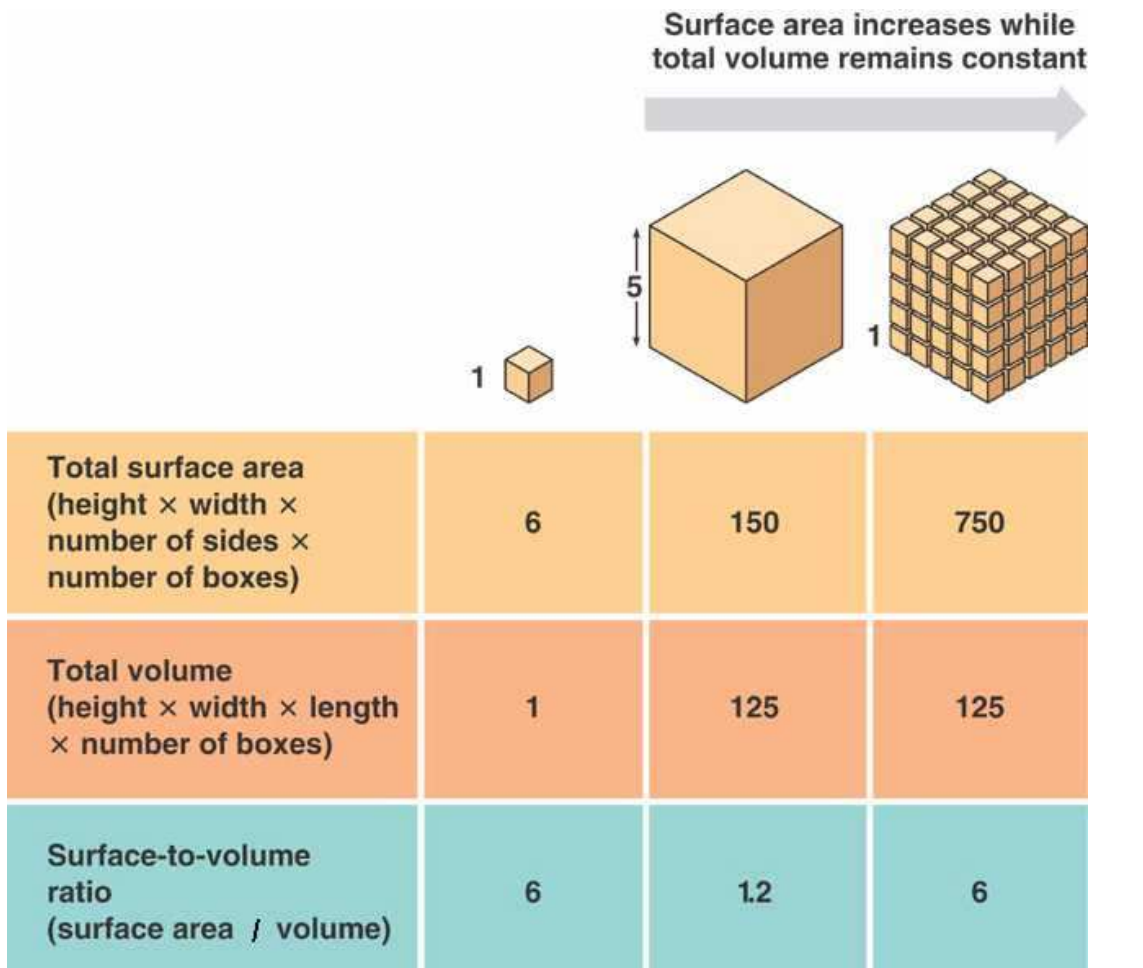


MITOSIS Note-Taking Handout
10-1 and 10-2

As an organism grows and it becomes larger its cells will not necessarily _____ but they will increase in _____.

There are two main reasons why cells can't simply get larger and larger.

