Kit water treatment

C-9941

The circulation of the water is like a very large filter. The water evaporates into the clouds and rains, later it seeps into the ground and flows into a stream, river, etc. That is the circulation of water. This water purification experiment is just like a small purification plant. It offers children the opportunity to experience the water purification process through different surfaces. Science is a way of learning from nature. Until now, science has revealed the mystery of nature. Scientific knowledge plays an important role in our life. Betting on scientific knowledge is very important. Through this experiment, children can investigate the source of purified water and learn scientific knowledge. It is a good opportunity to develop your interest in technology and your environmental awareness.

P1 Plastic hopper		Qty 1
P2 Filter tube		Qty 4
P3 Plastic cover		Qty 1
P4 Plastic cup		Qty 1
P5 Crushed granite		Qty 1
P6 Porcelain sand		Qty 1
P7 Activated carbon		Qty 1
P8 Quartz sand		Qty 1
P9 Baking soda		Qty 1
P10 Potassium alum		Qty 1
P11 Sponge		Qty 2
P12 Filter paper		Qty 6

Experiment - 1

Kit Materials needed: filter, filter paper, sponge

Other materials required : Water, paper, spices, edible oil, edible pigment, ink, etc.

1 - Have some dirty water, you can make it, adding a bit of paper, spices, edible oil, edible pigment, ink, etc.

2 - Put the filter paper and sponge inside of the filter tube, and binds filtration column as seen in the image.

3 - Slowly pour dirty water on top of the hopper, look carefully each state, as the dirty water flowing past each layer of the filter tube.
Look carefully at the water that has passed through the filter and ends in the plastic cup

NOTE:
Clean drinking water but not drink

Experiment - 2

Kit Materials needed : Column water purifier, crushed granite, porcelain sand, activated carbon, quartz sand and filter paper.

Other materials required : cloudy water

1 - Put the crushed granite and porcelain sand filtration tube. Paper filters should be placed in the bottom of the tube where small materials such as activated carbon or quartz sand will be placed. Granules larger going up, and the granules are smaller than them below. This is the way to mount the filter tube.

2 - Pour the muddy water slowly from the top of the plastic tube. Clean water is deposited in the plastic cup.
Why muddy water becomes clean?
It is because the granite stones and sand make their porcelain filter function correctly.

* After pouring the water inside, it may spill some water during the experiment. Therefore you must do the experiment in a place that does not spoil anything.

NOTE:
Fit the plastic tube and tighten. Otherwise, it can easily result in water leakage

The finer the sand, will have better effect decontamination. The empty space between the sand will be very small and the water can not flow easily, so it will take longer for this search. If starch is used instead of sand, you should not make too thick. The ideal measurement is less than 1 cm. By being dirt particles between the sand can clog the water flow normally. However, water can continue to flow but more slowly.
Remember: Don't pour water sharply inside, it can lead to water leaks.
In addition to filtering cloudy water, you can also make this experiment with rice water washing or watercolor painting. Turbid water itself contains very small grains and are not easy to filter. If you want to repeat the experiment, clean sand and clear water before reloading the plastic tube.

Collection method of sand and gravel

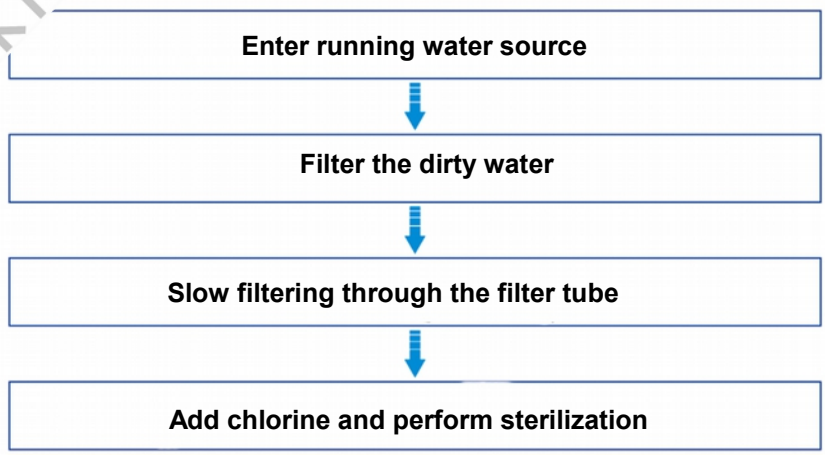
Loot 1 or 2 cups of sand and place them on a sheet of newsprint. While the move leans a little paper. Thus, large stones will fall first, then small stones fall, and eventually sand is small. Repeated again and again until you separate the gravel from the sand, as you can see in the picture.
We will now perform the following operation. Use a plastic bottle of 1.5 liters to load sand (1 or 2 cups) and then poured water inside. Then closes very strong plug and shake vigorously. After stirring, the bottle allowed to stand for a while. After which you will find that the sand and stones have been forming strata. Move the bottle very carefully. Use scissors to cut and open the plastic bottle. Then use a spoon to remove each layer of sand and stones, and save them grouped by size.

