Cell Cycle & Mitosis

Section 2 – The Cell Cycle

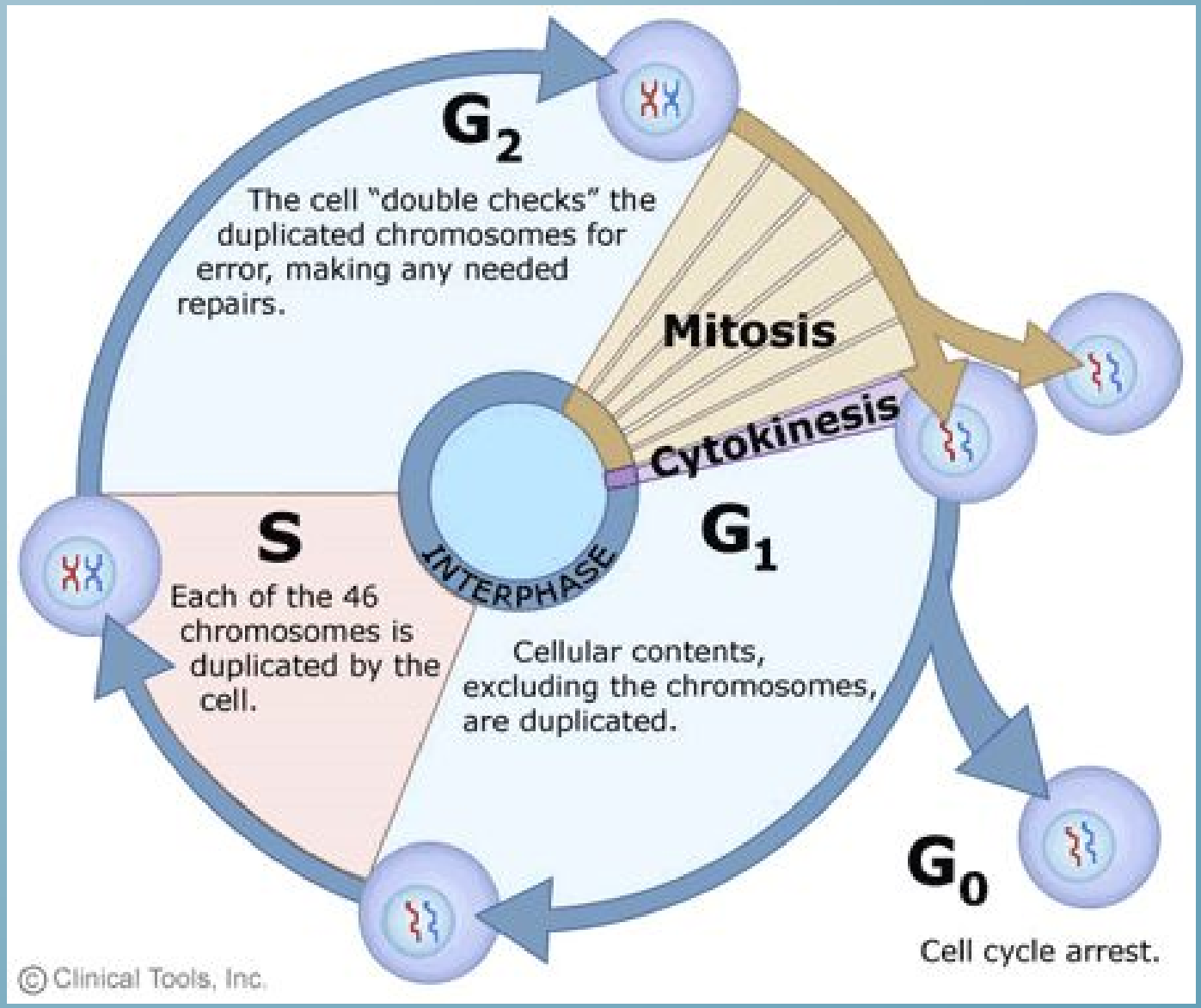
Section 3 – Mitosis & Cytokinesis

THE CELL CYCLE

- *A **repeating sequence** of cell growth and division during an **organism's lifetime***
- *Interphase (G1, S & G2): collection of the first three phases where a cell spends 90% of its life*
- **specific cell functions are carried out**

PAUSE TO ANSWER QUESTIONS

THE CELL CYCLE



[Cell Cycle Overview Video]

THE CELL CYCLE - Break Down

G1 Phase - <u>Cell organelles/contents</u> duplicate (double so there are TWO sets)

S Phase - <u>CHROMOSOMES</u> duplicate

G2 Phase - **<u>preparation for mitosis</u>** by checking for errors in the chromosomes

Check In

1. With your group on a whiteboard, come up with an analogy for every stage of Interphase (G1, S & G2)
2. Remember analogies mean something that you can relate the topic to so it is easier to remember

February 14th, 2017 Bell Ringer

1. When discussing interphase - are we discussing chromosomes or chromatids?
2. When discussing mitosis - are we discussing chromosomes or chromatids?
3. Does it matter which one we are talking about?

