

EDUCATIONAL GUIDE *for the professor*

EDUCATIONAL CARD ON UNIVERSAL ACCESS AND CONSUMPTION OF DRINKING WATER

LEVEL : Secondary 1-2

DISCIPLINE(S) : Ecology, Geography, home economics, personal and social formation, religious and/or moral studies, etc.

LENGTH: 50 minutes (or more)

GENERAL OBJECTIVE : Teach students about the wealthy value of water to the world.

Following the activity, the student will be able to: _____

- Analyse relevant information on the problematic of access of drinking water.
- List causes and consequences of the scarcity and the pollution of water.
- List factors contributing to the amplification of the problematic on access to drinking water.
- List some actions that can be taken to consume water more responsibly.
- Estimate their daily water consumption.
- Exploit, inasmuch as possible, relevant references on the subject.

Secondary aptitudes developed by the educational card: _____

1. Intellectual aptitudes:

- Make use of the information
- Exercise his critical judgment
- Use his creativity

2. Social and personal aptitudes:

- Cooperate (if possible)

3. Methodological aptitudes:

- Make use of the new technologies of information and communication

4. Communicative aptitudes

- Communicate properly in writing



EDUCATIONAL SCENARIO



1 At the beginning (5 minutes)

A- Poll: How much do you know about water? _____

Do you think there is enough water on the planet to satisfy everyone's thirst?

We estimate the world resources to be sufficient. The problem is related to distribution (10 countries share 60% of the water), deterioration (pollution of water) and responsible management (wasting water).

What percentage of the planet is covered in water?

Almost three quarters (70%) of the planet is covered in water.

What percentage of water on the planet is fresh water?

2.5%, less than 1% of which is easily accessible.

The remaining percentage of water (97.5) contains so much salt that it is unusable to humans, to agriculture and to the manufacturing sector.

How many people on the planet wont have access to drinking water today?

Roughly 1.2 billion people.

NOTICE: *It would be interesting to ask a student to come up to the board and write down this number (1 200 000 000). Comparing it to the population of Canada (30 000 000).*

How many litres of water do you think you use every day?

The average usage of water per capita in North America and Japan is about 600 litres per day. In Europe, this average falls to 250-350 litres per day and it falls even further for sub-Saharan Africa with an average of 10-20 litres per capita per day. The world average is about 137 litres.

Compare the price for a litre of water (\$1.19) and a litre of gas (\$0.75)?

Do you think this is normal?

B- Presentation of the course's objectives. _____

NOTICE: *Mention to students that their educational card contains an activity where they can calculate their daily consumption of water.*

II Explain and carry out the educational card (30 minutes)



III Correction (12 minutes)

Block B

Answer 1: personal answers from students

Answer 2:

- Access to water is difficult because it is buried deep underground or located on glaciers in around the tips of the earth.
- Water pollution
- Overexploitation of water resources leads to the draining of water streams.
- Many people do not have access to a water purification system.

Answer 3: If time allows, this question can spark a debate in class.

Answer 4: Some examples:

- Don't let water run needlessly when brushing your teeth.
- Install a water-saver device in the toilet.
- Install a showerhead with a smaller debit of water.
- Wait for the dishwasher to be full before turning it on.
- Obey municipal rules concerning the watering of lawns (don't water under the sun because the water evaporates).
- At all times, don't let water running needlessly.
- Use water-saver household appliances.
- Repair leaks.
- Water the plants down with the water used to wash vegetables.
- When possible use biodegradable detergents.
- Collect all chemical agents, paint, oil, greases, etc. and bring them to your municipality's toxic waste container.



Block D

Out of the 10 choices given on the causes of pollution and scarcity of water, students should have chosen the following:



- **Resource Wasting:**

An obvious reality is that the more water we need, the more it becomes scarce. The speed of the natural water cycle can sometimes lack behind the speed of human usage. This causes lakes and rivers to disappear.

- **Excessive spreading of manure and fertilizers:**

Agriculture requires a large amount of chemical fertilizer and manure spreading. A large part of the nutritional elements, such as nitrogen and phosphorous, ends up in the water streams. This disrupts ecosystems and increases the cost of water purification.

- **Pumping of water tables for commercial use:**

In accordance with many civil codes, water is regarded as a private property. The more a company pumps water out for itself, the less there is for others. This contributes to the scarcity of water and causes conflicts.

- **Climate change (due to greenhouse gas):**

Climate changes have been the causes of many natural catastrophes encountered around the world. One cause is the decrease in rain in arid regions. Less rain means less water.

- **Unequal geographical distribution of fresh water:**

Certain regions and/or countries enjoy very important fresh water resources. Quebec holds 3% of the worldwide fresh water resources. At the opposite side are the sub-Saharan African countries. Many factors are responsible for this unequal distribution (hydrography, topography, winds, etc.)

