

Chip Off the Old Block – Module Overview

Student Challenge – Design a hypothetical baby.

Module Intent:

- Introduction to bioengineering.
- Learning to write a detailed lab report.

Module Science Concepts

- Heredity and genetics
- Mitosis & Meiosis

Module Math Concepts

- Independent vs. Dependent variables
- Types of graphs
- Make predictions based on probability

Module Engagement

Introduce module challenge.
Assess background knowledge.

Scientific Investigation

Activity 1 – Take a Gook

Look at Yourself –

Structured Inquiry – Students conduct inventories of their own inherited traits..

Concepts: Inherited traits. Simple random samples.

Activity 2 – What is Your Pedigree

Structured & Guided Inquiry – Students explore, explain, and evaluate on Pedigree chart.

Concepts: Inherited traits. Analyze tables and graphs.

Activity 3 – Are You My Phenotype

Structured Inquiry – Students explore the phenotypes of genetic corn seedlings.

Concepts: Dominant and recessive genes. Probability

Activity 4 – Language of Chromosomes

Guided Inquiry – Students explore the structure of cells and chromosomes.

Concepts: Diploid and Haploid

Activity 5 – Cell Cycle and Mitosis

Structured Inquiry – Students explore where new cells come from when old cells dies.

Concepts: Mitosis. Cell Cycle

Activity 6 – A Different Type of Cell Division: Meiosis

Structured & Guided Inquiry – Students explore the process by which sex cells are produced in plants and animals.

Concepts: Meiosis.

Design and Engineering

Activity 7 – Dominant and Recessive Traits in Humans

Structured & Guided Inquiry – Students begin designing their hypothetical baby.

Concepts: Homozygous, Heterozygous, and Punnett Squares. Dominant and recessive traits.

Activity 8 – In All Probability

Structured & Guided Inquiry – Students practice combining alleles through the use of Punnett Squares.

Concepts: Make predictions based on probability.

Activity 9 – Engineering a Hypothetical Baby

Guided and Open Inquiry – Students engineer two hypothetical babies.

Concepts: Well structured inquiry. Learn to write a detailed lab report.

Module Extension Effects of Gravity

Activity 10 – DNA Fingerprinting

Structured Inquiry - Students explore the structure of DNA

Concepts: Chemical structure of DNA. Replication and structure of base pairs.

Activity 11 – Recombinant DNA

Structured Inquiry - Students explore the technologies of recombinant DNA.

Concepts: Present and future uses of recombinant DNA technology.