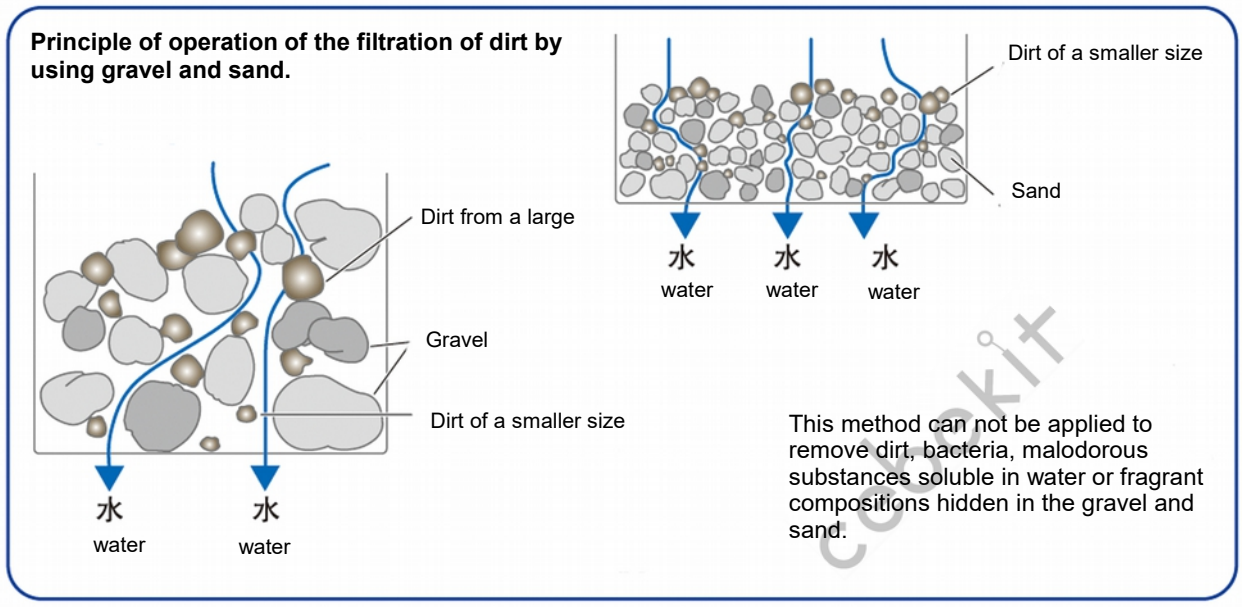
NOTE:
It is very important that you go very carefully to not cut yourself when using scissors.

The principle of operation of filtration (filtration method on low speed)

Cloudy water contains all kinds of impurities with different measures. When the muddy water is poured into the tube filter, which was previously filled with gravel and sand, the impurities contained in the water is deposited in small gaps between the gravel and the sand. However, water can seep through the gaps and thus filtering dirt.
When the water drops on the glass tube outlet, we confirm if there is any dirt that remains after filtration. Of course, there is still dirt and bacteria and malodorous substances soluble (such as ammonia, iron, manganese, etc.), which have a much smaller than the small spaces between the sand and gravel size. These substances can not be cleaned or deleted. Usually, the filters used in large sewage plants are similar to, but a super long size. Above the filter are large algae and microbial filter layer. Small particles of dirt, bacteria and malodorous substances in the water, decompose and are eliminated by slow swimming microorganisms, and then filtered through sand and gravel in the filtration layer.
This form of water purification called "slow filtering". Because so much time is consumed in the course of filtration, rarely the wastewater treatment plants use this system. This does not mean that this is not a good pair method to make drinking water safe.