1. _____
2. _____

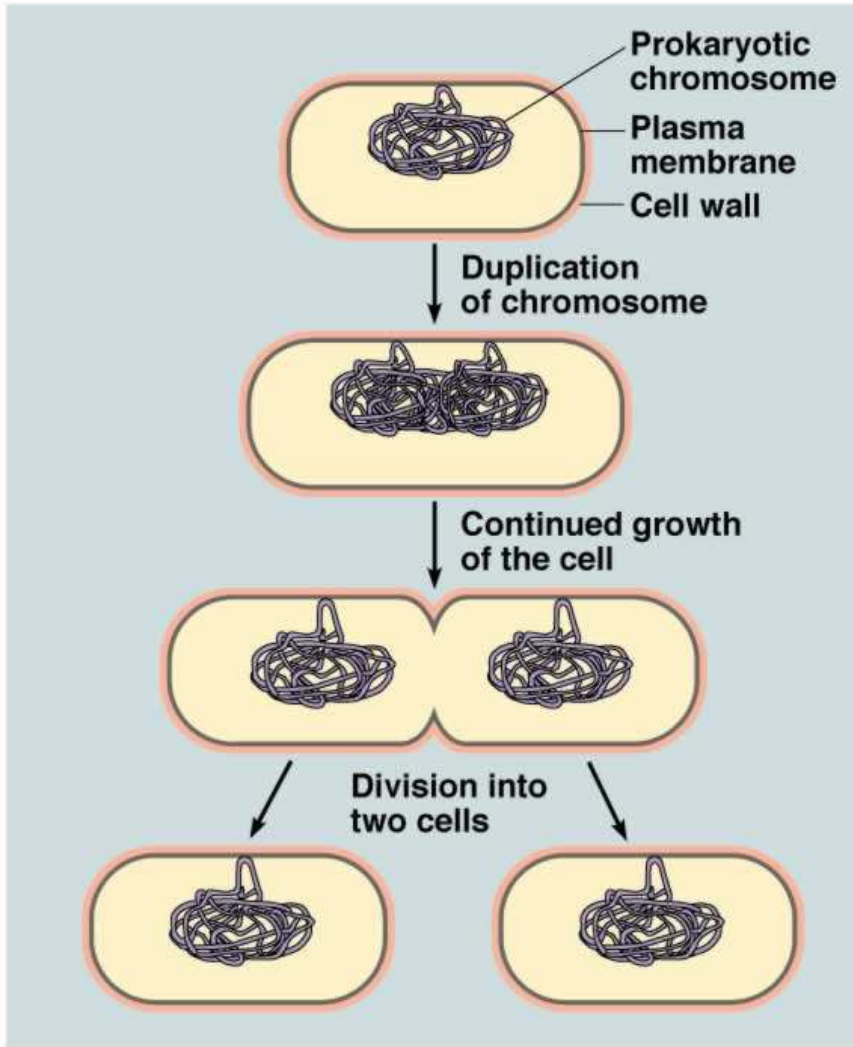


Before it becomes too large, a growing cell divides forming _____

The process by which a cell divides into two daughter cells is called _____

2. _____ cell division occurs, the cell _____ or _____ all of its DNA. This replication of DNA solves the problem of _____ because each daughter cell receives its own _____
 In addition each daughter cell will have an increased _____ allowing _____ exchange of materials with the environment.

3. Cell division in **prokaryotes**:



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In **eukaryotes** though, division is more _____ and occurs in two stages:

Stage 1: _____

Stage 2: _____

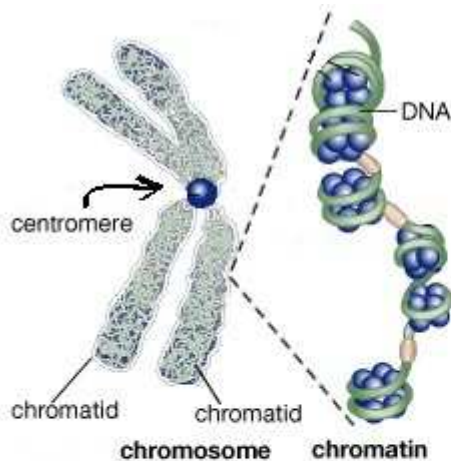
3. In eukaryotic cells, the genetic information is carried by _____
Chromosomes are made up of _____ and _____.
The cells of each organism will have a characteristic number of chromosomes.
Fruit flies have _____, humans have _____ and carrots have _____

