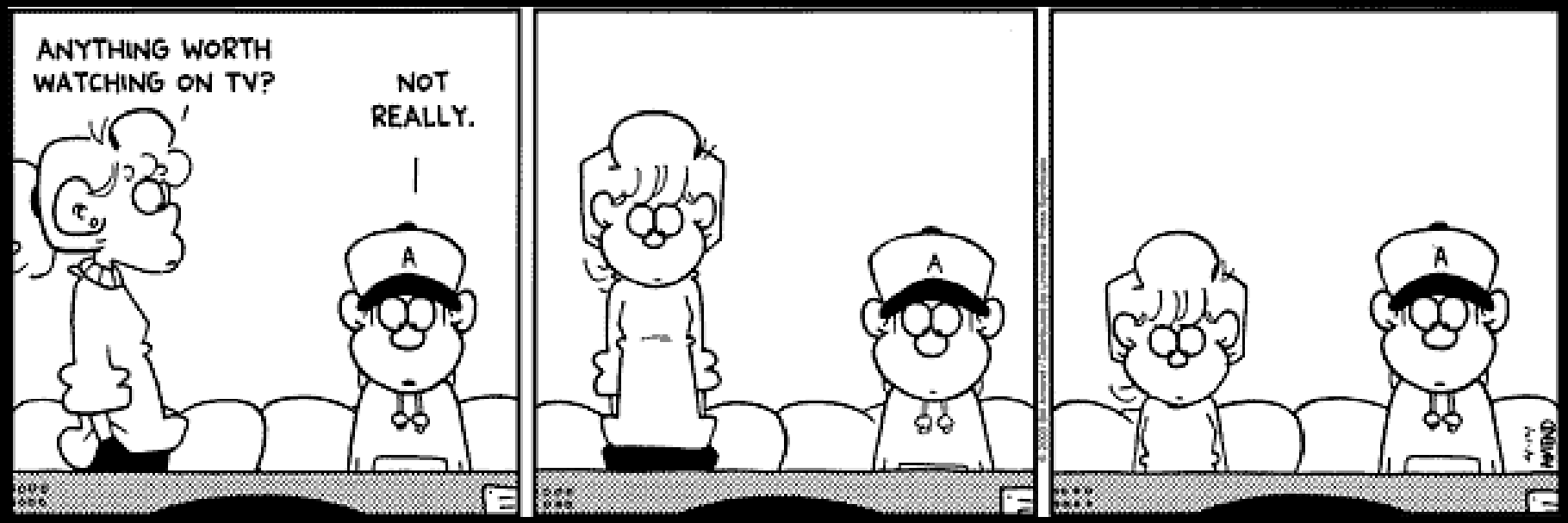
Newton's Second Law and Weight

Opener

- How many Forces are on this Plane?

