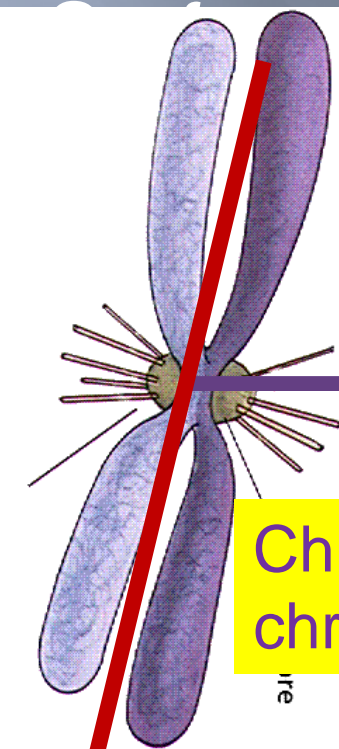


START-UP FOR 12/4/14

1. Cells divide for reproduction and to avoid problems with DNA overload, and nutrient absorption and waste removal.

2. Surface area indicates nutrient and waste exchange while volume indicates its usage. If the surface area becomes too large, movement is not quick enough for cell size.



Centromere = center of chromosome

Chromatid = $\frac{1}{2}$ of doubled chromosome

and label

Chapter 10-2, pgs. 244-249

Objectives: Students will

- A) List and summarize the role of the four stages of mitosis
- B) Identify the spindle and its role in mitosis
- C) Define cytokinesis

A) List and summarize the role of the four stages of mitosis

M stage

Mitotic Stage

The nucleus splits to make two new identical cells =

DIPLOID cells = $2N$ ← chromatid

46 chromosomes or 23 pair

If parent cell = 8 chromosomes, how many in daughter cells after mitosis?

8 chromosomes

REMEMBER!

OR

Indeed **P**imps **M**migrate **A**fter **T**hursday

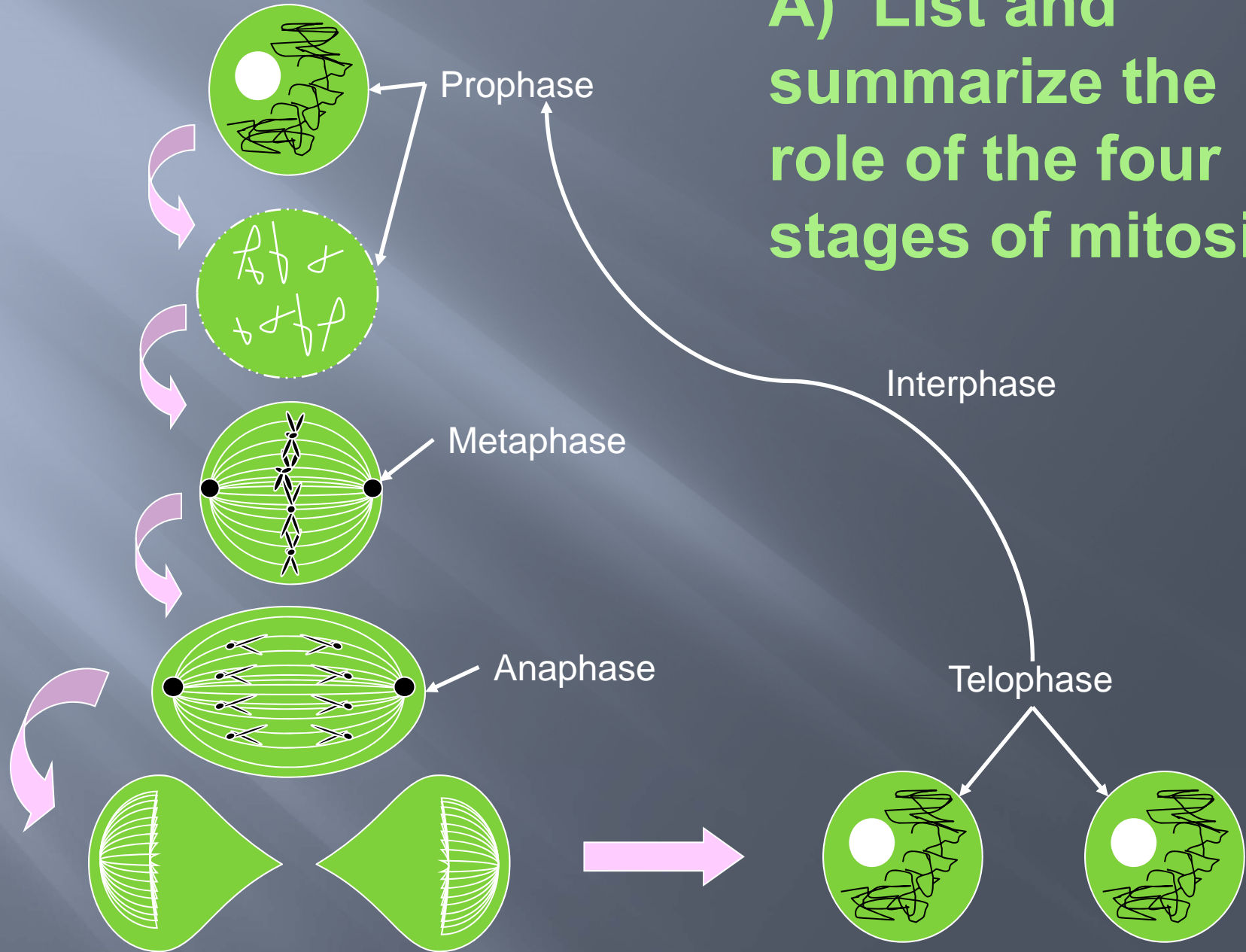
- ◆ **I**nterphase
- ◆ **P**rophase
- ◆ **M**etaphase
- ◆ **A**naphase
- ◆ **T**elophase