4. Chromosomes are _____ in most cells
_____ during cell division. When the cell is **not dividing**,
the _____ is spread throughout the nucleus.
However, at the beginning of cell division, the DNA condenses (_____
_____) into _____

that can be seen _____

Well before _____ each _____
is replicated (_____) After each chromosome is copied,
each "chromosome" will consist of _____
sometimes referred to as _____
Each new daughter cell will receive one of these **sister chromatids**. The sister
chromatids are attached at an area called the _____

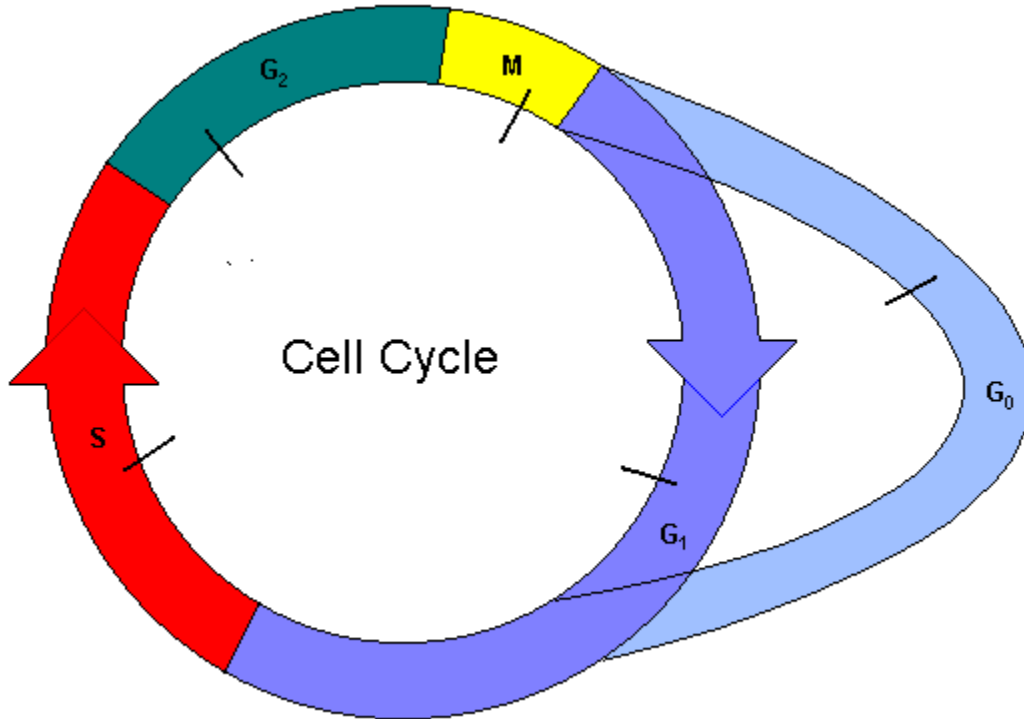
Centromeres are usually located near the middle of the chromatids, giving the
chromosome its "X-shape". Some chromosomes have centromeres that are a bit
off center.



Sketch several chromosomes in the space above with centromeres that are off center.

5. The **cell cycle** is a series of _____

During the cell cycle, a cell _____, prepares for _____ and divides to form _____ each of which then _____



The cycle consists of four phases:

M phase _____

S phase _____

G₁ phase _____

G₂ phase _____

The stages in-between cell divisions were once referred to as a “resting period”, as if all the cell did was divide. This period in a cell’s life cycle is actually a time of _____

