



# Discovering Our Relationship with Water

Figure 1: Rattlesnake Creek (Kehi-oo-lee in salish). The Confluence of Rattlesnake creek and the Clark Fork River was known as “Place of the Small Bull Trout” (Salish-Pend d’Oreille Culture Committee, Elders Cultural Advisory Council, and Confederated Salish and Kootenai Tribes, 2008).

## ABSTRACT

Water is fundamental not only to our survival, but it is essential to our personal health, the food we eat, the industries that we engage with, the traveling we do, and almost every activity that we participate in. The relationship that we have with our water will determine our lifestyles and possibly our survival into the future. Through this curriculum, students will be guided to discover and build their own relationship with water by learning to connect to the water in their community and understanding how water is related to everything that they do. The curriculum utilizes maps and information from Lewis & Clark and the Corps of Discovery's search for a waterway to the Pacific Ocean. While students learn beliefs and practices related to water of tribal peoples along the trail, they participate in activities that connect scientific concepts with resources that offer different perspectives on relationships with water. Teaching children to appreciate and build a personal relationship with water in a way that honors tribal legacies provides an understanding that water is a sacred and living entity. Looking at water in this way will allow children to recognize that we need to take care of our water, just as water is always taking care of us. Engagement in these teachings will inspire and initiate a journey of play and inquiry that are designed to promote understandings, discoveries, and relationships related not only to water, but also to the world around us.

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## MY STORY

My name is Rose Honey and I grew up in a small town in Western Montana called Darby. I am an educator with experience in various aspects of education - as an educational researcher, formative evaluator, teacher, curriculum developer, and program developer. My passion in my work is to bring traditional culture and science education together into classrooms for both Native and non-Native children. As a non-Native person, I am very honored to have been given this opportunity to develop this curriculum with the Honoring Tribal Legacies team.

As a young child, one of the activities that I enjoyed the most was collecting rocks. On family outings and just in my backyard, I loved to collect colored rocks, shiny rocks, smooth and interesting rocks – but I also welcomed grey, normal, or what some might call uninteresting rocks to my cherished collection. My parents owned a local hardware store and decided to give me an old Timex watch display case that lit up and had rotating shelves to present my rocks. Each of my rocks had the pleasure of taking turns sitting in the display case, rotating on the shelves and basking in the fluorescent light for all to see. The fancy rocks flaunted their colors and luster proudly. But in my little rock world, the ordinary, everyday grey rocks were also eager for a place on the shelf to sparkle, to shine, and to feel included. Through my work with Native communities as an educator and especially through projects such as this one, I have started to realize that my relationship with these rocks may have seemed insignificant at the time, but these rocks had a lesson to teach to me about differences and variations in the world, and that even if something seems ordinary at first, it should be given a place to sit on the shelf so that it can bask in the glory of the rotating Timex watch display case. This curriculum focuses on the relationship that we have with water – and though we feel water, see it, drink it, bath in it, brush our teeth with it and use it in various ways every day – it is important to slow down and to recognize that it too has many lessons to teach us.

Through my experiences as an educator, researcher, and student, the things that I have come to value above most things are my relationships - with family and friends, with students, and in general with the world around me. I see now that as a young girl, I also had a relationship with these rocks. And that as I was growing up, the rocks were telling me a story about taking care of people, and teaching me that no matter what our color or how sparkly or dull we think we are, if we are given our own shelf to sit on so that we can display our unique qualities, we too will shine. This is a good way to think about my philosophy on education. I believe that the opportunities that we are given and the ways that these opportunities are presented will result in how much we shine. This is why it is so important to bring Native perspectives into classrooms and give children the chance to look at the world through a Native lens. My hope is that by offering children the opportunity to experience the world through relationships, in ways that are familiar to their histories and their cultures - children, as well as their parents and their teachers, will be actively engaged in learning that focuses on bringing worlds and educational disciplines together.

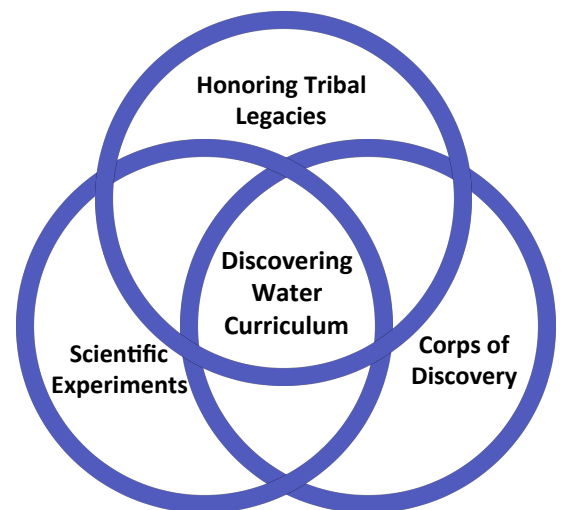


FIGURE 2: THE SACRED HOOP IS USED TO ILLUSTRATE THE WATER CURRICULUM, INCORPORATING THE THREE COMPONENTS: HONORING TRIBAL LEGACIES, SCIENTIFIC EXPERIMENTATION AND THE CORPS OF DISCOVERY.



This curriculum focuses on early learning and science education that Honors Tribal Legacies through our relationship with water. In my experiences with research and education related to Native education, my focus has been on describing and exploring the notion that some Native students who hold traditional worldviews can sometimes have difficulty “crossing the border” into a scientific worldview in their classrooms (Aikenhead & Jegede, 1999). Ways of thinking about the world may differ or even conflict with the ways of life that students experience at home, compared to thinking and behavior expectations at school. As I developed this curriculum and incorporated Native worldviews into each lesson, I struggled to recognize whether or not I was thinking about these concepts “correctly.” It occurs to me that I, myself, am border crossing as a curriculum developer. Experiencing this gives me a window into how it must feel for children who are asked to think about the natural world in ways that feel foreign or vague to them.

In developing each learning episode, I focused on the Big Ideas that I had decided to explore in this curriculum (connections, balance, transformation, cycles, reciprocity, and relationships) and thought about what scientific experiments would be engaging for young children. Then I tied each Big Idea (and experiment if possible) to the Lewis & Clark and Corps of Discovery Journey. As I developed each episode, I thought about how to balance teaching science without taking away from larger ideas that focus on honoring tribal legacies. One method that I encourage using is to learn words and phrases for scientific processes in the local Native language, and then integrate these into your teaching by posting the words on the walls, practice saying the words with the children, and making a point to use the words while doing experiments in class. Each learning episode includes some words and phrases from tribes mentioned in the activities. However, it is important that words and phrases from the local language that are related to the places you are teaching about are integrated into these activities.

My life has taken me to many places in the world where I have had the opportunity to meet all kinds of people. My experiences remind me over and over again that people may speak different languages and have different cultures, but they also have a lot of similarities. People want to make connections with one another and they want to be understood. This realization has helped me in this type of work as I have learned to build relationships with the people in the communities that I am working in, and reach out to people and ask for their help when I need it. I have also learned that asking Elders or community members for knowledge or information is sometimes the same as asking for peoples treasure that they hold very near and dear, and this knowledge should be respected as such.

My hope is that this curriculum will be utilized by Native and non-Native teachers alike. If you are a Native teacher, I hope that you will find new ways to help your fellow non-Native teachers to bring the local culture into their classrooms. Perhaps you can help them to pronounce some tribal names or words, or maybe have a discussion with them about some of the ideas included in these learning episodes - like transformation or reciprocity. And, if you are non-Native, I encourage you to reach out to the Native community around you and invite them into your classrooms. Any way that you are able to reach out will build stronger relationships with other educators and will ultimately help the children. When teachers are connected through strong relationships with their students, they are also able to connect them with the subject area that they are teaching.

# TITLE OF TEACHINGS: DISCOVERING OUR RELATIONSHIP WITH WATER

## Honoring Tribal Legacies in Early Childhood Science Education

### 6 weeklong Learning Episodes

Authored with help from various people, by Rose E. Honey

#### ➤ INTRODUCTION

*Discovering Our Relationship With Water* helps to guide teachers and their students toward discovering and building a relationship and connections to water as well as think about water's relationship to everything in the world. Utilizing Lewis & Clark and the Corps of Discovery's search for a waterway to the Pacific Ocean as a starting point and drawing from beliefs and practices of tribal peoples along the trail, the learning episodes connect scientific concepts related to water with resources that offer different perspectives related to water. This curriculum is intended for children ages 3-5 who live in Tribal or non-Tribal communities. Each learning episode suggests that prospective teachers envision activities at various levels (both Emergent and Advanced Learners) and teach to ability as opposed to age.

#### ➤ CURRICULUM DESIGN APPROACH

The Honoring Tribal Legacies curriculum follows a place-based multiliteracies design approach. This type of framework incorporates learning about "place" using physical and cognitive activities that focus on our visual, auditory, tactile, spatial, smell/taste, movement/gestural, linguistic, and spiritual abilities. Learning episodes provide a variety of learning experiences including watching and listening to video footage of water flowing, singing and listening to songs about water, listening to words spoken new languages, looking at different spatial perspectives of a place or event, feeling water in various forms, envisioning movement of water and thinking of water as a living entity that the children can have a relationship with.

