Lesson – Humidity & Dewpoint

THE FOLLOWING **VIDEO** HAS BEEN APPROVED FOR
ALL AUDIENCES
BY THE EARTH SCIENCE TEACHERS ASSOCIATION OF AMERICA , INC

THE VIDEO HAS BEEN RATED

I	INTELIGENT
	UNDER 15 REQUIRES TEACHER ASSISTANCE
	STRONG EARTH SCIENCE LANGUAGE, DETAILED DIAGRAMS, AND SUPER AWESOMENESS

- I can define atmospheric moisture & describe how it enters the atmosphere
- I can describe factors that increase & decrease evaporation
- I can describe humidity & how temperature affects it
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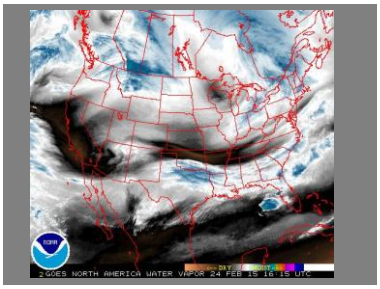
Atmospheric Moisture

-Amount of moisture in the air is constantly changing

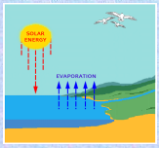
3 STATES of MATTER:
1) **LIQUID**
2) **SOLID**
3) **GAS**

Gaseous water in the atmosphere is called **WATER VAPOR**



Water vapor enters the atmosphere by:

EVAPORATION
LIQUID changes to GAS



TRANSPIRATION
PLANTS release water vapor

SUBLIMATION
Change of phase from SOLID to GAS
(NO LIQUID PHASE)

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Factors INCREASING Evaporation:

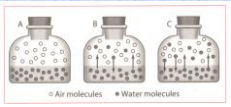
1) **MORE ENERGY** available

2) **INCREASE** in SURFACE AREA of the water

3) **GREATER** WIND SPEED

Factors DECREASING Evaporation:

1) INCREASE in **SATURATION** of the air



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Humidity

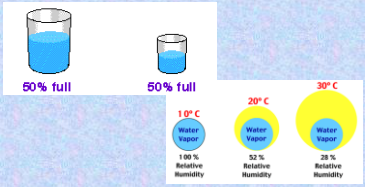
ABSOLUTE HUMIDITY
- AMOUNT of water vapor present in the air

MOISTURE CAPACITY
- TOTAL amount of water vapor the air can hold

RELATIVE HUMIDITY
- Ratio between the amount of moisture in the air with the amount the air can actually hold at that temperature

Relative Humidity & Temperature

HOT AIR HOLDS MORE MOISTURE THAN **COLD AIR**



EXAMPLES:

1) Temperature ___INCREASES___ but amount of water vapor remains the SAME, then the Relative Humidity will ___DECREASES___.

2)Temperature ___DECREASES___ but amount of water vapor remains the SAME, then the Relative Humidity will ___INCREASES___.

3) Temperature remains the SAME, but MORE water vapor is added, then the Relative Humidity will ___INCREASES___.

DON'T WRITE!!

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Determining Relative Humidity

-Instrument used to measure called a **PSYCHROMETER**

Smaller the difference between the dry & wet bulb temperature the **more humid** the air

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Dew Point

Temperature at which the air becomes SATURATED with water vapor & the RELATIVE HUMIDITY is 100%

Air drops BELOW the dew point condensation will occur (CLOUDS FORM)

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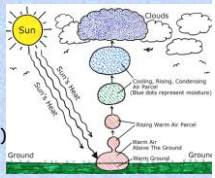
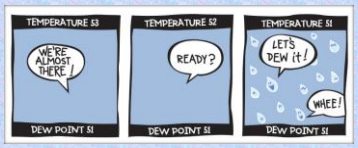
Cloud Formation

1. Warm Air Rises
2. Expands & Cools
3. Reaches its Dewpoint
4. Condensation (Cloud Formation)
5. Precipitation



IF THE AIR TEMP & THE DEWPOINT ARE THE SAME OR ALMOST THE SAME YOU GET RAIN



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Dewpoint (°C)

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	−20	−33														
−18	−18	−28														
−16	−16	−24														
−14	−14	−21	−36													
−12	−12	−18	−28													
−10	−10	−14	−22													
−8	−8	−12	−18	−29												
−6	−6	−10	−14	−22												
−4	−4	−7	−12	−17	−29											
−2	−2	−5	−8	−13	−20											
0	0	−3	−6	−9	−15	−24										
2	2	−1	−3	−6	−11	−17										
4	4	1	−1	−4	−7	−11	−19									
6	6	4	1	−1	−4	−7	−13	−21								
8	8	6	3	1	−2	−5	−9	−14								
10	10	8	6	4	1	−2	−5	−9	−14	−28						
12	12	10	8	6	4	1	−2	−5	−9	−16						
14	14	12	11	9	6	4	1	−2	−5	−10	−17					
16	16	14	13	11	9	7	4	1	−1	−6	−10	−17				
18	18	16	15	13	11	9	7	4	2	−2	−5	−10	−19			
20	20	19	17	15	14	12	10	7	4	2	−2	−5	−10	−19		
22	22	21	19	17	16	14	12	10	8	5	3	−1	−5	−10	−19	
24	24	23	21	20	18	16	14	12	10	8	6	2	−1	−5	−10	−18
26	26	25	23	22	20	18	17	15	13	11	9	6	3	0	−4	−9
28	28	27	25	24	22	21	19	17	16	14	11	9	7	4	1	−3
30	30	29	27	26	24	23	21	19	18	16	14	12	10	8	5	1

Dew point = 1°C

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	8									
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

Relative Humidity = 54%

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