Unit 1 – Life Cycle and growth of "Flowering Plants."

Parts of a flowering plant:

Shoot system: Fruit, leaf, flower, bud, and stem.

Root system: Primary roots, and secondary roots.

Parts of a flower:

Stamen (male parts): Filament, and anther.

Carpels (female parts): Style, and ovary.

Other parts: Petal, sepal, and receptacle.

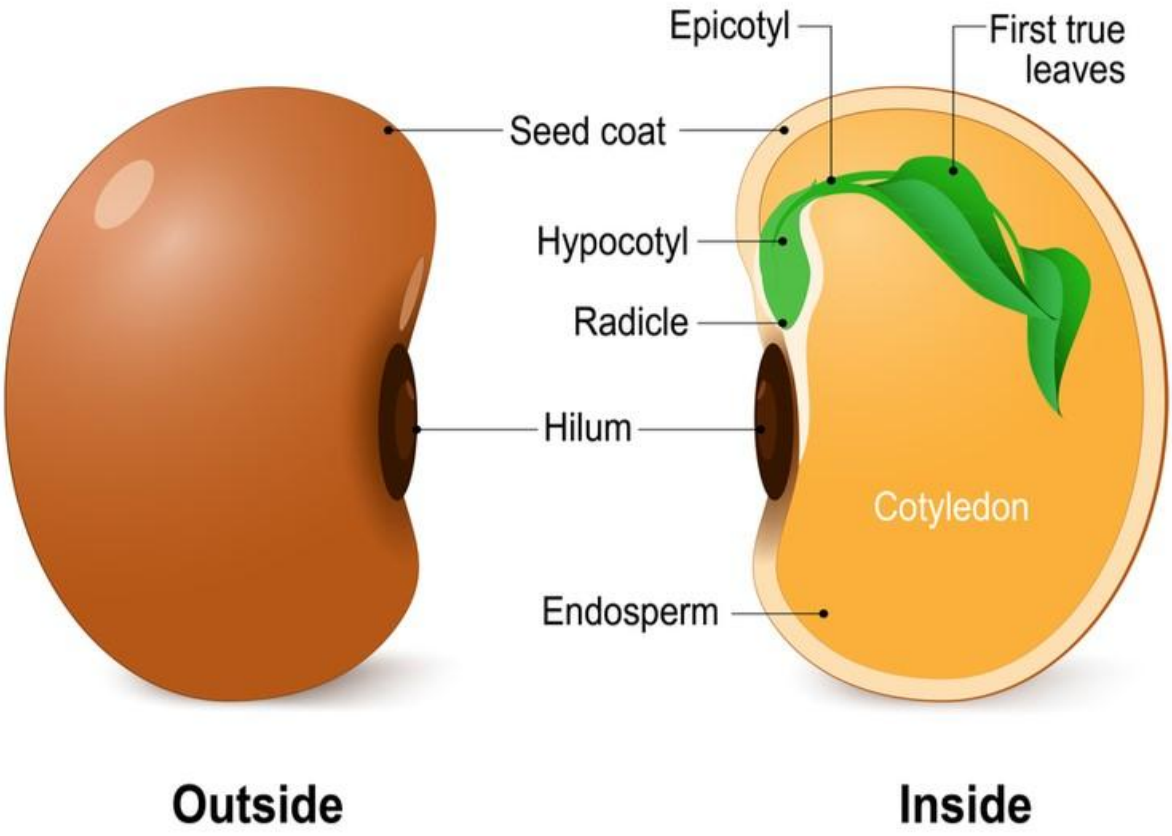
Life cycle of a flowering plants:

1. Seed – The first stage in the life cycle, it need to have the right conditions, such as water and warmth (No sunlight), to start to grow. Once the seed starts to grow we say it has "Germinated."
2. Seedlings – The second stage in the life cycle, we can start to see the first shoots and roots at this stage.
3. Young plants – The third stage in the life cycle, at this stage we should be able to identify what kind of plant it is.
4. Adult plants – The fourth stage in the life cycle, at this point the plant is fully grown.

Observing seeds:

Seeds have a strong seed coat to protect them. Each seed contains an embryo. The embryo will grow into new plant by producing shoots and roots.

Seeds also have a food store called a cotyledon. Some seeds have one cotyledon and others have two.