A) List and summarize the role of the four stages of mitosis



IPMAT

A) List and summarize the role of the four stages of mitosis



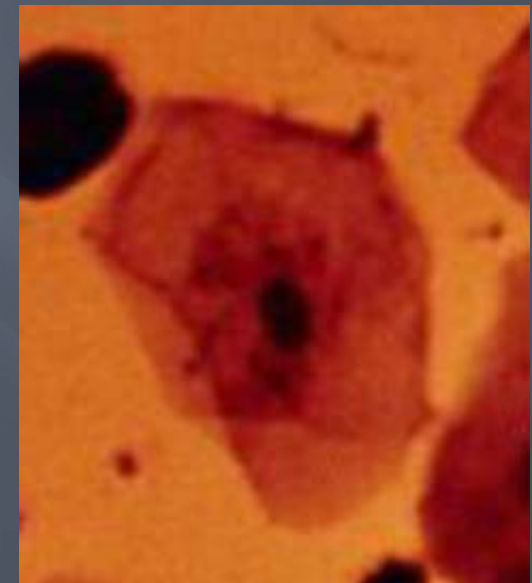
A) List and summarize the role of the four stages of mitosis

PROPHASE

- ▣ The chromatin (unravelled DNA) condenses = visible chromosomes.
- Nucleolus breaks down



- The centrioles move to opposite ends of the nucleus.
- Nuclear membrane disappears
- Spindle starts to form

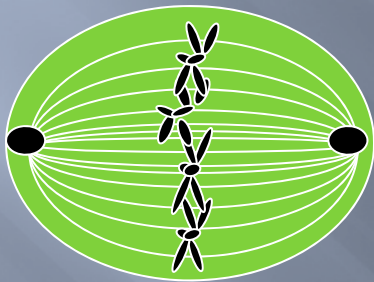


B) Identify the spindle and its role in mitosis

The Spindle

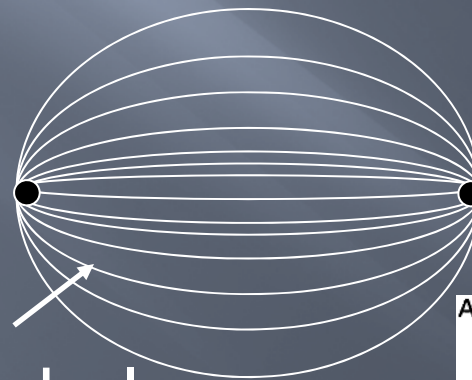
Description: Web-type structure made of microtubule fibers.