In addition to this multiliteracy approach, each learning episode also offers a **multilevel** approach with a suggested activity focused on the "emerging learner," and the "advanced learner." These suggestions are meant to help teachers think about how to teach for different ability levels in their classrooms, instead of teaching to age levels. It also offers teachers the flexibility to use this curriculum to teach older children including kindergarten and up into first grade. One way to create a nice learning environment that is focused on water is to play music while students are working on projects or during snack time. There are many water-focused songs available online. Here are a few to try:

- Water (Paisley, 2010) [LINK: <http://www.youtube.com/watch?v=1AHnQtY1bg4>]
- Rainy Mood (Rainy Mood, 2012) [LINK: <http://www.youtube.com/watch?v=SDmbGrQqWog>]
- A Song Made Out of Water (Huang, 2013) [LINK: <https://www.youtube.com/watch?v=-uyM2Q8aGp0>]
- Native American Water Healing Song (MacIntyre, 2010) [LINK: - <http://www.youtube.com/watch?v=T6H75gcAlXg>]
- The Water Song (Incredible String Band, 2011) [LINK: <http://www.youtube.com/watch?v=8ZG5is9QqrE>]
- Have you Ever Seen the Rain (Creedence Clearwater Revival, 2007) [LINK: <http://www.youtube.com/watch?v=Gu2pVPWGYMQ>]
- Red Rain (Gabriel, 2009) [LINK: <https://www.youtube.com/watch?v=u6BesY5DoeC>]
- Let it Rain (Clapton, 2011) [LINK: <https://www.youtube.com/watch?v=mi3WxjnjJ80>]

## ➤ HONORING TRIBAL LEGACIES STANDARD (I.E. THE ELEVENTH STANDARD)

This curriculum as well as other curriculum in the Honoring Tribal Legacies (HTL) Handbook focuses on the Honoring Tribal Legacies Standard which aims to: “Demonstrate environmental stewardship and a sense of service achieved through acknowledgement of the interconnectedness of humanity in historical, cultural, scientific, and spiritual contexts.” In addition to this overall HTL standard, the stages and standards table included in the *Discovering Our Relationship with Water* curriculum, are individual standards that honor tribal legacies and relate specifically to lessons in each learning episode.

## ➤ COMMON CORE STANDARDS

The common core standards focused on in this curriculum are for students who are in kindergarten. This means that though specific standards are listed for each learning episode, the cognitive and fine-motor skills and understanding levels of the students in these classrooms are moving towards these understandings and are not expected to master them. These standards are in place for the teachers to use as a guideline to use for the critical knowledge areas that the students should be developing down the road. Following is a list of the standards that these learning episodes help to develop.

- CCSS.ELA-Literacy.RI.K.10
- CCSS.ELA-Literacy.RF.K.2
- CCSS.ELA-Literacy.W.K.8
- CCSS.ELA-Literacy.SL.K.4
- CCSS.ELA-Literacy.SL.K.5
- CCSS.ELA-Literacy.SL.K.6
- CCSS.ELA-Literacy.L.K.5.A
- CCSS.Math.Content.K.MD.A.1
- CCSS.Math.Content.K.MD.A.2
- CCSS.Math.Content.K.MD.B.3
- CCSS.Math.Content.K.G.A.1
- CCSS.Math.Content.K.G.B.5

## ➤ CURRICULUM EXPRESSIONS

- **BIG IDEAS**
  - Honoring tribal legacies along the Lewis and Clark National Historical Trail through honoring water and helping children to build a reciprocal and respectful relationship with water.
  - Water connects us to everything and everyone on the globe.
  - Water utilizes different processes that work towards keeping nature and us happy and healthy.
  - Our relationship with water is sacred and important to respect.
  - Recognizing our relationship with water, and learn to take care of water, just as water takes care of us.
- **ENDURING UNDERSTANDINGS**

Water is sacred in that it is essential to all living things. Our relationship with water is important to respect and take into consideration in our daily lives.
- **ESSENTIAL QUESTIONS ALIGNED WITH LEWIS AND CLARK NATIONAL HISTORIC TRAIL AND/OR TRIBAL THEMES**

Where is water in our community? What is our relationship to water? How can we treat water as a friend, and how does water treat us as a friend? How did and how has water altered tribal relationships, values and practices along the Lewis and Clark Trail? What was the significance of water



to Lewis and Clark and their journey? These questions as well as scientific phenomenon regarding water at the early learning level are explored.

- **EARLY LEARNING IN SCIENCE**

The Pre-Kindergarten and Kindergarten Grade Level Expectations Handbook developed by the Louisiana Department of Education (<http://www.doe.state.la.us/lde/uploads/4251.pdf>) states that, “Science at this level should foster children's natural curiosity of the world around them. Prekindergarten children are actively engaged in observation, exploration, and discovery in their environment. Students begin to acquire a scientific knowledge of the natural world.” To this end, each activity within the learning episodes will encourage early learners to practice and sharpen their scientific exploration skills. One way to do this is to explain, utilize and emphasize the following words and phrases while working with the children: **Formulate Questions, Predict, Explore, Experiment, Observe, Identify, Record, Data, Form Conclusions, and Communicate Results.** Within the learning episodes, these words are bolded and highlighted in green as a reminder to use this language.

- **STAGES AND STANDARDS TABLE**

In order to ensure that this curriculum is accessible and appealing for teachers that range from Head Start, Public Schools to informal education programs such as those in the National Park System, I focused on a number of standards. The standards listed in the Standards Table [[LINK: Intro.a.stages.standards.table.pdf](#)] include: Honoring Tribal Legacy standards, scientific concepts that are explored, Next Generation Science Standards, and Common Core Literacy and Math standards. The Scientific Concepts listed include natural systems (i.e. waterways, weather, the human body), models (representation of a real object; maps), constancy and change (i.e. growth), scale (size, distance, etc.), patterns and relationships, cause and effect, structure and function (relationship between the way things look, feel, smell, sound, taste and the actions they perform), variations (discontinuous and continuous properties) and diversity among objects and organisms in the natural world. The Honoring Tribal Legacies encompass tribal values that are included in each learning episode, and are more detailed expansions upon the Honoring Tribal Legacies 11<sup>th</sup> Standard described above.

- **DISCOVERY JOURNALS**

*“The Corps of Discovery didn’t discover anything. Everything the Corps reported on - plants, animals, and landforms - had been known to and used by American Indian tribes for generations. The Corps were, however, the first to record these items for science.”*

- National Park Service, 2013

One of the main assignments of the Lewis and Clark expedition was to learn what they could of the land and its wildlife. Lewis spent a lot of time walking along animal trails and climbing hills along the river to learn about plants and animals. He noted different animal habitats, described how predators like wolves hunted antelope, listened to bird calls and tasted, smelled, looked at and felt plants so that he could describe them accurately in his journals (Lavender, 2011). Discovery journals are a part of each learning episode, and can be worked into the activities at any point. Some children learn best when allowed to process their discoveries on paper. At the early learning stage, student journals may

not be detailed, complex or lengthy. However, copying or pasting an already printed word into their journal, pasting an object such as a leaf or a photo, or even drawing a picture in their journal will promote literacy and an awareness of the idea of recording information in journals like Lewis and Clark did, and that the process of scientific discovery includes recording and documenting information.

## ➤ LEARNING EPISODE SECTIONS

Each learning episode title incorporates an Honoring Tribal Legacies theme with a description of how water is focused on through the learning episode activities. The six learning episode themes and descriptions are as follows:

1. Connections - The Water in Our Community
2. Balance - Sinking & Floating
3. Transformation - Gas, Liquid & Solid
4. Cycles - The Movement of Water
5. Reciprocity - Happy & Healthy Water
6. Relationships - Plants, Animals & Water

### A. LEARNING OBJECTIVES

While numerous learning objectives and learning modalities are included and achievable in each episode, the most significant learning objectives are listed in this section.

### B. LEARNING EPISODE DESCRIPTION

A journal entry from the Lewis and Clark journals introduces the themed activities, followed by background information for the activities in each learning episode. These descriptions will provide teachers with some contextual information related to HTL, the Corps of Discovery, and the scientific experiments, and allow them to share and adjust this information according to their students.

### C. MATERIALS

Basic materials needed for each activity are listed here.

### D. CIRCLE TIME

Circle time is a time at the beginning of each day to sit down with the students and experience an activity with them to introduce the week's topic. During this time, you can look at the "Learning Episodes Along the Trail" map in order to talk about Lewis and Clarks journey and the tribes who lived along the trail [[LINK: intro.c.image.2.learning.episodes.along.the.trail.docx](#)] This section will sometimes include audio, video, and a book list of relevant books to share with the students.

#### BOOKS TO READ

These suggested books align with the topics and themes presented in each learning episode. Many of them have stories with Indigenous characters. The books here may be relevant for multiple learning episodes, so keeping content in mind and re-reading stories will reinforce learning as you proceed with your students through the curriculum. Some of these books are easily accessible for free online (links provided) or for purchase on websites such as Amazon.com – but don't forget to check your local

library. Books are referenced in each learning episode, and downloadable Book List includes all of the books listed in this curriculum [[LINK: intro.d.Book.List.pdf](#)]

#### **E. ACTIVITIES**

Each activity begins with a research question that will be explored in the activity. Activity explanations include differentiated instruction with suggestions for both above standards and emerging learners.

Multi-level instruction ensures that different age groups of children as well as different learning levels are addressed within each activity, in the hopes that teachers will teach to ability instead of teaching to the age of the students within their classrooms.

#### **F. SUGGESTED FORMATIVE ASSESSMENT**

These describe various ways to assess the learning that is taking place in the classroom. It might be a simple question during snack time, or a game or activity that demonstrates student conceptual understanding. The purpose of these formative assessment activities is to reveal the direction students are going in with the lesson. They are meant to help answer the question that CHiXapkaid likes to ask, “Are we all riding in the same canoe?” Formative assessment is also meant to inform educators of the places in their lesson where they might want to put more emphasis, and what concepts and activities could be repeated before moving forward.

#### **G. BIBLIOGRAPHY AND RESOURCES**

This section lists the sources of used to get information for lesson activities and information related to child development and teaching activities and concepts.



## I. CONNECTIONS - WATER IN OUR COMMUNITY

### A. Learning Objectives:

- Models/maps can communicate many different kinds of things.
- Documents can be used to record events, times, locations, and landscapes including mountains, valleys, rivers, and the places where we live.
- Water connects us to people and places in the world.
- Tribes have place-names for many of the locations where Lewis and Clark traveled.



