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What Physical and Chemical Changes/Processes Happen in the Spring?



*in December*



*in March*

*Change:* Physical change

*Process:* Melting – when water changes its state from solid to liquid

Freezing point of water: 0°C

*Location:* Our garden

In December we built a giant snow ball, but it melted. When it melted, the water entered the ground. This process is called *INFILTRATION*.

*INFILTRATION* is when water goes through the soil into the ground water. When the water goes through the soil, it is filtrated and it takes minerals from the soil (from some stones, that contain these minerals). That's why water contains minerals. Mineral water is the water that contains the biggest amount of minerals. Minerals cause the salinity of water. The difference between saline water and fresh water is that saline water has more dissolved salt (minerals) in it.



*Change:* Physical change

*Process:* Heating up

*Location:* Our garden ( in whole city, Slovakia)

In December I wore gloves because it was too cold outside, but now, in March I don't need them anymore because it isn't so cold in spring. I think , it's because the air is warmer in spring than is winter.

The air consists of Nitrogen (78%), Oxygen (21%), Water Vapour, Ozone (0,96%), Carbon Dioxide (0,04%). The air is stored in the atmosphere. Atmosphere is a layer of air , which consists of 5 layers: Troposphere, Stratosphere, Mezosphere, Thermosphere and Exosphere.



*Change:* Chemical change

*Process:* Rusting

*Location:* Our garden

Our garden gate has rust on it , because it is made from metal and when it gets in contact with water, it gets rusty. When it was snowing, the snow stayed on the gate for a while and snow is just frozen water, so it got rusty. Snow is solid state of matter of water. Water can have also another state. Water can be: Solid, Liquid, Gas. Water can change these states according to the conditions. It freezes, when the temperature is low and evaporates, when the temperature is high. The processes, when water changes the state from to another are called: Liquid-> Gas = Evaporation ,

Gas->Liquid = Condensation, Solid-> Liquid = Melting, Liquid -> Solid = Freezing, Gas-> Solid Sublimation ( this can't happen with water, but for example iodine).

Water: Freezing Point: 0°C, Boiling point: 100°C



*Change:* Chemical change

*Process:* Drying

*Location:* Our garden

When the snow melted, I found dry grass. In spring we take dried branches of trees and shrubs and dried grass and plants and we put them into garbage for BIO waste. But waste isn't just from dried plants and plastics, but waste can be also dirty water. The water, which you already used is called waste water. This water is cleaned during the waste water treatment process, which has some parts:

Mechanical cleaning: 1. Pre-treatment 2. Primary

Biological cleaning: 3. Secondary

Chemical cleaning: 4. Final

*Mechanical cleaning:* we remove sand and big garbage such as branches of trees, leaves or plastic by grit chambers and circular clarifiers.

*Biological cleaning:* we remove biological impurities in settling tanks by adding microorganisms.

*Chemical cleaning:* we disinfect the water by chlorine, ozone and ultraviolet light

The order of processes, that happen during the waste water treatment process is: coagulation, sedimentation, filtration.



*Change:* Physical change

*Process:* Melting

*Location:* Our garden

In winter, when there was snow, the soil was very hard because it was frozen.

Now, in spring it melted and the water, which causes that the soil was frozen is now melted, so now it is soft enough, that plants can even grow through it. When the water melted it entered the soil, as when my giant snow ball melted.

*But is there another way, how the water can go to a river or a lake?*

The answer is YES. The water can enter the river or a lake during the process called *Surface run-off*.

It is when water from the surface of the ground transports by a small water flow to the river or a lake. When water is in a river or a lake it then evaporates in the process called *Evaporation*. Water evaporates when the heat from the sun heats up the water and then it evaporates. When it reaches the height of 10 - 11 km and in this height there is colder temperature and in this temperature the water creates clouds in the process of *Condensation*. When the cloud is too heavy and it is filled with small water droplets, the droplets fall back to the surface of the ground in form of rain, snow or hail in the process called *Precipitation*. Then the water enters the soil in the process called *Infiltration* or it goes back to rivers and lake in the process called *Surface run-off*.

This was the *WATER CYCLE*, but there is also the *CARBON CYCLE*.

*The CARBON CYCLE* starts when people or animals breath. During the process of breathing you uptake oxygen (O<sub>2</sub>) and you release water vapour and carbon dioxide (CO<sub>2</sub>). Then plants during the process called *Photosynthesis* (for this process plants need chlorophyll) uptake water, sunlight and Carbon dioxide (CO<sub>2</sub>) and they release Oxygen (O<sub>2</sub>). Then this process happens all over again.