Give me an example of Inertia



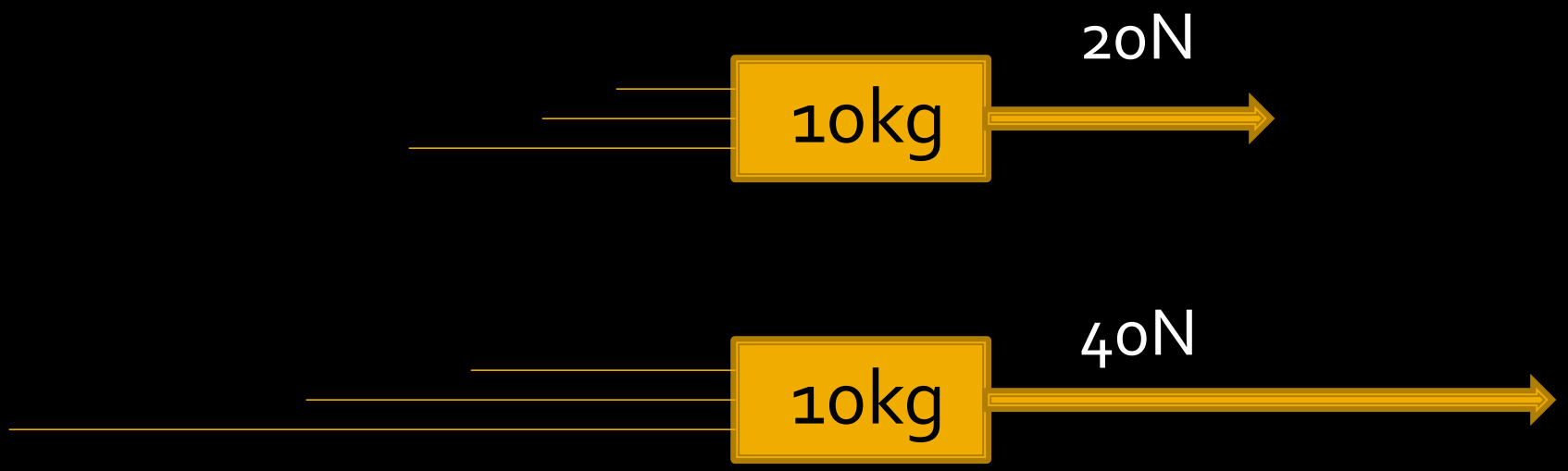
Newton's 2nd Law

The acceleration of an object is proportional to the force acting on it and inversely proportional to its mass

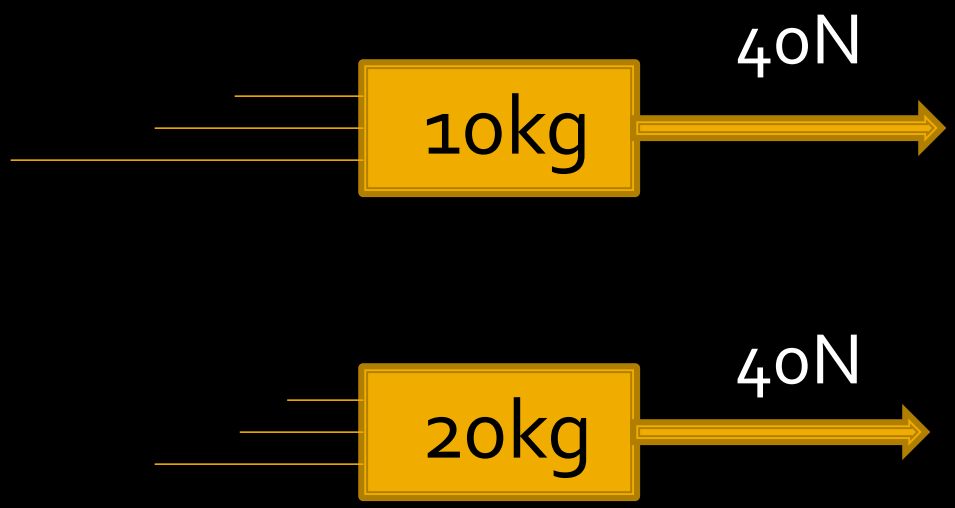
or

More force causes more acceleration; more mass causes less acceleration

Which one if going to move faster?



Which one if going to move faster?



Force and GERC

- The formula for Force is:

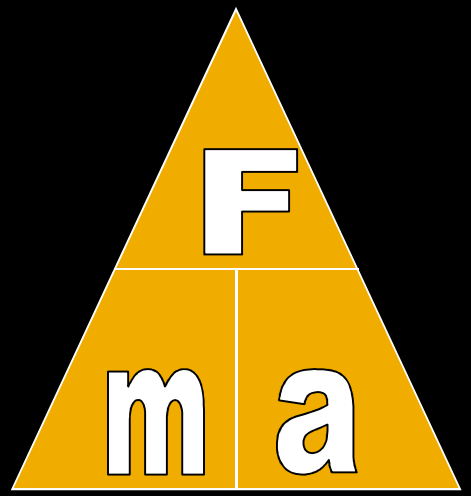
$$F=m*a$$

The units for Force are Newtons

F – Force (N)

m – mass (kg)

a – acceleration (m/s^2)



How big a force does it take to give a 50 kg object an acceleration of 40 m/s^2

Word/Term: Gravity	Drawing:
Describe in own words:	
Textbook Definition:	Rate my Understanding: 1 2 3 4
How I remember it:	Reflections:

Gravity and Gerc

$$F_{grav} = G\frac{m_1 \cdot m_2}{r^2}$$

The size of the gravitational force is dependant upon the mass of two objects and the distance between them

