

Fantastik'eau

I love water. I take care of it!



.....
**THE FANTASTIK'EAU EDUCATIONAL PACKAGE (2ND EDITION)
COMPLETE GUIDE: CYCLE 1**
.....

2nd edition, 2022

ISBN 978-2-9814648-7-3 (Set, PDF)

(Édition originale : ISBN 978-2-9814648-6-6 (2^e édition, 2022) (Ensemble, PDF), Éditions Centre d'interprétation de l'Eau, Laval)

ISBN 978-2-9814648-1-1 (1st edition, 2014) (Set, Printed version)

Published in 2014 under the title Fantastiko! I love water, I care for it! : educational kit for the elementary cycle three on the conservation of drinking water (Édition originale: ISBN 978-2-9814648-0-4 (1ere édition, 2014) (Ensemble, imprimé), Éditions Centre d'interprétation de l'Eau, Laval)

Registration of Copyright – Bibliothèque et Archives nationales du Québec, 1st Term 2022

Laval, Québec

EXCERPT TAKEN FROM:

Fantastik'eau I love water. I take care of it!

The Fantastik'eau educational package: Complete Guide, 2nd edition

This educational package was created by the CENTRE D'INTERPRÉTATION DE L'EAU

12 Hotte Street

Laval (Québec) H7L 2R3

Phone and fax: 450 963-6463

www.cieau.org • info@cieau.org

CREDITS

This educational package was created by the Centre d'interprétation de l'eau (C.I.EAU), with the financial support of the Québec Ministry of Municipal Affairs and Housing (MAMH).

The C.I.EAU would like to thank everyone involved in the production of these materials, including all creative resources, technical and educational advisors, translators, and anyone whose ideas enriched the content of the Fantastik'eau I love water. I take care of it! project.

The full list of people who contributed to the project (employees, volunteers, contract workers) is displayed on the C.I.EAU's website.

Collaboration—education: Virus 1334, Le Récit

Graphic design: Virus 1334

Illustrations: Simon Says Design

TABLE OF CONTENTS

INTRODUCTION

Current Situation	04
Foreword	05
Fantastik'eau Activities	06
Educational Objectives	07
Meet The Fantastik'eau Crew!	08

MINI-ACTIVITY

Mini-Activity A : Aqua-Responsible Behaviour	09
Teacher's Guide	10
Student Workbook	12
Answer Key	15
Mini-Activity B : The Water Expert's Report	17
Teacher's Guide	18
Student Workbook	20

EXTRA MISSION

Mission 03 : Water's Path, What A Maze!	22
Student Workbook	23
Answer Key	28
Bibliography & Webography	31

CURRENT SITUATION*

In 2018, the water distributed in Québec amounted to 1 345 million cubic metres per year, which is the equivalent of 358 667 Olympic swimming pools! Québeckers are among the people who consume the most drinking water in the world, even though their way of life is similar to that of many other countries, particularly in Europe, where water is used sparingly.

Water may seem overabundant on our planet, but treating it is more complicated than it seems. The vast majority of the Earth's water (the oceans, for instance) is salty, making it very difficult and costly to use as drinking water.

The Québec Ministry of Municipal Affairs and Housing estimates that, in 2018, the average distribution of drinking water in a city of Québec amounted to 536 litres of water per capita per day. Half of this water is dedicated to commercial, industrial and institutional uses or is lost to leaks in the water supply system. Citizens, however, can have a significant impact on half the volume of this colossal consumption of water.

Currently, over 40% of Québec's water distribution network suffers from a high or very high level of leaks while the levels of moderate and low leakage account for 26% and 31% respectively. In general, Québec's leakage level is high, which significantly increases its distribution of drinkable water.

Bottled water represents another major problem. Not only does bottled water cost consumers 1 000 times more money, but 25% of the bottled water on the market is regular tap water. Producing a bottle of water requires even more water than it carries. Therefore, drinking bottled water is not a viable long-term solution.

The quality of Québec's drinking water is excellent. Several of the province's drinking water treatment plants exceed government standards in terms of water quality. Without a doubt, this resource is the blue gold of Québec.

The Québec government's goals for 2019–2025: reduce the amount of water distributed per capita by at least 20% compared to 2015, and reach moderate or low leakage levels throughout the province.

For more information on water and the issues affecting it, visit C.I.EAU's website at www.cieau.org.

*To learn more about the sources of this documentation, please refer to the Bibliography and Webography at the end of this document.

FOREWORD

The Centre d'interprétation de l'eau (C.I.EAU) is pleased to present this second edition of the Fantastik'eau activity package. The materials and the slogan "I love water. I take care of it!" aim to raise awareness about a very valuable resource: water.

Fantastik'eau is an educational package that includes eight scientific missions. These missions describe fun and instructional learning situations for elementary students in all three cycles. The package was designed to offer connections with the curriculum of the Québec Education Program (QEP).

