GASP! At Home

Week 3: Water

Hello all!

While our Girls Advancing Scientific Progress (GASP!) program is, the Environmental Learning Center would still like to provide families with environmentally themed activities that they can do at home! Below are a variety of activities ranging from quick, 10-minute activities to more in-depth, 45-minute activities that all explore the topic of **water and why it is important**!

At the Environmental Learning Center, our mission is to connect people to nature. We want to encourage families to get outside, here's some tips to do it safely:
Please visit this website for the most up to date information on COVID-19 (coronavirus) in Larimer County. Larimer County is currently under a stay at home order; read more about the stay at home order here. This order currently allows outdoor recreation, as long as physical distance guidelines are adhered to.

- When you go outside, always **maintain at least 6 feet of physical distance** with people who do not live in your household.

- New guidance has come out about the use of facemasks, click the link to see the guidance from Larimer County: https://www.larimer.org/health/communicable-disease/coronavirus-covid-19/fabric-face-coverings
- **Be mindful of signs** posted in outdoor areas you visit. In most parks the playgrounds, picnic areas and bathrooms are closed.
- **Stay home** if you or your child feel sick.

Please practice everyday actions to prevent the spread of disease:

- **Frequently and thoroughly wash your hands** with soap and water for at least 20 seconds, especially after coming in from outside.
- If soap and water are not available, **use hand sanitizer** with at least 60% alcohol.
- **Avoid touching your eyes, nose, and mouth** with unwashed hands.

Scientist of the Week!

Ever wondered what the bottom of the ocean looks like? You can ask Sylvia Earle all about it. She's an oceanographer that studies one of the deepest darkest places in the world; the ocean! Watch this video to learn more about the ocean and how Sylvia chooses to discover it:

https://www.youtube.com/watch?v=KM-bEVFw8fQ

Watch this video to see actual footage of the sea floor and the wonderful wildlife that lives there as scientists take a submersible to explore an area Sylvia Earle explored 40 years ago:

https://www.youtube.com/watch?v=IlDt9gz2x8c

Pre-discussion questions for all activities:

- **Watch this video of animals crossing a river and pick one animal to discuss the following questions:** https://www.youtube.com/watch?v=DhYT2iQO_r4
- How does your animal use the river?
- Would your animal live in the river?
- Did the river change at all during the video? Was it ever higher or lower?
- How would trash or chemicals in the river affect your animal? Would it hurt your animal if they accidentally ate it?

Activity 1: What's the point of Water?

Time: 10 minutes

Materials:

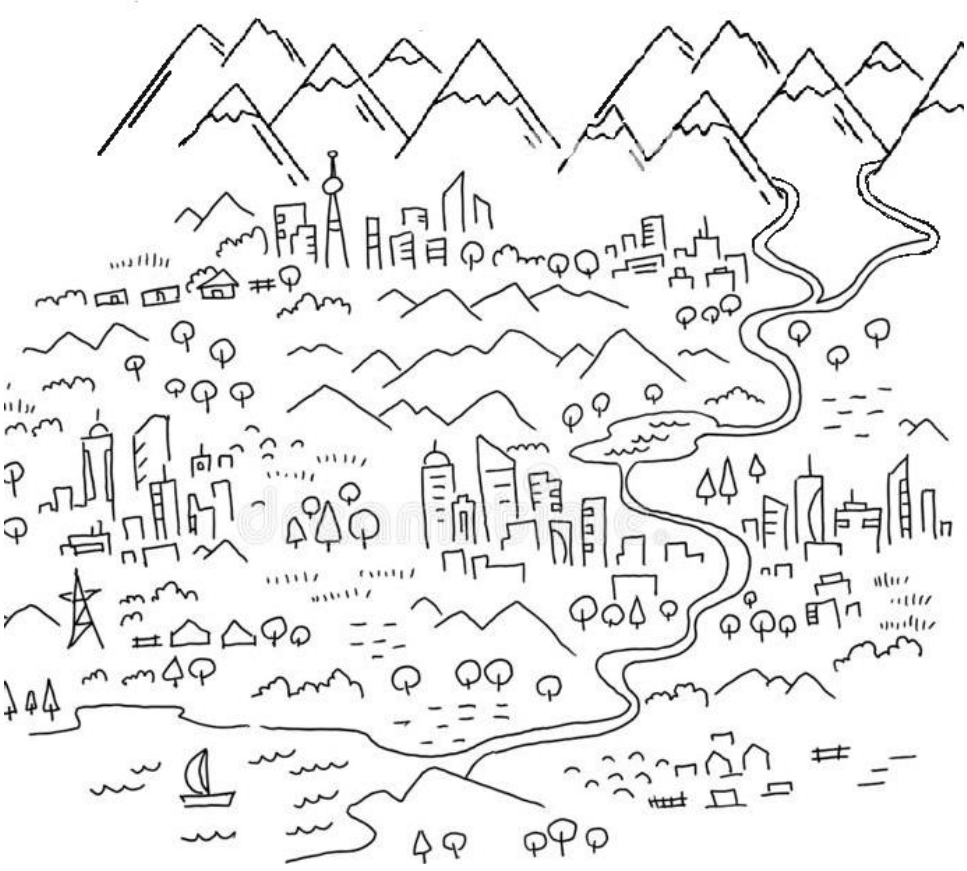
- paper and pen

Objectives:

- Draw a map of a river system.
- Model locations that create pollutants.

