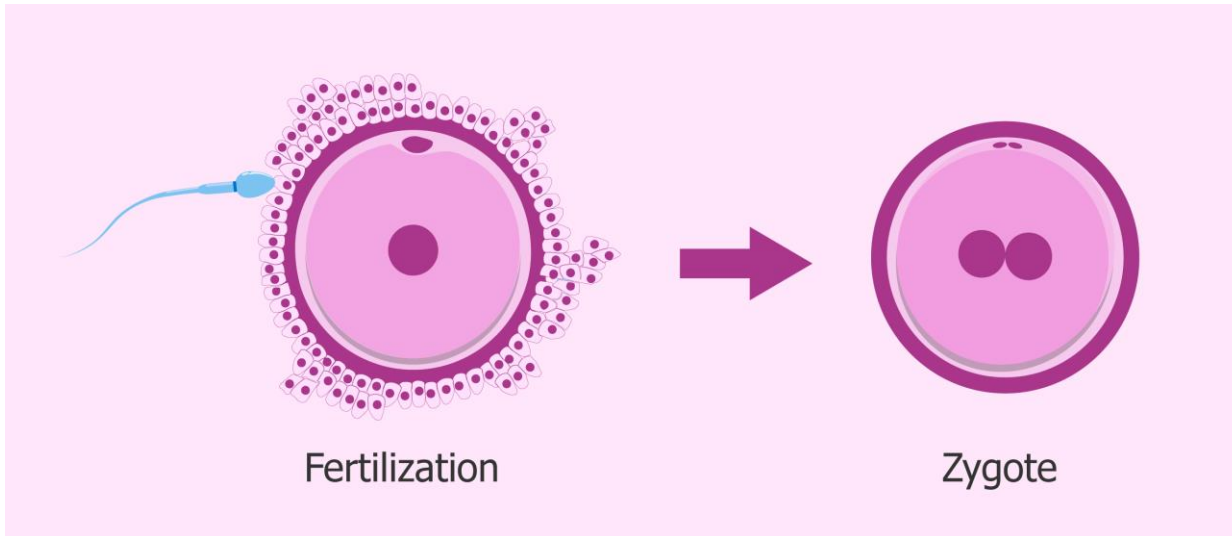


MITOSIS

4A Mr. Erick Santizo

INTRODUCTION:

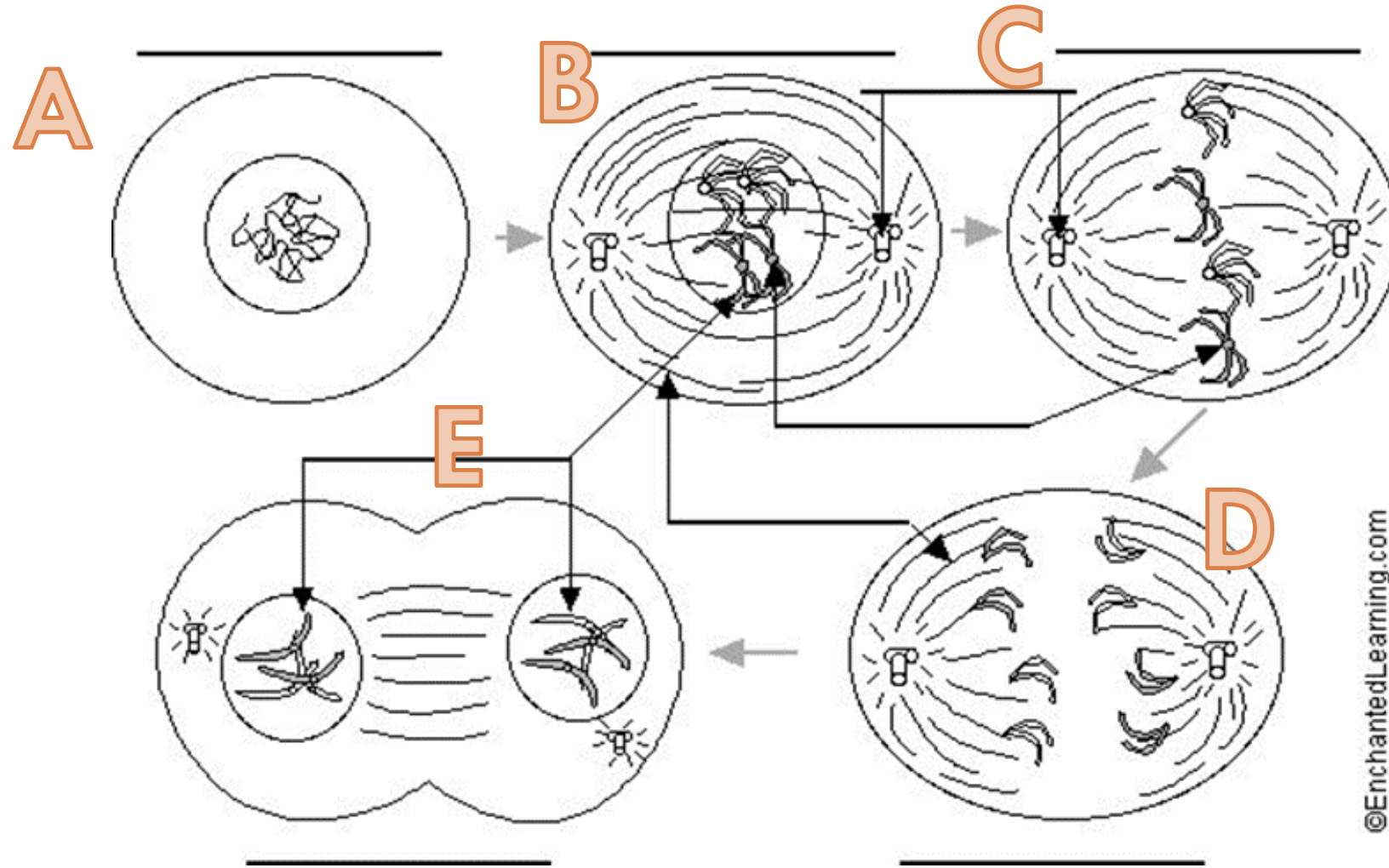
Why a cell such as a zygote cannot grow by getting larger ?



Because its surface area to volume ratio would **DECREASE** and it would not get enough oxygen to sustain itself.

Therefore, cell division occurs for an organism to grow, involving nuclear division; where the nucleus divides by **MITOSIS** so that each new cell has the genetic information it needs.

