Physics
Weight and circular motion

Weight and mass are not the same

Mass

- Mass means how much stuff is inside an object
- Mass stays same everywhere in the universe
- Mass is a scalar quantity because it has only size and no direction
- Mass is measured in kilograms
- You measure mass with mass balance this is basically the old style scale with two pans

Gravity

- Gravity pulls all mass towards each other
- you only notice gravity when the mass is very big like a planet

Weight

- Weight is the force of gravity pulling on an object
- Near Earth weight is caused by Earth's gravitational field
- Weight is a force and it is measured in Newton

Centre of mass

- The weight force acts from one point called the centre of mass
- Weight is measured using spring balance or Newton metre

Weight depends on the mass and gravitational field strength

Formula

w= mg

What is gravitational field strength

- g changes depending on where you are
- g is stronger if you are close to a planet or if the planet is bigger
- This means weight changes but mass stay same

A chicken has a mass of 2 kg on Earth g= 10
W = 20N

Circular motion- Velocity is always changing

- Velocity will be equal to speed and direction
- When objects move in a circle
- It's speed stays the same
- But it's direction keeps changing
- so it's velocity keeps changing

- Which means it is accelerating

What is centripetal force

- If something accelerates a resultant force must act on it
- This force always points towards the centre of circle
- This force is called centripetal force

Gravity can cause circular motion

- Moons Orbit planets
- satellite Orbit Earth
- they stay in circular paths because of gravity

investigating motion experiment

Aim of this experiment is to measure the acceleration of trolley using light Gates and understand how mass and force affect acceleration

For this

- Ramp
- Trolley
- string plus hanging mass
- two light Gates
- Data logger

Process

- Adjust Ram so trolley just starts to move
- mark a start line before the first light Gate
- attached trolley to hanging mass with the string
- Release the trolley from the start line
- light Gates record
- in Initial speed
- final speed Final speed
- time between the Gates
- so to calculate acceleration change in speed divided by time

Changing mass

- And mass to the trolley
- keep hanging mass constant
- more mass will be equal to less acceleration

Changing force

- Move message from trolley to the hanging hook
- keep Total system as the same
- bigger force bigger acceleration

Conclusion

- Force and acceleration are directly proportional it means If force is increases so acceleration will also increase
- Mass and acceleration are inversely proportional it means if mass is increased so acceleration will decrease