Asexual Reproduction
Mitosis

EQ: Mitosis is the process in which the nucleus divides to form two new nuclei. How does mitosis differ in plants and animals?

ANALYZE

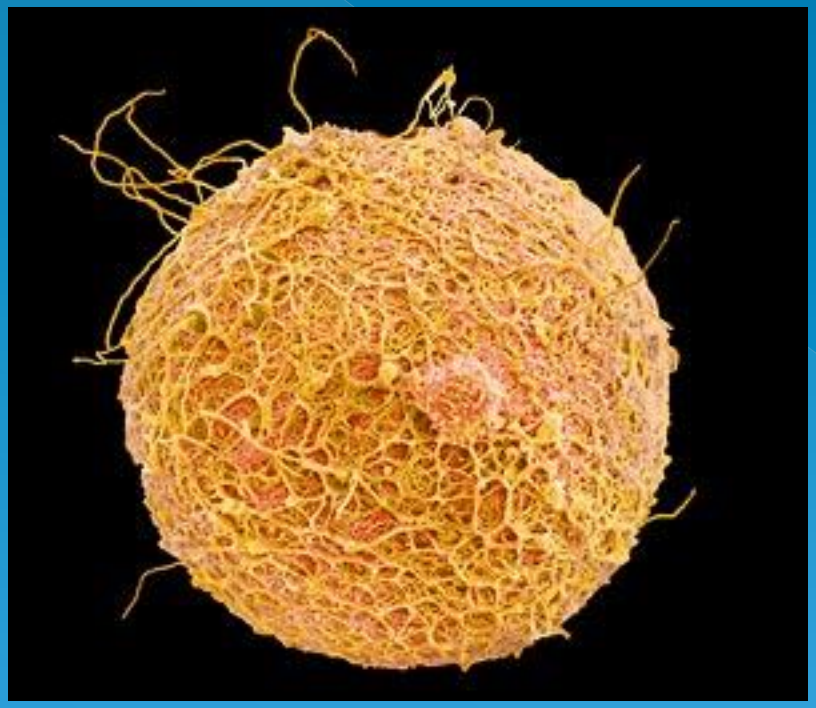
(break apart, study the pieces)

There is a question within a question in this EQ. Can you identify the question within the EQ?

How do little elephants grow up to be BIG elephants?

Why do animals shed their skin?

The process of asexual reproduction begins after a sperm fertilizes an egg.



Three reasons why cells reproduce by asexual reproduction:

1. Growth
2. Repair
3. Replacement

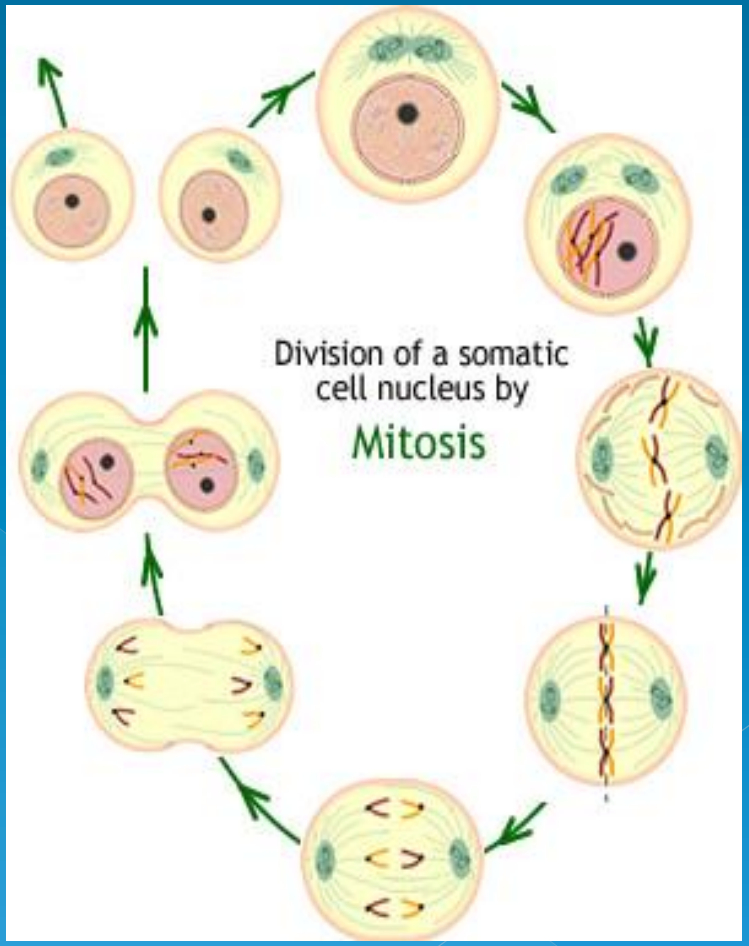
Skin cancer - the abnormal growth of skin cells - most often develops on skin exposed to the sun.

Cell that reproduce by asexual reproduction reproduce constantly.

