

## DENSITY OF WATER

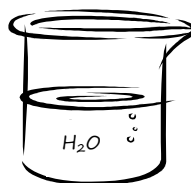
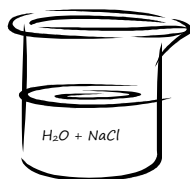
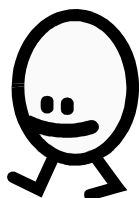
Do a research with an egg in different kinds of water (fresh and salty).

Take a graduated cylinder and make saturated salt water solution in it (as salty liquid as possible: 100 ml of water and a few table spoonfuls of salt). Put some caramel colour in to solution to help your observation.



Then put a whole egg (not broken) in to graduated cylinder. What can you say about densities of egg and salt water? Add some fresh water to the same glass. Use beaker and pour the water gently so that layers of water don't mix up.

What happened and why? Arrange egg, fresh water and salty water in order from most dense to less dense.

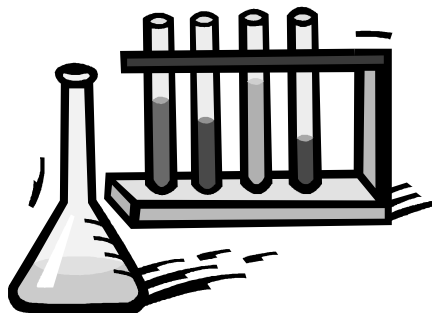


Watch a small video clip (“vettä verkossa” : <http://virtuaaliyliopisto.jyu.fi/oppi/ako/>). What happened and why? Why this phenomenon is important? Write down some examples from nature.

## DETERMINATION OF pH

Equipment: micro dwells, pipets, red cabbage indicator, pH-paper, orange, lemon, Coca-Cola, coffee, detergent, washing powder & baking soda

First make a hypothesis of pH of substances. Then add approximately 10 drops of red cabbage indicator to six micro dwells. Add substances to the micro dwells containing the indicator and to six empty micro dwells. Observe the change in colour in the dwells containing red cabbage indicator and substances. Then determine pH with pH-paper from the dwells containing only added substances (NOT from those containing indicator).



Substance	Hypothesis	colour with red cabbage indicator	pH with pH-paper
Lemon			
Coca-Cola			
Coffee			
Detergent			
Washing powder			
Baking soda			

What causes differences in pH? Why some solutions are acidic and some alkaline?

## SURFACE TENSION

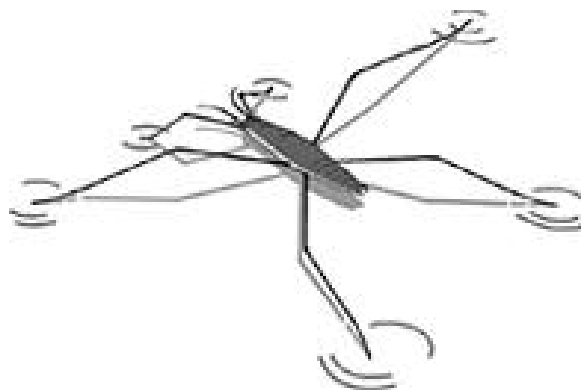
1. Take approximately 150 ml of water into a 250 ml beaker and put a piece of pencil graphite gently into the surface of water so that it floats.

What do you see at the ends of the piece of graphite?

Mix some detergent with a small amount of water in a beaker and pour this solution into the beaker with graphite. What happens and why?

2. Put some cinnamon evenly with sieve in water so that it makes a sort of thin "film" into the surface. Put a drop of water (with a pipet) gently into the film of cinnamon. Then put a drop of detergent in the same way. What do you see on the surface? Can you explain this?

