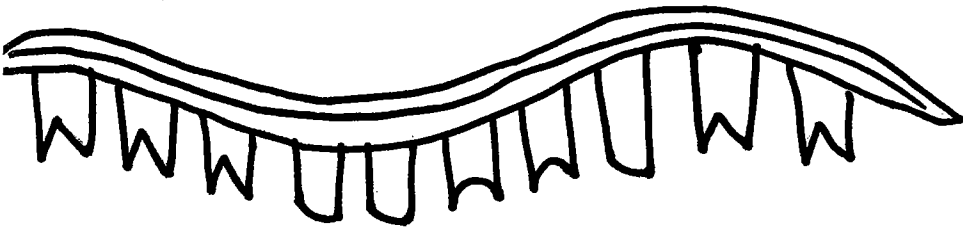
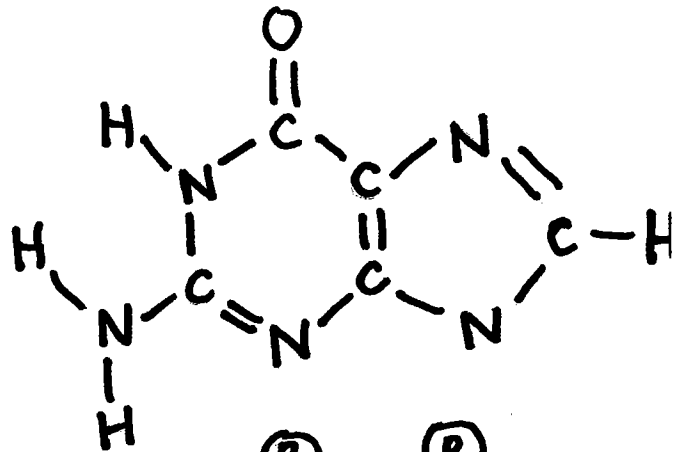
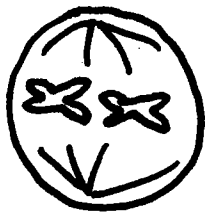