Animated Mitosis Cycle

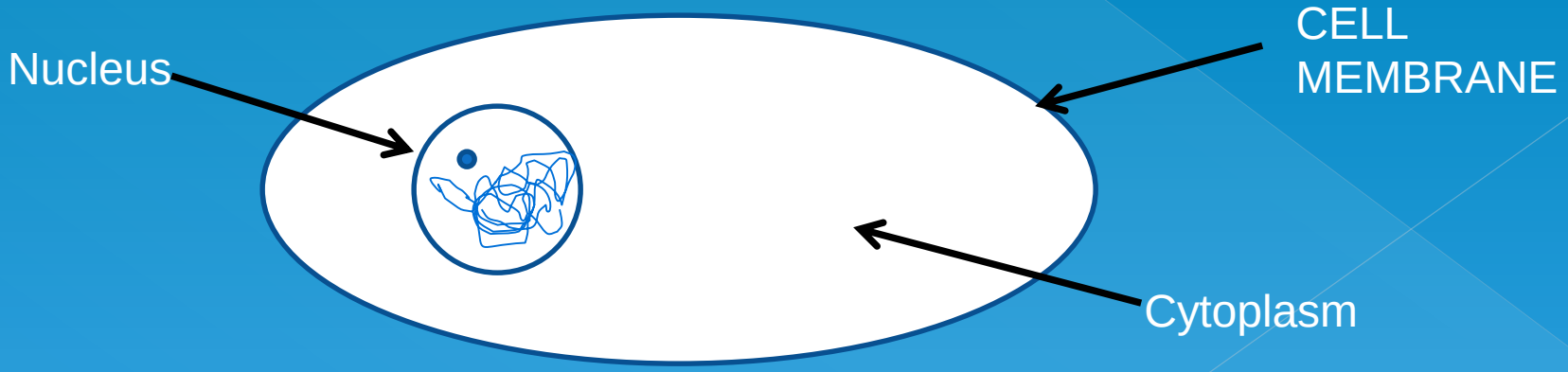
http://www.cellsalive.com/mitosis.htm

- Interphase
- Prophase
- Metaphase
- Anaphase
- Telophase & Cytokinesis



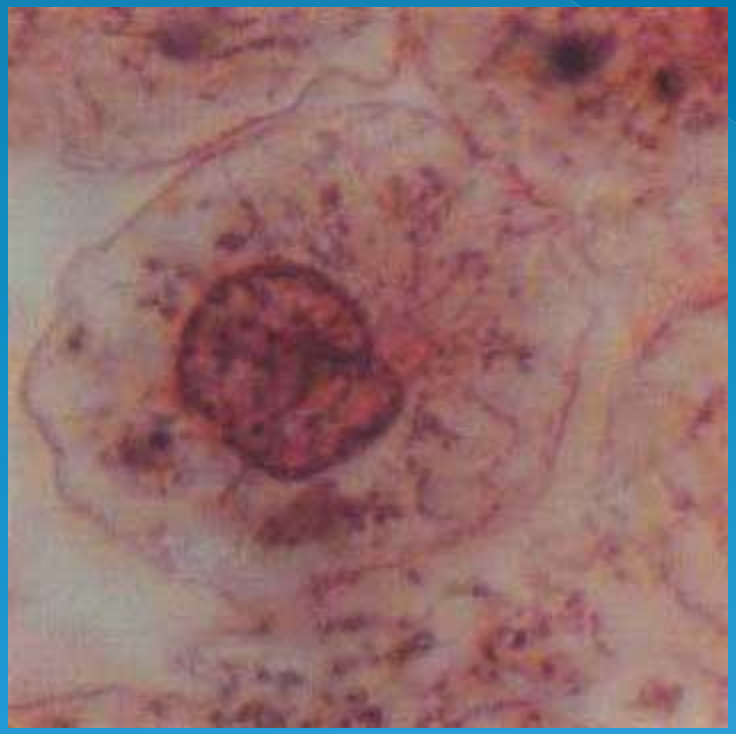
Interphase
occurs before mitosis begins

- Chromosomes are **copied** (# doubles)
- Chromosomes appear as threadlike coils (**chromatin**) at the start, but each chromosome and its copy(**sister** chromosome) change to sister chromatids at end of this phase



