Fifth & Sixth Class Science Revision

Chapter 1: Can't Stop Me Now!

- Inertia is a force that causes a body at rest (i.e. not moving) to stay still, or a body in motion to stay in motion, unless it is acted upon by an outside force such as brakes.
- Friction happens when things rub against each other and, in so doing, movement becomes difficult e.g. pulling brakes on a bicycle.
- Friction can generate heat and cause wear and tear.

Chapter 2: Reduce, Reuse, Recycle

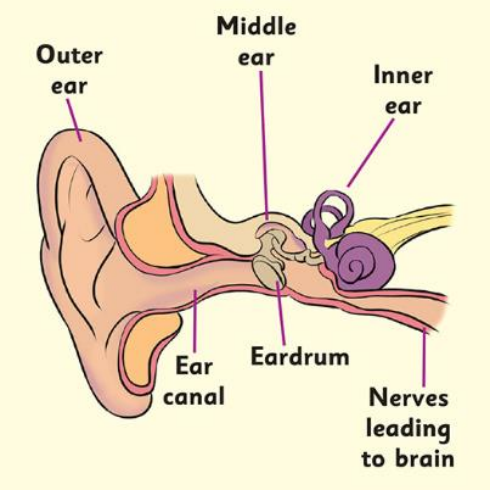
- Glass is made from a mixture of sand, soda ash, limestone and other additives. These materials are heated together to a very high temperature in a furnace. The molten mixture is then made into glass. A lot of energy is used in this process and it often involves burning fossil fuels.
- When glass is recycled, it is broken into small pieces called cullet. Contaminants are removed from the cullet and then it is crushed and added to new glass that is being made. Using recycled glass greatly reduces the amount of raw materials and energy needed to make the new glass as well as reducing the amount of glass that is being dumped in landfill sites.
- The highest proportion of aluminium is found in bauxite. Bauxite is crushed and heated to a very high temperature. Chemicals are added, and impurities are removed from the molten mixture. The molten bauxite mixture has to go through many more processes before it becomes aluminium as we know it. Most of these processes involve a lot of heating which requires a large amount of energy. Recycling aluminium uses only about 5% of the energy that is needed to extract it from bauxite.

Chapter 3: Minibeasts

- Vertebrates are animals that have a backbone. Invertebrates are animals that do not have a backbone. They include Arthropods, Molluscs and Annelids.
- Arthropods have jointed legs and a hard-outside skeleton called an exoskeleton. The main groups of arthropods are: Insects, woodlice, millipedes, spiders and centipedes.
    1. Insects have three body parts – the head, the thorax and the abdomen. Antennae on its head are used to feel and smell. An insect has two eyes. They have six jointed legs that are attached to the thorax. Most insects have wings which are also attached to the thorax. An insect's digestive, reproductive and excretory organs are found in its abdomen.
    2. Spiders have eight legs and two body segments.
    3. Woodlice have grey bodies and seven pairs of legs. They live in damp places.
    4. Centipedes has a flattened brown body divided into many segments. It has one pair of legs per segment.
    5. Millipedes have a cylindrical body with many segments and two pairs of legs per segment.
    - Molluscs have a soft non-segmented body usually enclosed in a shell. Many shellfish are members of the mollusc family. So is the garden snail.
    - Annelids have long cylindrical bodies made up of numerous segments. The earthworm is an annelid.

Chapter 4: I'm All Ears

- We hear using our ears and our brain.
- The ear is divided into three parts – The outer ear, middle ear and inner ear.



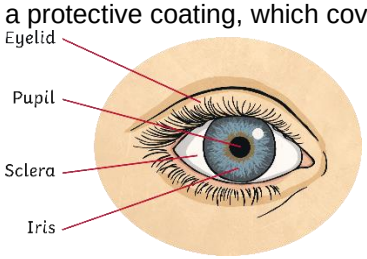
- The outer ear (Pinna) collects sounds. Sound travels through the ear canal until it reaches a thin layer of tissue called the eardrum. The sound makes the eardrum vibrate. Tiny bones within the eardrum transfer the sound to the inner ear. Here the sound enters a spiral shaped tube called the cochlea. The tube is filled with fluid. The sound passes from here through special nerve cells to the auditory nerve and on to the brain. The brain processes the sounds, so we can hear.
- The ear also helps with our balance. In the inner ear, there are three semi-circular canals filled with fluid. When your head moves, the liquid in the semi-circular canals moves too. The fluid moves tiny hairs which send messages to the brain. The brain in turn sends messages to our muscles so that we maintain our balance.
- Ultrasound is a medical imaging technique that uses high-frequency sound waves and their echoes to form an image of the internal organs.
- Sound can be reflected off some surfaces (desk) and absorbed by others. (cloth)

