



Lesson Plan

What Makes Water Special? Some Properties of Water

This lesson plan works very well with children preschool through second grade. The lesson lasts between 45 minutes and 1.5 hours, based on the number of books read and the number of experiments conducted.

To orient the children to what it means to be a scientist, think scientifically and “do science,” take a look at the handouts at the end of the lesson plan: **“A Scientist Is...”** and **“Scientific Method.”** They give you a good introduction to a simple version of the scientific method and to questions that scientists ask themselves when approaching their work.

SING

Begin with your favorite welcome song.

SCIENCE CHAT

This lesson covers important **properties of water: cohesion, surface tension, and absorption/desorption.** It is helpful to begin by discussing what a “property” is. Children at this age might not know what it means but by relating it to themselves, they can quickly understand its definition. Discuss some of the properties of the children in the room (permanent characteristics they possess such as curly hair, brown eyes, round face, long eyelashes, etc.).

Then point out that **water, too, has properties (see next page)!**

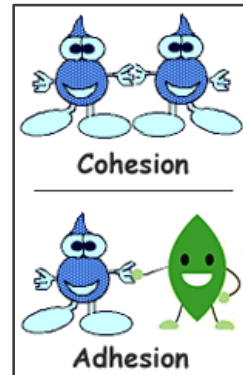
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Water Property Definitions

COHESION and **ADHESION** are the "stickiness" that water molecules have for each other (cohesion) and for other substances (adhesion).

Water molecules want to stick to each other due to **Cohesion** - a good way to demonstrate this is for the children to clap their hands – this is cohesion. They can also take their hand and put it on top of their head or on their shoulders.



Water can stick to things that are not water, things that are different! And we call that **Adhesion**.

A good way to demonstrate it for the children is to have them stick their hand to their neighbor's hand, shoulder, head. . .

On a simple level, **SURFACE TENSION** is a special term we use to describe what happens on the top of fluids, for example, due to the **cohesion** between water molecules. Because water molecules want to cohere so badly, surface tension can form a tight "film" on top of water. We'll demonstrate that in the *Do Science* part of the lesson.

When water shows **ADHESION**, and becomes part of a different object it touches, this is called **ABSORPTION**.

What do we call it when water does not become part of the object it touches: **DESORPTION** (another active word for this is **REPEL!**)

A great way to have the children learn these concepts is to PLAY classic game of "Simon says" (or "Sally says"). When Simon says "cohesion," kids should stick their hand to a part of their body. When Simon says "adhesion," kids should stick their hand or leg or shoulder to another child's hand or leg or shoulder (or they can get funny: "belly," "nose"). BUT, when you don't say "Simon says," the children that perform cohesion and adhesion are out! Play until all/most kids are out.

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READ

Suggestions from the Wisconsin Water Librarians, but feel free to swap out with your own.

READ: *I Get Wet (2002)* by Vicki Cobb illustrated by Julia Gorton

READ: *Small Elephant's Bathtime (2015)* by Tatyana Feeney

READ: *Little Bird Takes a Bath (2015)* by Marisabina Russo

READ: *Tap Tap, Boom Boom (2014)* by Elizabeth Bluemle illustrated by G. Brian Karas

SING

Use any song you like adapted to the theme of the above water properties. Here is one suggestion fitting with the theme of bath time, towels, absorption:

After A Bath from *The Complete Book of Rhymes, Songs, Poems, Finger plays, and Chants* by Jackie Silberg and Pamela Schiller

After a bath I try, try, try	(hands on thighs then point to nose)
To wipe myself dry, dry, dry	Just think how much less time I'd take
(rub upper arms with hands)	If I were a dog and could shake, shake,
Hands to wipe and fingers and toes	shake.
(hold hands out, palms up, then point to	(shake body)
toes)	
Two wet legs and a shiny nose	

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DO SCIENCE I: SURFACE TENSION (w/clear plastic cup and dropper)

Adapted from: <http://www.stevespanglerscience.com/lab/experiments/penny-drops/>

Supplies:

Water, Clear plastic cup (tumbler size), Small water dropper

How To:

- Fill a low, clear plastic, tumbler-size cup with water as far up to the brim as possible without spilling over
- Place on a very flat surface
- Use eyedropper to pipette small droplets of water, one at a time, on the calm surface repeatedly.
- Repeat until water spills over the edge
- Keep track of the water drops as you add them. You'll probably be surprised by the number of drops you get on there. The cohesion and surface tension of water becomes apparent when the drops of water you add reach the edge. Once the water has reached the edge, you begin to see a bubble or dome of water forming on top of the cup. The bubble shape is a result of the water molecules clinging to one another in an optimal shape (just like the bonds on the surface of a blown bubble).