THE CELL CYCLE - Specific Cell Types

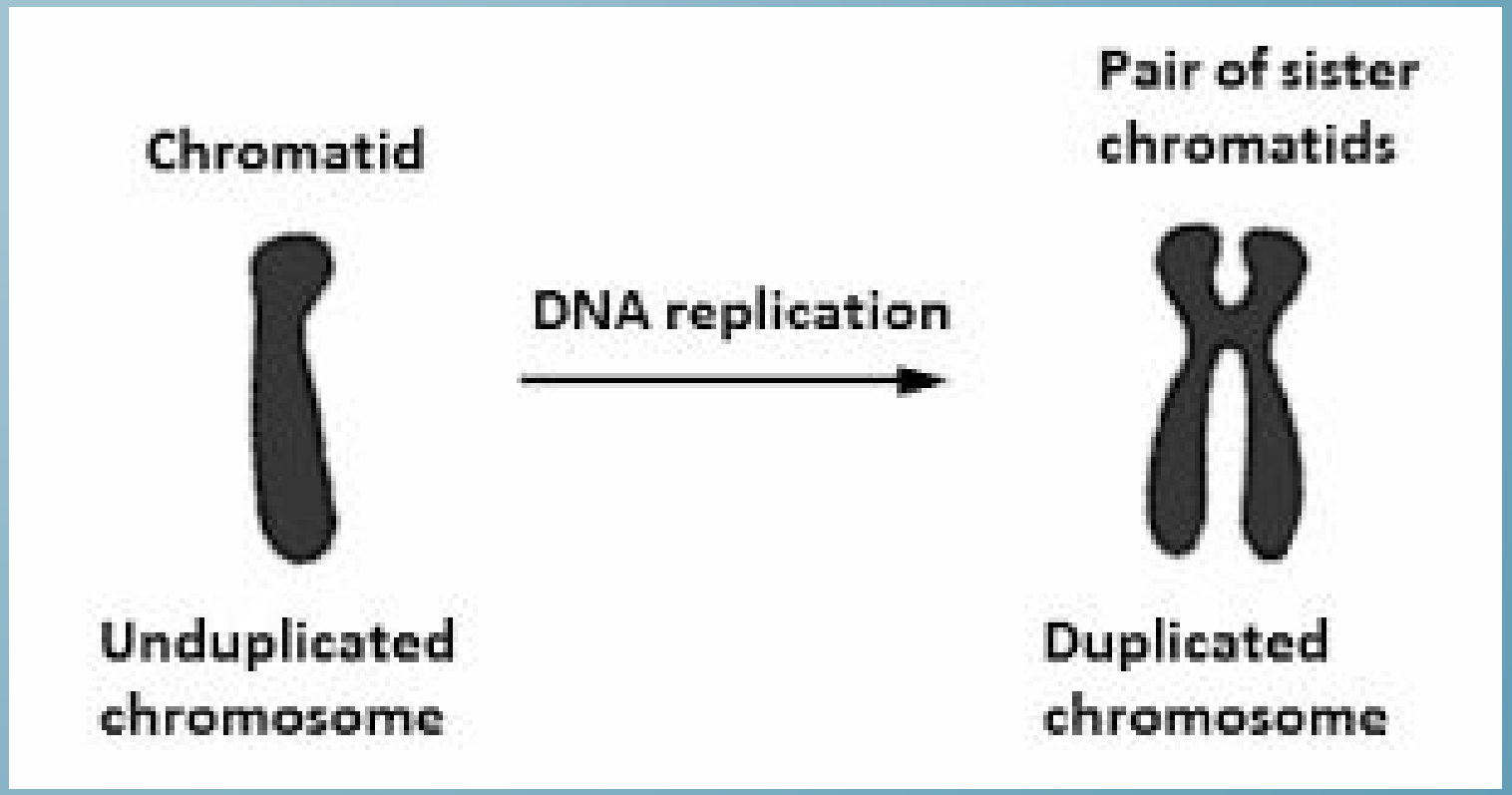
An **abnormal** cell cycle can lead to **unlimited cell divisions** which leads to different types of **cancer**.
Internal regulation - cells need to be **healthy enough** to proceed within the cycle

