
VRIJE ASO.SCHOOL		
<h2>See you in space</h2>		
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SCHOOL / CLASS:	MARKS: /...	
EXPERIMENT:changing of weight in elevator		

RESEARCH QUESTION

- Why do astronauts think that they weigh more or less when their spacecraft starts and lands.
- How does the weight of somebody or something change in a moving elevator?
Which elevator moves the quickest, the one in Lyon or the one in Tiel?

HYPOTHESIS (indicate the correct answer)

If the elevator accelerates going up, the weight will increase / ~~decrease~~ / ~~stay the same~~.

If the elevator moves with a constant velocity, the weight will ~~increase~~ / ~~decrease~~ / stay the same.

If the elevator slows down while moving up, the weight will ~~increase~~ / decrease / ~~stay the same~~.

What will happen when the elevator moves down? The weight would drop.

MATERIAL

- People balance
- Elevator
- Camera and chronometer

OPERATION OF THE EXPERIMENT

- Go in the elevator on the ground floor and stand on the balance.
- Let the elevator move up until the third floor and look what happens with the weight. Record the balance while the elevator is moving.
- Repeat this for moving down.

THE RESULTS:

- ❖ doing the experiment
 - Go in the elevator on the ground floor and stand on the balance.
 - Read the mass on the balance and calculate the weight.
 - Let the elevator move up to the third floor. Start the chronometer and the camera.
 - Record the balance and the chronometer at the same time.
 - Do the same while moving down (from third floor to ground floor)

- ❖ Complete both tables (elevator moving up – elevator moving down). Write down the time and corresponding weight (f.i. every 30 seconds, choose a suitable interval yourself)

SITUATION 1: elevator moving up

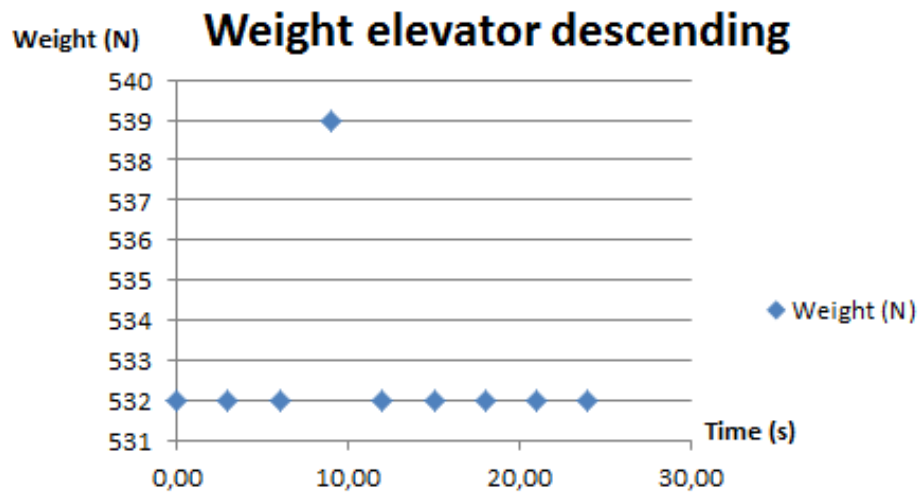
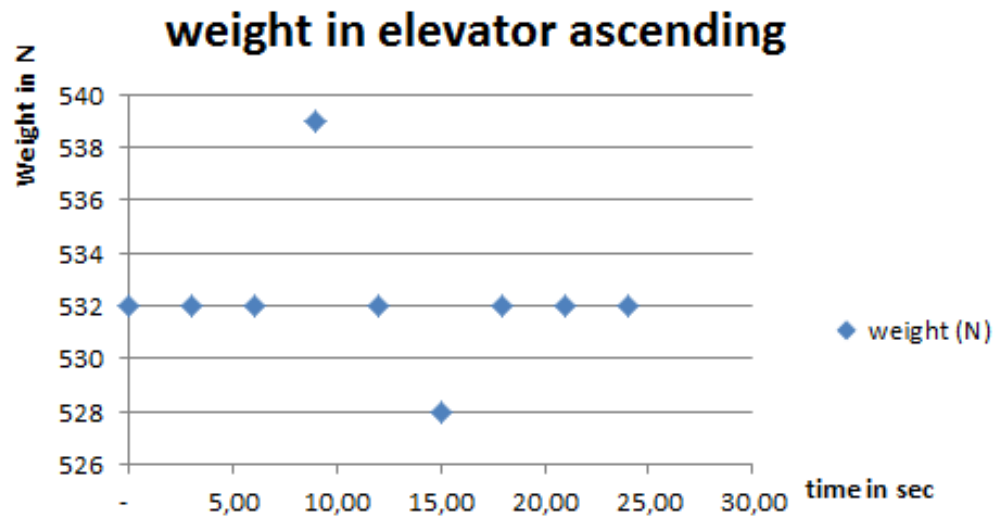
Time (s)	Mass on the balance (kg)	Weight (N)
0,00	54,2	532
3,00	54,2	532
6,00	54,2	532
9,00	54,9	539
12,00	54,2	532
15,00	53,8	528
18,00	54,2	532
21,00	54,2	532
24,00	54,2	532

SITUATION 2: elevator moving down

Time (s)	Mass on the balance (kg)	Weight (N)
0,00	54,2	532
3,00	54,2	532
6,00	54,2	532
9,00	54,9	539
12,00	54,2	532
15,00	54,2	532
18,00	54,2	532

21,00	54,2	532
24,00	54,2	532

- ❖ Make graphs (excel) of the weight (F_g) in function of the time in the moving elevator. Make a graph for each situation. Copy the graphs in this document.



CONCLUSIONS

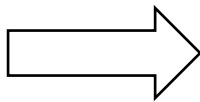
- If a lift accelerates up, the weight will increase.
- If a lift moves up on the same speed, the weight will stay the same.
- If a lift slows down while moving up, the weight will decrease.
- What happens when the elevator moves down?

When the elevator moves down the weight should decrease in the beginning and should increase at the end.

REFLECTION

- How do you explain the conclusions?

When the lift accelerates your body gets pushed with a larger force against the surface.



The weight will increase.

- How do you notice this without standing on a balance?

When the lift accelerates you feel the pressure of the gravity.

- Compare your results with the results in the other school. Which school has the fastest elevator?