Patterns of Inheritance

What are Chromosomes?

They are formed when the DNA is tightly coiled, to keep it organized. We see chromosomes when the cell is dividing.

What are Genes?

On each pair of Chromosomes, it is a specific area when the DNA codes a specific protein. Eg Hair Colour

What are Alleles?

Are the different forms of the genes.
Dominant - Capital letter eg Brown Hair (B)
Recessive - small letter eg Blonde Hair (b)

Summary

Movie

Remember that every person has 2 alleles for every gene.
After meiosis, one allele from each parent is passed on to the gamete.

Homozygous - 2 alleles that are the same (purebred)

Heterozygous - 2 alleles that are different (hybrid)

Dominant - the allele that always shows when present

Recessive - the allele that only shows when homozygous

Genotype - letters of the alleles (eg) Aa

Phenotype - physical appearance (eg) Brown hair or Blond hair

Let's look at a specific example.

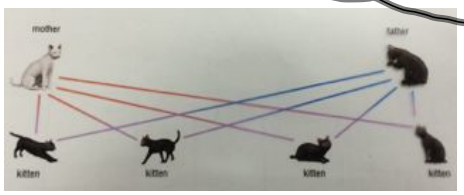
Gene - Hair Colour
Alleles Brown - dominant B
Blonde - recessive b

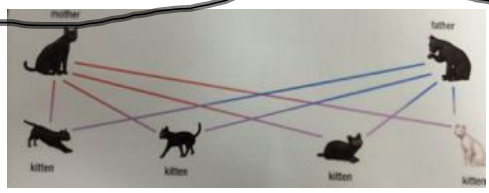
Parent 1 - Homozygous Dominant
BB What two gametes can be formed from this genotype?

B + B

Parent 2 - Heterozygous
Bb What two gametes can be formed from this genotype?

B + b





Punnett squares help us predict what offspring can be produced.

Parent 1

Parent 2	B	B
B	BB	BB
b	Bb	Bb

Offspring Genotypes
BB → 2/4 → 50%.
Bb → 2/4 → 50%.

Offspring Phenotypes
Brown 4/4 → 100%

Let's try two heterozygous parents

Parent one genotype Bb Gametes produced B + b

Parent two genotype Bb Gametes produced B + b

	B	b
B	1) BB	2) Bb
b	3) Bb	4) bb

Offspring Genotypes

BB → 1/4 → 25%.

Bb → 2/4 → 50%.

bb → 1/4 → 25%.

Offspring Phenotypes

Brown 3/4 75%.

Blonde 1/4 25%.

What if a pure bred blonde (homozygous recessive) produced offspring with a heterozygous mate? What are the chances of having a blonde baby?

Parent one genotype bb Gametes produced b + b

Parent two genotype Bb Gametes produced B + b

	b	b
B	1) Bb	2) Bb
b	3) bb	4) bb

Offspring Genotypes

bb 2/4 50%.

Bb 2/4 50%

Offspring Phenotypes

Brown 2/4 50%.

Blonde 2/4 50%.

Do Check and Reflect Questions pg 54 # 1, 2, 4, 5, 7