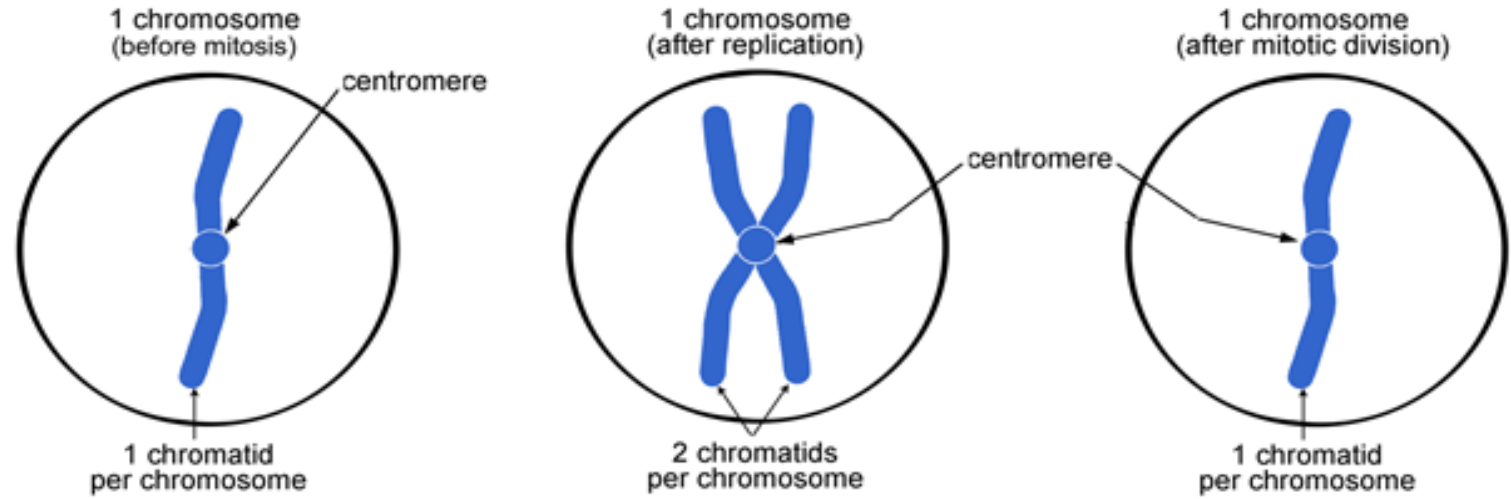
EXPLORE: FIGURE OUT THE PROCESS



**VIDEO: WHAT ARE THE NAME OF EACH STAGE: USE
UNSCRAMBLE PROCESS**



EXPLAIN:



Before Mitosis:

- New copies of genetic information in the DNA of each chromosome must be made.
- During copying, the DNA in the chromosome is uncoiled and arranged very loosely in the nucleus.
- After copying, each chromosome consists of two copies of all DNA Material.
- As Mitosis begins, DNA coils up tightly.
- Each chromosome appears double stranded.
- The two genetically identical strands are chromatids. (copying of DNA is replication)

DURING MITOSIS:

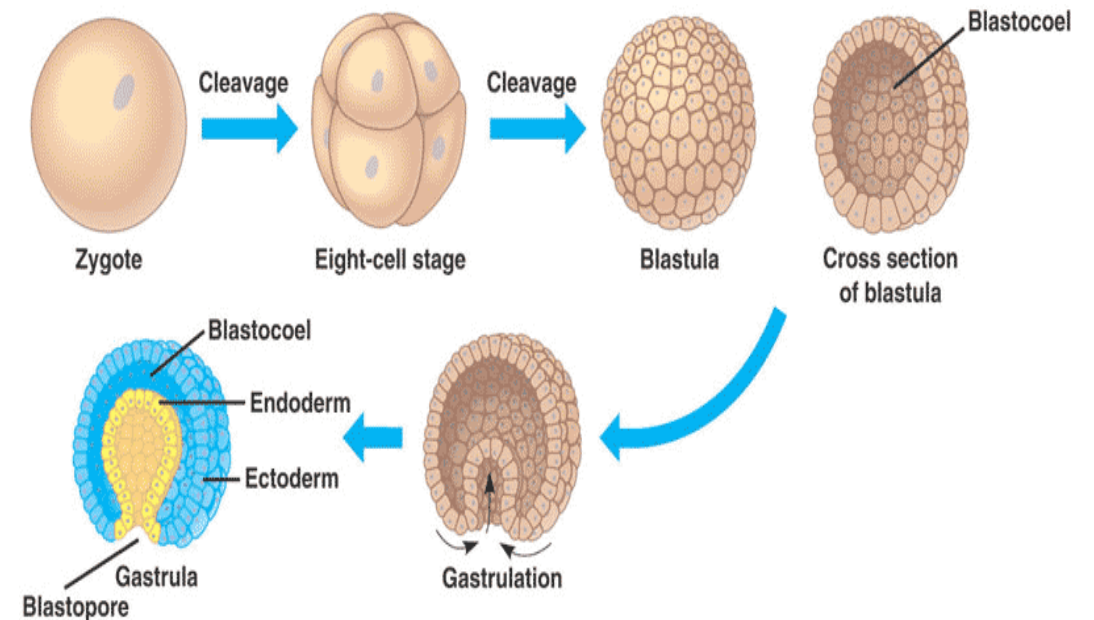
Human cells have 46 chromosomes.

- As a result of mitosis each daughter cell has the same number of chromosomes as the original parent cell.

Mitosis occurs in:

- **Growth:** starts with 1st division of the zygote and then throughout the body of a plant or animal embryo; later it is restricted to certain places: meristems in plants and long bones.

- **Replacement of cells:** cells wear out and die, such as red blood cells, which only live for a short time as they do not have a nucleus.



