|  |
| --- |
| **The big picture:**An introduction to science at KS3 involving the development of important scientific skills |
| **lesson** | **Objectives** | **Activities** | **Resources** | **Skills** |
| Lab rules / safety in the lab | Students should learn to* Identify when someone is not working safely in the science lab.
* Explain Hazards, risks & how to control them.
* Construct 10 rules to keep the environment safe for yourselves and others.
 | START* New seating plan and general introduction from teacher.

MAIN:* Read through lab rules. Students to sign and date the document.
* Safety in the lab worksheet. Explain hazard, risk and control methods.

PLENARY:* 10 rules to work safely in the lab.
 | * Bridging booklet pages 2, 3 & 4.
* Agar jelly in watch glass with acid / alkali / water demonstration.
 |  |
| Safety symbols | Students should learn to* Locate the keywords within the word search.
* Describe what each of the safety symbols mean.
* Create a warning / safety symbol.
 | START* Keyword word search
* Show symbol explanation video. http://www.youtube.com/watch?v=izeWHwDCUes

MAIN:* Match up the safety symbol to the correct definition.

PLENARY:* Create a safety symbol for use within school.
 | * Word search
* Bridging booklet pages 5 & 6.
* You tube video.
 |  |
| Apparatus and glassware. | Students should learn to* Identify apparatus used in science.
* Draw diagrams correctly to represent the piece of apparatus.
* Explain the use for each apparatus.
 | START* Show symbols on IWB students to identify familiar symbols and if they know what they mean.

MAIN:* Draw a scientific diagram of each piece of apparatus.
* Match the apparatus to the correct use.

PLENARY:* Pictionary with students drawing the diagrams on the whiteboard and group members need to guess by calling out the name.
 | * Booklet page 7
* Different pieces of apparatus for students to observe.
 |  |
| Reading scales | Students should learn to* Identify the unit and symbol of quantities.
* Read scales accurately.
 | START* Complete the quantities table by filing in the gaps.

MAIN:* Circus of measurements- record results in table.

PLENARY:* Record readings shown on a ruler.
 | * Booklet pages 8 & 9.
* Metre rulers to test for reactions when dropped by a partner. Reading degrees Celsius on a thermometer.
* Measuring liquid using measuring cylinders with different levels of water.
* Calculating volume of different shaped blocks.
* Measuring mass of blocks using scales.
 |  |
| The Bunsen burner | Students should learn to* Identify the features of a Bunsen burner
* Describe how to use a Bunsen safely.
* Display use of a Bunsen.
 | START* Label the appearance of a Bunsen burner.

MAIN:* Use a Bunsen to perform a flame test

PLENARY:* Operate a Bunsen safely and perform in front of the group.
 | * Bridging booklet
* Heatproof mats, Bunsen burners, magnesium strips.
 |  |
| Constructing a bar chart | Students should learn to* Display categorical results within a bar chart.
* Collect results from individuals in the group.
 | START* Odd one out – examples of continuous and categorical data displayed.

MAIN:* Construct bar charts using the data provided and data collected from the group.

PLENARY:* Peer assess bar charts using purple pens
 | * Bridging booklet
* Graph paper
 |  |
| Constructing a line graph | Students should learn to* Display continuous data within a line graph.
 | START* Odd one out – examples of continuous and categorical data displayed.

MAIN:* Construct line graphs using the data provided.

PLENARY:* Peer assessment of line graphs using purple pens
 | * Bridging booklet
* Graph paper
 |  |
| Collecting and communicating continuous data. | Students should learn to* Read temperature using a thermometer and display data collected in a line graph.
 | START* Set up apparatus as shown on the board.

MAIN:* Collect results by recording the temperature every minute for 15 minutes. Then construct a graph displaying the results.

PLENARY:* Peers assess using success criteria.
 | * Bridging booklet
* Beakers, 25 ml measuring cylinders, thermometers, gauze mat, tripod, Bunsen burners, heatproof mats.
 |  |
| Using a key | Students should learn to* Follow the instructions from the key
 | START* Four pictures one word – Display images on IWB students to discuss and provide an answer.

MAIN:* Complete Bioglyph diagram using the symbols within the key.

PLENARY:* Guess the student using their Bioglyph.
 | * Bridging booklet
 |  |
| Explaining variables | Students should learn to* Explain the variables used in science.
 | START* Observe a time trial video of The Stig performing a time trial in TopGear.
* Explain the definitions of variables. (IV, DV, Control)

MAIN:* Identify variables for the time trial.
* Students plan an investigation for hypothesis provided.

PLENARY:* Q+A with students to identify the students understanding.
 | * http://www.topgear.com/uk/videos/stig-lap-r8-v10 - r8 time trial.
* Bridging booklet
 |  |
| Planning an investigation | Students should learn to* Plan and prepare for an investigation.
* Follow instructions to collect data.
* Display data in the correct graph or chart.
 | START* Match the key words to their correct definition.

MAIN:* Plan an investigation for the hypothesis provided.
* Perform the investigation to test the hypothesis provided.
* Display data collected within a graph or chart.

PLENARY:* Quiz – linked to the starter.
 | * Bridging booklet
* Retort stands, Clap, Mass hangers, Springs / Elastic bands.
* Graph paper
 |  |
| Recording observations | Students should learn to* Describe detailed observations for use when recording.
 | START* Spot the difference involving the professor.

MAIN:* Describe observations of the equipment.
* Students sit back to back with one facing the image on the board and needs to describe it to their partner. The partner will need to draw what is being described to them.

PLENARY:* Complete observations within the bridging booklet.
 | * Bridging booklet
* A4 paper and clip boards.
 |  |
| Flying SOLO | Students should learn to* Display progress using SOLO taxonomy.
 | START* Introduce the verbs and symbols of SOLO taxonomy.

MAIN:* Play Lego model of SOLO. Students to display thinking and understanding of houses.

PLENARY:* Provide model answer for students to assess before assessing peers work.
 | * http://www.youtube.com/watch?v=uDXXV-mCLPg - Lego video explaining SOLO.
* Bridging booklet
 |  |
| Baseline testing | Students should learn to* Display knowledge of science.
 | STARTMAIN:* Baseline test

PLENARY: | * Exam paper (SATs)
 |  |