

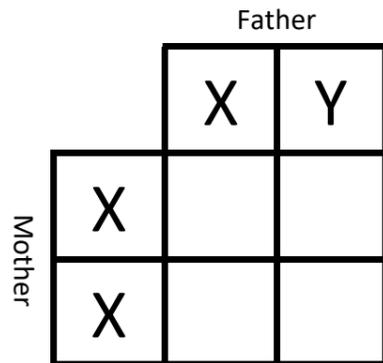
Paper 2 — Chapter 6A

Reproduction and Inheritance

Sex Determination

Ordinary human body cells have ___ chromosomes. Gametes (eggs and sperm) have ___ chromosomes. Males have ___ sex chromosomes. Females have ___ sex chromosomes.

Finish the genetic diagram to show the possible offspring sex chromosomes



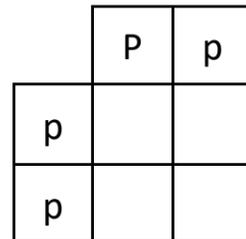
What is the chance of the parents having a male child? ___

Inherited Disorders

_____ (having extra fingers or toes) is caused by a DOMINANT/RECESSIVE allele.

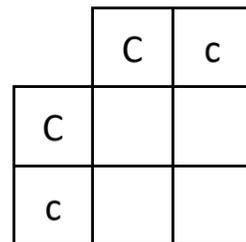
_____ (a disorder of cell membranes) is caused by a DOMINANT/RECESSIVE allele.

What is the chance of these parents having a child with polydactyly?



P = polydactyly allele
P = healthy allele

What is the chance of these parents having a child with cystic fibrosis?



C = healthy allele
C = cystic fibrosis allele

What are people called who have the recessive allele for the disease but not the disease?

How could the parents ensure they had healthy children?

Genetic Inheritance

GAMETE
CHROMOSOME
GENE
ALLELE
DOMINANT
RECESSIVE
HOMOZYGOUS
HETEROZYGOUS
GENOTYPE
PHENOTYPE

The alleles present
The expressed characteristic
A sex cell e.g. egg or sperm
A long section of DNA that contains many genes
A small section of DNA that codes for a protein
Different forms of a gene
A type of allele that is always expressed
A type of allele that needs 2 copies to be expressed
Both alleles are the same
The organism has 2 different alleles

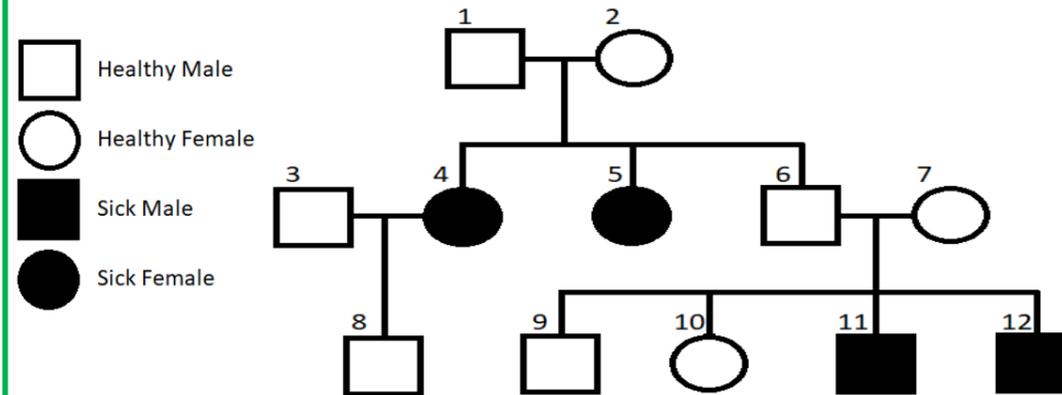
Most characteristics are a result of SINGLE/MULTIPLE genes interacting

Name 2 Characteristics that are the result of a single gene

- _____ in mice
- Red/Green _____

Most phenotype characteristics are the result of SINGLE/DOUBLE/MULTIPLE genes.

Below is a family tree for the recessive disease cystic fibrosis. The healthy people could be carriers or could be completely healthy



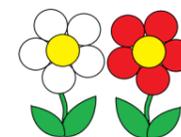
Which 5 healthy people must be carriers?

Which 3 people could be carriers or healthy?

Genetic Crosses

R = Red Flower Allele, r = White Flower Allele

RR = Homozygous Red, Rr = Heterozygous Red, rr = Homozygous White



What is the ratio of red flower to white flower offspring from the following crosses

- RR x rr RR x Rr Rr x Rr Rr x rr rr x rr

DNA and the Genome

The genetic material in the NUCLEUS/MEMBRANE/VACUOLE of a cell is a chemical called DNA.

DNA is a MONOMER/POLYMER/TRIMER made up of two strands forming a SINGLE/DOUBLE/TRIPLE helix. The DNA is contained in structures called CHROMOSOMES/BASES/PROTEINS.