(ANDERSON, 2013)

- B. Learning Episode Description:** In May of 1804, Lewis and Clark and the Corps of Discovery went on a journey. They were asked by the United States government to look for a water passageway from St. Louis to the Pacific Ocean. One important way that they did this was to look at documents and maps that had already been made, using knowledge from Native American tribes and others (like hunters and trappers) who had traveled on their route. In the beginning of the journey, Lewis wrote in his journal, *"Set forward to that village in order to join my friend companion and fellow laborer Capt. William Clark, who had previously arrived at that place with the party destined for the discovery of the interior of the continent of North America"* (Lewis, Clark and Members of the Corps of Discovery, 2002).

The title of this expedition may contain the word "discovery," but there were many people already living in the places where they were traveling, and many of the land features and waterways had already been documented and named (Restoring Our Names, 2009). Lewis and Clark talked with many Native American tribes along their journey, who helped them to learn about the landscape, and to decide which waterways or land routes to take.

Starting this curriculum by teaching the idea of where the water is in our community will introduce the idea and give an understanding of spatial relationships. Through searching on maps for bodies of water (lakes, rivers, ocean, etc.), creating maps as a class, and visiting locations on a map, learners can begin to connect these documents with the world around them and to explore the many ways in which water connects us all.

### C. Materials:

- Various examples of ways in which people document events, time, landscapes, etc. like winter counts, Lewis and Clark journal entries, calendars, etc. For examples of winter counts, go to this Lakota Winter Counts exhibit at the Smithsonian National Museum of Natural History (2012) [LINK: <http://wintercounts.si.edu/index.html>] or this curriculum (South Dakota Public Broadcasting, 2013) [LINK: <http://www.sdpb.org/wintercount/>].
- Maps: globes, flat maps of the world, topographical maps, city maps, subway map, bus route map, river maps, etc.
- Large sheets of flip chart paper or butcher paper, markers
- Individual Discovery Journals for students
- Internet access to look at documents such as Winter Counts. Two resources are Smithsonian National Museum of Natural History (2012) and South Dakota Public Broadcasting (2013).

- D. Circle Time:** Spread the documents (calendars, winter counts, maps, journals, etc.) out onto the floor in the middle of the circle. Ask the children: *What do you see? What do you notice or wonder about when*

you look at these documents? If there are no questions, model asking questions. *What kind of story does that blue color that you see here (point to lake, river or ocean on map) tell us? What story does that animal (point to symbol on winter count) on this document tell us? Does anyone have a guess?* Give them time to think about it and allow for questions. Direct the conversation to the maps. *What do you see on this map? What else do you **observe**? Can you **identify** the water on this one?* Emphasize that maps are documents that represent towns, roads, or natural features such as mountains and rivers and that they can show us how we are connected to other places in the world. Watch videos and read books (listed below) on the water cycle, and where our water comes from (rain, rivers, melting snow from the mountaintop, etc.). Talk about the idea that water starts as rain or snow high in the mountains and trickles down to small streams, then to larger rivers, and finally the ocean. Discuss the idea that water connects us to these places, and that when we touch water, we are connected to every place in the world. Talk about Lewis and Clark and their journey using water to travel to the ocean. Show them a map of Lewis and Clarks Journey. Point to where Lewis and Clark started their journey, and have the children do the same. Next, ask them: If you used the water as your highway, how would you travel to the Pacific Ocean?

Guide the students to some water (either inside of the classroom or outside). Ask them to touch the stream of water from the faucet or hose (or river or pond). Discuss where this water comes from by asking the students, “Where do you think this water came from?” Ask them to take a guess (use the word **predict**) about where the water traveled from, and where it is traveling to next.

**Videos:** focused on where water comes from and where it is going:

- The Water Cycle Rap (Cottenham, 2010):  
[http://www.teachertube.com/viewVideo.php?video\\_id=230786](http://www.teachertube.com/viewVideo.php?video_id=230786)
- The Life of Water. Water Which Gives Life (Water Project H2Ooooh!,2010): **[LINK: <http://www.youtube.com/watch?v=FAnDIYRycqs>]**

**Discovery Journals:** Ask the students to think about their relationship with water in their daily lives. Prompt them to think about this by saying things like, “Have you touched water today? How did you come in contact with water today? Did you drink it? Did you use it to wash? Did you play with it?” Pre-write in their Discovery Journals at the top of the page, “What has been your relationship with water today?” Discuss this question with the group, then ask them to draw a picture that represents this, or help them to write words like, drink water, brushed teeth with water, cooked with water, walked through a puddle of water, etc. in their discovery journal.

**Books to Read:**

- *Water, Water Everywhere* [Book 1] (Overbeck & Rauzon, 1995).
- *As the Crow Flies: A First Book of Maps* [Book 2] Hartman, 1993).

## E. **Activities:**



### *Inside Activity: Mapping Our Community*

This particular activity is designed to lead students towards asking questions about water. Where is the water in our community? Where does it come from? How does the water in our community get into our

faucets? Where does it go from there? These activities will encourage learners to think about the places where they live and their place within their community as well as how everything within their community (and the world) are connected. Jane Goodall's *Roots and Shoots* (2012) inspired this activity.

**Drawing Maps:** Introduce the idea of a map to students. Ask them what they think a map is? What are maps trying to communicate? (You may have already gone over this during the circle time) Then, ask students to explore on their own by drawing a map in their **discovery journal**. Allow them to draw whatever type of map they would like to draw. Try not to give them preconceived ideas about what a map is (this initial map drawing can be utilized for assessment later on).

**Community Map:** Next, guide the students towards drawing a large map together of the community that you all live in. Once you decide together on what to include, tell the students, "Now we have collected **data** on where the water is in our community. We are going to communicate these **results** on a map."

**Research Question:** Where is the water in our community?

1. On a large piece of flip chart paper, draw the boundaries of the area. *"Let's think about drawing a map of where we live. What kinds of **questions** do we need to ask before we begin to draw our map? What kind of **data** should we gather?"*
2. Guide the students to **identify** areas of importance for people, animals, the environment, and don't forget to focus on where the water in your community is, and how to represent it. *"What shall we include in our map? Do we want houses in our map? Our school? The mountains?"*
3. Focus on the water in the community for this map by asking the following **questions** and encourage the children to formulate their own **questions**:
  - Where does the water that you drink come from on this map?
  - When you take a shower/bath, where does the water go after it travels down the drain?
  - If it is raining outside, show me on this map where the water goes?
  - Where do you like to go swimming?
  - When animals are thirsty, where do they go to get a drink (birds, deer, cows, frogs, etc.)?
  - Where else is there water on this map? Where does it come from?
4. **Record** the answers to these questions on your community map. Try to draw a feature on the map for each idea the learners provide. Even if a child says that water goes "into the ground," or "in the air" indicate this on the map somehow.
5. Introduce the map of Lewis and Clark's journey to the students. Talk about how Lewis and Clark were looking for a waterway to the Pacific Ocean, and how the tribes along their journey helped them to decide what rivers to travel on. Ask the students: What do you **observe**/notice about this map? Where on the map do you think Lewis and Clark might have traveled? How do you think Lewis and Clark might have traveled? If Lewis and Clark traveled on water, what path do you think they took? Can you show me the path with your finger?

**Emerging Learners:** If you feel that your classroom or specific children in your classroom need an activity prior to drawing a map of the community, try drawing a map of your classroom together. Use simple drawings of real items like sinks, desks, chairs, etc. to represent the location of items in the classroom. Using the classroom map or the community map, focus on spatial concepts. For example, "Let's look at the map. Where is the river on this map? Does the river go above the town or below the town? Is the lake between the mountains or under the mountains? Early Learners are beginning to understand the concept of space and their environment. Engaging them in language that describes spatial concepts will help them to develop this understanding (Spivey, 2009). Use words like over, under, on top of, below, between, in front of, behind, etc. to help children develop spatial intelligence.



**Advanced Learners:** Advanced learners can also begin to think about relationships between symbols and objects in reality. For example, instead of using a blue line or a blue circle to represent water, use a dotted line, or an X to represent water. This pushes the learner to distinguish between alternate forms or representation and can help children to develop skills for things like problem solving (Goria & Papadopoulou, 2008).

**Helpful Hints:**

- Research shows that an awareness and understanding of spatial concepts and relationships can predict later success in math, reading, and in following directions (Spivey, 2009).
- On the community map that you draw with your students, it might be helpful to place different colored stickers, or use markers to color in different areas to indicate areas of importance. For example, place blue dot stickers in areas where water needs to be represented, and brown dots where forests are.
- For students who are having trouble thinking about the classroom or the community in a 2-dimensional space, it might them to create a 3-dimensional representation of the room or the community with your students. Use materials such as blocks or empty boxes for houses, small branches or plants for forests, and blue cellophane, felt, or clay to represent the water in the community.



**Outside Activity: Visiting Water in Our Community**

1. Visit one of the places on the map that you drew together (Ideally, this will be a location that Lewis and Clark traveled through). Remind students of the map you drew together and show them where you are going on the map. Next, look at a professionally drawn map of your community and ask the learners to point to the water in this map. Talk with them about where this water came from and where it's going.
2. Listen to the audio story by Julie Cajune, talking about what the rivers meant to the Salish people. It is titled "Salish Water Highways." [LINK: 1.e.audio.Salish Water Highways.mp3]
3. Once you arrive, look at the maps again and help students to connect features of the landscape to them.
4. If you know or can find the tribal place name, talk about the current local name for that place and the tribal place name that it used to be called. How did the location get these names? What is the difference between the two names? Is there any connection between the two names? Utilize the Honoring Tribal Legacies Place-Name map [LINK] or other online resources like Restoring Our Names (2009) [LINK: <http://www.digitalcultures.com/ctuirMap/>] to find names for your location. For example, the place name for Missoula where the Clark Fork River flows was originally called Nmesuletk<sup>w</sup> by the Bitterroot Salish people, which means place of the very cold water. It is now called the Clark Fork River, which is named for William C. Clark of the Lewis and Clark Expedition.
5. Ask students to draw another map on a new page in their **Discovery Journals**. Share and discuss these maps as a group. Ask students what "place name" they would call the location where you are.