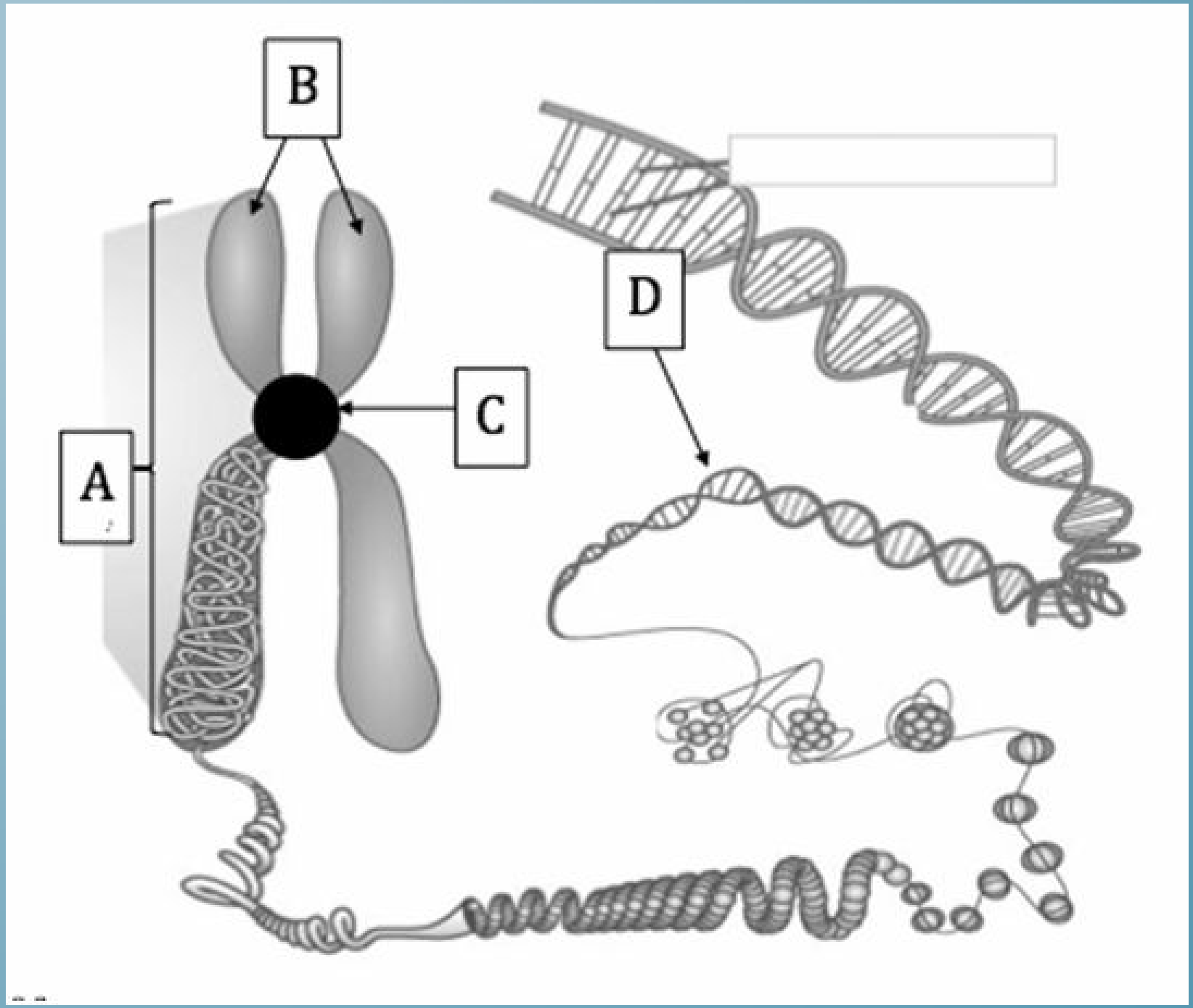
Stomach cells are reproduced in 3 days, while brain cells never reproduce.
Why?

THE CELL CYCLE
MITOSIS

- *Process by which the cell's nucleus is divided into* **two nuclei**
- *Each nuclei will have the* ***same amount and type*** *of genetic material*
- Purpose: **organism growth** & **development**