Interphase

Animal Cell

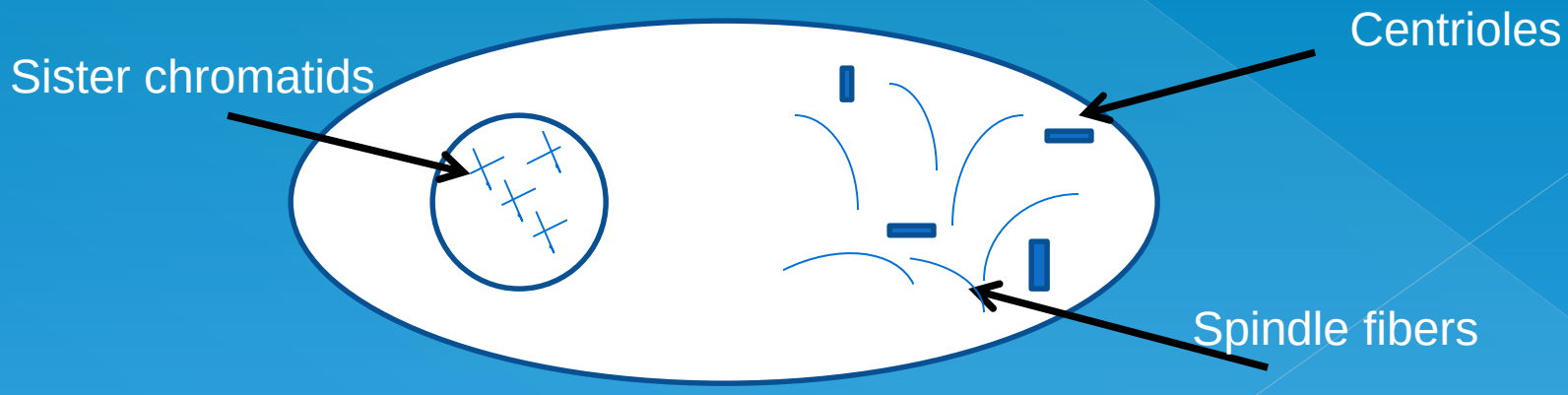


Plant Cell

Photographs from: http://www.bioweb.uncc.edu/biol1110/Stages.htm

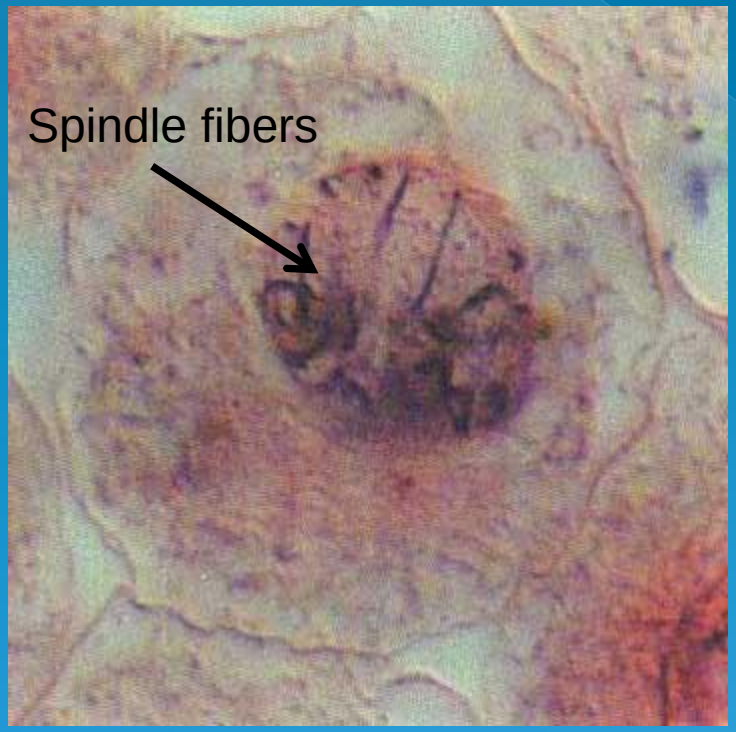
Prophase
1st step in Mitosis

- **Mitosis** begins (cell begins to divide)
- **Centrioles** (or poles) appear and begin to move to opposite end of the cell.
- **Spindle fibers** form between the poles.

