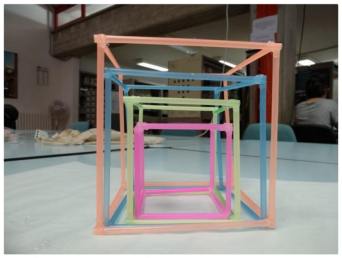

instructables Cubes Volumes and Sides Instruction Manual

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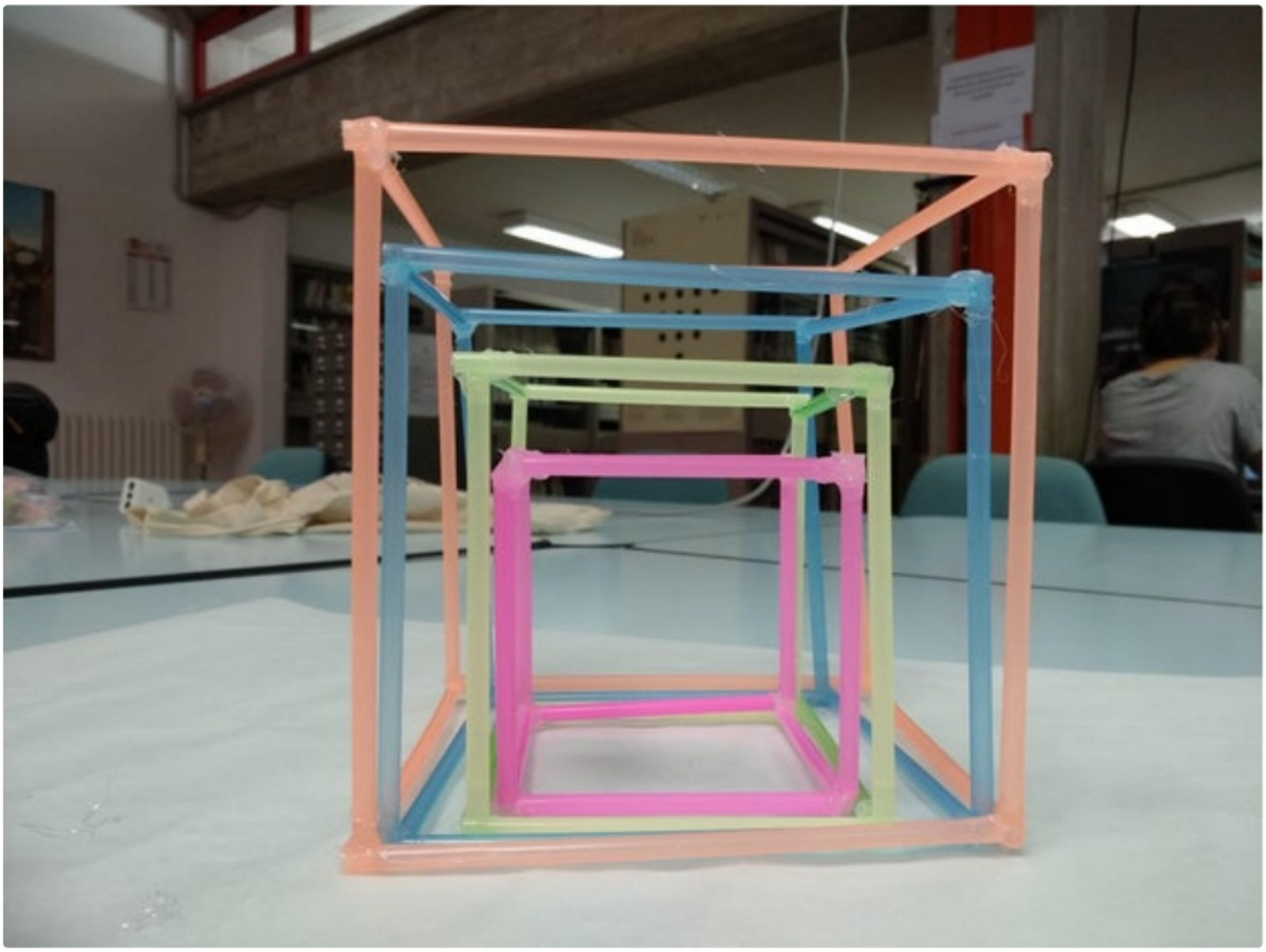


Contents

Cubes Volumes and Sides

by gales Sandroni

This activity is aimed at teaching the basics of solid geometry.

Kids are asked to build cubes of different volumes: half a litre, one litre, two litres and three litres, therefore 500 cm^3, 1,000 cm^3, 2,000 cm^3 and 3,000 cm^3, respectively.

Afterwards, we are asked to investigate on the respective sides of these cubes. Easy to compute in the case of the cube with capacity one litre, which by de%nition is 10 cm.

Regarding the other sides, we would like teach that the cube with a capacity of two litres doesn’t have a side of 20 cm (as one might mistakenly venture) but $\sqrt[3]{2{,}000\ cm^3} \approx 12.56$ cm.

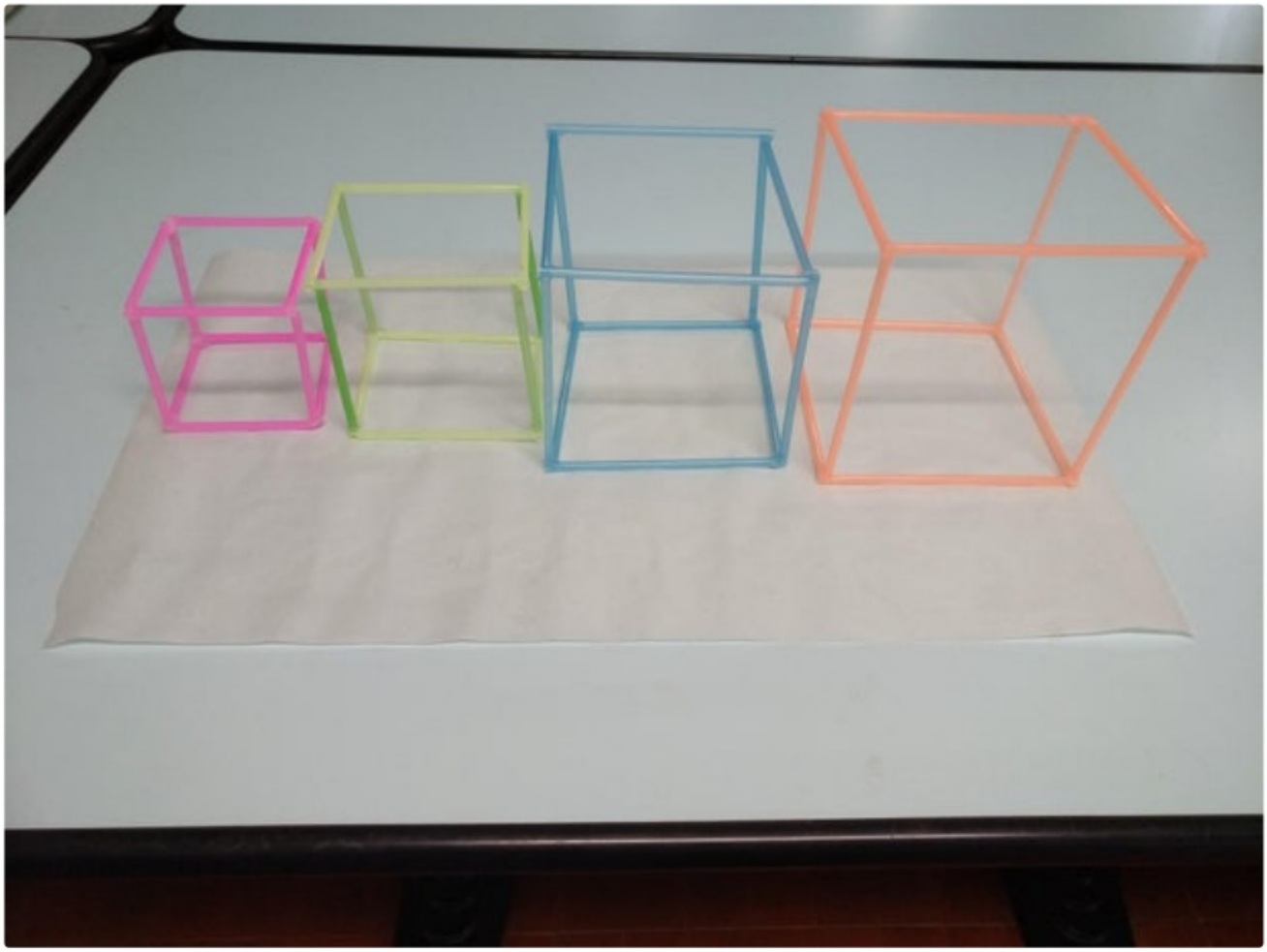
Therefore, the doubling of volume capacity generates an increase in the side by a factor of 1.256. Supplies:

In order to realise the project, only 12 straws per cube were needed (one on each side). In total: 48, better if cultured di-erectly.

The straws have been glued with hot glue.

To prevent damage to the desk, parchment paper or other material can be used (it is not required for the project, only to avoid damaging).