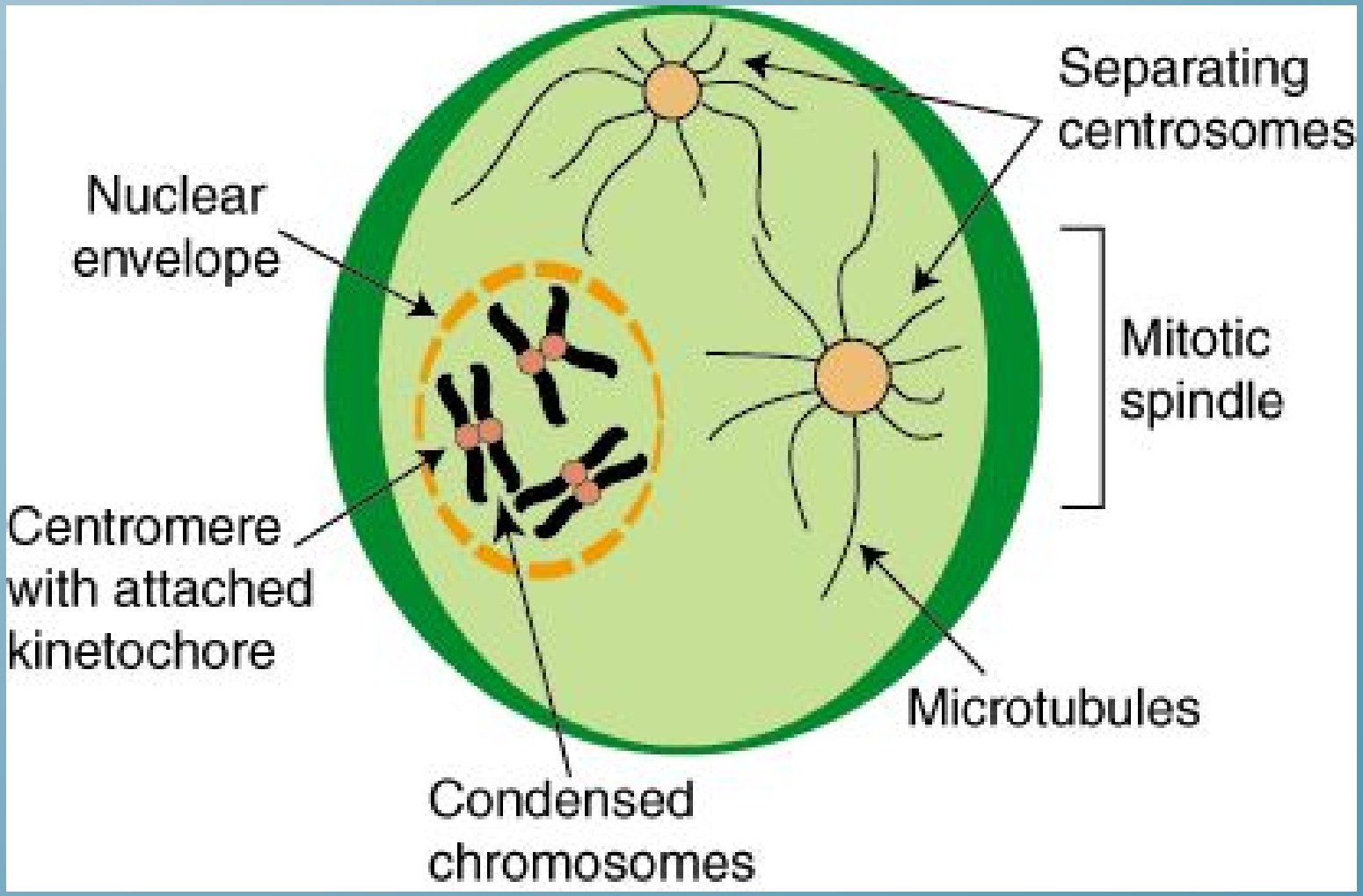
DNA & AKA's


Chromatid
Pair of sister chromatids
DNA replication
Unduplicated chromosome
Duplicated chromosome