📚 Grade 5 Oxford International Science Mock Test:

Section A: Flowering Plants:

22 Name the male reproductive part of a flower.

1. Stigma
2. Stamen
3. Pistil
4. Ovary

23 Name the female reproductive part.

1. Anther
2. Filament
3. Pistil (Carpel)
4. Petal

25 List stages of plant life cycle.

1. Seed → Germination → Seedling → Adult Plant → Flowering → Seed
2. Egg → Larva → Pupa → Adult
3. Birth → Growth → Reproduction → Death
4. Pollination → Fertilisation → Seed → Flower

34 Name 3 characteristics of living things.

1. Movement, Respiration, Growth
2. Color, Shape, Size
3. Light, Water, Air
4. Fast, Slow, Still

40 Why are plants producers?

1. They make their own food through photosynthesis
2. They eat other organisms
3. They produce oxygen only
4. They create soil

Vocabulary (Key words):

Germination

Cotyledon

Stigma

Dispersal

Life cycle

Pollen

Unit 5 – Force in action!

The scientist Galileo..

Galileo Galilei (1564–1642) was an Italian scientist called the "father of modern science."

He loved doing experiments and looking through telescopes.

Important things Galileo did:

- Showed that heavy and light objects fall at the same speed (not what people thought before).
- Improved the telescope and used it to see:
    - Mountains on the Moon
    - Four moons around Jupiter
    - Phases of Venus
    - Spots on the Sun

His discoveries helped prove that planets (including Earth) go around the Sun.

Some people didn't like his ideas, so he was told to stay home for many years.

Galileo asked brave questions and used experiments — that's why we still remember him today! 🌙🔭

Newton and the force of gravity…

Isaac Newton (1643–1727) was an English scientist and mathematician. Many people say he was one of the smartest people ever!

He was born on **January 4, 1643** (some say Christmas Day in the old calendar), in a small village in England. His dad died before he was born.

Famous things Isaac Newton did:

- He came up with the idea of **gravity** — the force that pulls things down (like why an apple falls from a tree!). People joke about an apple hitting his head, but he really just watched one fall and thought about it.
- He created the **three laws of motion** that explain how things move (like why a ball keeps rolling until something stops it).
- He invented a new kind of math called **calculus** (super useful for science!).
- He built a better **reflecting telescope** and studied light and colors.

His big book in 1687 explained how the whole universe works with gravity and motion — it changed science forever!

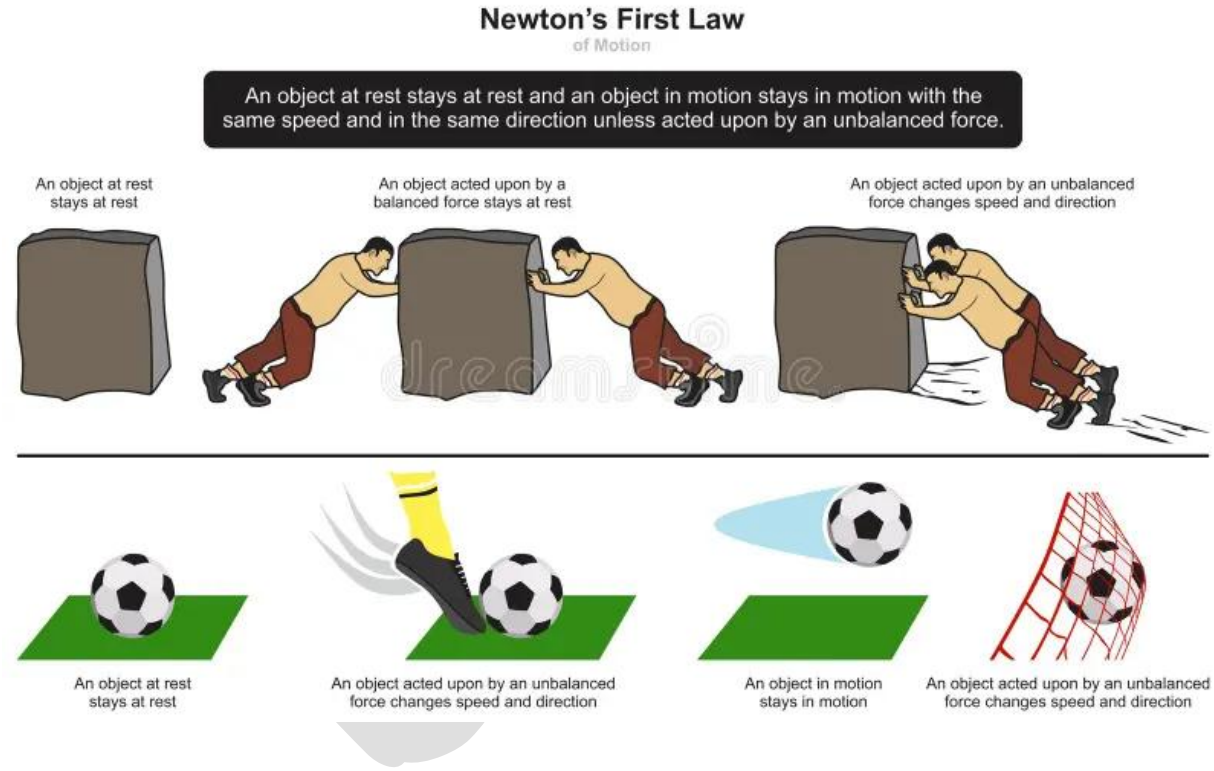
Newton helped us understand why planets orbit the Sun and why things fall. He lived a long life and died in 1727.

