

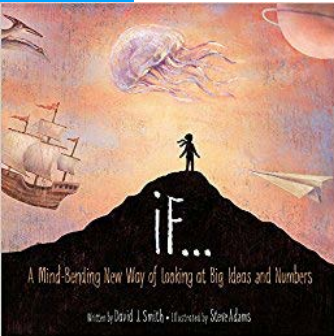
IF . . .

A Mind-Bending New Way of Looking at Big Ideas and Numbers

Written by David J. Smith - Illustrated by Steve Adams

Dance Lesson Plan written by Jana Shumway

This lesson focuses on WATER (pp. 22-23)



CORE STANDARDS

5th Grade Science Strand 5.1: Characteristics and Interactions of Earth's Systems; **Standard 5.1.2:** Use mathematics and computational thinking to compare the quantity of saltwater and freshwater in various reservoirs to provide evidence for the distribution of water on Earth. Emphasize reservoirs such as oceans, lakes, rivers, glaciers, groundwater, and polar ice caps. Examples of using mathematics and computational thinking could include measuring, estimating, graphing, or finding percentages of quantities. (ESS2.C)

5th Grade Dance Standard 5.D.CO.2: Select a topic of study in school and research how other art forms have expressed the topic, then create a dance study that expresses the idea.

STUDENT LEARNING OUTCOME

The fifth grade students will understand the differences between oceans, lakes, rivers, glaciers, groundwater and polar ice caps by responding to the descriptions of each water type with movement. They will also understand the proportions of each water type on the earth through movement exploration.

GRADE 5th Grade

LENGTH OF LESSON

Two 45 minutes sessions

MATERIALS

Visuals of an ocean, lake, river, glacier, groundwater, and polar ice caps

The book "If . . . A Mind-Bending New Way of Looking at Big Ideas and Numbers" by David J. Smith (specifically show pages 22 & 23).

Music suggestion: Waters of Cesme by Cusco; Firetongues by Tangerine Dream; Tribute by Yanni; San Rocco by Tangerine Dream; A Romance with Electrons by Kurt Bester

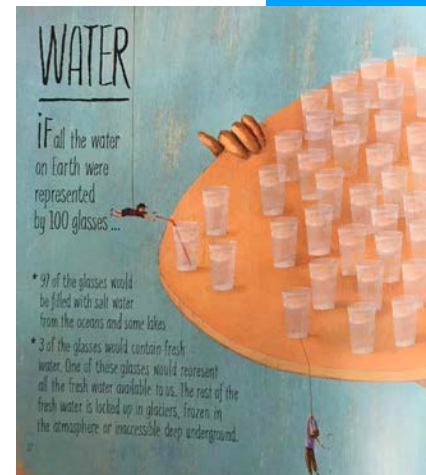
Tape: to tape off 3/100th of a space in the room

One small blue scarf

One really large piece of blue fabric

CREATE / PERFORM

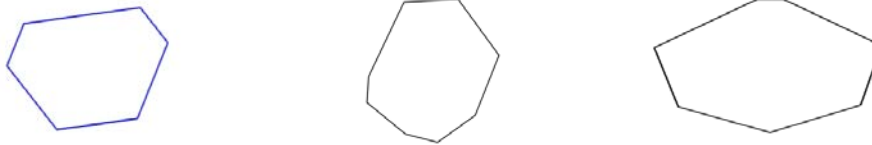
Place 6 pictures on the wall: **RIVER, LAKE, OCEAN, GLACIER, GROUND WATER, and POLAR ICE CAPS**



Do the following 6 movements without telling the students which water form connects to each movement.

FIRST MOVEMENT: Immediately have the kids line up behind you and play follow the leader. Do a variety of movements as the students follow you (run in curving pathways, slide sideways, walk at a low level then a high level, swirl, explode, roll, jump, twist, etc.). Let a student be the leader. Encourage the leader to do creative movements like in the examples above. Then split the line into two lines and have two leaders. Remind the leaders to not cross through the other line and encourage them to make interesting floor pathways as they do their creative movements. **(RIVER)**

SECOND MOVEMENT: Have the class make a circle. Have them touch finger to finger with the students next to them. While keeping light contact with each other, see if they can vary the shape from a circle to other shapes while still keeping connected. Some students will lunge in while others will lunge back. The shapes might look something like the following: **(LAKE)**



THIRD MOVEMENT: Have the students spread out to the furthest edges of the room. As they cross from one side to the other have them create wavelike motions and big jumping explosions like crashing waves. Have them keep their movements really big and wide. Pay attention to the large space as they use the whole space with really big movements. Run, leap, explode, gallop, spin, etc. **(OCEAN)**

FORTH MOVEMENT: Make huge shapes with jagged edges. Make them alone, with a partner or with a small group, or all three options. Then try one glacier shape with the whole class by creating big shapes with jagged edges that connect to each other. Once everyone is frozen in their shape, try “calving” by touching the head of one student (who is towards the front of the shape) and having them collapse to the ground. Then wait a while and touch another student’s head and have them collapse. Calving is when the front part of the glacier breaks off because the glacier is expanding. **(GLACIER)**

FIFTH MOVEMENT: Do low sustained movement. While keeping low to the ground try reaching with arms or legs, try rolling, try squirming, try low curved shapes, try upper body verses lower body movements, try symmetrical verses asymmetrical movements. Keep the movements and shapes low. **(GROUNDWATER)**

SIXTH MOVEMENT: Go to one end of the room to make medium leveled round dome shapes. Run to the other end of the room to make medium leveled round dome shapes. Come into the middle of the room and have the students decide which side of the room they want to go to to make their round dome shapes. After they get there have them run to the opposite sides to make their last medium leveled dome shape. **(POLAR ICE CAPS)**

RESPOND

Now gather the students to the visuals. Point to one picture and have them guess which movement connects with each water form: the river? the lake? the ocean? a glacier? groundwater? polar ice caps? Continue until all water forms have been matched to the above movements.

