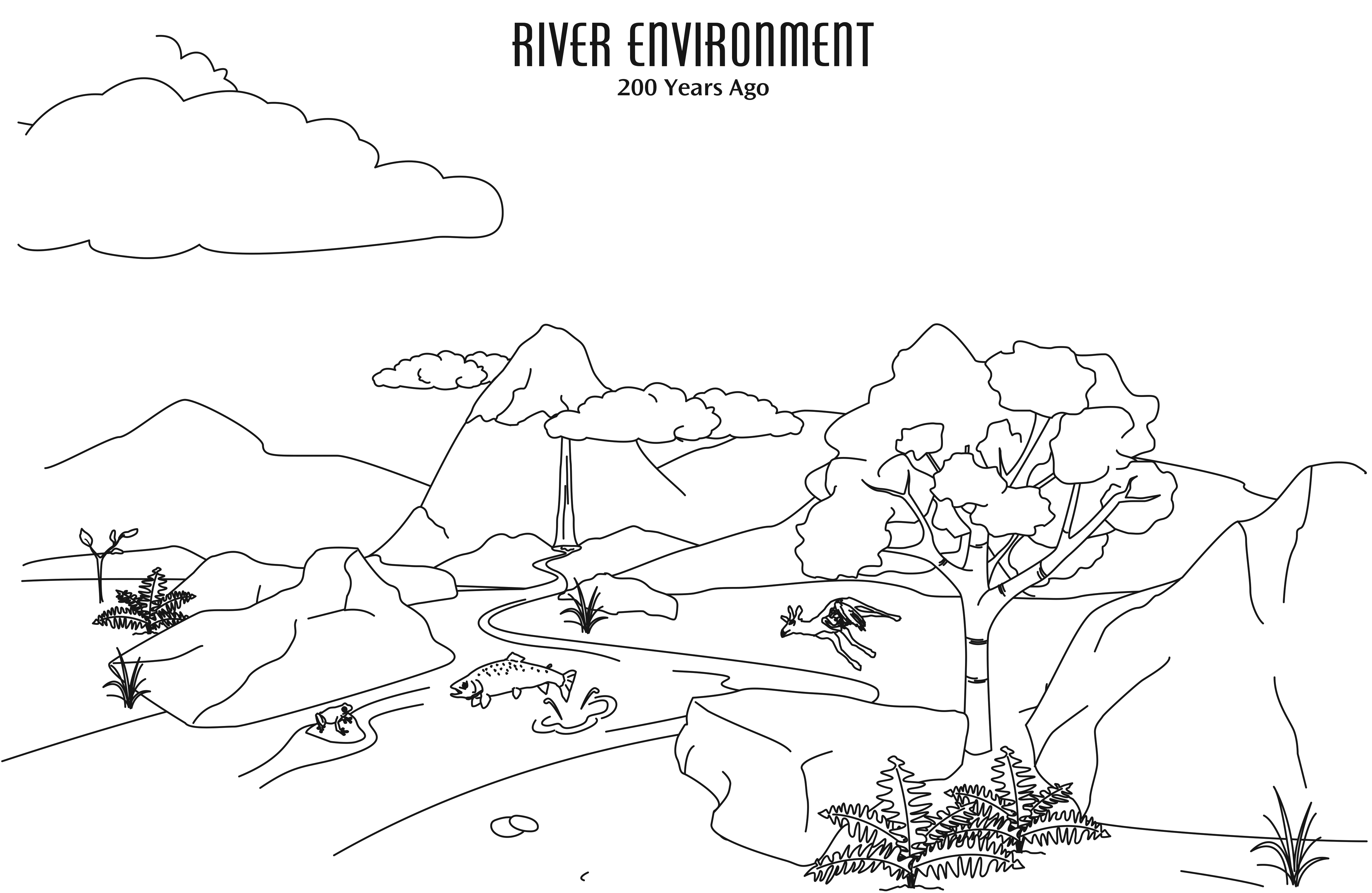
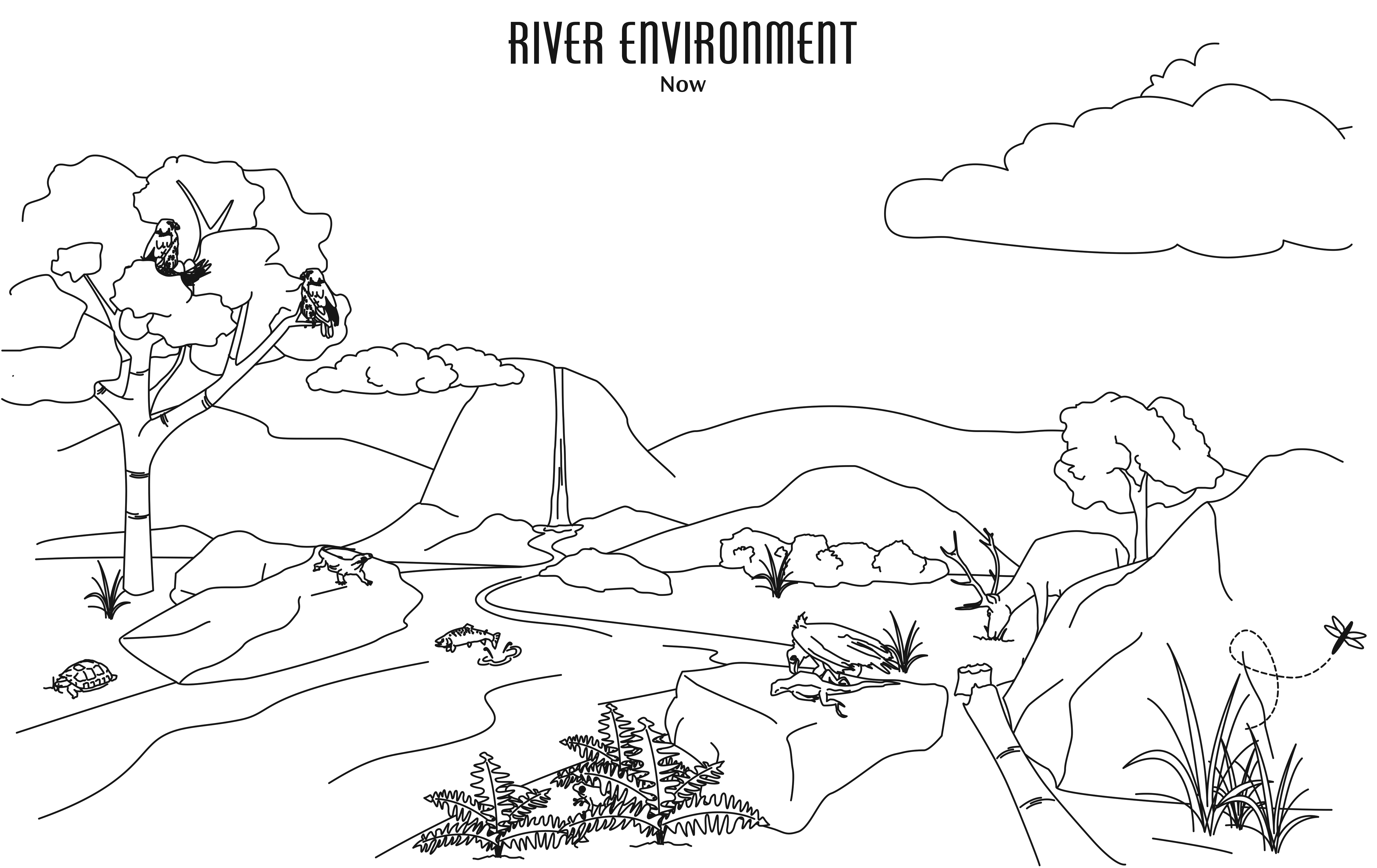
**Unit Essential Question:** *How does energy and matter flow within natural and designed ecosystems?*

