

Name: _____ **KEY** _____

Period: _____

“A Study of Seeps and Springs” Reading Guide

1. Describe the Grand Canyon’s Seeps and Springs Study (who is involved, how long is it, why is it taking place, what are the possible implications of the study).
 - **Who: Grand Canyon National Park, U.S. Geological Survey, Grand Canyon Wildlands Council**
 - **How Long: Three year study**
 - **Why: To examine the Coconino Plateau’s ability to sustain a water supply for growing towns**
 - **Implications: There may not be enough water to sustain growing populations on the Coconino Plateau (answers may vary).**

2. Where does all the water on the Coconino Plateau between Tusayan and Flagstaff come from?
 - **Groundwater, either flowing from seeps and springs, or being pumped from wells.**

3. Is the Colorado River’s source located in the Grand Canyon? If not, where is it located?
 - **No.**
 - **The source is located in the Never Summer Mountains of Colorado**

4. What are aquifers? How many regional aquifers exist on the Coconino Plateau?
 - Permeable rock layers that hold water
 - 2 major regional aquifers exist on the Coconino Plateau

5. How are aquifers formed?
 - Porous rock strata are bottomed by less permeable rock layers
 - When water reaches these denser layers, it moves along their surfaces and dribbles and bursts from canyon walls

6. Fifty to seventy years ago, a chemical called tritium rained on the Coconino Plateau. It was caused by fallout from atomic bomb testing during the 1950s. What does this tell researchers about the age of the water falling on the Plateau? Why is this important?
 - Researchers have not found traces of tritium in the water collected during the study
 - This tells them that the water is at least 50-70 years old, but does not tell researchers when the water first fell

7. If aquifers hold water that is 10,000 to 20,000 years old (water that fell during the Pleistocene Epoch), is it likely that the waters will ever be replenished? Explain your decision.
 - It is unlikely that they will ever replenish the same fossil waters
 - (Explanations may vary)

8. Springs make up less than 0.01% of the land in the Grand Canyon.

9. Explain the unique situation of plants and animals that make up the ecosystems surrounding springs in the Grand Canyon.
 - Plants and animals concentrate 500 times more around the springs in the Canyon.
 - Endemic species (found nowhere else) of plant and animals concentrate around these springs

10. What is the mission of the National Park Service?
 - "To conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same by such means as will leave them unimpaired for the enjoyment of future generations"

11. We should protect the Grand Canyon's seeps and springs to:

a. refresh hikers

b. nourish the canyon's plants and animals

c. continue the erosive processes that created this
magnificent canyon