VRIJE ASO.SCHOOL

See you in space

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EXPERIMENT:bodylength

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

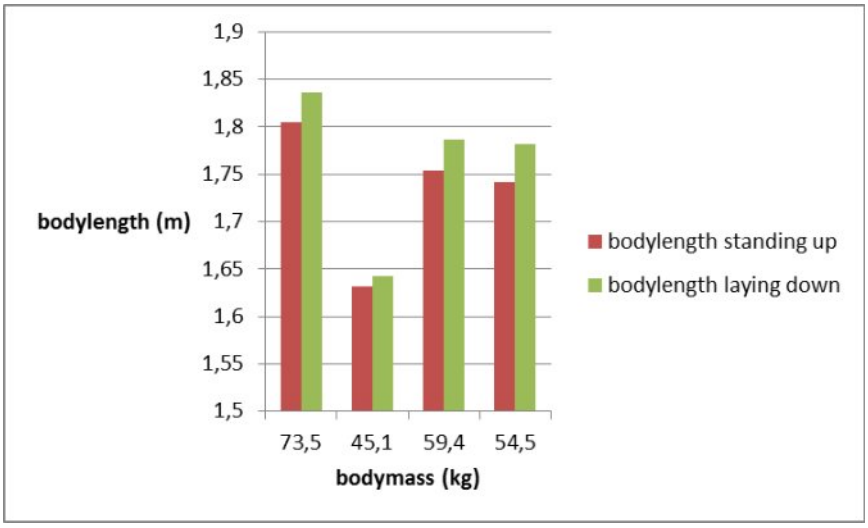
➢ Apply both tape measures. Work very accurately.

- 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
Jakob	73,5	1,805	1,836	1,688%
Julie	45,1	1,632	1,642	0,6090%
Chelsea	59,4	1,754	1,786	1,792%
Aiko	54,5	1,742	1,782	2,245%

❖ 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 longer than when you stand up.
- If your bodylength is longer, the percentage difference in bodylength is higher . There's no conclusive result.
- If your mass is bigger, the percentage difference in bodylength is bigger. There's no conclusive result

REFLECTION

- How do you explain the conclusions?

  When standing up the gravity pulls you down which makes you appear a little bit smaller. When laying down, this effect doesn't happen, which makes you appear taller so when you stands up you are smaller than when you lay down.

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

  Because there is no gravity is that your body is not compressed and your height does not change.

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

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