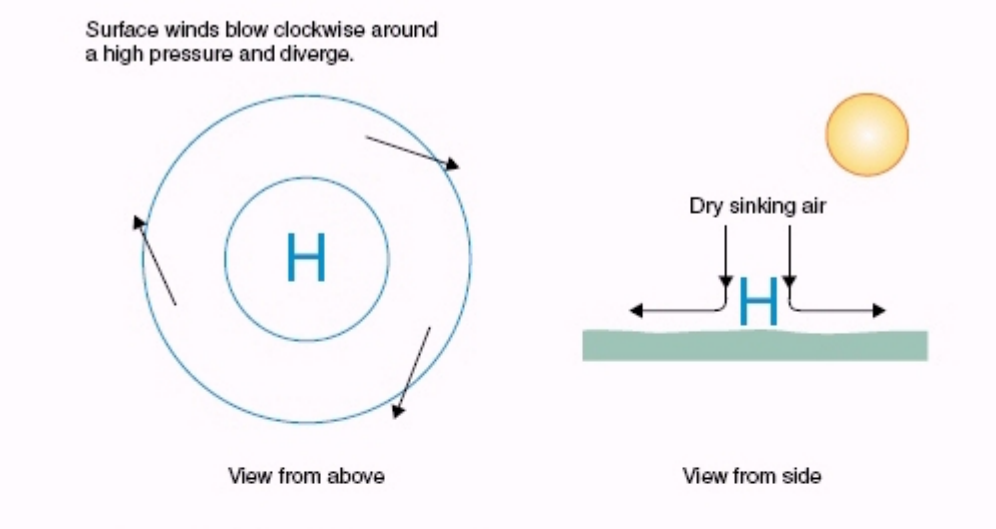
- Identify Key Words From the Rules
- Read Articles and Watch Videos to Learn about the Key Words
- Realize that understanding new vocabulary is the beginning, not the end
- Apply your knowledge to real world situations

Engage Students by Using Models and Activities to Help them Understand the Content

Hand Twist Model for High & Low Pressure Systems in the Northern Hemisphere

https://www.youtube.com/watch?v=L10yv2-yO00&feature=youtu.be





Weather Instruments / Data Collection

Students should be collecting their own weather data and keeping a record over a period of time. Students should observe the changes in the quantitative data and recognized the resulting weather occurrence.

- **Use any type of data collection device, but make sure that students can recognize traditional weather instruments**

Reading A Relative Humidity Chart

Air Temp. ↓

Relative Humidity (%)

Dry-Bulb Temperature (°C)	Difference Between Wet-Bulb and Dry-Bulb Temperatures (C°)															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
−20	100	28														
−18	100	40														
−16	100	48														
−14	100	55	11													
−12	100	61	23													
−10	100	66	33													
−8	100	71	41	13												
−6	100	73	48	20												
−4	100	77	54	32	11											
−2	100	79	58	37	20	1										
0	100	81	63	45	28	11										
2	100	83	67	51	36	20	6									
4	100	85	70	56	42	27	14									
6	100	86	72	59	46	35	22	10								
8	100	87	74	62	51	39	28	17	6							
10	100	88	76	65	54	43	33	24	13	4						
12	100	88	78	67	57	48	38	28	19	10	2					
14	100	89	79	69	60	50	41	33	25	16	8	1				
16	100	90	80	71	62	54	45	37	29	21	14	7	1			
18	100	91	81	72	64	56	48	40	33	26	19	12	6			
20	100	91	82	74	66	58	51	44	36	30	23	17	11	5		
22	100	92	83	75	68	60	53	46	40	33	27	21	15	10	4	
24	100	92	84	76	69	62	55	49	42	36	30	25	20	14	9	4
26	100	92	85	77	70	64	57	51	45	39	34	28	23	18	13	9
28	100	93	86	78	71	65	59	53	47	42	36	31	26	21	17	12
30	100	93	86	79	72	66	61	55	49	44	39	34	29	25	20	16

After twirling the sling psychrometer for 10 -20 seconds, take readings in Celsius from both thermometers and record the results.

Dry-Bulb Reading _____

Wet-Bulb Reading _____

Dry-Bulb – Wet-Bulb _____

Cloud Spotter Wheel

Recognize Cloud Types

Understand Resulting Weather

Weather Resources

NASA – Hurricanes & Tropical storms

Tropical Tidbits – great blog explaining current weather phenomena

NOAA – National Hurricane Center click on the Education and Outreach sections on the left side bar

The Weather Channel

NASA – Meteorology Educator's Guide

The Teacher's Guide – Weather

Internet4Classrooms- Weather Links

American Meteorological Society – lots of good info and links

Weather Wiz Kids – Tornados, Hurricanes, Rain and Floods, Safety, and many activities.

Hurricane Sandy – a summary

NOAA – Climate

NOAA – Ten Climate Science Activities

Earth Climate Course

Earth Climate System – good notes

NC State University – Climate Education for K-12

NOAA – Climate Education

http://climatekids.nasa.gov/

NOAA – Climate

Good Climate Activity with answers

NASA Precipitation Education page, lots of good activities, scroll towards the bottom for a water cycle dice game