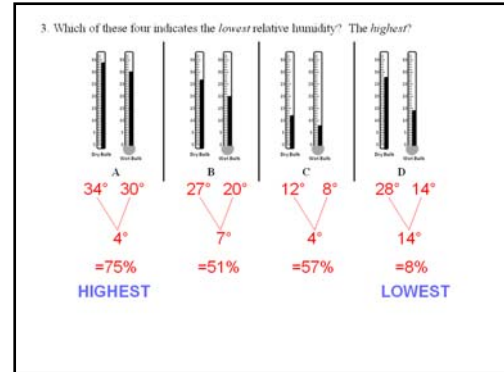


# Atmosphere And Humidity

Yes, you can measure temperature with a thermometer. But did you know you can also measure relative humidity with one? This lesson also sneaks in some background information about earth's atmosphere.

**Materials-** thermometer, cotton ball, water



1. Warm students up with the following fill in the blank statements. (This is available as a Student Handout- see last page.)

Have you ever heard of “dry heat”? Relative humidity refers to how saturated, or filled to capacity with water vapor, the atmosphere is.

The air you’re breathing right now is about 1% water vapor, 21% is oxygen, and 78% is nitrogen. There are also some solid dust particles in there and even a few liquid droplets.

Earth’s atmosphere goes up 500 km (300 miles). Right now you’re reading this paper in the tropo sphere. Above that is the strato sphere, followed by the meso sphere and the thermo sphere. The exo sphere is at the very top.

It’s also available as a PowerPoint.

2. To help students remember the order of layers of the atmosphere, write this acronym down and challenge them to come up with a saying. The sillier the better.

Think of a catchy phrase to help you remember the layer names

T	<u>the</u>
S	<u>spaghetti</u>
M	<u>monster...</u>
T	
E	

3. Distribute thermometers to student groups and have them record the “dry” temperature of it.

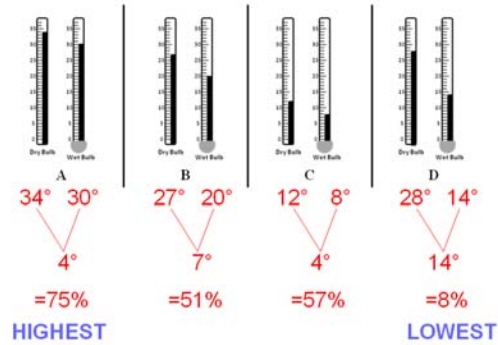
4. Give each group a wet cotton ball and show them how to lay it on the bulb of the thermometer.

After doing so, have them come back to their seats so we can do some practice problems.

5. When humidity is high, the temperature difference between a wet and dry thermometer is only a few degrees. When humidity is low, the temperature drops a lot (10 or more degrees) when the bulb becomes wet.

Give students 4-5 practice problems where they are given a dry and wet bulb temperature and asked to provide the humidity. Use the chart below.

3. Which of these four indicates the *lowest* relative humidity? The *highest*?



Dry bulb reading	Difference between dry and wet bulb temperature, in Celsius															
	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	
2	84	68	52	37	22	8										
4	86	70	56	42	29	26	3									
6	86	73	60	47	34	22	11									
8	87	75	63	51	39	28	18	7								
10	88	76	65	54	44	33	23	14	4							
12	89	78	67	57	47	38	29	20	11	3						
14	89	79	69	60	51	42	33	25	17	9						
16	90	80	71	62	54	45	37	29	22	14						
18	91	81	73	64	56	48	41	33	26	19	6					
20	91	82	74	66	58	51	44	37	30	24	11					
22	91	83	75	68	60	53	46	40	34	27	16	5				
24	92	84	76	69	62	55	49	43	37	31	20	9				
26	92	85	77	70	64	57	51	45	45	39	34	14	4			
28	92	85	78	72	65	59	53	47	42	37	26	17	8			
30	93	86	79	73	67	61	55	49	44	39	29	20	12	4		
32	93	86	80	74	68	62	56	51	46	41	32	23	15	8	1	
34	93	87	81	75	69	63	58	53	48	43	34	26	18	11	5	
36	93	87	81	75	70	64	59	54	50	45	36	28	21	14	8	

6. After that practice, your students now know exactly what to do when they check their “wet” thermometers.

Pull up a site like weather.com and compare what they say with what students get.

