

## **The Blue Traveler (Teacher notes)**

Adapted from “The Watercourse” by S. Uyeda, Sunnyside High School, SUSD

**Preparation:** Make laminated copies of all station signs. Place stations evenly around room. Tape the title of the station the highest above the floor so students can easily see the station. Text and picture explanation should be at eye level. Use soft drink flats or trays for dice. Have extra dice handy. Make copies of student activity pages [data tables to be copied on the back side of the activity pages; overhead of data tables needed], water journey maps 1 and 2 [will need overheads of map 2 only], analysis, pre-test and post-test.

**Word list:** water cycle, precipitation, condensation, evaporation, transpiration, infiltration, runoff, reservoir, freezing, melting, phases of matter

### **Procedure :**

1. Have students fill out pretest. (Draw a picture of the water cycle)
2. **Activity 1 – system without human influences:**
  - a. Initial setup - “For this activity we are going to pretend we are water molecules and will be traveling through the water cycle.”
  - b. Introduce scenario and stations: “In the first part of the activity, we will go through a water system that is not affected by humans. Call this the ‘natural’ water cycle. Here are the stations...”
  - c. Pass out activity page and explain the rules:
    - i. Send students to one of the stations [spread them out evenly].
    - ii. “In the blank for number 1, write the name of the station where you are right now.”
    - iii. “Every person at the station should roll the die. Write down the number rolled next to number one.”
    - iv. “Look at the sign with the numbers and pictures. That tells your where to go next. In the first blank for number 2, write the name of the next station you go to and circle ‘moved to’. If you stay, circle ‘stayed’ and write the name of the station where you are.”
    - v. “Now look at the text explanation (the small sign). Read the explanation and write it down in the second blank on your paper.” It is important that students write the entire explanation.
    - vi. “We have now finished the round. On the word go, you will all move to your next station and repeat the steps we just finished waiting for the word “go” to move to the next station. Questions? Ready? GO!”
    - vii. Continue rounds until the sheet is filled up to 10. Have the students return to their seats.
3. **Analysis**
  - a. Pass out water journey map 1.
  - b. “Now I want you to map where you went in your journey. Here is how is how you record your journey”:
    - i. “Write a small “1” near the place you started.”
    - ii. “Draw a small arrow from ‘1’ to the next place you went. Write a number ‘2’ near the end of the arrow. If you stayed at the same station, then write

'2' next to that station so you will have a '1' and also a '2' at that station. Continue this process until you have gone through number 10 on the activity page."

- iii. Ask students to turn the activity page over for the data table.
  - iv. Ask students: "How many made it to (station name here) ? More than once?" Record the number of students on the overhead version of the data table. Have student helpers to count with you. Go through each station.
4. **Activity 2 – system with human influences**: Change the signs so human influences are also posted. Conduct Activity 2 the same way as Activity 1.
  5. **Analysis**: Pass out Water Journey Map 2. Have students fill out the map the same way as Activity 1. Complete the whole class analysis the same way as Activity 1. Add the question - " how many made it through the activity without going through human influences?"
  6. **Interpretation**
    - a. Phases of matter
      - i. "What different forms does water come in? [make list]. OK these forms can be called a gas (water vapor only, NOT STEAM), liquid or solid. Label the different stations on both water journey maps with the correct phase of water. Use WV for water vapor (gas), LW for liquid water and ICE for solid water."
      - ii. " Now label the arrows where water changes form – solid to liquid, liquid to gas and back again. Use terms freezing, melting, evaporation, condensation."
    - b. Spheres – help students to label stations that are part of the atmosphere, hydrosphere, biosphere and lithosphere
    - c. The role of each station: Use overheads and different color pens to highlight the different roles of each station. Use water journey map 2 for this part of the activity,
      - i. Reservoirs (blue) – ocean, clouds, lakes, soil, groundwater, rivers, glacier, well?
      - ii. Users (green) – animals, plants, urban, rural, irrigation, industry, recreation
      - iii. Pollution (red) – urban, irrigation, septic, waste water, recreation, animals
      - iv. Treatment (brown) – water treatment, desalinization, waste water, septic system
  7. Ask student to make a number key (1 – 4) and number the stations on both maps with the appropriate role.
  8. **Assessment**
    - a. Students will complete a set of analysis and interpretation questions concerning the activities.
    - b. Students will complete the post-test – a more formal summative assessment that also includes the picture of the water cycle as one of the questions.

## THE BLUE TRAVELER – Whaduhyaknow?

Water travels through a number of places as it is cycled and recycled on the Earth. In the space below, draw a diagram of where a drop of water can go, also known as the water cycle. Be sure to label the different parts of the cycle that you know. Feel free to use common words as well as more scientific terms

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## THE BLUE TRAVELER

### Activity 1: A water system without human influences

1. I started at the \_\_\_\_\_ station. At this station, I rolled\_\_\_\_\_
2. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
3. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
4. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
5. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
6. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
7. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
8. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
9. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
10. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_

## THE BLUE TRAVELER

### Activity 2: A water system with human influences

1. I started at the \_\_\_\_\_ station. At this station, I rolled\_\_\_\_\_
2. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
3. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
4. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
5. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
6. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
7. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
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9. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_
10. I moved to / stayed at the \_\_\_\_\_ station because  
\_\_\_\_\_. At this station, I rolled\_\_\_\_\_