

16.1 Earth's Chemistry



Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction



Summarize your understanding of each paragraph.

There are ninety-two elements found on Earth. But only a few are very common. Most elements are found only in small quantities.

<http://science.jrank.org/kids/pages/212/Common-Elements.html>

The Earth's atmosphere is primarily made up of nitrogen and oxygen. The Earth's oceans are made up primarily of water (hydrogen and oxygen) along with a dissolved ions (originating from sodium, chlorine, calcium, magnesium, and sulfur).

The Earth's crust is mostly oxygen, silicon, aluminum, and iron. These, along with the additional elements of calcium, magnesium, potassium, and sodium make up well over 95% of the Earth's crust. Molecules and combinations of these elements make rocks and minerals.

The Earth's core is primarily Iron, using the symbol of "Fe" on the Periodic Table. Iron, along with the metal Nickel make up the majority of the Earth's core.

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.

Earth Chemistry at a Glance for Earth Day

As scientists are not able to visit the Earth's deep interior or place instruments within it, they explore in subtle ways. One approach is to study the Earth with non-material probes, such as seismic waves emitted by earthquakes. As seismic waves pass through the Earth, they undergo sudden changes in direction and velocity at certain depths. These depths mark the major boundaries, also called discontinuities, that divide the Earth into crust, mantle and core.

1

2

www.decodedscience.org

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.

The Crust. The Earth's crust is the thin outermost layer of the Earth, with an average depth of 24 km (15 mi). The crust accounts for 1.05% of the Earth's volume and 0.5% of its mass. The chemical elements oxygen, silicon and aluminum dominate the crustal composition. The major mineral type – the feldspars – are aluminosilicates of the alkali and alkaline-earth metals. Silicon dioxide is the second most common group.

The Mantle. The mantle extends from the base of the crust to the core and is about 2865 km (1780 mi) thick, occupying about 82.5% of the Earth's volume. The upper mantle is rich in olivine and pyroxenes. The major mineral type in the lower mantle appears to be pyroxenes, especially magnesium silicate. Scientists think that the lowest layer of the mantle called "D layer" is richer in aluminum and calcium than the higher layers of the mantle.

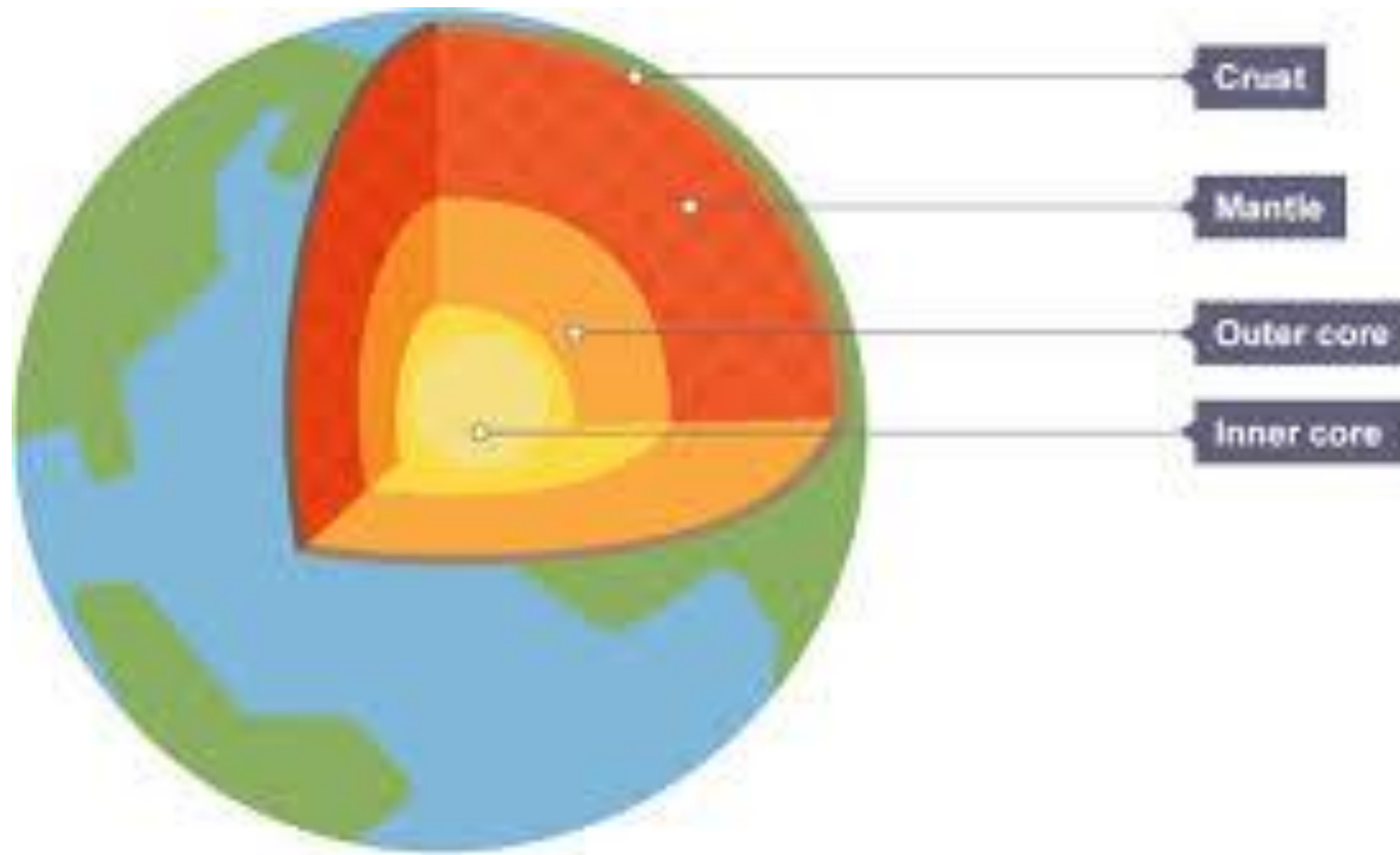
The Core. The core extends from the base of the mantle to the Earth's center, and is 6964 km (4327 mi) in diameter – accounting for only 16.3% of the Earth's volume, but 33.5% of its mass. The core is made up of two distinct parts – a liquid outer core, which is 2260 km (1404 mi) thick, and a solid inner core, which has a radius of 1222 km (759 mi). The core is chemically distinct from the mantle and contains about 89% iron and 6% nickel. The remaining 5% is made of lighter elements, possibly sulfur – but we cannot rule out the presence of oxygen and silicon, in light of a 2013 study published in *Nature*, which calls them "prime candidates" for the lighter elements in the Earth's core.

