



## Wellington Primary Science

### Parental Information

**Year Group – 3**

**Term – Autumn**

**Topic – Forces and Magnets**

In the Forces and Magnets project, your child will learn what forces are and what they do. They will learn about pushing and pulling forces and sort different actions into pushes and pulls. They will identify and explain contact forces. They will learn about and investigate frictional forces. They will use force meters to measure the forces needed to carry out everyday tasks and record their measurements. They will learn about magnetism (a non-contact force) and explore bar magnets. They will find out about magnetic attraction, repulsion and magnetic fields. They will test the magnetic properties of different objects. They will learn about the magnetism of the Earth and how this enables compasses to work. They will use this knowledge to make compasses. They will learn about the uses of friction and magnetism and carry out research. They will use different methods to investigate the strength of magnets.

**Your child will receive a copy of the knowledge organiser below to aid their learning. Please take time to look through this at home with your child.**

**Your child will be bringing home a 'Home Learning' guide and workbook, in which they can record home learning tasks for this topic. Included is a further reading suggestion list and some suitable child friendly websites, which can be used to deepen their understanding of the topics that they will be covering in class.**

**Class teachers will guide your child on activities which will directly support that week's learning and any homework expectations – there is no requirement for the children to complete all of the tasks in the pack.**

**Should you have any questions please don't hesitate to contact the Year Group Team.**

## Forces and Magnets

### What is a force?

A force is simply a push or a pull that makes something move. Forces act in pairs that oppose each other. Forces cause objects to move, change their speed or change their shape.



push



pull

### Contact forces

Contact forces happen when two objects or bodies physically touch each other. Frictional forces are a type of contact force.



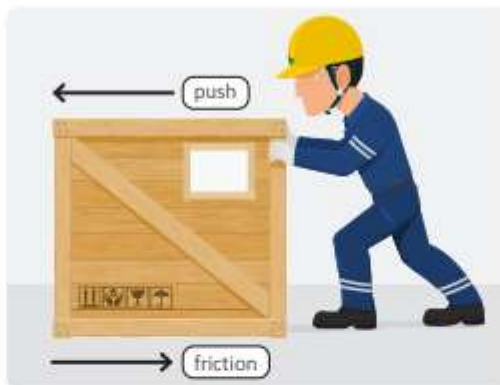
foot pushes ball



hand pulls fishing rod

### Frictional forces

Friction is a force between two surfaces as they move across each other. Friction acts in the opposite direction to the movement. Friction always slows down a moving object. It also produces heat.



### Sizes of frictional force

The size of a frictional force depends on the materials both surfaces are made from. The rougher the materials, the larger the frictional force. The smoother the materials, the smaller the frictional force.



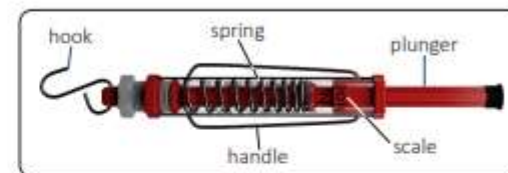
large frictional force



small frictional force

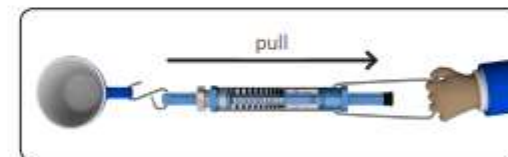
### Force meters

A force meter is a piece of scientific equipment that measures force. It can also be called a newton meter or a spring balance. Forces are measured in newtons (N). A force meter has a handle, hook, plunger, spring and scale.



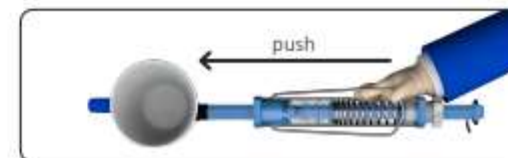
#### Measuring a pulling force

Attach the object to the force meter's hook. Pull the force meter gently by the handle. When the object starts to move, read the pulling force on the force meter's scale in newtons.



#### Measuring a pushing force

Place the force meter's plunger on the object. Push the force meter gently against the object until it starts to move. Read the pushing force on the force meter's scale in newtons.



## Non-contact forces

Non-contact forces exert a push or a pull but have no direct contact with the objects they affect. We cannot see non-contact forces, but we can feel them. Magnetic forces are a type of non-contact force.

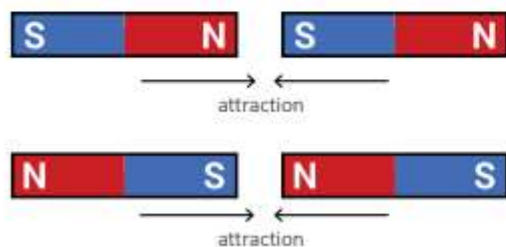
## Magnets

Magnets have two ends called poles. The red end is the north pole and the blue end is the south pole.



## Magnetic attraction

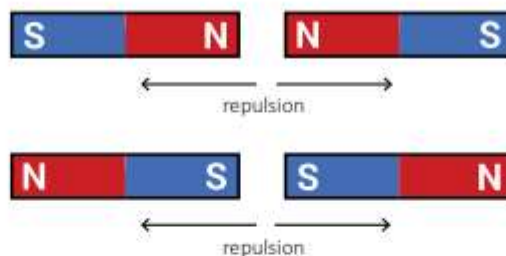
When different, or unlike, poles of two magnets are placed near each other, the magnets pull towards each other. This is called magnetic **attraction**.



Magnets also attract some materials towards them. These materials are known as magnetic. Materials that are not attracted to magnets are called non-magnetic.

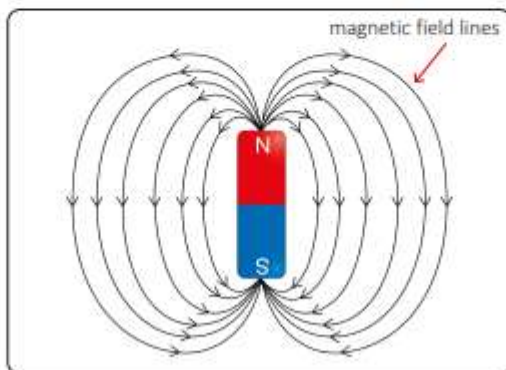
## Magnetic repulsion

When the same, or like, poles of two magnets are placed near each other, they push apart. This is called magnetic **repulsion**.



## Magnetic fields

The invisible forces we can feel when magnets are close together are caused by their magnetic fields. Magnetic fields are invisible but can be shown as lines on a diagram.



## Magnetic Earth

The Earth acts like a huge bar magnet. It is surrounded by an invisible magnetic field called the magnetosphere. Without the magnetosphere, nothing could live on Earth. The magnetosphere is responsible for creating lights in the sky called aurora and also makes navigational compasses work.



aurora

## Glossary

|                             |  |
|-----------------------------|--|
| <b>attraction</b>           | When one object moves towards another object.  |
| <b>aurora</b>               | A natural phenomenon characterised by coloured lights in the sky near the North and South Poles. |
| <b>bar magnet</b>           | A rectangular magnet.  |
| <b>magnetic</b>             | Attracted to or acting as a magnet.  |
| <b>navigational compass</b> | An instrument used for finding directions.   |
| <b>repulsion</b>            | When one object pushes another object away.  |