

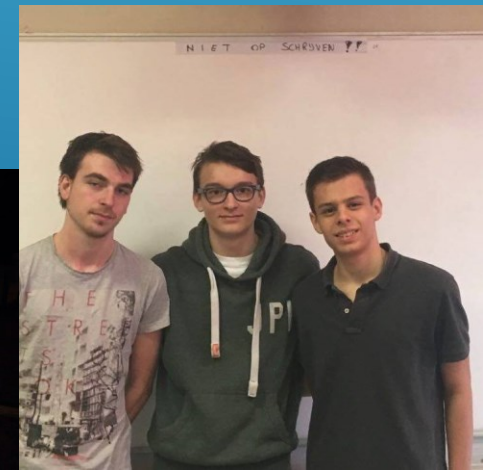
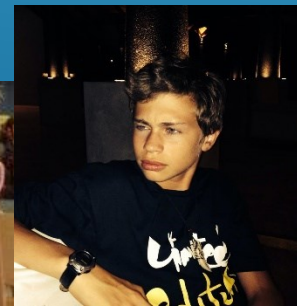
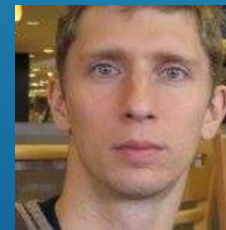
# ASGARD PROJECT: BALLOON DYNAMICS



ATHENEUM  
Etterbeek

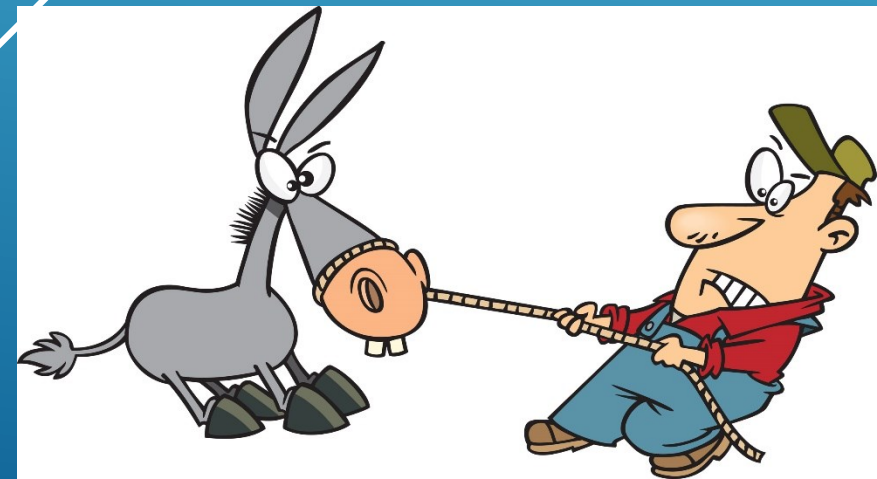
# WHO ARE WE?

- KAE students
- Fifth grade
- Mathematic engineering
- Amaury van Trappen, Malcolm Ludinant, Nathan de Bruyne, Jeremie Carlier and our teacher David Maquenne



