



Checking the conditions of bodies floating in a liquid

Purpose of the work:

To find out the dependence of bodies floating in a liquid on the ratio of gravity and Archimedean force.

Devices and materials:

070 - scales

019 - measuring cylinder 250 ml.

067 - test tube

Theoretical part:

Archimedes force F_A acts on all bodies immersed in liquid (buoyancy force), directed vertically upward, but not all bodies float up. To understand why some body float and others sink, you should consider another force acting on the whole body - the gravitational force F_m which is directed vertically downward, ie, the opposite of F_A . If the body is left at rest inside the liquid, then it will begin to move in the direction towards which the greater force is directed. It is proposed to verify this in this work, as well as to formulate the conditions for the floating of bodies in a liquid.

Work progress

1. According to the picture on the board with, select the workplace for the experiment.
2. Start the simulation and pour 200 ml into the graduated cylinder. water.
3. While adding sand, change the weight of the tube.

4. Enter in the Table the volume of displaced water (V) and the mass of the test tube with sand.

5. Draw up the formula for calculating the buoyancy force

$$F_A = \rho_{\text{and}} gV$$

6. formula for calculating the weight of the test tube. The result will be automatically reflected in the table.

$$P = mg$$

7. Pour some more sand into the test tube. Determine the buoyancy and weight of the tube again. Do this several times until the corked tube sinks.

8. Enter the results of measurements and calculations in the Table.

No.	ρ_w (kg * m ³)	V (ml)	F_A (N)	m (gr)	P (N)	Test tube in water (floats / sinks)
1	1000		
2			
3			
4			

10. Output:

AND. If the buoyant force is greater than the weight of the body, the body floats until these forces are balanced. If the buoyancy force is equal to the weight of the body, the body floats at any point in the fluid. If the buoyancy is less than the body's weight, the body sinks.

B. If the buoyancy force is less than the body weight, the body floats until these forces are balanced. If the buoyancy force is equal to the weight of the body, the body floats at any point in the fluid. If the buoyancy force is greater than the body's weight, the body sinks.

C. If the buoyant force is greater than the weight of the body, the body floats until the force of Archimedes becomes greater than the force of gravity. If the buoyancy force is equal to the weight of the body, the body sinks. If the buoyancy force is less than the body's weight, the body floats at any point in the liquid.