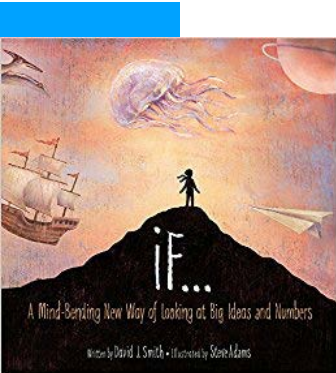
CONNECT

Now say a characteristic of each body of water. When you say the characteristic have them **DANCE THE ANSWER**. Do not let them say the answer out loud.

It is at a high-latitude region of the planet that is covered in ice. (polar ice caps)
 It has flowing water. (river)
 It is still water that doesn't travel. (lake) (The students can also create lakes in smaller groups)
 It is found in the cracks and spaces of soil, sand and rock. (groundwater)
 It can change a mountain valley that is "V" shaped to a "U" shape. (glacier)
 It forms a "V" shape in a valley or canyon. (river)
 It is found at both the north and south poles. (polar ice caps)
 It is mostly fresh water. (river) OR (glacier) OR (lake) OR (groundwater) OR (polar ice caps)
 It is the largest reservoir of fresh water on the planet. (glacier)
 It supplies drinking water for 51% of the U.S. population and 99% of the rural population. (groundwater)
 It is often formed by remnants of glaciers. (lake)
 It has tides. (ocean) (A tide is the rising and falling of the sea due to the attraction of the moon and sun)
 There are around 100,000 of these in Alaska. (glacier)
 It contains the most extreme climates on earth. (polar ice caps)
 It is surrounded by land on all sides. (lake)
 It is salty. It contains saline (which is dissolved salts). (ocean)
 It stores approximately 75% of the world's supply of fresh water. (glacier)
 It is dome shaped sheets of ice. (polar ice caps)
 It travels to another body of water. (river)
 It helps grow our food and is used for irrigation to grow crops. (groundwater)
 It is similar to, but is larger than a pond. (lake)
 It is very, very, very deep. (ocean)
 They cover approximately 10% of the Earth. (glacier)
 It forms because it receives less solar radiation from the sun resulting in lower temperatures.
 (polar ice caps)

CONNECT TO THE BOOK "IF..."

Now show the picture in the book (pages 22-23). Explain that out of 100 glasses of water, 97 of the glasses represent salt water found in either the oceans or a few lakes.



Now have the students go back out into the space and tape off a little tiny space (judge what you think is 3/100th of your room). Have the kids dance those big exploding and crashing ocean waves again in 97% of the room. They can't go into that tiny space that is taped off. Notice all the oceans and salt water on the earth.

Now notice the tiny space. Can the whole class fit into that space? No! Can the whole class put just one hand into that space? Have everyone try. Have them cup their hand to hold all the fresh water while they put their hands into that tiny space. Notice how small it is compared to the oceans. Tell them that the tiny space represents how much fresh water there is on the earth. Then have the students create moving pathways with one finger in that small amount of space to represent the rivers. Next have them create tiny circles with their finger and thumb to represent the lakes. Next have the 5th graders make jagged shapes with all their fingers to represent the glaciers; then wiggle their hands down low to represent the groundwater; and finally reach their hands up high to represent the polar ice caps.

Now try the ratio with the actual kids in the class. Remember that $3 : 100 = 1 : 33.3$. Most of your classes won't have 33 kids so the closest we can get to this ratio without having to split a child in two would be something like this: have 29 kids do the ocean movements (big, exploding, leaping, wide movements) and one child can be the "fresh water kid." Give the "fresh water kid" a blue scarf so he/she stands out as they move about the other "ocean" kids. The

“fresh water kid” can run curving pathways (rivers), create circle shapes (lakes), create big jagged, angular shapes (glaciers), dance low (groundwater), and make high pointed shapes at either end of the room (polar ice caps). Again point out just how much salt water there is on the earth compared to fresh water. Then take away the small blue scarf and pull out the large piece of blue fabric. Now have the “ocean” kids all hold on to the big blue fabric. Have them wave it up and down. Have the “fresh water kid” dance around like above but without their scarf. Again just notice the comparison between salt water and fresh water.

CREATE / PERFORM

Divide the kids into groups of 5. Have the students create a dance that contains new ideas for the following water forms:

1. Rivers
2. Lakes
3. Oceans
4. Glaciers
5. Groundwater
6. Polar Ice Caps

Also include the following expectations:

They can choose to enter into the space or to begin their dance in a shape out on the floor.

They can put the water forms in whatever order they want.

Have them create new ways to dance each water form.

After they've created ideas for each water form have them finish their dance by demonstrating the ratio of fresh water to salt water.

Then end the dance in a shape or by exiting off the floor.

After they are done creating their dances have them perform them for the rest of the class.