# WHAT IS OUR GOAL?

Find the forces on the balloon



# WHAT ARE THE FORCES ON THE BALLOON?

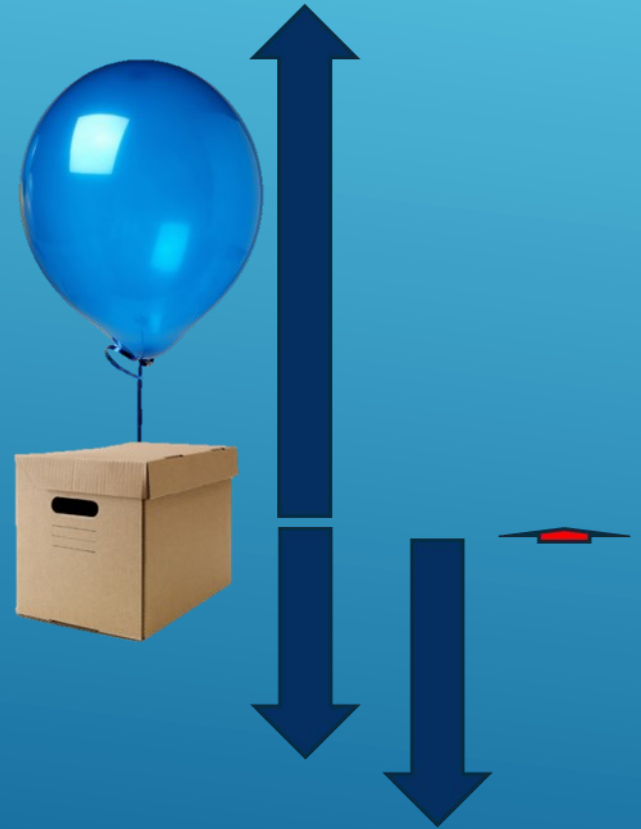
- Archimedes force
- Gravitation force
- Friction force