DURING MITOSIS:

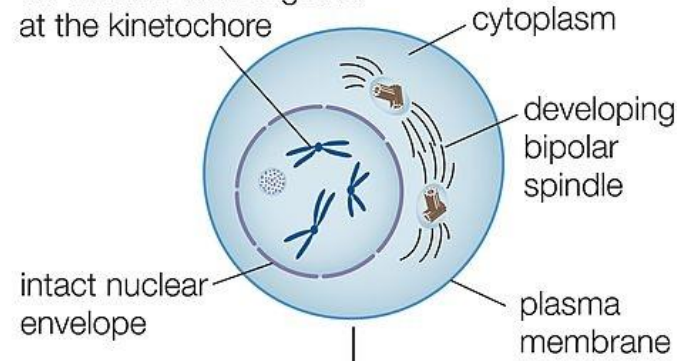
- Tissue and wound repair: stem cells at the base of the epidermis divide to repair wounds in the skin.
- Asexual reproduction: fungi and plants, rare in animal kingdom. (clones) twins are clones as they form from the same embryo that split.



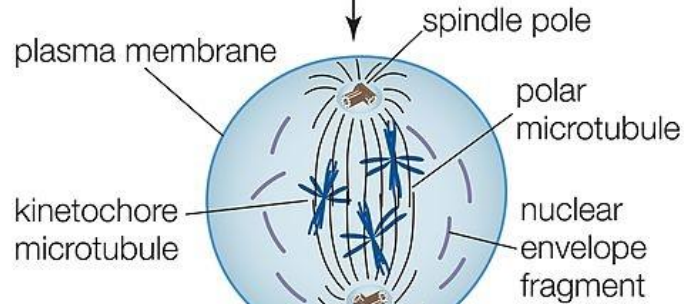
Mitosis, or somatic cell division

prophase

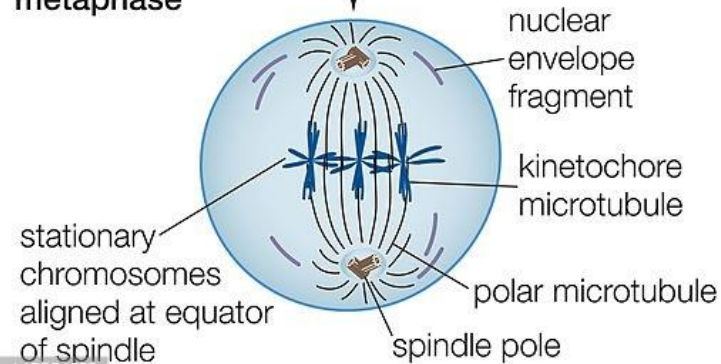
condensing chromosome with two chromatids held together at the kinetochore