Draw Illustration



Copy and Label the Illustration in the Space Provided

Illustration



<http://www.bbc.co.uk/education/guides/zysbgk7/revision>

Draw (Copy) the Illustration Here

Interpret a Graph



Write the title of the graph _____

Circle the type of chart this represents

Bar Chart Line Chart Pie Chart Other

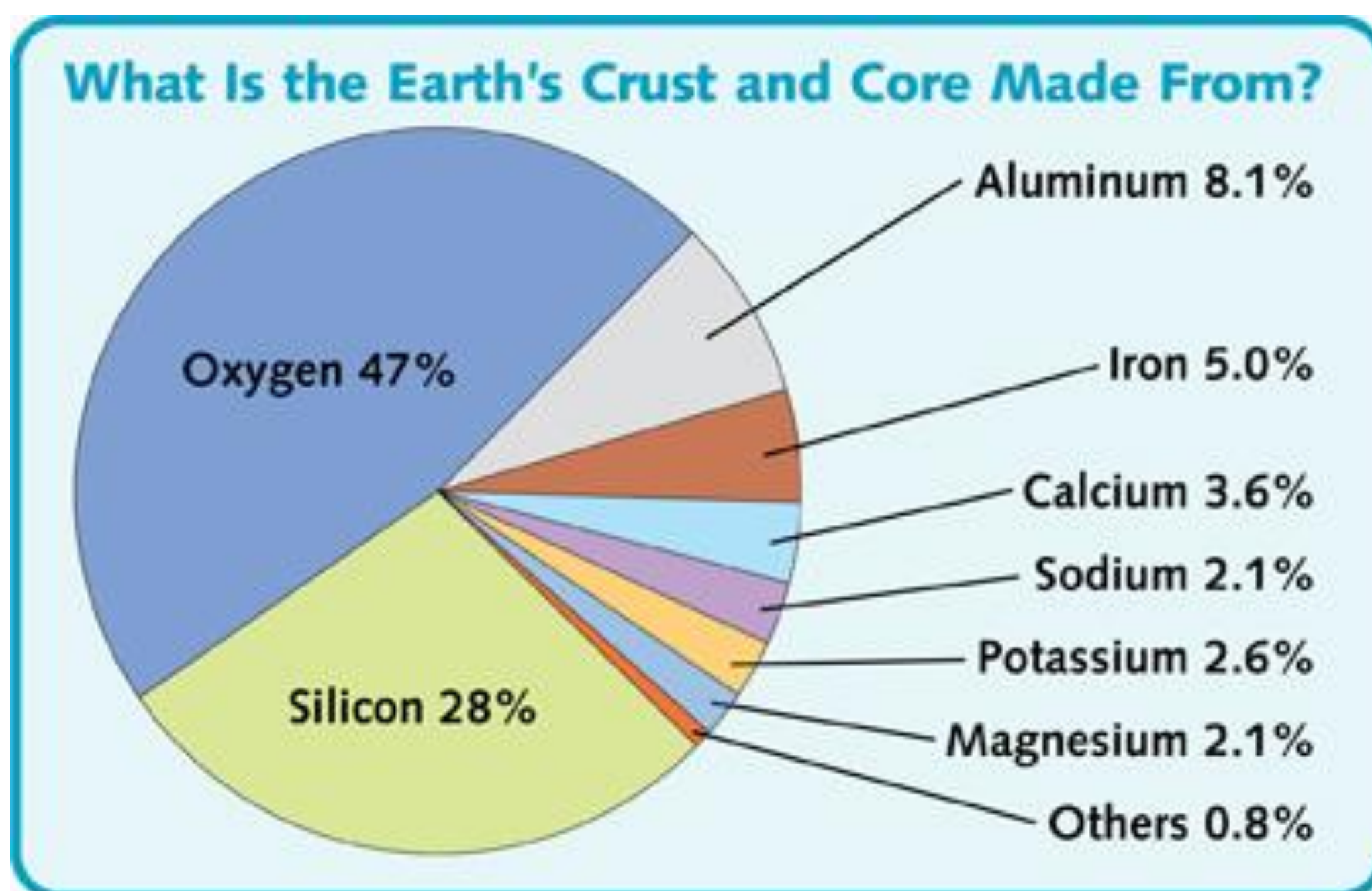
If applicable,

