17.1 Mitosis and Cytokinseis

Summarize main points from each video.

Video Title / topic

Video Title / topic

Video Title / topic

Topic Introduction

Summarize your understanding of each paragraph.

During mitosis, the first and longest phase of mitosis is prophase. During prophase, chromatin condenses into chromosomes, and the nuclear envelope, or membrane, breaks down.

Next, during metaphase, spindle fibers attach to the centromere of each pair of sister chromatids. The sister chromatids line up at the equator, or center, of the cell. Spindle fibers move sister chromatids to separate and go to different daughter cells when the cell divides.

Then, during anaphase, sister chromatids separate and the centromeres divide. The sister chromatids are pulled apart by the shortening of the spindle fibers. One way to imagine this is that this is similar to reeling in a fish by shortening the fishing line.

Finally, during telophase, the chromosomes begin to uncoil and form chromatin. This prepares the genetic material for directing the metabolic activities of the new cells. The spindle also breaks down, and new nuclear membranes (nuclear envelope) form.

https://www.ck12.org/biology/mitosis

Read/Summarize Text

1. **Read the passage.**
2. **Underline key expressions in each sentence.**
3. **Re-write each word (or expression) you underlined.**
4. **Summarize the passage.**

Title of Passage.

(1)

(2)

Mitosis actually occurs in four phases. The phases are called prophase, metaphase, anaphase, and telophase. They are described in the paragraphs above and illustrated in the diagrams following this page.

Mitosis is the phase of the eukaryotic cell cycle that occurs between DNA replication and the formation of two daughter cells.

There are a few differences between plant and animal cells during mitosis. Muck of the process is the same, however.

https://www.ck12.org/biology/mitosis/lesson/Mitosis-and-Cytokinesis-BIO/

Re-write words you underlined

(3)

_____   _____   _____

_____   _____   _____

Using a complete sentence, summarize or rephrase the passage

(4)