Ground water treatment plant according to the method "slow filtering"





Experiment - 3

Precipitation procedure dirt clotting chemicals for purification

Material necessary kit : Potassium alum and baking soda. (saleratus)

Other materials required : 4 cups or glasses, rice washing water, a small spoon, a stick to remove water, water, a cup or glass to measure measure.

1- Prepare 50 ml of water in two separate cups (fig. 1). Put half teaspoon of alum in one of the containers and a half teaspoon of baking soda in the other (Fig. 2). Completely removed with a disposable stick (fig. 3).

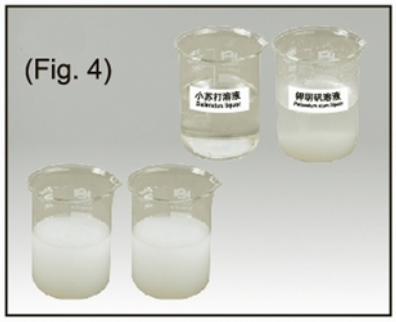
2 - Place the rice water in the other two vessels (Figure 4). The volume should be approximately one third of the container.

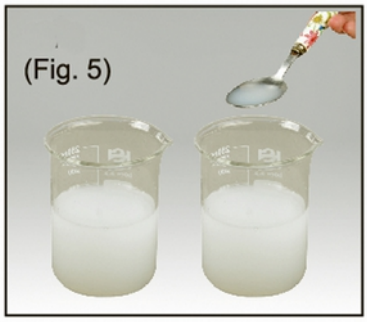
3 - Add 5 spoons of alum solution in water and completely remove rice. Then add 3 teaspoons of sodium bicarbonate and stir slowly (Fig. 5).

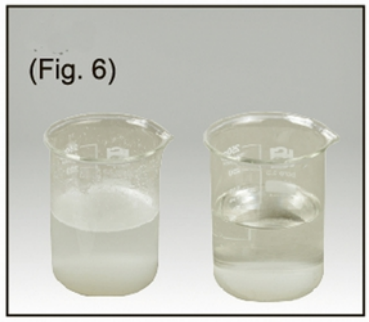
4 - Place the two containers with rice water, next to each other. Let stand completely of 1-2 hours.

5 - After this time at rest, not only water has been clean and transparent after adding alum and baking soda, but also has settled to the bottom of the container the filtered water so floored and white .

* If the deposit described in section 5 does not occur, increases the portion of potassium alum and baking soda, and try again. Watercolors pigment used in school can also be used for this experiment.







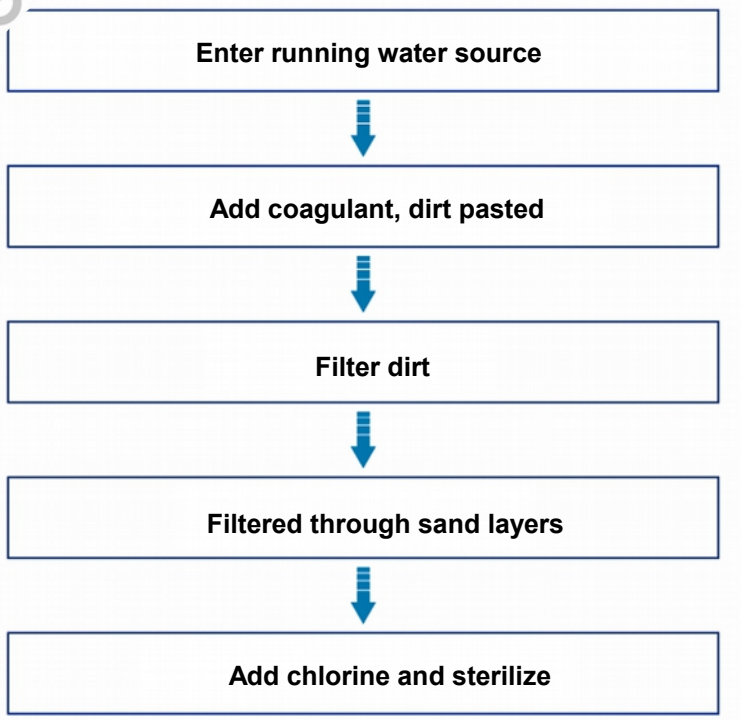
NOTE:
DO NOT DRINK !
Clean water, but not drinking