Some cells will enter a **G₀ phase**. These cells _____

6. Biologists divide the phases of **mitosis** into four phases:

PROPHASE

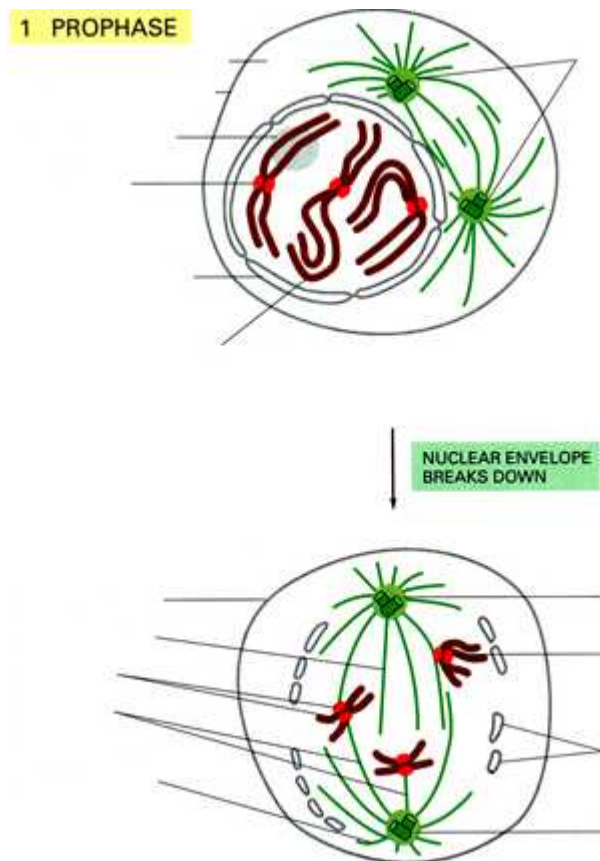
This is the _____ and _____ phase of mitosis. During _____, the chromosomes become visible. Two tiny structures called _____, located _____

separate and move to _____

As the centrioles separate, special microtubules called _____ or _____ form. While the centrioles are separating, the nuclear envelope _____. The spindle will stretch across the entire surface of the cell.

The condensed _____ will become attached to _____

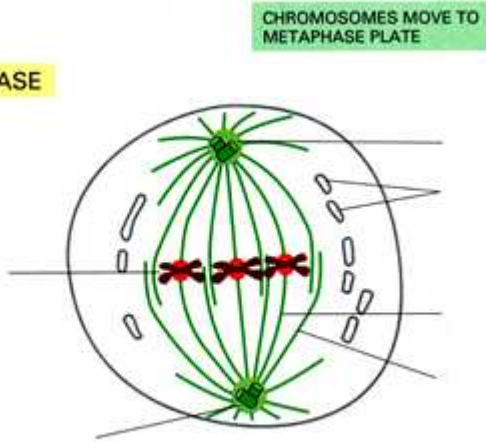
Plant cells do not have _____ but still produce _____.



METAPHASE

This phase often lasts only a few _____. During metaphase the chromosomes _____

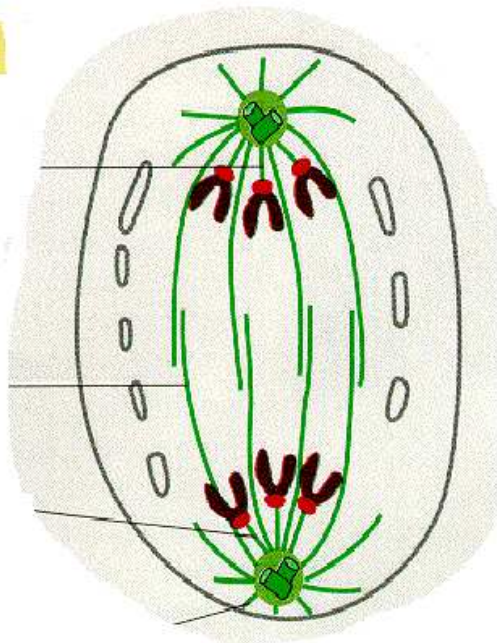
METAPHASE



ANAPHASE

During anaphase the _____ that join _____ split allowing sister chromatids to separate and become _____ again. The spindle fibers _____ and drag the chromosomes to opposite ends of the cell. Anaphase ends when the chromosomes _____