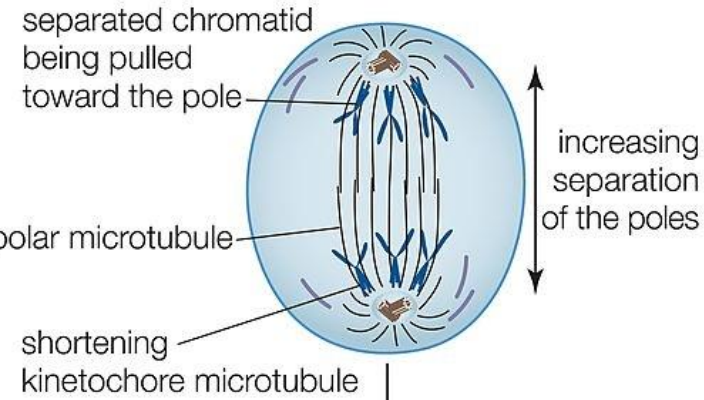
prometaphase



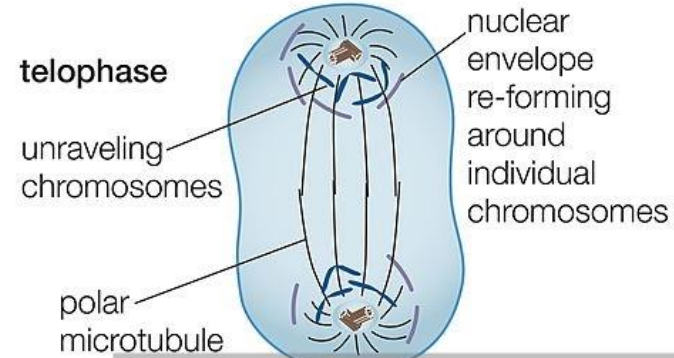
metaphase



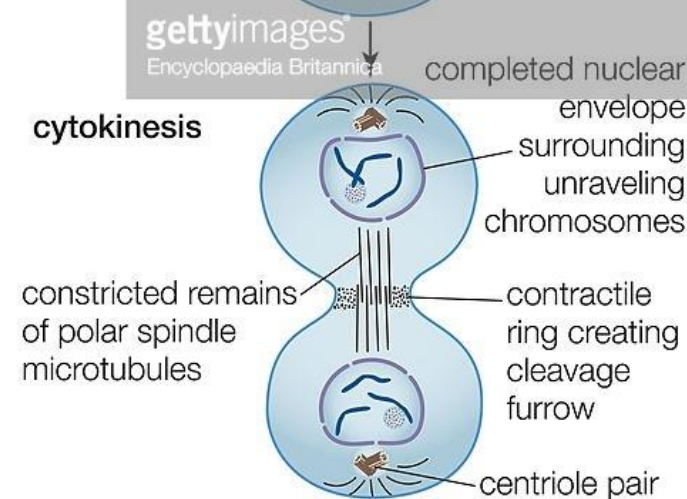
anaphase



telophase



cytokinesis



MITOSIS AND ASEXUAL REPRODUCTION IN PLANTS

Some plants can reproduce asexually by mitosis occurring in certain structures of the parent plant.

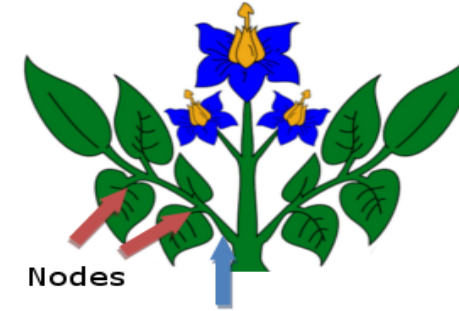
This is known as vegetative propagation.

All offspring's are produced from one parent (genetically identical)

Collectively they are known as clones

Cloning is the process of making genetically identical organisms through non-sexual means.

How to Clone Plants



1. Take clone from mother plant

2.

