WATER LITERACY 101:

Water literacy videos for home-based education during the COVID 19 pandemic

Objectives:

1. Give kids and parents simple and fun ideas for ways they can experiment with water and soils using readily available materials at home
2. Introduce some of the most basic concepts of water literacy (many of which lead to advanced research when applied to real-life!)
3. Connect and celebrate our growing community of teachers, practitioners, staff, board members and partner organizations

Watch a sample video.
This was an experimental pass, and we're going to re-make it :)

Sample Script:

1. Hi! I am ___name___ and I'm ___job/ position___.
   Example:
   Hi! I'm Claire, and I'm the executive director of Ripple Effect.

2. I'm going to show you how to do a simple, at home demonstration/ experiment that answers the question, ___insert Topic or Driving Question___.
   Example:
   I'm going to show you how sediment, or tiny particles of rock, behave when they are mixed with water. -- or-- I am wondering, "Is there any air inside soil?"
   - *Feel free to turn the statement listed on the cards into a question, instead.*

3. You can do this at home with easy-to-find materials. All you need is ___ and ___. [Feel free to show kids when different materials will work instead of exactly what's on the card.]
   Example:
   You don't need any special materials for this experiment. All you need is a jar, or any see-through plastic container with a lid, some dirt, and water! You don't even need an adult.

4. Give basic directions, roughly following the card.
   Make it snappy and "show, don't tell", as much as possible. If you want to, you can make a prediction about what might happen, or you can ask the viewer, "What do you think might happen when we [start the experiment]?"

5. Do the experiment or demo and record what happens, or "cut" and make a second reveal-video.
   Make sure the camera is close enough to see what you see, or narrate a bit, as needed. If you don't want to give away the ending, consider stopping the video at this point, encourage kids to make a prediction and try it themselves at home, then make a second, short video that shows the results. We can post the second video another day.

6. Sum up the learning in 1-2 sentences.

   Example: "This experiment shows us that, although water can carry sediment, those tiny pieces of rock eventually settle and fall to the bottom, with the heaviest pieces falling first, like sand. This is important because this is exactly how the Mississippi River carries soil, but once the river slows down closer to the Gulf, the sediment starts to settle out. Cool, huh?"

How to send/ share:

1. Upload the video to Google Drive or Dropbox, then send a download link to Claire * (claireanderson@rippleeffectnola.com)
2. When your video is posted, definitely feel free to share widely with parents, teachers, or students in your network.

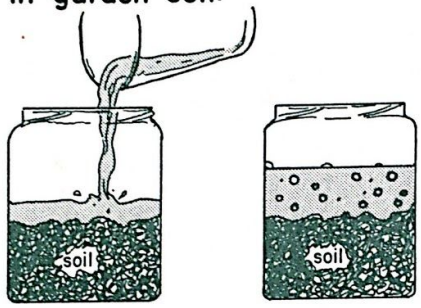
*If you represent an organization that wants to post your video to your own social media feeds, make sure your settings allow for re-posting so that Ripple Effect can re-post your video to our network, as well. Please use #waterliteracy101 as one of your hashtags and @rippleeffectnola on Instagram, or @CAndersonRipple if on Twitter.

On-camera notes

1. Don't forget to smile :)
2. It's a-ok to get creative with your video, as long as it stays under 1-2 minutes
3. If you want to do a video with your child, but don't want their pic shown on social media, just focus on their hands, instead. Kids could also narrate, while you are shown on camera.