He's a huge hero in science, just like Galileo! 🍎🔬

The laws of motion:

Newton's Laws of Motion are three simple rules by Isaac Newton that explain how things move. They help us understand everyday things like balls, cars, and rockets!

1st Law (Law of Inertia): An object stays still if it's not moving, or keeps going at the same speed in a straight line, unless a force pushes or pulls it. (Example: A hockey puck slides forever on ice until friction stops it!)



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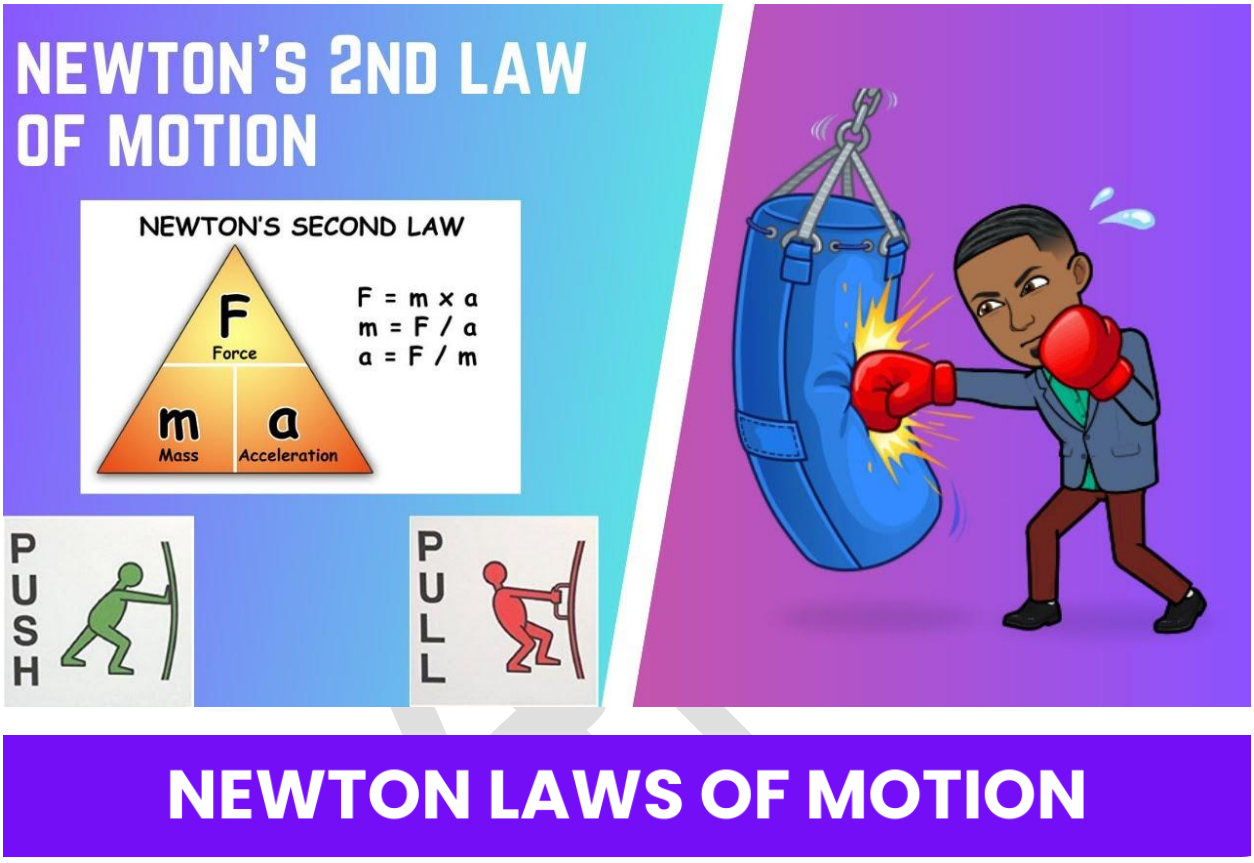
2nd Law: Force = mass × acceleration (F = m × a). A bigger force makes things speed up more. Heavy things need more force to move fast.

