A STEAM Approach to Investigating the Hydrologic Cycle

Handout 1 – Field Notebook Prompts and Questions

Make keen field observations. Learning to read the landscape can help you acquire the intuition necessary to develop conceptual models. **Complete three journal entries and three sketches about your field observations.** Each journal entry should address the four prompts below.

- 1. Notice hydrologic processes that are occurring near you: condensation, precipitation, evapotranspiration, infiltration, and runoff. Choose one to focus on for this journal entry.
- 2. Use your senses to make detailed observations of the process you chose to observe. Here are potential questions to consider:
 - a. <u>For condensation</u>: Where do you see condensation occurring? What time of day is it? Is the sun out? Is it overcast? Is it humid or foggy? What is the air temperature? Does condensation occur in more than one area? If so, why does it occur in some areas and not others? Is it impacted by vegetation? Is it windy? What is your elevation? Do you see condensation at areas of higher/lower elevation than you?
 - b. <u>For precipitation</u>: Is it raining, sleeting, or snowing? If so, how would you describe the rainfall (e.g., heavy, large droplets or a light mist). Is there thunder or lightning? If not, what evidence do you see that precipitation has recently or not recently occurred? Do you notice runoff or erosion? Do you notice tributaries? Is there vegetation around you? If so, how does the vegetation affect the rainfall?
 - c. <u>For evapotranspiration</u>: What is the air temperature? What time of day is it? How much has the temperature fluctuated today? How much does the temperature fluctuate on a seasonal basis? What vegetation is near you? How old is the vegetation? How much surface area does the vegetation have? Are there large roots? If it is raining, do leaves intercept a lot of rainfall? If not, would you guess that leaves intercept a lot of rainfall? Is it windy or sunny?
 - d. <u>For infiltration</u>: What type of soil is near you? Near the banks of the river? Are there boulders? Sand? Gravel? If it is raining, does the rain infiltration quickly into the ground? Are there many puddles? Can you see overland flow? Is there developed area nearby? If so, how do the developed areas affect infiltration? Is there vegetation nearby? How is the rain impacted by the vegetation?
 - e. For runoff: What is the width and depth of the river and how much does it vary throughout the terrain? How steep are the banks of the river? What types of materials are along the banks of the river? How fast is the river flowing? Are there many channels? What is the temperature of the water? How does the temperature vary in the river? What vegetation is along the river? What is the color of the water? Is it clear or opaque? How does it smell? Are algae present? What is (are) the source(s) of water for the river? Does the river have any springs? Where are the springs located? If so, what does that indicate about groundwater flow? Does the river have any tributaries connected to it? What does the river flow into?
- 3. In what ways do you observe that humans have impacted this process?
 - a. Are there nearby agricultural, industrial, or urban areas? Are irrigation or drainage systems present? Has the river been channelized and/or dammed?
- 4. Given your observations, what question(s) do you have about the hydrologic process?