WATER

WHAT IS WATER?

- Water (chemical formula: H_2O) is a transparent fluid which forms the world's streams, lakes, oceans and rain, and is the major constituent of the fluids of organisms.

- Water is made of tiny molecules of hydrogen and oxygen.

- Water exists in three forms on the Earth:

-**solid** (snow,ice or frost)

-**liquid** (oceans, fog, rain, in lakes and in rivers)
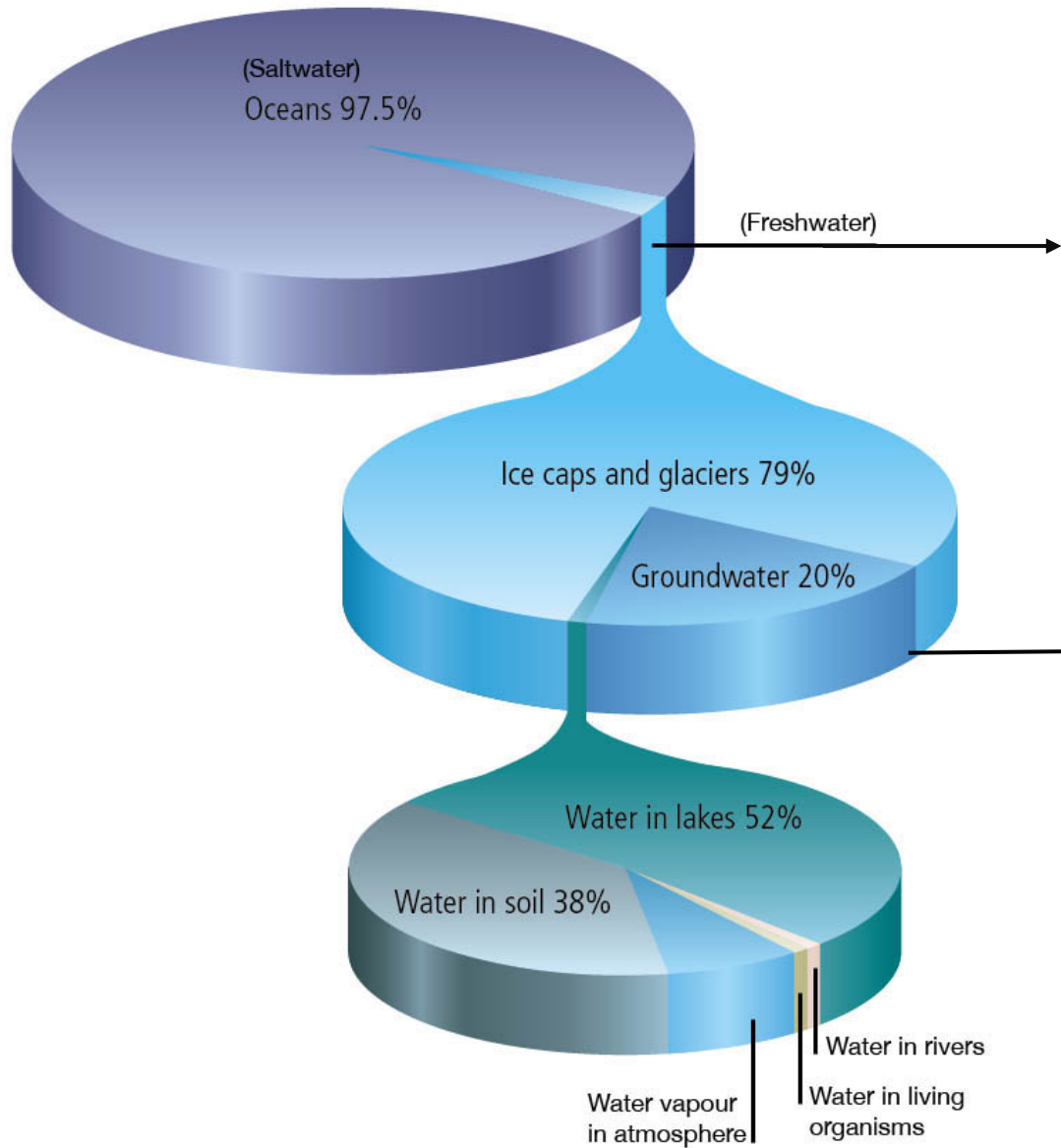
-**gas** (water vapour or steam)

