

Strand: 8.1	Standard: 8.1.6	Episode 1	Big Idea: What happens to atoms during a chemical reaction?
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Title: Phenomenon: Rubbing Alcohol	Time: 20 min.	CCCs: <u>Energy and matter</u>	Practices: Developing and Using Models
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Episode Snapshot:

Students experience a phenomenon in which matter appears to be lost when a chemical reaction takes place. They will measure the mass of the reactants, perform the reaction, and measure the mass of the products. Students will ask questions about what they experienced.

Gather:

Explain to the students that they will be conducting an experiment in which they will observe what happens when rubbing alcohol is burned. As part of this they will need to measure the mass of the alcohol before it is burned. Ask the class how they can do that since rubbing alcohol is a liquid? Guide students to the idea that if the mass of a container is known, they can measure the alcohol in the container then subtract the mass of the container to get the mass of the rubbing alcohol.

Provide each group with a weighing scale, a watch glass, safety goggles, and a pipette containing rubbing alcohol. Ask them to find the mass of the rubbing alcohol using their [student sheet](#) as a guide.

As the students proceed with the next step, ask them to record any observations they have about what is occurring. Provide each group with a match and allow them to carefully light it and touch it to the rubbing alcohol until the alcohol catches fire. Do not leave any part of the match in the watch glass.

Once the flames have died, ask the students to again measure the mass of the contents of the watch glass and find the difference in mass from before the alcohol was burned to after it was burned.

Teacher's Note: If you are not comfortable allowing students to burn alcohol in class, you may get the point across with another reaction such as Alka-seltzer and water or vinegar and baking soda. If you do these, do them in an open container to allow the created gas to escape. If you do not do the baking soda and vinegar reaction here, the students will experience it as part of episode 2. ***While it is true that the Law of Conservation of Matter applies to both physical changes as well as chemical reactions, it is better to use a chemical reaction for the phenomenon since the remainder of the standard focuses on recognizing that the number of atoms does not change during a chemical reaction.

Reason:

Ask the students to record any other observations they made about the experiment, especially what happened to the mass.

Discuss with the students whether or not this was a chemical reaction. How do they know? What are some signs that a chemical reaction occurred?

Communicate:

Ask the students to record questions they have about what occurred, focusing on what happened to the mass of the alcohol. Discuss the questions the students came up with as a class but refrain from explaining what happened or anything about the Law of Conservation of Mass at this point. Students will be discovering the answers for themselves during the following episodes.

Assessment:

Students complete a reflection sheet that includes their questions about what happened to the rubbing alcohol.

Materials, resources, handouts, etc:

- Scale
- Rubbing Alcohol
- Watch Glasses (or bowls made from aluminum foil)
- Safety goggles
- Matches
- [Student Reflection Sheet](#)