What does the X-axis represent _____

What does the Y-axis imply _____

Summarize what this graph represents or conveys

<http://science.irank.org/kids/pages/212/Common-Elements.html>



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?

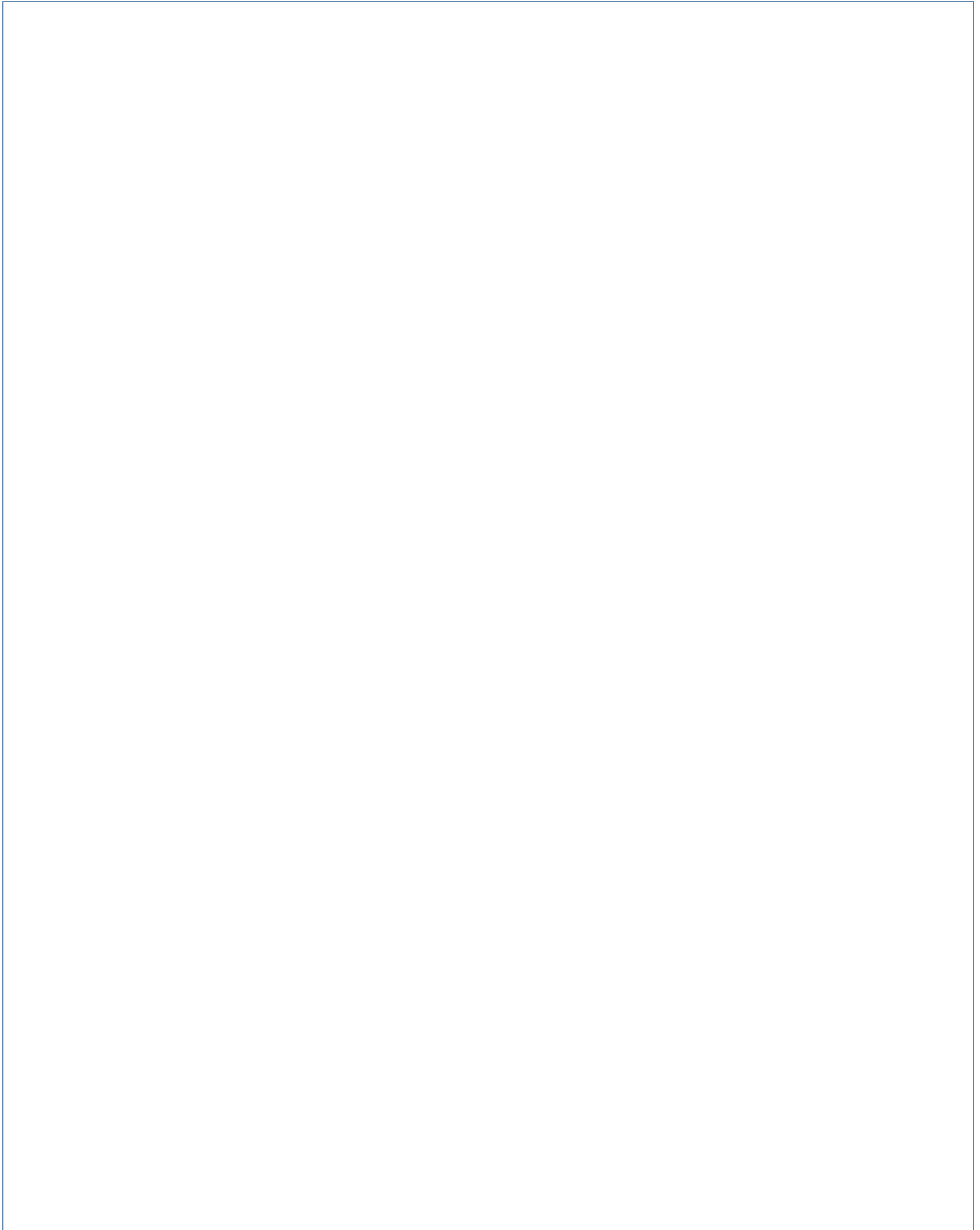
Q5. How does this topic connect to other science topics or math?

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.