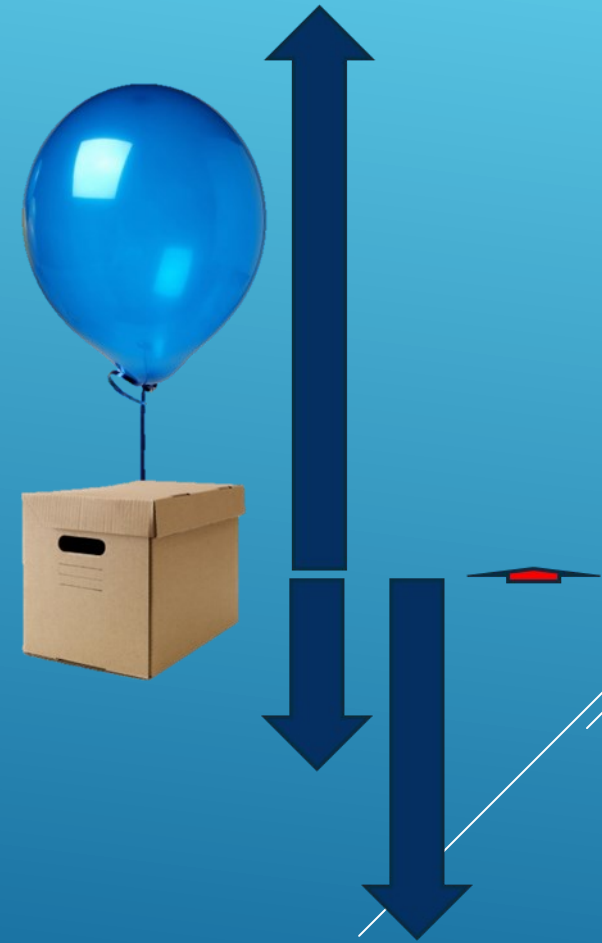
Begin



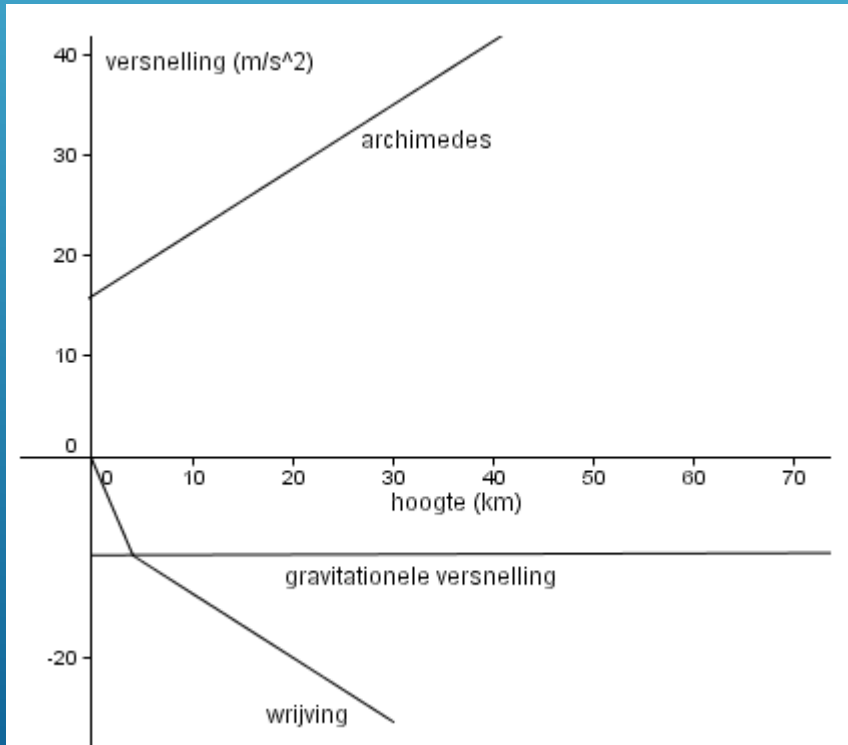
Middel of the fligth



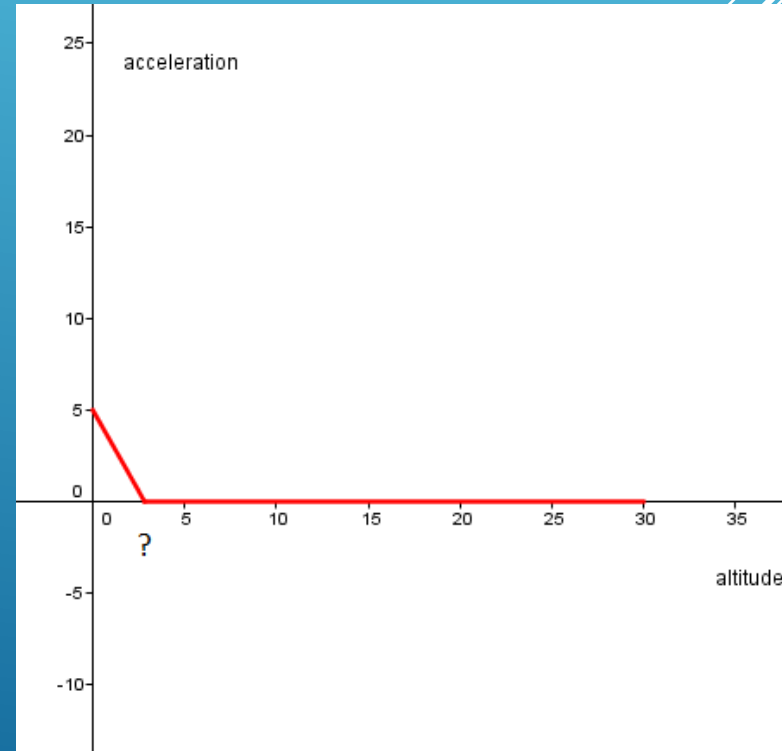
End of the fligth



# HOW IS THE ACCELERATION DURING THE FLIGHT?



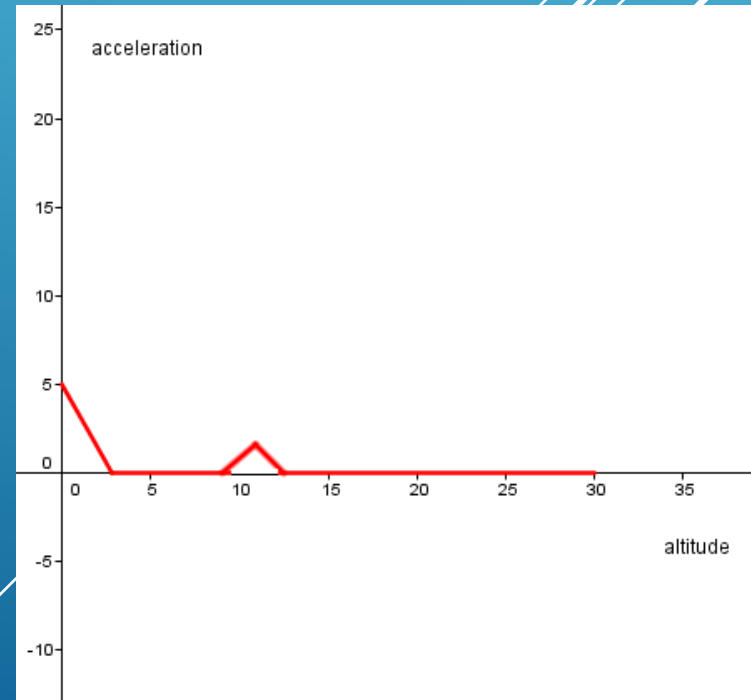
