AQUIFER MAZE

Objectives: Students will understand that an aquifer is an underground region where the water is held. And, they will understand that as water percolates through the soil, traveling at different rates, it may pick up contaminants. Students will understand that soil can act as a natural filter which will remove some contaminants but not all contaminants.

Site: Outdoors

Time: 30 to 45 minutes

Materials:

* Lime or flour
* Contaminant/filter cards, poker chips or different colored construction paper
* Blind folds or scarves
* Baggies

Preparation:

Construct contaminant/filter cards. Contaminant/filter cards can be poker chips, index cards, or playing cards. Use some method to designate three different groups of cards or chips. You can use different symbols or colors to indicate the three different groups. One variation of the game only allows the marking to be seen from one side. This is so the students can not tell which card contains what symbol and can't plan their trip through the maze to aim for different cards. Another variation allows the student to see which group is where and plan their trip through the maze to avoid or pick-up certain groups of cards. (Suggestion: Laminating the cards will allow them to be used over and over again.)

Use the lime or flour construct a maze on a flat clear area. This could be a playing field or parking lot. The flour or lime is easily washed away and will not cause any permanent damage. An alternate form of constructing the maze is to use yarn or survey ribbon and hooks (made from parts of clothes hangers) placed into the ground. Or the yarn can be used inside the classroom by tying it to desks and chairs creating an indoor maze. Make several routes through the maze to a center or ending point which will be the aquifer. You can also construct routes that end nowhere.

Procedure:

Split your class into teams of three. These will become water molecules - H_2O. If your class is not able to be broken into teams evenly, use the left over

members of the class to be umpires or judges. Designate one team member to become the eyes or oxygen molecule for the team.

Explain the following rules to the students and ask the umpires or judges to enforce them:

1. Each water molecule is made up of three team members - as with H2O. One member will be an oxygen molecule, two members will be hydrogen. The hydrogen team members are blind folded. Only the Oxygen team member can see.

2. The Oxygen is responsible for getting the all team members through the maze to the aquifer.

3. All team members must be touching at all times. They may change their positions but must remain in contact. Oxygen may verbally or physically instruct the other team members on where to place their feet, turn and move through the maze.

4. If a team member touches a line the water molecule is then frozen and must stay in that location until all molecules have completed the course. Any following molecules must negotiate the course around them.

   Explanation: The water molecule has encountered an impenetrable layer in the soil such as clay, rock, etc. Ask the students for some suggestions for what they think an impenetrable layer might be.

5. Any time the water molecule passes within reach of a card, they must pick up one card. If the molecule picks up a red card, it must be matched with a blue card or vice versa, and discarded. Yellow cards are never discarded. (Note: you may use whatever cards or indicators you desire.)

   Explanation: Red cards represent contaminants that may be cleaned up through filtering. Yellow cards represent contaminants that can never be cleaned up by filtering. Blue cards represent the filtering process of the soil.

6. Students may not reverse or move backwards. They may move sideways through the maze. If they reach a branch of the maze that goes no further, then they have encountered an impenetrable layer and become groundwater.

After explaining the rules, blindfold two team members who will act as Hydrogen (only the Oxygen will not be blindfolded). Place teams at the starting points. Have the judges time how long it takes each team to reach the aquifer. Have the judges check the cards to see which water teams are

polluted with contaminants. Remember certain colored cards will cancel each other out and one group is not filtered as it travels through the soil.

Conclusion:

A discussion should be conducted on what happened to the different water drops. Why did some drops pick-up more pollution than others? Was it because the more water traveling through the systems flushes the pollutants out of the soil? What are some contaminants that can't be filtered out by the soil? (nitrates, phosphorus, etc.) What happens to the clean water when polluted water gets into the aquifer?

More...

The contaminant cards can be scattered throughout the maze or stacked in small piles. As the team travels through the maze they take a card from the top of the stack, thus allowing following teams to pick-up contaminants.

This activity can be used to point out the difficulties encountered by handicapped people and their families. If time allows, you might want to let each member of the team become the Oxygen, to experience the difficulty in leading the Hydrogens. This activity will force the team members to communicate and work together. A discussion should take place on why some teams were more successful than other teams. Was it due to the method they used to negotiate the maze, how they gave and received instructions, etc.?

Suwannee River Water Management District
9225 CR 49
Live Oak, Fl 32060
1-800/266-1066 or 904/362-1001