SUGGESTED TOPICS AND INSTRUCTIONS ON FOLLOWING PAGE

SUGGESTED TOPICS & DIRECTIONS

Topic/ Driving Question	Notes/ Person
Demo subsidence with a sponge	Waggonner & Ball
Is there air in garden soil? Exploring Our Environment AIR Task 9 There is a small amount of air in garden soil. MATERIALS Jar or glass Loosely packed garden soil Water  1. Fill the jar about ½ full of the loosely packed soil, and pour in enough water to cover the soil by about 1½ to 2 inches. 2. Notice that the pressure of the water on the soil causes the air in the soil to form bubbles. These bubbles float up through the water. *NOTE:* Worms and other small creatures breathe the air that is in the soil. The air in the soil also helps keep it fresh, and helps some plants grow better. Sometimes we see bubbles like these floating up near the edge of a stream, lake, or pond.	- Could be combined with drawing your observation - A different question might be: I know living things need air, and I know worms live in soil. So how do worms and other organisms breathe underground? Is there any air in soil?

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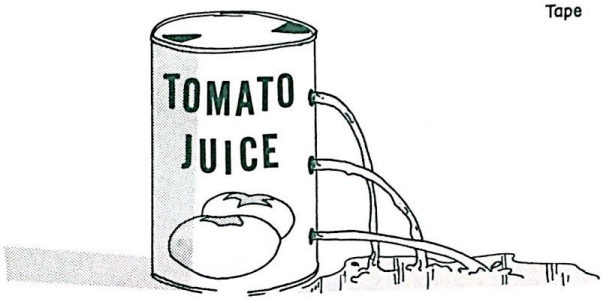
Exploring Our Environment

WATER

Task 101

Water has more pressure at greater depths.

MATERIALS
Tall juice or coffee can
Water
Hammer and nail
Tape



1. Punch three holes in the side of the can with a nail and a hammer. Put the holes where they are shown above.
2. Cover the holes with tape or plugs, and fill the can with water.
3. Uncover all the holes at the same time, and notice that the water squirts out the farthest from the bottom hole. This is because of the amount of pressure or weight of the water above the bottom hole.

NOTE: If a car has an accident and drives into a lake or river, the water pressure can be so great that the people inside can not open the doors. If this occurs the people inside must slowly roll down the windows to let the water in, and swim out through the open windows.

At great depths in the ocean the pressure is powerful enough to crush a submarine.

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- Since this requires a hammer and nails, the video may need to show that an adult helper is required for younger kids.
- This would be a perfect one for a parent + child video
- Suggest adding a definition for water pressure, such as “Water pressure is the force that makes the flow of water strong or weak.”
- Question could also be, “What is water pressure?” or “Can water pressure be different at varying depths?”

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<td>What happens when sediment is mixed with water, like in the Mississippi?</td>
<td>Claire’s sample video

- When water stops moving, sediment settles, with the heaviest particles settling first. The finer particles take longer to settle, but they eventually do
- Be sure to show what dirt types to scoop.

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<td>How much water do different soil types hold?</td>
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- Instead of milk cartons, you could use plastic water bottles, toilet paper tubes, or any other

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Exploring Our Environment

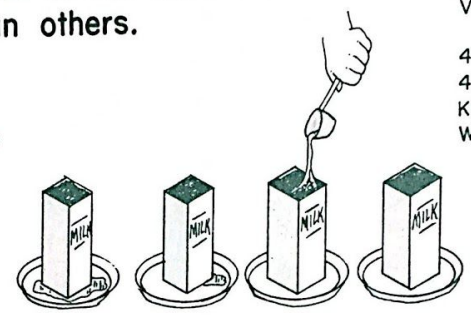
ROCKS, SOIL, MINERALS & FOSSILS

Task 71

Some kinds of soil hold more water than others.

- Rocks
- ⇨ Soil
- Minerals
- Fossils

MATERIALS
Various samples of soil
4 1 qt. milk cartons
4 pie tins
Knife
Water



1. Carefully cut the tops off of four milk cartons, and fill each one with a different sample of soil from the school or neighborhood (sandy, rich, clay base, etc.)
2. Turn each of the soil filled milk cartons upside-down onto a pie tin. Now carefully cut the bottom off of each carton.
3. Slowly pour measured amounts of water (about ¼ cup at a time) into each soil sample. Be sure each carton gets the same amount of water.
4. Notice which one of the soil samples holds the most water by observing how much water runs through each into its pie tin.

