

Today's Objective:

How Are Relative Humidity and
Dewpoint Related?

Do Now:

Describe everything that comes to
mind when someone says it's
humid.



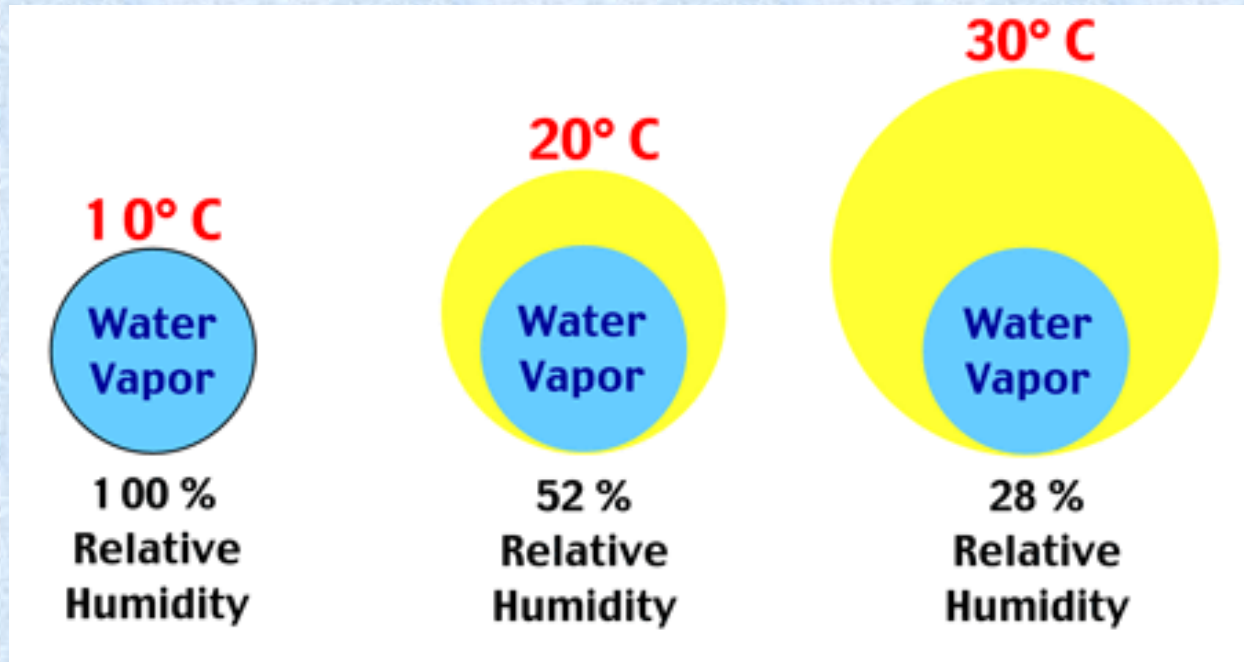
Humidity –

is a measure of how much **Water Vapor** is in the air.

**** Warmer air can hold more water vapor than cooler air.****

Relative Humidity (RH) –

is “how full” the air is with water vapor,
expressed as a %.



Since warm air expands it can hold
more water, lowering it's relative
humidity

Saturation:



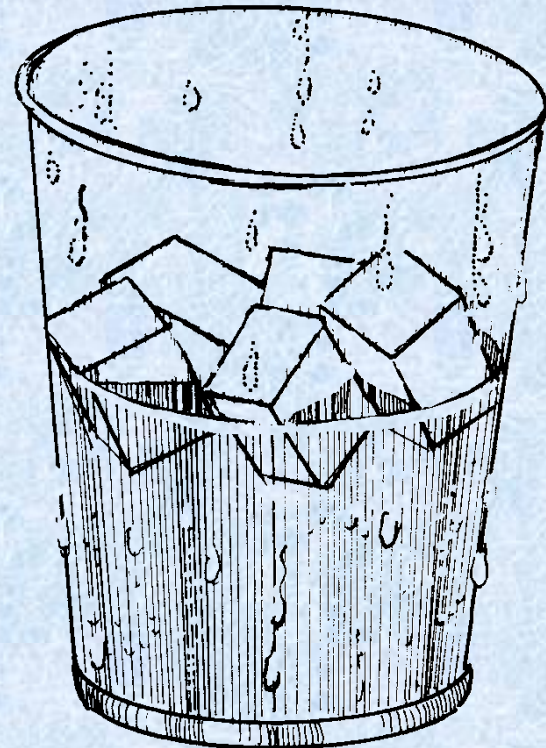
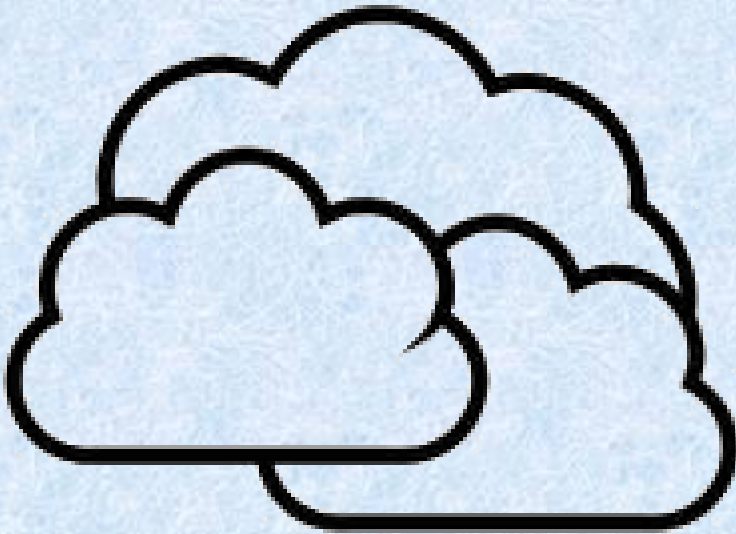
Occurs when the air contains the maximum amount of water vapor it can hold at a specific temp. and pressure.

*****When saturated, warm air contains more water vapor than cold air.*****



When the Relative Humidity is 100%

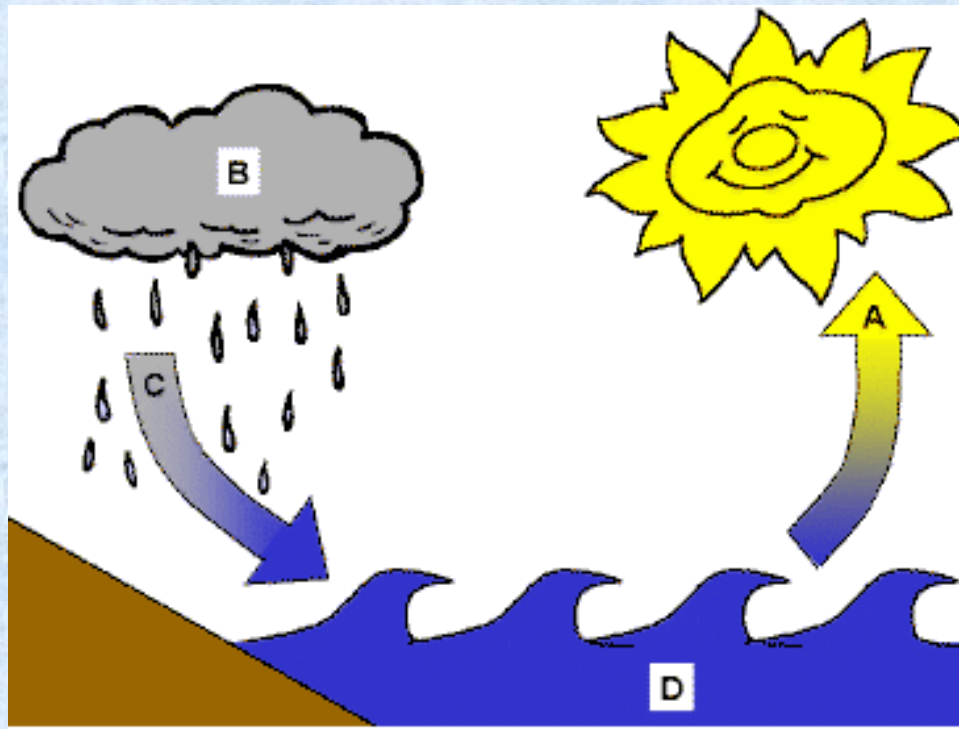
- the air is Saturated
- Condensation may occur.