Function: Arranges chromosomes into position for cell division.



A cell at metaphase

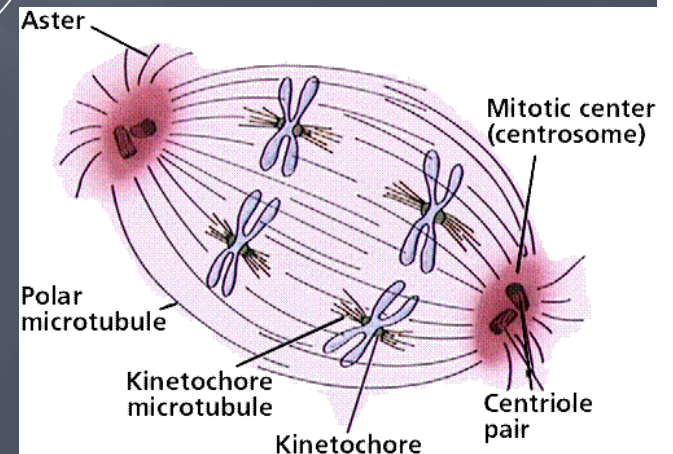
A spindle



Microtubule

Centriole

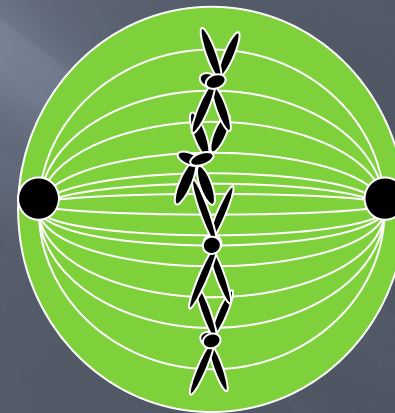
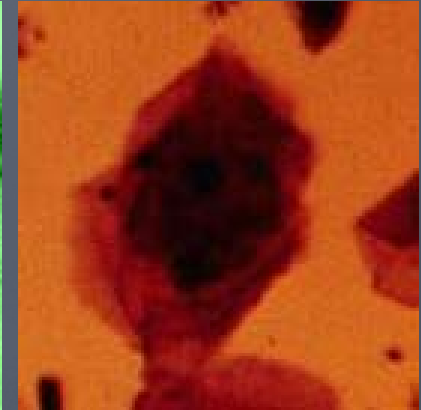
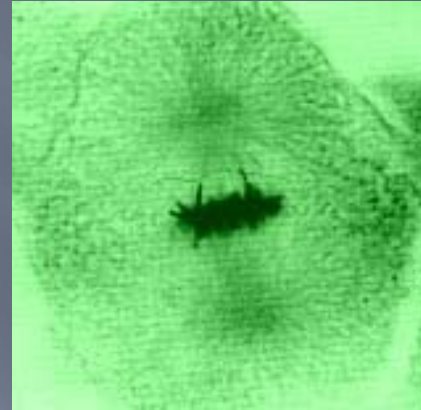
Chromosomes attached to spindle during nuclear division



