**LIVING WORLD – INHERITANCE**

**Electronic Science LabBook**

***Designed by ALH***

When you are required to put an answer in this booklet, the point at which you start typing is marked with a **red X.** Your typed answer should also appear in **red**. Delete the **X** leaving just your answer.

If you are required to paste or draw something, this is stated in **BLUE.** You can then photograph your work and paste it into this LabBook. In many experiments and investigations, you will be asked to photograph or video the experiment. You should insert these in the appropriate place in this LabBook.

When you are asked to look at a website for information to write an answer don’t just cut and paste the information in. Read the information and write an answer in **YOUR OWN WORDS**. You may wish to discuss your answer with your classmates and teacher first to make sure you understand it correctly.

For additional work (e.g. homework, revision) you will use the following books. You will be told which pages to use.

SciPad Book 2 Pg 124-148

Science World 10 textbook (written as SW10) Chapter 13

**Learning outcomes for this topic**

Describe the relationship between DNA, genes and chromosomes

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Describe how sex is determined

Task 12

Describe how inheritance provides variation

Task 13

Task 14

Describe how variation is used by Natural Selection to ensure survival of a species

Task 15

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Task 17

* **Describe the relationship between DNA, genes and chromosomes**

### Task 1

Use the information in the link below to describe the relationship between DNA, genes, chromosomes and alleles using the diagram below (remember to include key words in your answer):

<http://learn.genetics.utah.edu/content/chromosomes/intro/>

X

**Task 2**

Take a look at the timeline in the link below to discover the history of DNA.

<http://www.dnai.org/timeline/index.html>

**Task 3**

Use the interactive link below to revise the structure of DNA and the base pairing rule.

<http://www.dnai.org/a/index.html>

**Task 4**

Use the interactive link below to read the information on DNA and to build a DNA molecule.

<http://learn.genetics.utah.edu/content/molecules/builddna/>

**Task 5**

Read the information in the link below to answer the following questions.

<http://learn.genetics.utah.edu/content/chromosomes/intro/>

Describe the structure of DNA. X

Describe the function(s) of DNA. X

Name the three main structures that make up a nucleotide. X

Name the four different bases found in DNA. X

Explain the complimentary base pairing rule. X

## Define and use genetic terms

**Task 6**

The following words are key scientific terms from the inheritance topic. They important to understand, and incorporating them into answers where appropriate can be helpful.

Define each term listed below:

DNA X

Gene X

Allele X

Chromosome X

Punnett Square X

Phenotype X

Genotype X

Heterozygous X

Homozygous X

Recessive X

Dominant X

Purebred X

Variation X

Natural Selection X

## Use simple genetic crosses to predict inheritance of certain traits

### Task 7

View the video in the link below as an introduction to inheritance of characteristics from parents.

<http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel/classification_inheritance/genesandinheritanceact.shtml>

**Task 8**

Use the link below to practise predicting inheritance of genes using Punnett Squares.

<http://www.mhhe.com/biosci/genbio/virtual_labs/BL_05/BL_05.html>

**Task 9**

Use the link below to practise predicting inheritance of genes using Punnett Squares.

<http://vital.cs.ohiou.edu/steamwebsite/downloads/FurryFamily.swf>

**Task 10**

Watch the video in the link below about Punnett Squares.

<http://www.youtube.com/watch?v=d4izVAkhMPQ>

**Task 11**

Click on the link below and test yourself on inheritance and genes.

<http://www.bbc.co.uk/bitesize/quiz/q95090745>

## Describe how sex is determined

## Task 12

Watch the video in the link below on sex determination (pay attention to the human example).

<http://www.youtube.com/watch?v=kMWxuF9YW38>

*Extension*

<http://media.hhmi.org/hl/01Lect1.html>

## Describe how inheritance provides variation

**Task 13**

Try the quiz using the links below to test your knowledge on inheritance and variation.

<http://www.bbc.co.uk/bitesize/quiz/q19540345>

**Task 14**

Fill in the gaps with an appropriate missing word to make the following paragraphs complete.

Using the following words: *parent, variation, genes, random, alleles*

When organisms reproduce, not all offspring are necessarily the same. The scientific term for this is X. The traits of organisms can vary greatly, even in organisms with the same parents.

Each characteristic is coded for by X, which are made up of two different versions, called X. Each offspring receives one allele from each X. Which allele is inherited from which parent is completely X and there are multiple possibilities. This gives rise to difference within a population, which is known as genetic variation.

## Describe how variation is used by Natural Selection to ensure survival of a species

**Task 15**

Variation in a species ensures some organisms to survive better which means they are more likely to reproduce and pass on their alleles to the next generation.

If parents possess alleles which allows them to survive better and therefore reproduce, their offspring will inherit those alleles too and will also survive better. Eventually all individuals will possess the advantageous alleles. This is known as survival of the fittest, or Natural Selection.

**Task 16**

Use the link below to play genetics games with Charles Darwin

<http://www.sciencechannel.com/games-and-interactives/charles-darwin-game.htm>

**Task 17**

Watch the video in the link below about natural selection survival of the fittest

<http://www.youtube.com/watch?v=AMtT5_AQmLg>