The Relative Humidity changes when:

- Water vapor enters or leaves the air.
- The temperature changes.

Precipitation
take water out of
the atmosphere.



Evaporation
puts water back
into the
atmosphere.

The Dew Point Temperature is the temp. at which the air becomes saturated with water vapor (or the relative humidity = 100%)

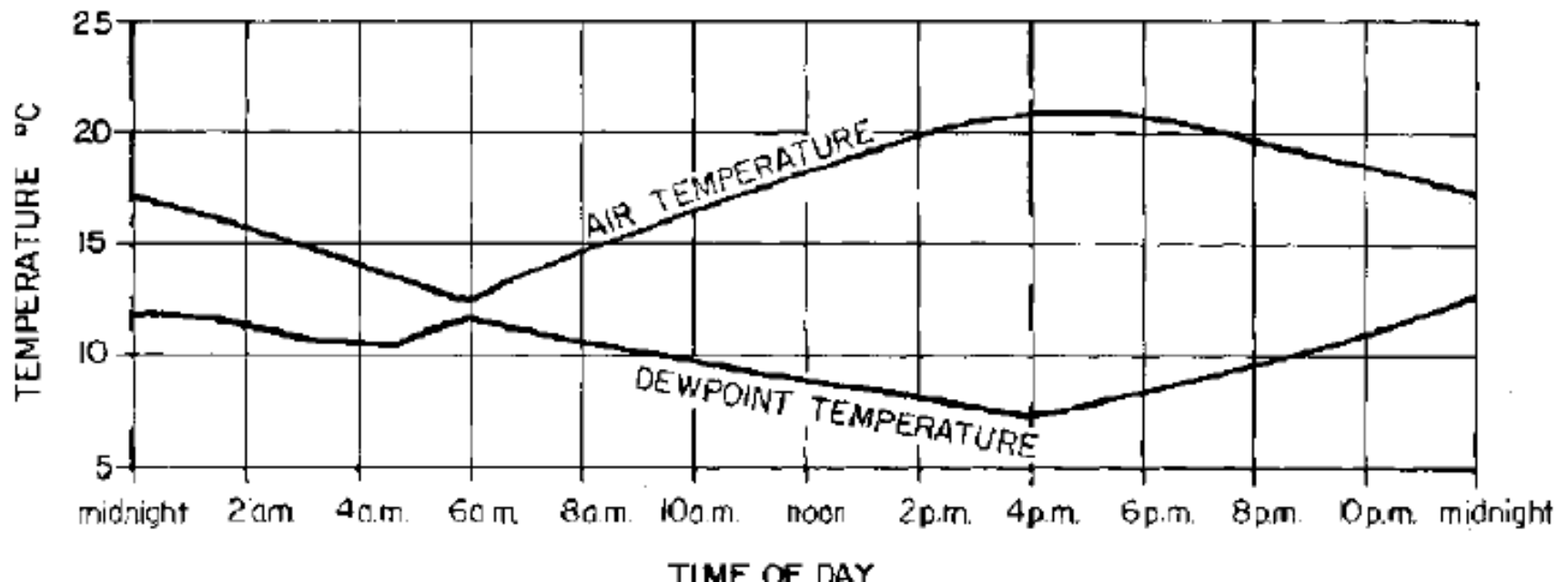


When temp is more than DP there is no condensation

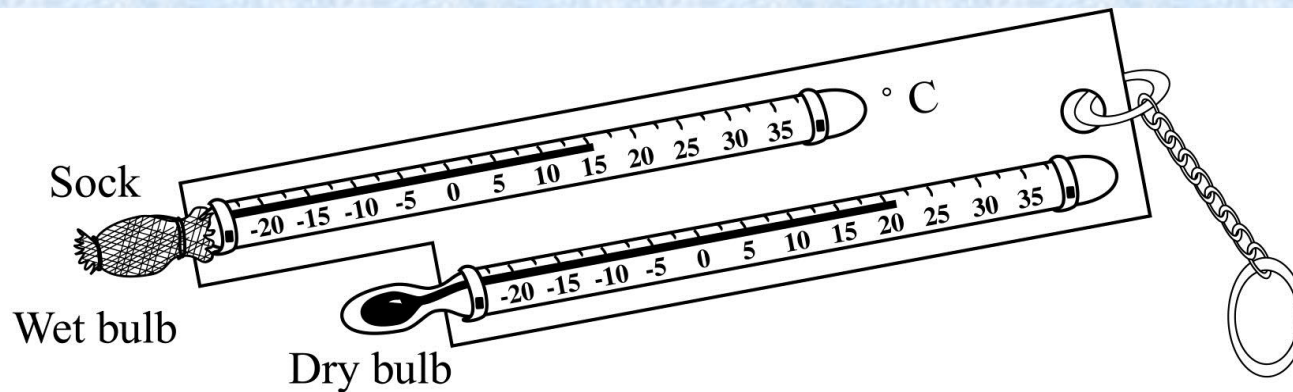
When temp is less the DP condensation may occur

The closer the air temp. is to the dewpoint temp.:

- the higher the RH
- the greater the chance of precipitation



Dew Point Temp. and Relative Humidity are measured using a **Sling Psychrometer**.



A Sling Psychrometer

As this instrument is "slung" through the air, rapid evaporation from the wet "sock" will result in a lower temperature reading on the wet-bulb thermometer. the dry-bulb thermometer will read the true air temperature

Relative humidity and Dew point Charts:

- Can be found on ESRT pg 12
- Dry bulb is the air temperature

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														
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-6	100	73	48	20												
-4	100	77	54	32	11											
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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	88	79	72	66	61	55	49	44	39	34	29	25	20	16

Dewpoint Temperatures (°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														
