

Relative Humidity

Answers

Relative humidity compares how moisture is in the air to how much moisture air can hold at a temperature.

The higher the humidity, the more uncomfortable we usually feel.

- Which room would have a higher relative humidity, a warm room with 22 grams of water vapor or a cold room with 22 grams of water vapor? Explain.

The colder room will have higher relative humidity. Cold air has less room to hold moisture so 22 grams will take up a larger percentage of space.

Use the chart at the right to answer the following:

- Calculate the relative humidity of both locations. In a kitchen, the dry bulb reading was 30 degrees and the wet bulb reading was 23 degrees, calculate the relative humidity of the room.

Difference: $30 - 23 = 7$

Go down to the 30 row (dry bulb) and then go over to the 7 column (difference).

Relative Humidity = 55%

- The smaller the difference in the dry and wet bulb temperatures on a sling psychrometer, the *higher* the relative humidity.
- A humid bathroom has a dry bulb reading of 34 degrees and a wet bulb reading of 32 degrees. Determine the relative humidity.

Difference: $34 - 32 = 2$

Go down to the 34 row (dry bulb) and then go over to the 2 column (difference).

Relative Humidity = 87%

- If a room has a relative humidity of 76% and the difference in the temperatures of the wet and dry bulbs is 3 degrees, find the temperature of the room.

Since we already know the relative humidity, we need to look for it in the 3 column (difference). Go down until you get to 76% then move over to the first column for the dry temperature which will be the temperature of the room.

Temperature of the room is 24 degrees Celcius

		Relative Humidity Chart (%)															
Temp Dry Bulb (°C)	Difference Between Dry Bulb and Wet Bulb Temperatures (°C)																
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20		
2	84	68	52	37	22	8											
4	85	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							
15	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	39	34	23	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		
38	94	88	82	76	71	65	60	56	51	47	38	31	23	17	11		
40	94	88	82	77	72	66	62	57	52	48	40	33	26	19	13		
42	94	88	83	77	72	67	63	58	54	50	42	34	28	21	16		
44	94	89	82	78	73	68	64	59	55	51	43	36	29	23	18		

6. Determine the wet bulb temperature of an area with a temperature of 14 degrees and a relative humidity 25%.

Since we already know the relative humidity, we need to look for it in the 14 row (dry bulb). Go over until you get to 25% and then move up to the first row for the difference.

The difference is 8 degrees. However, that only tells you that the wet bulb is 8 degrees colder than the dry bulb. So, subtract 8 from 14. Wet bulb is 6 degrees Celcius.