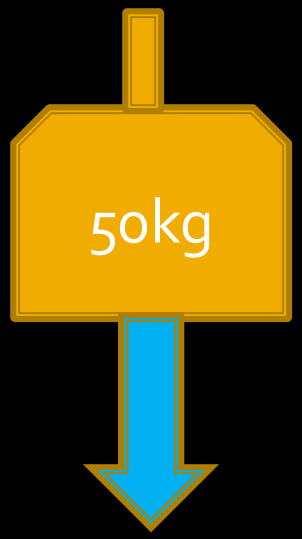
Word/Term: Weight	Drawing:
Describe in own words:	
Textbook Definition:	Rate my Understanding: 1 2 3 4
How I remember it:	Reflections:

Mass vs. Weight

- What really does the unit grams measuring?
- Mass is the amount of matter in an object (all of its atoms and molecules)
- Weight is the force of gravity pulling on mass

Where do we weigh more, on Earth or in Space?

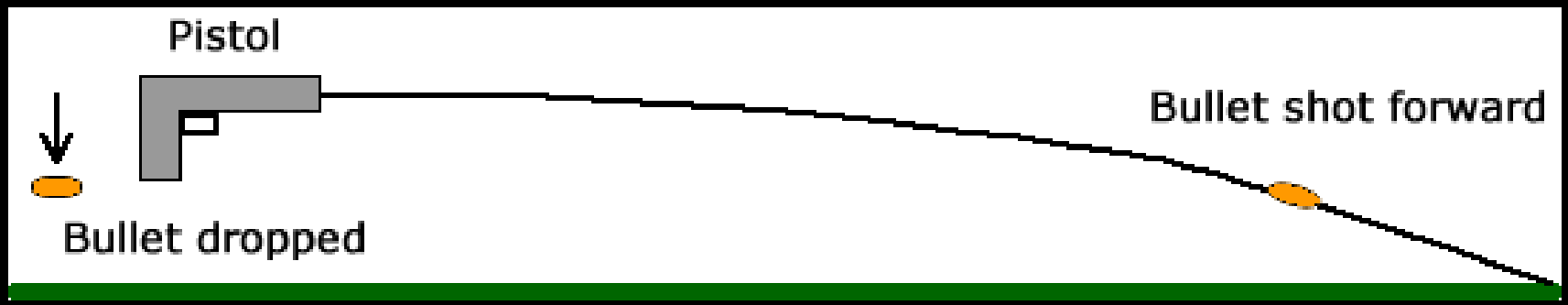
On Earth



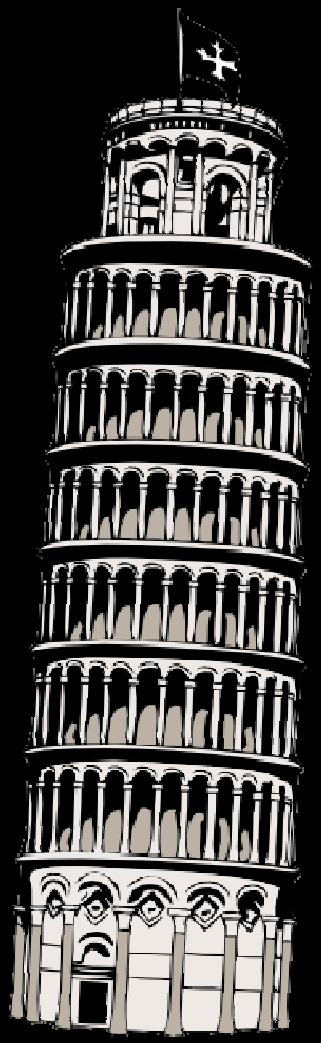
Where do we weigh more, on Earth or in Space?

In Space

Which would hit the ground first?