Two of the missions were designed to be done in a classroom environment. The six other missions are intended for families at home or to deepen students' learning at school. Each of these eight missions includes a short video featuring Jérémie Larouche, a comedian, host, and scientific popularizer.

This package is intended to provoke questions and a sense of wonder about the omnipresence of water in our daily lives. Its ultimate goal is to instill a desire to protect it and manage it more effectively.

From a young age, children today have a strong awareness of environmental issues, along with a willingness to play an active role in society. Therefore, it is important to provide these future agents of change with opportunities to develop their burgeoning sense of civic responsibility.

Schools provide an ideal environment to raise or strengthen awareness about the wasting of our most precious resource.

Together, we can make a difference!

FANTASTIK'EAU ACTIVITIES



Cycle 1

AQUA-RESPONSIBLE BEHAVIOURS

This activity invites students to think about different habits they can adopt regarding water. What are the impacts of these habits? Which ones are ideal, and why?



Cycle 1

THE WATER EXPERTS' INVESTIGATION

Your class will embark on an investigative adventure to find out where drinking water is used at school. Students will offer suggestions to improve water consumption by completing the "Water experts' report."



Cycle 2

Cycle 3

WHERE DOES DRINKING WATER COME FROM?

This first mission explains where drinking water comes from. Students learn about the source from which a drinking water treatment plant draws its water and how it is treated. A problem arises at the drinking water treatment plant, and students must therefore make their own "water filter" and calculate the proportions of water they can filter using it.



Cycle 2

Cycle 3

SAVING DRINKING WATER

During this second and main mission, your students will dive into the action by learning how a water-saving device works (scientific method). All the materials you need are easy to find at home! This mission offers fun ways to approach problem-solving, to calculate surface areas, and to determine drinking water savings in percentage values.



Cycle 1

Cycle 2

Cycle 3

WATER'S PATH, WHAT A MAZE!

THE WATER TOWER

ALERT! THERE'S A LEAK!

THE SONOSCOPE IS LISTENING!

IN HOT WATER

QUIZ: HOW WATER-CONSCIOUS ARE YOU?

Your students are thirsty for more? No problem! We have a list of short missions that can be done in the classroom or at home to deepen their learning in mathematics and in science and technology. From experiments to games and quizzes, there's something for everyone!

THE FANTASTIK'EAU WEBSITE

To view and download all of the Fantastik'eau content, visit the C.I.EAU's website at www.cieau.org/fantastikeau

THE FANTASTIK'EAU VIDEO SERIES

Our extra missions are all accompanied by a video featuring Jérémie Larouche, who invites students to experiment with him. Check them out on our website or YouTube channel!



EDUCATIONAL OBJECTIVES

LEARNING OBJECTIVES



Each activity is put into a fun and practical context with inspiring characters, all while focusing on learning.



Through these activities, your students will learn:

1. How to use certain objects and simple scientific principles to save drinking water on a daily basis.
2. How to calculate water savings achieved by adopting environmentally responsible behaviours.
3. Where the water that goes through the urban water cycle comes from.

CONNECTIONS WITH THE CURRICULUM OF THE QUÉBEC EDUCATION PROGRAM (QEP)

- **Ethics and Religious Culture** (Cycle 1): Give examples of actions that can foster the well-being of living beings; Give examples of actions that are harmful to living beings.
- **Mathematics** (Cycles 2 and 3): Measurement units; Decimals; Perimeter; Estimating surface areas; Proportions; Percentages.
- **Science and technology** (Cycles 2 and 3): Technological design; Scientific method; Impact of the quality of water on living beings; Water cycle.

At the end of this adventure, everything will be crystal clear... like a glass of fresh water!



INTERACTIVE WHITEBOARD

To facilitate classroom activities, some assignments are available in **IWB** formats.

Mini-Activity A: Aqua-Responsible Behaviours

Mini-Activity B: The Water Expert's Report

Mission 01: Crystal Clear

Mission 02: Saving Drinking Water

Extra Mission 03: Water's Path, What a Maze!

Extra Mission 08: Quiz: How Water-Conscious Are You?

Find and download the **IWB** formats for these activities on our website at www.cieau.org/fantastikeau

THE FANTASTIK'EAU EDUCATIONAL PACKAGE

MEET THE FANTASTIK'EAU CREW!

Join **Wasteful Wally** and **Conscious Charlie** in their misadventures, while experiencing science and technology. These two characters do their best to protect our precious blue gold ... but despite their best intentions, they always seem to be treading water! You and your students must come up with inventive solutions to help them out.

The **Fantastik'eau crew** will help you succeed in this mission.

Young, curious and meticulous, **Aqua-Mary** is eager to know how everything works. She's also a swimming athlete. Her discipline is ... unwavering, which is especially helpful in mathematics and in science and technology!

