



Aqua Rangers

(Change—Water in Motion)

Dear 3rd Grade Teacher,

Welcome to the Chugach National Forest's new Forest Ranger Academy- Aqua Ranger Unit! We are very excited to have your class participate in our new and improved Conservation Education program!

In an effort to more effectively meet your needs as a teacher, we have developed a set of curricula specifically designed to meet the Anchorage School District 3rd grade Science Standards. In addition, the classroom visit and the Portage Valley field trip will be a fun and memorable experience for your students!

Enclosed you will find copies of a pre-visit test which we ask you administer to your students. This same test will be used after the Forest Ranger Academy. Your commitment to administering the pre and post-visit tests will help us assess the impact of our instruction on your students, and know to implement changes when necessary. Also included are suggested pre-visit activities. Conducting the quick and easy pre-visit activities will prepare your students for the classroom visit and field trip.

We are working hard to develop a program that will enhance your existing science program. As this is a pilot year, we welcome and strongly encourage your feedback at any time during the program! If you have any questions or comments, please do not hesitate to call or write to the contact information provided at the bottom of the page. We greatly appreciate your participation and assistance while we pilot our new Conservation Education program!

Many Thanks,

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Conservation Education



Aqua Rangers

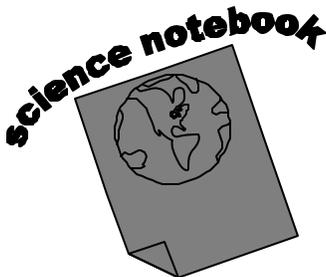
(Change—Water in Motion)

Teacher Instructions

Before the Forest Rangers
come to your class.....

This Kit should Include:

- sufficient copies of pre-tests
- 2 measuring cups per class (for simple H₂O experiment)
- 1 Set of postcards per class from Sally Splash



1. Administer the pre-test (15 minutes)

The purpose of this test is to evaluate the impact of the Earth Ranger Academy on the students' knowledge. How well the students do is NOT important, only that they do their best! Because this is an evaluation tool, we ask that you provide minimal assistance to the students once they begin. It will be used again as the post test, the final phase of the Earth Ranger Academy.

2. Conduct a quick and easy experiment (5 minutes/day throughout week)

- 2 measuring cups have been provided for you.
- Fill the cups with the same amount water.
- In your classroom, place one cup as near to a window as possible, the other far away from the window (possibly closer to a heating source....but not too close!)
- In their science notebooks, have students record the level of water in each cup, and predict what will happen if we let them sit out. Will the water level increase? Decrease? Stay the same?
- Throughout the week, when time permits, allow students to observe the changes in the two containers, and record their observations in their science notebooks.

3. As a class, read the postcards from Sally Splash as she makes her way through the wacky water cycle!! (15-20 minutes)

- The postcards are numbered 1-4, and should be read (have the students take turns reading) in consecutive order.
- As a journaling activity, have the students write or draw what is happening to Sally Splash in each postcard. (What state of matter is she? Solid, Liquid, or Gas? Is this Evaporation, Condensation, etc.?) **And/Or** have the student draw their own adventures as a water drop through the water cycle. Where would they go?



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In-Class Ranger Visit

This Kit should Include:

- Letter from Sally Splash (in the PV watershed)
- CD Player
- Water-cycle Boogie Recording
- Boogie Lyrics
- Tape
- Pictures of watersheds and wetlands
- Plastic Trays
- Sponges
- Containers for catching water
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Introduction:

Give brief introduction to Forest Service and Chugach National Forest.

Topics to address:

- National Forests are managed by the Forest Service, but all citizens of the US share ownership
- Basic principles of multiple use
- Resources available from the Forest, many products used in our lives come from National Forests
- Chugach NF as a Temperate Rainforest ecosystem—we have WATER + ICE!!!!

Body:

In the pre-visit materials, students should have read postcards from Sally Splash. Have the student recall what happened to Sally on her journey. She was traveling through the **water cycle** !!! Sally changed form from a drop of water, to an air vapor (gas), into a cloud, and then fell back to earth as a raindrop again!

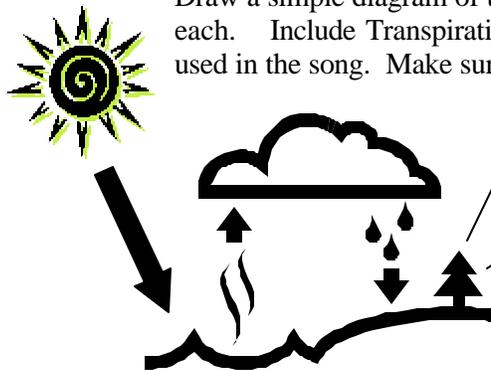
Also, as part of the pre visit activities, they should have been observing, comparing, and recording the changes occurring in the two glasses of water (one by the window, one away from window). Review this next.