My Dry bulb reading: 25 °C  
 My Wet bulb reading: \_\_\_\_\_ °C  
 Depression: \_\_\_\_\_ °C  
 Humidity: \_\_\_\_\_ %

Dry bulb reading	Difference between dry and wet bulb temperature, in Celsius															
	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	14°	16°	18°	
2	84	68	52	37	22	8										
4	86	70	56	42	29	26	3									
6	86	73	60	47	34	22	11									
8	87	75	63	51	39	28	18	7								
10	88	76	65	54	44	33	23	14	4							
12	89	78	67	57	47	38	29	20	11	3						
14	89	79	69	60	51	42	33	25	17	9						
16	90	80	71	62	54	45	37	29	22	14						
18	91	81	73	64	56	48	41	33	26	19	6					
20	91	82	74	66	58	51	44	37	30	24	11					
22	91	83	75	68	60	53	46	40	34	27	16	5				
24	92	84	76	69	62	55	49	43	37	31	20	9				
26	92	85	77	70	64	57	51	45	45	39	34	14	4			
28	92	85	78	72	65	59	53	47	42	37	26	17	8			
30	93	86	79	73	67	61	55	49	44	39	29	20	12	4		
32	93	86	80	74	68	62	56	51	46	41	32	23	15	8	1	
34	93	87	81	75	69	63	58	53	48	43	34	26	18	11	5	
36	93	87	81	75	70	64	59	54	50	45	36	28	21	14	8	

Now go get your wet bulb reading and calculate the humidity in the room

Come back and visit [InteractiveScienceTeacher.com](http://InteractiveScienceTeacher.com) to upgrade this lesson with:

## PowerPoint- lead your students through the lesson click-by-click

Have you ever heard of "dry heat"? Relative humidity refers to how saturated or filled to capacity with water vapor, the atmosphere is.

The air you're breathing right now is about 1% water vapor, 21% is oxygen, and 78% is nitrogen. There are also some solid dust particles in there and even a few liquid droplets. Earth's atmosphere goes up 500 km (300 miles). Right now you're reading this paper in the tropo sphere. Above that is the strato sphere, followed by the meso sphere and the thermo sphere. The exo sphere is at the very top.

Think of a catchy phrase to help you remember the layer names

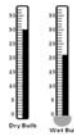
T	the
S	spaghetti
M	monster...
T	
E	

1. In this example, what is the wet-bulb depression?



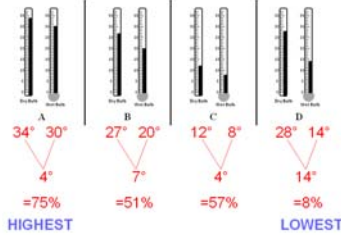
$27^\circ - 20^\circ = 7^\circ \text{C}$   
dry wet

2. What is the approximate relative humidity? (Use the chart on page 1.)



$30^\circ - 21^\circ = 9^\circ \text{C}$   
dry wet

3. Which of these four indicates the *lowest* relative humidity? The *highest*?



## Student Handout

Have you ever heard of "dry heat"? Relative humidity refers to how \_\_\_\_\_ or filled to capacity with water vapor, the atmosphere is.

The air you're breathing right now is about 1% \_\_\_\_\_, 21% is \_\_\_\_\_, and 78% is \_\_\_\_\_. There are also some solid dust particles in there and even a few liquid droplets.

Earth's atmosphere goes \_\_\_\_\_ km (300 miles). Right now you're reading this paper in the \_\_\_\_\_ sphere. Above that is the \_\_\_\_\_ sphere, followed by the \_\_\_\_\_ sphere and the \_\_\_\_\_ sphere. The \_\_\_\_\_ sphere is at the very top.

Think of a catchy phrase to help you remember the layer names

T	
S	
M	
T	
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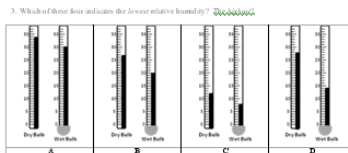
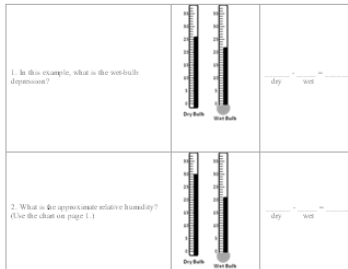
Date \_\_\_\_\_

My Dry bulb reading: \_\_\_\_\_ °C  
My Wet bulb reading: \_\_\_\_\_ °C  
Depression: \_\_\_\_\_ °C  
Humidity: \_\_\_\_\_ %

Depression	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	95	85	75	65	55	45	35	25	15	5																				
2	80	70	60	50	40	30	20	10	0																					
3	65	55	45	35	25	15	5																							
4	50	40	30	20	10	0																								
5	35	25	15	5																										
6	20	10	0																											
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