B
D
C
A

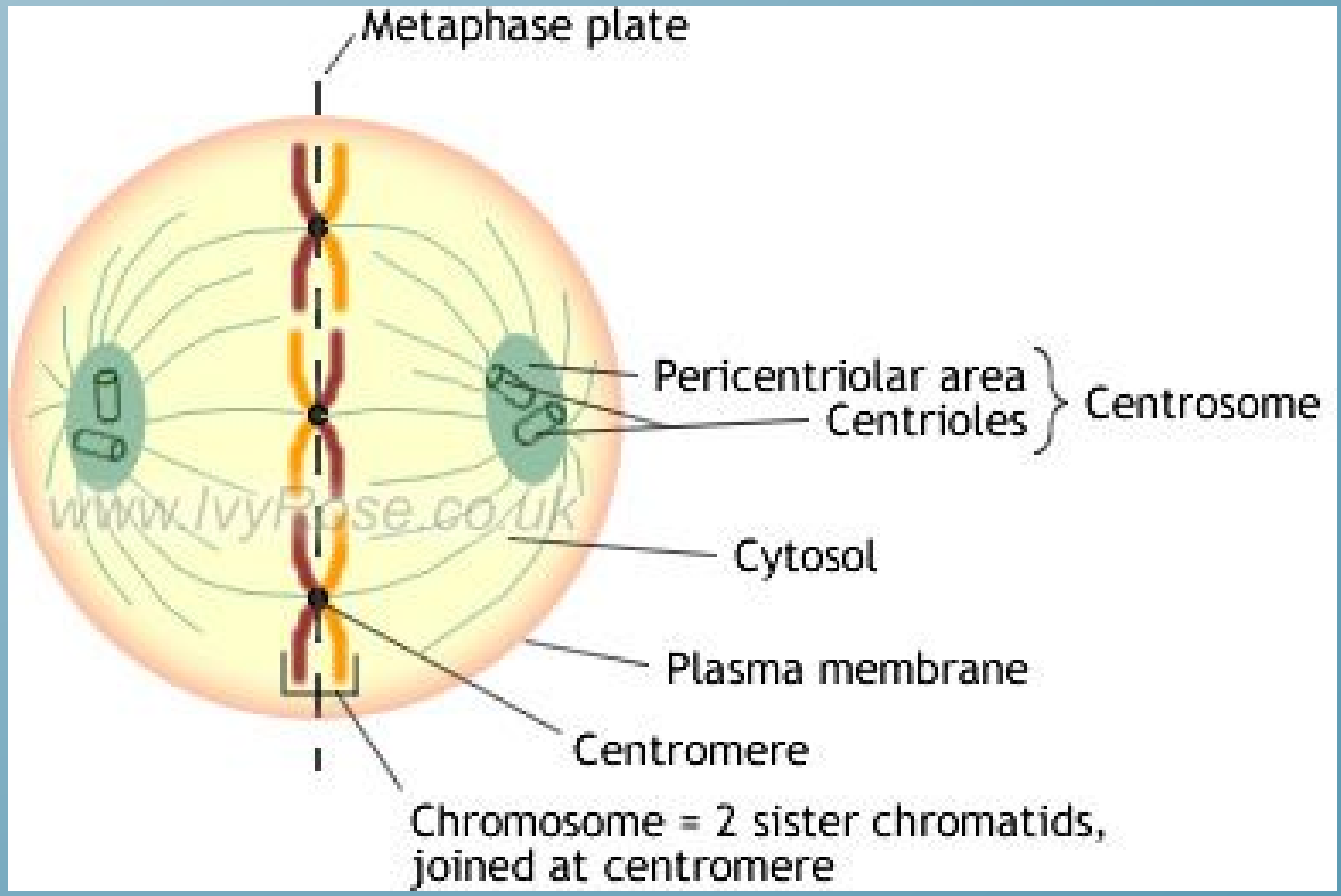
MITOSIS - PROPHASE

Chromosomes **<u>coil up</u>**, *nuclear envelope dissolves and spindle fibers form*



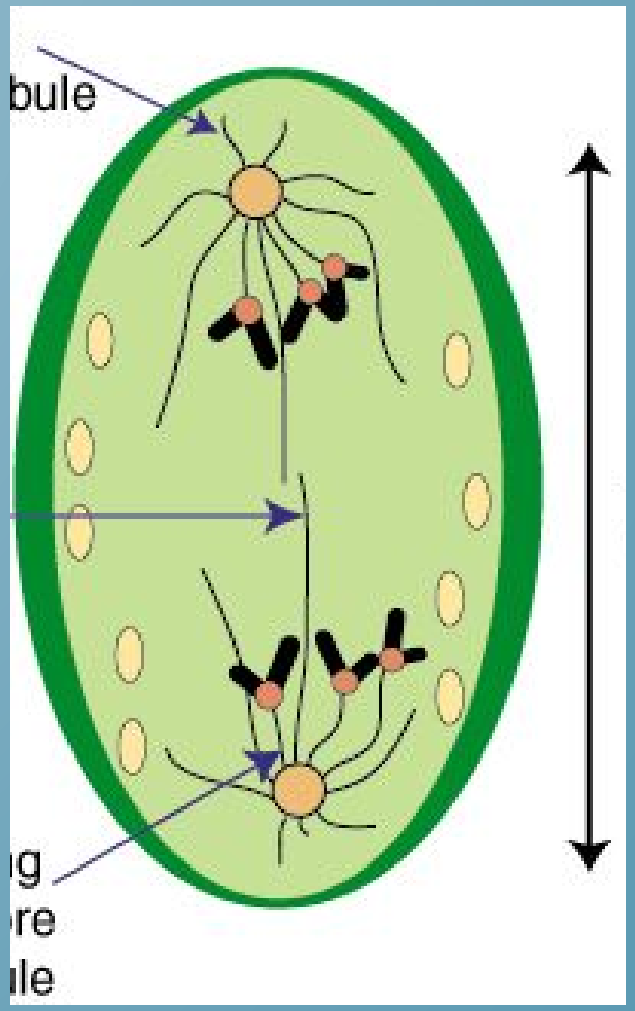
MITOSIS - METAPHASE

Chromosomes are lined up in the **center of the cell ("equator")** *and the spindle fibers attach to each side of the chromatids*