A) List and summarize the role of the four stages of mitosis

METAPHASE

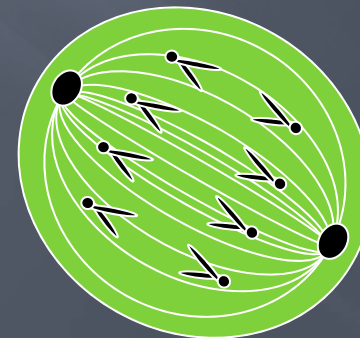
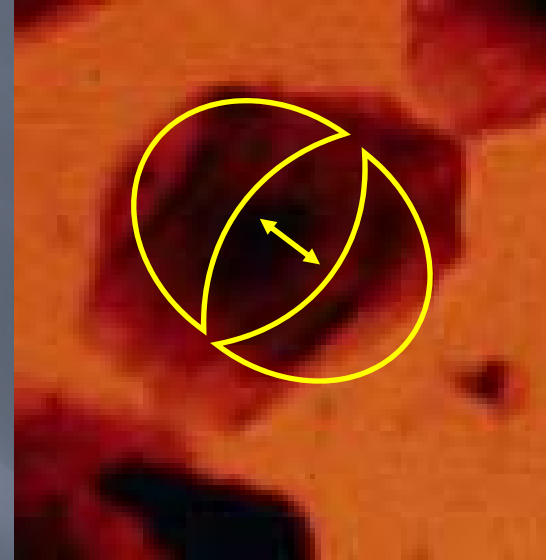
1. Spindle is fully developed
- 2. Chromatid pairs = middle of the spindle, still visible



A) List and summarize the role of the four stages of mitosis

ANAPHASE

- ▣ Chromatid pairs split
- ▣ Travel to opposite ends of the spindle
- ▣ The halved chromatids are now called chromosomes



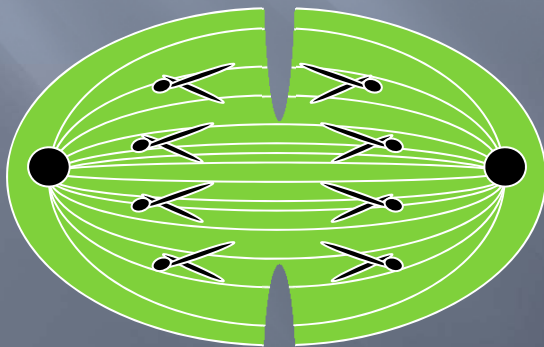
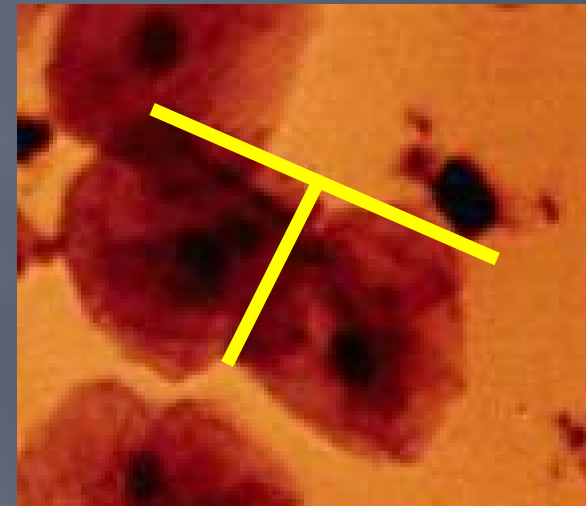
A) List and summarize the role of the four stages of mitosis