Operating principle on chemical precipitation and filtration (about quick filtration method)

Using this method simply add a coagulating agent to bond and deposit the little dirt and substances that are not deposited, and can not be removed by filtration. This is where we use alum. In water treatment plants, it is widely used aluminum sulfate and aluminum chlorohydrate. Baking soda is used to neutralize the acid potassium alum, however, plants for various water treatment chemicals are applied.
Due to the small size of the dirty granules mixed in water, it always contains electrostatic substances, once the chemical positive electricity is added, the phenomenon of neutralization, that the composition of the soil can be combined with the composition of water appear and form the block. This is the same method of operation with detergent and dirt binder, it is block the molecules stick together and thus form a block larger sized sediment to be deposited in the fund. The role of clotting agents make it possible.

Today, most water treatment plants, use a similar method called "quick filter method". Once dirt is deposited by chemical methods, we proceed to filter through layers of sand. On the one hand has the advantage over the "slow filtration method", which can process a large amount of water with less time. Furthermore, chlorine and activated carbon can be used for the sterilization of bacteria and eliminate water soluble fragrances, however, this will also affect the taste and smell of the water end.

Water treatment by "filtering fast"



In some places, add chlorine after entering the water. In others, they can add the charcoal directly on the water, at the beginning of the process to get rid of dirt. Different water treatment plants have different ways of cleaning. You can vary the specific workflow or work process.

Chlorine function

Chlorine has the anti-virus sterilization of microorganisms and bacteria function. Chlorine can not only acidification and eliminate foul odor caused by ammonia, iron, manganese, etc, it also helps get rid of the stink.
In the water plant, the procedure is complete the job by adding chlorine. Therefore, chlorine becomes a factor that directly affects the taste and odor of water.

Experiment - 4

The function of activated carbon - Convert the fruit juice and coffee on clear liquids

Material necessary kit : Activated carbon

Other materials required : water, soy sauce and two plastic bottles (500 ml approx.)

1 - Place the activated water to wash coal completely. Dirt rise to the surface and can remove it (Fig. 1).
* When pouring coal into water, it can produce bubbles. This is caused because water seeps into small pores of the carbon surface. Rinse until the water runs clear.

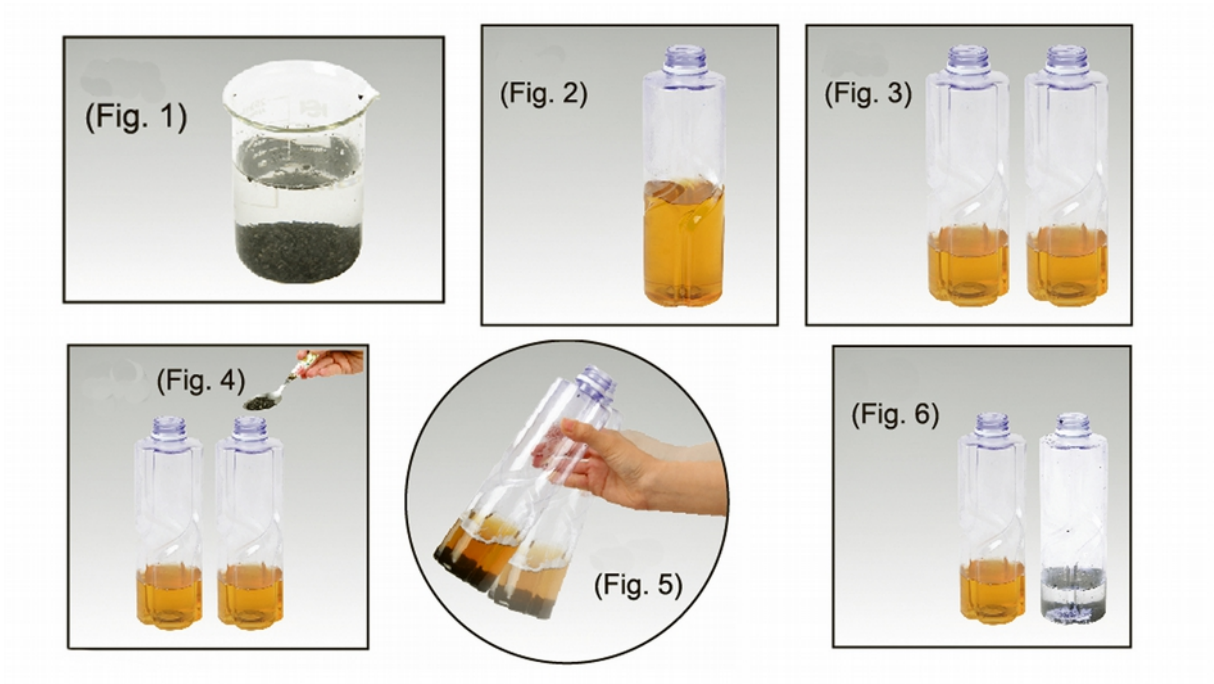
2 - Load the bottle with a third water. Then slowly add a little soy sauce, until the water is the color of tea (fig. 2).