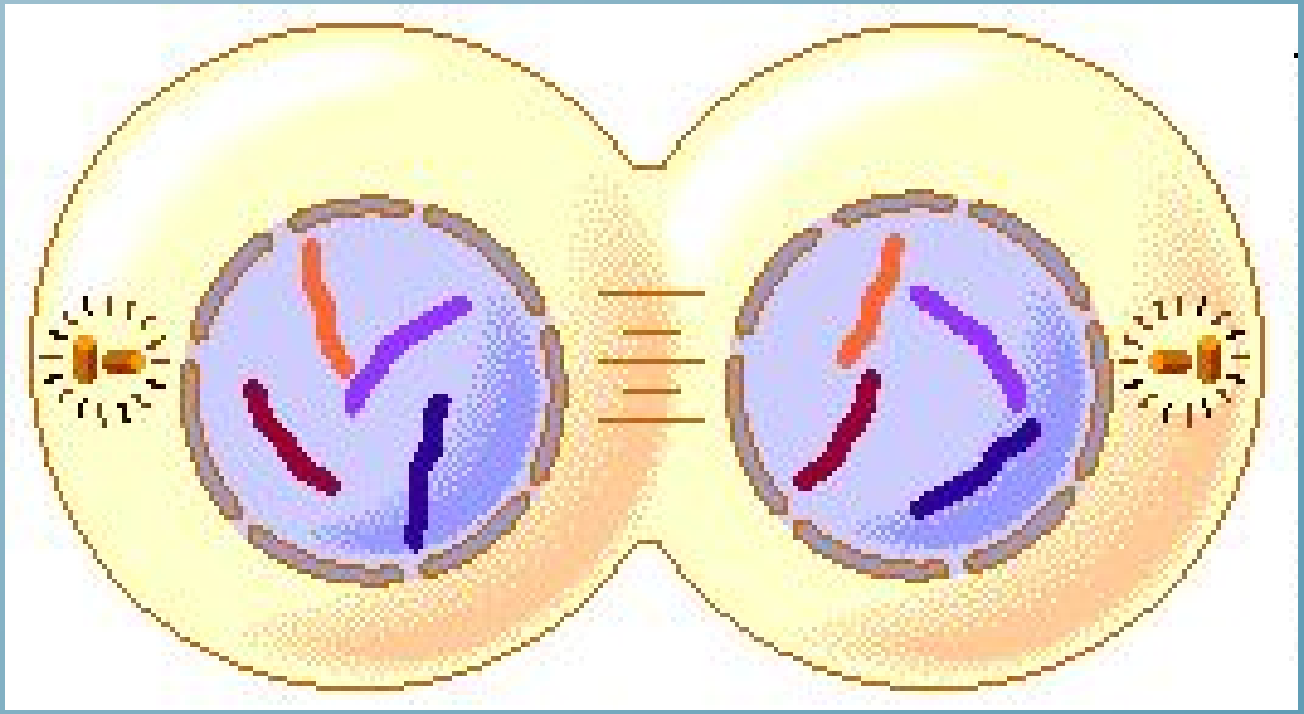
MITOSIS - ANAPHASE

Chromatids are separated to **<u>opposite poles</u>** *. Spindle fibers now shorten.*