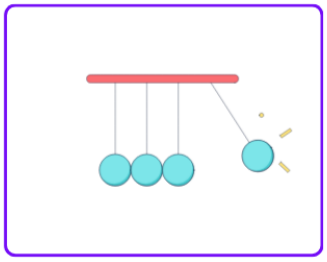
(Example: It's easier to push a light skateboard than a heavy wagon!)



NEWTON LAWS OF MOTION

Newton's Laws of Motion comprise three fundamental principles that describe the relationship between the motion of an object and the forces acting on it. These laws help explain how objects move in our everyday world and in the universe.

Newton's First Law of Motion



Newton's Second Law of Motion

Newton's Third Law of Motion

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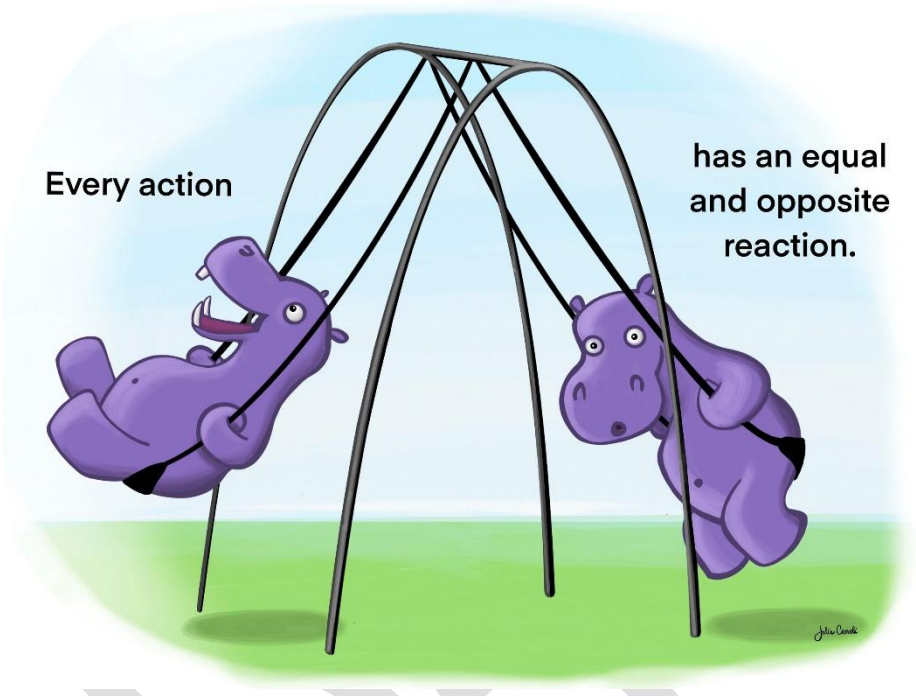
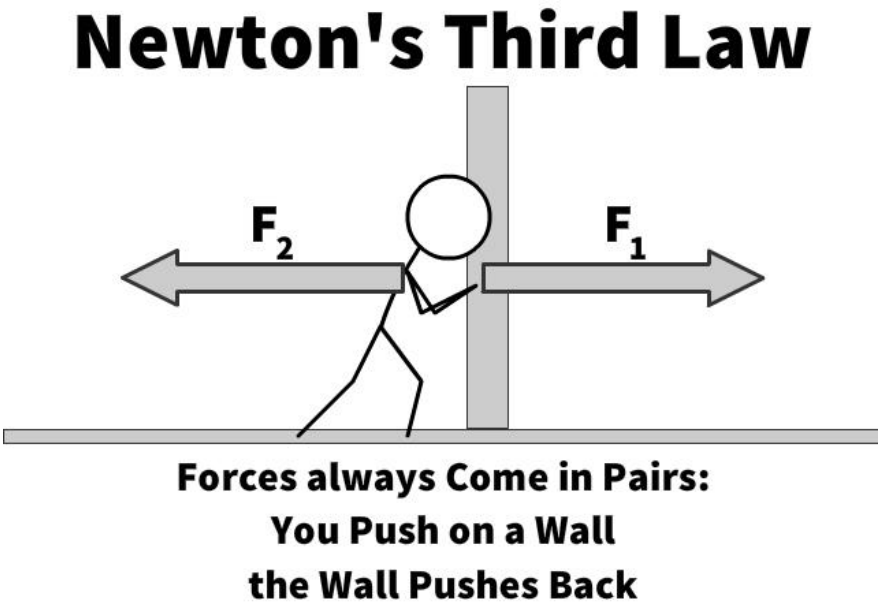
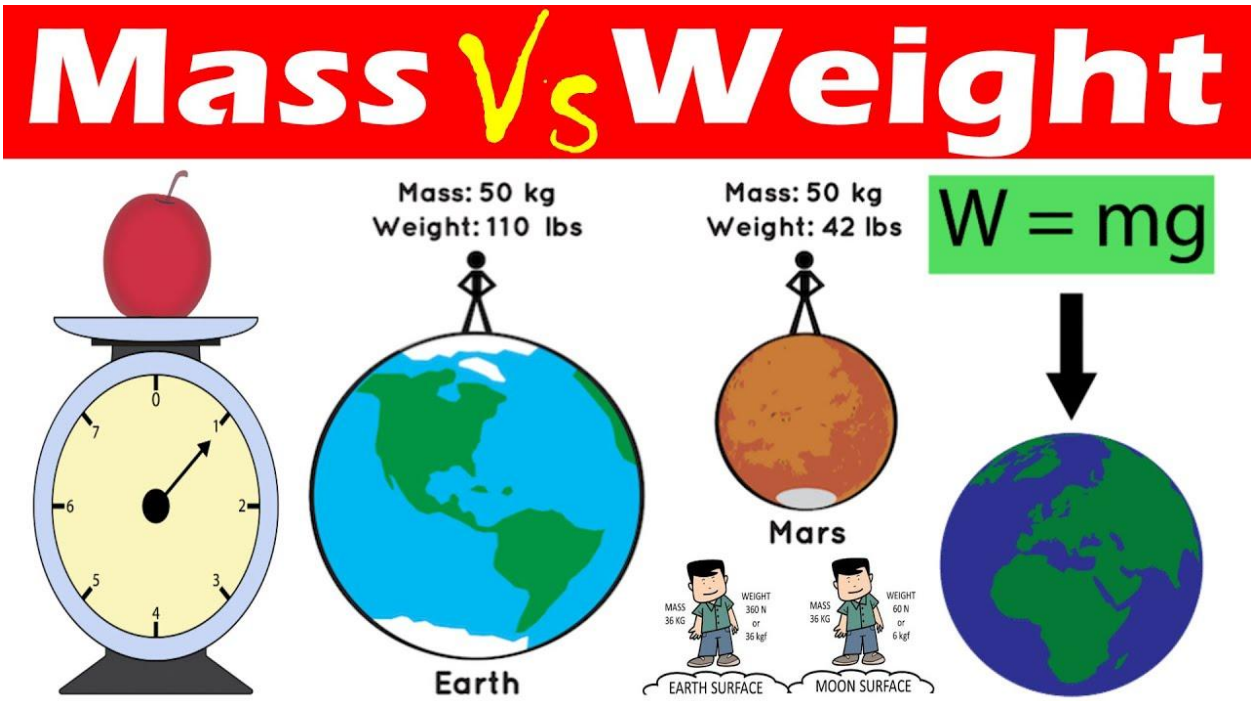
3rd Law (Action-Reaction): For every action, there is an equal and opposite reaction. When you push something, it pushes back just as hard.

(Example: When you jump, you push down on the ground, and the ground pushes you up!)





"Mass" and "Weight"



Mass and Weight are not the same thing — even though people sometimes mix them up!

