**SKILLS IN SCIENCE**

**SEPARATION TECHNIQUES**

**Separation techniques.** The separation of substances depends on differences in their physical properties; for example, one solid may be soluble and the other insoluble.

**FILTERING:** separate soluble substance from an insoluble substance eg sand (insoluble) from salt (soluble in water). Technique uses a filter paper and funnel, to separate insoluble materials from a liquid. The liquid that collects in the flask is called the filtrate. The insoluble solid on the filter paper is called the residue.

**EVAPORATING:** heat a solution - the water evaporates - the solid is left behind in the evaporating basin eg get salt from salty water.

**DISTILLATION:** The process of separating a liquid from a solution by evaporating the liquid and then condensing it. The liquid collected is called the distillate. Eg get water from blue ink, or water from salty water.

**MAGNETIC SEPARATION:** Process of separating magnetic iron from non magnetic materials.

**CHROMATOGRAPHY:** Separating dissolved solids from one another eg colours in an ink.

**GLOSSARY**

**Aim** - Purpose of experiment.

**Apparatus** - The gear eg Bunsen, beaker.

**Average** - The mean of numbers – calculated by adding numbers together and dividing by how many pieces of data you had.

**Conclusion** - What you found out from the experiment.

**Condensation** - Water droplets when water vapour turns to water.

**Condense** – a gas turning to liquid.

**Crystal** - Regularly shaped solid, with flat faces.

**Data** - Results, numerical results.

**Decant** - Pour off a liquid and leave a solid behind.

**Diagram** - Labelled picture, usually 2D of science apparatus.

**Dissolve** - Solid splits up and mixes with a liquid to make a solution.

**Equipment** - The apparatus, gear, eg Bunsen, beaker, test tube.

**Evaporate / evaporation** – Turn a liquid into a gas.

**Experiment** - Practical activity to find something out or to demonstrate an idea.

**Fair test** - Type of experiment where just one thing is changed (called the independent variable).

**Hypothesis** - Scientific "guess" or prediction, tested by experiment.

**Insoluble** - A solid (usually) that will not dissolve.

**Laboratory** - Specialist science room.

**Meniscus** - Curved surface of a liquid eg when you look at water in a measuring cylinder.

**Method** - The procedure, instructions of how to do an experiment.

**Mixture** - More than one type of stuff mixed together, eg salty water.

**Results** - Observations or data collected in an experiment.

**Saturated** - Solution that will dissolve no more solid at that temperature.

**Scales** - Markings on side of ruler, thermometer etc or graph axes.

**Soluble** - A substance that can be dissolved.

**Solute** - A substance that is dissolved in a liquid (solvent).

**Solution** - A mixture of a solute dissolved in a solvent.

**Solvent** - A liquid that substances can be dissolved in.

**Suspension** – Insoluble material that “hangs” in the solvent and settles if the mixture is left to stand.

**Temperature** - A measure of how hot or cold a substance is. It is measured in degrees Celsius.

**Units** - What a variable or quantity is measured in.

**Vapour** - Gas state.

**HEAT**

**SY2008**

**WANGANUI HIGH SCHOOL**

**WHS SCIENCE DEPARTMENT**
Soluble and Insoluble
A substance that dissolves is said to be **soluble**. Eg When copper sulfate and water mix they form a **solution**. The "stuff" that dissolves is called the **solute**. The liquid that the stuff dissolves in is called the **solvent**.

A substance that does not dissolve is said to be **insoluble**. Insoluble substances do not mix in water. They usually sink in water (settle out on), and others float on top. Insoluble mixtures do not form solutions but form **suspensions** instead. Eg when mud and water mix the mud does not dissolve in water. If it is left to settle for a while it will eventually sink to the bottom. There is a limit to how much of any solid can dissolve in water or other liquids at a particular temperature. When no more of a solid will dissolve the solution is called **saturated**.

### RESULTS TABLES, BAR CHARTS AND LINE GRAPHS

**Results Table:** This records the data collected from an experiment.

<table>
<thead>
<tr>
<th>Material</th>
<th>Temperature (°C)</th>
<th>Start</th>
<th>After 15 minutes</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pink bats</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminium foil</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Bar Chart:** The items being compared do not affect each other. The bars do NOT touch each other. The numbers on the Y-axis start at 0 and go up evenly.

**Line Graph:** A line graph is best for showing how one variable affects another variable. Generally, with a line graph, both variables are measurable and so both have a number (and units) associated with them.

**Cooling Curve for wax**

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