**F. Suggested Formative Assessment:**

- Ask students to describe the maps they drew in their journals (in the beginning of this episode).
- During discussion about the community map, question students about features of the map and be attentive to who responds.
- Ask students to identify the water on their classmate's maps.

- Draw a simple map of your classroom. Point to a place on your map and ask a student to go stand there in order to assess their understanding of maps as models or representations of a place.

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## II. BALANCE - SINKING & FLOATING

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### A. Learning Objectives:

- Water has relationships with entities in the world.
- The relationship between objects and water will determine whether an object floats or sinks.
- Objects are made out of different kinds of materials.
- We can predict whether an object will sink or float based on its properties.
- We can test our predictions by experimenting, make conclusions based on the experiments that we do, and apply what we have learned to different situations.



**B. Learning Episode Description:** Near the end of August in 1804, Lewis and Clark met with the Yankton Dakota Sioux Tribe (Ihanktonwan Dakota Oyate) near a place that Lewis and Clark called Calamut Bluff. At this location, one of their boats hit a snag in the river, causing it to have a hole and almost sink to the bottom of the river. You can read about this in Clark's journal on August 28<sup>th</sup>, 1804 (Lewis, Clark, and Members of the Corps of Discovery, 2002a). You can utilize this story to introduce the idea that along their journey, Lewis and Clark had to make sure that their boats were able to float in order to transport them down the river. Introduce this idea to your early learners by saying things like, "What makes a boat float? Why do you think happens to a floating boat that might make it sink? What kinds of materials are boats made of?"

This unit is focused on **balance** and the importance of having a balanced relationship with water. From experiences in the bathtub, in swimming pools or at the beach, young learners form early ideas about sinking and floating and tend to focus on the properties of the object instead of the relationship between the object and the liquid. Even the words "sink" and "float" indicate that an object has a property within it, that results in it being a "sinking" object or a "floating" object. But an object only sinks if its density is higher than the liquid it is submersed in, and only floats if its density is lower than the liquid it is placed in. From a scientific perspective, objects float when the upward push of water balances the downward push of the object. Objects sink when the downward push of the object is greater than the upward push of the water (Department of Education and Early Childhood Development, 2013). Though preschool children may not yet be able to grasp the complexity of this concept, this learning episode introduces the idea of balance. Instead of focusing on whether objects sink or float in water, this unit is designed to inspire learners to think instead about the *balance* between objects and the liquid they are immersed in.

### C. Materials:

- Large bucket or container (clear if possible) big enough to fit two cans of coke
- 1 can of regular Coke and 1 can of Diet Coke
- Objects such as a sponge, paper clip, toothpick, marble, straw, crayon, leaf, twig, bark, rock, fruit, etc.
- Butcher paper, markers
- Water table or large bins of water for multiple children to experiment with objects and water balance.



**D. Circle Time:** Let your learners know that today you are going to explore relationships between different objects and water. Before talking about sinking/floating, demonstrate objects that have a balanced relationship with water. Show the students a bucket of water, a diet coke, and a regular coke. Drop the cans of coke into the bucket of water and ask the students: *What do you **observe** (see)? What do you notice?* Lead the conversation towards the idea that sinking and floating is about the balance between objects pushing down on water, and water pushing up on the object (not property of individual items). *What kind of relationship does the diet coke have with the water – is it balanced? What relationship does regular coke have with the water – is it balanced?* Then ask the students - *What kind of relationship do you have with water?* Tell your students that the Dakota word for water is “mini [mee-nee] (Native Languages of the Americas (2013).” Have them repeat this back to you.

**Discovery Journals:** Ask the students to draw pictures of things that they have seen when they have visited water. Give them some prompts such as, “Name some things that you see when you go to the lake/river/ocean. Which of those things are on top of the water? Are any of them under the water? What happens to the soap when you take a bath? What about when you go swimming?” Ask students to share their experiences with water to the group.

**Audio:** Listen to the audio of Renee Sans Souci talk about her relationship with water as an Omaha woman. [LINK: 2.b.audio.1.Relationship With Water.mp3] After listening to this story, ask the students if they can remember what the Omaha word is for water (Ni [Nee]). How is this the same or different from the Dakota word for water?

**Books to Read:**

- *Shin-chi's Canoe* [Book 3] (Campbell, 2008).
- *Morning on the Lake* [Book 4] Waboose, 1998).
- *Skokomish Baskets and Canoes* [Book 5] (Coast Area Planning Committee, 1978).



**E. Activities:**

**Inside Activity: Density Relationships**

1. Introduce a number of objects into the discussion circle (small sponge, paper clip, buttons, toothpick, marble, plastic straw, crayon, leaf, twig, piece of bark, rock, pieces of fruit, etc.) and ask the students to **“predict”** the relationship the objects have with water. Tell them, “Let’s make a **hypothesis** about what will happen when I drop this object into a bucket of water.” Use questions like, “Will the “up” push of water balance the “down” push of the object?” Then talk about testing your **prediction** and **experiment** by immersing the object into a bucket of water or water table.
2. Tape a large piece of paper on the wall and record student **predictions** for each object in a table. A prediction is a guess about what might happen based on observation. For example:

Object	Our Prediction	Collected Data	Conclusion
Rock	When the rock is placed in the water, the rock will go to the bottom.	The rock goes to the bottom.	Down push of rock is not balanced with up push of water.
Block of wood	When we let go of the piece of wood, the wood will go down to the middle of the water.	The wood stayed on top of the water.	Up push of water balances down push of wood.
Leaf			

3. Have students **explore** and test the objects in bins of water. Model how to **record** your **data** by filling in the chart when each child makes a new **discovery**.

**Emerging Learners:** Learners in the earlier stages of cognitive development will be able to think about objects in terms of color and shape (Informed Parents Successful Children, 2008). Ask these students if objects of different colors and shapes go to the bottom of the water bucket, or float in the water. For example, “Does the red button go to the bottom or stay on top? What about the blue button? Do both the red and the blue button act the same when you place them in the bucket, or do they act differently? What about the round wooden block? Does it act the same or different from the way that the square wooden block acts when we put it into the bucket of water?”

**Advanced Learners:** Learners who are more advanced can think about how “heavy” or “light” and object is. Remember to talk about the relationship between the object and the water. Ask them questions like, “Which one do you think is more dense? Does the rock have a larger density, or does the water have a larger density? Let’s put the rock into the water and find out. Oh! The rock goes to the bottom, so the rock has a greater density than the water. This means that the down force of the rock pushing on the water is larger than the up force of the water pushing on the rock. Now let’s try this feather! Do you think that the feather will have a bigger down force, or the water will have a bigger up force? Does this mean that the feather will go to the bottom, or stay on top?”

**Helpful Hints:** Do not “dumb down” words or concepts when working with the children. In this learning episode, I encourage use of the word “density” and “force” to explain the properties of the objects the students are experimenting with. Using the proper words will familiarize early learners with this language, and promote thinking about things from a scientific perspective.



## Outside Activity: Boat Building With Objects in Nature

**Research Question:** How can we build a boat that floats?

1. During circle time, ask the students: *What do you think a boat needs in order to float?* Look at the chart that you made during the object/water balance experiment. *Let's look at the **data** that the class collected together. How can our **conclusions** help us to answer our research question?*
2. Show students pictures of different types of canoes and boats. Include pictures of Native American boats and the boats utilized by Lewis and Clark and the Corps of Discovery. Some examples of traditional Native American boats can be seen here: [[LINK: 2.f.download.2.boats.jpg.](#)] Ask the students to **observe** what these boats are made out of, and what shapes the boats are.
3. Tell the students: *Let's pretend that we need to help Lewis and Clark to build a new boat. How should we do this? What kinds of materials should we use?* Encourage the students to think about all of the **data** you have gathered including your object chart, materials and shapes discussion from the photographs.
4. Go on an outing with the children to find items in nature to help them make boats. Remind students to think about the information that they know about boats from the **observations** and **experimenting** they have done.
5. Once you have collected materials, return to your classroom and begin building boats (you may want to gather extra materials from the forest for children who need more leaves, twigs, moss, etc.). Avoid telling children how to build a boat. Let them create their own designs - however improbable or silly. If you want, it is a good idea to guide by example. Participate as a peer, quietly making your own simple boat.
6. When the boats are finished, try floating them. Watch what happens and encourage students to talk about their boat design, describe the materials they used and to **analyze** with the children why some models work better than others. Can the children use the findings from these **experiments** to design their next boat?

**Helpful Hints:** Misconceptions that students can have about sinking and floating include: small objects float and large objects sink, soft objects float and hard objects sink, floating objects have air in them somewhere, floating means that most of the object is on top of the water, objects that are submerged (like fish or submarines) are not floating, and that floating has to do with the weight of an object. Ways to counteract these misconceptions or prevent them from developing in the first place includes getting students to experiment and test different ideas and different objects and their relationship to water (English, Davies & Green, 2010).

### **F. Suggested Formative Assessment:**

- Look at the chart that you created in the sink/float activity. Ask students to count the number of objects they tested that have a balanced relationship with water. How many objects did NOT?
- During snack time or while traveling on field trips, ask students randomly whether they think this object (pick up a rock or a stick, for example) has a balanced relationship with water and to describe what might happen if you placed it in a bucket of water.
- Discuss with students why they chose the materials and shape they did to when they built their boats, and ask them if they were to build a boat again, would they change anything?

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### III. TRANSFORMATION – GAS, LIQUID & SOLID

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#### A. Learning Objectives:

- Transformation means that something changes the way it looks (shape or color) or its state of matter (water from liquid into solid or gas).
- Know that things in nature (like water) can sometimes change or transform, and that sometimes this transformation can help to keep nature in balance.
- Recognize that transformation influenced the travels of Lewis and Clark and the Corps of Discovery.



