

# Four Questions Explanation Checklist

Scientists explain many processes in nature by connecting the things we can observe and measure (such as CO2 concentrations in the atmosphere) with things that are more difficult to observe and measure (such as carbon pools and fluxes). You can use the Large-Scale Four Questions as a guide for using pools and fluxes to explain Earth systems and processes. The checklist below will help you make sure you include important information.

## Setting the stage

1. Did you name and describe the observations or patterns in data that you are explaining?
2. Did you explain how the system is changing (or how you predict it will change)?

## 1. Carbon Pools: Where are the carbon pools in our environment?

1. Did you name and describe all the pools that are involved in the process?
2. Did you say what kinds of carbon molecules are in the pool (CO2 or organic carbon)?

## 2. Carbon Cycling: How are carbon atoms cycling among pools?

1. Did you name all the fluxes that move carbon atoms from one pool to another?
2. Did you explain the chemical changes that go with those carbon fluxes?

## 3. Energy Flow: How does energy flow through environmental systems?

1. Did you identify the carbon pools with stored chemical energy?
2. Did you explain where the chemical energy in those pools comes from?
3. Did you explain how energy is transformed in carbon fluxes?

## 4. Stability and Change: How do carbon fluxes change the size of carbon pools?

1. Did you explain whether the fluxes going into or out of each pool are balanced or unbalanced?
2. Did you explain or predict how unbalanced fluxes will change the size of pools?

## Other Elements to Consider

1. Did you use scientific vocabulary correctly?
2. Did you organize your explanation logically to tell a story that flows?