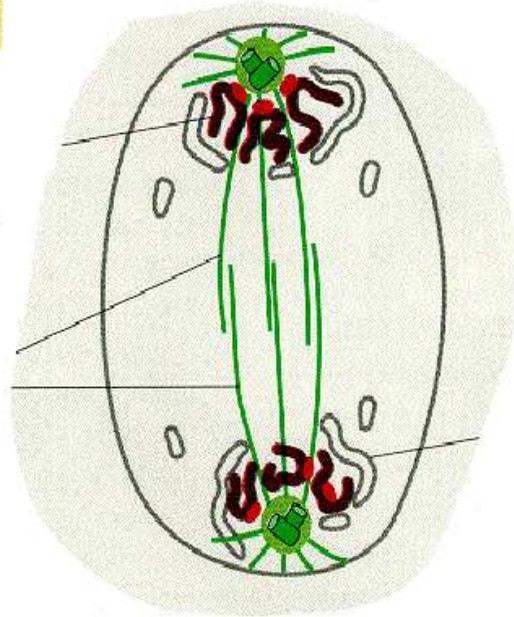
ANAPHASE



TELOPHASE

In telophase the chromosomes, which were _____
begin to disperse into a tangle of _____
A nuclear envelope _____
around each _____
The spindle _____ and a nucleolus
becomes _____.
Mitosis is _____ but cell division _____

TELOPHASE



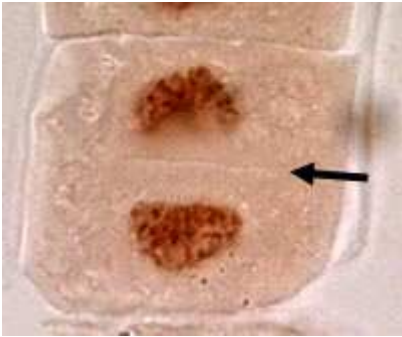
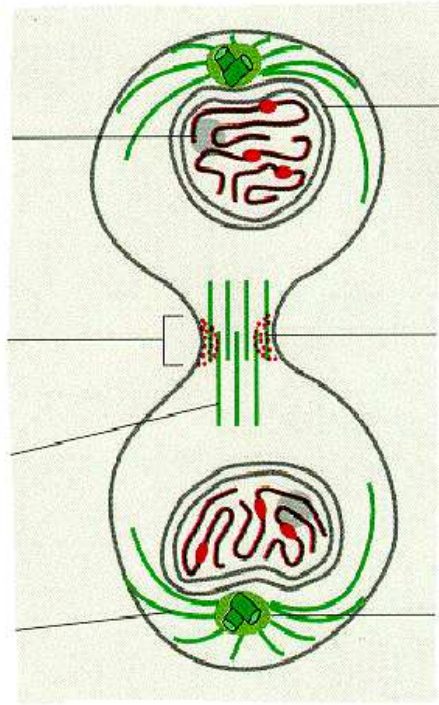
7. As a result of mitosis, _____ each with a
_____ are formed. All that remains to complete the **M** phase of the cycle is

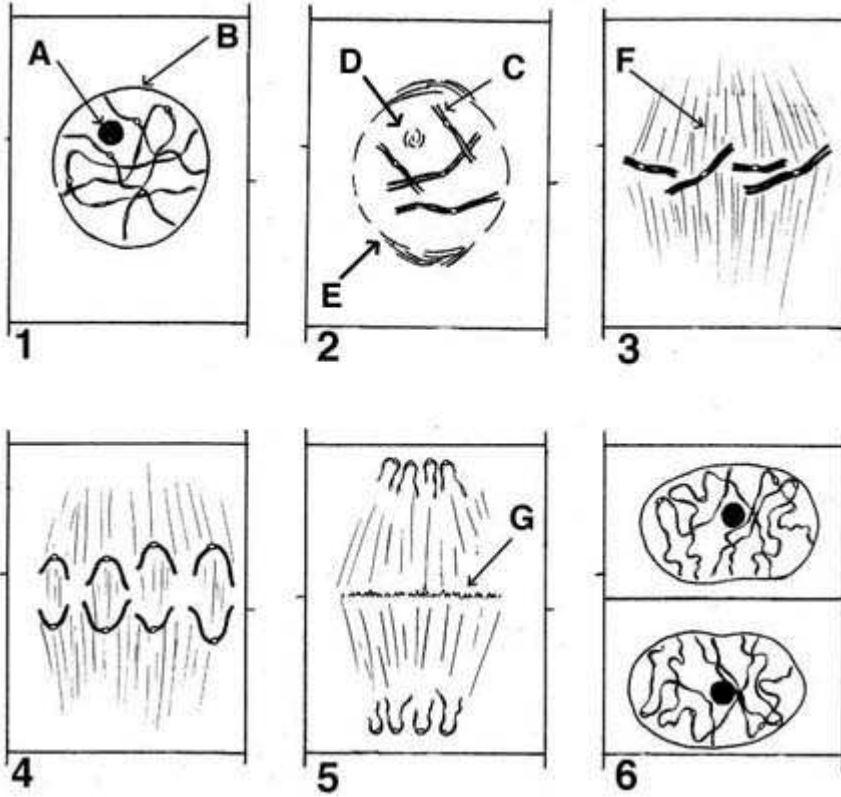
Cytokinesis can occur in two ways.