NOTE: When planting flowers, vegetables, or crops it often pays to add peat moss, humus, etc., to the soil to help it hold water. Soil that holds moisture well requires less water since the water does not run through or off. The seeds and plants also grow better because the roots stay damp and keep growing steadily.

container that you have multiple of
- Use the same type of container for all soil types you include
- Can be fewer than 4 types

Exploring Our Environment

ROCKS, SOIL,
MINERALS & FOSSILS

Task 70

Look at various types of soil.

Rocks
⇨**Soil**
Minerals
Fossils

MATERIALS

Various samples of soil in pans, jars, or milk cartons
Magnifying glass

1. Collect samples of soil in jars or other containers from various locations in backyards, school, or the neighborhood.
2. Try to get samples of: clay soil, loam soil, sandy soil, rich soil of decayed matter or *humus*, etc.
3. Examine small amounts of each type of soil with a magnifying glass, and observe some of the differences.
4. Notice that all soil is not the same. Different areas of a yard, neighborhood, community, and nation have different kinds of soil.

NOTE: All dirt or soil is not the same, just as all houses, buildings, automobiles, and people are not the same. Some soil is much harder than others. Other differences include coloring, texture, chemical content, acidity, alkalinity, content of organic matter, and many other observable differences.

- This one may only work in combo with a drawing activity.
- Could just be 2-3 samples of different soils.
- May be perfect for Cyndhia!

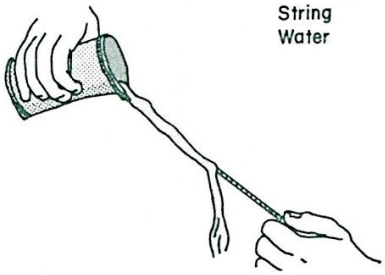
Exploring Our Environment

WATER

Task 105

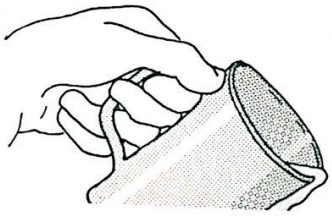
Surface tension can cause water to act strangely.

MATERIALS
Tin can
String
Water



1. Bend the open end of the can so that one side has a spout or point from which to pour, and tie a piece of string around the top with one end hanging from the spout.
2. Put about 1½" of water into the can, stretch the string out at a downward angle, and slowly pour the water.
3. Notice that the water's surface tension (the tendency of the molecules of water to stick together) causes it to flow along the string instead of falling straight down.

NOTE: The surface tension (sticking together of molecules) of liquids often causes them to run and drip down the side of a can, glass, or even a pitcher when pouring.

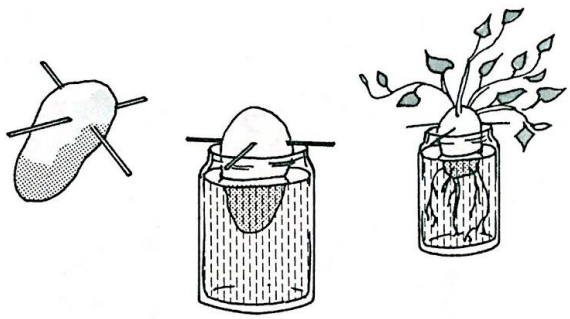


A little oil, butter, or lard rubbed onto the lip of the container will break the tension, and the liquid will pour out properly.

Exploring Our Environment
SEEDS, LEAVES & PLANTS

Task 83

Grow a plant in the classroom.



MATERIALS

Potato
Jar
Toothpicks
Water

1. Insert three or four toothpicks into the potato, leaving the ends protruding to support it on the lip of the jar as shown.
2. Put enough water in the jar to cover the bottom portion of the potato.
3. Place the jar and potato in a place where it can grow for the next few weeks. Be sure to keep enough water in the jar.
4. Notice that the potato sprouts roots under the water, and that stems and leaves grow out of the top portion of the potato. Closer examination of the roots and leaves will lead to many interesting discoveries.