Separate Forces

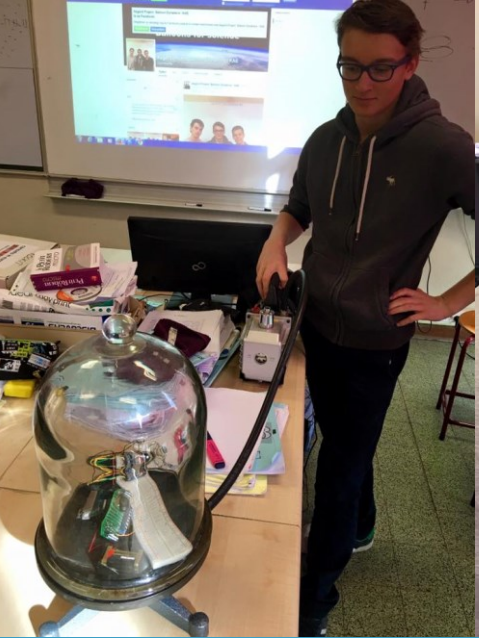


Expected total force

# WHAT CAN EXPLAIN DIFFERENCES BETWEEN OUR CALCULATION AND THE REALITY?

- The vertical wind
- Other ?





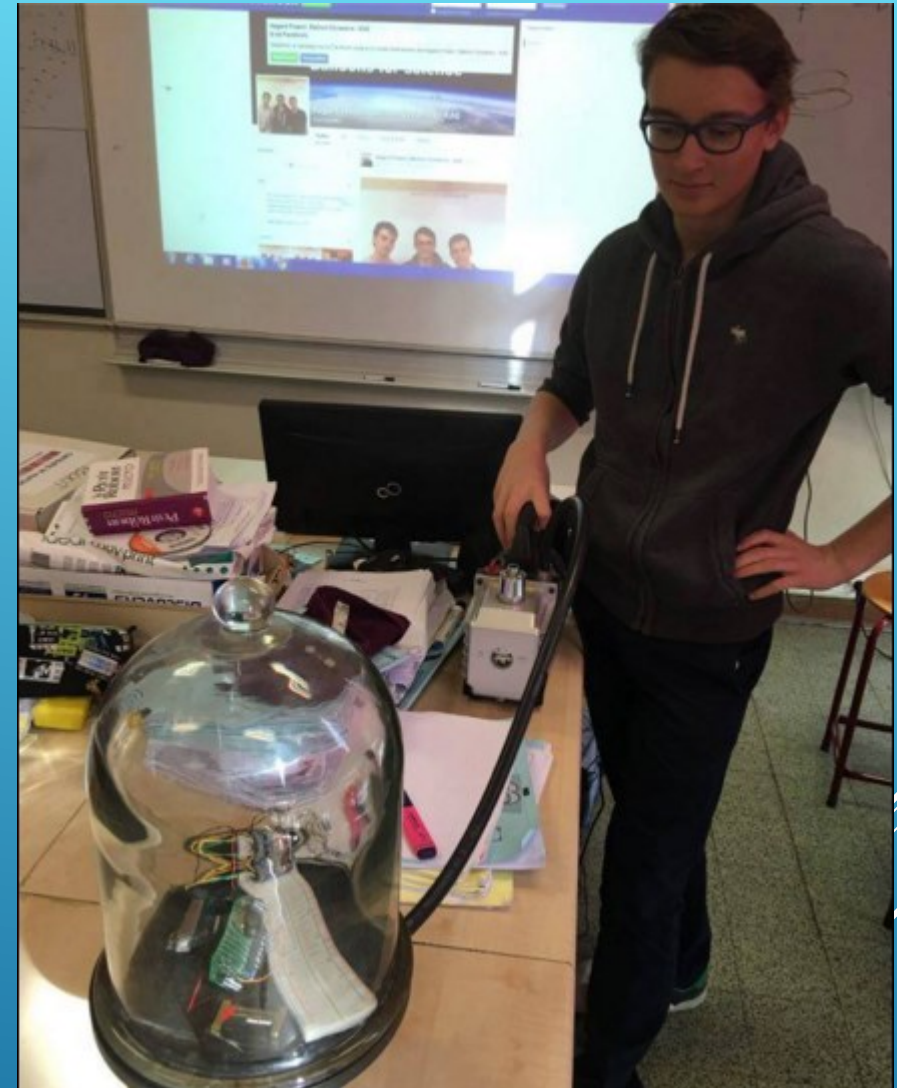
# WHAT HAVE WE DONE?

