Meden School Curriculum Planning							
Subject	Physics	**Year Group**	7	**Sequence No.**	2	**Topic**	Forces and Magnetism

Retrieval	Core Knowledge	Student Thinking
What do teachers need **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to **development of our students thinking, encouraging them to see the inequalities around them** and 'do something about them!'
KS2 Y3: Know that forces are **pushes** or **pulls.** Notice that **unbalanced forces** can cause an object to **move.** Observe how different surfaces produce different levels of **friction** which can cause an object to **slow** down. Notice that some forces need **contact** between **2 objects**, but other forces such as **magnets** can act at a **distance.** Observe how magnets **attract** or **repel** each other and attract some **materials** and not others.	**L1:** Types of Forces: Name a variety of forces including **push, pull, friction, gravity, air resistance, reaction, weight, upthrust, magnetism and electrostatic.** Different forces can be labelled on different objects. **Size** of force can be indicated by the size of the **Force arrows.** A force will either change the **speed, shape or direction** of the object it is acting on. **Contact forces** can be identified as forces that require **contact** with an object for the effects of the **force to be experienced**. Contact forces act in **pairs** on an object. For every **action** there is an **equal and opposite reaction**. Contact forces can be named and labelled on diagrams. not all forces require contact with the object. **Non-contact** forced can **exert** a force on an object w**ithout physical contact** with it. **Air resistance** is **NOT** a non-contact force (common **misconception** to address). Non-contact forces can be quite easily demonstrated using balloon and magnets. **L2:** Friction: define friction as whenever an object moves against another object, it feels **frictional** forces. These forces act in the **opposite direction** to the **movement**. Friction makes it **harder** for things to move. Know that **lubrication** is putting oil between surfaces to reduce friction. Understand that on a **microscopic level,** objects that appear **smooth** are not necessarily as smooth as they think. Know that **mechanical engineers** need a good understanding of forces. Through practical, investigate different frictional surfaces and calculate a **mean** by adding all results together and dividing by how many there are. **L3 & 4:** Drag: know that racing cars are more **streamlined** so they can go **faster.** Drag is higher when an object goes faster because the air hits it harder so a **greater backwards force**. If the	

	object is streamlined many of the particles get swept around the object **instead of hitting it**, so the drag force is **less**. Through practical, investigate different shapes and their effect on drag, also calculate a **mean** by adding all results together and dividing by how many there are. **L5:** Balanced forces: Know that the **size of force arrow** on diagrams can be used to identify **balanced** and **unbalanced** forces. **Newton's Frist Law:** if forces are balanced on an object it will **remain at rest** or **continue** to move at a **constant speed**. For forces to be balanced they must add up to **0**. If forces are in **opposite** directions you **take them away**, if they are in the **same** direction you **add them together**. This is **resultant force. Newton** also stated if forces are **unbalanced** an object at rest will **start to move** or if it is already moving; **speed up, slow down or change direction.** Practise. **L6:** Hooke's Law: **Engineers** need to be able to work out how easy or hard it is to **stretch** or **squash** a spring. Hooke's Law can be investigated using springs, plot a graph of **extension (cm)** over **weight** (N). **Hooke's law** states that the extension of an elastic material is **directly proportional** to the **force applied**. All this means is that as the force applied **increases**, the extension will **increase in proportion**. Name springs in **everyday life**: brakes, clothes pegs and clocks. **L7:** A **magnet** is a piece of metal that attracts other metals. A bar magnet is a **magnetised** piece of steel. **Iron**, **cobalt** and **nickel** are elements that are magnetic. **Steel** is magnetic because it is mostly made of iron and some carbon. A **non-contact force** is a force where the objects involved are not touching. The poles of a magnet are known as **North** and **South**. **Permanent** means always. Magnets are used in scrap yards. **L8:** By way of a practical. **Opposite** poles of a magnet **attract**, **like** (which means the same) poles **repel**. A suspended, freely moving bar magnet will line up with the **Earth's magnetic field.** **L9:** Know the shape of **magnetic field lines** around a bar magnet. Know how to reveal the magnetic field lines by gently shaking **iron filings** over a bar magnet covered in clingfilm on a white sheet of paper. Identify the difference between the magnetic field lines of attracting and repelling magnets. Magnetic force is **stronger** the **closer** the field lines are. Magnetic field lines **enter the South pole** and **leave the North pole.** **L10:** Topic Review and Revision	

	L11: test **L12:** GPA	