3 - Set half the soy sauce diluted in the other bottle (fig. 3).

4 - Put 3 or 4 teaspoons of activated charcoal (washed in the first step), one of the two bottles of water to dilute soy sauce.

5 - Adding active carbon and stir gently. Place the two bottles they rest side by side. After a time compare the color change (Fig. 5).

6 - The color of the water bottle that had activated carbon, gradually clearing after a few hours (Fig. 6).



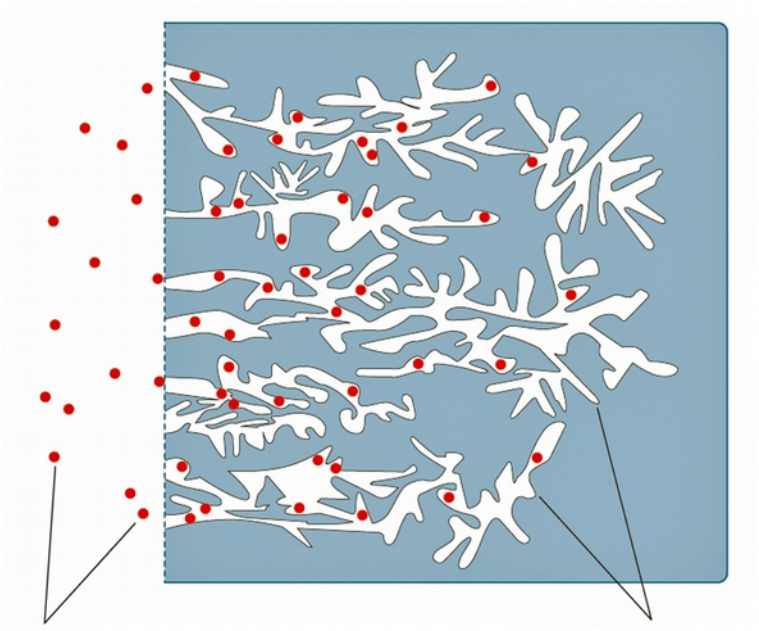
NOTE:
DO NOT DRINK !
Clean water, but not drinking

If you need more activated carbon, where you can buy or sell aquariums accessories. Activated carbon is usually used to filter water from the tanks.
How active carbon filtration works?
We can do research together. You can try a liquid containing no juice, wheat and tea, coffee or mouthwash (brown color). Prepare bottles with water and dilutes the liquid going to try instead of soy sauce. The time of the chemical reaction to lighten the color may differ depending on the product that is, from a few hours to several days.

Operation activated carbon

This experiment proves that the activated carbon has the function of absorbing the color composition. In a water treatment plant, activated carbon is used to clarify the composition of odor in water and some substances can not be cleaned by coagulants, chlorine, etc. Activated charcoal seems black pellet. Actually there are some very small pores on its surface. Are these small open pores which help absorb odors.
Activated carbon can also be used in our home water purifier, to get rid of the chlorine contained in tap water. In addition, it can also be used as a deodorant in the refrigerator. Of course, once activated carbon absorbs a certain amount of soil, absorption capacity is limited. Therefore, it is necessary to regularly replace the activated carbon.