MITOSIS - TELOPHASE

At **each pole** *the chromatids are surrounded by a nuclear envelope*

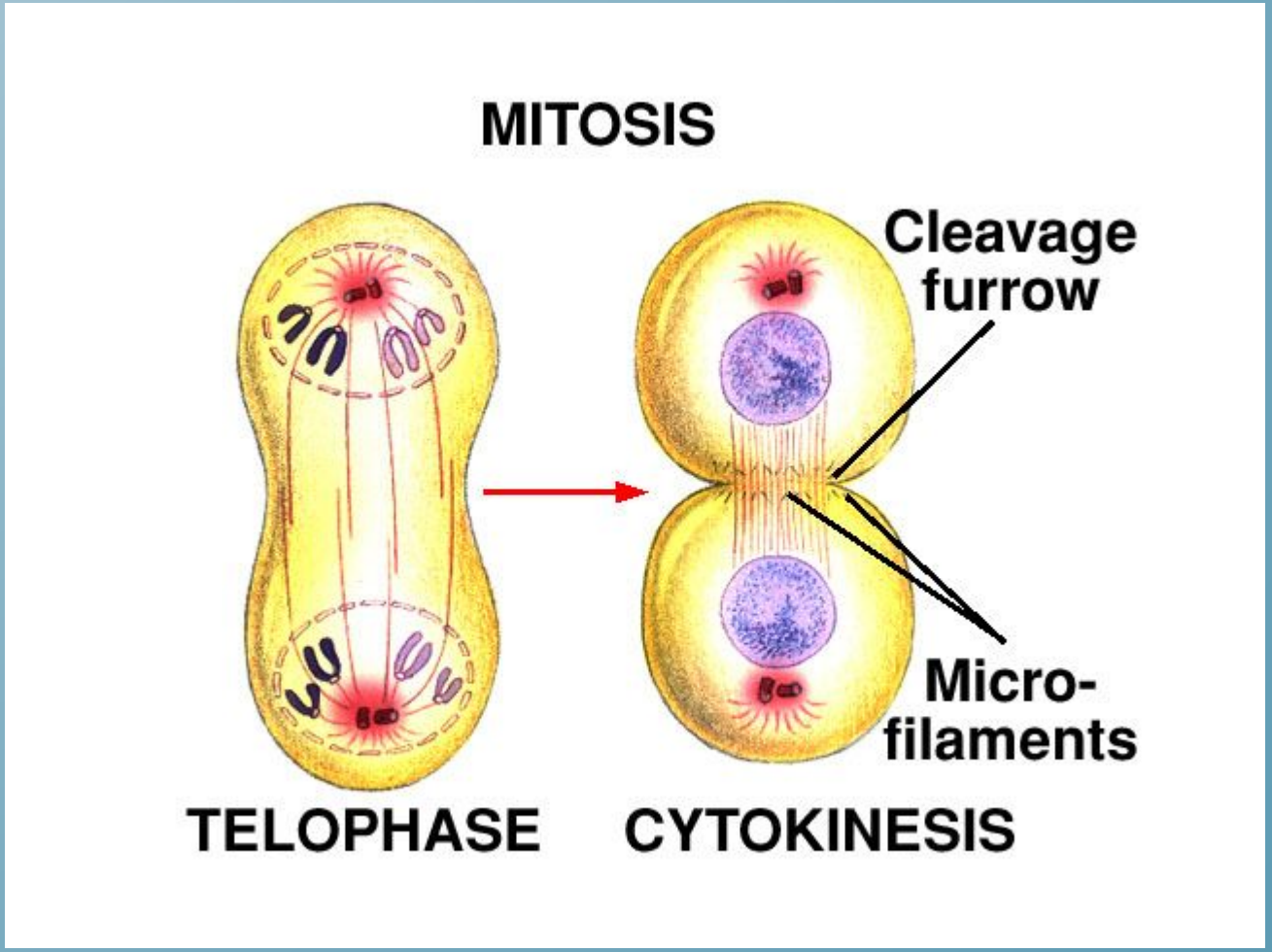


THE CELL CYCLE
CYTOKINESIS

- *Allows cells to produce asexually when needed*
- *The cells are* **split** *and genetically identical*
- *After cytokinesis , a cell will proceed to interphase to begin the process again!*