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

In cell biology, mitosis is a part of the cell cycle when replicated chromosomes are separated into two new nuclei. In general, mitosis (division of the nucleus) is preceded by the S stage of interphase (during which the DNA is replicated) and is often accompanied or followed by cytokinesis, which divides the cytoplasm, organelles and cell membrane into two new cells containing roughly equal shares of these cellular components. Mitosis and cytokinesis together define the mitotic phase of an animal cell cycle—the division of the mother cell into two daughter cells genetically identical to each other.
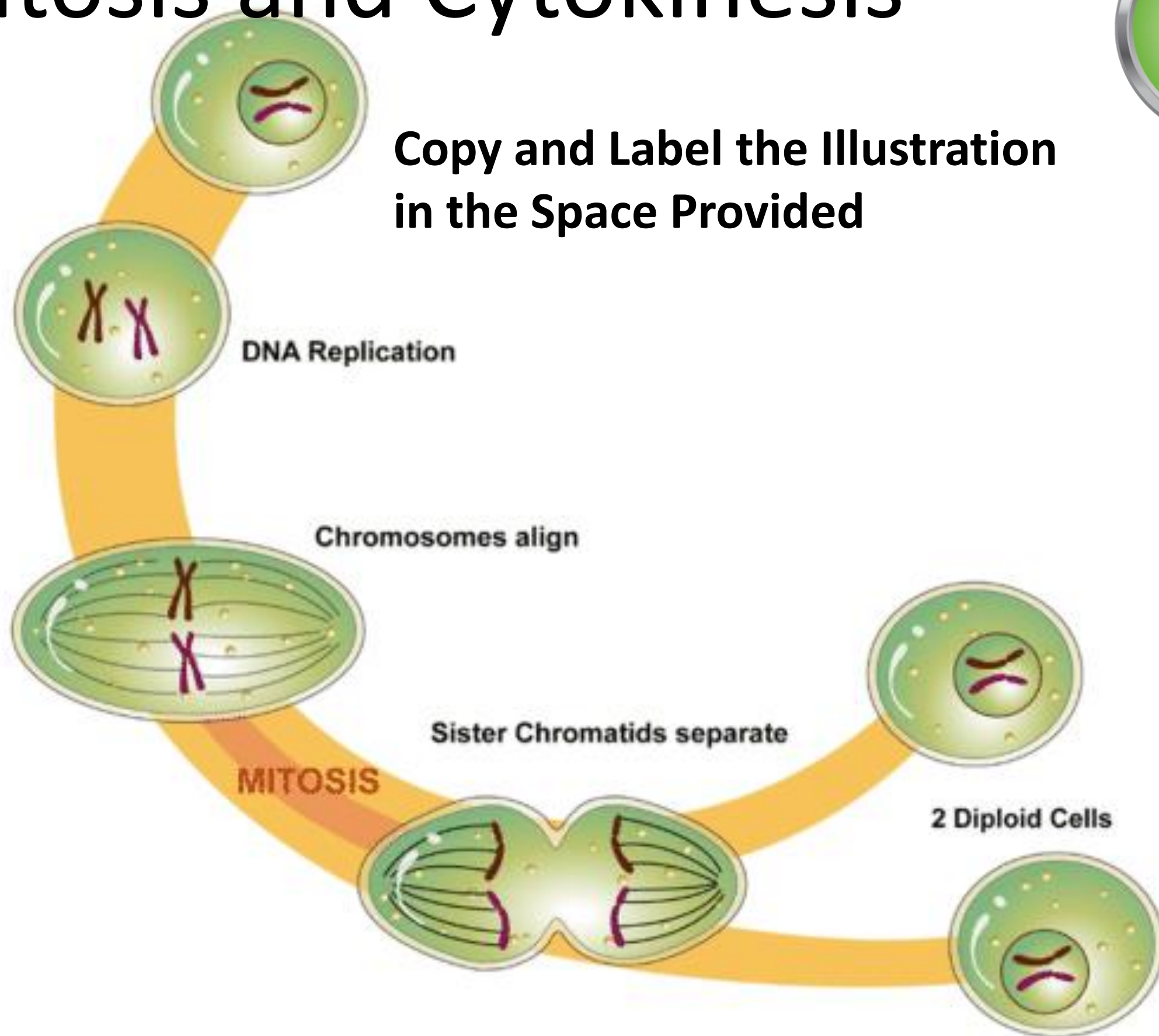
The process of mitosis is divided into stages corresponding to the completion of one set of activities and the start of the next. These stages are prophase, prometaphase, metaphase, anaphase, and telophase. During mitosis, the chromosomes, which have already duplicated, condense and attach to spindle fibers that pull one copy of each chromosome to opposite sides of the cell. The result is two genetically identical daughter nuclei. The rest of the cell may then continue to divide by cytokinesis to produce two daughter cells.

Mitosis occurs only in eukaryotic cells. Prokaryotic cells, which lack a nucleus, divide by a different process called binary fission. Mitosis varies between organisms. For example, animal cells undergo an "open" mitosis, where the nuclear envelope breaks down before the chromosomes separate, whereas fungi undergo a "closed" mitosis, where chromosomes divide within an intact cell nucleus. Most animal cells undergo a shape change, known as mitotic cell rounding, to adopt a near spherical morphology at the start of mitosis. Most human cells are produced by mitotic cell division. Important exceptions include the gametes – sperm and egg cells – which are produced by meiosis.

