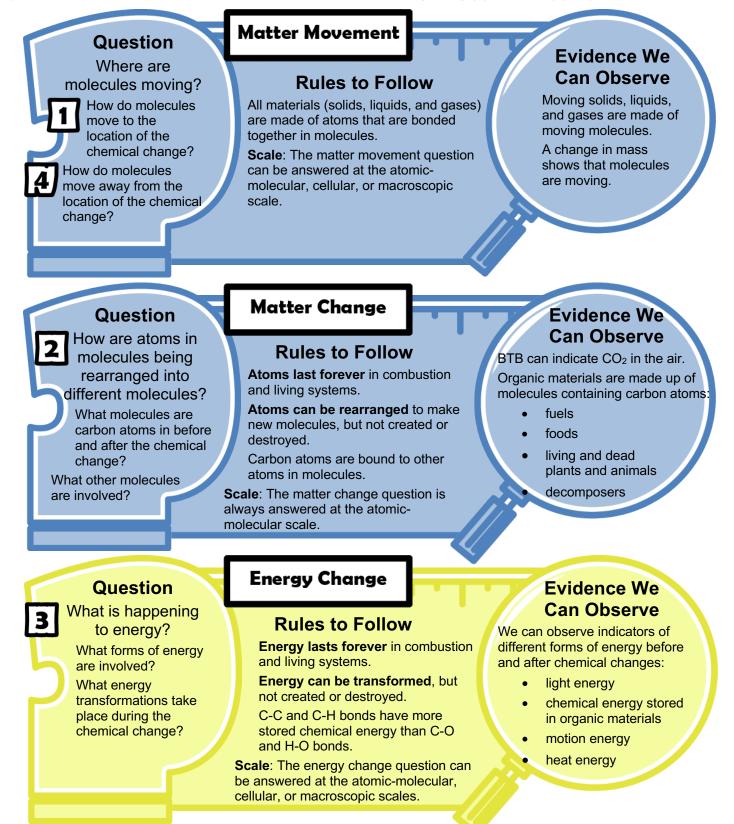
# The Three Questions

Answer each of the questions (numbered 1-4) below to explain how matter and energy move and change in a system. Note that matter movement is addressed at both the beginning (1) and end (4) of your explanation.





### **Three Questions Explanation Checklist**

Scientists explain many processes in nature by connecting the things we can see with things we can't see, such as chemical changes at the atomic-molecular scale. You can use the Three Questions as a guide to explaining these processes. Your explanation should include steps for each of the four numbered questions, and the checklist below will help you make sure you include important information. Remember that a good explanation also answers the question; return to your prompt to be sure you have answered yours.

#### Setting the stage

- a. Did you name the system (what fuel, plant, animal, or decomposer) where the process is happening?
- b. Did you name the carbon transforming process?

### 1. Matter movement: How do molecules move to the location of the chemical change?

- a. Did you "zoom in" to a location (a cell or part of a flame) where the change takes place?
- b. Did you identify the molecules that move to that location?
- c. Did you describe where those molecules came from?
- d. Did you say how they got to the location?

### 2. *Matter change: How are atoms in molecules being rearranged into different molecules?*

- a. Did you identify the reactants-the molecules that go into the chemical change?
- b. Did you identify the products—the new molecules that are created when the atoms from the reactants are rearranged?
- c. Did you follow the rule that "atoms last forever:" Are all the atoms that were in the reactant molecules in the product molecules?

#### 3. Energy change: What is happening to energy?

- a. Did you identify the form(s) of energy before the chemical change?
- b. Did you identify the form(s) of energy after the chemical change?
- c. Did you follow the rule that "energy lasts forever:" Is all the energy that was there before the change still accounted for after the change?

## 4. Matter movement: How do molecules move away from the location of the chemical change?

- a. Did you identify the molecules that don't move away and the molecules that do move away after the chemical change?
- b. Did you explain what happens to the molecules that move away—how they go to other parts of the system or leave the system?

#### Other Elements to Consider

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