TELOPHASE

Two new nuclei are formed

Nuclear membrane is formed- the nucleolus reappears

Chromosomes disperse in nucleus



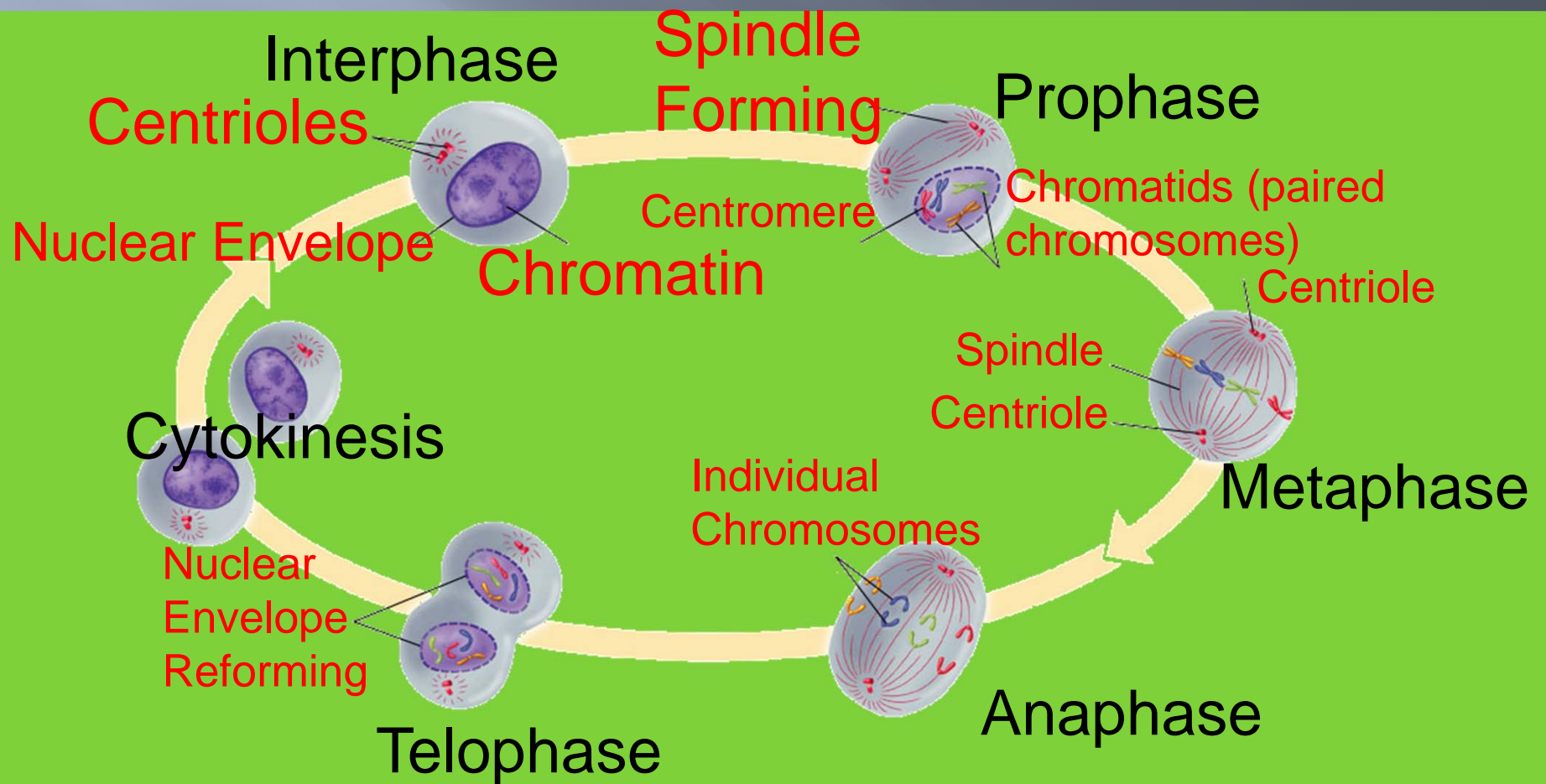
C) Define cytokinesis

- Literally = **division of the cytoplasm**
- Mitosis = Splitting of nucleus.
- **Cytokinesis = Splitting of cytoplasm**
- In Plants = Cell Plate, becomes cell wall



A) List and summarize the role of the four stages of mitosis

Starting with the resting stage.