WATER DISTRIBUTION ON THE EARTH

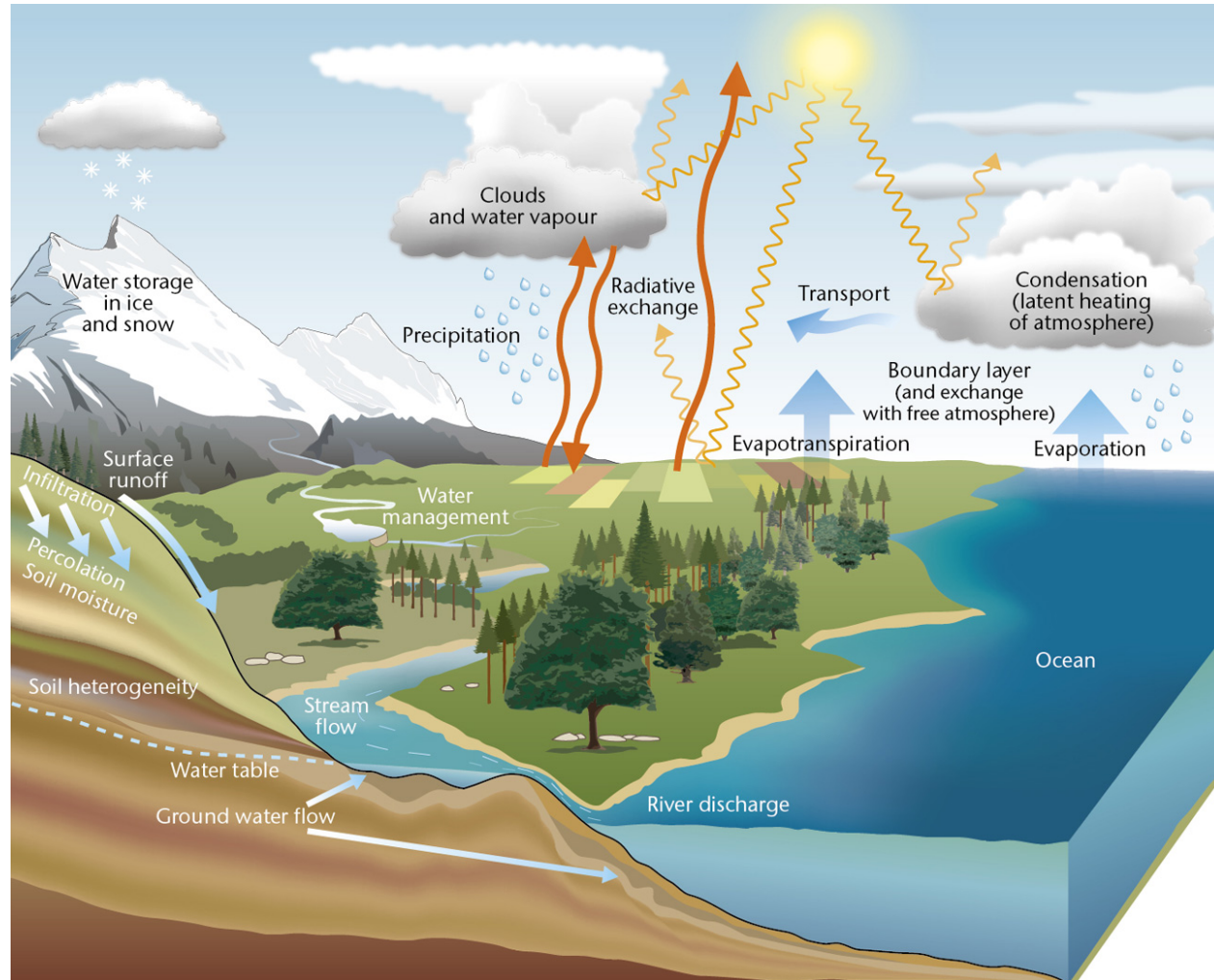Earth is known as the "Blue Planet" because 71% of its surface is covered with water.