Mass is how much **stuff** (matter) something is made of. It stays the **same** everywhere — on Earth, on the Moon, or in space! We measure mass in **kilograms (kg)** or grams. (Example: You have the same mass whether you're on Earth or jumping on the Moon.)

Weight is how hard **gravity** pulls on your mass. It changes depending on where you are — stronger gravity means more weight! We measure weight in **newtons (N)** (but bathroom scales often show "kg" which is really mass). (Example: On the Moon, gravity is weaker, so you weigh about 1/6 as much as on Earth — you feel super light and can jump really high!)

Quick fun fact: An astronaut with 60 kg mass weighs about 588 N on Earth but only about 98 N on the Moon. Same amount of "you," but much less pull from gravity!

Mass is always constant — weight depends on gravity! 🌍 🌕 ⚖️

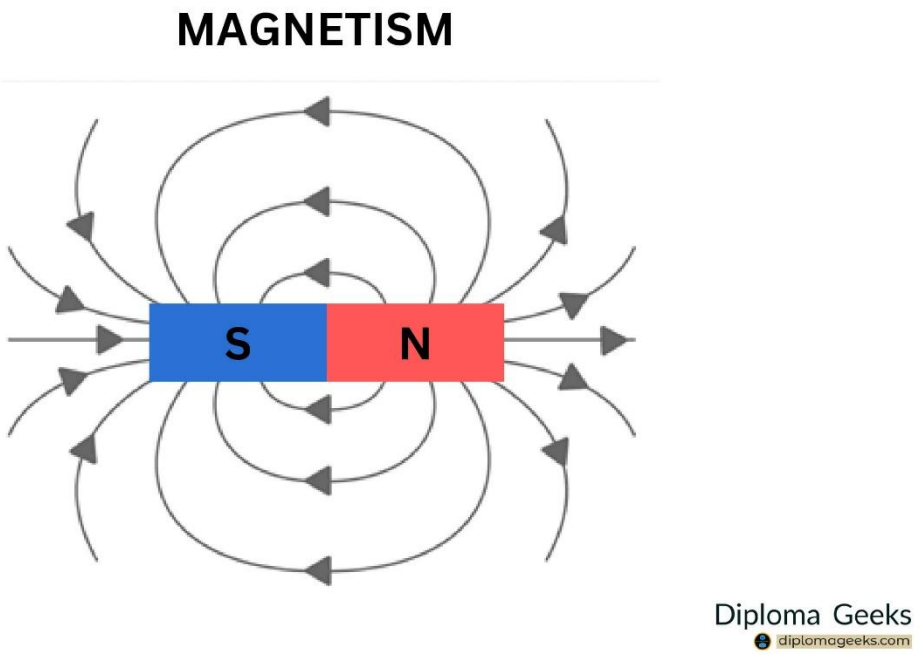
Investigating Magnetism and Floating

Magnetism is an invisible force that magnets use to attract (pull) or repel (push) things. Magnets have two ends called **poles**: **North (N)** and **South (S)**.

Key magnetism facts:

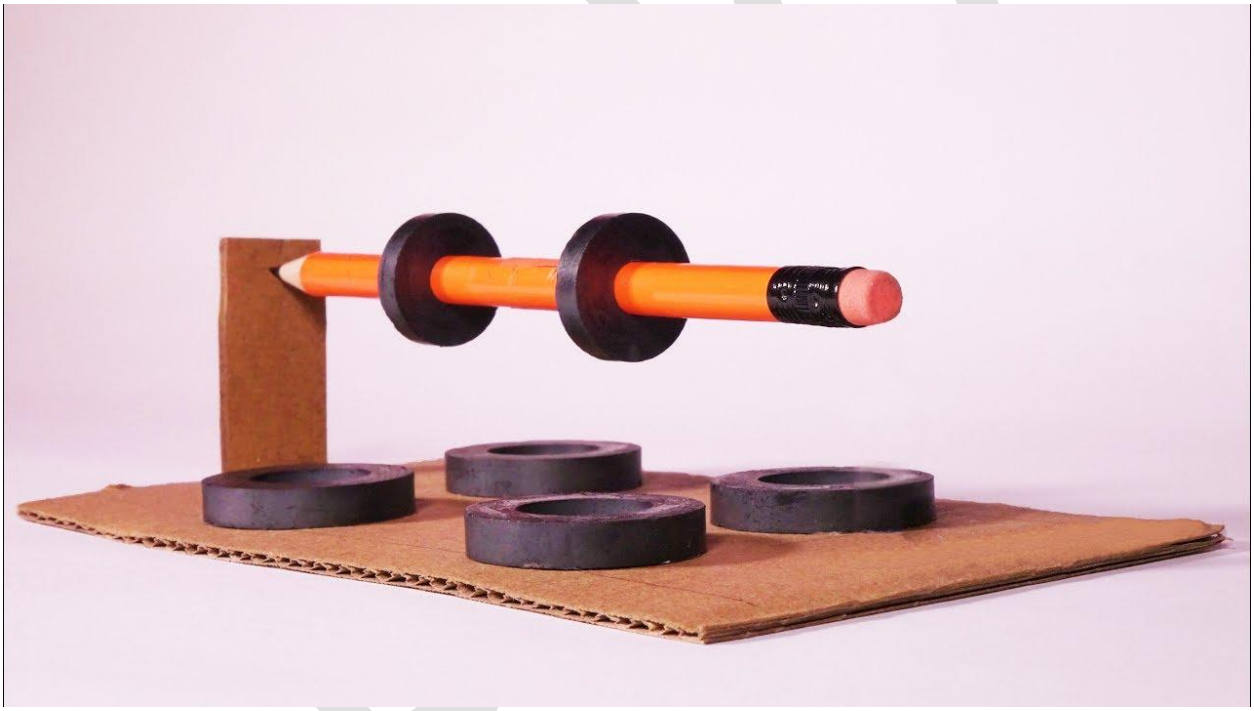
- Like poles repel (N pushes away N, S pushes away S).
- Opposite poles attract (N pulls S).
- Magnets can make things like iron nails or paperclips stick without touching them!
- You can see magnetic force lines using iron filings — they make cool patterns around the magnet.

MAGNETISM



Floating with magnets (called **magnetic levitation** or "maglev") happens when magnets push things up so they float in the air!

- Strong repelling magnets can make a pencil, toy, or even small objects hover without falling.
- Fun experiments use ring magnets stacked to repel each other and float a marker or pencil on top.
- (Super strong lab magnets can even make tiny animals like frogs float — but don't try that at home!)



Investigating Friction

Friction is the force that happens when two surfaces rub or slide against each other. It tries to stop or slow down motion. Friction happens everywhere — between your shoes and the floor, between a toy car and the table, or even between your hands when you rub them together (that makes them warm!).

Key things about friction:

More friction makes things slow down faster (example: sliding on rough sandpaper stops quickly).

Less friction lets things slide farther and faster (example: sliding on smooth ice goes a long way).

Friction depends on:

How rough or smooth the surfaces are (rough = more friction)

How hard the surfaces are pushed together (heavier object = more friction)

What the surfaces are made of (rubber on concrete has lots of friction; ice on ice has very little)

Air Resistance (also called **drag** or **air drag**): This is a force from the **air** pushing against a moving object. The faster you go or the bigger/wider the object, the more air resistance you feel! It only happens when things move through air (or water).

- A flat piece of paper falls slowly because lots of air pushes against it.
- A crumpled paper falls faster because less surface for air to push on.
- Skydivers spread out to increase air resistance (slow down), then open a parachute for even more to land softly!

Water resistance (also called drag or water drag): This is a force that slows objects moving **through water**. It's like air resistance but much stronger because water is thicker and heavier than air! Water particles push back hard against anything trying to move through them.

Key facts about water resistance:

- It happens when you swim, push a boat, or drop something in water.
- The faster you go, the more water resistance you feel (just like running fast into wind).
- Bigger or wider shapes face more resistance (a flat board pushes lots of water → slows quickly).
- Streamlined shapes (pointy, smooth, like a fish or torpedo) face less resistance → move faster and easier!

Investigating simple machines…

Simple machines are basic tools that make work easier by changing the direction or amount of force needed.