A gene is a section of DNA that codes for a particular sequence of AMINO ACIDS/FATTY ACIDS/GLUCOSE MOLECULES, to make a specific FAT/CARBOHYDRATE/PROTEIN molecule.

All the genetic material in an organism is its CHROMOSOME/GENOME/GAMETE

Give 3 reasons why it is important to continue studying and understanding the human genome.

-
-
-



Sexual and Asexual Reproduction

Name the gamete (sex cells)

Plant Male Cell —

Animal Male Cell —

Plant and Animal Female Cell —

Sexual Reproduction	Asexual Reproduction

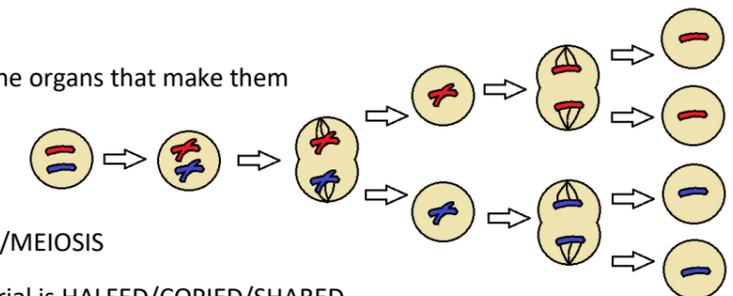
Add the key words to the table

Meiosis, Mitosis, 1 parent, Clones, No Gametes, Variation, Gametes, Genetically Identical, 2 Parents, Non-Identical

Meiosis

Name the human gametes and the organs that make them

-
-



Gametes are formed by MITOSIS/MEIOSIS

Before division the genetic material is HALFED/COPIED/SHARED

During meiosis the cell divides ONCE/TWICE/4 TIMES to form 2/4/6/8 gametes, each with a SINGLE/DOUBLE/TRIPLE set of chromosomes

All gametes genetically DIFFERENT FROM/IDENTICAL TO each other.

Human gametes have ___ Chromosomes. Human body cells have ___ chromosomes.

Gametes join at fertilisation. The new cell divides by MEIOSIS/MITOSIS to form a ball of cells called an EMBRYO/ZYGOTE/FETUS.

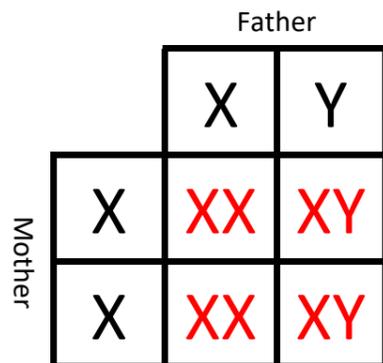
Paper 2 — Chapter 6A

Reproduction and Inheritance

Sex Determination

Ordinary human body cells have **46** chromosomes. Gametes (eggs and sperm) have **23** chromosomes. Males have **XY** sex chromosomes. Females have **XX** sex chromosomes.

Finish the genetic diagram to show the possible offspring sex chromosomes



What is the chance of the parents having a male child? **50%**

Inherited Disorders

Polydactyly (having extra fingers or toes) is caused by a **DOMINANT/RECESSIVE** allele.

Cystic fibrosis (a disorder of cell membranes) is caused by a **DOMINANT/RECESSIVE** allele.

What is the chance of these parents having a child with polydactyly?

	P	p
p	Pp	pp
p	Pp	pp

P = polydactyly allele
P = healthy allele **50%**

What is the chance of these parents having a child with cystic fibrosis? **25%**

	C	c
C	CC	Cc
c	Cc	cc

C = healthy allele
C = cystic fibrosis allele

What are people called who have the recessive allele for the disease but not the disease? **Carriers**

How could the parents ensure they had healthy children? **Embryo screening**

Genetic Inheritance

GAMETE	The alleles present
CHROMOSOME	The expressed characteristic
GENE	A sex cell e.g. egg or sperm
ALLELE	A long section of DNA that contains many genes
DOMINANT	A small section of DNA that codes for a protein
RECESSIVE	Different forms of a gene
HOMOZYGOUS	A type of allele that is always expressed
HETEROZYGOUS	A type of allele that needs 2 copies to be expressed
GENOTYPE	Both alleles are the same
PHENOTYPE	The organism has 2 different alleles