In animal cells: _____

In plant cells: _____

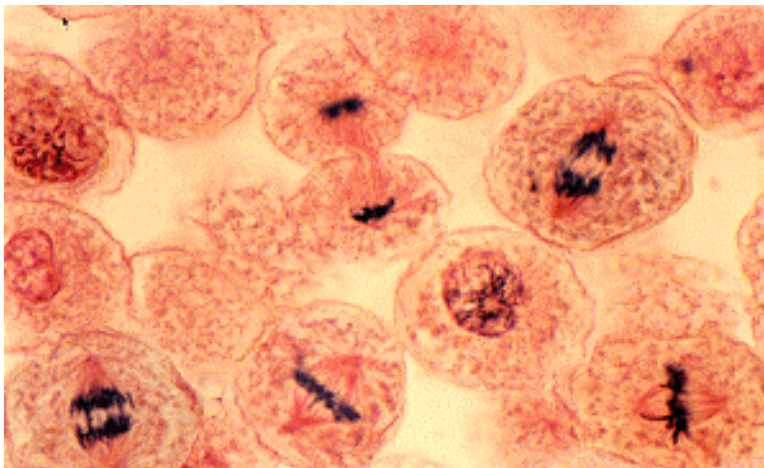
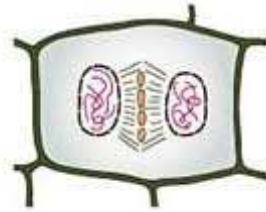
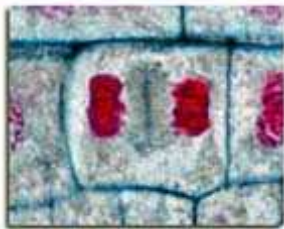
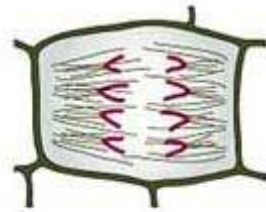
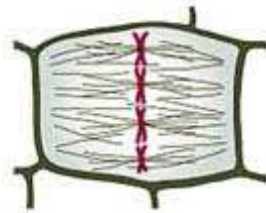
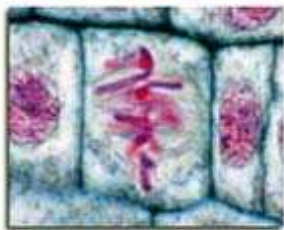
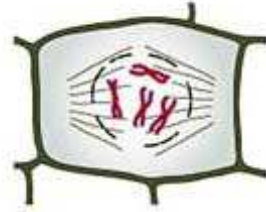
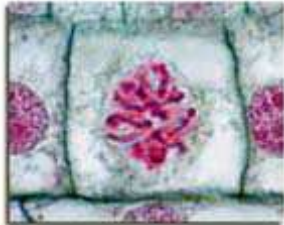
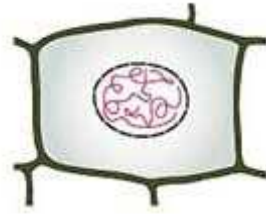
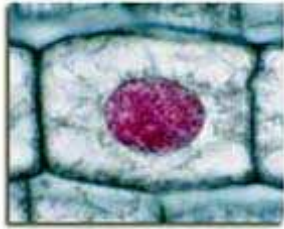
CYTOKINESIS