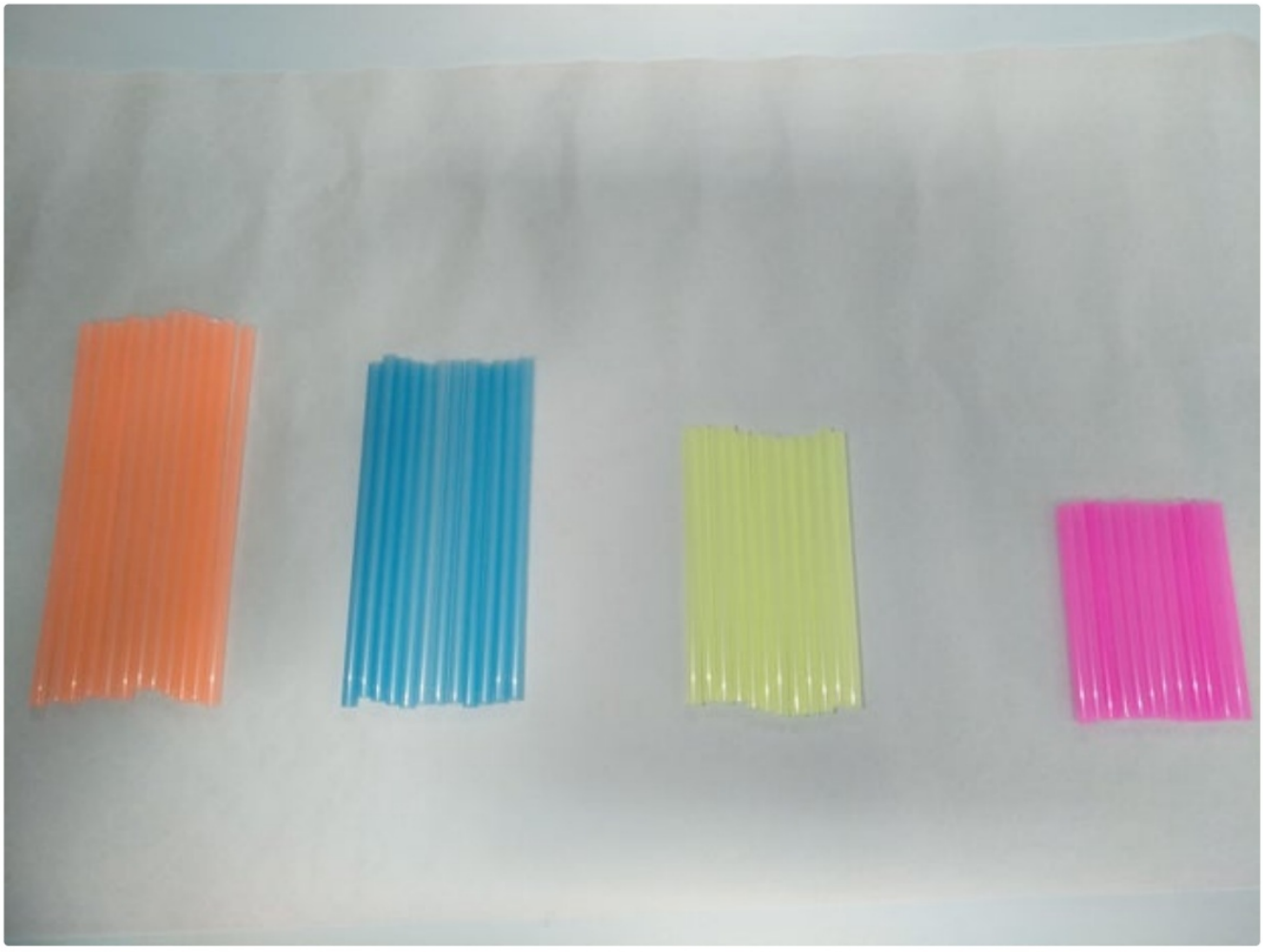
Step 1: How Long Are the Straws?



The %rst step is cutting the straws to the right length.
The idea is to build four cubes whose volume is half a litre, one litre, two litres and three litres respectively. Therefore, knowing the volumes, the corresponding sides will be its cubic root.

Volume	Side
500 cm³	7,94 cm
1,000 cm³	10,00 cm
2,000 cm³	12,56 cm
3,000 cm³	14,42 cm

