

Genetics

Reproduction and meiosis

Asexual reproduction **Triple only**

One parent No mate needed Rapid cycle No variation

Sexual reproduction **Triple only**

Two parents Variation Must find a mate

Meiosis

Four daughter cells Half the chromosomes
Genetically different

Gametes

Haploid Fuse at fertilisation

Human chromosome numbers

Body cell: 46 Gamete: 23 Zygote: 46

DNA and the genome

DNA polymer

Nucleotides Double helix Two strands

Nucleotide

Sugar Phosphate group One of four bases

Complementary base pairs

A with T C with G Weak hydrogen bonds

Genome

Entire DNA of an organism

Gene

Section of DNA Codes for a protein

Extracting DNA from fruit

Mash Detergent and salt Filter Cold ethanol

Protein synthesis **Triple only Higher tier**

Base order to amino acids **Triple only Higher tier**

Chain folds Specific shape Enzymes

Transcription **Triple only Higher tier**

RNA polymerase Non-coding DNA binding
Complementary mRNA

Translation **Triple only Higher tier**

mRNA on ribosome Codons tRNA Polypeptide

Variant in non-coding DNA **Triple only Higher tier**

RNA polymerase binding Quantity of protein

Variant in coding DNA **Triple only Higher tier**

Amino acid sequence Protein activity

Inheritance

Gregor Mendel **Triple only**

Pea plants Factors inherited Mechanism unknown

Key terms

Allele Dominant, recessive Homozygous, heterozygous
Genotype, phenotype

Monohybrid cross

Punnett square Pedigree 3 : 1 ratio

Sex determination

XX female XY male 50% each

Probability

Ratios Fractions Percentages Carriers: 1 in 4

ABO blood groups **Triple only**

Multiple alleles Codominance IA, IB codominant
IO recessive

Sex-linked disorders **Triple only Higher tier**

X chromosome Males more affected Carrier females

Variation and genome

Multiple genes

Most features

Genetic variation

Mutation Sexual reproduction

Environmental variation

Acquired characteristics

Mutations

Most no effect Some small effect Rarely significant

Human Genome Project

Medical uses Testing Treatments