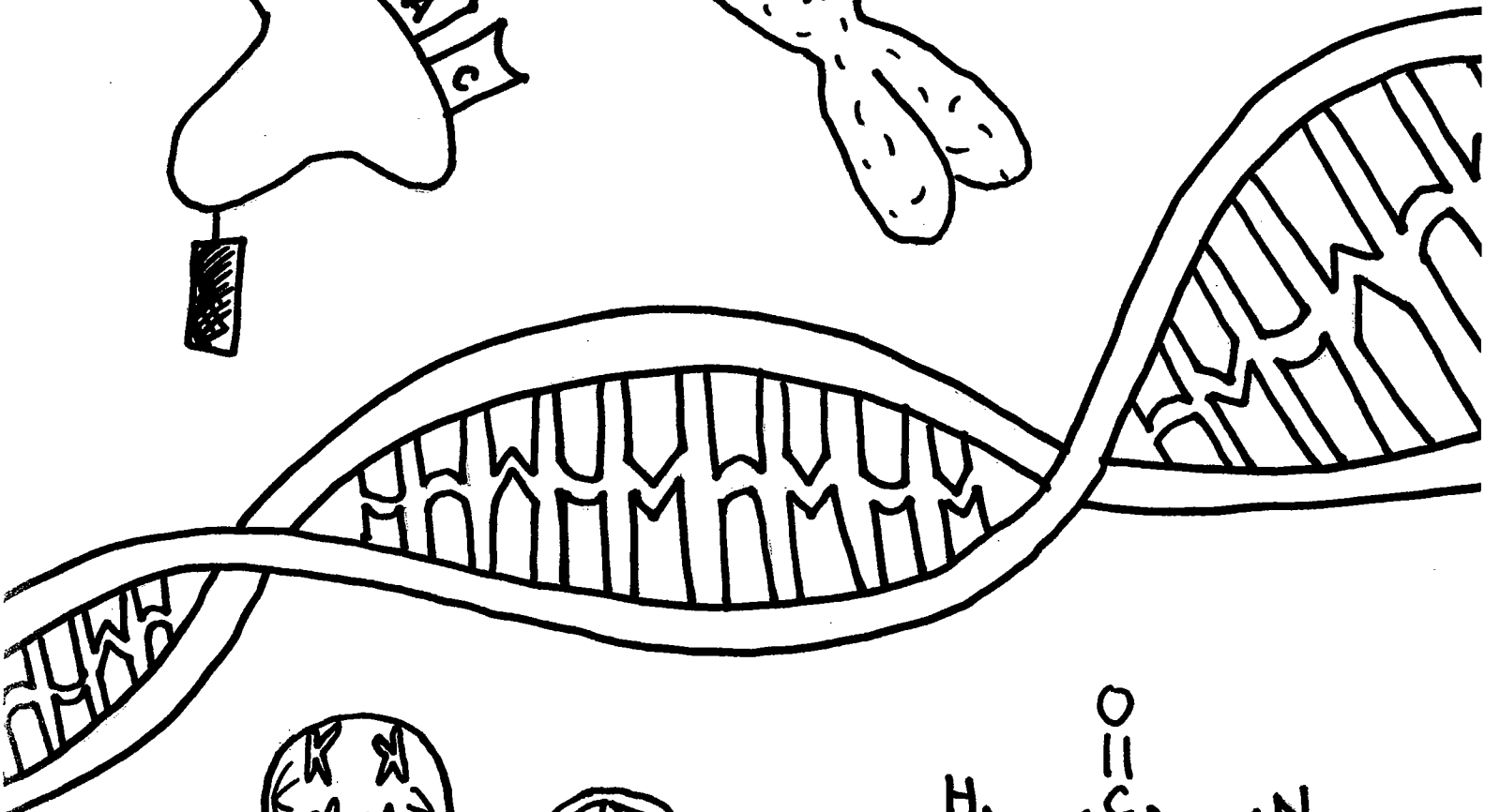
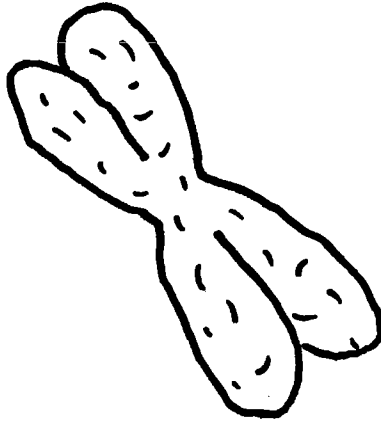
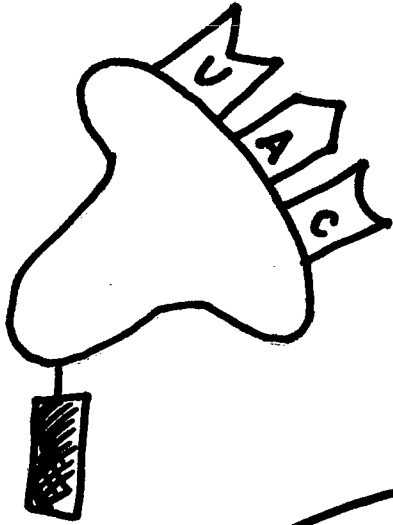