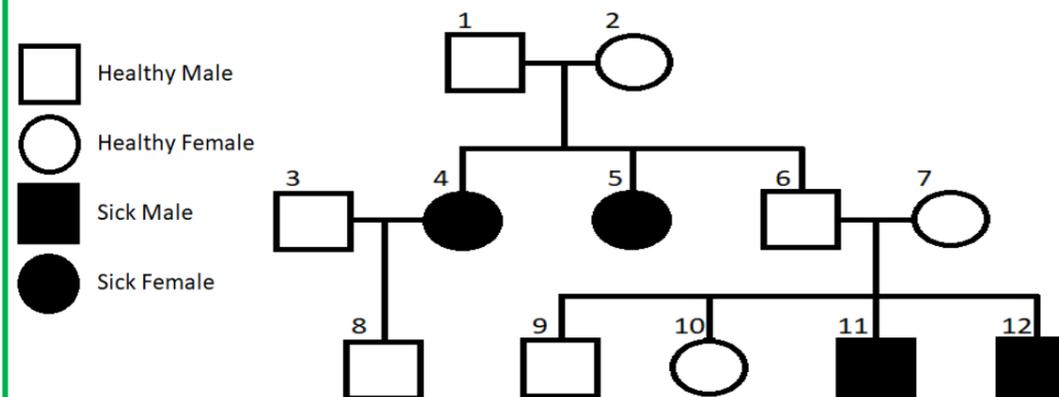
Most characteristics are a result of **SINGLE/MULTIPLE** genes interacting

Name 2 Characteristics that are the result of a single gene

- Fur Colour** in mice
- Red/Green colour blindness**

Most phenotype characteristics are the result of **SINGLE/DOUBLE/MULTIPLE** genes.

Below is a family tree for the recessive disease cystic fibrosis. The healthy people could be carriers or could be completely healthy



Which 5 healthy people must be carriers? **1, 2, 6, 7, 8**

Which people could be carriers or healthy? **3, 9, 10**

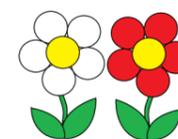
Genetic Crosses

R = Red Flower Allele, r = White Flower Allele

RR = Homozygous Red, Rr = Heterozygous Red, rr = Homozygous White

What is the ratio of red flower to white flower offspring from the following crosses

RR x rr	RR x Rr	Rr x Rr	Rr x rr	rr x rr
100% Red	100% Red	3:1	1:1	100% White



DNA and the Genome

The genetic material in the **NUCLEUS/MEMBRANE/VACUOLE** of a cell is a chemical called DNA.

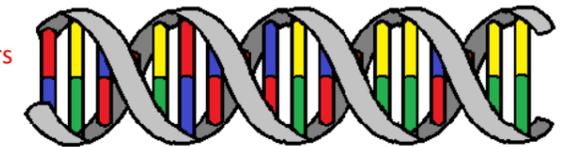
DNA is a **MONOMER/POLYMER/TRIMER** made up of two strands forming a **SINGLE/DOUBLE/TRIPLE** helix. The DNA is contained in structures called **CHROMOSOMES/BASES/PROTEINS**.

A gene is a section of DNA that codes for a particular sequence of **AMINO ACIDS/FATTY ACIDS/GLUCOSE MOLECULES**, to make a specific **FAT/CARBOHYDRATE/PROTEIN** molecule.

All the genetic material in an organism is its **CHROMOSOME/GENOME/GAMETE**

Give 3 reasons why it is important to continue studying and understanding the human genome.

- To find genes linked to diseases**
- To understand and treat genetic disorders**
- To trace past human migration patterns**



Sexual and Asexual Reproduction

Name the gamete (sex cells)

Plant Male Cell — **Pollen**

Animal Male Cell — **Sperm**

Plant and Animal Female Cell — **Egg Cell**

Add the key words to the table

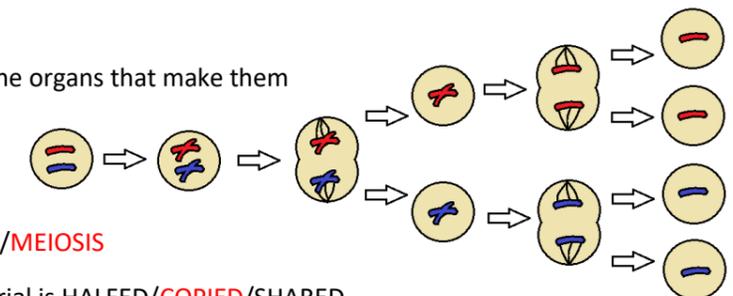
Meiosis, Mitosis, 1 parent, Clones, No Gametes, Variation, Gametes, Genetically Identical, 2 Parents, Non-Identical

Sexual Reproduction	Asexual Reproduction
Meiosis	Mitosis
2 Parents	1 Parent
Variation	Genetically Identical
Gametes	Clones
Non-Identical	No Gametes

Meiosis

Name the human gametes and the organs that make them

- Egg cells — Ovaries**
- Sperm Cells — Testes**



Gametes are formed by **MITOSIS/MEIOSIS**

Before division the genetic material is **HALFED/COPIED/SHARED**

During meiosis the cell divides **ONCE/TWICE/4 TIMES** to form **2/4/6/8** gametes, each with a **SINGLE/DOUBLE/TRIPLE** set of chromosomes

All gametes genetically **DIFFERENT FROM/IDENTICAL** TO each other.

Human gametes have **23** Chromosomes. Human body cells have **46** chromosomes.

Gametes join at fertilisation. The new cell divides by **MEIOSIS/MITOSIS** to form a ball of cells called an **EMBRYO/ZYGOTE/FETUS**.