(Saltwater)
Oceans 97.5%

(Freshwater)

Ice caps and glaciers 79%

Groundwater 20%

Water in lakes 52%

Water in soil 38%

Water vapour in atmosphere

Water in rivers

Water in living organisms

The Earth has an abundance of water, but unfortunately, only a small percentage (about 0.3 percent), is even usable by humans. The other 99.7 percent is in the oceans, soils, icecaps, and floating in the atmosphere.

Still, much of the 0.3 percent that is useable is unattainable. The majority of fresh water is actually found underground as soil moisture and in aquifers.

THE WATER CYCLE

Clouds and water vapour
Radiative exchange
Precipitation
Transport
Condensation (latent heating of atmosphere)
Water storage in ice and snow
Boundary layer (and exchange with free atmosphere)
Evapotranspiration
Evaporation
Surface runoff
Water management
Infiltration
Percolation
Soil moisture
Soil heterogeneity
Stream flow
Water table
Ground water flow
River discharge
Ocean

The **water cycle**, also known as the **hydrological cycle** or the **H$_2$O cycle**, describes the continuous movement of water on, above and below the surface of the Earth.

This cycle is made up of a few main parts:
-**evaporation** (and transpiration)
-**condensation**
-**precipitation**

EVAPORATION

The **sun**, which drives the **water cycle**, heats **water** in the **oceans**. Some of it **evaporates** as **vapor** into the air; a relatively smaller amount of moiture is added as ice and snow sublimate directly from the solid state into vapor. Rising air current take the vapor up into the atmosphere, along with waterfrom **evapotranspiration**, which is water transpired from plants and evaporated from the soil.
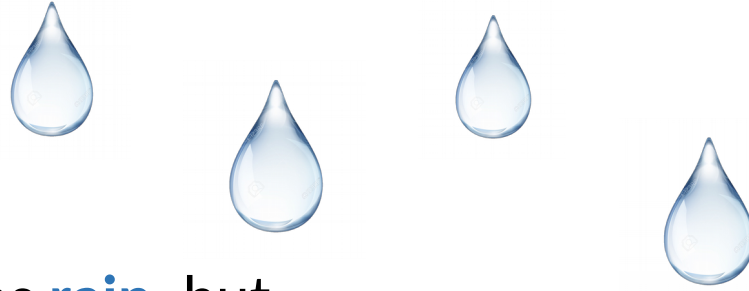
CONDENSATION

The vapor rises into the air where cooler temperatures cause it to condense into clouds. Air currents move clouds around the globe, and cloud particles collide, grow, and fall out of the sky as precipitation.

PRECIPITATION

Precipitation usually falls as **rain**, but when it falls as **snow** it can accumulate as ice caps and **glaciers,** which can store froze water for thousands of years. Snowpacks in warmer climates often melt when spring arriver, and the melted water flows overland as snowmelt. Most precipitation falls back into the **oceans** or onto land, where, due to gravity, flows over the ground as surface runoff.

HOW MUCH WATER DO WE USE EVERYDAY?

