ROQED PHYSICS LAB

Measurement of relative air humidity

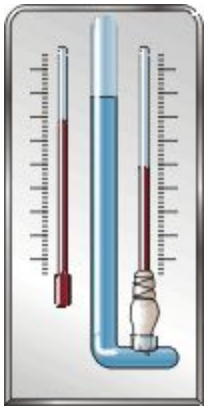
Purpose of work:
Hauchitsya use psychrometer Augustus and hygrometer and to determine the relative humidity of the air in the classroom.

Devices and materials:
086 - August psychrometer,

On the board

RELATIVE HUMIDITY CONVERSION TABLE

Dry-bulb temperature	Dry-bulb temperature minus wet-bulb temperature, °C									
	1	2	3	4	5	6	7	8	9	10
10°C	88	77	66	55	44	34	24	15	6	
11°C	89	78	67	56	46	36	27	18	9	
12°C	89	78	68	58	48	39	29	21	12	
13°C	89	79	69	59	50	41	32	22	15	7
14°C	90	79	70	60	51	42	34	26	18	10
15°C	90	80	71	61	53	44	36	27	20	13
16°C	90	81	71	63	54	46	38	30	23	15
17°C	90	81	72	64	55	47	40	32	25	18
18°C	91	82	73	65	57	49	41	34	27	20
19°C	91	82	74	65	58	40	43	36	29	22
20°C	91	83	74	66	59	51	44	37	31	24
21°C	91	83	75	67	60	53	46	39	32	26
22°C	92	83	76	68	61	54	47	40	34	28
23°C	92	84	76	69	62	55	48	42	36	30
24°C	92	84	77	69	62	56	49	43	37	31
25°C	92	84	77	70	63	57	50	44	39	33
26°C	92	85	78	71	64	58	51	46	40	34
27°C	92	85	78	71	65	58	52	47	41	36
28°C	93	85	78	72	65	59	53	48	42	37
29°C	93	86	79	72	66	60	54	49	43	38
30°C	93	86	79	73	67	61	55	50	44	39



φ

Theory:

The Earth's atmosphere always contains water vapor. Their content in the air is characterized by absolute and relative humidity. Absolute humidity is defined by the density pwater vapor$_{and}$ $_{the}$present in the atmosphere, or a partial pressure $p_{f.}$Partial pressure p_p is the pressure that water vapor would produce if all other gases were absent in the air.

Relative humidity **φ** is the ratio of the partial pressure $p_{p\ of\ the}$ water vapor contained in the air to the saturated vapor pressure $p_{n.p.}$, at a given temperature. Relative humidity shows how many percent is the partial pressure of the saturated vapor pressure at a given temperature and is determined by the formulas:

$$\varphi = \frac{\rho}{\rho_{нас}} \cdot 100\%$$

$$\varphi = \frac{p}{p_0} \cdot 100\ \%.$$

The August psychrometer has two thermometers: "dry" and "wet". They are so called because the end of one of the thermometers is in the air, and the end of the second is tied with a piece of gauze immersed in water. Evaporation of water from the surface of a wet bulb leads to a decrease in its temperature. The second, dry thermometer, shows the usual air temperature.
A relative humidity of 40 to 60% is considered normal.

Work progress:

1. Put the psychrometer on the table.

2. Run the simulation, the thermometers will show the room temperature.

3. Enter the “dry” (readings in the Table$_1$) and “wet” t_2 thermometer.

4. Collect the formula for calculating the difference in thermometer readings
$\Delta t = t_1 - t_2$

5. Using the psychrometric table on the board, determine the air humidity **φ**

6. Table

t_1 ℃	t_2 ℃	Δt ℃	**φ** (%)
...	...		

7. Conclusion:
A. The relative humidity in the room is within normal limits. ...
C. The relative humidity in the room is higher than normal.
C. The relative humidity in the room is below normal.