ECOLOGICAL

Quarter Three

BIOLOGY

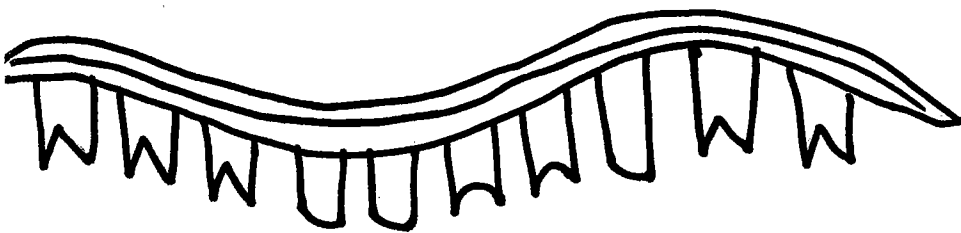
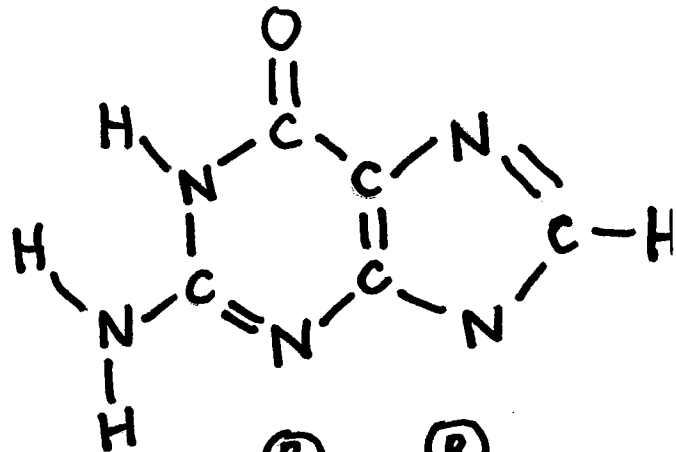
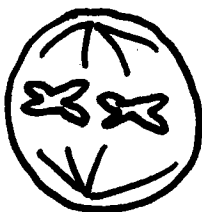