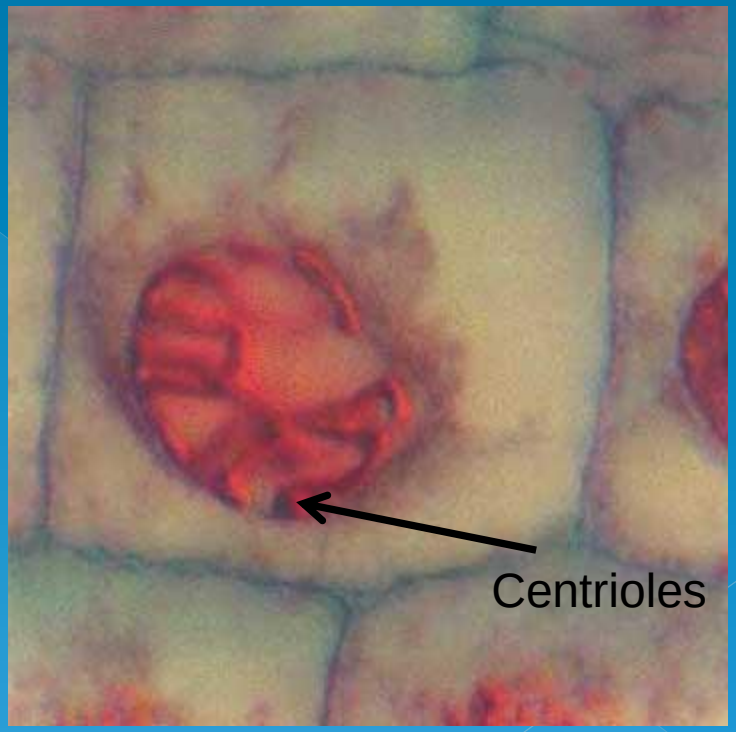


Prophase

Animal Cell



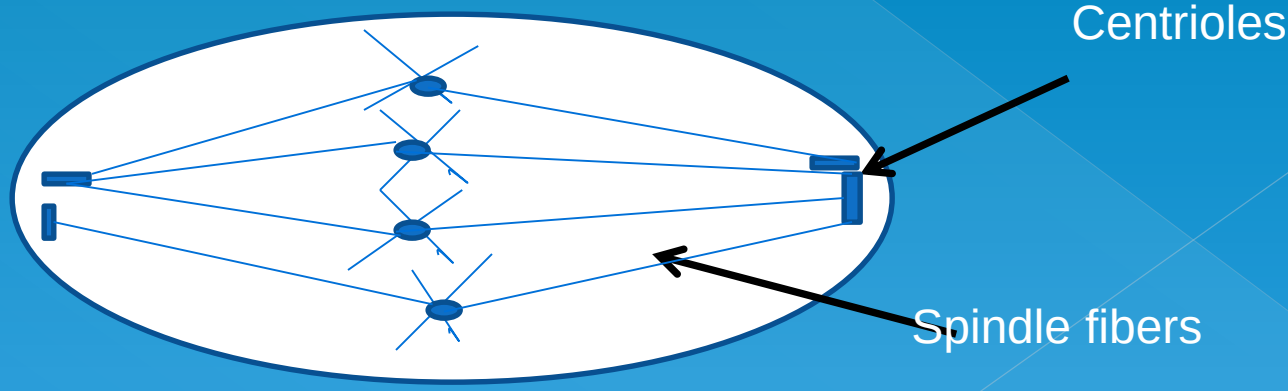
Plant Cell



Photographs from: http://www.bioweb.uncc.edu/biol1110/Stages.htm

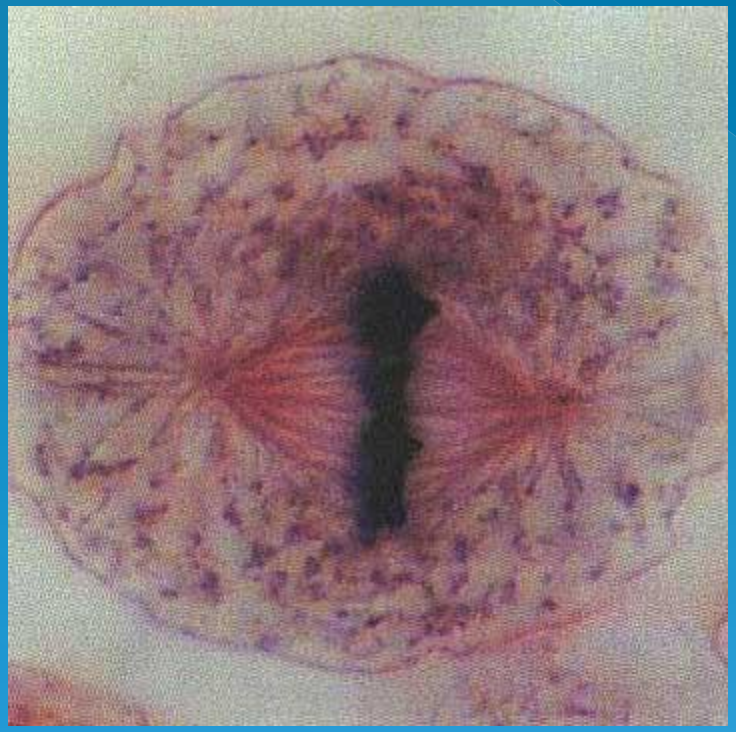
Metaphase
2nd step in Mitosis

- **Chromatids** (or pairs of chromosomes) attach to the spindle fibers.