NOTE: There are many different ways in which plants propagate (reproduce) themselves. Seeds, bulbs, tuberous roots, cuttings, and spreading plants or runners like ivy which reroot themselves as they spread out. We should be aware that seeds are not the only way to grow plants.

- Perfect to simply show kids how to set up their own at home.
- Can do update videos later, if it starts to sprout
- What else could kids try to grow at home?

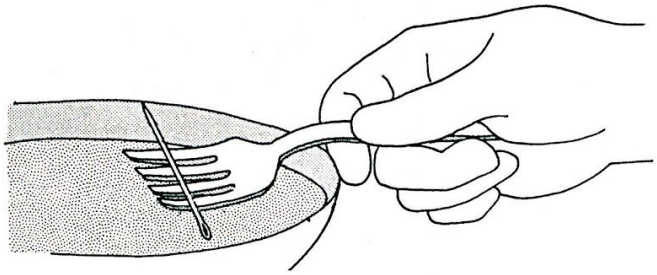
Exploring Our Environment

WATER

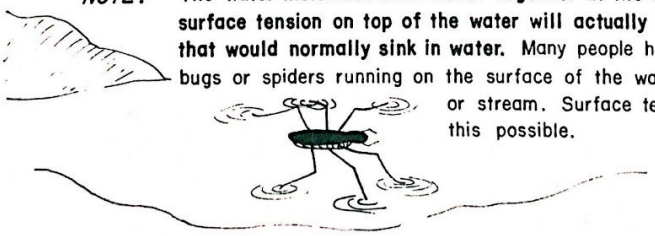
Task 104

Water and other liquids have a thin film (surface tension) which covers their surfaces.

MATERIALS
Container of water
Several needles
Fork



1. Fill a container with water.
2. Drop one needle into the water to demonstrate that needles sink in water.
3. Carefully lower a thoroughly dry needle on the tines of a fork onto the surface of the water.
4. Notice that the surface film (surface tension) seems to bend under the weight of the needle.



NOTE: **The water molecules hold closer together at the surface. This surface tension on top of the water will actually hold things up that would normally sink in water.** Many people have seen little bugs or spiders running on the surface of the water in a pond or stream. Surface tension makes this possible.

Exploring Our Environment

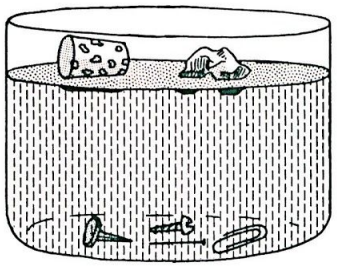
WATER

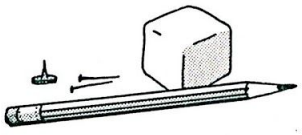
Task 97

Some things float better than others.

MATERIALS

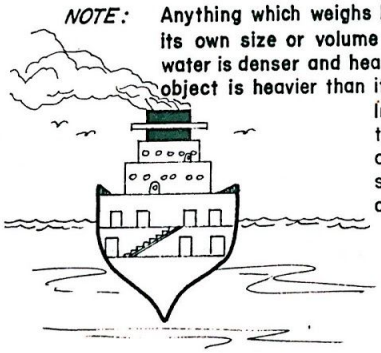
Container of water
Miscellaneous items:
paper clip, pencil, cork, tack, cloth, eraser, pin, etc.





1. Fill the container about ¾ full of water.
2. Try floating the various objects in the water.
3. Notice that some objects (wood, paper, cloth) float, while others (paper clip, tack, pin) sink. You may notice that some of the objects which float actually float higher in the water than others.

