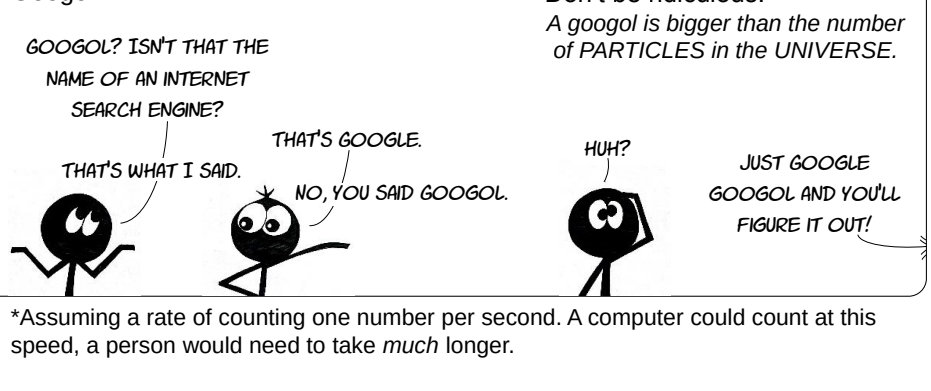
LET'S TALK ABOUT BIG NUMBERS

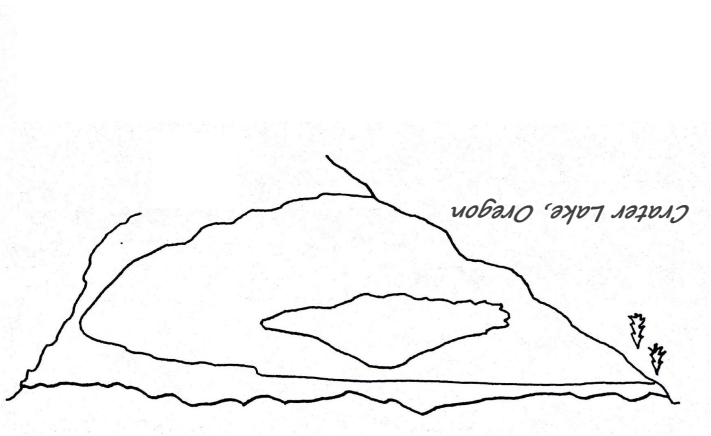
Name	How many zeros	How long to count that high*
Million	6 (1,000,000)	11 days
Billion	9 (1,000,000,000)	31 years
Trillion	12	31,704 years
Quadrillion	15	31 million years
Quintillion	18	31 billion years
Sextillion	21	31 trillion years
Septillion	24	317 trillion centuries
Googol	100	Don't be ridiculous!

A googol is bigger than the number of PARTICLES in the UNIVERSE.



*Assuming a rate of counting one number per second. A computer could count at this speed, a person would need to take *much* longer.

Think of a big lake versus a dewdrop. Pretty big difference in size, right?



The dewdrop is SUPER small compared to the lake. But a water molecule (the smallest bit of water you can have) is MUCH smaller than a dewdrop.

A single drop of water has more than 1,000,000,000,000,000,000,000 water molecules! That huge number with 21 zeros is called a sextillion, and it is a *TRILLION TIMES BIGGER* than one billion.

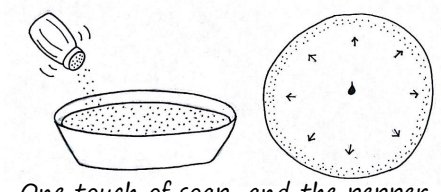
1. Pepper Scatter

Materials:

- Bowl or plate
- Ground black pepper
- Concentrated dish soap
- Water

Method:

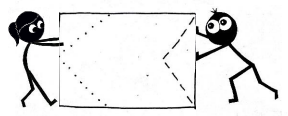
a) Place water in bowl and sprinkle with pepper.
b) Add a touch of soap to the surface of the water.
c) Watch the pepper scatter!



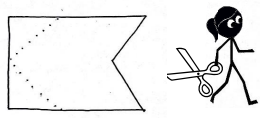
One touch of soap, and the pepper shoots to the edges of the bowl!

2. Soap Boat

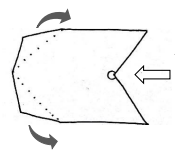
GET A SQUARE OF PAPER, PREFERABLY CARDSTOCK.



CUT THE PAPER LIKE THIS FOR THE BACK OF THE BOAT:



THEN FOLD THE FRONT LIKE THIS:



ADD A DROP OF SOAP HERE.

THEN SET THE BOAT IN WATER AND WATCH IT GO!

3. Floating Pin

Materials:

- A small pin or needle
- Bowl or cup
- Concentrated dish soap
- Water

Method:

a) Fill bowl or cup with water and carefully place pin on surface. *Hint: tweezers may help. The pin must be flat with the surface of the water. It will sink if it comes in at an angle.*
b) Add a touch of soap.
c) Watch the pin sink!