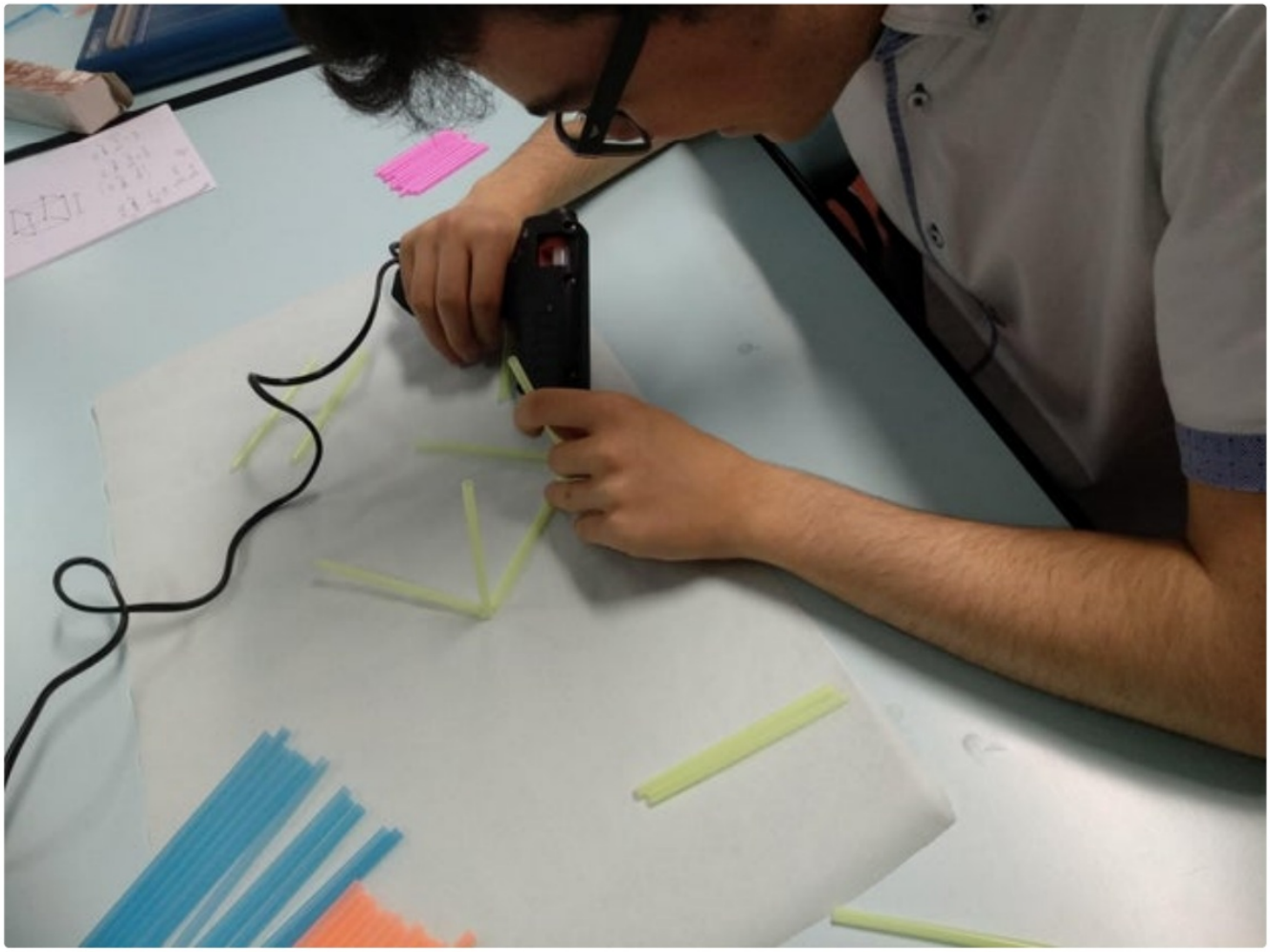
Step 2: Cube Construction

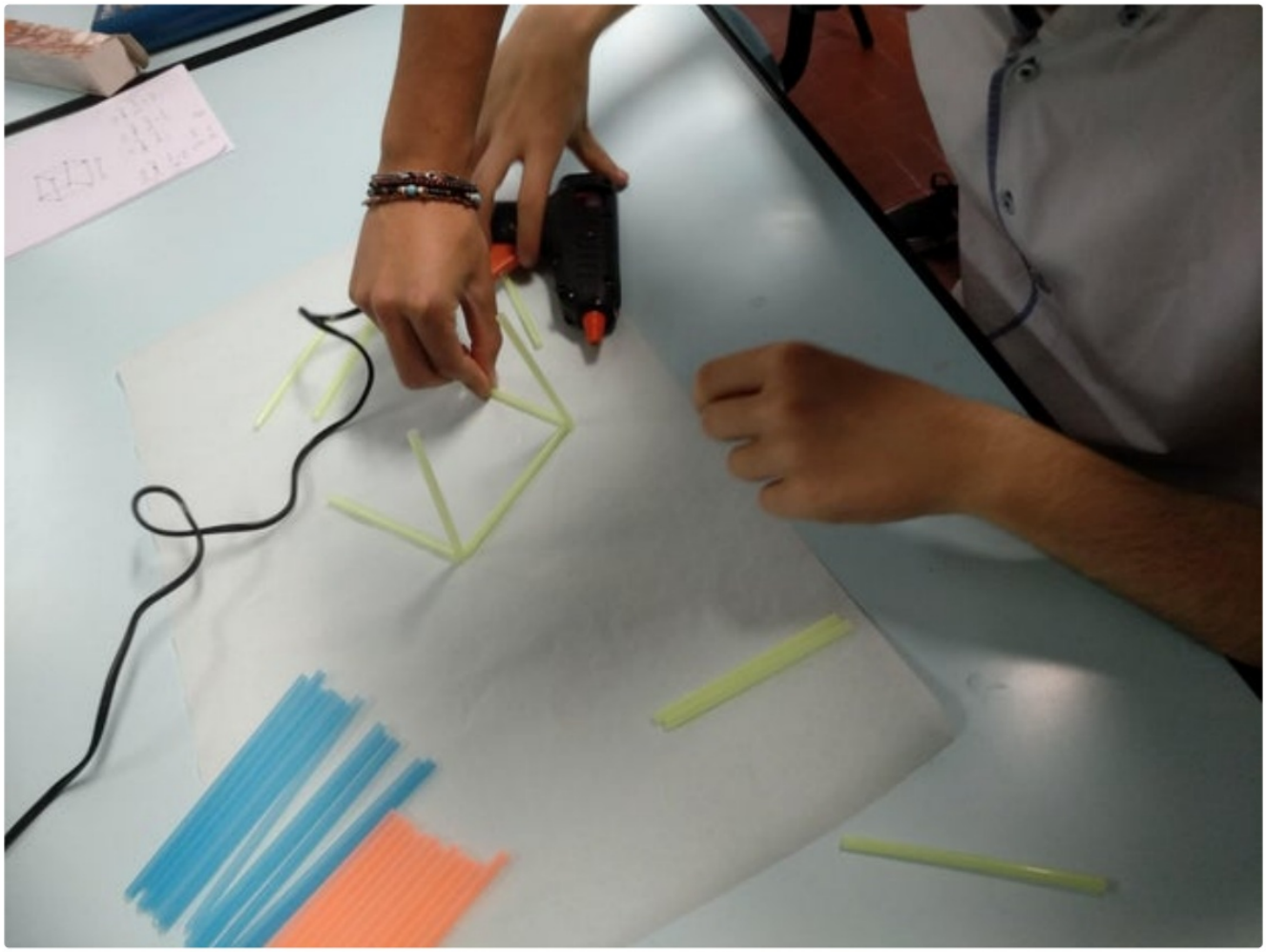


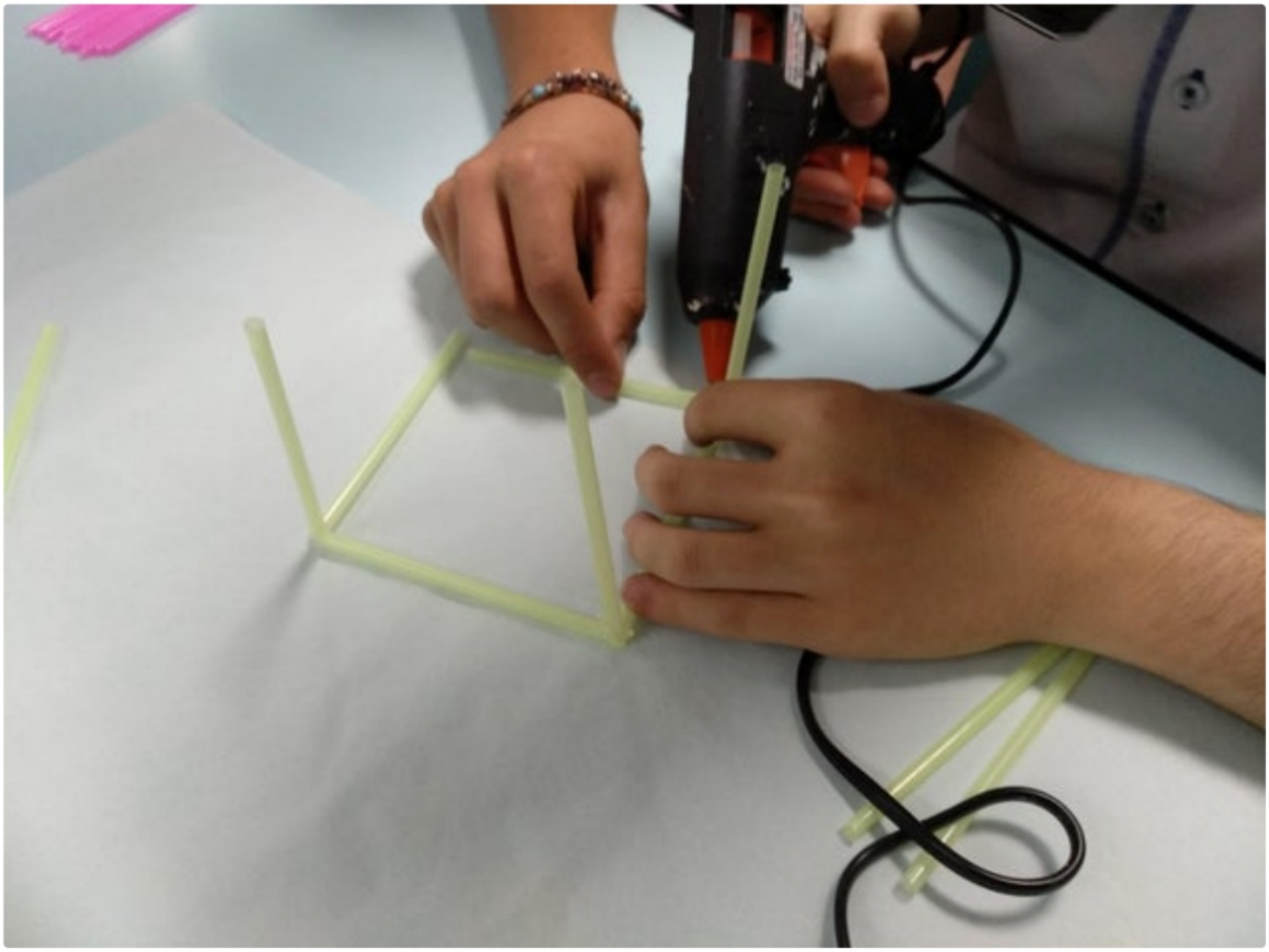
To make a cube, at least two people are needed: one to put the straws in place; another to glue them.

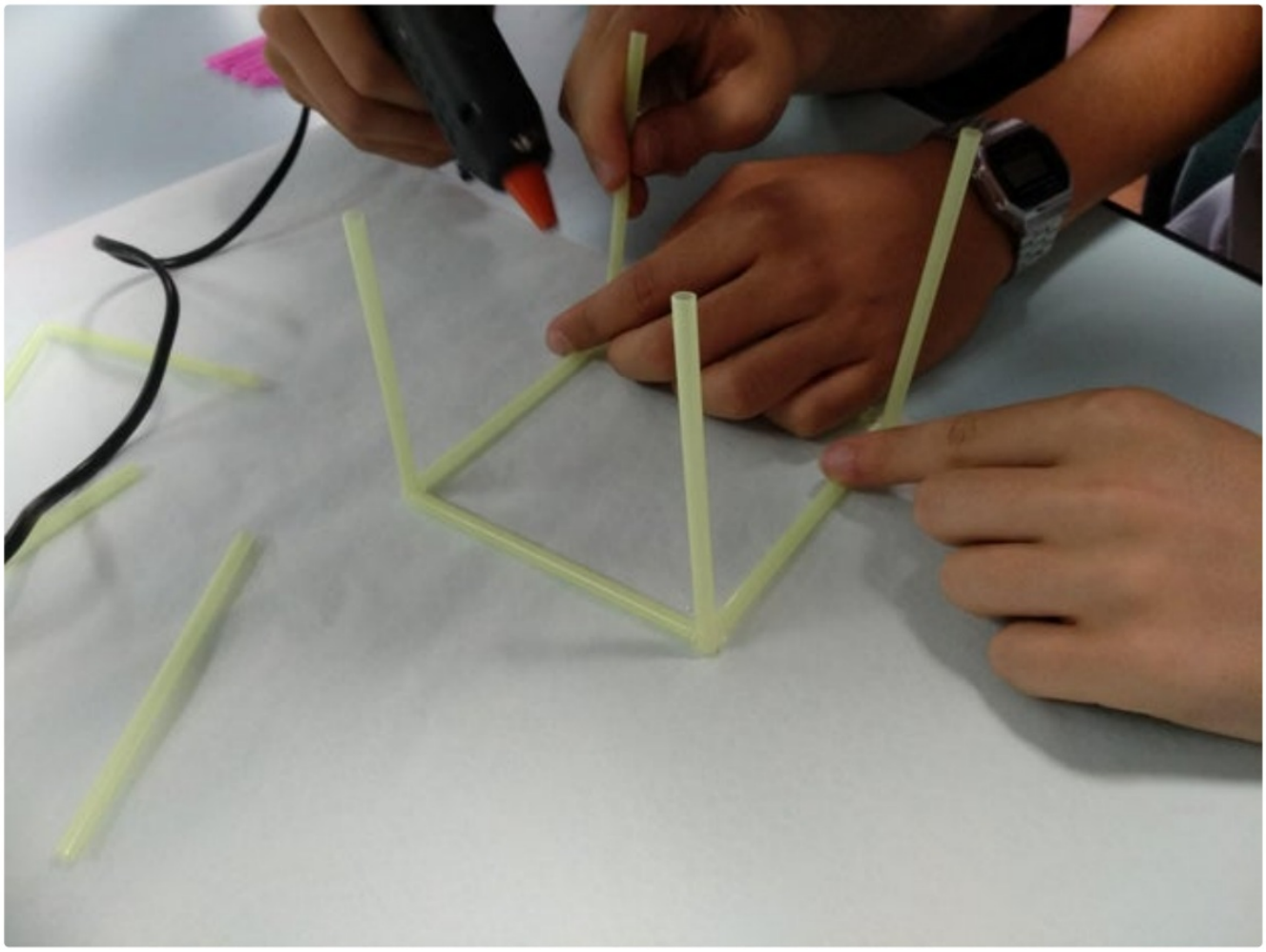
In the %rst picture, the unglued cube is shown, so that you can get an idea about the desired result. After the steps followed by my pupils.

