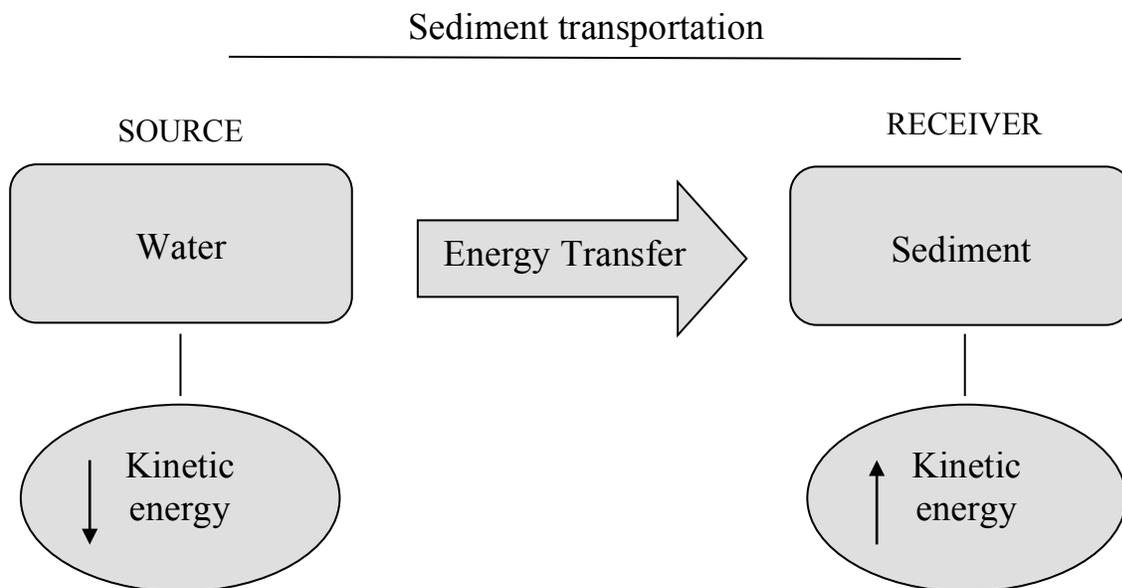


Energy Diagrams

Construction of energy diagrams is a useful approach to investigating the flow of energy in, through, and out of Earth materials. **Any** change that occurs on Earth requires an energy transfer. We can map out this energy transfer by thinking about what provided the energy, what type of energy it was, and what received the energy. Sometimes in that energy transfer process the type of energy may even change form. Below are some basic guidelines for constructing energy diagrams.

1. The process under consideration becomes the title of the energy diagram and is written above the transfer arrow.
2. The object that is the energy **source** (provides the energy) is written in the left hand box of an energy diagram.
3. The object that is the energy **receiver** (receives the energy) is written in the right-hand box.
4. '**Energy transfer**' is written in the large arrow between the two boxes.
5. The type of energy that **decreases** is written in the drop down circle of the left-hand box.
6. The type of energy that **increases** is written in the drop down circle of the right-hand box



Explanation of energy diagram:

In energy diagrams, energy type may stay the same, or it may be transformed from one type (e.g. chemical) to another type (e.g. thermal). It is important that we keep track of these transformations, so we need to state not only if energy has decreases or increases as the result of a process, but what kind of energy has increased or decreased.

The guidelines for the “explanation” section of energy diagrams are as follows:

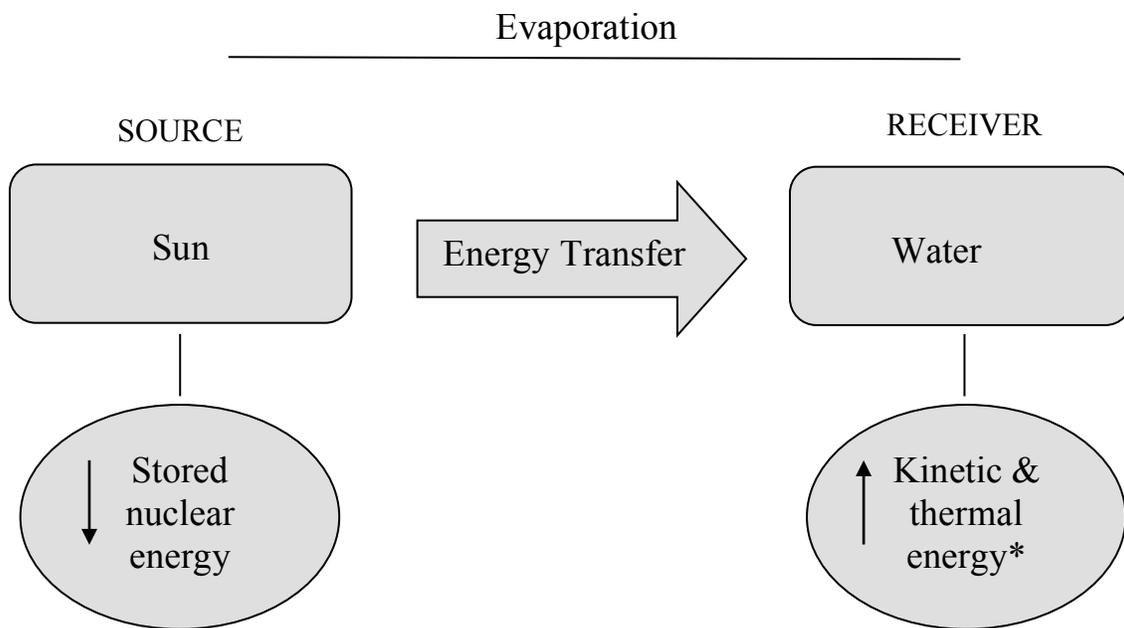
Briefly and succinctly describe the process indicated by the transfer arrow, focusing on what happens to energy during the process.

Include in your narrative:

1. What form the energy is in (e.g. chemical, thermal, mechanical) at the beginning of the process.
2. What form the energy is in (e.g. chemical, thermal, mechanical) at the end of the process?
3. What happens to energy during the process?

Using these guidelines, write a narrative for the above energy diagram representing the transportation of sediment.

Here is another example that deals with thermal energy:



Explanation of energy diagram:

The sun transfers its energy (via infrared radiation) to the water molecules in the lake. The sun decreases in nuclear energy, and the water molecules increase in thermal energy. This thermal energy of water molecules can be simplistically related to their motion (kinetic) energy. If water molecules in a lake have greater **average** kinetic energy, a certain proportion of them will have even higher kinetic energy and will escape the lake, or evaporate. This energy transfer diagram doesn't specifically deal with the phase change, which is OK for our purposes. In your own words, briefly describe the matter and energy changes that occur when water evaporates:

*If, rather than considering individual water molecules, you considered the entire body of water, you could consider the water as increasing in thermal energy. If you think about it, increased thermal energy is actually the same thing as increased kinetic energy of individual molecules.

What kind of energy transfers might occur during condensation? Don't worry if your answer is right or not at this point, just brainstorm what you think might be involved. We will discuss this transfer more during Activity 1.
