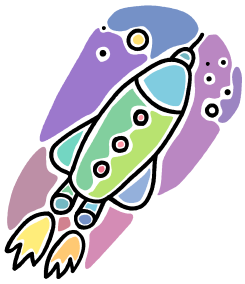
Basically Botany

By the end of this topic I will be able to:

- Identify and name the main parts of a plant (flower, growing tip, roots, stem, leaves)
- Explain what the different parts of the plant are used for
- Label the parts of a flower on a diagram
- Define the terms fertilisation, pollination, seed dispersal and germination
- Describe the differences between wind pollinated and insect pollinated flowers
- Recall the main ways in which seeds can be dispersed (wind, stuck to animals, eaten by animals, explosion)
- Work out how seeds are dispersed by looking at their structure
- Describe the conditions needed for seeds to germinate
- Name the main parts of a seed and label them in a diagram
- Explain what photosynthesis is and why plants carry out photosynthesis (including leaf adaptations)
- Explain what respiration is and why plants carry out respiration
- Explain the purpose of transpiration

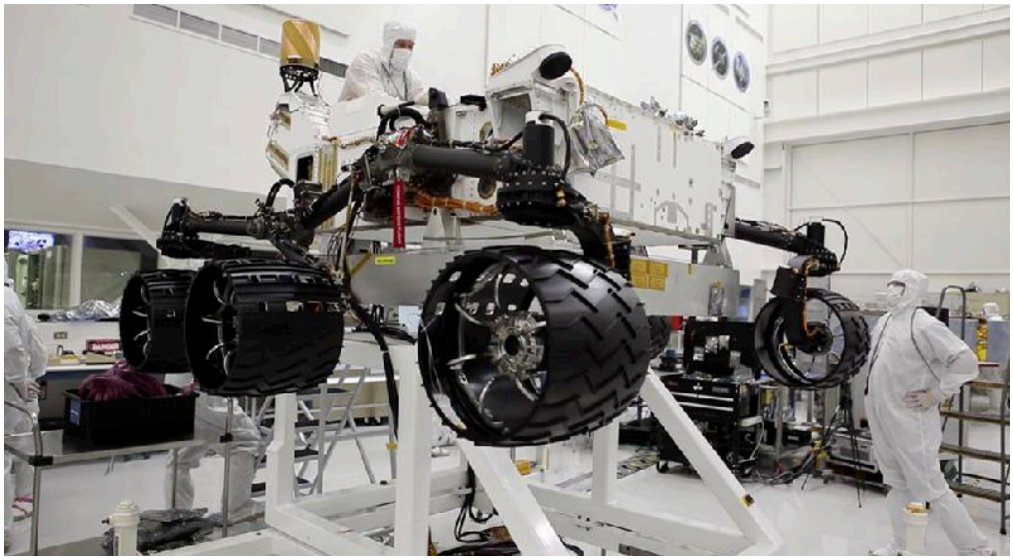
Rafflesia arnoldii – produces the largest flower in the world (11kg, 1m across)

space



By the end of this topic I will be able to:

- Solar system basic plan
- Investigate how the planets of the solar system differ from each other
- Explain the causes of the seasons
- Investigate the reasons for moon phases
- Investigate star life cycles
- Investigate the following terms:
  - galaxy
  - light year
  - universe
  - constellations
  - satellite
  - meteor
  - comet
  - black hole
- Investigate impacts of meteorites
- Explain how eclipses occur
- Investigate aspects of exploring space
  - current and future space travel
  - exploration via probes, telescopes

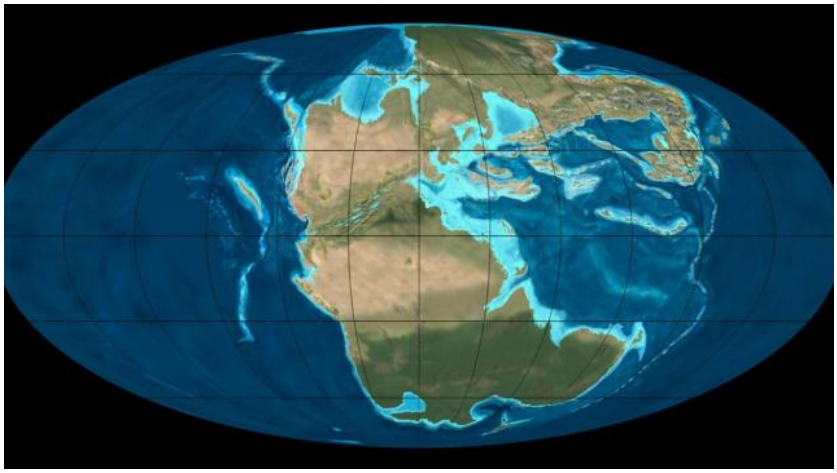


The Curiosity rover gets its wheels
(due to land on Mars Aug 2012)

My Earth - My Past

By the end of this topic I will be able to:

- Name the layers of the earth
- Explain how igneous, sedimentary and metamorphic rocks are formed
- Sort rocks into these 3 groups (igneous, metamorphic and sedimentary) based on their properties
- Describe how fossils are formed
- Explain how fossils can be used to help date rocks
- Interpret the rock cycle
- Use a key to identify a rock
- Recall the names of some common rocks
- Recall that the earth's crust is made of large, solid tectonic plates
- Describe what can happen at plate boundaries
- Explain what a fault line is
- Explain, using examples, why New Zealand is known as the "shaky islands"
- Research an aspect of New Zealand's geological history



Earth +250 million years?

