



U.S. Fish & Wildlife Service

# Natural Springs and the Water Cycle

You will need to use your observation and critical thinking skills to complete this activity.

**Description:** Search for a natural spring and discover the role of springs in the water cycle

**Location:** Corn Creek Trails, Desert National Wildlife Refuge

**Materials:** pencil (cups, sand, clay, gravel, and plastic bottle for activities)

## Find a natural spring (remember to stay on the trail!)

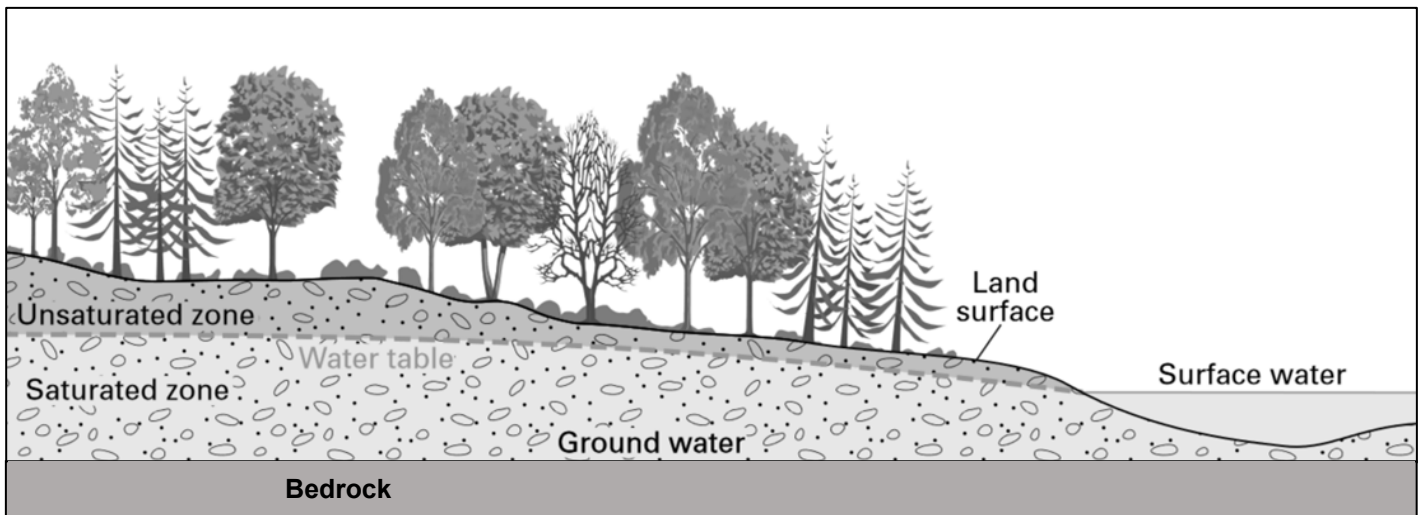
What are some signs of a spring?

- Look for patches of moisture and areas with lots of vegetation
- Look for signs of increased wildlife activity (tracks, droppings)
- Listen for the sound of trickling water
- You may also be able to smell damp soil

**In a few words, describe how this spring looks to you** \_\_\_\_\_

Natural springs come in all shapes and sizes. Some look like large ponds while others look like part of a stream or just a wet patch of soil. Springs can be warm if they come up from heated underground rocks or they can be icy cold. The water in springs can be freshwater or it can contain minerals such as salt or sulfur (these are called mineral springs). The one thing all springs have in common? Springs are **groundwater** that has come to the surface!

## What is groundwater?



During the water cycle, some water moves underground. It passes through soil and rocks until it comes to a layer where it cannot go any further. When water fills all the small cracks in the rocks and all the small spaces between soil particles this is called the **saturated zone** and it is where we find **groundwater**.

In the **unsaturated zone** there is both water and air filling all the small spaces between rocks and soil. The water here is under the ground but it is not groundwater! The boundary between the saturated and unsaturated zones is called the **water table**.

Try it!

**Find out how water moves through different materials:**



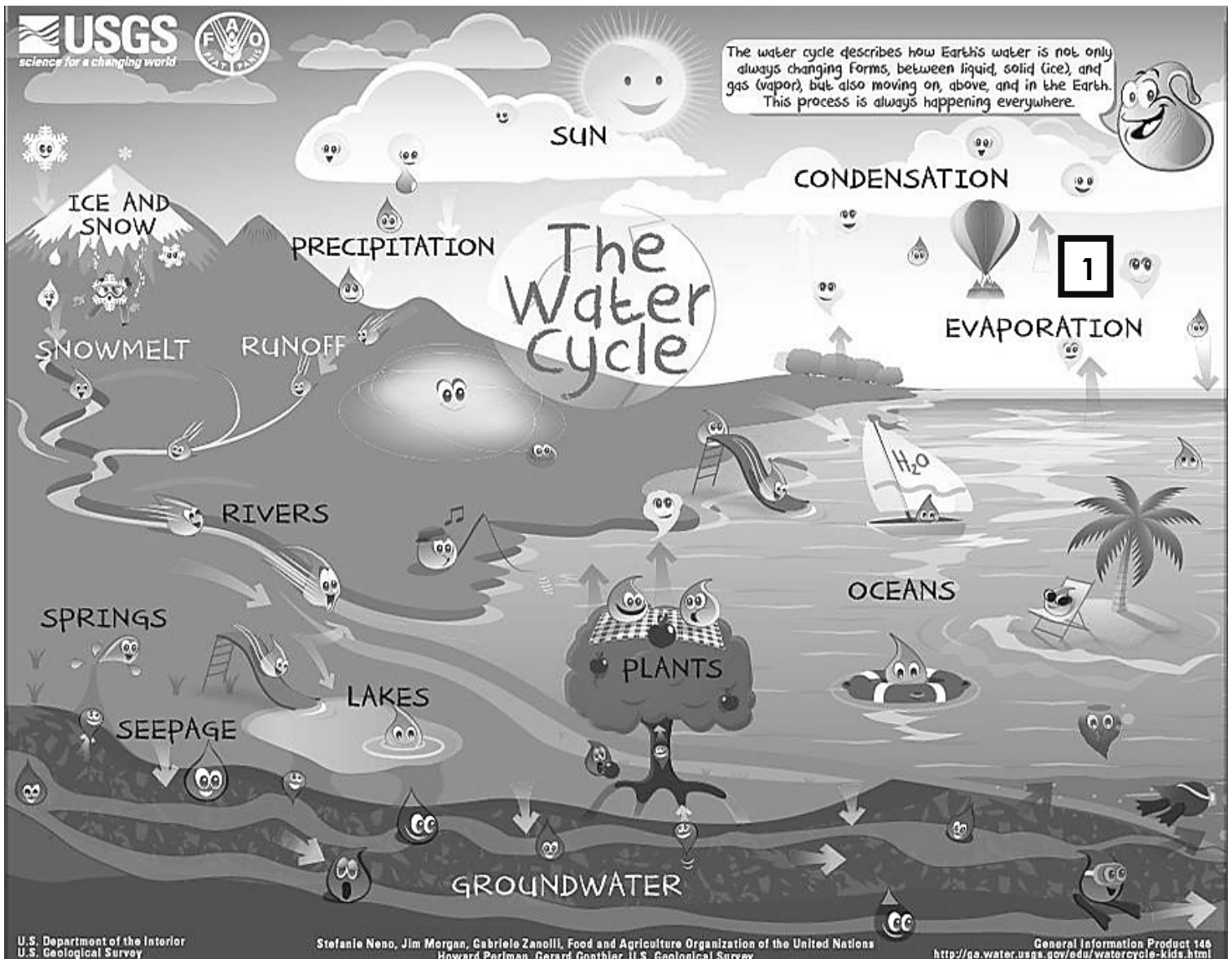
Fill three glasses with a different material – one with sand, one with clay, and one with gravel. Which one will allow water to move through it the fastest and slowest? Now pour some water into each glass and see if you are right! (Answer Key on last page)

## Water in the desert?

When groundwater collects in a saturated zone, we call this an **aquifer**. This is a huge storehouse of water deep under the ground. **Aquifers** are found all over the world – even in the desert!

Even though it is hot and dry in the desert, groundwater stored in aquifers comes up in springs or is pumped up through wells. This helps plants, animals, and people live here.

## How does groundwater fit into the water cycle? Let's check it out:



The heat of the sun provides the energy needed for the water cycle which has three main processes. Write the number for each process on the picture – number 1 is done for you!

**1. Evaporation** (liquid changing to gas) – the sun evaporates water from the oceans into water vapor. The invisible vapor rises into the atmosphere.

**2. Condensation** (gas changing to liquid) – the water vapor condenses into clouds. Air currents move the clouds all around the Earth.

**3. Precipitation** – water drops form in clouds, and the drops fall to the Earth as precipitation (rain and snow).

There was a lot happening in that picture of the water cycle. Let's take a look at some of the other processes that are shown. Match each word to its correct definition (Answer Key on last page).

**Runoff**

Water from lakes, rivers, or precipitation that soaks into the ground

**Springs**

Water found deep in the ground and filling all the small spaces between rocks and soil

**Seepage**

Rain that flows from the land into rivers, lakes, oceans, and into the ground

**Snowmelt**

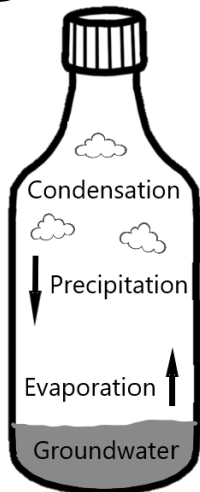
A place where groundwater comes up to the surface of the land

**Groundwater**

Melted snow (or ice) that flows from the land into rivers, lakes, oceans, and into the ground



**Create your own water cycle in a bottle:**



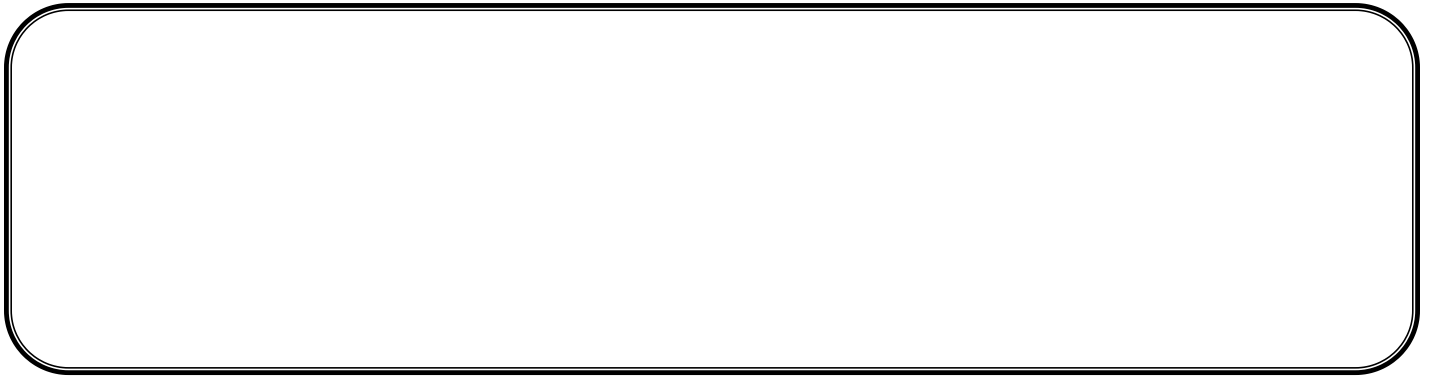
Use a clear plastic bottle with all the stickers removed. With a permanent marker, write groundwater, condensation, evaporation, and precipitation. Add arrows and clouds too!

Then add  $\frac{1}{2}$  inch of water to the bottom of the bottle along with a few drops of blue food coloring. Close the lid, and place your bottle in a warm sunny place.

Come back the next day to see what happens. Did the heat from the sun make the water move?

**Why are springs important? Let's take a walk to the refugium to start finding out.**

Did you spot a rare Pahrump poolfish? Draw a picture of this endangered species:



Springs provide important habitat for creatures like the Pahrump poolfish as well as other plants and animals. Scientists can also use springs to track climate change because they are sensitive ecosystems. This means that even small changes (like slightly increased temperature) can have big impacts on springs.

Springs were also highly valued by many indigenous cultures. Freshwater springs provided an important water source while mineral springs were valued for their healing properties.

Pollution and using too much groundwater threatens this special resource.

**What are some ways you can conserve water?**

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**Circle three things you will pledge to do to protect groundwater and springs:**

Conserve water

Use more natural/nontoxic household cleaners

Safely dispose of waste like paint and motor oil

Reduce the amount of "stuff" you use, reuse what you can, and recycle as much as possible

Use eco-friendly fertilizer for your yard

## Answer Key

### Try it! Find out how water moves through different materials:

- Water moves the fastest through gravel
- Water moves the slowest through clay

### Water Cycle matching:

- Runoff – rain that flows from the land into rivers, lakes, oceans, and into the ground
- Springs – a place where groundwater comes up to the surface of the land
- Seepage – water from lakes, rivers, or precipitation that soaks into the ground
- Snowmelt – melted snow (or ice) that flows from the land into rivers, lakes, oceans, and into the ground
- Groundwater – water found deep in the ground and filling all the small spaces between rocks and soil