All About Cycles

Standards of Learning
Science 6.3, 6.8, 6.9, LS.6, LS.7, LS.8, LS.11, LS.12

Objective
Students will:
- Develop an understanding that many different cycles operate in the environment
- Develop an understanding that cycles are continuous and repetitive

Materials
- Blank transparencies
- Scratch paper
- Water cycle transparency
- Clean white sock
- Overhead marker
- Mud/Soil

Background Knowledge
On Earth, there is a finite amount of matter available which is used over and over again. Matter is needed to sustain life and is dependent on this recycling. Energy is a necessary input for some steps of a cycle and is an output of other steps in a cycle. For example, sunlight causes evaporation and the synthesis of sugars and starches in plants, wind causes evaporation and erosion, and the increase or decrease in temperature or movement. Remember, when discussing cycles, to mention the need for energy to make cycles operate.

Procedure
1. Place a clean, white sock in the front of the classroom, preferable hanging where students will see it and question its presence.
2. Discuss methods of how to dirty the white sock such as rub on ground outside, rub along a dirty floor or pour mud on it.
3. Choose a student to dirty the sock.
4. Discuss and/or write the process to clean the sock.
5. As a class, list the steps/stages/procedure the sock could go through to become clean.
6. Create a class diagram/illustration of the clean/dirty sock cycle.
7. Using the sock as a model, discuss the following:
   - Energy must be added to the cycle in order for it to operate.
   - One cycle may affect other cycles.
   - Matter from other cycles is often added/removed from the cycle being analyzed. For example, soap and water were added and removed from the sock cycle. Dirt is removed from one part of the sock cycle and added at another part of the cycle.
8. Create cooperative learning groups of approximately 3-4 students. Each group must have scratch paper available.
9. Using scratch paper, instruct groups to brainstorm examples of cycles found in the environment. Discuss results of brainstorm.
10. Have each group choose a different (complete) cycle and create an illustration of the chosen cycle (on the transparency sheet) to be shared with the whole class.
11. Have each cooperative learning group present illustration to the class.

Extension

- Use large pieces of bulletin board paper instead of overhead transparency sheets.
- Display cycle illustrations on a bulletin board or in the hallway highlighting SOL involved in cycle.
- Invite a farmer, professional launderer, recycling manager or compost expert to the classroom to discuss how nutrients are recycled in his/her operation.
- Examine cycles that are affected by chosen cycle. These cycles may precede or follow the chosen cycle.
- Examine how energy flows through various cycles.