**B. Learning Episode Description:** During the first winter of Lewis and Clark's journey, (1804-1805) they decided to build cabins and stay near the Mandan-Hidatsa Native American villages. The Mandan-Hidatsa peoples talked to them about the landscape and rivers ahead of them and helped them to plan the next segment of their journey. It was a very cold winter and the water on the Missouri river frozen over. One member of the Corps of Discovery wrote, *"The wind blew hard from the north and it began to freeze (January 17, 1805)."* Clark recorded that their boats were frozen solid in the ice and talked about how they had to *"...continue cutting the ice"* from around the boats *"...in order to get them out of the river (January 22-23, 1805)."* This took them many days. (Lewis, Clark, and Members of the Corps of Discovery, 2002). This learning episode is about the idea of **transformation** and how water can transform in various ways. Transformation is a part of many Native American stories and can help to demonstrate that nature is always changing and that change and adaptation is something that is necessary and helps to keep nature in balance. The activities in this episode help learners think about transformation from the perspective of shape change and changes in states of matter.

#### C. Materials:

- Aquarium or different large clear container
- sand and/or clay (enough for all students to build a landscape)
- one foil roasting pan (or large clear rectangular pan if possible) for each student or pair of students.
- Rocks, sticks, cardboard shapes, etc. to create obstacles for water flow in the pans.
- multiple balloons in three different colors
- markers
- butcher paper

**D. Circle Time:** Tell the students the story above about Lewis and Clark's boats becoming frozen in the river. Be sure to look on the Episode Map to see where Fort Mandan is located. Tell your students that the Mandan word for water is "mini [mee-nee] and the Hidatsa word for water is "miri [mee-ree] (Native Languages of the Americas (2013))." Have them repeat these words back to you.



Introduce the idea of different states of matter to your learners. Tell them that water can take on different forms. Discuss with them the boats that they created in the last learning episode, and ask them, *“What would happen if the boats that you made were outside in a river or a lake, and the weather became very, very cold. What would happen to the water?”* Prompt them to get your learners to talk about ice. Ask them if they can think about the other forms that water can transform into. If they need some help, ask the learners, *“What happens if we take a pot of water and make it really, really hot? What do you notice when you boil a teakettle? What happens if you take a glass of water and make it really, really cold?”*

Next, talk about how these actions can make water change and transform. Ask students what they think the word transformation means.

Demonstrate the idea of transformation with the following activity. Tell the students that this activity demonstrates how water can transform its shape. *“One way that water transforms is by changing its shape. What do you think can make water change its shape?”* Show the students a tall glass of water. Ask them to **observe** and describe the shape of the water. Emphasize that you want them to talk about the water, not the glass that the water is in. Next, pour the water into a bowl or a different shaped container. Ask the students to **observe** and describe the shape of the water now. How has the shape of the water transformed? Why did it change shape?

Play the game called Magic Water with your students. (This game was originally called Magic Rock and was suggested by Dr. Kathy Moxley-South from the University of Oregon). Explain that in this game, they are going to act like water that *transforms* into other things:

- The children curl up into a small ball on the floor.
- The teacher (or another student, once they learn the game) chants, “magic water, magic water, transform into a \_\_\_\_\_!” (This can be anything from nature like a spider, bird, snake, grasshopper, snowball, cloud, etc.)
- The children transform into the object by acting it out.

**Video:** Watch this video again (it is also in Learning Episode 1) called The Life of Water, Water Which Gives Life (Water Project H2Ooooh!, 2010). In this video, water droplets named Dew and Drip travel downstream to the ocean, evaporate, and then become raindrops. Discuss how Dew and Drip transformed into gas that floated up into the air to form clouds, and then transformed into raindrops and fall back to the earth.

**Photo:** Have the students look at this photo of water [[LINK: 3b.image.2.solid.liquid.gas.jpg](#)] See if they can pick out the 3 forms where water exists in this photo. If not, have a discussion about this with the group.

**Discovery Journals:** Ask the students to draw water in their discovery journals by first giving them some ideas of water that is in different matter states. Draw on a large piece of butcher paper or on the chalkboard things like an ice cube, glass of water, rain drop, clouds, natural body of water like a pond or a river, snow flake, etc. For children who have trouble with drawing these things, you can have them practice their fine-motor skills by having a snowflake cutting activity, then pasting their snowflake into their discovery journal. Discuss the different ideas that the children had, and talk about how all of these things are water, but that they are in different shapes, and different states of matter (solid, liquid and gas).

**Books to Read:**

- *The Gift of the Bitterroot* [Book 6] (Arlee, 2008).
- *Salmon Boy: A Legend of the Sechelt People* [Book 7] (Joe, 2001).
- *The Story of Jumping Mouse* [Book 8] (Steptoe, 1989).
- *Water Story* [Book 9] (Real Bird, 1978).



### *Inside Activity: Transformation By Shape*

#### **E. Activities:**

**Research Question:** How does water change/transform it's shape?

1. Watch one or more of these videos and discuss them with the students as they relate to water transformation. [[LINK TO SHANA BROWN's CURRICULUM HERE](#) for teachers to use as a resource)
  - "See Through the Water" This is a short documentary (9 min.) on the destruction of Celilo Falls (Columbia River, Oregon) and the subsequent fate of Celilo Village (Venkov, 2009). [[LINK: http://www.youtube.com/watch?v=nXFYu7I\\_rNk](#)]
  - "Celilo Falls" This is also a short version (2 minutes) of the same story, with a greater focus on the loss of culture and history with the loss of Celilo Village (Fuller, 2007) [[LINK: http://www.youtube.com/watch?v=dT\\_nxvZ3UVw](#)]
- Audio:** Listen to the word for water in the Yakama language, spoken by Shana Brown [[LINK: 3.c.audio.1.Yakama Word for Water.mp3](#)]
2. Ask students about the places where they live. Was their home ever a lake or a river? Have the waterways changed where they live, and how? Have an Elder tell a story about how the waterways were shaped when they were children. You can also tell the students to ask their grandparents or other Elders about this.
3. Demonstrate the activity that they are going to do using the aquarium. Prior to class (or with the students if you have time), build a structure out of sand and/or clay on the bottom that simulates a river bottom or a lake bottom (you can also build structures like mountains and valleys). Fill it with water and then look at it from different perspectives. On the side, you can see underneath the water, on the top you can see the shape of the lake. Talk to the students about the different shapes that you see from these perspectives.
4. Give learners plastic containers or foil turkey roasting pans and modeling clay.
5. Demonstrate for the students how to use the clay to build models of mountains and valleys in the pan. You can also have them use small rocks or sticks to simulate large boulders, logs and trees.
6. Using a glass of water, pour the water over the landscapes the students created. Talk about the shape of the water in their containers. Take an aerial view photograph of one or two of them. Print the photos out. Outline the shape of the water with the students and compare differences and similarities. You can also prop the containers up and pour water down the container to simulate a river.
7. Talk with them about the different shapes the water makes because of the way their clay is modeled and relate it to different landscapes around them.

**Emerging Learners:** For children who are less cognitively developed or might need some help with their fine motor skills, you can have a few landscapes already made for them out of clay or sand, and ask them instead to place rocks and or obstacles in the landscape for the water to flow around.

**Advanced Learners:** Students who are more advanced learners can explore with making different types of riverbeds, or other bodies of water like lakes or oceans. They can also explore with sticks or pieces of cardboard to make dams or to divert the flow of the water. Discuss how changes in land or structures such as dams transform water. Rivers can become lakes; falls in rivers can change into flat water. Bring up the notion that humans can transform the shape of water when they build dams or move the earth around.

**Helpful Hint:** Between the ages of 2-5, children are developing spatial awareness related to their experiences with their bodies and their surroundings. Giving children experiences with space in different contexts will help them to develop a better understanding of the size of objects in relation to other objects, and spatial awareness in regards to position. Using language like “behind the tree, next to the rock, on top of the box, etc.” will help them to develop their spatial awareness further (Poole, Miller & Church, 2014).



Have your students listen to the following Solid, Liquid, gas song: [LINK: <http://www.youtube.com/watch?v=btGu9FWSPtc>] by the band *They Might Be Giants* (They Might Be Giants, 2010). Talk about solid, liquid, and gas water, and tell the students that you are going to explore these three states of matter using balloons.

Next, do this activity that was influenced from an activity by Fit Kids Clubhouse (Fit Kids Clubhouse, 2012).

#### 1. GAS

- Hand out unfilled balloons to everyone.
- Ask the students, “*Is there anything inside of these balloons?*” Discuss: “What can we fill these balloons with?” *Air!* Tell the students that air is made up of gases and it is all around us but we don't see it. If you put some air into the balloon, it captures it and this helps us to see it and feel it. Emphasize that air is a GAS. Help them blow up their balloons, tie them and tell them to **experiment** with the GAS balloons.
- Blow up your own balloon and let each child take a turn pinching the bottom and letting it go. Tell them, “*Let's watch gas in action. What do you **predict** will happen?*”

#### 2. LIQUID

- Next, talk about what kind of LIQUID they might fill their balloons with. Eventually (or rather quickly) they will come up with the idea of water.
- Help them fill their balloons with water and emphasize that water is a LIQUID.

- Again, let them play with these balloons. You may need to have multiple water balloons prepared, as they will likely break them easily.

### 3. SOLID

- Pre-freeze water balloons so that you can bring out SOLID balloons filled with ice.
- Let them play with all three types of balloons. Let them feel them, jiggle them, hang them down by the end, and even throw them down onto the ground if they would like to.
- Pay special attention to the play with the solid ice balloons – be sure that students are closely supervised during this activity and have them slide the ice balloons instead of throwing them if necessary.