Cut off large leaves on the bottom

Leave the small leaves on top



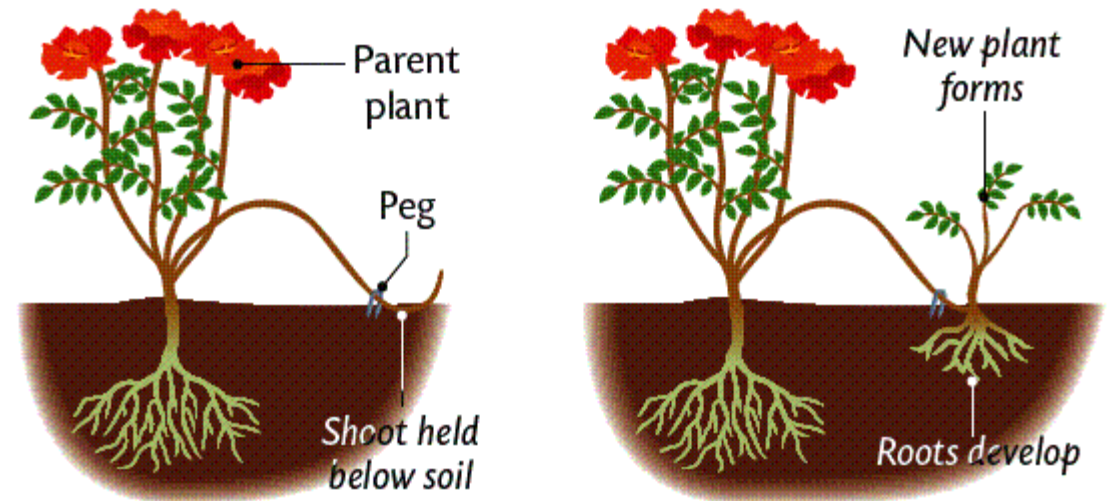
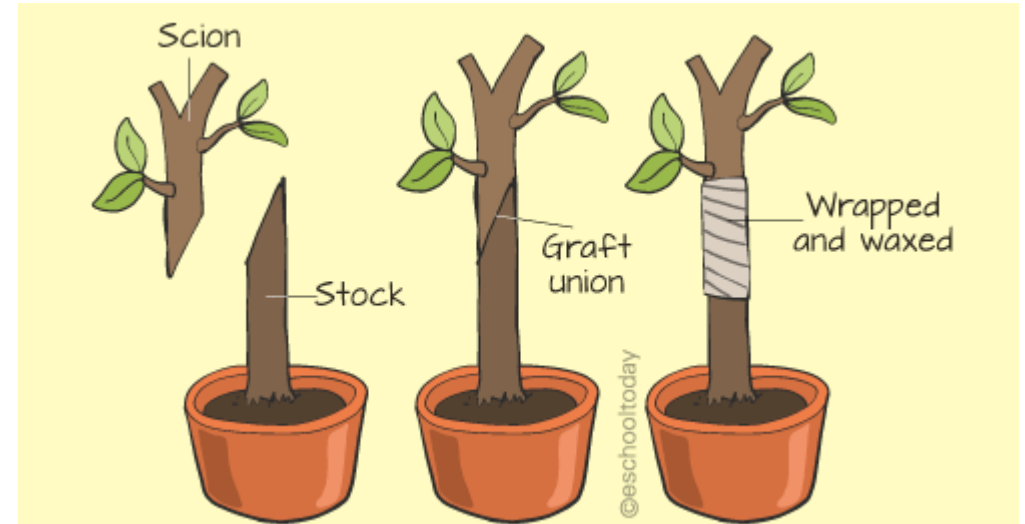
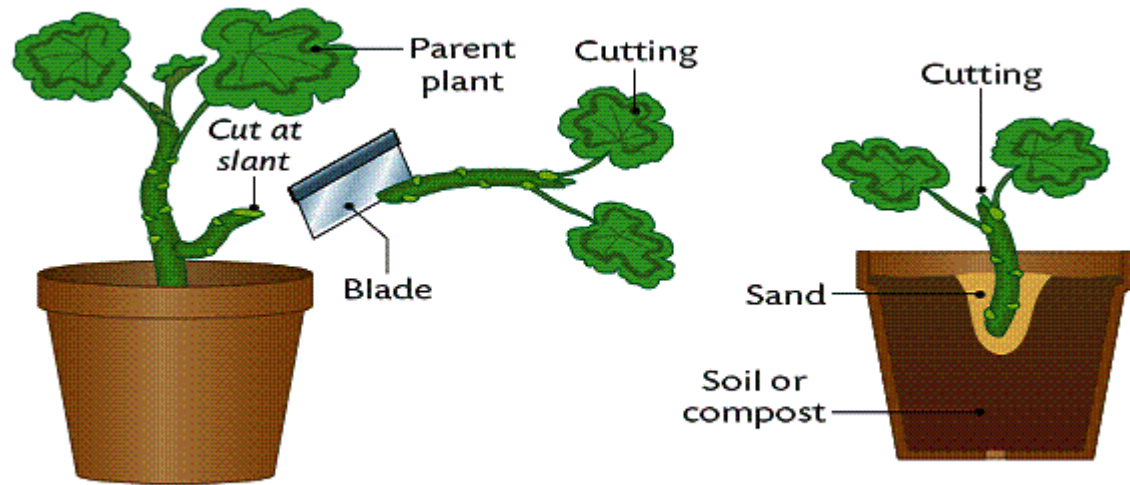
Cut bottom of stem at 45° angle with a razor blade

