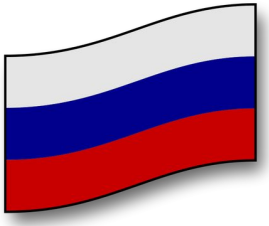
International Young Naturalists' Tournament

26. Steamed up mirror

When one blows air on a mirror or a window pane, it gets foggy. Investigate this effect.



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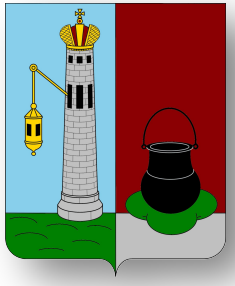

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A bit of the theory

*A*ir is a mixture of nitrogen, oxygen, and a number of other gases, including **water vapor**.
Steam is a gas, colorless and invisible.
The peculiarity of its mixture with air is that air cannot contain as much steam as desired - at room temperature and pressure, no more than 20 grams of steam can be placed in a cubic meter. Anything beyond these 20 grams will turn into liquid, into small drops of fog.
When cooled, the limiting amount of vapor in the air drops and some of it turns into water.
This is what happens when it comes into contact with any cold (as compared to air) object.

Moisture appears as a result of cooling the outer glass of the glass unit below **the dew point temperature** of the ambient air.

Plan of Research

<u>The hypothesis of the research:</u>

fogging depends on the difference of temperature air(the more, the more fogging), type surface.

<u>Subject</u>: fog

<u>Aim</u>: investigate glass fogging in different conditions

<u>Tasks</u>:

1. experiments with several different parameters:
    a. ambient temperature
    b. surface type
2. Analyze the results
3. Get conclusions

<u>Methods</u>:

1. Observation
2. Analysis
3. Comparison
4. Conclusions

Experiments

The aim is to investigate glass fogging in different conditions and on different surfaces.
Equipment: glass, thermometers, telephones, plastic screen, ice
Measuring instruments: psychrometer, hygrometer, barometer.
Source of errors
inaccurate measurements of expiratory force, evaporation rate
and how it decrease:
we did not try to make the most accurate measurements, our task is to trace the qualitative dependencies

Experiment data

table

t of air, °C	φ, %	p, kPa		spot diameter, cm
+18	70	102.5	in room #1	3
+15	70	102.5	in room #2	**2**
+7	90	102.5	in outdoor	5
+9	90	102.5	in outdoor	6
0 (ice and water)	70	102.5	in room #1	**8**
0	90	102.5	in outdoor	7

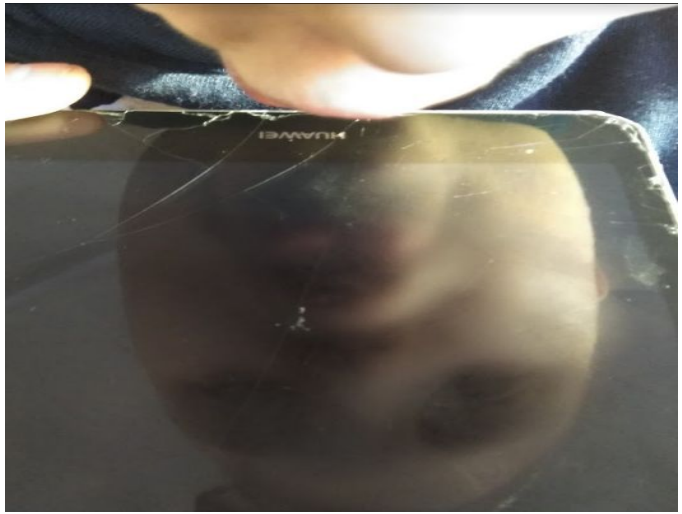
Equipment

Experiments # 1

Purpose: To investigate condensation on different surfaces.

Equipment: plastic, phone screen.

Conclusions: the strongest condensation has formed on the plastic surface, the worst on the phone screen.



Experiments # 2

Purpose: to study condensation on surfaces with different temperatures.

Equipment: glass plate Move: the plates were placed outside for 5 minutes and 20 minutes.

Conclusions: The steam condensed better on the plate that had been lying on the street for 20 minutes than on the plate that had been lying for 5 minutes.

References

https://en.wikipedia.org/wiki/Humidity
https://en.wikipedia.org/wiki/Dew_point