DO SCIENCE II: ABSORPTION OR DESORPTION (REPEL)?

Supplies:














Pitcher of water, Chart (next page), Clipboards, Other items: paper napkin, wax paper, sponge, plastic wrap, paper towel, Styrofoam plate, sock, zip lock bag, cotton balls, construction paper, aluminum foil

How To:

Use the scientific method of hypothesis building, testing/observation, and recording to test whether various items absorb water or repel (desorption) water. **Use the chart below!**

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ITEM		ABSORPTION (X)	DESORPTION (X)
			
Napkin			
Wax Paper			
Sponge			
Plastic Wrap			
Paper Towel			
Styrofoam Plate			
Sock			
Zip Lock Bag			
Cotton Balls			
Construction Paper			
Aluminum Foil			

CRAFT IDEA: PAPER WATER LILY (ABSORPTION)

Supplies:

Water Lily Template (on next page)
Paper
Scissors
Crayons, Markers
Large, flat, clear bin filled with water

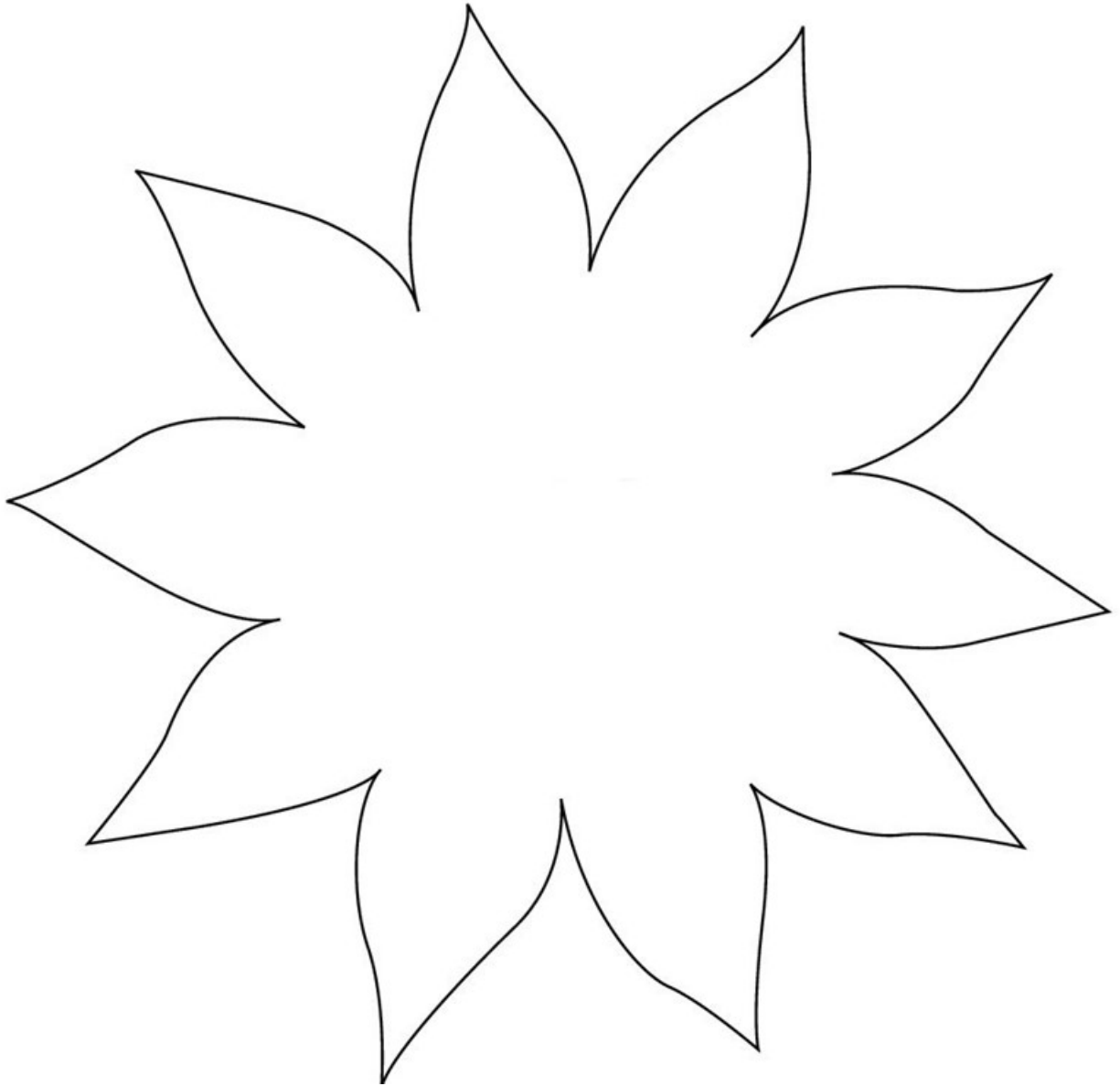
How To:

- Cut out paper water lily
- Decorate
- Fold pedal-like pieces of lily pad over
- Place lily pad in water with folded-pieces side up
- Watch what happens (lily pad absorbs the water and pedal-like pieces open up)

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A SCIENTIST IS SOMEONE WHO...

- Observes and wonders
- Asks questions
- Listens to ideas of others
- Conducts experiments
- Shares his/her ideas and discoveries
- Explores the world around him/her
- Uses tools to solve problems

A SCIENTISTS SAYS...

- I agree with you because...
- I disagree with you because...
- Why do you think that?
- So, what you're saying is...
- Can you tell me more?
- Can you give me an example?
- How could we test that?
- That reminds me of...

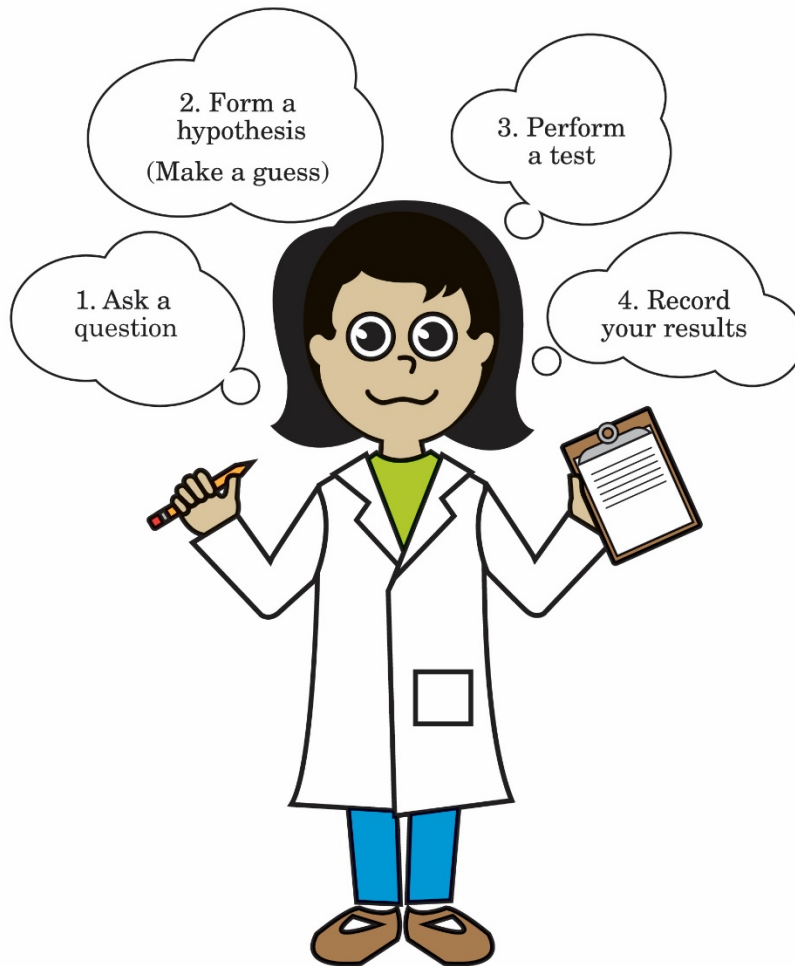


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DOES IT SINK OR FLOAT? SCIENTIFIC METHOD

THINK LIKE A SCIENTIST



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