There are **six main simple machines**:

1. **Lever** — A stiff bar that turns around a fixed point (fulcrum). It helps lift heavy things with less effort. Examples: Seesaw, crowbar, scissors, wheelbarrow.
2. **Pulley** — A wheel with a groove and a rope or chain over it. It changes the direction of force (pull down to lift up!). Examples: Flagpole, well bucket, blinds.
3. **Wheel and Axle** — A wheel attached to a rod (axle) that turns together. It makes moving things easier by rolling. Examples: Bicycle wheels, doorknob, steering wheel, wagon.
4. **Inclined Plane** — A slanted surface (ramp). It lets you move heavy objects up with less force, but over a longer distance. Examples: Ramp, slide, wheelchair ramp, loading truck ramp.
5. **Wedge** — Two inclined planes put together to make a sharp edge. It pushes things apart or holds them in place. Examples: Axe, knife, scissors, doorstop, nail.
6. **Screw** — An inclined plane wrapped around a cylinder. It holds things together or lifts by turning. Examples: Screw in wood, bottle lid, jar lid, drill bit.

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Aerodynamics and Streamlined Shapes:

What is aerodynamics? Aerodynamics is the study of how **air moves around objects** and how that affects movement. It helps explain why some things go fast and smooth through air (or water), while others feel slow and bumpy.

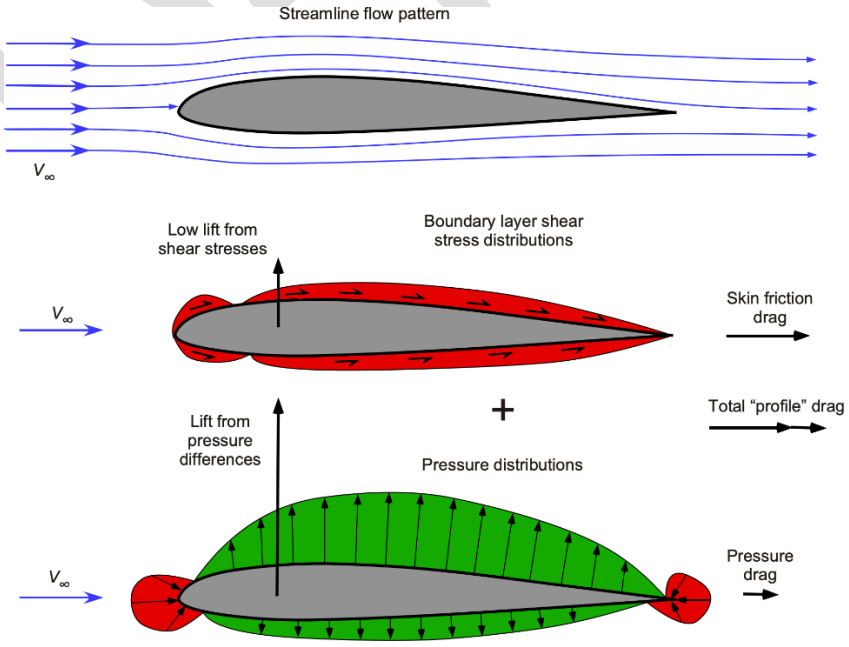
What does "streamlined" mean? A streamlined shape is smooth, pointed at the front, and tapered (narrower) at the back — like a teardrop or bullet. This shape lets air (or water) flow around it easily with **less resistance** (less drag).

Why is streamlining important?

- Less air/water resistance = faster speed with the same effort.
- It reduces drag force, so things move more efficiently.
- Without streamlining: Boxy or flat shapes push lots of air/water → more drag → slower and uses more energy.

Real-life examples:

- **Fast animals** — Dolphins, sharks, birds (when flying), fish — all have streamlined bodies to swim or fly quickly with low drag.
- **Vehicles** — Race cars, airplanes, submarines, bullets, rockets — pointed noses and smooth shapes to cut through air or water.



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📚 Grade 5 Oxford International Science Mock Test:

Section A: Forces in Action:

27 What is a force?

1. A push or pull that can change motion
2. The speed of an object
3. The weight of an object
4. Energy from the sun

28 Name 3 types of forces.

1. Gravity, Friction, Magnetic
2. Air, Water, Land
3. Hot, Cold, Warm
4. Fast, Slow, Medium

30 What is friction?

1. A force that opposes motion between surfaces
2. A force that makes things move faster
3. The smoothness of a surface
4. A type of heat energy

33 Give an example of magnetic force.

1. A magnet attracting iron nails
2. Pushing a door open
3. Water flowing downhill
4. Wind blowing leaves

Vocabulary (Key words):

Aerodynamic

Friction

Gravity

Mass

Weight

Forces

Surfaces

Magnetism

Float

Balanced/Unbalanced

Speed

Kinetic energy