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-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

- Wet bulb is the temperature of a thermometer that has a wet “sock” attached to it
- The wet bulb depression is the difference between the two, it shows how much evaporation has taken place,

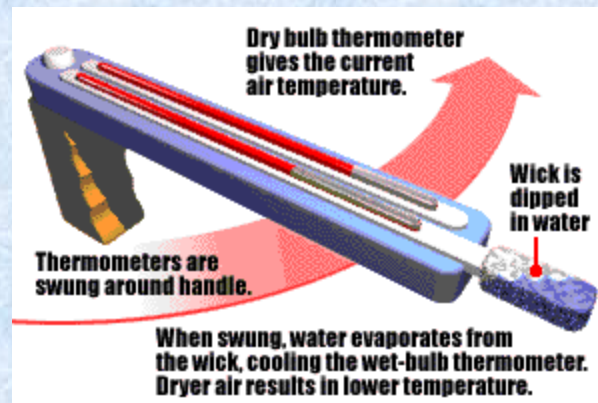
Relative Humidity (%)

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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				
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28	28	27	25	24	22	21	19	17	16	14	11	9	7	4	1	-3
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Measure Dry Bulb Temperature and Wet Bulb Temperature by swinging instrument for 30 seconds.



Ex. Dry Bulb Temp. = 24 C.

Wet Bulb Temp. = 20 C.

- Calculate difference between dry and wet bulb temps.
- This is called the **Wet Bulb Depression**.

Ex.: $24\text{ C} - 20\text{ C} = 4\text{ C}.$

** Use ESRT pg 12 to find the RH or DP **

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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			
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24	24	23	21	20	18	16	14	12	10	8	6	2	-1	-5	-10	-18
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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	18	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
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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		
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