**Relative Humidity**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **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** |  |

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.

1. 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:

1. 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%*

1. The smaller the difference in the dry and wet bulb temperatures on a sling psychrometer, the *higher*  the relative humidity.
2. 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%*

1. 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*

1. 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 Celsius.*