Chapter 5: Believe your Eyes

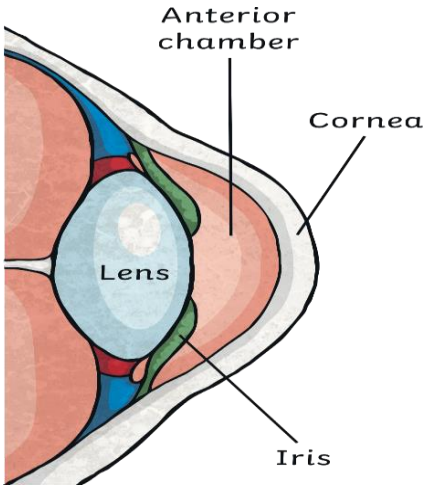
- Two eyes give you more depth perception, which is the ability to judge how near or far objects are.
- The blind spot is the area on the retina without receptors that respond to light. Therefore, an image that falls on this region will NOT be seen.
- Optical Illusions can use colour, light and patterns to create images that can be deceptive or misleading to our brains. The information gathered by the eye is processed by the brain, creating a perception that, does not match the true image

Chapter 6: The Human Eye

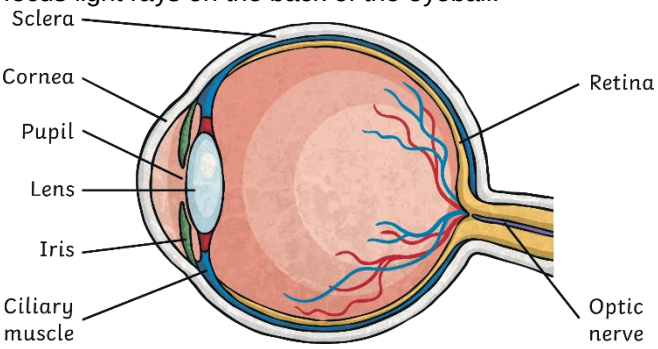
- Our eyes take in information about the world around us, and constantly send images to the brain to be processed.
- The eyes are about the size of a ping pong ball and sit in the eye sockets in our skulls. Our eyelids cover the front part of our eyes. Their job is to keep the eye clean and moist by blinking several times a minute. The eyelashes on our eyelids also help to keep dust and dirt from getting in our eyes.
- The **sclera** is the white part of the eye. It provides a protective coating, which covers most of the eye.



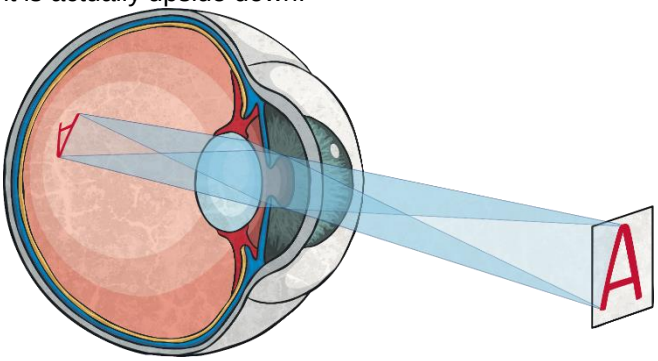
- The **iris** is the colourful part of the eye. It can change in size to control how much light goes through the **pupil.**
- The **pupil** is an opening in the iris which lets light enter the eye. The pupil can change in size; it gets smaller in very bright conditions and larger in dark conditions.



- The cornea is the clear dome that sits in front of the iris (the coloured part of the eye). It helps your eye focus as light passes through.
- The **anterior chamber** is the space between the cornea and the iris. This space is filled with a special fluid that helps keep the eye healthy.
- After light enters the pupil, it hits the lens. The lens sits behind the iris and is clear. The lens' job is to focus light rays on the back of the eyeball.



- The vitreous body is the biggest part of the eye and gives the eye it shape. It is filled with a clear, jelly like material called the vitreous humor.
- The retina is in the very back of the eye. The retina takes the light the eye receives and changes it into nerve signals so the brain can understand what the eye is seeing. When the image hits the retina, it is actually upside down!