WE CONSUME 3496 LITRES OF WATER PER DAY!!
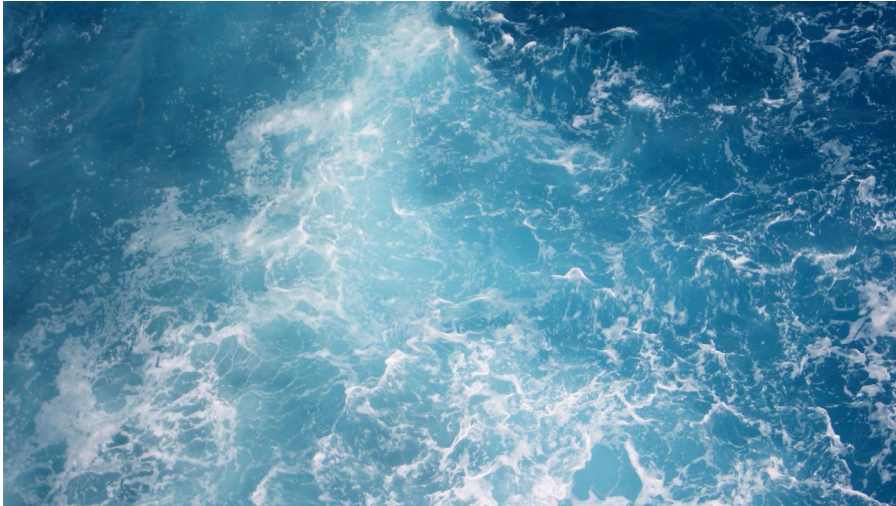
DOMESTIC CONSUMPTION

-Much of the water we use is obvious it's **visible** in our homes.

-Our domestic consumption s **137** litres of water everyday.

-It's the water we use at home for drinking, cooking, washing. That is our **domestic consumption.**

-What we consume at home is visible to us, but it is **only a small** bit of what we use **in total.** There are two **invisible parts.**

DOMESTIC CONSUMPTION: 137 LITRES EVERYDAY

35%

Bathing and showering

30%

Flushing toilet

5%

Cleaning

20%

Laundry

10%

Cooking and drinking

What we consume at home is visible to us, but it is **only a small** bit of what we use **in total**.
There are two **invisible parts**.

INVISIBLE PARTS

Industrial products

Food production

The first invisible part is the water used for the production of the industrial products we consume everyday, such as paper, cotton, clothes.
This part amounts to **167 litres per day.**

The second big invisible part is associated with the production of the **food** we consume.
This amounts to **3496 litres per day** which means that **92%** of the water we use is **invisible and it is hidden in our food!**

INVISIBLE WATER: FOOD PRODUCTION

TO BETTER UNDERSTAND THE INVISIBLE PART OF WATER WE CONSUME, CONSIDER THE EXEMPLE BELOW.

In an industrial beef production system it takes on average **three years** before the animal is slaughtered to produce about **200 kilos** of boneless beef.

During the three years the cow consumes nearly **1300 kg of grains** such as wheat, oats, barley, corn, dry peas, and other small grains.