- Facebook page
- We have worked with arduino
- We tested the accelerometer,thermistor, SD card and the altimeter





```
Initializing SD...
initialization done.
Initializing sensors
... initialization done
X: 0.98 Y: 8.12 Z: 5.61 m/s^2 Alt: -31.34 m; Temp: 23.60 C
X: 1.02 Y: 8.20 Z: 5.61 m/s^2 Alt: -31.18 m; Temp: 23.60 C
X: 1.10 Y: 8.20 Z: 5.77 m/s^2 Alt: -31.51 m; Temp: 23.70 C
X: 1.06 Y: 8.16 Z: 5.65 m/s^2 Alt: -31.26 m; Temp: 23.60 C
X: 1.10 Y: 8.16 Z: 5.65 m/s^2 Alt: -31.51 m; Temp: 23.60 C
X: 1.14 Y: 8.16 Z: 5.53 m/s^2 Alt: -32.00 m; Temp: 23.70 C
X: 1.06 Y: 8.20 Z: 5.65 m/s^2 Alt: -31.34 m; Temp: 23.60 C
X: 1.41 Y: 8.71 Z: 5.92 m/s^2 Alt: -32.17 m; Temp: 23.60 C
X: -0.67 Y: 9.10 Z: -6.79 m/s^2 Alt: -31.68 m; Temp: 23.60 C
X: 0.39 Y: 7.77 Z: 2.63 m/s^2 Alt: -31.75 m; Temp: 23.60 C
X: 1.02 Y: 8.24 Z: 5.69 m/s^2 Alt: -31.34 m; Temp: 23.60 C
X: 0.98 Y: 7.34 Z: 6.00 m/s^2 Alt: -31.51 m; Temp: 23.60 C
X: 0.94 Y: 8.12 Z: 5.81 m/s^2 Alt: -31.68 m; Temp: 23.50 C
X: 1.02 Y: 8.12 Z: 5.69 m/s^2 Alt: -31.34 m; Temp: 23.50 C
X: 1.02 Y: 8.12 Z: 5.65 m/s^2 Alt: -31.18 m; Temp: 23.50 C
X: 1.06 Y: 8.20 Z: 5.53 m/s^2 Alt: -31.43 m; Temp: 23.50 C
X: 1.06 Y: 8.16 Z: 5.69 m/s^2 Alt: -31.75 m; Temp: 23.50 C
X: 1.02 Y: 8.20 Z: 5.61 m/s^2 Alt: -31.84 m; Temp: 23.50 C
X: 1.02 Y: 8.20 Z: 5.57 m/s^2 Alt: -32.09 m; Temp: 23.50 C
```



# MEASUREMENTS AND TESTS



PROBLEMS ENCOUNTERED

THANK YOU FOR YOUR  
ATTENTION!