During all three parts of this activity, record statements that the children say, like: “The LIQUID is squishy in there,” “The LIQUID swings the best,” “The SOLID is heavier than the liquid,” “The GAS one floats,” or, “SOLID hits the ground hard.” Write their statements on butcher paper and put them on the walls of your classroom for discussion during circle time, or even the next day.

**Helpful Hint:** Write GAS, LIQUID and SOLID in permanent marker on these balloons so that the students begin to recognize these words. Another way to help students to distinguish between the different states of matter is to make sure the GAS, LIQUID, and SOLID balloons are different colors.

### F. Suggested Formative Assessment:

Use the following questions as talking points to have discussions about the different states of matter that we experience with water. Use the children’s answers and knowledge to gauge what parts of the activities they understood or may need to repeat in the future.

- During snack-time, ask the students if they are drinking a solid, liquid or a gas?
- Discuss the air that you are breathing and ask them to tell you what state of matter that is... Am I breathing in a liquid? A solid? A gas? What about when we go swimming? What do we swim in? Is it a solid, liquid or a gas?
- What would happen if I put this glass of juice into the freezer? What about if I put it in a pot on a hot stove? What would the liquid do?

**Video:** Have your students watch this video, and ask them to tell you where they water as a solid, water as a liquid, and water as a gas in the video. [LINK: 3.e.video.1.solid.liquid.gas.mov]

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## IV. CYCLES - THE MOVEMENT OF WATER

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### A. Learning Objectives:

- Water is always moving from place to place. Sometimes it moves quickly, sometimes it moves very slowly.
- Water can communicate to us if we listen very carefully.
- Clouds are part of the water cycle and there are many different types of clouds



**B. Learning Episode Description:** On June 13, 1805, Lewis discovered the Great Falls of the Missouri River. He wrote, "... my ears were saluted with the agreeable sound of a fall of water and advancing a little further I saw the spray arise above the plain like a column of smoke which soon began to make a roaring too tremendous to be mistaken for any cause short of the great falls of the Missouri... From the reflection of the sun on the spray or mist is a beautiful rainbow produced which adds not a little to the beauty of this majestically grand scenery (Lewis, Clark and Members of the Corps of Discovery, 2002)." **Cycles – The Movement of Water** is focused on teaching learners about how water is always moving, and how it moves from place to place around the world, making a cycle called the water cycle. Activities teach students to listen carefully to moving water, to hear what it has to tell us, to observe clouds as they move across the sky and to think about how clouds produce rain.

### C. Materials:

- Butcher paper
- Eyes and ears!

**D. Circle Time:** Read this quote to the children by Black Elk, a holy man of the Oglala Lakota Sioux: *"Everything the Power of the World does is done in a circle. The sky is round, and I have heard that the Earth is round like a ball, and so are the stars. The wind in its greatest powers whirls. Birds make their nests in circles, for theirs is the same religion as ours. The sun comes forth and goes down again in a circle. The moon does the same, and both are round. Even the seasons form a great circle in their changing, and always come back again to where they were. The life of man is a circle from childhood to childhood, and so it is in everything where power moves (Caduto & Bruchac, 1991, p. 5)"* Ask the students, "What did you notice about the story I just told you? What does Black Elk say about the sun? What shape is the sun and the moon? Do you have any questions about what Black Elk said about circles?"

Show the students a diagram of the water cycle. One diagram [[LINK: 4.image.2.water.cycle.poster.pdf](#)] is included in this curriculum (USGS Science for a Changing World, 2013). With a little research, numerous diagrams of the water cycle can be found online. Look at the diagram and lead your students in a discussion about where the water in the local rivers and lakes comes from? Where does rain come from? Where does it go? What about snow – where does snow go when it melts?

**Audio:** Ask your students to say the word for water is in Black Elk's language, Lakota Sioux, which is "Mini" [Mi-nee] [LINK: <http://www.native-languages.org/images/audiolakota032.wav>] (Native Languages of the Americas, 2013)."

**Video:** Watch the following Water Cycle video [LINK: <http://www.youtube.com/watch?v=StPobH5ODTw>] (Arunrattananont, 2010).

**Discovery Journals:** Ask students to draw a water cycle in their journals. Help them begin their drawing by drawing a big circle on the page (you can do this for them if it is helpful). Guide them to include water as it exists on the ground, as it evaporates into the air, clouds at the top of their circle, and rain coming back down to the earth. Let them get as detailed as they would like. For students who may not be able to do this yet, have cut-out pictures of clouds, rain drops, etc. for them to paste onto their water cycle.

**Books to Read:**

- *Follow the Water From Brook to Ocean* [Book 10] (Dorros, 1991).
- *Shingebiss: An Ojibwe Legend* [Book 11] (Van Laan, 1997).
- *The Snowflake : A Water Cycle Story* [Book 12] (Waldman, 2003).
- *Story of the Seasons* [Book 13] (Warm Springs Reservation Committee, 1978).



**E. Activities:**

**Inside Activity: Communication With Water**

"'Wauna' is the Indian name for the Columbia River. Wauna is a beautiful word. It means 'the River.' The Indians all love to listen to the music of the crashing river as it goes tumbling down over the big rocks at Celilo Falls. And they love to listen to the echoes as they come singing back from the high cliffs on either side. These Indians are the Wy-ams. "Wy-am" means the echo of the water against the rocks at the Falls. These Indians are called Fish Indians. That is because they make their living here fishing for salmon. They build these platforms out over the water. They tie themselves onto the platforms. Then they hold their dip nets down in the water and wait for the big, silver salmon to swim into them (McKeown, 1956).

What can moving water communicate to us? This activity engages learners in listening closely to water and thinking about how moving water can communicate with us. Encourage learners to explore different water sounds in the classroom (sinks, toilets, fish tank, sprinklers), to mimic them, to look at pictures of water and think about what it might tell us, and to listen carefully to water sounds and describe what they hear.

1. Ask learners, what does moving water sound like? Ask them to talk like water to each other.
2. Ask them to practice saying the name for 'the river' in the story: "wauna"
3. Next, ask them what they think water is trying to tell us? What can moving water tell us when we listen closely to what it is saying? Is it happy? Is it in a hurry? Is it playing, singing or maybe dancing?

4. Play videos [[LINK: 4.d.videos.communication.with.water](#)], listen to the audio recordings, or show still photos of different types of water. You can also look on YouTube for more examples of water sounds, videos or pictures of waterfalls, rapids in a river, babbling brooks, still ponds/lakes, ocean waves, ice cracking, snow falling, raindrops, lightning and thunder, etc.

**Emerging Learners:** You can provide smaller steps for emerging learners by introducing the videos slowly. First, watch the video together and make observations together about what you see. Next, ask the students to close their eyes and listen. What do they hear? Some children might just say, “water.” Ask them to mimic what they hear. Then ask them, “if this water was telling you to do something, what do you imagine it might be saying?”

**Advanced Learners:** For more advanced learners, you can start to ask them more directed questions about the movement of water. Does the movement of water help us? What if water didn’t move (there were not rivers, no rain, no snow), what would our lives be like? How did moving water traditionally help tribal people? How did it help Lewis and Clark’s journey? Were there ways in which moving water (like the Great Falls) might make travel difficult?

**Helpful Hint:** What children can learn from listening can contribute to their later ability to read and write (Strickland & Riley-Ayers, 2006). Emphasizing good listening by asking children to listen and then sharing what they heard will develop listening comprehension and help them to slow down and think about what they are hearing. Give the children time to watch and listen to the videos, play them a few times if necessary, and then make sure that the other children are listening to the observations that each student made about what the water is communicating to them.



1. First, read the following book to your students: The Cloud Book [Book 13] by Tomie de Paola [Holiday House, 1984]. Ask your students, “Have you ever observed the clouds? What did you see?” Go over the three types of clouds and draw an example of each one onto a large piece of butcher paper. Ask the students to draw or paint examples of these clouds in their Discovery Journals. For examples of these clouds online, go to Wonders in Weather page (Meyerhorn, 2001). [[LINK: http://www.cityofportsmouth.com/school/dondero/msm/weather/cirrus.html](#)]
- Cirrus clouds are feathery white and high in the sky. They are thin, wispy clouds that you can see through.
  - Stratus clouds are the thick, mid-level clouds that coat the sky like a sheet.
  - Cumulus clouds look like cauliflower. They are the puffy fair weather clouds that we see on sunny days.
  - Cumulonimbus clouds have lumps that look like cows’ udders.

2. Take your students outside (preferably on a day with a lot of clouds). Have your students lay on the grass and look at the clouds while you tell them the following story:

#### Cloud People - An American Indian Legend

A little boy stood watching the changes in the sky while his father finished making arrows. "Father, why is it that I see the cloud people's faces in the sky and then they change?" "The cloud people are telling you a story, my son. Shall we watch and figure out the Medicine Story the sky nation is giving you today?" As the two watched, they saw the giant profile of a man, made of clouds, with his lips pursed as if he was whistling or blowing air. Then it changed. An eagle appeared to be gliding on the currents. Later, another change brought the lone figure of an Indian warrior, reaching for an arrow that was flying across the sky. The arrow changed to an eagle feather, and the clouds rolled away (First People – The Legends, 2013).

- Cloud People, An American Indian Legend – Nation Unknown

3. After the story, have the students **observe** the clouds in the sky. Are there any stories in the clouds that they can see or hear? Are the clouds moving? Are the clouds high in the sky or low in the sky? Are some clouds higher than others? Can they see any raindrops coming from any of the clouds? Have the students, one-by-one, describe to the group what they see. Encourage them to use words like *above*, *below*, *beside*, *in front of*, *behind*, and *next to* while they are talking about what they observe. Remind the students that clouds are part of the water cycle and that clouds are made up of evaporated water.
4. **Audio:** Listen to Carol Buswell talk about her ancestors and the Cherokee word for water [[LINK: 4.f.audio. Cherokee Word for Water.mp3](#)].