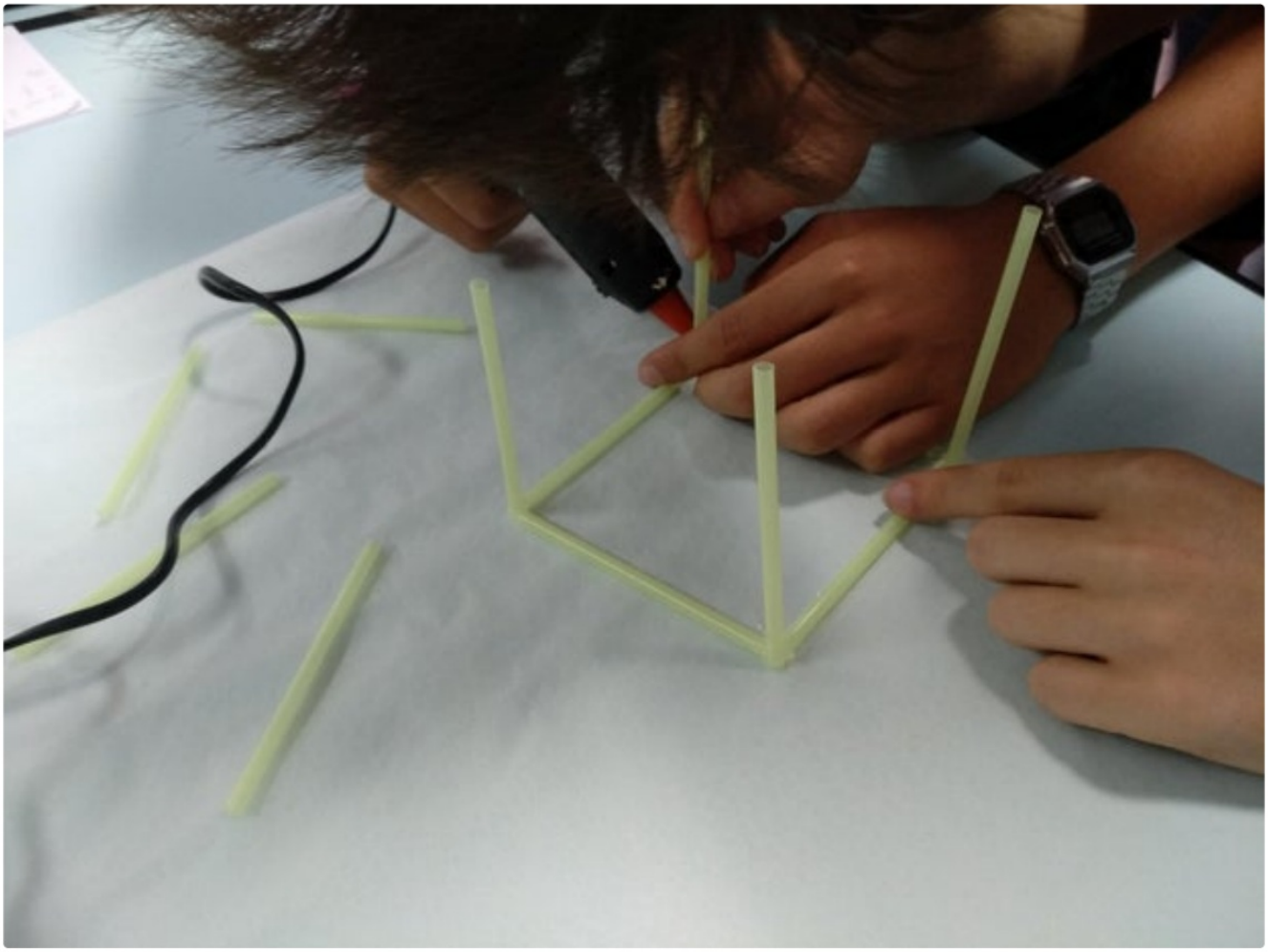
Product Information

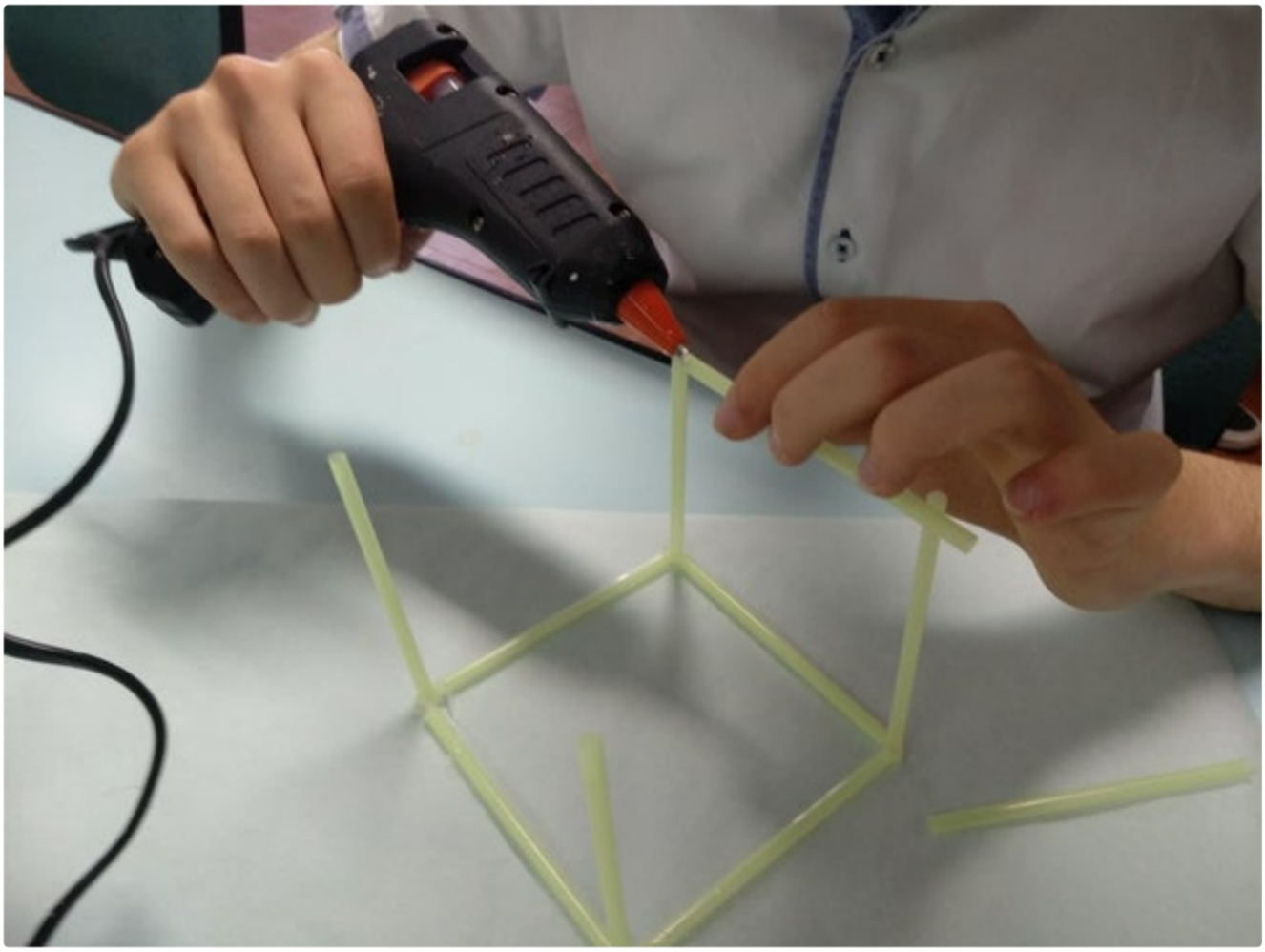


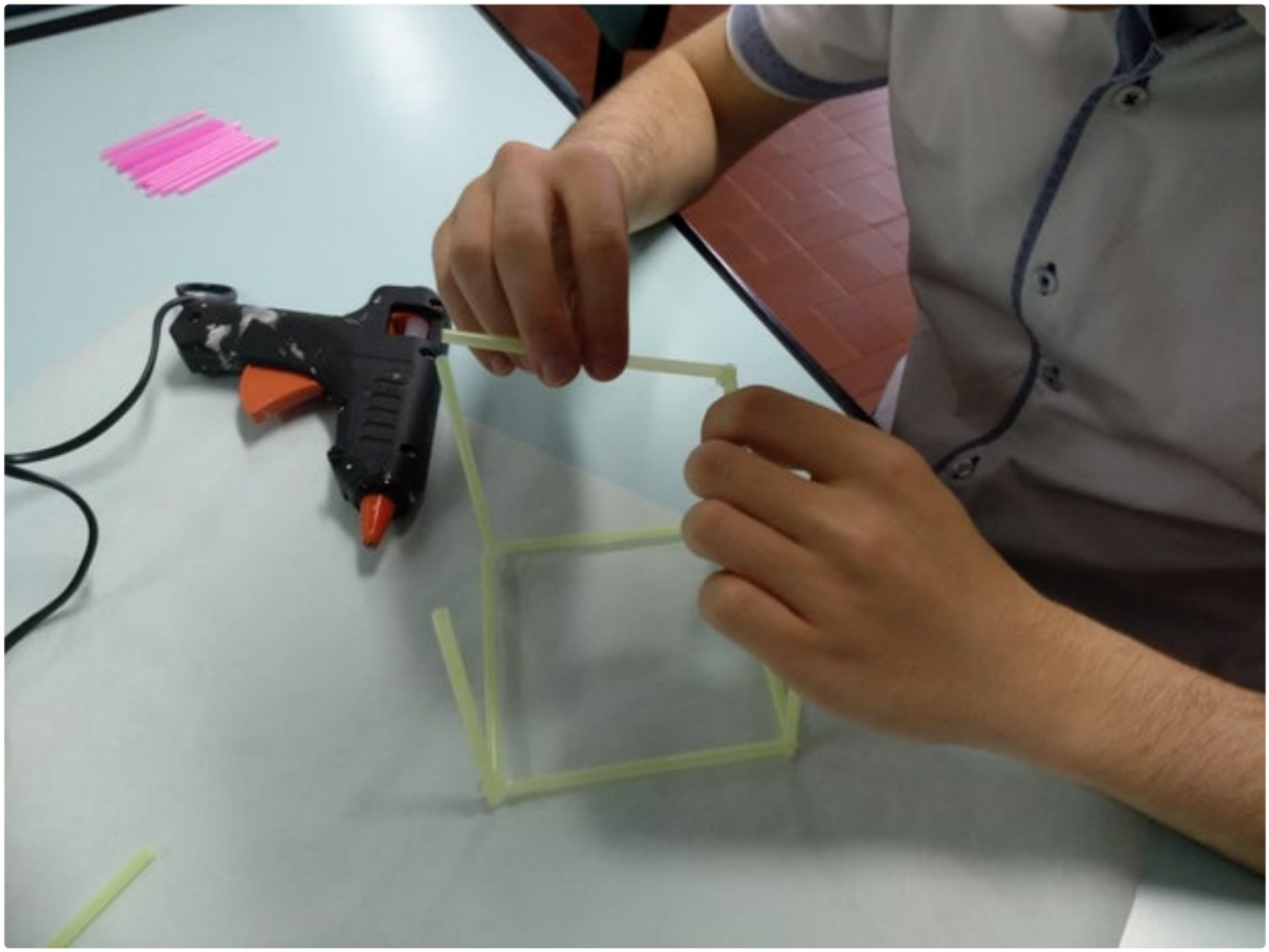


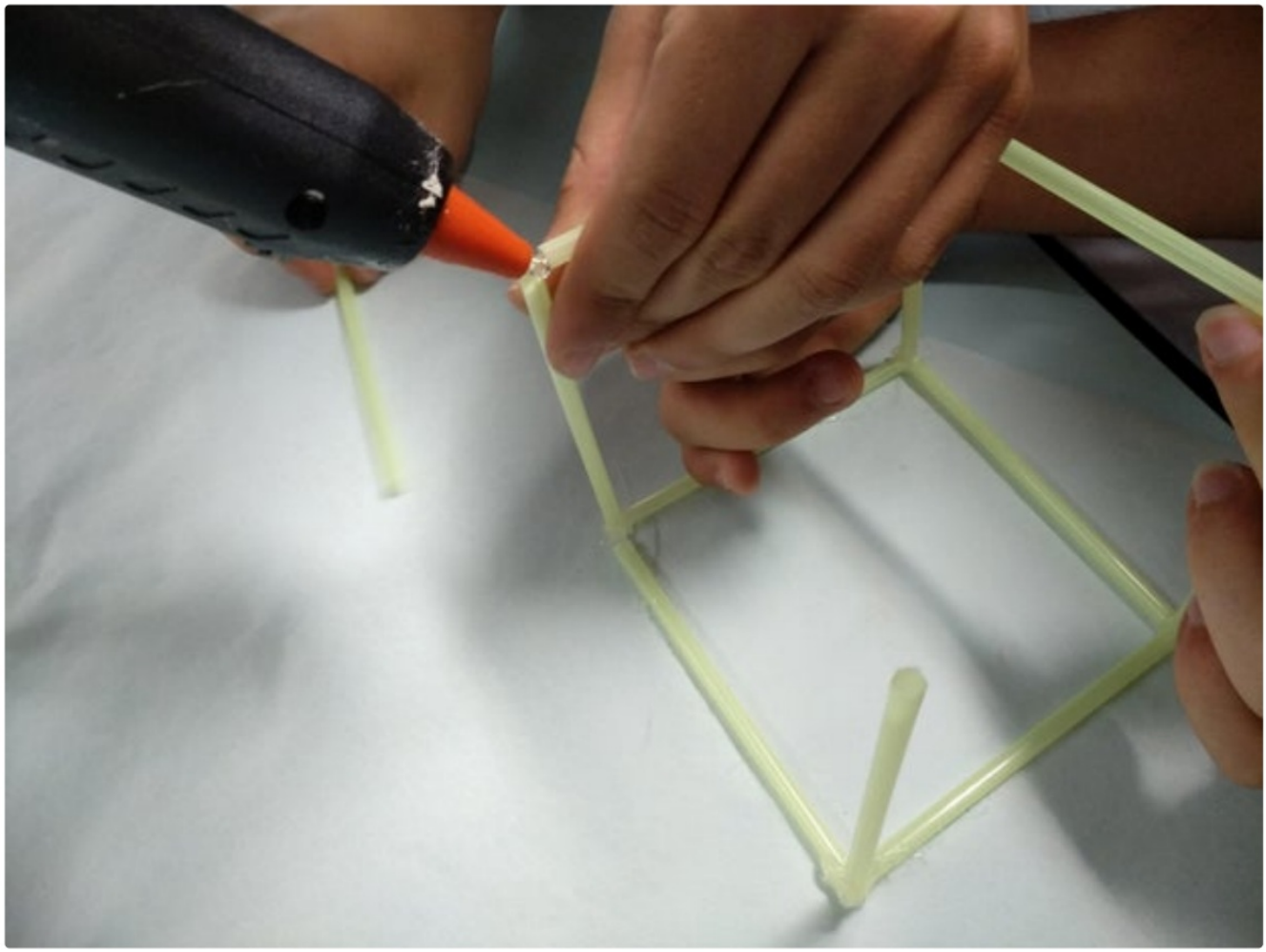


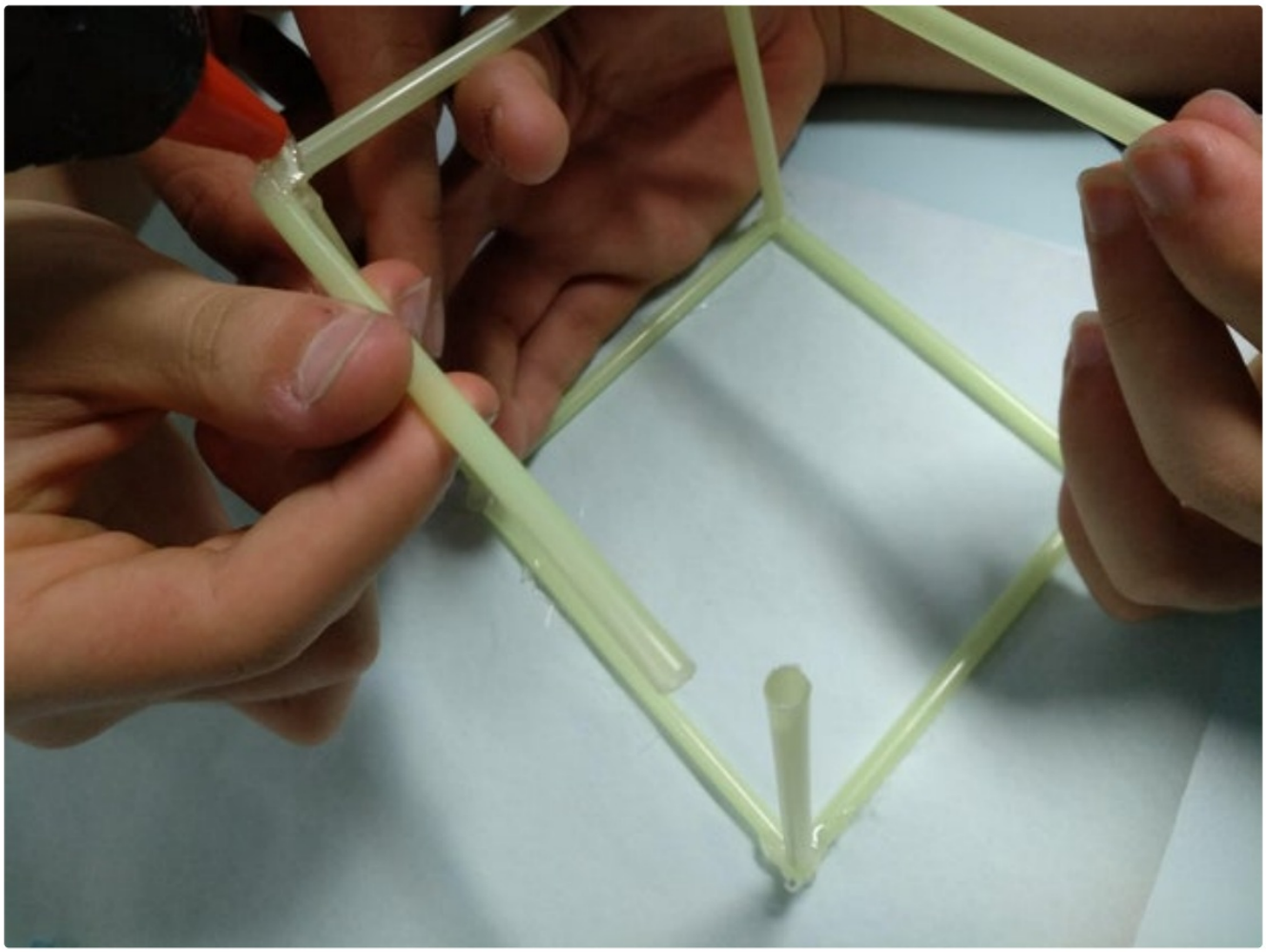


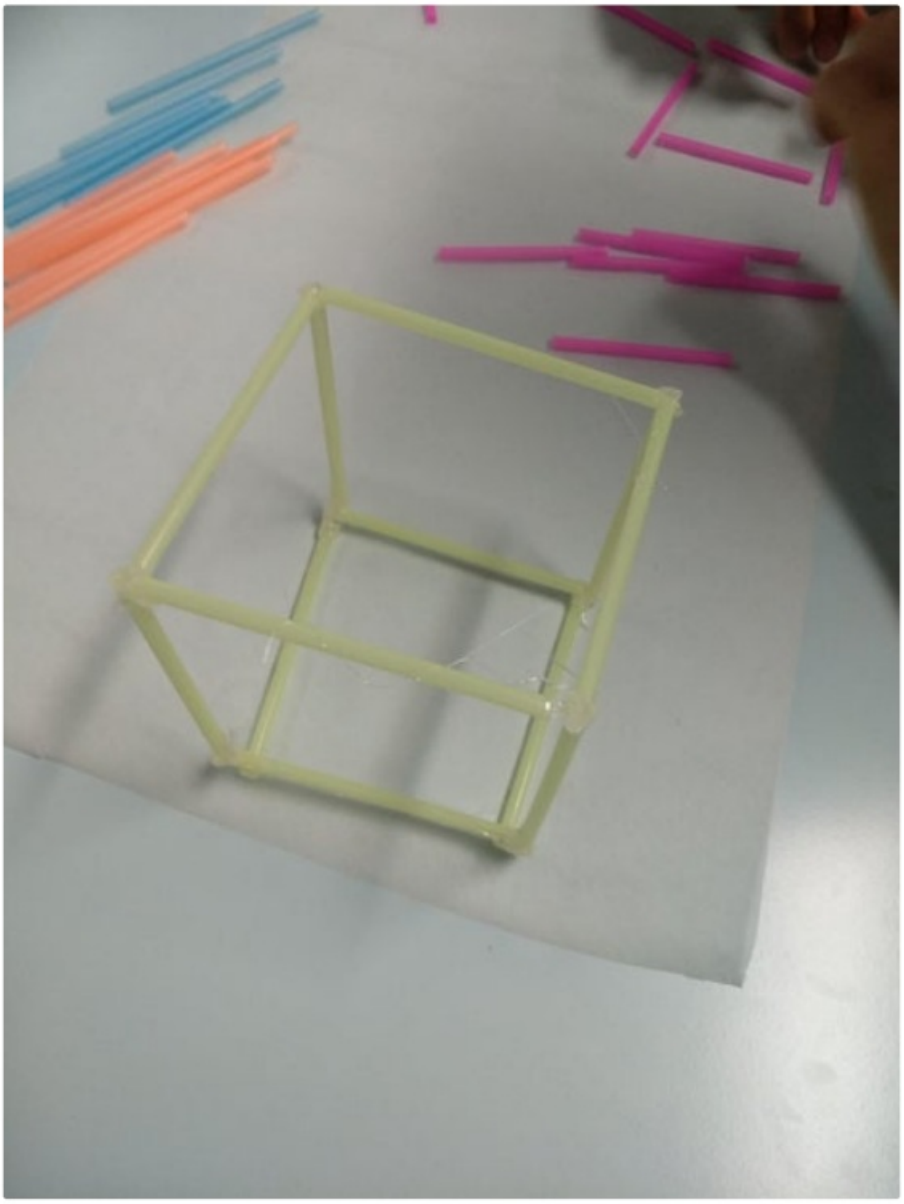


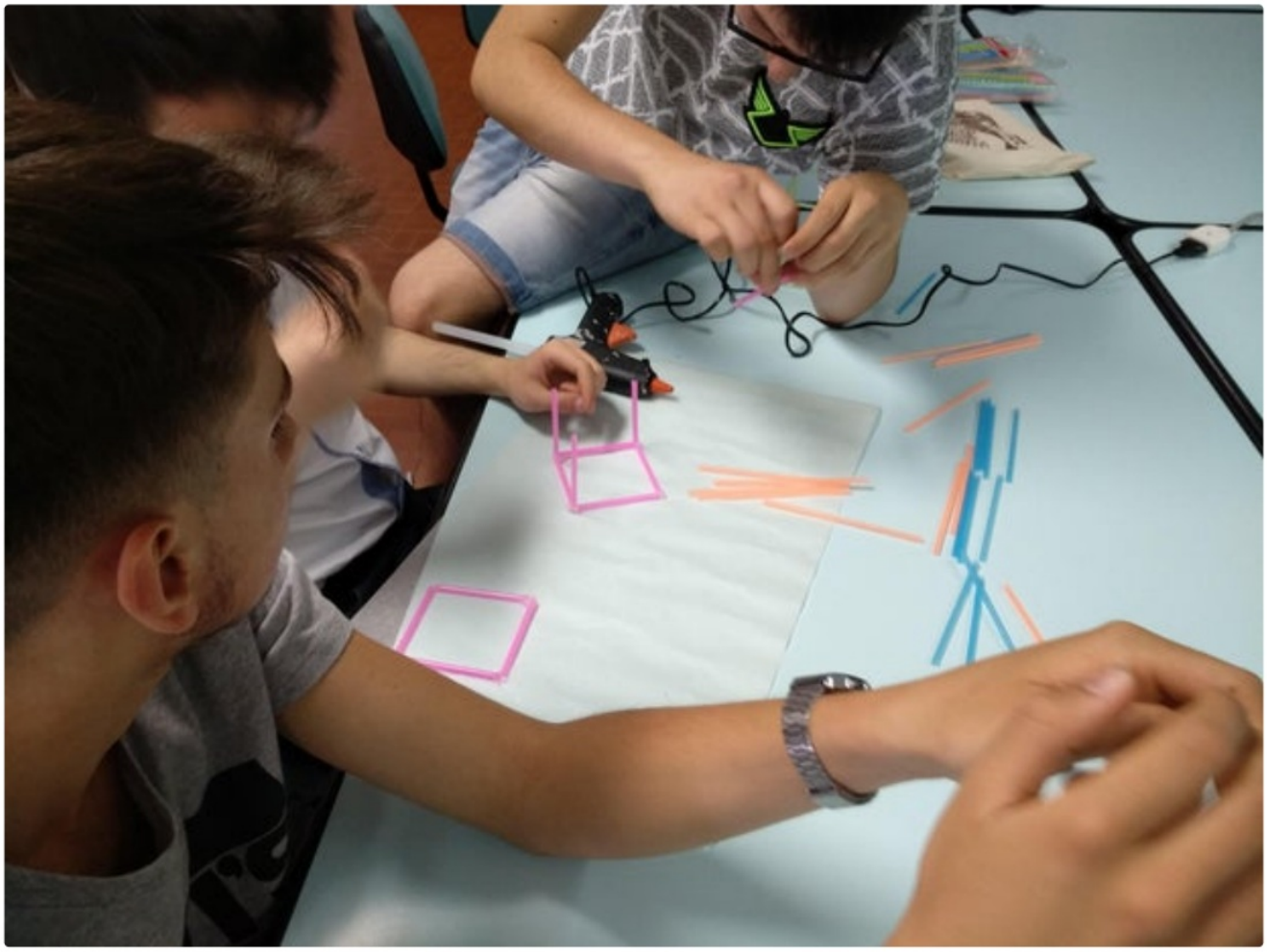


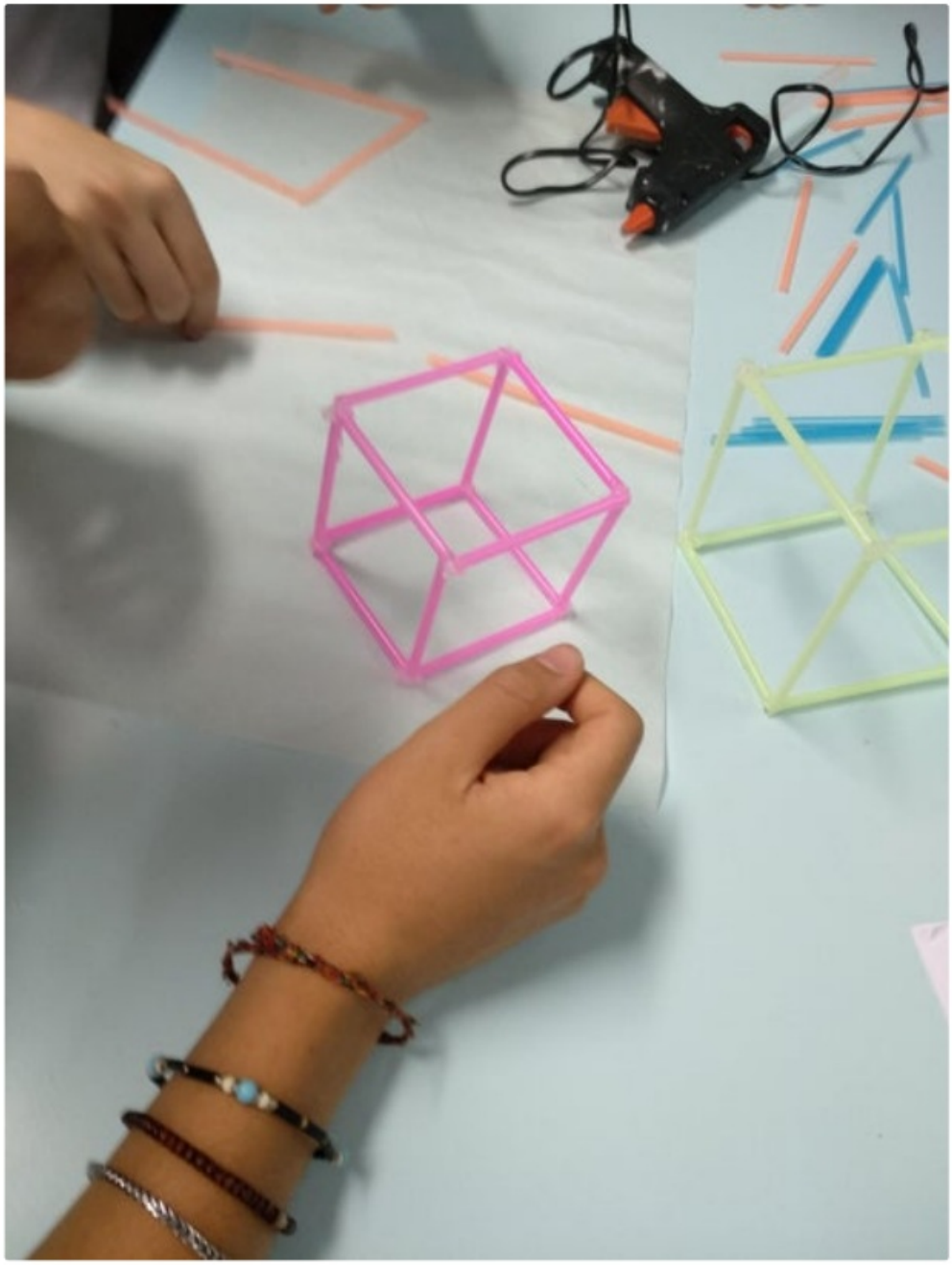


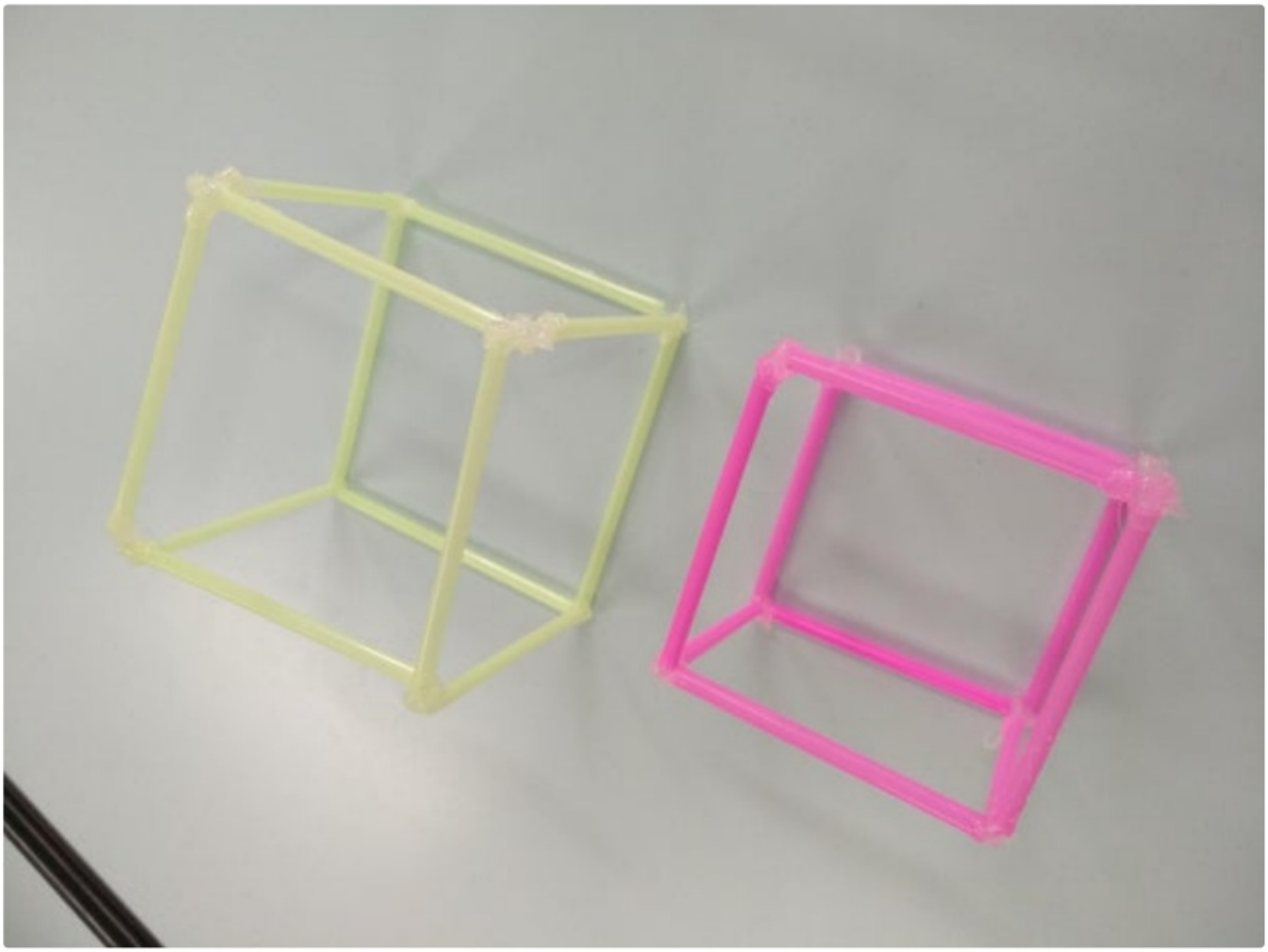




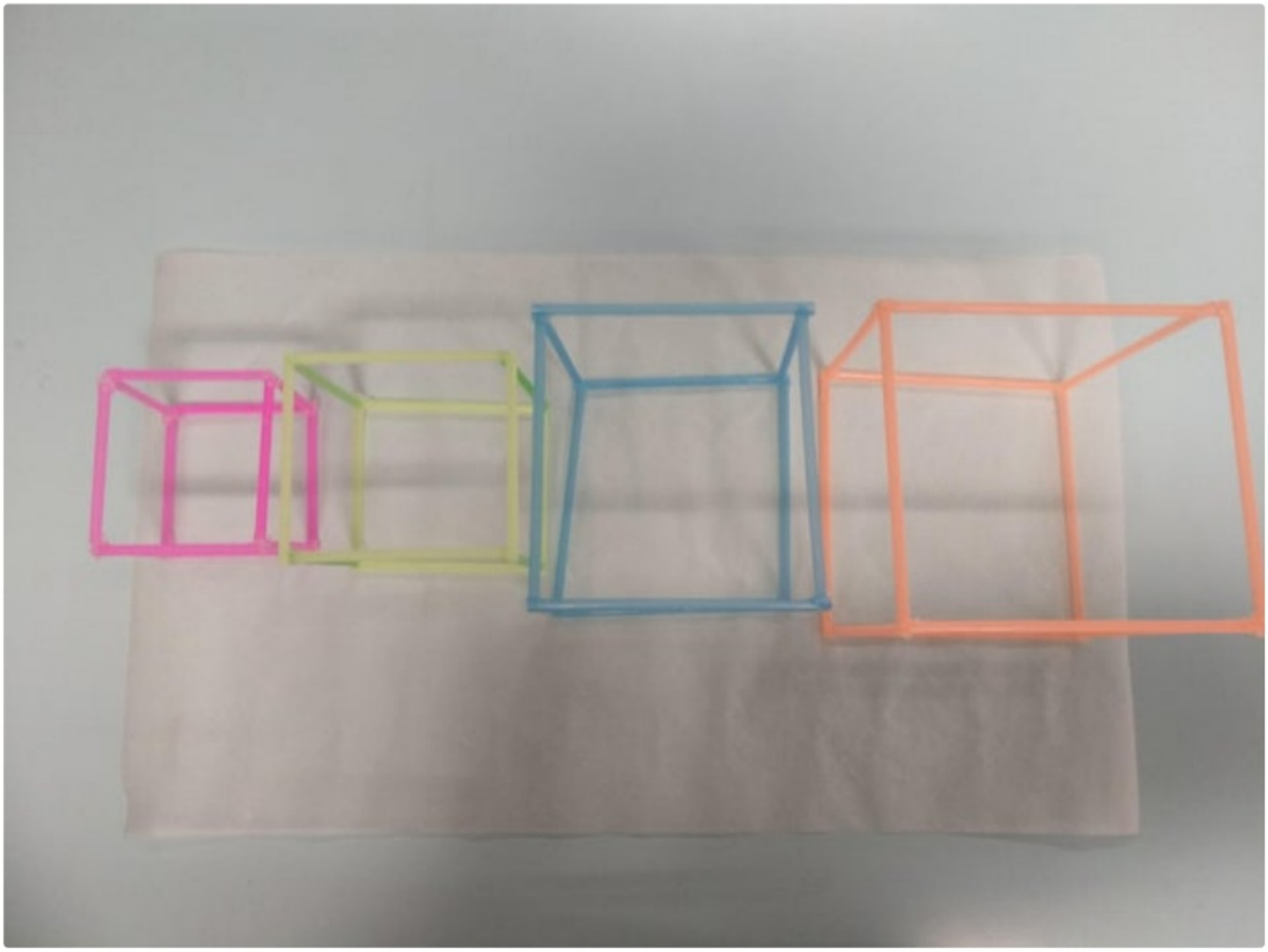


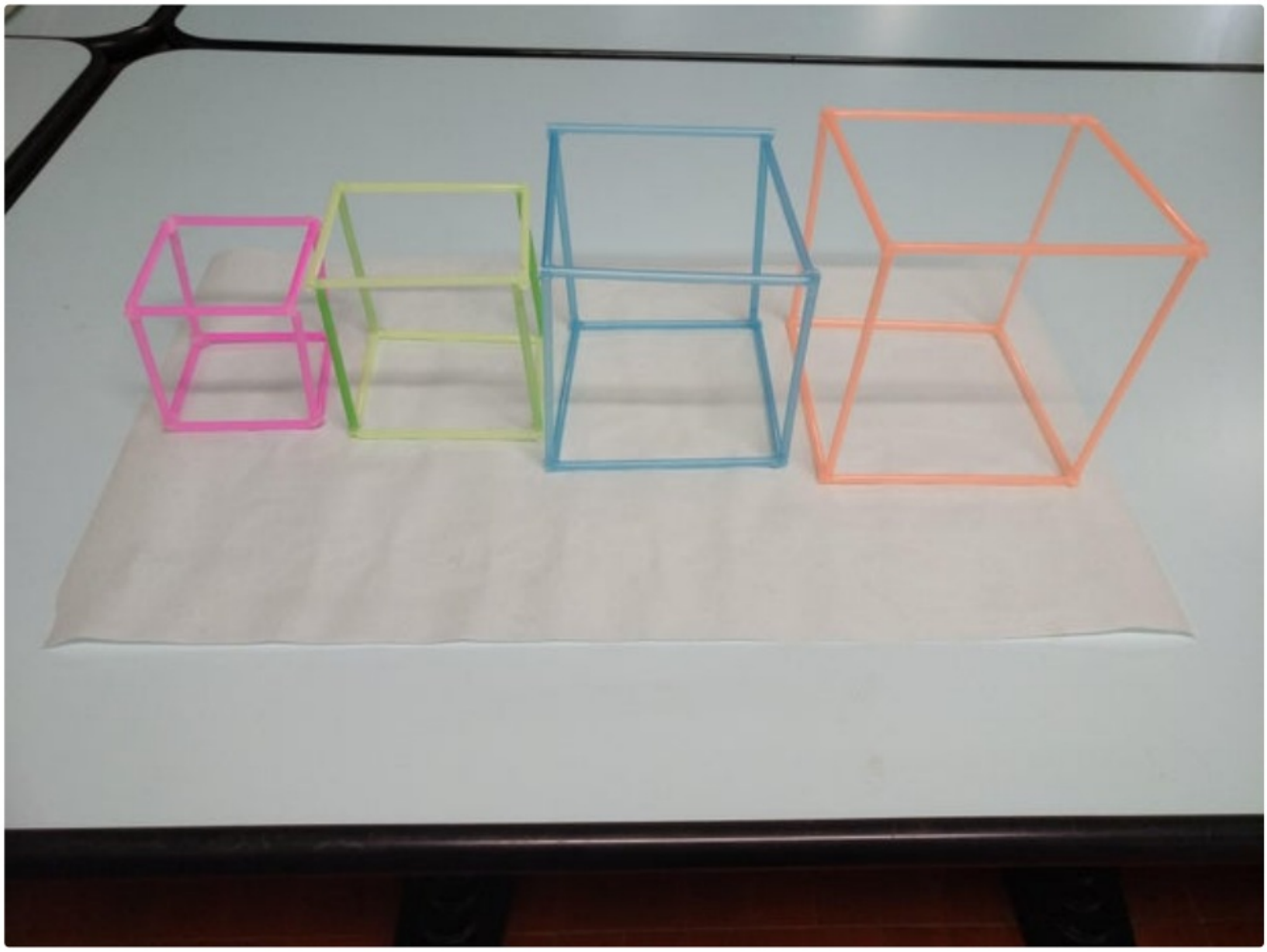






Step 4: What Will Appear?





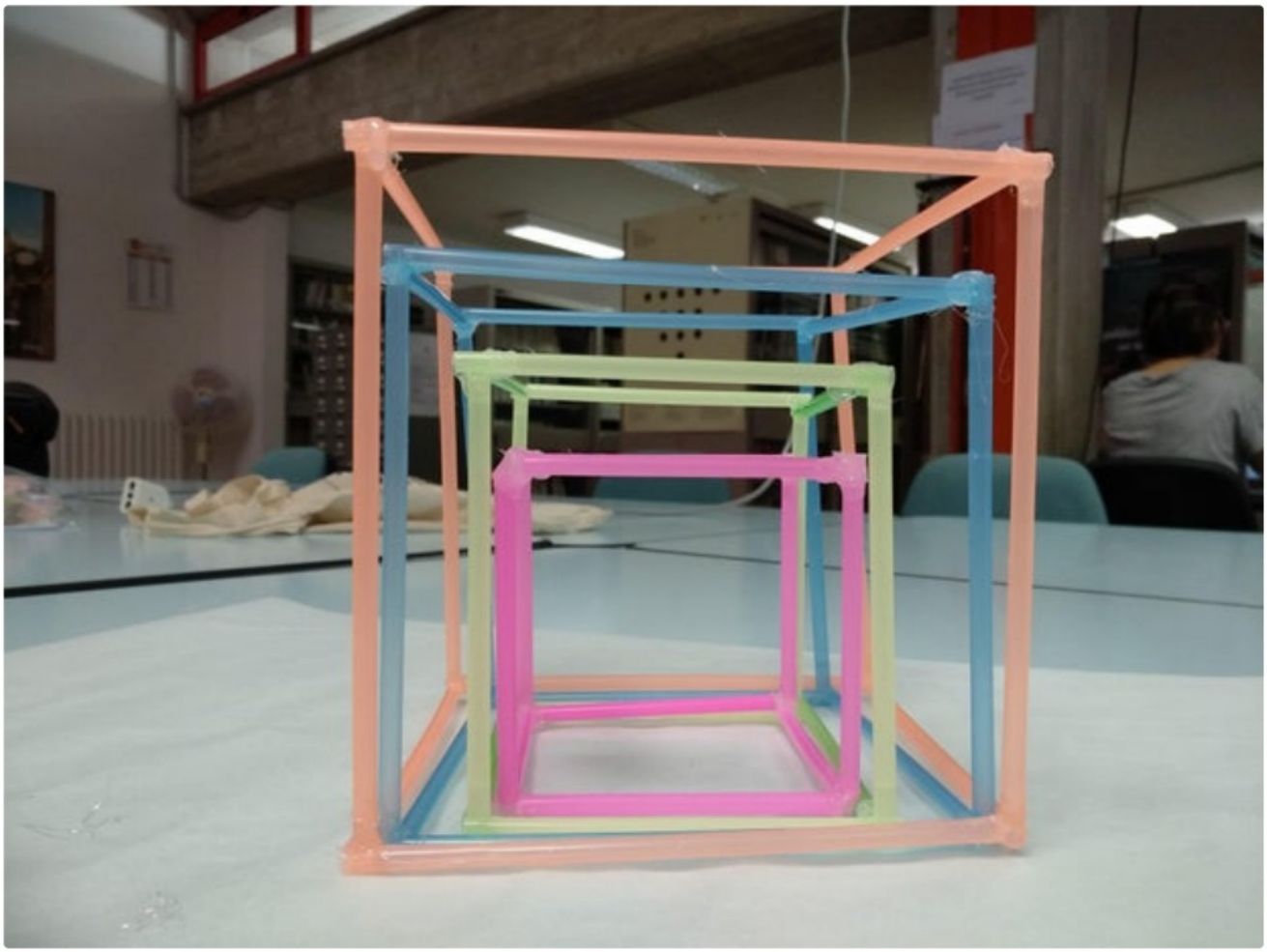
Above the four cubes of half litre, one litre, two litres and three litres. It is evident that the sides don't double when the volume doubles.

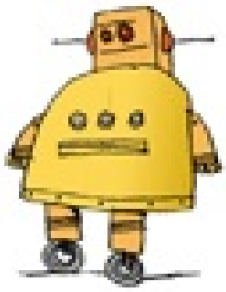
This is a surprisingly simple method for explaining a complex concept: the relationship between the side and volume ratio in a geometrical solid.

I have chosen the cube because it has the simplest calculations.

Step 5: Matryoshka Effect

The temptation to insert one cube inside the other and create a spectacular Matryoshka e-ect is simply irresistible!





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Documents / Resources

	**instructables Cubes Volumes and Sides** [pdf] Instruction Manual Cubes Volumes and Sides, Volumes and Sides, Cubes Sides, Cubes Volumes, Cubes

References

- Yours for the making - Instructables
- Cubes, Volumes And... Sides : 5 Steps (with Pictures) - Instructables
- Galessandroni's Profile - Instructables