- The optic nerve carries the messages from the eye to the brain. The messages it sends to the brain are still upside down but amazingly the brain knows how to flip this image up the right way!

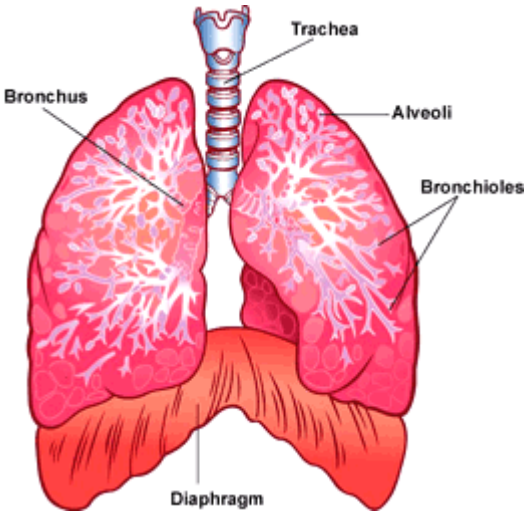
Chapter 7: Static Electricity

- Everything on earth has electricity in the form of positive charges (+) and negative charges (-). The positive charges are called protons and the negative charges are called electrons.
- A static charge is formed when two surfaces touch each other, and the electrons (negative charge) move from one object to another. One object will have a positive charge and the other a negative charge.
- Items with different charges (positive and negative) will attract, while items with similar charges (positive and positive) will push away from each other. Sort of like a magnet.
- A storm cloud has a build up of static electricity because the water droplets and ice crystals inside it rub against each other. Static electricity builds up. Positive charges build up at the top of the cloud and negative ones build up at the base of the cloud. When the charge is strong enough, the negative charge at the base of the cloud jumps to the positive charge on the ground causing a flash of lightning.

- The lightning is so hot that it heats up the air around it. The hot air expands quickly, making a big explosion of noise, which we call thunder.

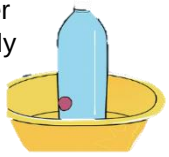
Chapter 8: Take a Deep Breath

- When we breathe, air is sucked in through either the nose or mouth and then down the trachea. The lining of the nose and trachea make a slippery liquid called mucus. This warms and moistens the air so that it travels more easily along our air passages and also traps germs and dusts.
- Tiny hairs called cilia line the inside of the nose and trachea. These hairs also help to trap tiny dust or dirt that might be in the air that we breathe.
- The trachea divides into two tubes called the right bronchus and the left bronchus. One bronchus goes to each lung.
- The right and left bronchus divide into several narrow tubes called bronchioles.
- At the end of each bronchiole is a cluster of air sacs called alveoli. Oxygen passes through the thin wall of the alveoli into the bloodstream. Carbon dioxide passes from the blood into the alveoli. It is removed from the body when we breathe out.
- The process of breathing in and out is controlled by muscles. The intercostal muscles move the ribs in and out, up and down. The diaphragm is a large flat muscle positioned under our lungs. It can move up and down.
- We sneeze to remove irritating material that we have breathe in from our nose.
- We cough to remove irritating material from our trachea.
- We yawn to raise the level of oxygen in the blood.
- The voice box is also called the larynx. It is situated at the top of the trachea. Inside the larynx are muscles called vocal cords which vibrate as air passes through the cords. These vibrations can be heard as sounds.



Chapter 9: Out of Thin Air

- Air exerts a lot of pressure on water. Water in a bottle with a hole in the bottom will only spill out of the bottle when the lid is removed and the air presses down on the water.



- The water will not pour out of the upturned jar at first because the air under the card is stronger than the water pushing down on it. When the card absorbs water and gets soft it will fall off and the water will pour out.

- Air has both weight and strength.

- Air pressure in tyres was usually measured in pounds per square inch or psi. The metric unit now used to measure air pressure is Pascals.
- Up until a few years ago, the air within the tyres was contained in a tube. Nowadays, almost all tyres are tubeless. The tyre fits so tightly on the rim of the wheel that is able to keep the air inside it without the use of a tube.