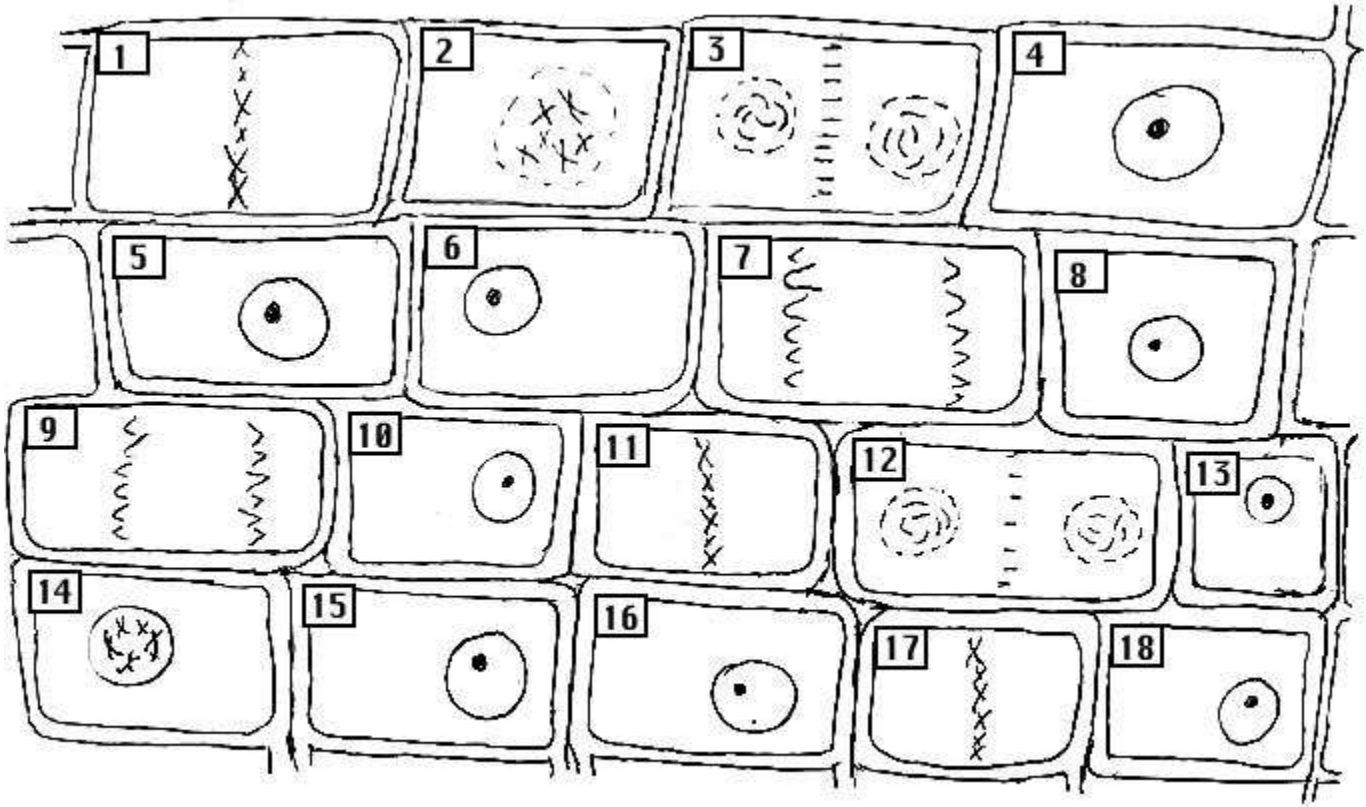




1. _____
 A. _____
 B. _____
2. _____
 C. _____
 D. _____
 E. _____
3. _____
 F. _____
4. _____
5. _____
 G. _____
6. _____

Is this an animal or plant cell? _____ How do you know?





- | | |
|-----------|-----------|
| 1. _____ | 13. _____ |
| 2. _____ | 14. _____ |
| 3. _____ | 15. _____ |
| 4. _____ | 16. _____ |
| 5. _____ | 17. _____ |
| 6. _____ | 18. _____ |
| 7. _____ | |
| 8. _____ | |
| 9. _____ | |
| 10. _____ | |
| 11. _____ | |
| 12. _____ | |