Mapping Rivers:

1. **Draw your own map** with a river running through it! Be sure to include mountains (where rivers come from in Fort Collins), a city and natural areas. If you don't want to draw a map, use the drawing below for this activity.



2. **With one color, draw arrows** that show the direction that the river is flowing.
3. **With another color, draw arrows** where pollutants might get into the river.
    a. What is a **pollutant**?
        i. A chemical or object that gets into a place where it doesn't belong and has a negative effect on that place.
            1. Examples of pollutants include plastic, trash, and chemicals.
4. **With another color, circle** where animals might feel most comfortable living along the river.
5. Now **discuss**:
    a. What kinds of pollutants would get into your river?
        ii. From a factory, chemicals and trash might pollute the river
        iii. From a city, trash might pollute the river
        iv. From a farm, chemicals from fertilizers might pollute the river
    b. Why is it important to have healthy rivers?
        i. Healthy rivers provide habitat and water for animals
        ii. Healthy rivers provide clean water for people to clean and use as water to drink or for growing food
        iii. Healthy rivers keep the plants around them healthy which provide habitats and homes for wildlife

Activity 2: Pollution Clean Up

Time: 25 minutes

Materials:

- container to hold water
- plastic, or paper
- oil (vegetable, olive, coconut)
- spoon

Objectives:

- Model pollutants in a body water.
- Observe how pollutants can react with water.

Introduction:

How are rivers formed?

- Most rivers in the U.S. start in the mountains. The place where rivers start is a headwater. Colorado is a headwater state because it's the place where rivers that run through the Western US start.
- Rivers form from snowmelt in the mountains. During the winter, snow becomes packed on the mountains and it melts in the spring and flows down the mountain into the rivers. That's why rivers are usually lower in the winter and higher in the summer!
- As people built towns and cities around rivers, they began to use the water but also pollute it.

Clean Some Water:

1. Using a large container at home, **fill it halfway with water.**
2. Then **add some pollutants** you find around your house (plastic, trash, paper) and add some oil (cooking, olive, coconut, etc.).
3. Now, **make observations** about how the pollutants react in the water.
    a. Did some sink? Did some float? Did any change the color of the water?
    b. Remember to use your **senses** when making observations (sight, smell, sound, touch).
4. Then, using a spoon and your hands, **remove the pollutants** from the water.
5. Which ones were easy to remove? Which ones were hard?
6. **Discuss**:
    a. **How would these pollutants get into the river in nature?**
    b. **How would some of these pollutants hurt animals or plants in the river?**
    c. **How could we prevent these pollutants from getting into rivers?**

Activity 3: Oil Clean Up and Water Testing

Time: 45 minutes

Materials:

- tap water
- water from a stream, river or puddle
- 2 cups
- piece of paper or field journal
- pen
- pan or flat baking dish
- vegetable oil
- soap
- large stone

Objectives:

-Conduct an experiment that demonstrates an oil spill
- Write observations that compare and contrast filtered water and water from the outdoors.

Water Watchers:

1. **Fill a cup with water** from your sink or fridge. Then, go outside and find water from either a stream, river or puddle and put it in a different cup. **Adult supervision near rivers or streams required!**
2. **Take a look** at each of the cups of water. Do you notice any differences?
    a. Is one clearer than the other?
    b. Are there little specks floating in either of them?
    c. Does one smell different?
    d. Are either of them colored?
3. **Write your observations** in your field journal.
    a. Remember to use your sense to make observations (sight, smell, sound, touch).
    b. **DO NOT DRINK WATER FROM OUTSIDE**
4. Now, **test your siblings or parents**! Remember which one is which and have them try and guess which is tap water and which one is water from outside.
5. **Discuss:**
    a. **Why are the two waters different? Why shouldn't you drink water from a river or stream?**
        i. The tap water goes through a special treatment before you drink it to clean it and get rid of bacteria and germs that might make you sick.

b. **Does the river water seem "clean" to you? How do we know if river water is "clean" or safe for wildlife to live in?**
    i. Scientists use **chemical strips** and **water testing kits** to test the water and find information about the chemicals in the water. Based on the results, or answers, from the kits, scientists can determine if the water is safe for wildlife or humans to use.
    ii. Water that is not clean or safe may have a lot of trash in it or it may be very dark and hard to see through. Remember, even if river water looks clear, it's never ok for humans to drink it. We can't see the bacteria that make us sick.

Clean up an Oil Spill:

1. **Take out pan** or flat baking dish, put an stone in the middle of the pan, this will be our land mass.
2. Then **add enough water to fill it half full**, but have the stone still be above water.
3. **Place a small amount of oil into the pan**.
    a. Observe what happens!
        i. Does it move towards the land?
4. **Place a feather or a piece of grass** or anything else found in nature in the pan. Leave the object in the pan for at least 30 seconds, then take it out and observe.
    a. What impact does the oil have on the feather or nature object when you pull it out?
    b. Does the oil stick to that object?
    c. How would this affect this object or an animal if it was exposed to oil in the wild?
5. **Using a spoon** try and remove the oil into a cup, without removing a lot of water.
    a. How much oil were you able to get into your cup?
    b. Was this easy?
6. Now try and **use a piece of fabric or dishcloth** to absorb the oil.
    a. How well did this work to absorb the oil?
7. **Put 2 drops of soap** into your tray, notice what happens to the oil.
    a. The soap is acting as a dispersant, what does this do to the oil?
8. **Discuss:**
    a. **Were any of these very effective?**
    b. **If you were to clean up an oil spill in the ocean which would you most likely use?**