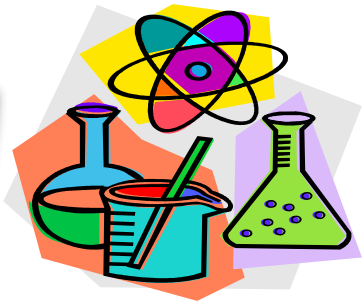
Body works

By the end of this topic I will be able to:

- State the purpose of an internal skeleton
- Name the **major** bones in the body
- Name the different types of joints and give examples of where in the body each type of joint is found.
- Know the difference between tendons and ligaments.
- Describe how antagonistic pairs of muscles work.
- Explain how the body excretes wastes
  - Includes: basic kidney structure + blood vessels, urinary system
- Discuss water balance in the body
- Discuss circulation (heart parts, veins, arteries, capillaries)
- Describe the functions of the skin.
- Define the term gas exchange.
- Identify the main parts of the human gas exchange system and explain how the lungs function.

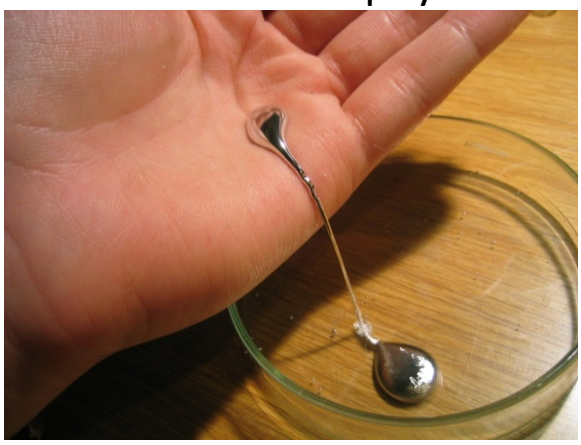
Broken femur

Atoms.... and other stuff!

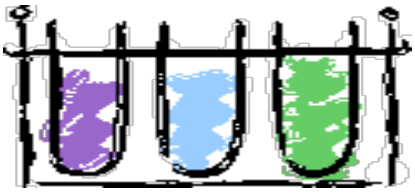


By the end of this topic I will be able to:

- Use the Periodic Table to identify an element as a metal or non-metal
- Recall the names and formulae of the first 20 elements and the other elements studied during this topic
- Recall the properties of metals and recognize common metals
- Recall the structure of an atom
- Define the terms atomic number and mass number
- Calculate the number of electrons, protons and neutrons of atoms and ions using the Periodic Table as a tool
- Write the electron configuration for any of the first 20 elements (atoms and ions)
- Explain why and how atoms form ions
- Use the table of ions to write formulae for ionic compounds
- Name ionic compounds when given ionic formulae
- Classify compounds as ionic or molecular using their formulae
- Explain the difference between physical & chemical changes



Acids and bases



By the end of this topic I will be able to:

- Recall and write the chemical formulae for the following: hydrochloric acid, sulphuric acid, nitric acid, sodium hydroxide, ammonia, sodium bicarbonate
- Recall the names of common indicators and the colours they turn in acidic, basic and neutral solutions.
- Explain how to make an indicator from common materials such as flower petals.
- Classify a substance as acidic, basic or neutral by measuring its pH or from information supplied about its pH.

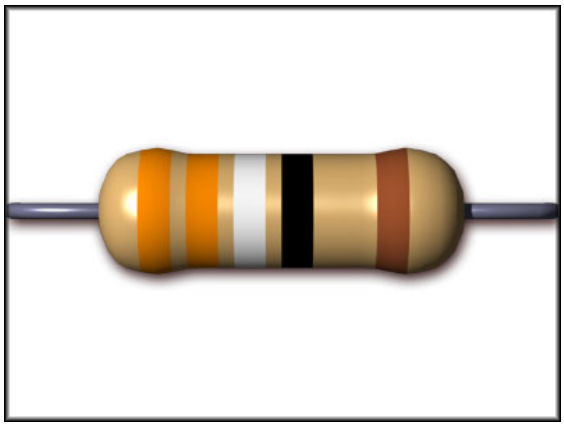
Nitric acid dissolving copper

- Recall that pH scale ranges from 1-14 and understand the significance of pH values.
- Recall that an acid will react with a base to form a neutral salt and water.
- Indicator use (litmus, universal indicator, phenolphthalein)
- Recall some everyday examples of neutralization reactions.
- Recall that an acid will react with a metal to form a metal salt and hydrogen gas.
- Explain how to test for hydrogen gas.
- Recall that carbon dioxide, a metal salt and water are produced when a metal carbonate reacts with an acid.
- Explain how to test for carbon dioxide.
- State the products of a given reaction
- Write a balanced chemical equation for a given word equation

Zip Zap

By the end of this topic I will be able to:

- Explain how to use electricity safely.
- Be able to identify unsafe electrical situations.
- Explain what a current is, in terms of moving electrons.
- Explain the function of each of the following components:
  - power pack
  - wire
  - switch
  - ammeter
  - lamp
  - cell
  - voltmeter
- Set up a circuit from a circuit diagram.
- Explain the difference between parallel and series circuits.
- Design a simple circuit to solve a problem.
- Describe how to connect a voltmeter correctly
- Describe how to connect an ammeter correctly
- Use the equation P=IV to calculate the power of a lamp
- Describe how electrical safety devices work (switches, fuses and earth wires)
- Recall that electricity is a form of energy, measured in joules, and that it can be changed into other forms eg. Kinetic, heat ,light , sound.



A resistor