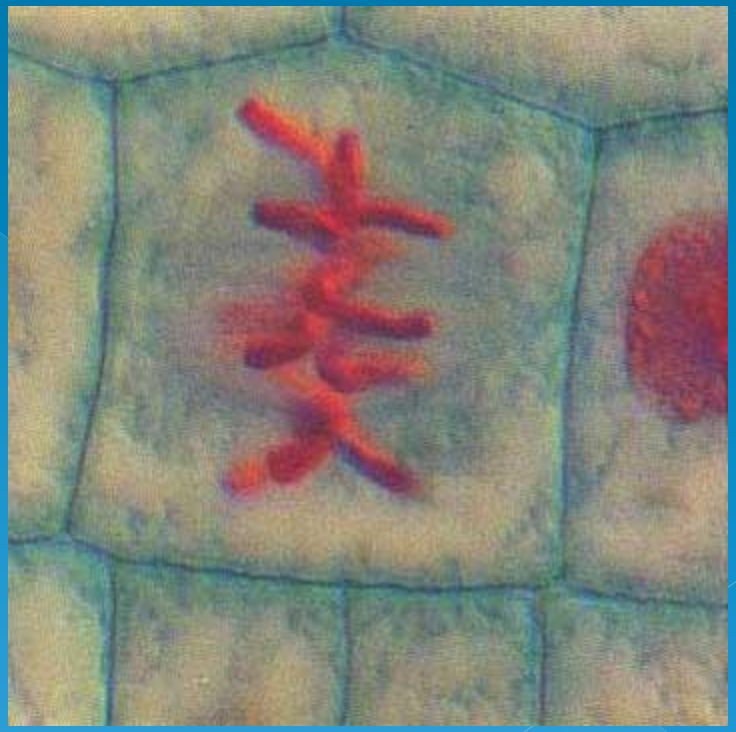


Metaphase

Animal Cell



Plant Cell

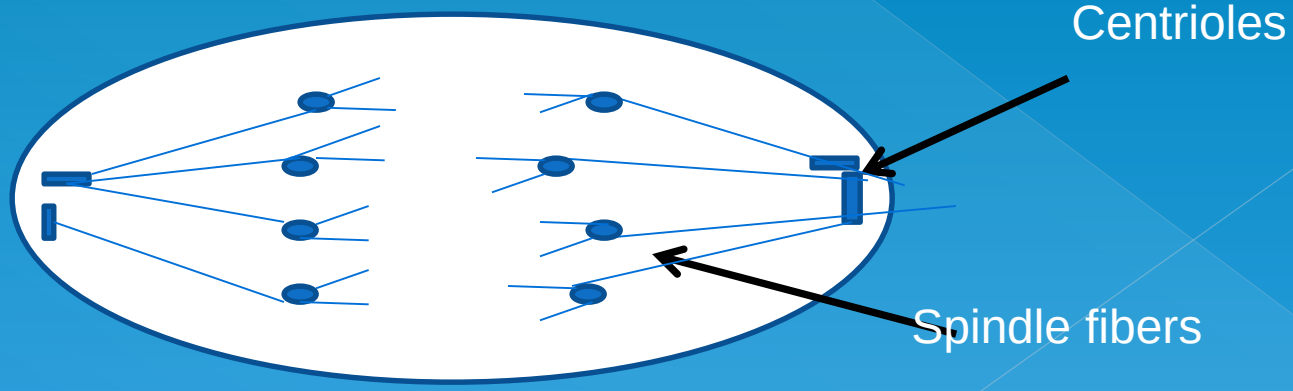


Photographs from: http://www.bioweb.uncc.edu/biol1110/Stages.htm

Anaphase

3rd step in Mitosis

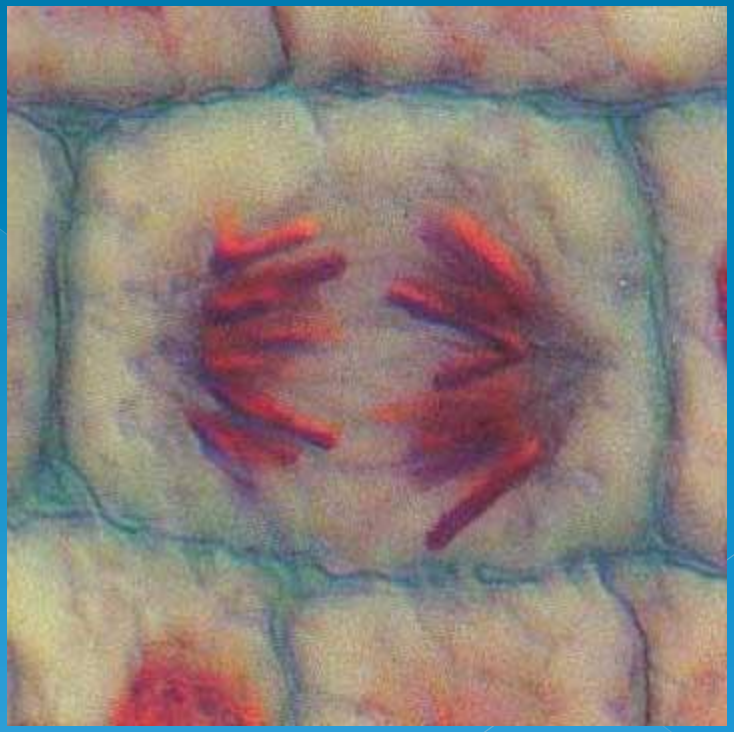
- **Chromatids** (or pairs of chromosomes) separate and begin to move to opposite ends of the cell.