NOTE: **Anything which weighs less than an amount of water equal to its own size or volume will float on water. This is because the water is denser and heavier than the object floating in it. If an object is heavier than its equal volume of water it will sink.**



Iron and steel alone sink in water because they are heavier than their equal volumes of water. When we build an iron or steel ship with a large hull it weighs less than an equal volume of water, so it floats.

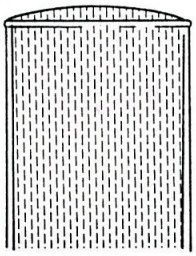
- If a teacher does this, would be helpful to show students how to record their own data by making their own table.
- "Next level" on this is doing one with salt water, one with fresh water.

Exploring Our Environment
WATER

Task 103

You can fill a glass with water or other liquids above the top of the glass.

MATERIALS
Glass or jar
Water
Pins



1. Slowly fill the glass with water.
2. Continue to slowly and carefully add water to the glass until it fills the glass to the top and bulges above the rim.
3. Begin dropping straight pins one by one into the glass until it overflows. (It takes dozens of pins.)
4. Notice that the surface tension of the water (molecules attracting each other and sticking together) makes it possible to fill the glass above the top.

NOTE: Even today we do not fully understand surface tension. Drops of the same liquid seem to attract each other when very close together, but lose this attraction when they begin to get slightly apart. This same attraction seems to have something to do with water traveling up a plant stem (capillary action).

Show how plant roots hold soil in place when water runs over them.

https://www.almadinah-school.com/apps/video/watch.jsp?v=93146

See this video, above. Could also be simplified with:

- Smaller plastic bottles
- Just two bottles
- Use an existing potted plant and another pot of just soil of the same size, run water through both
- See how much soil runs through the base of each pot.

Exploring Our Environment

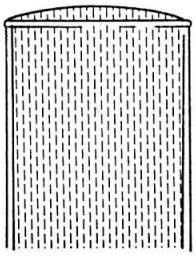
WATER

Task 103

You can fill a glass with water or other liquids above the top of the glass.

MATERIALS

Glass or jar
Water
Pins



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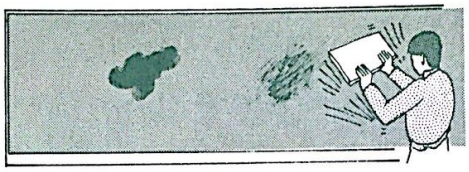
Exploring Our Environment
WATER

Task 107

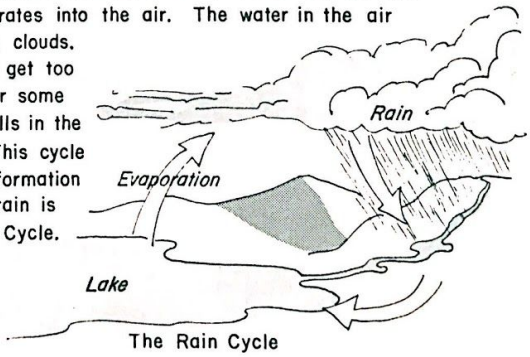
Water evaporates into the air.

MATERIALS
Chalkboard
Water
Paper towel
Book or magazine



1. Wet a paper towel or cloth in water and dampen two spots on the chalkboard about 4 or 5 feet apart.
2. Use a book or magazine to fan one of the damp spots.
3. Notice that the water evaporates (dries) off of the chalkboard into the air. The spot that is fanned should evaporate first since more air is moving near and over it.

NOTE: Water in rivers, streams, lakes, oceans, and on streets and sidewalks evaporates into the air. The water in the air collects to form clouds. When the clouds get too heavy with water some of the water falls in the form of rain. This cycle of evaporation, formation of clouds, and rain is called the Rain Cycle.



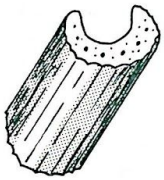
The Rain Cycle

- This one's going old-school with the chalkboard! Could also work with a concrete wall if you don't have a chalkboard at home.
- Water cycle connection at the bottom of the card could be a good place to begin the video.
- Alternate is to set a cup of water out and each day, mark how much water has evaporated.

