Natural Resources - Water

WHAT'S SO SPECIAL ABOUT WATER: EVALUATION

Science Series ACTpa021

BOARD GAME

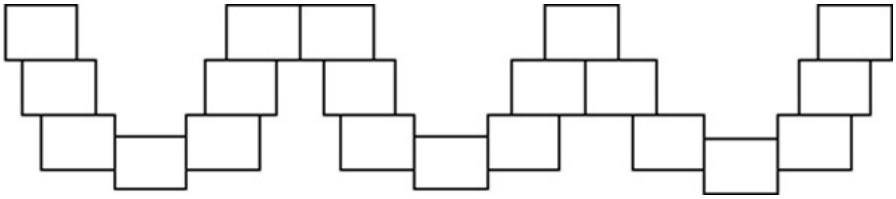
A board game is created for evaluating the four activity plans in the series on "What's So Special About Water."

Supplies:

- Large flip chart and or paper for the game board
- 35-40 multicolored 3x5 cards or multicolored paper cut to 3x5 size
- Markers
- Crayons
- Board markers for playing the game

HOW TO CREATE THE BOARD GAME

1. Draw about 20 blank squares on a large piece of flip chart paper or cardboard to make a curvy road like this diagram.



2. Helper asks youth to make a list of all different water activities and writes answers on chalkboard or flip chart paper so all can see. Here's an example of what youth might say.
    - *Absorption Activity* (Drop water on stuff and toothpick stars)
    - *Surface Tension Activity* (Water race, paper clip float, and water drops on a penny)
    - *It's Ice, Water, Steam Activity* (Ice cubes in Kool-Aid, boil water to see steam, hold cup of water over boiling pot)
    - *Solubility & Density Activity* (What liquids float, then shake it up)

3. Helper passes out two cards or cut paper per learner. Ask youth to write a question about a water activity on the front side, with the answer on back. Sample questions for youth in grades 3-5 include:

    Absorption Activity
    - What absorbs water?
    - What repels water?
    - Do plastic toothpicks absorb water?
    - Do wood toothpicks absorb water?
    - Does a sponge absorb or repel water?

    Surface Tension Activity
    - Did the straw move the water faster than the eyedropper?
    - How many drops stuck on a penny?
    - Why do water drops stick to each other?

It's Ice, Water, Steam Activity

- Does water dissolve sugar?
- How do you make water smoke?
- Why does ice float in water? (Water is more dense.)

Solubility &Density Activity

- Does oil dissolve in water?
- What was on top, the oil, corn syrup, or water?

All Activities

- How did you share your water science with a friend?
- How did you share your water science with your family?
- What was the most boring experiment?
- What was the most fun experiment?

4. Put these question cards in a pile to draw from as teams move their marker around the board.

5. On the other paper draw and color an activity to create the game board markers from something done during the water activities. (Sample drawings: water drop, toothpick, rock, pot with water steaming out, glass with three different colors, etc.) Each team chooses one marker to move around the board.

GAME RULES

Divide the group into three or four teams and have youth answer the questions together.

Each team picks a marker and the first one to play is the one with the lowest number on the rolled dice. After answering the question correctly the team goes to next square.

The winner is the first team to get to the end of the game board.

HINT: If you are short on time, roll the dice to determine how many spaces to move ahead (rather than moving just one square ahead after answering the question correctly.)

ADDITIONAL RESOURCES

Observation Worksheet
Worksheet to observe youth and evaluate the Evaluation Board Game.

Summary of Evaluation Data
Results of a formal evaluation of the "What's So Special About Water" activities completed in November 2006.

Observation Worksheet

Game Board Activity for "What's So Special About Water" Series

This observation worksheet works best for recording responses from small groups of 6-10 youth. You will need to either tape record the session or have another person who is not working with youth be the transcriber. They will need to listen closely as children play the Water Absorption Evaluation Board Game and write down statements youth make related to the two evaluation indicators.

Indicators

At the completion of this series, learners will demonstrate the following indicators:

1. The ability to verbally communicate by giving and sharing information and thoughts about the water experiments *with each other*.
2. The ability to verbally communicate by giving and sharing information and thoughts about the water experiments *with family or friends*.

Brief description of the site and the youth participating in this evaluation activity:

Date of observation: _____
Name of evaluator: _____
Number of youth participating in this evaluation activity: _____

DIRECTIONS: Try to capture verbatim the comments from youth and sort them into each activity. Then check off which indicator their comments best relate to. Add more lines to the grid if needed.

