



# Lowerhouse Junior School

## Science Overview Sheet



### Year 5 – Forces



**Rationale:** Teaching forces in Year 5 science is essential for building foundational knowledge in physics. Understanding forces helps students grasp how objects interact, move, and change direction. It fosters critical thinking and problem-solving skills, enabling students to explore real-world applications, such as gravity, friction, and magnetism, enhancing their scientific literacy.

#### Substantive Knowledge:

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

#### Disciplinary Knowledge:

- Comparative/Fair testing
- Reasearching

#### Overview:

**Lesson 1:**  
What is gravity and what is its impact on our lives?

**Lesson 2:**  
What is air resistance?

**Lesson 3:**  
What is friction?

**Lesson 4:**  
What is water resistance?

**Lesson 5:**  
How do mechanisms use force to help us?

#### Key Vocabulary:

**Force:** A push or pull upon an object resulting from its interaction with another object. Forces can cause objects to start moving, stop moving, change direction, or change shape.

**Gravity:** A natural force that pulls objects toward each other. On Earth, gravity gives weight to physical objects and causes them to fall toward the ground when dropped.

**Earth:** The third planet from the Sun in our solar system, which has a gravitational force that attracts objects toward its centre, giving them weight.

**Air resistance:** A type of frictional force that acts against the motion of objects as they travel through the air. It slows down objects moving through the air.

**Water resistance:** A type of frictional force that acts against the motion of objects as they move through water. It slows down objects moving through water.

**Friction:** A force that opposes the motion of one surface as it moves across another surface. It can slow down or stop the movement of objects.

**Mechanisms:** Systems of parts working together in a machine. Mechanisms can include levers, pulleys, gears, and other simple machines that help perform tasks more easily.

**Simple machines:** Basic mechanical devices for applying force, such as levers, pulleys, inclined planes, screws, wedges, and wheels and axles. They make work easier by allowing us to use less force to move an object.

**Levers:** Simple machines consisting of a rigid bar that pivots around a fixed point called a fulcrum. Levers are used to lift or move loads with less effort.

**Pulleys:** Simple machines consisting of a wheel with a groove around its edge, through which a rope or chain can run to change the direction of a force applied to the rope and lift heavy loads.

**Gears:** Simple machines consisting of wheels with teeth that mesh together to transmit torque and change the speed or direction of motion in machines.

#### Impact/Assessment

**Most Children will be able to:**

- demonstrate the effect of gravity acting on an unsupported object
- give examples of friction, water resistance and air resistance
- give examples of when it is beneficial to have high or low friction, water resistance and air resistance
- demonstrate how pulleys, levers and gears work
- explain the results of their investigations in terms of the force, showing a good understanding that as the object tries to move through the water or air or across the surface the particles in the water, air or on the surface slow it down
- demonstrate clearly the effects of using levers, pulleys and gears