

25.1 Protist Evolution



Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction



Summarize your understanding of each paragraph.

Protists evolved from prokaryotes, eventually giving rise to the entire line of eukaryotes that exists today. The first protists originated around 1.7 billion years ago from simple societies of prokaryotic cells. <http://faculty.college-prep.org/~bernie/sciproject/project/Kingdoms/Protists%207/evolution.html>

Protista are structurally the simplest eukaryotes in existence. As a result, the predator protista have evolved to exist mainly in aquatic habitats where they can use the water to move. Water is useful to the algae, as well.

Later, plants, animals, and fungi would evolve into more complex forms of the protista.

<https://www.livescience.com/54242-protists.html>

While exceptions exist, they are primarily microscopic and unicellular, or made up of a single cell. At one time, simple organisms such as amoebas and single-celled algae were classified together in a single taxonomic category: the kingdom Protista.

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.

What Are Protists?

All living organisms can be broadly divided into two groups — prokaryotes and eukaryotes — which are distinguished by the relative complexity of their cells. In contrast to prokaryotic cells, eukaryotic cells are highly organized. Bacteria and archaea are prokaryotes, while all other living organisms — protists, plants, animals and fungi — are eukaryotes.

At one time, simple organisms such as amoebas and single-celled algae were classified together in a single taxonomic category: the kingdom Protista. However, the emergence of better genetic information has since led to a clearer understanding of evolutionary relationships among different groups of protists, and this classification system was rendered defunct.

<https://www.livescience.com/54242-protists.html>

Re-write words you underlined

Using a complete sentence, summarize or rephrase the passage

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.

Evolution of Protists

Scientists think that protists are the oldest eukaryotes. If so, they must have evolved from prokaryotic cells. How did this happen? The endosymbiotic theory provides the most widely-accepted explanation. That's because it is well supported by evidence.

The First Eukaryotic Cells

According to the endosymbiotic theory, the first eukaryotic cells evolved from a symbiotic relationship between two or more prokaryotic cells. Smaller prokaryotic cells were engulfed by (or invaded) larger prokaryotic cells. The small cells (now called endosymbionts) benefited from the relationship by getting a safe home and nutrients. The large cells (now called hosts) benefited by getting some of the organic molecules or energy released by the endosymbionts. Eventually, the endosymbionts evolved into organelles of the host cells. After that, neither could live without the other.

As shown in Figure below, some of the endosymbionts were aerobic bacteria. They were specialized to break down chemicals and release energy. They evolved into the mitochondria of eukaryotic cells. Some of the small cells were cyanobacteria. They were specialized for photosynthesis. They evolved into the chloroplasts of eukaryotic cells.

Evidence for the Endosymbiotic Theory

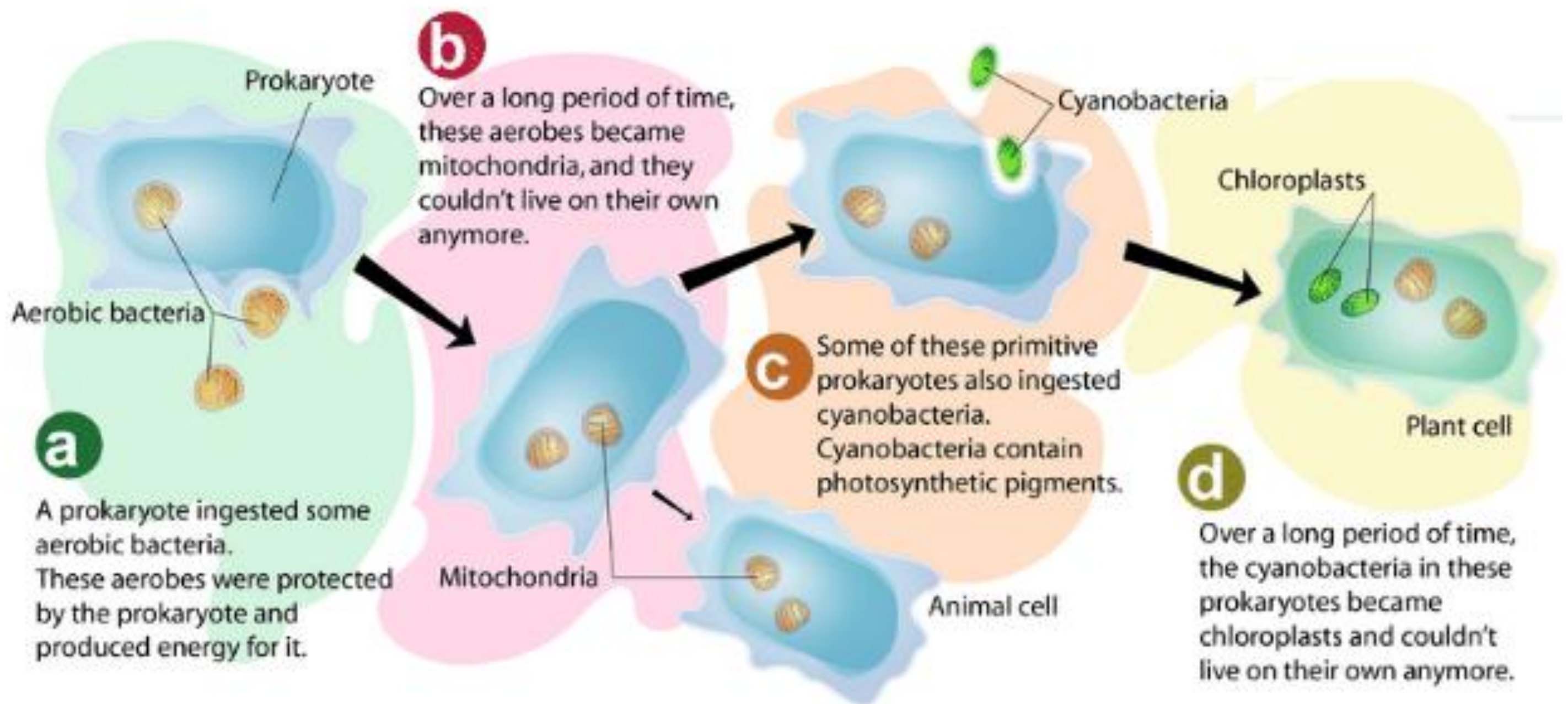
Many pieces of evidence support the endosymbiotic theory. For example:

- Mitochondria and chloroplasts contain DNA that is different from the DNA found in the cell nucleus. Instead, it is similar to the circular DNA of bacteria.
- Mitochondria and chloroplasts are surrounded by their own plasma membranes, which are similar to bacterial membranes.
- New mitochondria and chloroplasts are produced through a process similar to binary fission. Bacteria also reproduce through binary fission.
- The internal structure and biochemistry of chloroplasts is very similar to that of cyanobacteria.

Draw Illustration



Copy and Label the Illustration in the Space Provided



Endosymbiotic theory explains how eukaryotic cells arose.

<https://www.ck12.org/book/CK-12-Biology-Concepts/section/8.2/>

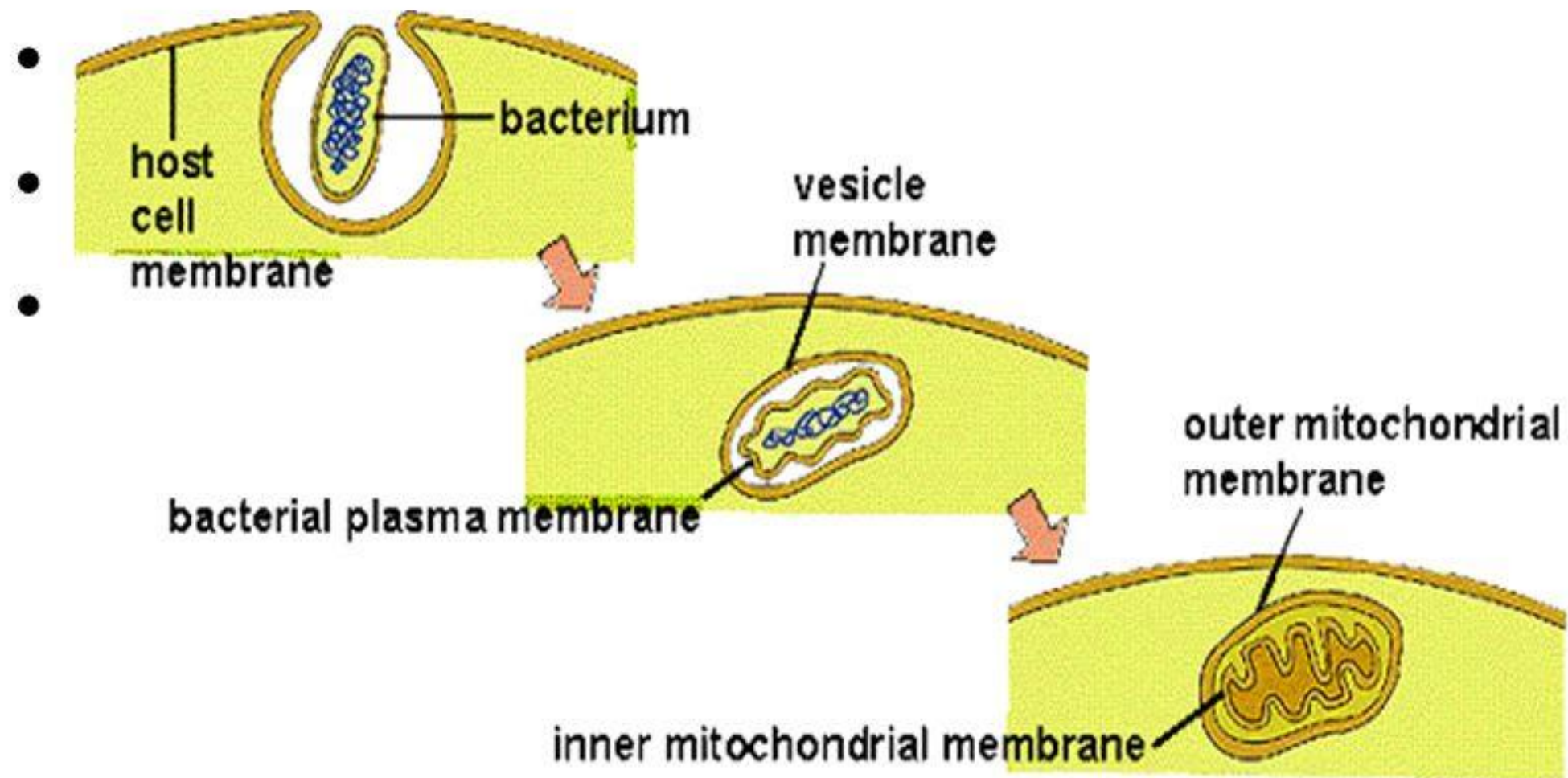
Draw (Copy) the Illustration Here

Draw Illustration



Copy and Label the Illustration in the Space Provided

Evolution of **Protists**



<http://www.biology.iupui.edu/biocourses/N100/2k2endosymb.html>

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?

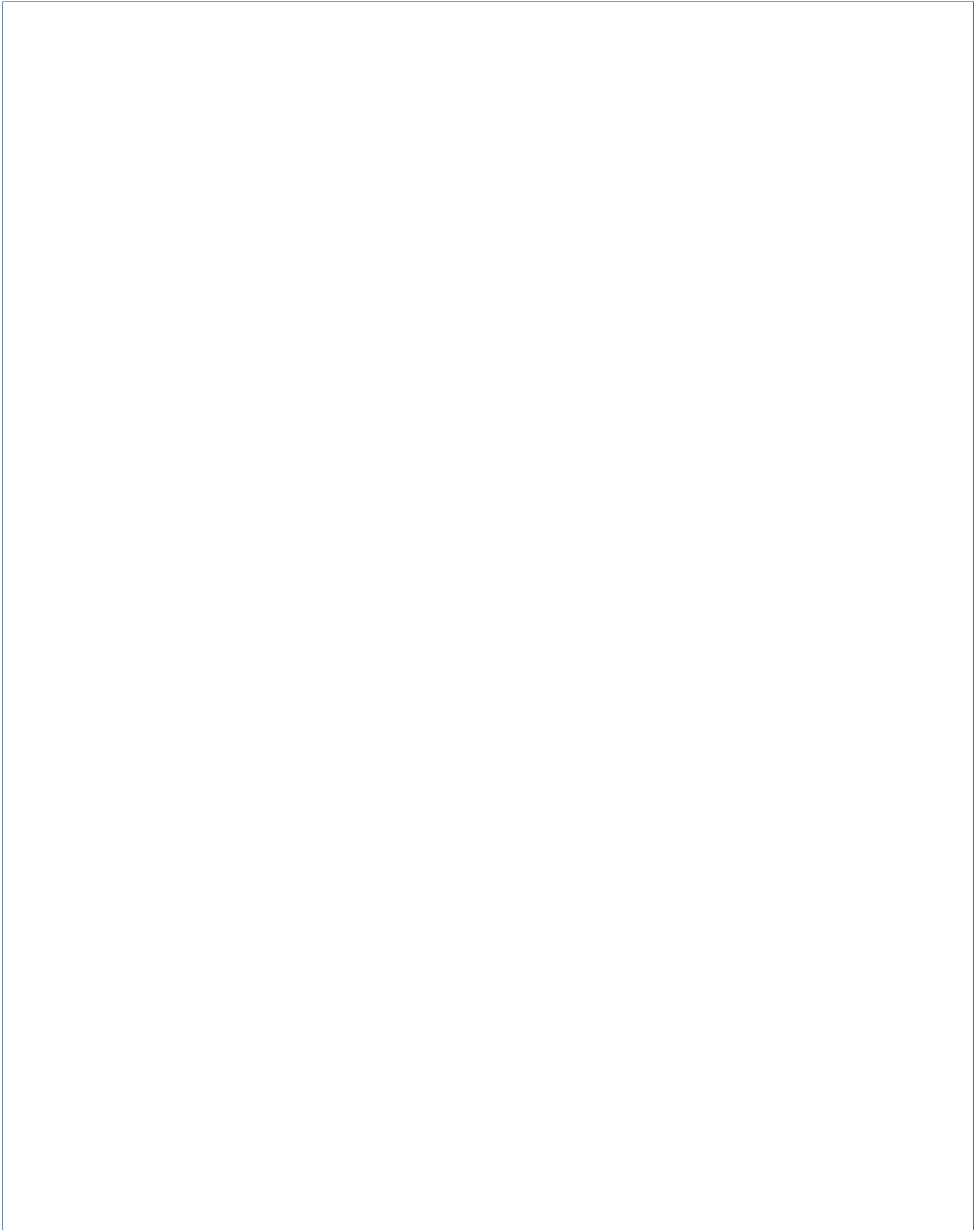
Q5. How does this topic connect to other science topics or math?

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.

A large, empty rectangular box with a thin blue border, intended for the student to create a poster. The box occupies most of the page below the instructions.