The pictures below show what a river environment looked like 200 years ago and what it looks like today. What do you notice?





A river environment with diverse forms of living and nonliving matter. Source: Making Sense of Science Earth Systems course, courtesy of WestEd.

Part A: If you wanted to know more about what is happening in these pictures of the river environment, what questions would you ask? Individually record any questions you would need to ask to get a better understanding of this river environment over time.

Part B: As a group,

* Discuss what questions each member wrote on his or her list.
* On a large piece of poster paper:
  + Write the phrase “Past vs. Present River Environment” in the middle of your poster and draw a circle around it.
  + Around the circle, record the questions that were similar across your group members.
  + Draw lines to link together questions that relate to each other.
  + Draft possible answers to the questions, using your prior knowledge. Connect these to the questions on your poster.
* Post your group poster on the wall.
* Walk around and look at each groups’ ideas.

Part C: As a whole class,

* Construct a class concept map with the phenomenon in the middle: “Past vs. Present River Environment”.
  + Decide which key questions you want to have on the concept map.
  + Draw lines with arrows between two key questions to show that there is a relationship.
  + Make as many connections as you can between the questions on the concept map.
* It’s important for everyone to share their ideas and it’s okay if you don’t agree.
* You will revise and add new questions and information to this concept map as you learn more about ecosystems.

**Unit Essential Question:** *How does energy and matter flow within natural and designed ecosystems?*

**Connecting to the Culminating Project**

You will be creating a sustainable aquaponics system that mimics the properties of the river environment you saw today. What did you see in the pictures that you might also want to include in your aquaponics system (garden and tank)?

This should be completed individually in your Project Organizer.

**Reflection**

Individually reflect on the Lift-Off Task, using the questions provided:

1. At the beginning of this task, you made a list of all the questions you have about the river environment in the past vs. the present. Look back at your list: think about the questions your peers asked that you did not initially write down. How are their questions different from the ones you originally asked?
2. In this unit, we will be focusing on three crosscutting concepts:
   * **Patterns**: Macroscopic patterns are related to microscopic structure.
   * **Energy and Matter**: The transfer of energy can be tracked as it flows through a system, is conserved, and drives the cycling of matter.
   * **Stability and Change**: Stability and change can be explained by looking at changes over time and at different scales.

Looking at your class concept map, give one example of how a crosscutting concept came up in today’s task.

1. Now that you understand what project you’ll be working on over the course of this unit, what else do you need to know? What additional questions do you have?