3. Dip clone into cloning solution



4. Put clone in grow medium
Spray with Herb Doctor

VEGETATIVE PROPAGATION



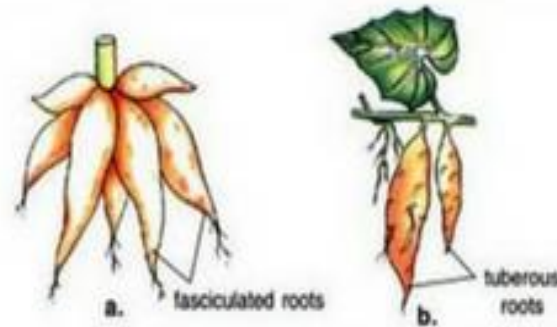


Vegetative

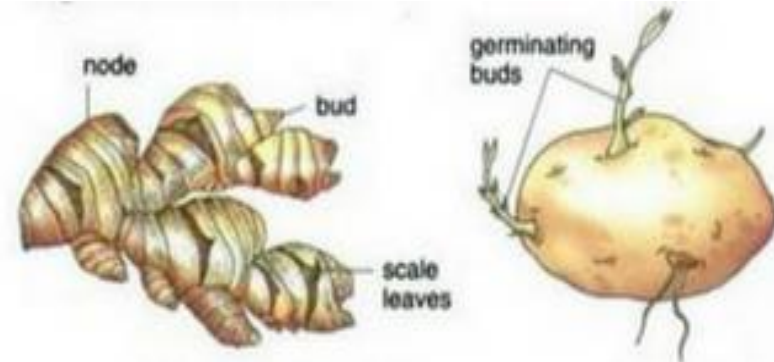
Propagation

Methods

www.plantscience4u.com

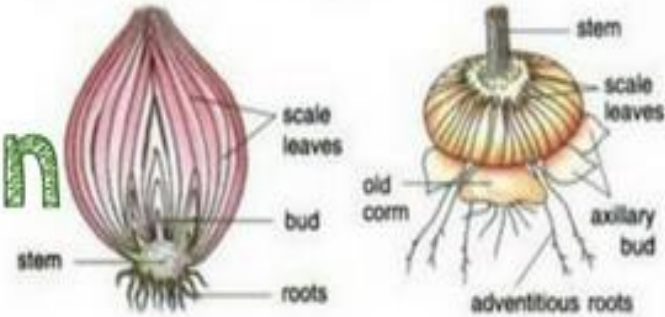


Vegetative propagation by roots of *Dahlia* and sweet potato



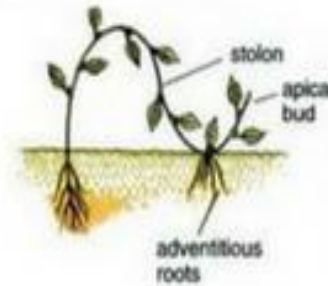
Vegetative propagation by rhizome in ginger

Vegetative propagation by tuber in potato



Vegetative propagation by bulb in onion

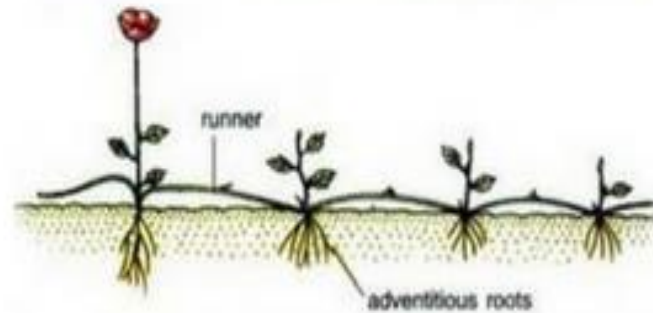
Vegetative propagation by corm in *Gladiolus*



