Chapter 5: “Mitosis is the basis of asexual reproduction.”
Complete Activity 5–1A
Mitosis

- The process in which the contents of a cell’s nucleus divide.
- Results in two daughter cells identical to the parent.
Phases of Mitosis:
1. Prophase
2. Metaphase
3. Anaphase
4. Telophase
Prophase

- The double stranded chromosomes shorten and thicken.
- The nuclear membrane begins to fade.
Metaphase

- X-shaped chromosomes are pulled into a single line across the middle of the cell.
Anaphase

- The chromatids are pulled to opposite poles of the cell.
Telophase

- The nuclear membrane forms around each set of chromosomes.
- The cell is ready to divide into two separate cells.
Animal cell

Plant cell
Complete Activity 5–1 C
Asexual Reproduction

- Only one parent is involved.
- Offspring are identical to the parent.
- Most reproduce quickly and in large numbers.
Types of Asexual Reproduction

1. Binary Fission
   - A single parent cell replicates its genetic material and divides into two equal parts.
1 Parent cell

2 Nucleus divides

3 Cytoplasm divides

4 Two daughter cells

Amoeba
Bacteria
2. Budding

- Part of the cell pushes outward to form an outgrowth or bud.
- The bud pinches off to form the new offspring identical to parent.

Not all buds break away.
yeast
Sponge
3. Fragmentation

When an organism breaks apart as a result of injury, each fragment then develops into a clone of its parent.
Sea Stars
Japanese Knotweed
Occurs when special cells, in plants and roots, divide repeatedly to form structures that will eventually develop into plants identical to the parent.
Strawberry Runners
Tulip Bulbs
5. Spore Formation

- A spore is a reproductive cell that grows into a new individual by mitosis.
- Light in weight.
- Rely on water, or wind to carry spores away from parent plant.
Bread Mold Spores
Puffball
Summary of Asexual Reproduction...

- Large # of offspring are produced quickly.
- Large colonies can form to out-compete.
Large # of offspring mean the species may survive when conditions change.

Energy is not required to find a mate.
Offspring are genetic clones. Negative mutations can destroy large #s.

Those produced close together must compete.
Unfavorable conditions can wipe out entire colonies.
Core Lab Activity 5–2B  Pg. 162–4

“Determining the Best Conditions for Yeast Reproduction”