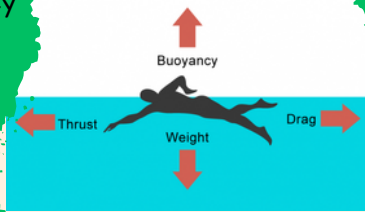


# SCREAM MACHINE



**Water and Air Resistance**  
 Water and air resistance are types of friction. Water and air push against objects moving through them and slow the objects down. Many roller coaster carriages are streamlined, meaning they are designed to reduce air resistance.



**Centripetal Force**  
 Centripetal force keeps an object moving in a circle at a constant speed. On a swing ride, the chains of the swings exert a centripetal force on the swing seat and the rider, keeping them travelling at a constant speed in a circle.

## Friction



## Friction

Friction is a force between two surfaces that rub together. Friction slows down a moving object and produces heat. The amount of friction depends on the types of materials that rub together. Using a smooth mat on a helter-skelter slide creates less friction than using a rough mat, so the rider would travel faster.

## Forces

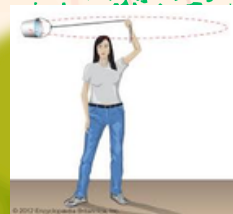
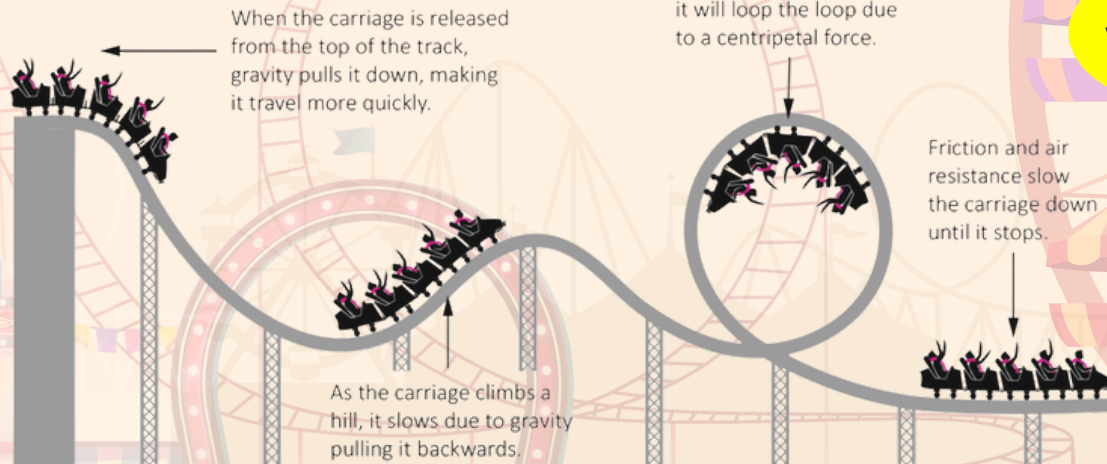
A force is a push or pull. To make an object move, such as a roller coaster carriage, a force must be applied to the object. Nothing will move without a force pushing or pulling. Roller coaster carriages don't have engines so they rely on forces to keep them moving.

## GRAVITY



Gravity is a force that pulls objects towards each other. On Earth, gravity pulls all objects towards its centre. On a roller coaster ride, gravity pulls the carriage faster on a downhill slope and slows the carriage down as it climbs uphill parts of the ride.

Isaac Newton is an important historical figure who has had a significant impact on the world. His discovery of gravity, as well as his work on white light and the laws of motion, changed science forever.



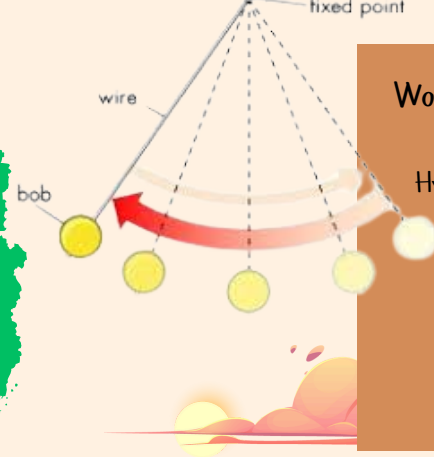
# SCREAM MACHINE

Gears are wheels with teeth that slot together. Gears are found in wind-up toys, clocks and bicycles.



What machines do roller-coasters use?

A pendulum is a weight hung on a long cord, wire, or lever so that it swings back and forth. Pendulums are used to control the movements of some clocks.



## Working Scientifically

- Observation skills
- Hypothesis development
- Measurement
- Variables
- Fair testing
- Data collection
- Analysis of results
- Evaluation

A lever is a long, rigid arm balanced on a fulcrum. Levers are found in seesaws, wheelbarrows and crowbars.



What materials are suitable for building a theme park ride? To allow for the forces of gravity, water and air resistance, typically, materials should be waterproof, buoyant, rigid and smooth. Which materials would be most suitable for a log flume?

Disneyland Florida is a famous theme park located in the southern part of the USA. A UK equivalent, Chessington, can be found in Surrey, a county in the South East of England.

A pulley is a rope looped around one or more wheels. Pulleys are found in lifts, roller coaster rides and attached to the sails of boats.



**DISNEYLAND, FLORIDA**

**CHESSINGTON**

## Key Vocabulary...

air resistance	A force that acts on an object when it moves through the air causing it to slow
force	A push or pull that can change one type of motion into another type.
friction	A force between two surfaces that are sliding across each other.
gear	A mechanism that is used to change the speed, force or direction of a motion.
gravity	A force that pulls things towards each other.
lever	A simple mechanism that is used to direct force or motion.
machine	A piece of equipment with moving parts which help people perform tasks.
pendulum	A weight on a thread or stick <u>that swings</u> from side to side.
pulley	A mechanism that is used to lift a load with less effort.
streamlined	Designed to move easily through air or water.

