

Learning Lesson: What-a-cycle

http://www.srh.noaa.gov/jetstream/atmos/ll_whatacycle.htm

OBJECTIVE	Discover the water cycle is more complex than just from the ground to the atmosphere.
OVERVIEW	Students will act as water molecules and travel through parts of the water cycle.
TOTAL TIME	30 minutes
SUPPLIES	A die for each student or each pair of students (or some device where a random number from 1 through 6 can be generated).
PRINTED/AV MATERIAL	Station cards (8 mb) for each station in the water cycle (print two-sided). Large labels (13 mb) for each station. Water cycle worksheet (for each student).
TEACHER PREPARATION	Before the exercise, print the front and back sides of each station card on its own sheet. Cut out each of the six cards for each station.

Background

At its basic, water moves from the ground to the atmosphere and then returns to the ground. However, the actual path water may take in its cycle is far more complicated. There are many sub-cycles within the main overall circulation.

Procedure

1. Around the classroom, select locations to represent different stations in the water cycle. Place the numbered cards (1-6) face-up at each station.
2. Distribute a die to each student or pair of students. Distribute a worksheet for each student.
3. Distribute the students to different portions of the water cycle by:
 - o Placing one-half of students at the 'Oceans' station.
 - o Evenly spreading the remaining students across the other stations except for the 'plants' station.
4. Have each student circle their starting location on their worksheet.
5. Each student is to roll their die.
6. Based upon the number rolled, the student turns over that card to determine their progress in the water cycle.
7. If told to move, have the students move to their new location. On their worksheet, draw an arrow from their starting location to their current position. Label that arrowhead with a number one (1).
8. If told to stay at their current position, have the students place a number one (1) inside their drawn circle.
9. Repeat steps 5 and 6.
10. If told to move, have the students move to their new location. On their worksheet, draw an arrow from their previous location to their current position. Label that arrowhead with a number one (2).
11. If told to stay at their current position, have the students place a comma and a number two (2) beside their number one (1).
12. Repeat the procedure up to a total of ten (10) times.

Discussion

- Most students should have traveled to several stations and have completed some sort of a cycle. Some students may have traveled through most of the water cycle while others have moved very little. There also may be a student or two who remained in the ocean through all ten turns.
- While this exercise is to be somewhat realistic, in actuality it is far more complicated to leave the ocean via evaporation due to the fact that nearly all of the earth's water is confined to the oceans. To truly represent the water cycle we would need approximately 100,000 people located at each station as seen in the table (at right).
- Not only would there be over 97,000 people who represented the ocean, it would take close to 3,600 rolls of the die before just one person would move to the atmosphere station via evaporation.
- This exercise also does not take into consideration human and animal interactions with the water cycle. The water we and animals consume is stored and then eventually eliminated or it evaporates (via perspiration).

If 100,000 people represented water on the earth...		
Water Source	Percent of total water	Number of people
Oceans	97.24%	97,240
Glaciers & Snow	2.14%	2,140
Aquifers	0.61%	610
Rivers & Lakes	0.017%	17
Ground	0.005%	5
Atmosphere (w/clouds)	0.001%	1
Plants	0%	0