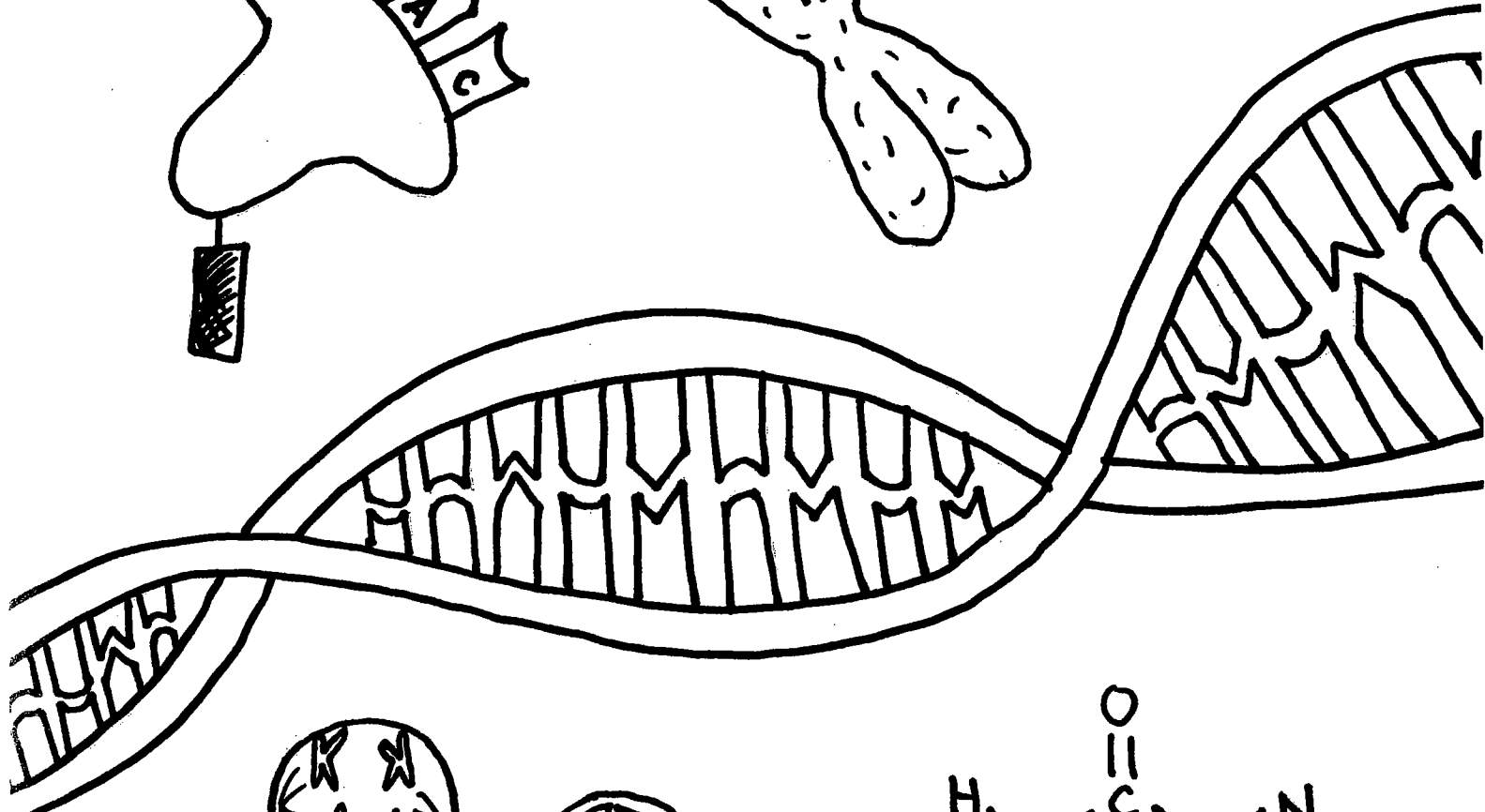
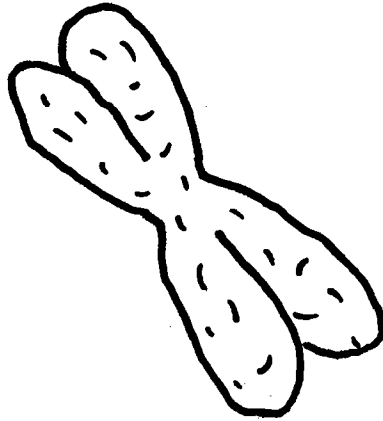
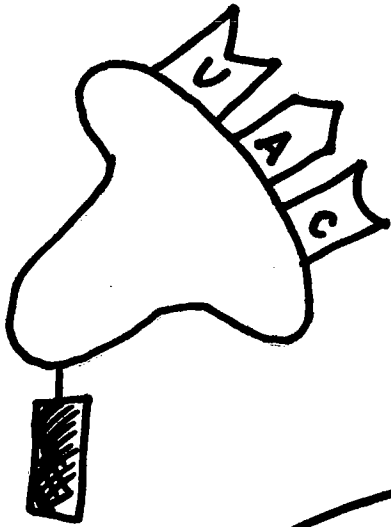