Anaphase

Animal Cell

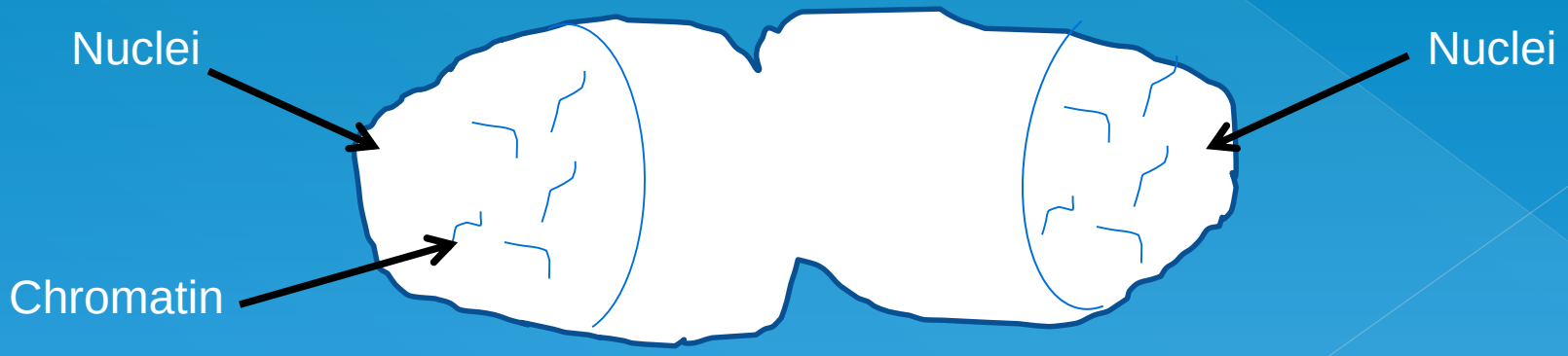
Plant Cell



Photographs from: http://www.bioweb.uncc.edu/biol1110/Stages.htm

Telophase
4th step in Mitosis

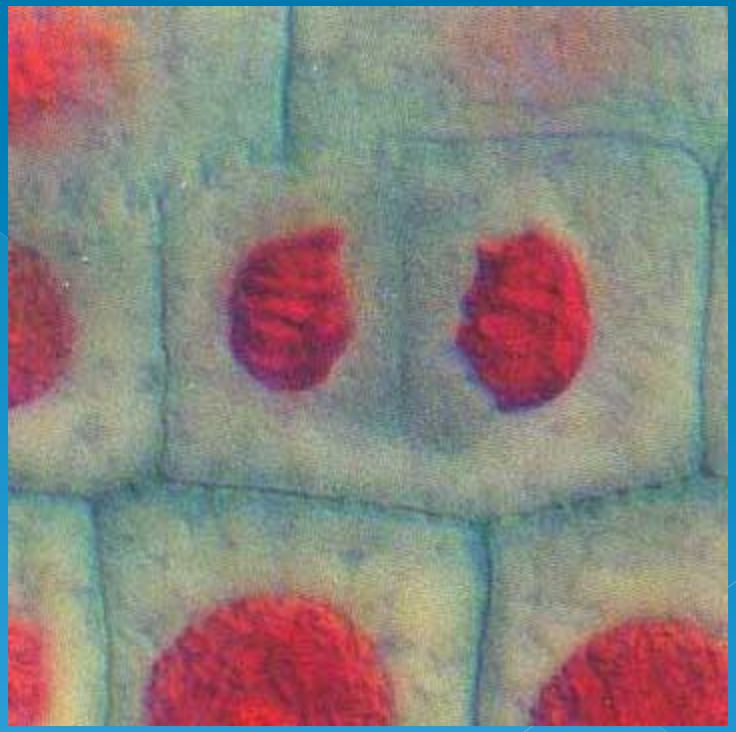
- Two new **nuclei** form.
- Chromosomes appear as chromatin **(threads** rather than **rods).**
- **Mitosis** ends.



Telophase

Animal Cell

Plant Cell

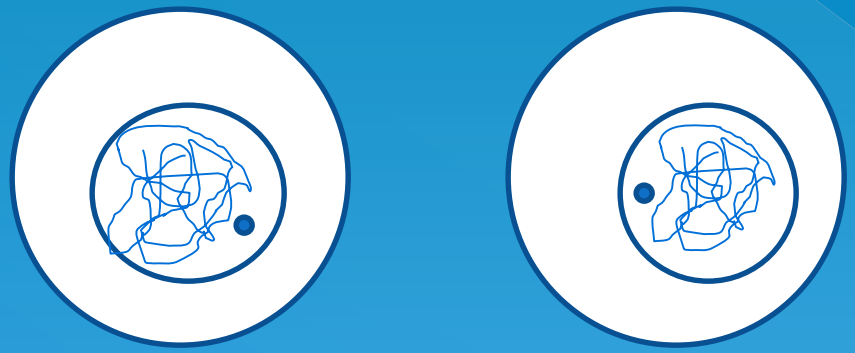


Photographs from: http://www.bioweb.uncc.edu/biol1110/Stages.htm

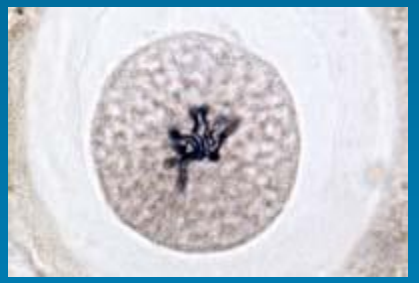
Cytokinesis

occurs after mitosis

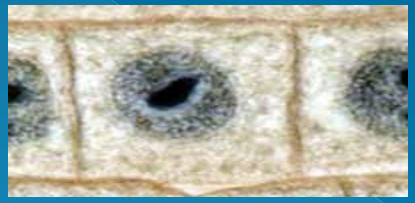
- Cell membrane moves inward to create two **daughter** cells – each with its own **nucleus** with identical **chromosomes.**