Chapter 10: Magnetic Fields

- Magnets attract some metals to them:
  1. Magnets attract ferrous metals to them – iron, nickel, cobalt and certain steels.
  2. Brass, aluminium, copper and most stainless steels are non-ferrous.
- A magnet has two poles – a north pole and a south pole.
  1. A north pole in one magnet will attract the south pole of another magnet.
  2. A north pole in one magnet will repel the north pole of another magnet.
  3. Likewise, a south pole in one magnet will repel the south pole of another magnet.
- The area around a magnet in which objects are affected by its magnetic force is known as a magnetic field.
- We can magnetise a steel nail by stroking it with a magnet from end to end a defined number of times. This makes all the atoms in the nail face in the same direction. We can demagnetise the steel nail by banging the nail against a hard surface so that the atoms are disturbed and point in different directions therefore losing their magnetic power.
- MRIs uses powerful magnets and radio waves to produce images of any part of the body.

Chapter 11: Water Birds

- A bird is an animal with feathers and wings. Most birds fly but few do not (e.g. penguins, kiwis). Birds are found all over the world in every climate and habitat. There are over 9,000 different species of birds. All birds are covered in overlapping feathers. Some types of feathers keep the birds warm, others help them to fly, while others can keep them dry. Feathers are made from keratin, the same material from which our hair and nails are made. Many animals have four legs, but birds have only two. Instead of front legs, birds have wings.
- There are three main types of swan found in Ireland. They are the mute swan, the whooper swan and the Bewick's swan.
    1. The Mute Swan is the only swan that lives in Ireland the whole year round. It swims with its wing feathers slightly raised and its bill turned downwards towards the water. Its bill is orange and there is a black knob at the base. It does not have a call, but it can hiss and snort. It builds its nest in April among reeds. The male is called a cob and the female is called a pen. The young swans (cygnets) are grey and do not turn white until they are about three years old.
    2. The whooper swan swims with its bill straight out and feathers down. Its bill is yellow and black and there isn't a knob at the base. It has black legs and feet. The whooper swan's call is a whopping sound. The whooper swan spends the winter in Ireland. It comes from Iceland.
    3. The Bewick's swan is the smallest of our swans. It does not have much yellow on its bill. It comes to Ireland from Russia for the winter months.
- Three common birds that you might see on our shores include the herring gull, the oystercatcher and the dunlin:
    1. The herring gull is our most common gull. It is about 60cm long. It is mainly white with a grey back and wings. The legs are pink. The bill is yellow, but a bill is visible on its lower half. Herring gulls eat herrings, small mammals, birds, eggs, scraps from dumps and fishing boats. They build their nests on cliffs, on islands and on roof tops.
    2. The oystercatcher is a large, black and white wading bird. It has a long, orange-red bill and thick reddish pink legs. It is 40 to 50cm long. They feed on shellfish, worms and insects. They nest on the ground.
    3. The dunlin is a small wader. It has a slightly down curved bill. In summer it has a rich chestnut colour on top, with some white underneath and a striking black patch on the belly. In winter, the dunlin is a plain brownish-grey on all upper parts, and white underneath. It pokes about in the mud and soft sand searching for worms, snails and shellfish. The dunlin builds its nest on the ground in sparse, low vegetation.
- Two birds that spend a great deal of their lives at sea are the gannet and the cormorant.
    1. The gannet is a large black and white bird, with long, pointed wings and a long, sharp bill. It has a yellow colour on its head. Gannets eat fish. They breed in hugs groups called colonies on islands and rocky areas. They lay just one chalky-blue egg and it takes the chick five years to reach maturity.
    2. The cormorant is a large, dark coloured sea bird. It has a long, thin bill which is hooked at the end.
    3. Cormorants eats all types of fish. After fishing, cormorants stand with their wings outstretched. This is because their feathers are not fully waterproof.