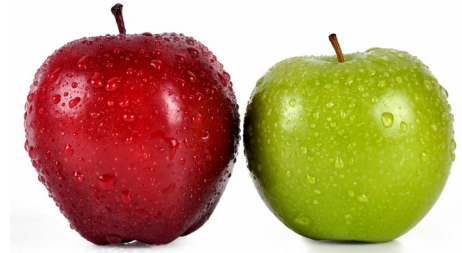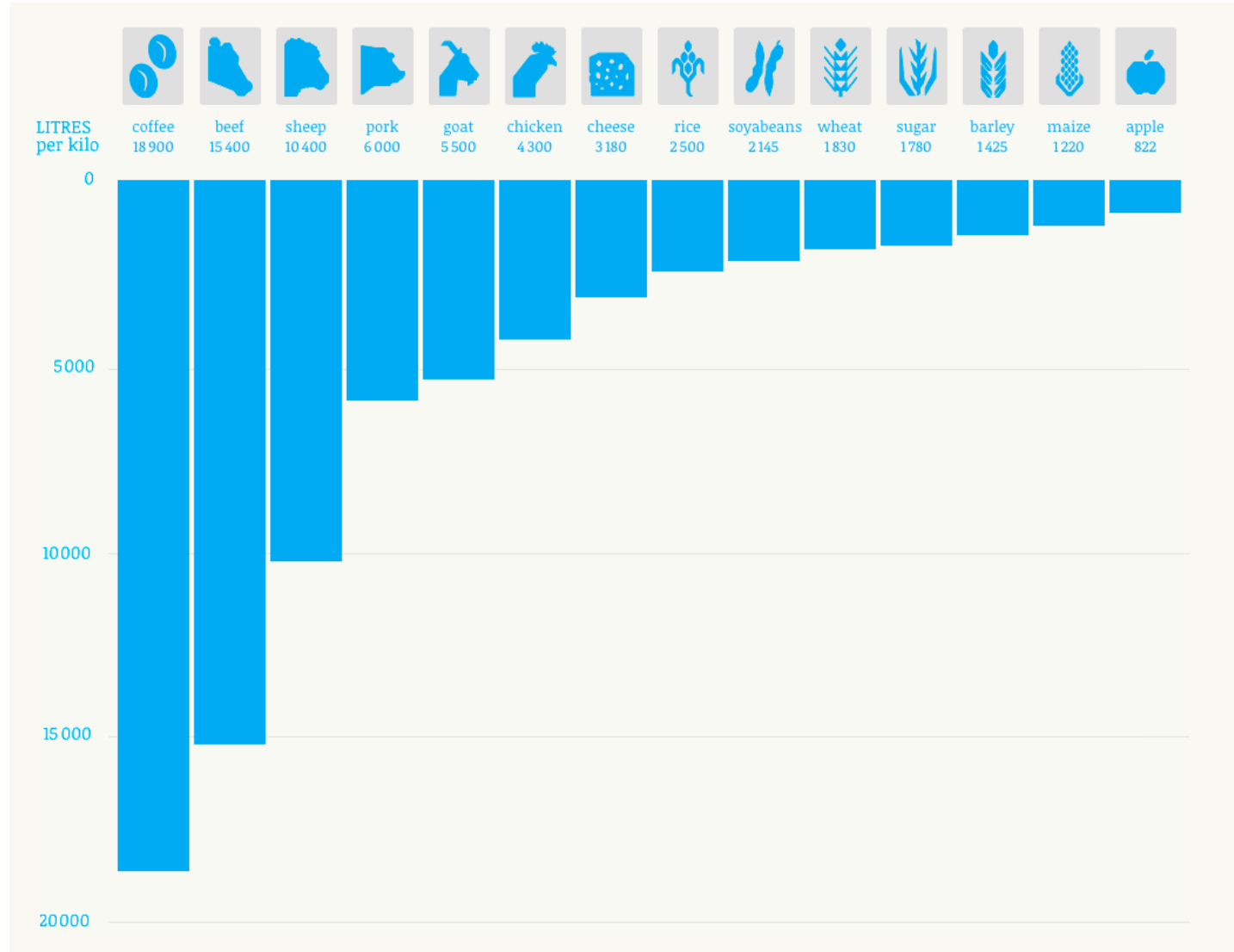The cow also consumes **7200 kg of roughages** such as pasture, dry hay, silage, and other roughages.

Production of all the grains and the roughages requires **3060000** litres of water, the cow drinks **24000** litres in the three years and **7000** litres are used in servicing the farmhouse and slauthering.