#### F. **Suggested Formative Assessment:**

Use the following questions as talking points to discuss the water cycle. Use the children's answers and knowledge to gauge what parts of the activities they understood or may need to repeat in the future.

- During the cloud watching activity, ask the children, "Where they think the clouds came from? Where do they think they will go when they leave the sky?"
- Talk again about the states of matter from Learning Episode III: Transformation. Probe the children to see if they can connect the idea that water exists in different states of matter within the water cycle. Ask them questions like, "In the water cycle, what happens when clouds turn into raindrops? What does water look like when it is in a cloud? What does it look like when it is in a raindrop?" Give them an example if you need to.
- Ask the children to recall what they think water can communicate to them. Ask them to create the sounds that water can make, and what those sounds mean to them.

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## V. RECIPROCITY – HAPPY & HEALTHY WATER

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### A. Learning Objectives:

- Water takes care of us and it is important for us to take care of water
- Experimentation like mixing substances together can sometimes cause a reaction and be fun and exciting.
- Water can have different properties, depending on what else is mixed with it.



**B. Learning Episode Description:** The Lewis and Clark journals on May 8, 1805 tell about a river that is the color of milk. The journals state, "... the water of this river possesses a peculiar whiteness, being about the color of a cup of tea with the a mixture of a tablespoonful of milk." Lewis and Clark named it the Milk River (Lewis, Clark, and Members of the Corps of Discovery, 2002a). In September 1805, the Corps of Discovery reached a different river, which is now called the Clearwater River (Lewis, Clark, and Members of the Corps of Discovery, 2002b). Here, they met the Nez Perce tribe who call the river "Koos-Koos-Kia" because of how clear and transparent the water in this river appeared. The activities in this learning episode focus on the idea that water can have different properties that may or may not be healthy for us, or for other living beings. The main learning objective is that we need to take care of water because water takes care of us by making sure that our water is healthy and clean.

### C. Materials:

- Cabbage juice indicator: Cut up a whole red cabbage (it has to be the red variety) and boil the chunks in a large pot full of water until most of the red color is boiled out of the plant and the water is a bright purple color. Strain the cabbage out of the juice and put the cabbage juice into jars. For more directions, there are various videos online that demonstrate this.
- Small clear beakers or clear Dixie cups. Each child needs one beaker for each solution they are testing.
- Testing solutions: water and foods to make solutions with for pH testing.
- Crayons, markers, colored pencils (a range of colors to match the pH chart colors).
- pH color chart print outs for display and food pH chart print outs for each child to color in.

**D. Circle Time:** Ask the students, "Let's talk about some ways that water helps us in our daily lives (drinking water, gardening, brushing teeth, washing clothes, etc.)?" Now ask the students "How do we know if our water is happy and healthy?" Revisit the discussion about where the water is in the community and refer to the map that your class created. Discuss where the water that you drink comes from. Ask the students if they think the water from the pond or the ditch is happy and healthy, and clean enough for them to drink? What do you think might happen to plants and animals (and to us?) if we drink water that is not clean? Ask students to practice saying some Nez Perce words like the name they called the Clearwater River, "Koos-Koos-Kia," and the Nez Perce word for water, "Kús (Native Languages of the Americas (2013))." Have them repeat these back to you.

## Books to Read:

- *Bull Trout's Gift: A Salish Story About Reciprocity* [Book 15] (Confederated Salish/Kootenai Tribes, 2011).
- *Did a Dinosaur Drink This Water?* [Book 16] (Wells, 2006).



## E. Activities:

### *Inside Activity: Learning About pH*

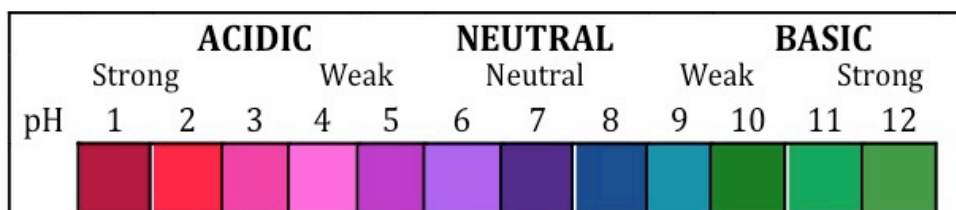
Explain the following to your students: Healthy water has a pH of 7.0. But sometimes, different kinds of chemicals get mixed into lakes and rivers, and can get into the water that we drink. pH levels range from 0 to 14. If the pH of a solution is less than 7.0, the substance is an acid, if it is 7.0 it is neutral (water), and a solution with a pH higher than 7.0 is called a base. Since chemicals such as fertilizer or other pollutions can change the pH of something, testing it will tell us if it is healthy and happy water. You can read more about water pH here at the U.S. Geological Survey (2013). This activity will familiarize learners with the idea that water can be just a little bit different, depending on what chemicals (and how many hydrogen molecules) are in it. This activity will familiarize students with the idea of testing water quality with a fun experiment that allows them to mix different colored solutions.

By using red cabbage juice as a pH indicator, students will test different foods, to begin to learn about the different pH of the foods that we eat. Red cabbage juice contains a mixture of colored substances that change from deep red at low pH to light blue at intermediate pH to yellow at high pH. Once students begin to understand that sugar, soda, juice, and even water from different locations can have different properties, this unit will help students to explore the idea that different things can change the pH of our water including pollution, animal excrement, pesticides, or even different kinds of soils being mixed into rivers or lakes.

1. Mix solutions of various foods from the list below. Mixing the food with water to make a liquid makes a solution. Sometimes you need to squeeze or mash the food before mixing it with water.

pH: basic to acidic	Foods that can be used to make solutions.
	more examples here: <a href="#">[LINK: Acid/Alkaline Forming Foods]</a> (Essense-of-Life, 2012)
10	spinach, baking soda, sea salt, watermelon
9	grapes, blueberries, tangerine, melons, olive oil, soy sauce, carrots
8	apples, tomatoes, pineapple, strawberries, bell pepper, avocado
7	pure water, milk, oils (except olive oil), zucchini, raw honey
6	processed fruit juices, tea, salmon, plums, prunes
5	honey, molasses, canned fruit, black beans
4	sports drinks, blackberries, sweetened fruit juice, tomato sauce
3	soda (coke, sprite, etc.), pickles, wine, black tea, lard
2	white vinegar, nutrasweet, sweet 'n low, jam, jelly,

- Put each solution in a small clear plastic container (film canisters or clear plastic Dixie cups will work). Try to have a solution from each pH category, or at least a good range of basic to acidic examples.
- Place a range of food solutions in front of the students. If you can, give each student his or her own set of solutions. This allows for individual practice mixing chemical solutions. Also have markers or colored pencils that align with colors on the pH color chart like the one below (California State University San Bernardino, 2012). You can download the following chart here: [\[LINK: 5.c.pH.scale.pdf\]](#)



- First, ask students to smell (and taste as long as you are using only solutions that are edible. If there is even ONE solution that is not edible, I recommend that you DO NOT have the students taste any of them).
- Drop or squeeze (using squeeze bottles or eye droppers) the cabbage juice into the cups full of food solution until you see a color change. Model this for the students before they try it on their own.
- Discuss each color change with the children, and look up the pH level/color on the pH chart. Once you agree on a color, ask the students to color in the pH level on their food chart. You can create a food chart like the one below:


**Emerging Learners:** This activity is more advanced than some of the others in this curriculum. Emerging learners may need more assistance for this activity with their fine motor skills in mixing the solutions and deciding which color of pen the solution is the closest to. Though they may not fully comprehend the idea of measuring pH, this activity will still familiarize the students with the idea of experimenting and mixing, and that solutions that might look the same in the beginning have different reactions to the cabbage indicator.

**Advanced Learners:** Ask advanced learners to help the emerging learners with their experimenting and color matching. These students might be able to distinguish between what foods are healthier to eat, and where they fall on the pH scale. Ask the students, “What do you think would happen to the fish in the ocean or in the rivers, if the whole river were made out of soda, or sugar? Would that be healthy for the fish?”

**Helpful Hints:** Please be mindful of the students you are working with, and recognize that some of them might not have some of these foods available to eat in their homes. Try using foods that are not extravagant like lemon juice or tea. Or, have special snacks for them to eat that include some of the foods that you are testing. Also, if there are traditional foods available (e.g. tinpsila, huckleberries, bitterroot, camas, etc.) try

making solutions with them and testing their pH. Talk about the foods that their ancestors ate, and what their pH levels are.



### *Outside Activity: Happy and Healthy Water*

This learning episode will give the children the opportunity to think about how clean the water is in their community. Read the following story:

#### *Why the Columbia River Sparkles (Carter, Green and Taylor, 2003).*

Five stars once came down from the sky and slept beside the river near The Dalles. The next morning, four of them rose into the air and took four sisters back to the sky with them. When the sisters got to the place where the stars lived, they saw that the sky would be just like this one, with grass and flowers. The oldest of the five stars did not go back with the others, because he was still tired from the journey. He remained lying there on the ground by the river, but he changed himself into a white flint rock, very large and thick and round and bright. It shone so brilliantly that it could be seen from a long distance. It became a good luck rock for the Wishram people who lived near it. The star rock brought many salmon up the river, enough for the Wishram to dry for their own use and also to trade with the people who came to the narrows and to the big falls of the river. The place where the rock lay was a great gathering place for many tribes. Everyone knew the star. The Wishram became known as the Star people. Across the river on the south side lived the Wasco people. They did not have a star, but they did have a big cup. Wasco means "those that have a cup." Near their main village was a rock in the shape of a big cup. Into it bubbled a spring of pure, cold water. The Wasco people prized the cup very highly.