Mitosis and Cytokinesis

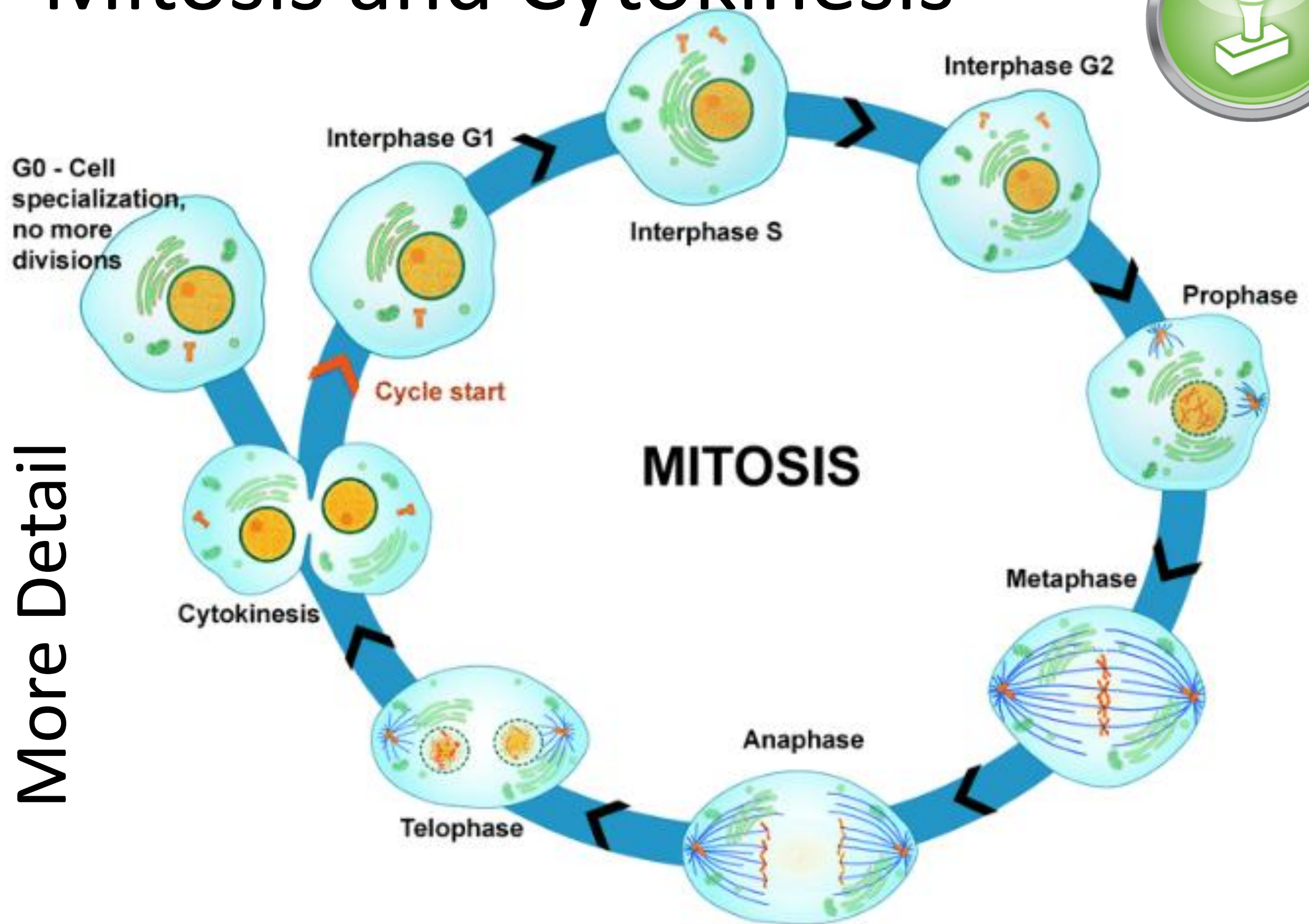**Copy and Label the Illustration in the Space Provided**

DNA Replication

Chromosomes align

Sister Chromatids separate

MITOSIS

2 Diploid Cells

https://www.ck12.org/biology/mitosis/lesson/Mitosis-and-Cytokinesis-BIO/

Draw (Copy) the Illustration Here

Mitosis and Cytokinesis

Draw (Copy) the Illustration Here

Show-Off Your Smarts!

Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Q1. How can this information be applied to a young-person's life?

Q2. How does this information apply to (or impact) communities?

Q3. When do scientists need to apply this information? How?

