WaterViz Investigation 4 Facilitator Guide

1. Short-term data from a 2-week rain event at the Hubbard Brook Experimental Forest were collected using environmental sensors. Water cycle data drives changes in the animated art and music. In the previous investigation, we listened to the individual data videos. Here we will listen to the Water Symphony, where all of the instruments are playing at once.

2. Play the Water Symphony video.

3. Review what you have learned about each of the water cycle components:

    a. Precipitation
        - The rain event took place in the summer time so what form of precipitation did we have? rain
        - What are some other forms of precipitation? snow, hail, sleet
        - Was it raining the whole time? no
        - What instrument was used to represent the precipitation data? cymbals
        - What do you remember about how the cymbals sounded – did they start and stop or play continuously? started and stopped
        - Think about the movement of water in the water cycle. After the precipitation fell, where did it go? into the stream and soil

    b. Streamflow
        - Water flowed into the stream – streamflow increased and flowed faster.
        - Think back to the music for streamflow. How was it different than the precipitation music?
            - bass guitar + French horn
            - played continuously because the stream was always flowing
            - could hear a change in pitch after the rain
            - notes also played faster after the rain because the stream was flowing faster

    c. Soil Water
        - Water soaked into the ground – soil water increased.
        - Think back to the music for soil water. How was it different than the precipitation music?
            - guitar played continuously because there was always some water in the soil
            - pitch changed when it rained (or a little after the rain)
            - slow change in the music as the pitch started to go back down as the soil slowly dried out

- Thinking about how water cycles, how did it get back into the atmosphere? evaporation from surfaces & transpiration from plants

d. Evaporation/Transpiration
   - Water vapor/mist rose up from surfaces; from water = evaporation; from plants = transpiration
   - Think back to the music for evaporation/transpiration. How was it different than the precipitation music? The marimba played, then stopped, played, then stopped, etc.

e. Temperature
   - This was one other type of data that cycled on a daily basis.
   - Why did the flute play continuously? Because temperature is always there, it just goes up and down.
   - How did the music indicate changes in temperature? Pitch was higher during the day when the temperature was higher. Pitch was lower during the night when the temperature was lower.

4. Use all of the information we have gathered about this summer rain event from each of the investigations (article, animated art, music) to help as you analyze the graphs. Tactile graphs are provided in Nemeth and UEB. Direct students to the transcriber's note (separate file).

5. Match each graph to a water cycle component & select the correct y-axis units for each graph.

Note: Students may have difficulty distinguishing between the Temperature and Evaporation/Transpiration graphs – HINT: think about the y-axis values and possible units.

Graph Number **Water Cycle Component**	**Measurement Units**
Graph 1 Precipitation	Inches per Hour (in/hr)
Graph 2 Streamflow	Cubic Feet per Second (cfs)
Graph 3 Soil Water	Inches (in.)
Graph 4 Evaporation/Transpiration	Inches per Hour (in/hr)
Graph 5 Temperature	Degrees Fahrenheit (°F)