We need **3091000 litres** of water for producing **200 kilos** of boneless beef. This means that to produce 1 kilogram of boneless beef **we need**

15 400
litres of water
1 kilo of beef

From the diagram below we can see how much **water** we need to produce the **food** we consume. Some products such as fruit and vegetables are more water-friendly than others.

| LITRES per kilo | coffee 18 900 | beef 15 400 | sheep 10 400 | pork 6 000 | goat 5 500 | chicken 4 300 | cheese 3 180 | rice 2 500 | soyabeans 2 145 | wheat 1 830 | sugar 1 780 | barley 1 425 | maize 1 220 | apple 822 |

HOW CAN WE ACTUALLY REDUCE THE AMOUNT OF WATER WE USE EVERYDAY?

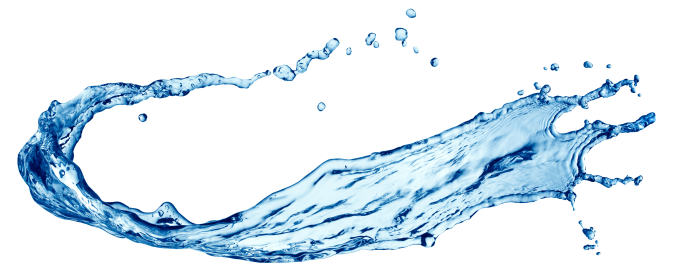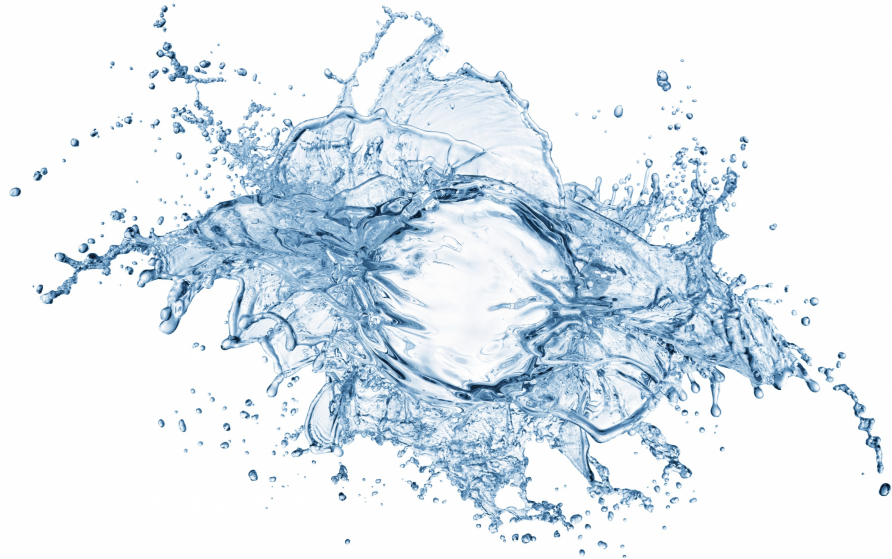## HERE ARE SOME VERY HELPFUL TIPS

1. **Turn off the tap** when you brush your teeth – this can save 6 litres of water per minute.

2. Place a **cistern displacement device** in your toilet cistern to reduce the volume of water used in each flush. You can get one of these from your water provider.

3. Take a **shorter shower**. Shower can use anything between 6 and 45 litres per minute.

4. Always use **full loads** in your washing machine and dishwasher – this cuts out unnecessary washes in between.

5. **Fix a dripping tap**. A dripping tap can waste 15 litres of water a day, or 5,500 litres of water a year.

6. Water your garden with a **watering can** rather than a hosepipe. A hosepipe uses 1,000 litres of water an hour. Mulching your plants (with bark chippings, heavy compost or straw) and watering in the early morning and late afternoon will reduce evaporation and also save water.

7. Fill a **jug with tap water** and place this in your fridge. This will mean you do not have to leave the cold tap running for the water to run cold before you fill your glass.

8.Install a **water meter**. When you're paying your utility provider for exactly how much water you use, laid out in an itemised bill, there's an incentive to waste less of the stuff.

SOURCES

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- www.wikipedia.com

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- http://www.kidzone.ws/water/