**S2 Genetics - Learning outcomes**

**Lesson 1 – KEYS**

* *Identify* what keys are used for
* Be able to *create* and use a branched key
* Be able to *create* and use a paired statement key

**Lesson 2 – Variation**

* Give a simple *definition* of variation
* *Describe* discontinuous variation, be able to give examples
* *Describe* continuous variation, be able to give examples
* *Choose* which graphs are appropriate to display each type of variation and *analyse* results

**Lesson 3 – What is DNA?**

* Be able to *explain* that DNA controls our characteristics
* *Know* where chromosomes are found in a cell
* *Know* that genes are the basic unit of inheritance
* *Understand* why gametes (sex cells) contain half the number of chromosomes of body cells

**Lesson 4 – DNA extraction**

* Be able to effectively *interpret* and *follow* instructions for the experiment
* Be able to extract DNA from Kiwi/Strawberry
* Be able to write up the aim, method and results of an experiment (*analyse and evaluate*)

**Lesson 5 – Inherited Characteristics**

* *Know* that each person receives 2 pieces of genetic information for each characteristic – one from each parent
* Be able to *interpret* a genetic family tree
* Know the *definitions* of the terms genotype, phenotype, dominant and recessive
* Be able to *apply* punnet squares to determine the genetic makeup of offspring

**Lesson 6 – Beaker Babies**

* *Understand* that offspring get 50% of their genes from their biological mother and 50% from their biological father.
* *Arrange* the combination of genes received in the task and use the data to *prove* that fertilisation is a random process that involves an element of chance

**Lesson 7 – Genetic Disorders**

* Be able to *explain* that genetic disorders are caused when a gene mutates causing a change in the proteins produced
* *State* that most disorders are recessive
* *Apply* your knowledge to learn about the genetic disorder Duchene muscular dystrophy
* *Construct* an argument giving your opinion on whether you think embryos should be screened for genetic disorders

**Lesson 8 – Genetic Disorder Research**

* Through research, *gather* and *interpret* information on a genetic disorder
* Using a resource that you created, *present* your findings to your peers

**Lesson 9 – Genetics and blood typing**

* Be able to *explain* how anti A and anti B serum is used in blood typing
* *Recognise* where blood typing would be used when given a range of scenarios

**Lesson 10 – Selective breeding**

* Be able to *identify* and *explain* uses for selective breeding
* *Apply* knowledge of selective breeding to create “offspring” with desirable characteristics.

**Lesson 11 – Cloning**

* Be able to *describe* the process of cloning, including the words nucleus, DNA, egg and clone
* Be able to *extract* and *evaluate* information from a piece of scientific writing
* What do you think about cloning? Should we clone humans? *Compile* responses to possible cloning debate questions.

**Lesson 12 – Cloning Mimi**

* Further *investigate* the technique used in cloning
* Clone your own Mimi mouse!
* Research selective breeding, cloning or designer babies

**Lesson 13 – Stem cells**

* Be able to *identify* what is special about stem cells
* Be able to give the 2 types of stem cells

**Lesson 14 – Cell Science Investigators**

* Be able to *identify* conditions that can be treated using stem cells
* *Understand* and *evaluate* the basic principles of testing treatments