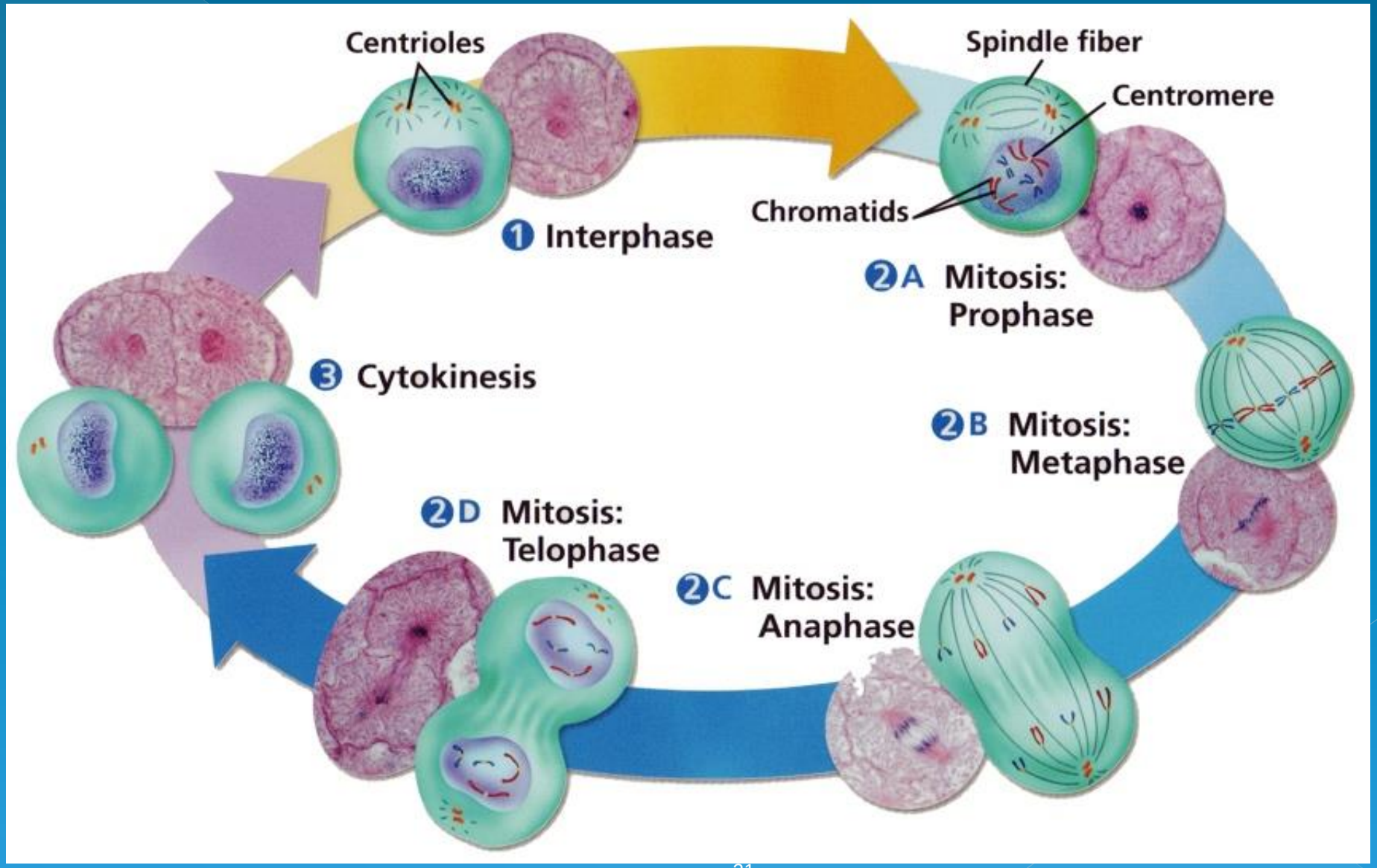
Animal Mitosis -- Review

Interphase 	**Prophase** 
Metaphase 	**Anaphase** 
Telophase 	**Interphase** 

Plant Mitosis -- Review

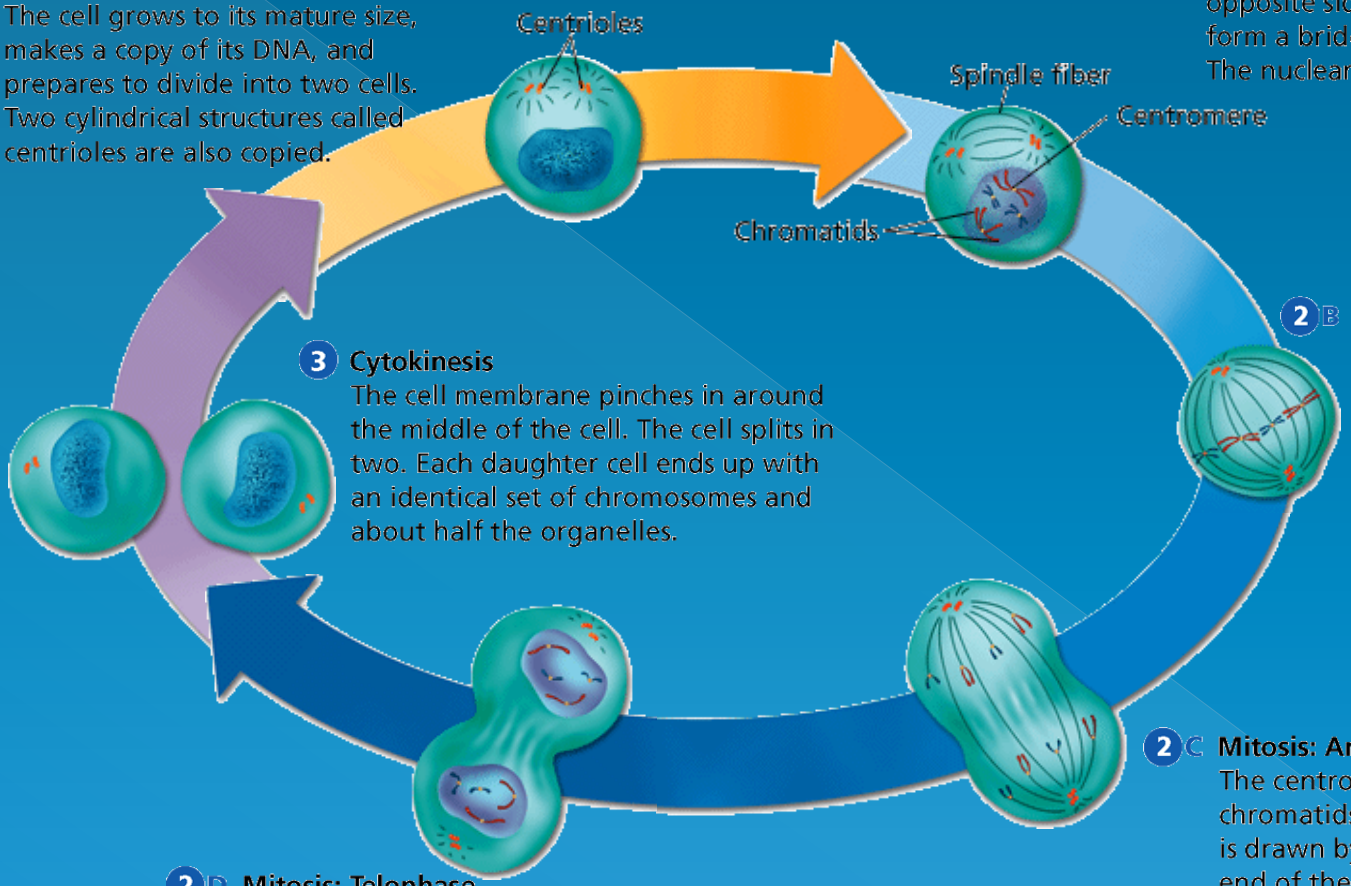
Interphase 	**Prophase** 
Metaphase 	**Anaphase** 
Telophase 	**Interphase** 

Cell Cycle


Centrioles
Spindle fiber
Centromere
Chromatids
1 Interphase
2A Mitosis: Prophase
2B Mitosis: Metaphase
2C Mitosis: Anaphase
2D Mitosis: Telophase
3 Cytokinesis

The Cell Cycle

1 Interphase
The cell grows to its mature size, makes a copy of its DNA, and prepares to divide into two cells. Two cylindrical structures called centrioles are also copied.



2A Mitosis: Prophase
Chromatin in the nucleus condenses to form chromosomes. The pairs of centrioles move to opposite sides of the nucleus. Spindle fibers form a bridge between the ends of the cell. The nuclear envelope breaks down.

2B Mitosis: Metaphase
The chromosomes line up across the center of the cell. Each chromosome attaches to a spindle fiber at its centromere.

2C Mitosis: Anaphase
The centromeres split. The two chromatids separate. One chromatid is drawn by its spindle fiber to one end of the cell. The other chromatid moves to the opposite end. The cell stretches out as the opposite ends are pushed apart.

2D Mitosis: Telophase
The chromosomes begin to stretch out and lose their rodlike appearance. A new nuclear envelope forms around each region of chromosomes.

3 Cytokinesis
The cell membrane pinches in around the middle of the cell. The cell splits in two. Each daughter cell ends up with an identical set of chromosomes and about half the organelles.

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Mitosis Animation

http://www.cellsalive.com/mitosis.htm