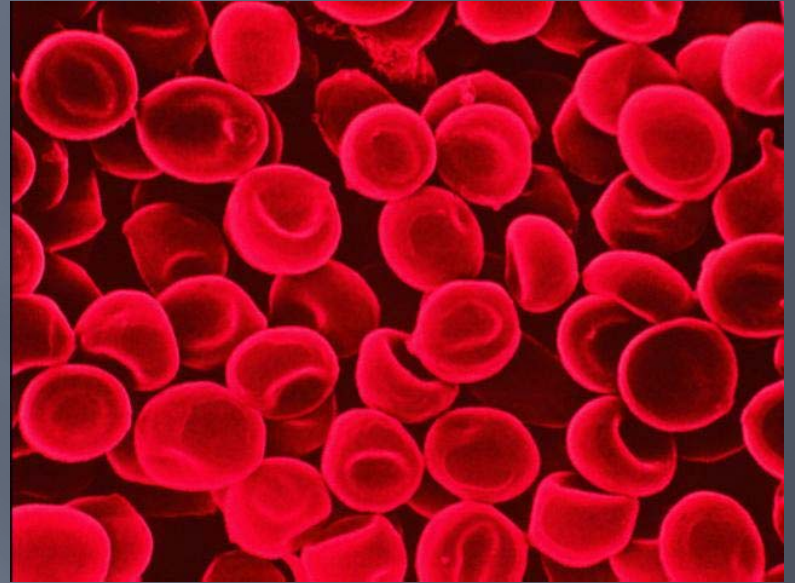
Cell Turnover - The speed of mitosis

Although you may have seen a speeded up video of mitosis in action. One full cycle can vary between a couple of minutes to days.

For example skin and epithelial cells have a rapid turnover in the human body in order to replace the ones constantly being worn away.

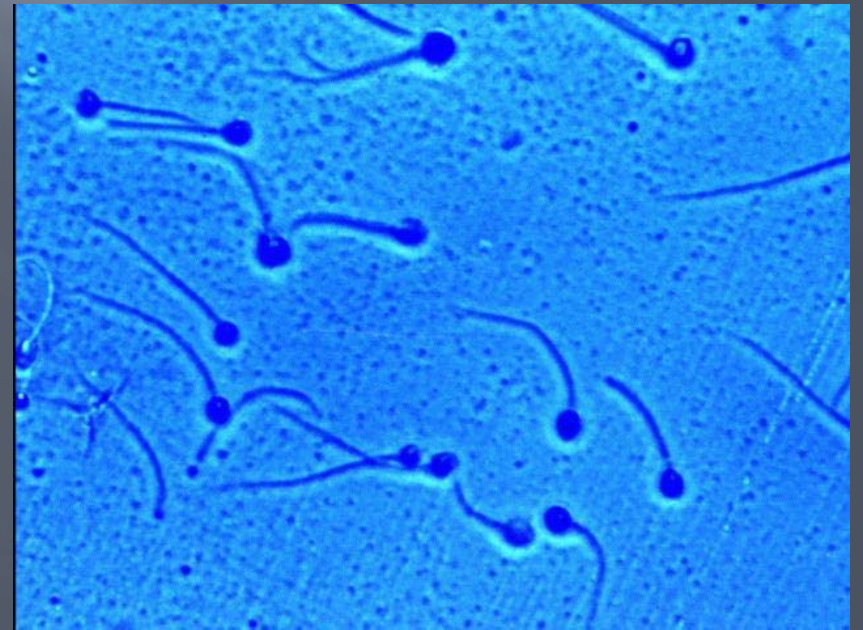
Cells which make up organs such as the eye and the brain, need not multiply as often once they reach adult size.

Organs which need to produce new cells continuously have the highest turnover.



For example:-

- Bone marrow- producing replacement blood cells
- The testes - producing semen



Understanding Check

Answer the following questions regarding the cell cycle.

- ▣ 1. Which phase of the cell cycle is the longest?
 - ▣ 2. Name one thing that happens during prophase.
 - ▣ 3. What happens to chromosomes during anaphase?
 - ▣ 4. What happens during cytokinesis?
-
- ▣ Prentice Hall Biology Video CD