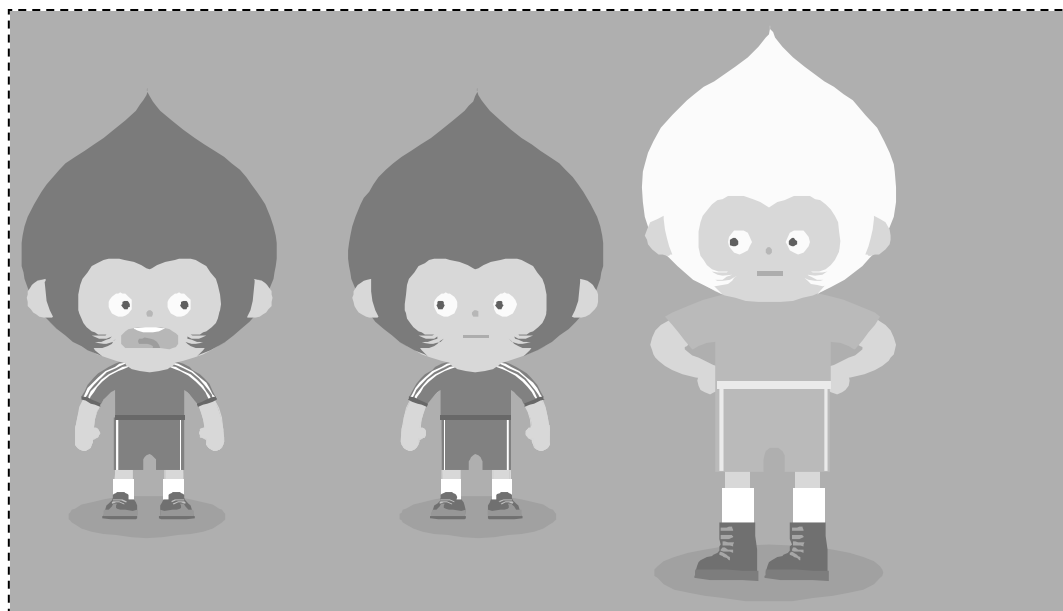
(OBS! Don't wash the sieve so that other groups can also use it.)



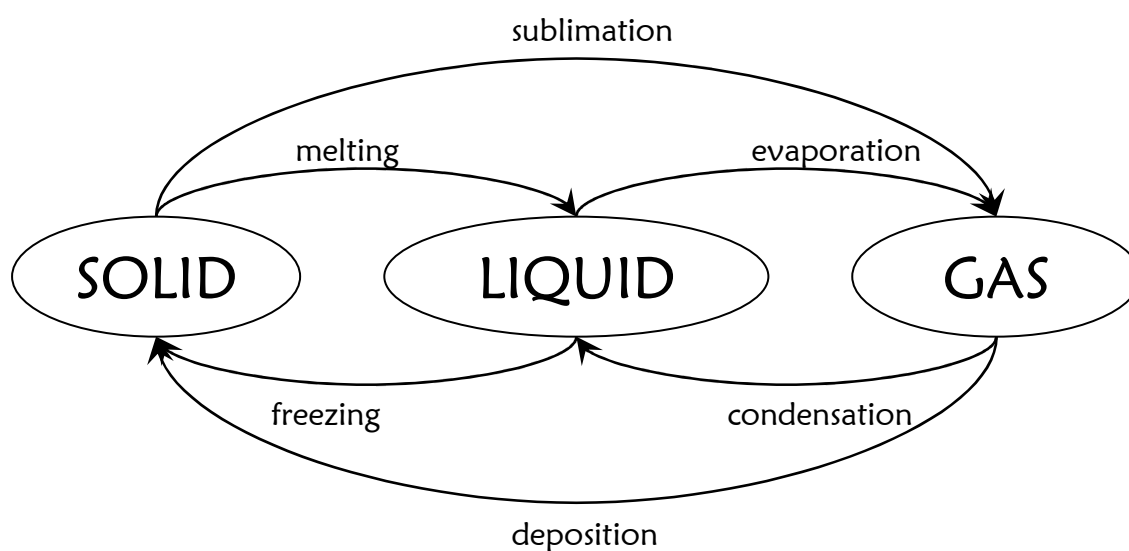
## FORMS OF WATER (solid, liquid, gas)

Make a drama of forms of water.

Each member of the group is one water molecule.



What happens to a group of water molecules when ice is melting or liquid is evaporating and how are they organized in different states? Demonstrate by means of drama.



2. Why do lakes freeze only on the water surface? Why is this important?