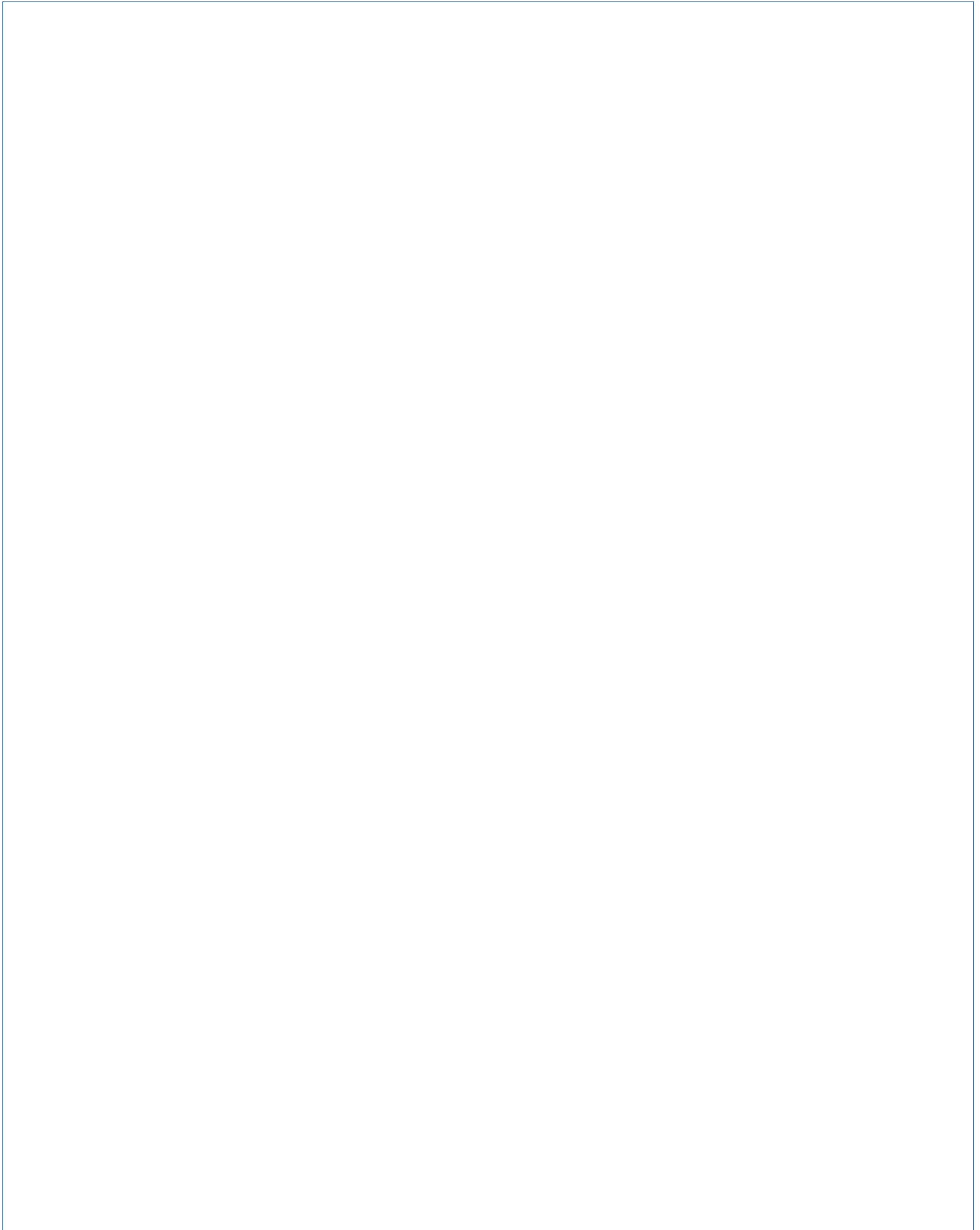**Q4. How would a person from 100 years ago view this information?**

Q5. How does this topic connect to other science topics or math?

Write down at least three words introduced or covered by this topic.

1.
2.
3.
4.
5.
6.

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.