Activated carbon



it seems like a lie !Let's do the experiment!

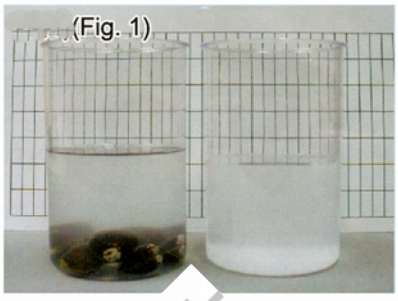
Other materials required : Materials also need: two transparent containers 10 clams (.. Must be alive if purchased at the store, you must store them in the refrigerator should be taken out of the refrigerator about 30 minutes before starting the experiment), water washing rice and water.

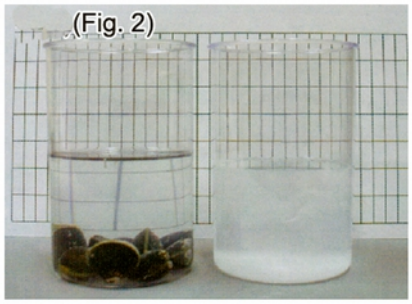
1 - Use water to dilute the water to wash the rice, until the white turbidity appears.

2 - Place equal amounts of water diluted in each of the two containers rice.

3 - Put the clams in one of the containers (fig. 1). This container is put on the inner side of a pot or a box used to cover and prevent it from direct sunlight (clams typically live in soil under water). After one hour, try to observe them.

4 - Once after 2 or 3 hours, have you noticed that the water container with clams has been transparent? Put two writings or drawings behind each container and compare them papers (fig 2).





When the clams remain in water, absorb and feed on plankton and algae that live on it, therefore, filter the water and cleaned. Wherever they are, they filter plankton and algae. When we are so amazed thinking that clam has strong purifying role of water, we think that in the case of water containing poisonous substances, people who eat these clams also poison.
This experiment can also be made with river snail.

NOTE:
DO NOT DRINK !
- Clean water is not drinkable but
- The clams used in this experiment can not be eaten.

Does the "filtered water" is what it seems?

Is clear water? o Is water safe to drink?
The guy who has a fishbowl may think it's filtered water of your aquarium.
In fact, both are correct; however, better from "drinking water" in order to discuss this issue.
Currently, the source of tap water is the water of the river. Water stored in the treatment plant or in the water tank is similar to have purified water in the four previous experiments. It is also filtered through a coagulating agent and a filter. At the end chlorine is added to disinfect and then distributed
each household.
This experiments kit is a "mini-water treatment plant."
Arguably water circulation in nature is like a long filtering system. Since the evaporation of water subsequently becomes clouds, then rain, and when it falls on the earth in rivers, where it circulates again; does the same operating principle as the end of the experiment 2. The space between the granules of sand of the riverbed, not only has the same function of the pores, but the microorganisms that live there, also help purify water and perform the function of "biological filtration".
The boy feeding her tropical fish or marine fish, you should understand the importance of the bottom of the tank must be covered with sand or coral rock. It requires a heavy time for the microbes living in the sand or rock, so we recommend the use of shells to do this experiment immediately. By following these tips, surely the result will be better.
The "biological filtration" a kind of purification of water, slowly but surely, you do not need chemicals for water. Today it is being studied.
The experimental device of this kit, can help purify dirty water clear and clean water; however, it is not at all safe drinking water can be drunk directly. Even if it seems completely clean and clear, because there in the water many chemicals, microbes and bacteria invisible. Still you need quite a lot of work procedures before the water becomes safe and potable. Still, you need to check carefully whether you drink or not, or whether it will be a harm to human body or not.
As you can see, do the clean, safe drinking water is a very complicated job.
We must cherish every drop of water!

NOTE: This product is an experimental device that is used only for explaining the operating principle of a water purification. Produced water after filtration of this experiment should not be taken as drinking water.DO NOT DRINK THIS WATER!

NOTE: This kit is recommended for children from 10 years, always accompanied by an adult