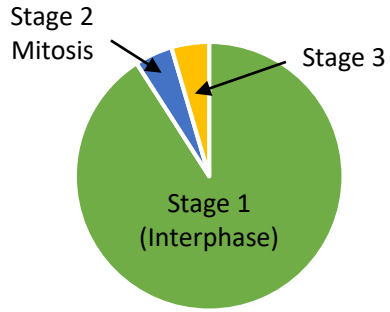
Biology: Cellular Division and Stem Cells

Key word	Definition
Specialised cell	A cell which has specific features to perform its function
Differentiate	The process when a stem cell becomes a specialised cell
Stem cells	Cells that can differentiate into specialised cells. Embryos contain stem cells
Embryo	An embryo develops from a fertilised egg. Cells at the early stages in the development of the embryo are stem cells
Ethics	Considering how scientific research or discoveries might effect communities and the environment
Therapeutic cloning	A technique in which stem cells are produced and can be used to cure disease
Mitosis	Cell division in which a body cell copies itself and divides into two identical (clone) daughter cells.
Cell cycle	The 'life cycle' of a cell. There are 3 main stages
Division	A process by which a parent cell divides into two or more daughter cells
Chromosome	DNA molecule containing genetic material (genome) of an organism

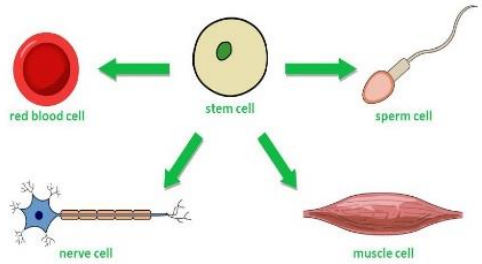


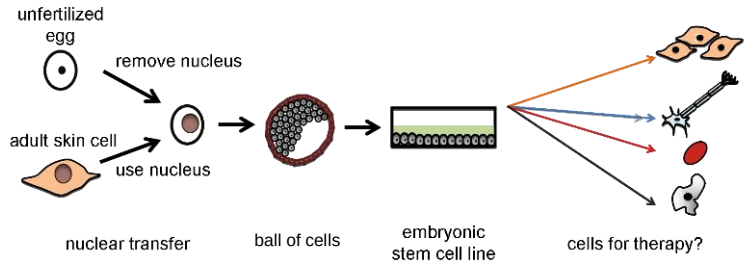
The cell cycle has 3 stages;

1. The cell grows, makes more organelles and **doubles** its DNA
2. Mitosis
3. The cell splits to make two new identical (clone) body cells

Stem cells differentiate into specialised cells.

- **Embryo** stem cells can **differentiate** into any type of cell.
- **Adult stem cells** will only differentiate into certain cells
- **Meristems** can differentiate into any type of plant cell



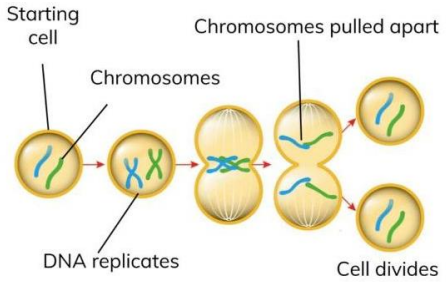


Stem cells and therapeutic cloning can treat diseases

Ethics (positive + or negative -)

+ Cells from embryos will not be rejected
+ Stem cells may be used to treat diseases in the future
- Risks such as transfer of viruses
- Using egg cells and embryos is viewed as killing a life
- The egg does not have a choice

In **mitosis** the doubled DNA is pulled apart into **two** separate, **identical** (clone) daughter cells.



Most human body cells have 23 pairs (46) chromosomes