Comments related to *Absorption Activity*	Share with each other	Share with family or friends
Comments related to *Surface Tension Activity*	Share with each other	Share with family or friends

Comments related to *It's Ice, Water, Steam Activity*	Share with each other	Share with family or friends
Comments related to *Solubility & Density Activity*	Share with each other	Share with family or friends

Other notes or observations:

Please return this worksheet with raw date to your site coordinator and/or 4-H Youth Development Educator. Thanks for your participation in this study.

SUMMARY OF EVALUATION DATA

Title of Study: "What's So Special About Water" Activity Series

Date of Study: November 2006

Principle Investigator: Sally Bowers, Dane County 4-H Youth Development Educator

Expected Outcomes/Objectives
Evaluation for the life skill of "Communicating by giving or sharing information and thoughts" allows the learner to truly experience science inquiry. The ability of youth to verbalize questions and testing the answers to those questions with these water experiments shows that they are beginning to learn the tools for experimenting. At the completion of this series most of the learners will demonstrate the following indicators:

1. The learners will demonstrate the ability to verbally communicate by sharing information and thoughts about the water experiments *with each other.*
2. The learners will demonstrate the ability to verbally communicate by giving and sharing information and thoughts about the water experiments *with family or friends*.

Description of Study
The Dane County Boys and Girls Center on the South Side of Madison, Wisconsin, was the site of this after school science club. The eight learners (grades 3-5) included six boys and two girls with five African Americans, two Latinos, and one Caucasian. In November 2006, youth created a board game at the end of their "What Is Special About Water" science unit, as a way to show what they had learned.

ANALYSIS OF DATA
The University of Wisconsin graduate student led the board game with Boys and Girls Club staff writing down the responses from the two teams. The Dane County 4-H Youth Development Educator analyzed responses from youth and made these observations.

Indicator 1 - Giving and sharing of information and thoughts about water experiments with each other.

Observation #1 – All eight learners (grades 3-5) shared details about the water experiments raised by the board game.

Responses to support this observation include:

- Three youth (38%) commented that "Water has negative charges; water has positive charges so that they stick together so we could do the race game and a penny could hold so many drops."
- Four youth (50%) commented that "Only the wooden toothpicks absorbed the water, not the plastic ones. The colored water showed us how the water went into the toothpick. Next time I think we should try dish soap, like we did the oil."
- Five youth (63%) indicated that "After drinking hot chocolate I saw water on my glasses . . . just like the smoke (vapor) from our experiment."

Indicator 2 - The learners will demonstrate the ability to verbally communicate by giving and sharing information and thoughts about the water experiments with family or friends.

Observation #2 –Four of the learners had shared information with their friends about the experiments. Two of the eight learners were attending science club as a result of being told by participants how much fun it was.

Responses to support this observation include:

- Four youth (50%) indicated that "After the star with the toothpick I told my friends about it."
- Two youth (25%) noted that "We saw you going outside with the water and we wanted to experiment, too."

- Two youth (25%) had shared with their family about the water experiment and one actually did the experiment at home with mom.
- Two youth (25%) indicated that they shared information their family. One said that "I told my brother about the water dissolving and he let me have his Happy Meal toy." Another noted that "I told my mom about how the water became like air when it became steam."
- One youth (13%) said that "I showed my mom about the water race and she got more drops on a penny than I did."
- Another youth (13%) noted that "At home I tried to see what else water would dissolve. I tried dish soap, dirt, and my little brother's Happy Meal toy."

Observation #3 – The questions prompted youth to share with excitement which experiment they liked the best and what happened in that experiment which made it exciting to them. Most really enjoyed the absorption and repelling of water with the toothpicks and the water dissolving or not dissolving other liquids and/or matter.

Responses to support this observation include:

- Eight youth (100%) indicated that "The toothpicks making a star was really cool. I didn't know water could do that. Then watching what other things would make the star surprised me too. And what would not make a star."
- Four youth (50%) said that "I really liked it when we went outside to put drops of water on different things to see if they would disappear (dissolve) or stay the same."

Observation #4 – As a team answering the true/false questions, youth shared with each other why they thought it was true/false before they gave the correct answer.

Responses to support this observation include:

- Four youth (50%) said that "Water could dissolve the sugar because the sugar was not strong enough for the water to mix with it."
- Four youth (50%) indicated that "Water could not break apart the oil because the oil was too strong so the water could not mix in with it."

Summary

In summary, these children did share their knowledge and thoughts with not only one another but also with friends and family.