- **Deforestation:**

Trees contribute to keep the water in the ground and also act as a cover for the soil. In large areas where all the trees were cut down, evaporation is increased and these masses of water are displaced further away with the winds.

- **Increase of water usage for the world's population:**

The world's population is constantly increasing. Therefore, the need for water is also increasing. So we can definitely say that an increase in water usage over the world's population is a factor of water scarcity.

The other answers are wrong for the following reasons.

·□ **Development of road infrastructure and Construction of bridges over rivers:**

Road infrastructures do not account to water pollution. Even though they often cross water streams, roads and bridges are designed with respect to the environment.

·□ **Usage of air tanker to put off forest fire:**

This activity uses a negligible amount of water compared to other human activities, such as the irrigation of fields, which causes pollution and scarcity of water.



Block E

Out of the 10 choices given on the consequences of pollution and scarcity of water on the population and their surroundings, students should have chosen the following:

·□ **Deterioration of ecosystems:**

When a stream of water is polluted, so are the living organisms living in it or adjoining it. Some examples: belugas found in the St-Lawrence river are often found dead because of chemical agents disposed in the river by adjoining industries.

·□ **Increase in diseases related to contaminated water:**

Water dirtied by soap, paint and excrements must be purified before it can be consumed. Unfortunately, in many poor countries, there is no purification system because of the costs related to it. Every year, over 5 million children under 5 years of age die because of contaminated water. On a worldwide scale, diseases caused by contaminated water account for more deaths than the one related to aids and cancer summed up together. (Conference on water, 1992)

·□ **Impoverishment of agriculture soils:**

You need water to grow plants. Water contains essential vitamins and minerals for plant growths. Therefore, regions where drought occurs often are unusable for agriculture.

·□ **Poverty, famine and human deaths:**

Without water there is no life! Without water you cannot grow plants. Without plants you become hungry. Without water you become thirsty. All these are factors of human deaths.

·□ **Contamination of water tables with chemical agents:**

Water around the planet follows a cycle. When this water is infected with chemical agents or other toxins, it consequently infects water tables.

· **Populations moving in search of water:**

People living in dry areas of the world have to move around continuously in search of water. Many wells are dug and then abandoned when they are empty.

· **Conflicts between countries for the water resources:**

Water, also called "blue gold", is an important economical stake for many people. It is therefore the reason for world conflicts.

The other answers are wrong for the following reasons.

· **Decrease of desertification:**

The scarcity of water causes desertification. This is an important problem, because the large deserts around the world are in expansion.

· **Easier daily tasks for people:**

Because water is becoming more and more scarce, daily supplies of water are getting harder and harder to get for some communities in poor regions. This means that cooking and washing, usually done by the woman, is taking more and more time.

· **Decrease in costs linked to water purification:**

Water must be treated before it is consumed. The dirtier the water, the more expensive are the purification systems. Therefore dirty water increases the cost of water purification.

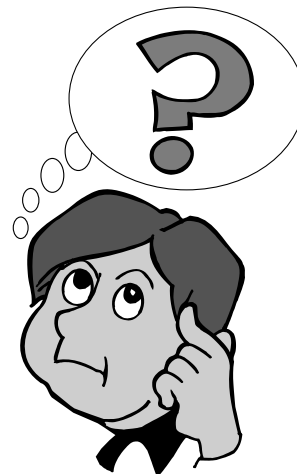
Block F

Fictitious case = 154 litres

Personal case = personal answers from students

It would be interesting to ask students:

- Who consumes more than 200 litres?
- Less than 100 litres?
- Between 100 and 200 litres?



NOTICE: It is important to remind students that this calculation only accounts for 4 daily activities. Many other activities were not considered and would greatly affect the total litres. Examples of these activities are washing clothes, personal hygiene needs, water needed for cooking, water needed to wash clothes/ the car, water for the plants and the animals, etc.

▼ Conclusion and Integration (3 minutes)

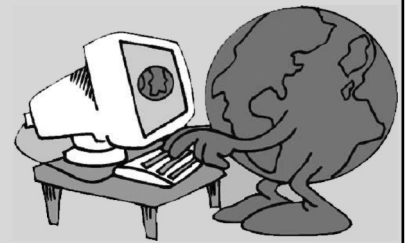
Ask students what they learned during this activity.

Problems related to water must make us question our consumption of this resource that is becoming more and more scarce. It is good to remind students the causes and consequences of the pollution and scarcity of water. We must become more responsible in the way we use this resource and stand together so that water becomes accessible to all of us.



RELEVANT REFERENCES ON THE SUBJECT

- <http://www.unesco.org/water/>
- <http://www.worldwatercouncil.org/>
- <http://www.irc.nl/>
- <http://www.worldwaterday.org/>



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