



Knowledge and Skills Mind Map (Science): Year 3 Spring Term 1

Note to teachers: see lessons 3-6 of Spring 2. Consider planting before Feb half term to give time to grow

Knowledge



1. Can I describe pushes and pulls as forces, and observe how objects move?

- **Prior learning (last term):** balance diet, nutrition, food groups, human skeleton,
- **Vocab:** force, push, pull
- Know that a force is a push or a pull that can make an object start moving, stop moving or change direction.
- Know that pushes and pulls can act on objects in different ways, (e.g. pushing a toy car makes it move away, pulling it brings it closer).
- Know that forces can affect how objects move, including changing the speed or direction of movement.
- Know that careful observation helps us to describe how objects move when forces are applied.
- **(note for teachers – suggested task:** give children a range of objects (e.g. toy cars, balls, books) to explore pushing and pulling, then ask them to observe and describe how movement changes when they apply different amounts of force.)
- **Making systematic and careful observations**
- **Identifying differences, similarities or changes related to simple scientific ideas and processes**

2. Can I compare how things move on different surfaces and explain why?

- **Prior learning (last lesson):** learnt about forces; described how objects move
- **Vocab:** surface, friction, rough
- Know that objects can move differently depending on the surface they are on.
- Know that rough surfaces create more friction which slows objects down, while smooth surfaces create less friction allowing objects to move faster.
- Know that friction is a force that acts between two surfaces and slows movement.
- Know that comparing how objects move on different surfaces helps us to identify patterns and explain changes.
- **(note for teachers – suggested task:** provide ramps covered with different materials (e.g. carpet, sandpaper, plastic) Roll the same object down each surface, measuring how far or fast it travels.)
- **Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units**
- **Identifying differences, similarities or changes related to simple scientific ideas and processes**

3. Can I identify that some forces need contact and others (like magnets) act at a distance?

- **Prior learning:** compared how things move on different surfaces
- **Vocab:** contact, non-contact, magnet
- Know that some forces need objects to be touching to work and are called contact forces.
- Know that magnetic forces can act without objects touching and are called non-contact forces.
- Know that magnets can attract objects from a distance without physical contact.
- Know that comparing contact and non-contact forces helps us understand how different forces work.
- **(note for teachers – suggested task:** place a small magnetic object (e.g. paperclip) on a table and ask pupils to move a magnet towards it without touching, observing when the object begins to move.)
- **Identifying differences, similarities or changes related to simple scientific ideas and processes**
- **Using straightforward scientific evidence to answer questions or to support their findings**

Forces and Magnets

6. Can I describe magnetic poles and investigate how magnet strength affects attraction and repulsion?

- **Prior learning (last lesson):** fair test to identify magnetic materials
- **Vocab:** pole, attract, repel
- Know that magnets have two poles called north and south.
- Know that opposite poles attract and like poles repel.
- Know we can predict whether magnets will attract or repel based on which poles are facing.
- Know that some magnets are stronger than others and can attract objects from further away or hold more objects.
- **(note for teachers – suggested task:** give pupils different magnets and ask them to test how many paper
- **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**
- **Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

5. Can I carry out a fair test to identify magnetic materials and record my results?

- **Prior learning (last lesson):** learnt how magnets attract and repel each other
- **Vocab:** magnetic, non-magnetic, fair test
- Know that some materials are magnetic and are attracted to magnets, while others are non-magnetic and are not attracted.
- Know that a fair test means changing only one thing and keeping everything else the same to ensure reliable results.
- Know that testing a range of materials helps us to identify which are magnetic and which are not.
- Know that results can be recorded and classified to help answer scientific questions, (e.g. sorting materials into a table of magnetic and non-magnetic).
- **(note for teachers – suggested task:** provide a range of everyday objects (e.g. paperclips, coins, plastic, wood, foil) and ask pupils to test each one with a magnet, record results in a table, and group materials into magnetic and non-magnetic.)
- **Setting up simple practical enquiries, comparative and fair tests**
- **Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

4. Can I observe how magnets attract and repel each other and describe what happens?

- **Prior learning:** identified some forces need contact and others (magnets) act at a distance
- **Vocab:** attract, repel, magnet
- Know that magnets can attract (pull together) or repel (push apart) each other.
- Know that attraction happens when magnets pull towards each other and repulsion happens when they push away.
- Know that magnets do not behave the same way every time and their interaction depends on how they are positioned.
- Know that careful observations help us describe patterns in how magnets behave.
- **(note for teachers – suggested task:** give pupils pairs of bar magnets and ask them to explore what happens when different ends are brought together, encouraging them to describe when magnets attract and when they repel.)
- **Making systematic and careful observations**
- **Identifying differences, similarities or changes related to simple scientific ideas/processes**