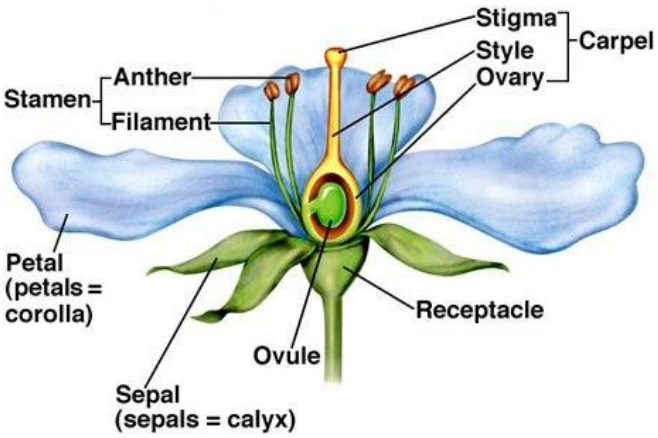
Chapter 12: Investigating Fabrics

- Cotton is a material made from a plant. Cotton is used to make clothing. It is hard-wearing, and it keeps the body cool in warm weather. It has good absorbency.
- We get wool from sheep in the main. Wool is used to make clothing. Wool is an excellent fabric to keep us warm in cold weather. It is quite waterproof.
- We get leather from the skin of animals, mainly cows. Leather is not woven.
- We get linen from the flax plant. Linen is used to make table clothes and suits.
- Nylon is a synthetic fabric made from petroleum. It is used in tights.
- Cotton, wool, linen and nylon can be seen to have a criss-cross pattern where the warp and the weft are visible. Warp is the term used to describe the lengthwise threads in a loom and weft refers to the cross threads used in weaving.
- The finest thread is that taken from the nylon cloth, while the thickest is taken from the woollen cloth. The linen thread varies in thickness.
- Cloth manufacturers often mix different types of thread to produce a cloth that is most suitable for a particular garment.

Chapter 13: Flowers

- Most flowers have male parts called stamen and female parts, called carpels.
- The stamens produce fine, dust like grains, called pollen and the carpels produce eggs.
- The male and female parts are surrounded by the petals of the flower. In many flowers, it is the job of the petal to attract insects, so that pollen can be transferred to other flowers. This process is called pollination. The pollen then joins together with, or fertilizes, the ovules (eggs), and produces new seeds.
- The ovary grows around the seed so that a fruit is formed. The fruit contains food for the seed, which

it will need when growth begins. The seed will be dispersed from the parent plant so that a new plant can be grown in a different place.



- Common spring flowers include daffodils, snowdrops, crocus, hyacinth and tulip.

Chapter 14: Mix and Separate

- When we mix flour, warm water, yeast, sugar and salt we create a dough which will rise as the yeast reacts with the other ingredients. When baked the mixture makes bread.
- We can separate materials that have been mixed together using sieves, static electricity, magnetism, decanting and evaporation.
- Decanting involves allowing a mixture to sit for a while e.g. sand and water. The heavier material will fall to the bottom and then the water can be poured off.
- Evaporation is when water is heated and turns it into vapor or steam. The water vapor or steam leaves the container leaving any material that was mixed with the water behind e.g. salt and water.
- Separation techniques are widely used in our environment.
    1. Filtration is one of these. It is used to purify our water. Filters remove any dirt, grit or sand from it.
    2. Separation and grading of stones in quarries is essential. The stone is sorted into different sizes depending on its purpose e.g. Large stones for foundations of roads with small stones placed near the surface.
    3. Magnets are often used to separate metal items from other materials e.g. in scrapyards.

Chapter 15: Rusting

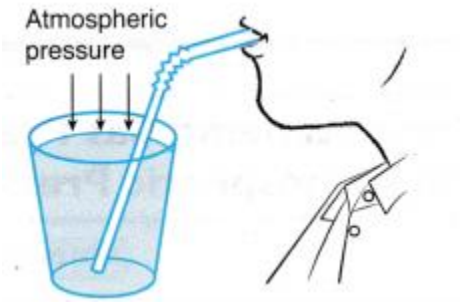
- Rust is scientifically known as oxidation, which happens when oxygen comes in contact with certain metals. Iron oxide (rust) occurs when oxygen comes in contact with iron or steel. The main catalyst for rusting is water. The water combines with the metal and other elements in the air to form mild acids. The acid attacks the metal. If sodium (salt) is present, rusting will occur more quickly.
- Only metals that have iron or steel in them will rust.
- Coating iron or steel items with oil, Vaseline or oil-based paint can help to prevent rusting as it will act as a water barrier.
- Galvanising involves submerging steel in melted zinc. The chemical reaction that occurs permanently bonds the zinc to the steel so that it becomes part of the steel.