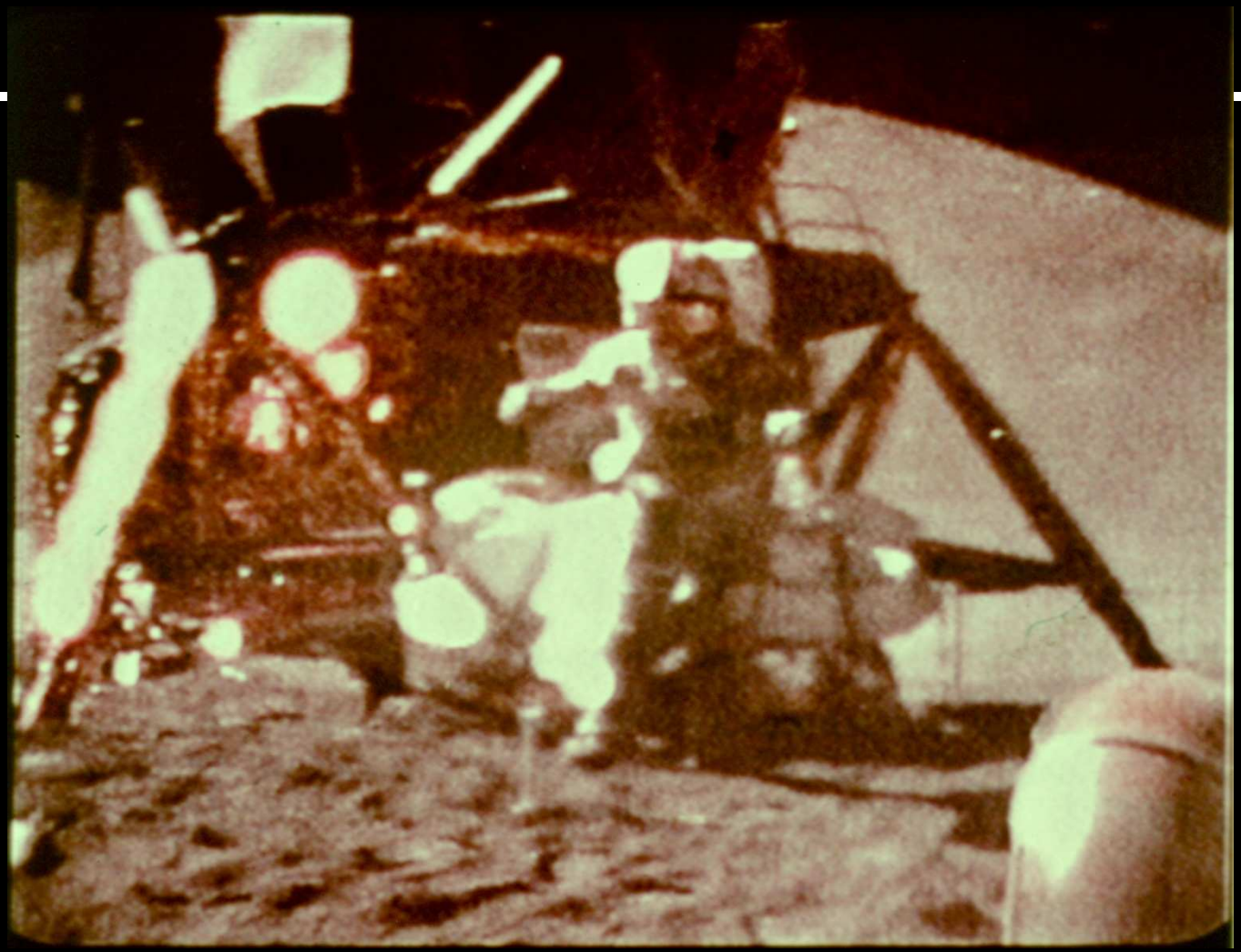


Acceleration due to Gravity



C_1= 980 N of Force
and 10 kg of mass
C_2=98N of Force
and 10 kg of mass

All objects fall towards the earth at the same rate of acceleration



Weight and GERC

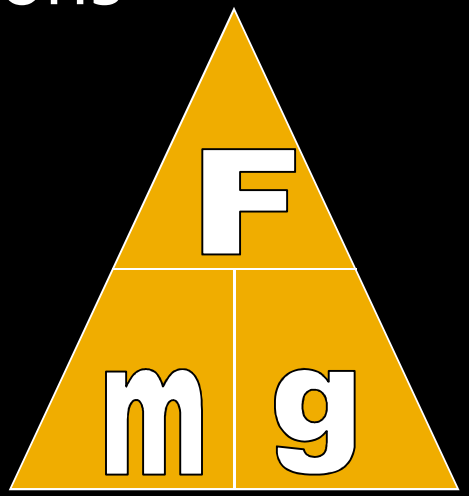
- If you already know the mass of an object, it is easy to calculate weight: just multiply mass times 10 m/s^2

The units for Weight are Newtons

F – Force (N)

m – mass (kg)

g- acceleration due to gravity ($10 m/s^2$)



Find the weight of a 2 kg mass.

Find the mass of a 2 N object

Homework

- We will grade this worksheet next class

- Next Class
  - Quiz 4
  - Apollo 13