What's happened? Have them review the entries from their science notebooks if necessary. What happened to the container by the window? What about the one by the closer to the heater? HEAT! The glasses of water should have evaporated some, but use this demonstration

to explain how the **water cycle** works. Heat is what makes water turn to gas, and evaporate. See if their predictions about each container were correct!



Draw a simple diagram of the water cycle on the board and review the parts of each. Include Transpiration as part of the water cycle, though it won't be used in the song. Make sure the whole class knows the and can pronounce each part of the water cycle.



Play up the water cycle boogie! Have the lyrics posted, and go over them with the class so they can sing along. Bring a volunteer to the front of the class to done the water drop costume, and help with dance moves.

After the excitement is over, explain that you have a recent letter from Sally if the class wants to know what she'd doing now.

Next, read the recent letter from Sally as she makes her way through the Portage Valley watershed.



Note: The letter introduces two new key concepts:
WATERSHEDS and **WETLANDS**

Watershed: The land area from which surface runoff drains into a stream channel, lake, reservoir, or other body of water, also called a drainage basin (Similar to a sink or bowl).

Wetlands: Lands covered and/or saturated by water for all or part of the year. Other common names for wetlands are sloughs, ponds, and marshes.

When you're finished reading the letter, ask the students they've ever heard of watersheds? Explain that a watershed is an area of land that acts like a sink/drain. Gravity moves water downhill, and creates a drain-like effect. The land surrounding the water, forming the sink, is the watershed! Watersheds are separated from one another by areas of higher elevation called ridge lines

or divides. (A valley that forms between two mountains will most likely be a watershed.) Near the divide of a watershed, water channels are narrow and can contain fast-moving water. At lower elevations, the slope of the land decreases, causing water to flow more slowly. Draw a diagram on the white-board to help illustrate a watershed. As smaller streams merge together, the width of the channel will increase. Eventually the water collects in a wide river that empties into a body of water, such as a lake or ocean.

If time is allowing, liken the branching pattern of watersheds to a tree. Smaller streams flow together to form bigger streams. Draw a branching pattern on the white-board and have students determine which direction the water would be flowing (always toward the biggest branch).

So if a watershed is the land collecting all the water that is draining into it, what bodies of water might we find in a watershed: Have the students name different bodies of water i.e. creeks, streams, rivers, lakes, ponds, puddles, glaciers, etc.

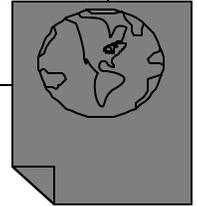
Ask the class to recall Sally's letter again. Can anyone recall where Sally said her "dirty" friends were going while she was on her way to the ocean? They were going to get clean in the WETLAND! Does anyone know what a wetland is? Show the class some photos of wetlands, and ask what the class sees in each picture....water, plants, grasses, etc. Wetlands are areas where the soil is saturated with water for all or part of the year. Wetlands capture, store, and eventually release water

Understanding the source of water in wetlands and how wetlands can capture, store, and release water helps students appreciate the importance of wetlands in watersheds. Tell the students that through a demonstration, they are going to compare watersheds that do and do not have wetlands.



1. Ask the students to imagine water flowing over a land area containing a wetland. What happens to the water when it reaches the wetland? Students should understand that wetlands collect and store water. Water is released when it evaporates, seeps into the ground water system, or flows out of the wetland and travels further downhill or downstream.
2. Using the plastic tray, prop up one end of the tray to form a slope. Put in as many sponges as will fit in the tray (making sure the sponges have been wrung dry). The set-up represents a watershed with wetlands (sponges) in it, and the hole simulates where water is discharged.
3. Have a volunteer pour two cups of water on the top portion of the tray. This represents water entering the watershed (precipitation). Water flowing through the watershed should be collected as it comes out of the hole. How much water is collected compared to the amount poured in? Keep track of the time it takes for the water to drain.
4. Ask students how they think the water would be affected if the wetlands were removed? Remove the sponges, dry the tray (or use another tray), and again pour two cups of water on the top portion of the tray. Compare the quantity of water drained and the time required for draining to when sponges (wetlands) were present.
5. If time permits, have students write a paragraph that includes the words capture, store, and release, comparing the flow of water through a watershed that has and that lacks wetlands.

science notebook



Conclusion:

When finished with the demonstration, explain to the students that they will have the opportunity to learn more about watersheds and wetlands by visiting a Sally Splash's recent hangout, Portage Valley! Get them excited for their field trip, and briefly explain what they can expect. They will get to visit some of the places that Sally went on her journey through the Portage Valley watershed. Play up their trip to the Chugach National Forest and challenge them to count the number of wetlands they observe between Anchorage and Portage.

Do a review of the concepts discussed: The water cycle, watersheds, and wetlands. Emphasize the importance of clean, healthy water because it's all connected!

Before leaving the class, make sure to remind them to dress appropriately for their field trip. If necessary (based on weather in PV), leave a pair of snowshoes with the school to have students practice putting them on and taking them off (leave for the teacher's discretion).