Exploring Our Environment
SEEDS, LEAVES & PLANTS

Task 80

A plant draws water from the ground up through the stem to the leaves and flowers.



MATERIALS

Celery stalk
Red ink
Drinking glass
Water

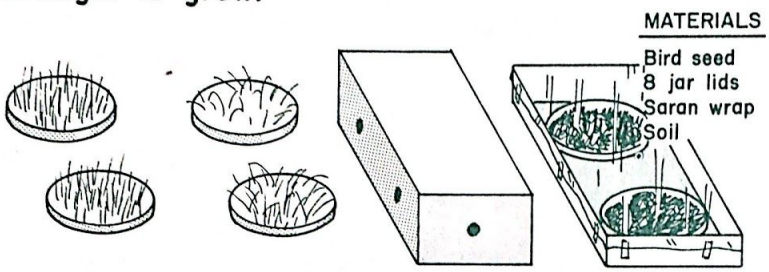
1. Mix some red ink into about half a glass of water.
2. Cut off a piece of celery and put it into the glass of colored water.
3. Notice that after several hours or by the next day the celery has drawn the red water up the stalk, and it has become red. This is called *capillary action*. Cut the stalk into several pieces and observe the tubes or canals which carry water.

NOTE: In many parts of the country it does not rain often enough to keep the leaves and flowers healthy and strong. The leaves of plants and even tall trees also get water from the ground through a drawing up effect (capillary action). Why and how this works is one of nature's marvels.

- Requires follow-up video after a couple of days to see the result.
- Capillary action!!

Exploring Our Environment
SEEDS, LEAVES & PLANTS — Task 79

Seeds and plants need air, water, and sunlight to grow.



1. Put a little soil into each of the 8 jar lids and scatter bird seed on top of the soil.
2. Place the lids on a suitable ledge or table, and water them daily until the seeds sprout and begin to grow.
3. Continue the above care for the seeds in two lids. Stop watering the seeds in two lids. Cover two other lids with a box that will cut off sunlight but still allow air in, and cover the last two with Saran or similar wrap to cut off all air.
4. Notice that seeds and plants must have air, water, and sunlight if they are going to stay healthy and continue to grow.

NOTE: Even indoor plants will grow better and be healthier if moved outdoors occasionally for fresh air and a little sunshine. Nearly all of nature's living things (including people) are healthier if they have fresh air, water, and sunshine.

- If no bird seed, see if there are small seeds or seed pods being produced by plants outside.
- Or, use beans wrapped in a wet paper towel inside a zip lock. Once sprouted, try planting those.
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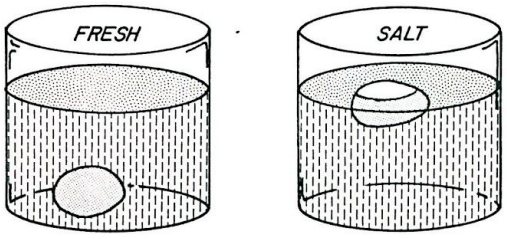
Exploring Our Environment

WATER

Task 99

Salt water is more buoyant than fresh water.

MATERIALS
2 containers of water
2 hard-boiled eggs
Salt



1. Fill the two containers about ¾ full of water.
2. Add 3 or 4 tablespoons of salt to one container and stir until the salt dissolves.
3. Put one hard-boiled egg into each container.
4. Notice that the egg in the salt water tends to float, while the egg in the other container sinks.

NOTE: The salt gives the water greater density. The denser the liquid the more it tends to float things, or the more buoyant it is. This is why ships ride higher in salt water than in fresh water. This also explains why it is easier to swim in salt water than in fresh water. A person who regularly swims in the ocean often finds it harder to swim in a lake, river, or pool.

- No idea why you need to use hard-boiled eggs… :)

This image offers a way to show what density means, and how it impacts buoyancy: