

 VRIJE ASO.SCHOOL	 eTwinning	
<h2>See you in space</h2>		
NAME: Pieter-Jan Warnez	NAME: Anton Devlaeminck	
NAME: Elien Walican	NAME: Lars D'haeyere	
SCHOOL / CLASS: 3WETA	MARKS:        /...	
<h3>EXPERIMENT:bodylength</h3>		

#### RESEARCH QUESTION

- Why does a spacesuit become too short in space?
- How does the bodylength change when a person lies down? Are you bigger standing up or lying down?
- Does the mass influence the change in bodylength?

#### HYPOTHESIS (indicate the correct answer)

- If you lie down, your bodylength is *longer/ shorter* than when you stand up.
- If your mass is bigger, the percentage difference in bodylength is *bigger / smaller*.

#### MATERIAL

- People balance
- Tape-measure
- 2 wooden planks in an angle of 90°

#### OPERATION OF THE EXPERIMENT

- Put one tape measure on the wall and the other on the long table.
- Measure all the pupils of your group, both standing up and laying down. Compare the results by calculating the percentage difference. Keep in mind the bodylength and the mass of the pupil.

#### THE RESULTS:

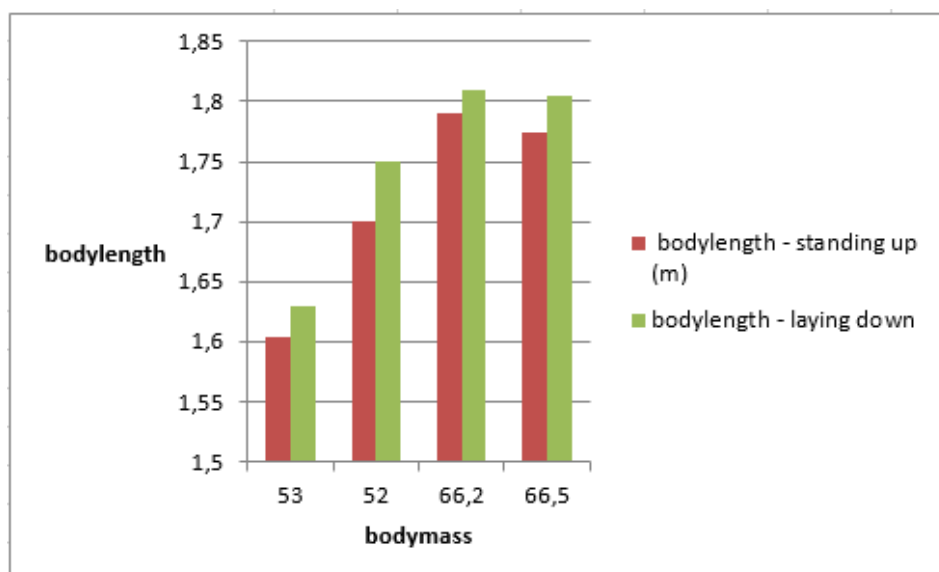
- ❖ doing the experiment
  - Apply both tape measures. Work very accurately.

- Read the mass on the balance of every pupil.
- Measure the bodylength of all the pupils of the group, standing up and laying down.
- Put the mass and length in the table. Make sure you measure to the millimeter!

❖ Complete the table

name	Bodymass (kg)	Bodylength – standing up (m)	Bodylength – laying down (m)	Percentage difference
Elien	53,0	1,605	1,630	1,5 %
Anton	52,0	1,701	1,750	2,8 %
Lars	66,2	1,790	1,810	1,1 %
Pieter-Jan	66,5	1,775	1,805	1,7 %

❖ Make column charts (excel). Keep in mind that you make the graph with the bodymass included. Copy the graphs in this document.



## CONCLUSIONS

- If you lie down, your bodylength is longer than when you stand up.
- If your bodylength is longer, the percentage difference in bodylength is  
You can't make a solution out of the results
- If your mass is bigger, the percentage difference in bodylength is  
You can't make a solution out of the results

- REFLECTION

- How do you explain the conclusions?

When you are standing up, the gravity is pressing you down a little bit, so you are a little bit smaller than when you are lying down, because the gravity doesn't push your length together because the gravity only works vertically.

- Why does NASA makes spacesuits longer than necessary for the bodylength on earth for the astronaut?

Because there is no gravity in space, your length doesn't get pushed down so your length changes.

- Compare your results with the results in the other school. Did you find the same conclusions?

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