4. Floating Paperclip

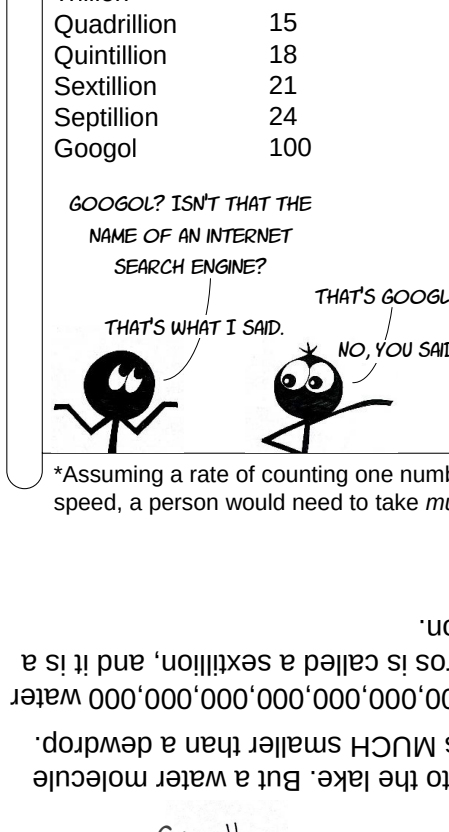
Materials:

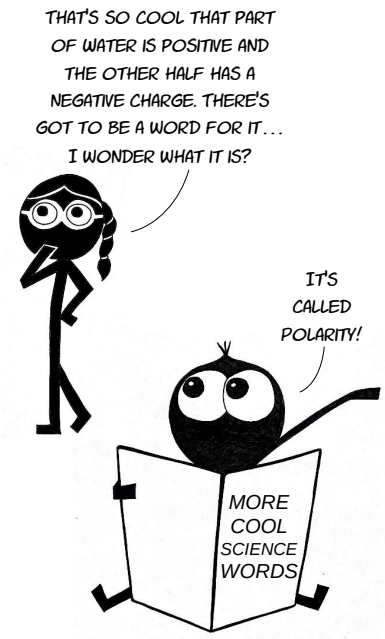
- Paper clip
- Tissue paper or paper towel
- Cup or bowl
- Water

Method:

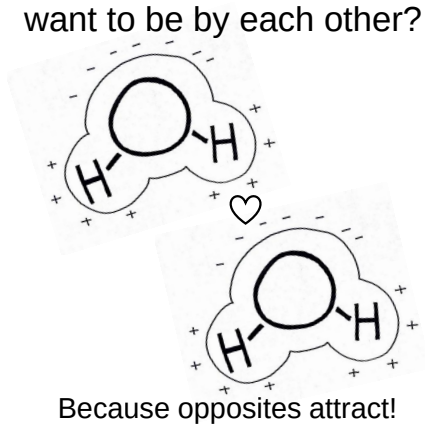
a) Fill the cup with water and gently place a piece of tissue paper on the surface.
b) Carefully place a dry paperclip on the tissue.
c) The tissue should sink. If it doesn't, give it a gentle push downward.

Tip: be sure that the cup and water are not soapy.





But Why do water molecules want to be by each other?

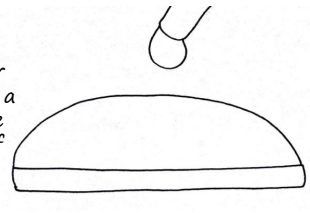


Because opposites attract! Positive loves negative. Each water molecule is part positive (+) and part negative (-). Hydrogen bonds (♡) form between the positive and negative sides.

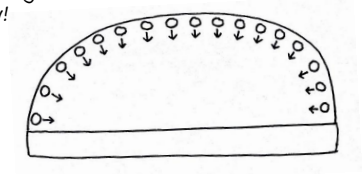
Surface Tension.

than they like air, so the molecules on eighbors. This creates surface tension, d allows us to fill cups above the brim,

Question:
How many drops of water can you fit on a coin before the water spills off the side?

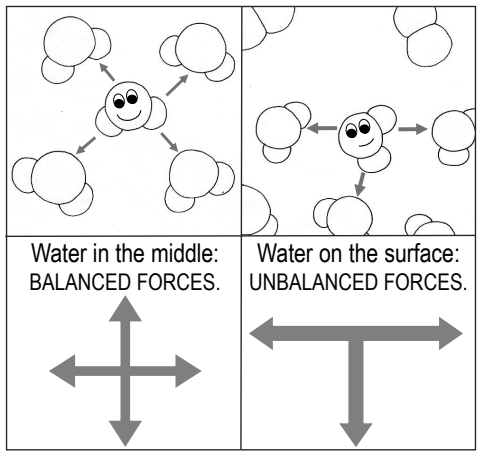


Answer:
A lot! The molecules on the surface pull in, creating a dome of water on the coin. Wow!



HOW DOES IT WORK?

Water molecules like each other more the surface bond more tightly to their n which helps raindrops stay together an or make a dome of water on a coin.



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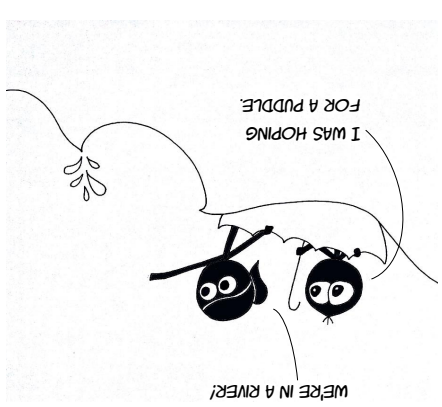

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