The Wasco, who were always quarreling and fighting with their neighbors, became jealous of the good luck the bright star was bringing the Wishram. One night when the Wishram people were away, some of the Wasco people crossed the river and stole the star. They wrapped it in an elk skin and threw it into the river. When the Wishram returned from picking berries, they could not find the star. Months later, when the water of the river was low, some people of the Wishram village saw it shining on the bottom. They got it and put it back on the shore. Always thereafter, someone guarded the star. But three summers later, when the Wishram were again in the Mount Adams country picking berries, Wasco men found the guard asleep one day and stole the star once more. This time they broke it into pieces and threw it into the river. When the Wishram came back to the winter village, the star rock was gone. Angrily they crossed the river and made war on the Wasco. Some of the young men pounded the big cup until they almost destroyed it. It had been very large and deep. It is now very small. After the star was stolen and broken, the Wishram lost the name Star people and became very common people. But the broken star rock is still in the river. That is why the water sparkles in the sunshine.

1. Plan a field trip with the children in order to collect samples of water from ponds, lakes, rivers, and streams or even from a mud puddle or a swimming pool.
2. Have the children take part in this experiment by looking at the community map (from Learning Episode 1) with them and **identifying** locations to collect the samples from.
3. Go to a location with water and help them collect some **data** water samples in jars. Be sure to label all of them.
4. Bring the water samples back to your classroom, place small amounts of the sample in clear containers and test them with cabbage juice. Arrange them in order. Ask students to use the colored markers and record what their **conclusions** in their **discovery journals**.
5. **Audio:** Listen to this recording of Dr. Shane Doyle, talking about how important water is to the Absaalooke Tribe [[LINK: 5.e.audio.1.Absaalooke Water.mp3](#)]. Talk what it means to take care of water in your community. What does this mean?
6. Have a discussion about how healthy the water is in your community. Remind them that the water in your community comes from other places, and that eventually it will travel away from your community and into other places in the world. Talk about the plants and animals that live in this water, and about how when water becomes more acidic, fish have trouble reproducing (having babies). When it becomes even more acidic, fish can die. Do we notice different kinds of plants and animals that live in water that has different pH levels? How do you think the pH level of water might change the health of plants and animals? How does pH of water effect what lives in the water?

**F. Suggested Formative Assessment:** During snack time or at other times throughout the day, ask the students questions about the pH activity that you did together. Ask them why one solution turned bright pink, and the other solution turned green? They won't be able to articulate very complex reasoning about this. However, at this point in their learning the students should begin to understand that solutions or foods are made up of different substances. Some of these substances are healthy for us and for the world, and some of them are not so healthy.

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## VI. RELATIONSHIPS - PLANTS, ANIMALS & WATER

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### A. Learning Objectives:

- Water is something that we need, and plants and animals need for our survival.
- Our relationship with water is sacred, and plants and animals also have a sacred relationship with water.



**B. Learning Episode Description:** Lewis and Clark wrote about many plants and animals on their journey. On May 30, 1806, Clark wrote about the reptiles he observed in the area. *"The reptiles which I have observed are... the common black lizard, the horned lizard, a small green tree frog, the small frog which is common to our country which sings in the spring of the year, a large species of frog which resorts the water considerably larger than our bull frog, it's shape seems to be a medium between the delicate and lengthy form of our bull frog and that of our land frog or toad as they are sometimes called. Like the latter their bodies are covered with little bumps or lumps, elevated above the ordinary surface of the body; I never heard them make any sound or noise* (Lewis, Clark, and Members of the Corps of Discovery, 1806)." This learning episode gives children the chance to think about the relationship that both plants and animals have with water. The inside activity will give the children the opportunity to visualize a celery stalk absorbing water. This is something that plants do every day and without this process, they would not survive. The outdoor activity will provide the students with experience thinking about animal habitats, and the relationship that animals have with water.

### B. Materials:

- 3-4 glass jars or glasses
- celery stalks
- food coloring
- plastic knife (if children are doing the cutting)
- paper towels
- camera or cell phone to take pictures.

**C. Circle Time:** We have been learning that different Native American tribes speak different languages, and by now we know quite a few Native words for water. A long time ago, when different Native American tribes would meet together, they sometimes spoke different languages and had to communicate with hand gestures or symbols in order to understand one another. Use the attached worksheet [[LINK: 6.b.download.1.symbols.signs.pdf](#)] to teach the students some Native American sign language and symbols that are related to water. Try the sign language gestures with the students. Ask them to come up with their own sign language for words that are related to water. "What gesture would you use to communicate to your friend that you are going fishing, if you could not use your words? What if you wanted to talk about a frog? A cloud? Snow? A rainbow?"

#### D. Books to Read:

- *Native American Sign Language* [Book 17] (Olsen, 1998).
- *The Rainbow Fish* [Book 18] (Pfister, 1999).
- *One Fish, Two Fish* (2007) *Lakota One Fish, Two Fish* in Dakota Lakota Sioux



#### E. Activities:

##### *Inside Activity: How Plants Absorb Water*

**Research Question:** How do plants absorb water?

This activity allows students to discover that plants absorb water by a process called osmosis (Teaching Tiny Tots, 2013). The concept of osmosis may be too complex to fully understand by this age group. However, this experiment demonstrates the idea that plants do absorb water up into their stems and into their leaves. It is best to start this activity early in the week, so that you can observe and record data throughout the week with the learners.

1. Ask the students what plants need in order to grow? Tell the students that they are going to do an **experiment** that will help them to **identify** water inside of plants. Tell them that they will **explore** the relationship between water and a plant called celery.
2. Give student bunches of celery and ask them to separate out stalks of celery with leaves still on them (lighter stalks will show the water absorption more vibrantly).
3. Measure out 8 oz. of water to put into each glass container (teachers can demonstrate this for students or ask a student to help with this step. Draw a line at the water level on the container with a permanent marker. Have one empty glass container, with no water.
4. Have students help put food coloring into each container with water (10-12 drops each). The color blue shows the water absorption most vibrantly.
5. Place a celery stalk in each container with water, AND in the container without water.
6. Ask children, “What do your **predict** will happen?” Write two or three predictions down. Point to the words and read them out loud with your students.
7. Take a picture of your experiment to record **data** on day #1, day #2, day #3, etc. of your experiment.
8. Observe the experiment each day with your children. Look at the photographs from previous days and discuss similarities and differences that they **observe**. Don’t forget to compare the celery stalks that are in the water with the celery stalk that does not have any water.
9. On the last day of the experiment, ask the students the research question: Do plants absorb water? How do they know? What did they **predict** in the beginning? What is the **conclusion** they have come to? What **data** can they use as **evidence** to make a **conclusion**?
10. Ask your learners, “what color is healthy water?” And remind them that it is difficult to **observe** plants absorbing water out in nature, since water does not normally have a color.

**Emerging Learners:** Younger or emerging learners will need more support while doing this experiment. Start by making sure that they know what the word absorb means. Ask them, “what do you think the word absorb means?” Tell them that absorb means to soak up, like a sponge. Give them a bowl of water and a sponge, and tell them to absorb the water with the sponge. Then discuss what it means that the celery is absorbing the water. Explain that this is how plants drink water!

**Progressive Learners:** Learners who are a bit more cognitively advanced can vary the experiment and test to see how much water a celery stalk is able to absorb. Have them set up the experiment so that there are multiple celery stalks (make sure that they take care to make them the same size). Measure the amount of water that is put into each container, in order to test how much water the celery can absorb in 1 day, 2 days, etc.

**Helpful Hint:** Since this activity takes a few days to get results, it would be helpful have a few celery stalks that have been absorbing colored water for a few days, so that you can observe and discuss them. You can also try different colors of water so that the students can compare. Carnation flowers also work for this activity. After the learners have completed the science activity with the celery or the flowers, take pictures with the camera, print and laminate them so the children can make a sequencing board that you can use to retell the activity.



### *Outside Activity: Frogs and Water*

1. Listen to Richard Basch talk about frogs and what they mean to the Chinook culture. He also teaches us the Chinook word for frog [[LINK: 6.e.audio.1.Chinook Frog Story.mp3](#)]. Ask the students to repeat the word for frog. What other sounds can they think of that they have heard frogs make?
2. Next, talk about where frogs live. Where are the many places where a frog might live? Ask the children to think about all of the places where a frog might live. If they need some help, show them some pictures of forests, riverbeds, or lake ecosystems. Give them some prompts such as, in a pond, swamp, deserts, gardens, rain forests, etc.? What is the environment like in these places? Is it dry? Is it wet? Is it hot? Or cold?
3. Teach The Speckled Frog Song (Five Speckled Frogs, 2014).

Five Green and Speckled Frogs

Sat on a Speckled (or bumpy) Log

Eating some most delicious bugs

YUM! YUM!

One jumped into the pool

Where it was nice and cool

Now there are four green speckled frogs

Gulp, Gulp

Continue to repeat until you sing, Now there are no green speckled frogs.

4. Next, watch the following two videos:

**Video:** Water skippers on top of a stream [[LINK: 6.video.1.water.skippers.mov](#)]

**Video:** Salmon swimming through the water to get back to their homes [[LINK: 6.video.2.salmon.mov](#)]

5. After watching the videos, think about where animals live, and where animals get water? Where do bears get their water? How do raccoons get water to drink? Where do we get our water?
6. Take a trip to a local water source. If it is possible, take the children to a place along the Lewis and Clark Trail that is also conveniently located near a water source. It can be a river, lake, pond, ocean, etc. Look for animals that live in or near the water. If possible, take large containers with lids along with you, so that you can collect water, plants along the water's edge, or other specimens. Remember that after you capture them and spend some time looking at them, it is best to let them go back to their natural homes.

#### **F. Suggested Formative Assessment:**

- Pay attention to how much students are enjoying their tasks - are they laughing? Are they smiling? Are they engaging with one another?
- While doing the celery experiment, state the directions first and then assess their listening skills by asking them, "What is the next step? What do I do next to set up our experiment?"
- During circle time, ask students if they can remember the words for water that they have learned over the past few weeks.

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