CYTOKINESIS

The cleavage furrow pinches and the one cell becomes two identical cells



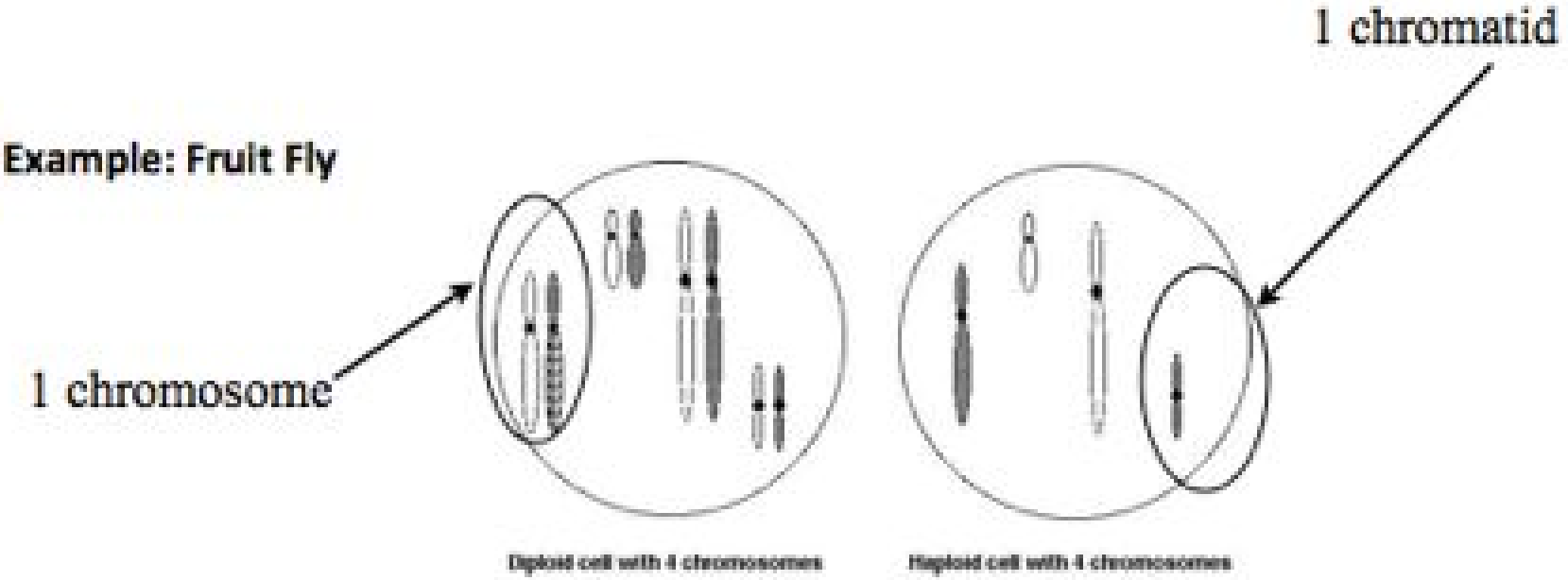
How do you tell if a cell is complete?

Diploid: cell that has **TWO** sets of chromosomes

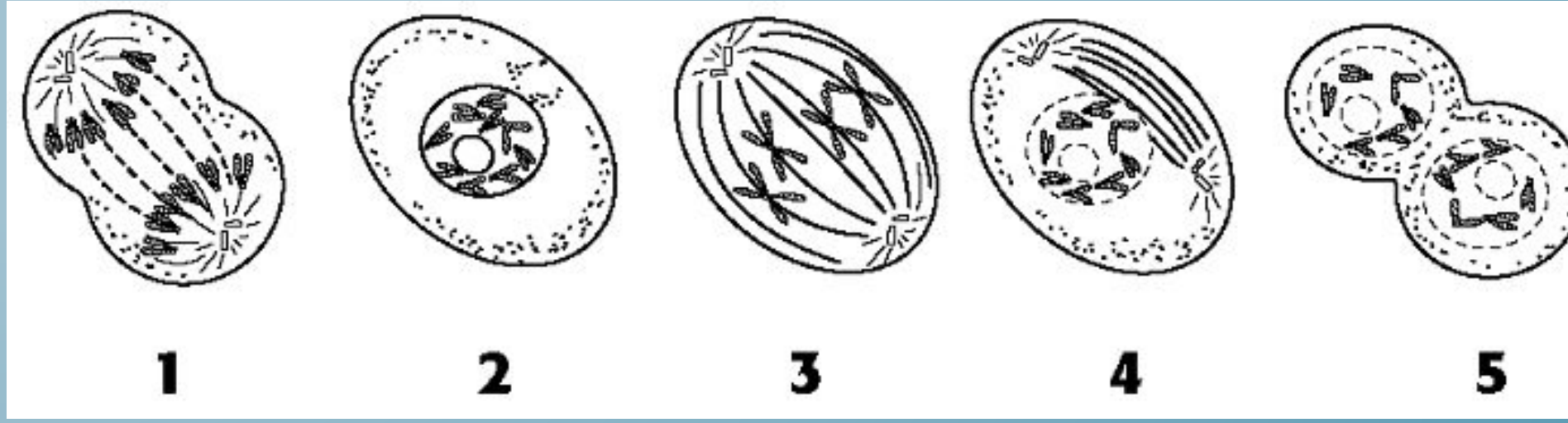
Called **body or somatic** cells

Haploid:cell that has **ONE** set of chromosomes
called gametes

Real Example: Fruit Fly



Explain the difference between the two cells.



#1 - Anaphase (chromatids)
#2 - Cytokinesis or Interphase
#3 - Metaphase
#4 - Prophase
#5 - Telophase (chromatids)

Wrap-Up
http://unctv.pbslearningmedia.org/resource/tdc02.sci.life.stru.dnadivide/mitosis/

Bill Nye
https://www.youtube.com/watch?v=W4vOPaonZng

Crash course
http://viewpure.com/L0k-enzoeOM