Vegetative propagation by stolon



Vegetative propagation by sucker in *Chrysanthemum*



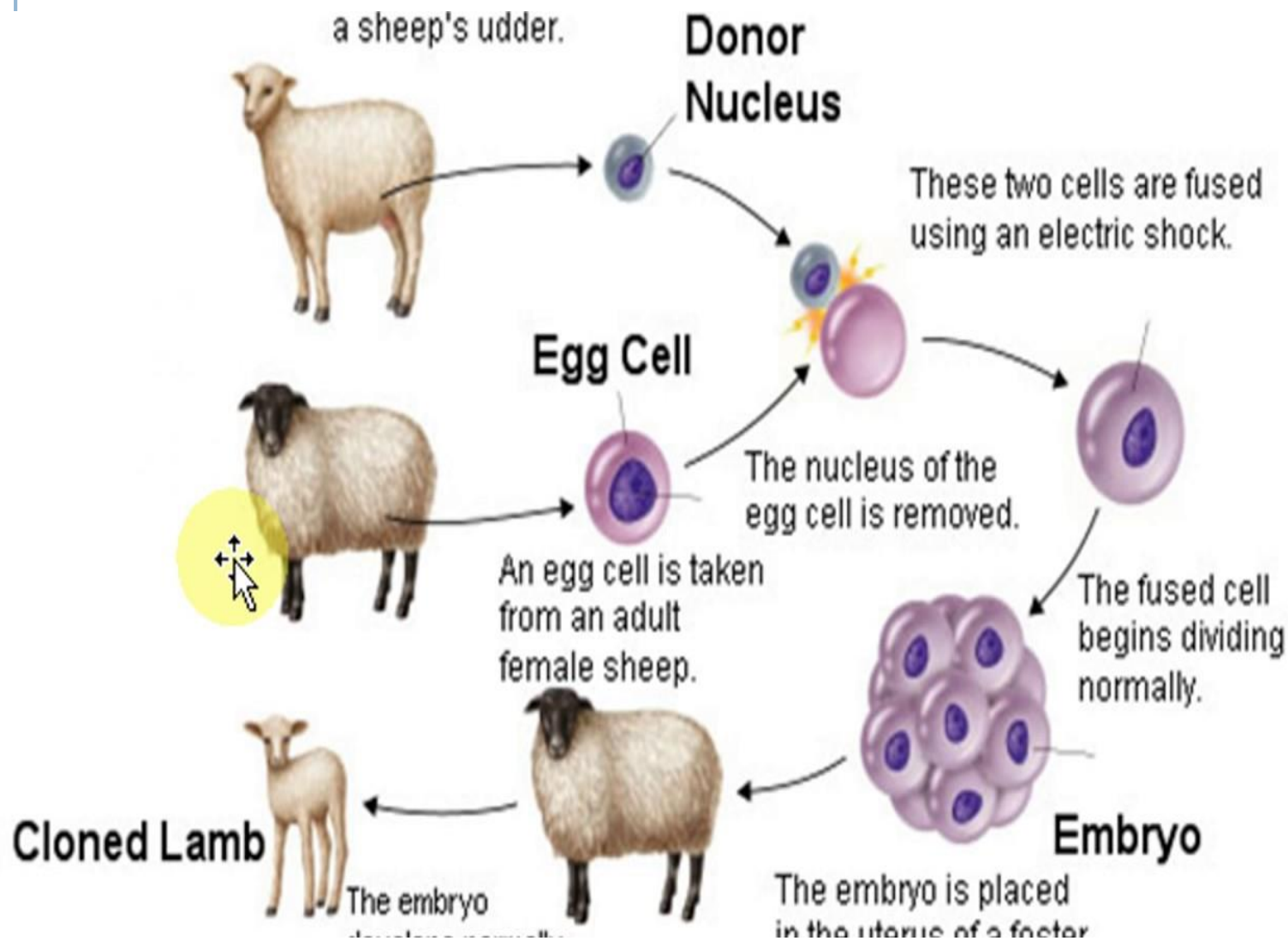
Vegetative propagation by runner in strawberry



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Vegetative propagation by offset in water lettuce

CLONING IN ANIMALS



1. A nucleus is removed from an ovum of a female donor.
 2. A cell, still containing its nucleus, is taken from the animal to be cloned and is fused with an ovum.
 3. This newly created ovum is placed into the foster mother where it is stimulated to develop into an embryo.
 4. Foster mother gives birth to a new individual which is genetically identical to the original animal in came.
- E.G Dolly the sheep

QUESTIONS:

1. Explain what is meant by: chromosome, chromatid, mitosis and cell division.
2. Describe what happens inside a cell before it can divide by mitosis.
 - B. describe what happens to a chromosome during mitosis.
 - C. Describe what happens to a cell after mitosis is complete.
3. Make models of chromosomes using modelling clay, pipe cleaners or lengths of wool or string. Use your models to show what happens to chromosomes when cells divide by mitosis.
4. Explain why:

Human red blood cells do not live very long and why they cannot divided.