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ECOLOGICAL

Quarter Three

BIOLOGY



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Ecological Biology

Chapter Vocabulary Assignments

In this workbook you will find vocabulary lists for each chapter we are covering. The lists have the words along with their definitions from the textbook - so you won't need to do spend time copying definitions from the glossary. ☺

Your assignment for each chapter will be to elaborate on the vocabulary words, and you will have a few choices as to how you complete these assignments. Each list has up to 15 terms (some have less). You will need to choose at least 12 words to support and extend with either of the following methods. (examples are all below)

- Vocabulary flash cards
- Vocabulary maps
- Frayer models
- A vocabulary flip book (See prepared example)

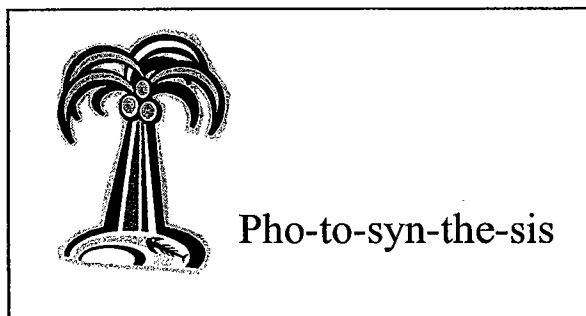
▣ Whichever method you choose, for each word you need to:

- Write out the definition in your own words.
- At least three of the following choices
 - List examples
 - Draw a picture to illustrate the term
 - Use the term in an original, scientific sentence
 - List characteristics/properties
 - Categorize the term
 - List non-examples

You can complete each assignment in the flip book format, on notecards, or on your own notebook paper. Either way, you should keep your vocabulary assignments for the whole semester, so that you can use them to study for tests, and so they are handy when finals time rolls around.

Vocabulary Flash Cards

Side one: Illustration (colored)
Word divided into syllables



Side two: Definition (in your own words)
Examples or characteristics
Original sentence

Definition: Process by which plants use sunlight to make sugar.

Overall Equation: Carbon dioxide + water + sunlight = glucose + oxygen

A tree uses photosynthesis to create sugar and oxygen, while in the presence of light

Name: _____

Period: _____

**Ecological Biology 2nd Semester
Unit 1 Objectives: Cells & DNA**

**Chapter 9: The Cellular Basis of Inheritance (pgs 178-189)
Chapter 11: DNA & the Language of Life (pgs 229-234)**

Chapter 9:

9.1.1 Describe how cell reproduction contributes to repair and to growth.

9.2.1 Describe the structure of a chromosome.

9.2.2 & 9.3.1 Summarize the major events that occur during the cell cycle, including mitosis.

Chapter 11:

11.2.1 Identify the building blocks of DNA.

11.2.2 Describe DNA's structure and the rules for base pairing in DNA.

11.3.2 Describe the process of DNA replication.

Ecological Biology: 3rd Quarter Vocabulary

List 1: (11.2, 11.3, 9.2 & 9.3)

These are some of the vocabulary words from this unit: **Protein Synthesis and Biotechnology**, complete with definitions. Your job is to describe how each word is used in biology. Choose a vocabulary assignment from the list of examples at the front of your workbook.

1. **Deoxyribonucleic acid (DNA)** [pg. 229]- a nucleic acid; a polymer built from monomers called nucleotides: pyrimidines & purines.
2. **Nucleotides** [pg.229]- the building blocks (monomers) of nucleic acid polymers; comprised of sugar deoxyribose, phosphate groups & a nitrogenous base.
3. **Nitrogenous Base** [pg.229]- carbon and nitrogen single-ringed structures (thymine & cytosine) and double-ringed structures (adenine & guanine) that comprise DNA.
4. **Pyrimidines** [p.230]- a single-ringed carbon and nitrogen structure made of thymine (T) and cytosine (C); a nitrogenous base.
5. **Purines** [pg.230]- a double-ringed carbon and nitrogen structure made of adenine (A) and guanine (G); a nitrogenous base.
6. **Double Helix** [p.231]- realized by Watson & Crick as DNA's structure: oppositely-twisting shape formed by 2 nucleotide strands.
7. **DNA Polymerase** [pg.234]- enzymes that make covalent bonds between nucleotides of the newly replicated DNA strand.
8. **Chromatin** [pg.182]- a combination of DNA and protein molecules; seen during cell reproduction.
9. **Chromosomes** [pg.182]- condensed chromatin before cell reproduction that may contain hundreds of genes; each species has their own number of chromosomes.
10. **Centromere** [pg.182]- the region where 2 chromatids are joined tightly together.
11. **Cell Cycle** [pg.183]- comprises the stages a cell undergoes during reproduction.
12. **Mitosis** [pg.184]- the cycle in which the cell's nucleus and duplicated chromosomes are evenly divided amongst 2 daughter nuclei.

Name: _____

Period: _____

UNIT 1: Cells and DNA
Chapters 9 & 11: Cellular Replication and DNA
Structure
Reading Guide

Chapter 9.1 - 9.3

- 1) The ability to _____ is an important characteristic of living organisms.
- 2) The division of cells into more cells enables living things to:
 - a. _____
 - b. _____
 - c. _____
- 3) All of the _____ of cells in your body result from cell _____, a series of cell divisions that began with a _____.
- 4) Explain asexual reproduction, AND identify two types of organisms you've studied this year that can reproduce this way. _____

- 5) How is sexual reproduction different from asexual reproduction? _____

- 6) Explain the difference between chromatin and chromosomes. _____

- 7) Before a cell divides, it must _____ all of its chromosomes.
- 8) In the space below, draw and label a pair of sister chromatids.
- 9) What is the cell cycle? _____
- 10) In which phase of the cell cycle does a cell spend most of its time? _____
- 11) Interphase consists of 3 phases. List the phases and what happens in each phase.
 - a. _____
 - b. _____
 - c. _____

12) Identify 2 important events that occur during the mitotic phase. _____

13) Chromosomes move around the cell during mitosis. How is their movement guided? _____

14) Examine figure 9-8 on pages 186 and 187. In your own words, summarize what happens during mitosis. (Use at least three complete sentences). _____

15) Analysis: A normal human skin cell has 46 chromosomes. Fill in the blanks below using your knowledge of mitotic division.

1 skin cell with 46 chromosomes  _____ skin cell(s) with _____ chromosomes (after mitosis).

16) How is cytokinesis different in plant cells? _____

Chapter 11.2 - 11.3

17) What molecule stores genetic material? (Don't abbreviate). _____

18) In the space below, draw a nucleotide and label the 3 main components.

19) Name the 4 nitrogenous bases found in DNA.

- a. _____
- b. _____
- c. _____
- d. _____

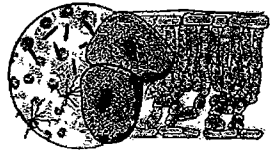
20) How are nucleotides joined to form the "backbone" of DNA? _____

- 21) The basic shape of DNA is a _____ with the _____ on the outside and the _____ on the inside.
- 22) Explain the pattern among the nitrogenous bases found in DNA. _____
- 23) If six bases on one strand of a DNA double helix are CGCTAA, what are the six bases on the complementary strand? _____
- 24) How does one strand of DNA act as a template for replication? _____
- 25) What are replication bubbles? _____
- 26) When during the cell cycle is DNA replicated? _____

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Cell Cycle and Mitosis

The Cell Cycle

The **cell cycle**, or **cell-division cycle**, is the series of events that take place in a **eukaryotic cell** between its formation and the moment it replicates itself. These events can be divided in **two main parts**: **interphase** (*in between divisions* phase grouping **G₁ phase**, **S phase**, **G₂ phase**), during which the cell is forming and carries on with its normal metabolic functions; the **mitotic phase** (M mitosis), during which the cell is replicating itself. Thus, cell-division cycle is an essential process by which a single-cell fertilized egg develops into a mature organism and the process by which hair, skin, blood cells, and some internal organs are renewed.

Interphase is a phase of the cell cycle, defined only by the absence of cell division. During interphase, the cell obtains nutrients, and duplicates its chromatids. Chromatids are connected by the **centromere** and have a **long and short arm**. *Label* the parts of the chromosome. Most eukaryotic cells spend most of their time in interphase. For example, human skin cells, which divide about once a day, spend roughly 22 hours in interphase. About 90 percent of cells are in interphase. Some cells, such as nerve cells, can stay in interphase for decades. There are 3 parts of interphase: **G₁** (growth 1 in which the cell creates organelles and begins metabolism), **S phase** (DNA synthesis in which the chromosomes of the cell are copied) and **G₂** (growth 2 in which the cell grows in preparation for cell division). *Draw an additional line in red* around those parts of the cell cycle diagram that are included in interphase.

Sometimes the cells exit the cell cycle (usually from **G₁ phase**) and enter the **G₀ phase**. In the **G₀ phase**, cells are **alive and metabolically active**, but do not divide. In this phase cells do not copy their DNA and do not prepare for cell division. Many cells in the human body, including those in **heart muscle**, eyes, and brain are in the **G₀ phase**. **If these cells**

are damaged they cannot be replaced. *Draw an arrow in black* on the cell cycle showing where a cell would enter the G_0 phase.

The G_1 phase is a period in the cell cycle during interphase, after cytokinesis (process whereby a single cell is divided into two daughter cells) and before the S phase. For many cells, this phase is the major period of cell growth during its lifespan. During this stage new organelles are being synthesized, so the cell requires both structural proteins and enzymes, resulting in great amount of protein synthesis. *Color the G_1 phase green.*

The S phase, short for synthesis phase, is a period in the cell cycle during interphase, between G_1 phase and the G_2 phase. Following G_1 , the cell enters the S stage, when DNA synthesis or replication occurs. At the beginning of the S stage, each chromosome is composed of one coiled DNA double helix molecule, which is called a chromatid. At the end of this stage, each chromosome has two identical DNA double helix molecules, and therefore is composed of two sister chromatids. During S phase, the centrosome is also duplicated. *Color the S phase orange.*

G_2 phase is the third, final, and usually the shortest subphase during interphase within the cell cycle in which the cell undergoes a period of rapid growth to prepare for mitosis. It follows successful completion of DNA synthesis and chromosomal replication during the S phase, and occurs during a period of often four to five hours. Although chromosomes have been replicated they cannot yet be distinguished individually because they are still in the form of loosely packed chromatin fibers. The G_2 phase prepares the cell for mitosis (M phase) which is initiated by prophase. *Color the G_2 phase light blue.*

Mitosis

Mitosis is the process in which a cell duplicates its chromosomes to generate two, identical cells. It is generally followed by cytokinesis which divides the cytoplasm and cell membrane. This results in two

identical cells with an equal distribution of organelles and other cellular components. Mitosis and cytokinesis jointly define the **mitotic (M) phase** of the cell cycle, the division of the mother cell into two sister cells, each with the **genetic equivalent of the parent cell**. Mitosis occurs most often in eukaryotic cells. In multicellular organisms, the **somatic cells** (body cells) undergo mitosis, while **germ cells** — cells destined to become sperm in males or ova in females — divide by a related process called **meiosis**. **Prokaryotic cells** (bacteria), which lack a nucleus, divide by a process called **binary fission**.

The process of **mitosis (division of the nucleus)** is divided into **four stages (Prophase, Metaphase, Anaphase, and Telophase)**. Immediately following nuclear division (mitosis), the **cell membrane** must also divide (**cytokinesis**). Animal cells divide the cytoplasm by constricting the cell membrane in the middle to form a **cleavage furrow**. Plant cells form a **cell plate** in the center to divide the cytoplasm. At Interphase, there is only one cell, but after cytokinesis there are two identical cells.

During **prophase**, the DNA molecules are progressively shortened and condensed by coiling, to form **chromosomes**. Spindle fibers form which will attach to the chromosomes. **Enzymes** break down the nuclear membrane and nucleolus which are no longer visible. At **metaphase**, the spindle fibers attach themselves to the centromeres of the chromosomes and align the chromosomes at the **equator** (middle of the cell). **Anaphase** is the next stage. The spindle fibers shorten and the centromere splits separating the two sister chromatids. During **telophase**, the chromosomes pairs (chromatids are pulled to opposite poles of the cell. The nuclear envelope and nucleolus reform before the chromosomes uncoil. The spindle fibers disintegrate.