Chapter 16: Heat

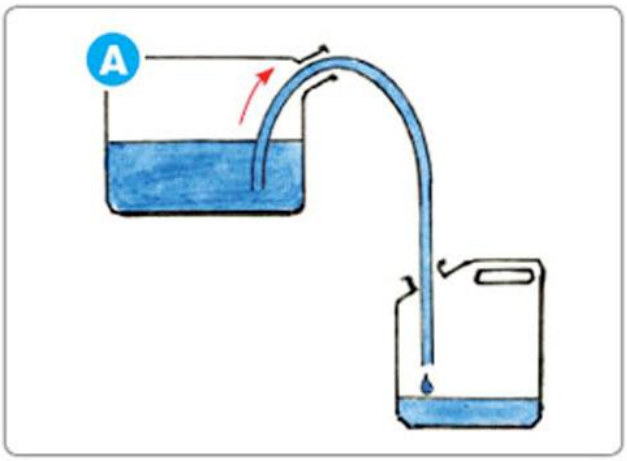
- Materials that conduct heat or electricity are known as conductors. Materials that do not conduct heat or electricity are known as insulators. Insulators and conductors have many useful functions.
- Materials that prevent heat from passing through them are called thermal insulators. A good thermal insulator will keep cold objects cold for a long time, and hot objects hot. Wood, plastic, and many fabrics, such as wool and cotton, are good thermal insulators. Thermal insulators are good materials for keeping people warm. Clothing, carpets, and curtains are examples of everyday thermal insulators.
- Energy from the sun is called solar energy. We can trap some of that energy to do lots of work.
- We use glass greenhouses and plastic polytunnels to shield crops from excess cold or heat.
- Scientists have invented two main types of solar cell. They have invented a solar electricity panel and a solar hot water panel. Solar panels are usually located on the roofs of buildings. They are shallow boxes covered with glass and the interior is generally black. Water is contained in pipes inside these boxes. The sun heats this water.
- Darker colours absorb heat better than brighter ones.

Chapter 17: Air and Water

- A straw works as follows: With the straw just sitting in the glass, the pressure on the surface of the water is the same all over, including on the little bit of surface inside the straw. When you suck the air out of the straw, you decrease the pressure inside the straw, allowing the higher pressure on the rest of the surface to push the water up the straw and into your mouth.



- A siphon is a tube used to make liquid travel upwards from a container and then down to a container at a lower level unaided. For the water to go into the tube, air must be removed from the tube. Atmospheric pressure pushes water into the tube and then gravity causes it to flow down to the container at a lower level.



- Moving air has less pressure than still air. By blowing over the top of a straw, we can reduce the air pressure here. The higher pressure on the rest of the water pushes it up the straw and causes water to spray out of the straw.

Chapter 18: Wild Flowers

- Gorse (Furze): Gorse flowers for much of the year but it at its finest in April and May. Gorse is a native plant of Ireland and it is evergreen. It has beautiful yellow flowers with large petals. The flowers have a coconut scent. The stem of this plant grows bluish-green thorns. The plant grows to 2 metres in height. Gorse grows on grasslands, roadsides, waste ground, mountain slopes and in woods.

- The daisy is one of the most common flowers. It is found on lawns, fields, on the roadside and in gardens. The petals are white, and the centre is yellow. The plant is usually between 3cm and 12cm high. It flowers all year round. The daisy is a composite flower. This means that each flower head seems to have just a single flower but in fact it has several tiny flowers packed together.

- Speedwell is a small flowering plant that can be found in river and streams, and in walls and hedgerows. It also grows in open fields and woodlands. It is a low growing plant, usually about 20cm in height. The flowers are bright blue with four petals. It blooms from May to July.

- Fuchsia flowers from June to October. It is a deciduous shrub which was introduced to Ireland from South America. The flowers hang downwards and are usually red. It produces a black berry which you must not eat. The shrub can grow up to 3 metres in height.

- The thistle flowers from June to September. It is native to Ireland and is found everywhere. It grows between 30cm and 50cm in height. It has a short, dark pink flower. It can sometimes be white. It has tough, grey-green leaves, which are toothed at the edges. This plant is very prickly with sharp thorns on the leaves.

- Clover can be red or white. It flowers from June to October. It is native to Ireland. Its height varies between 15cm and 45cm. It has round, globe like heads. It grows in fields and gardens and even on the roadside.

- Dog rose grows on a shrub. It flowers in June and July. The flowers can grow singly or in clusters. The plant produces a red fruit called a hip. The stems of the plant are long and straggly. They are lined with sharp, hooked thorns. This shrub grows in woods, in hedgerows and on roadsides.

- Honeysuckle grows on a shrub. It can grow up to 6 metres in height. It flowers from June to September and produces its fruits between August and October. The fruit is poisonous to humans. The honeysuckle is native to Ireland. The flowers are tinged with pink and yellow and give off a lovely scent. Honeysuckle grows in woods, hedgerows and amongst scrub. It also grows on the coast.