10th IYNT 2022; Tskneti, Georgia
Problem 21. Sinking paper clips

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Team Romania - Limitless 3.0

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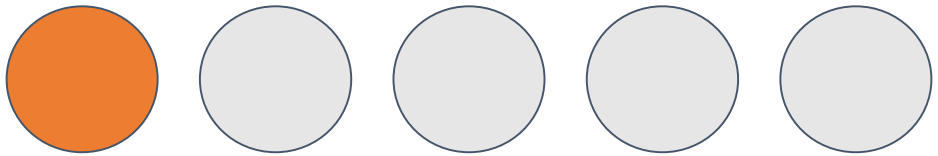
Summary

It is a well-known physics demonstration, **small metal objects** (e.g. paper clips, pins, or needles) **stay afloat** on water. If a **small amount of soap** is then added to the water, some of the floating objects **instantaneously sink**. **Investigate** the critical conditions for sinking.

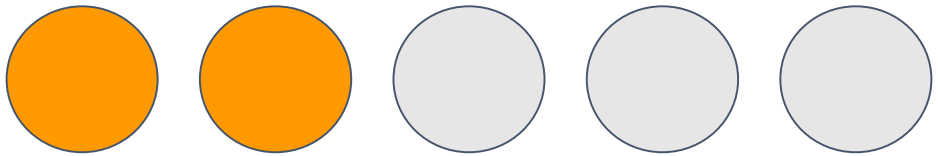
Theoretical Part

Strong points	Weak points
1. Good understanding of the phenomenon	1. Did not explain what happens to the atoms when connecting 2. Did not explain the chemical process behind the bubbles 3. very poor time management 4. didn't manage to answer the question of the opponent: "how does soap lower the water tension"



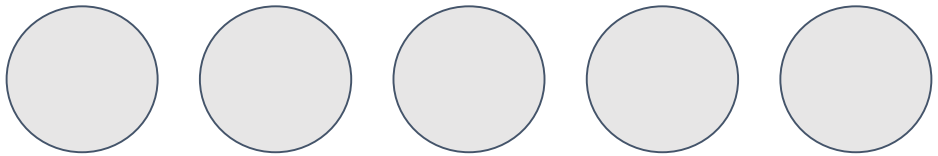
Experimental Part

Strong points	Weak points
1. Video clips 2. Compared the experiments 3. Varied the quantities of soap	1. No variation of soap, water 2. No hypothesis 3. No conclusions 4. No errors



Conclusion

Strong points	Weak points
1. varied the experiment	1. No conclusions 2. No theoretical explanation



Discussion topics

1. Does cold water have more tension then hot water?
2. Does it matter what type of water you use?
3. Why doesn’t soap increase the tension of water?
4. How can you increase the surface tension of water?
5. Which liquid has maximum surface tension?
6. What causes surface tension to break?
7. Does cold water have more tension then hot water?
8. What will happen if there is no surface tension?
9. What makes surface tension stronger?

Discussion