Walter was born in Québec, but his parents are from India, a country struggling with a drinking water crisis. Potable water is becoming increasingly difficult to source in his parents' home country. He understands that it is a very precious resource indeed, and he has a ton of clever ideas to conserve it.

Jérémie, **Aqua-Mary** and **Walter** are joined by **Crystal Clearwater**, a water treatment expert who helps them deepen their knowledge of water.



Wasteful Wally



Conscious Charlie



Jérémie



Aqua-Mary



Walter



Crystal Clearwater



JÉRÉMIE LAROUCHE:

A comedian who has won several awards, Jérémie also runs a YouTube channel with his daughters, hosts a podcast, and collaborates on a number of television shows. Among other projects, he is the host of several programs for young viewers. Jérémie dived into the Fantastik'eau experience by tackling the extra missions.

MINI-
ACTIVITY

A

Fantastik'eau

I love water. I take care of it!

AQUA-RESPONSIBLE BEHAVIOURS



CYCLE 1

MINI-
ACTIVITY

A

Fantastik'eau

I love water. I take care of it!

AQUA-RESPONSIBLE BEHAVIOURS



TEACHER'S GUIDE
CYCLE 1

IWB

ACTIVITY ALSO
AVAILABLE IN
INTERACTIVE
WHITEBOARD
FORMAT!

cieau.org/fantastikeau

MINI-ACTIVITY A: AQUA-RESPONSIBLE BEHAVIOURS

BACKGROUND

Wasteful Wally wastes a lot of water, and not just when he is taking a shower! He also wastes water in many daily activities, without even realizing it. Conscious Charlie doesn't like seeing all this precious water go to waste! He knows how important water is, and he cares a lot about saving it.



INSTRUCTIONS FOR CYCLE 1 ELEMENTARY STUDENTS

1. YOUR TASK

Place the careless water habits to be avoided under the picture of Wasteful Wally, and the wise water habits to adopt under the picture of Conscious Charlie.

CONSCIOUS CHARLIE'S WISE WATER HABITS



- Taking a 5-minute shower
- Closing the tap when washing your hands or brushing your teeth
- Putting water in a pitcher and keeping it in the fridge to have cold water at all times
- Starting the dishwasher when it's full

WASTEFUL WALLY'S CARELESS WATER HABITS



- Taking a 15-minute shower
- Taking a bath
- Watering the yard with a hose to melt the snow
- Leaving the tap open when washing your hands or brushing your teeth
- Letting the tap water run to have cold water
- Starting the dishwasher when it's half empty

MINI-
ACTIVITY

A

Fantastik'eau

I love water. I take care of it!

AQUA-RESPONSIBLE BEHAVIOURS



STUDENT WORKBOOK
CYCLE 1



BACKGROUND

Wasteful Wally wastes a lot of water, and not when he is taking a shower! He also wastes water in many daily activities, without even realizing it. Conscious Charlie doesn't like seeing all this precious water go to waste! He knows how important water is, and he cares a lot about saving it.



THIS IS A JOB FOR
THE FANTASTIK'EAU CREW!



ACTIVITY











Cut out the sentences below describing various water-related habits. Place the careless water habits that should be avoided under the picture of Wasteful Wally, and the wise water habits to adopt under the image of Conscious Charlie.

CONSCIOUS CHARLIE'S WISE WATER HABITS



WASTEFUL WALLY'S CARELESS WATER HABITS



	Taking a 5-minute shower		Taking a 15-minute shower		Taking a bath
	Watering the yard with a hose to melt the snow		Leaving the tap open when washing your hands or brushing your teeth		Closing the tap when washing your hands or brushing your teeth
	Letting the tap water run to have cold water		Putting water in a pitcher and keeping it in the fridge to have cold water at all times		Starting the dishwasher when it's half empty
	Starting the dishwasher when it's full	✂			

MINI-
ACTIVITY

A

Fantastik'eau

I love water. I take care of it!

AQUA-RESPONSIBLE BEHAVIOURS







ANSWER KEY
CYCLE 1



ANSWER KEY

CONSCIOUS CHARLIE'S WISE WATER HABITS



	Taking a 5-minute shower
	Closing the tap when washing your hands or brushing your teeth
	Putting water in a pitcher and keeping it in the fridge to have cold water at all times
	Starting the dishwasher when it's full

WASTEFUL WALLY'S CARELESS WATER HABITS



	Taking a 15-minute shower
	Taking a bath
	Watering the yard with a hose to melt the snow
	Leaving the tap open when washing your hands or brushing your teeth
	Letting the tap water run to have cold water
	Starting the dishwasher when it's half empty

MINI-
ACTIVITY

B

Fantastik'eau

I love water. I take care of it!

THE WATER EXPERTS' REPORT



CYCLE 1

MINI-
ACTIVITY

B

Fantastik'eau

I love water. I take care of it!

THE WATER EXPERTS' REPORT



TEACHER'S GUIDE
CYCLE 1

IWB

ACTIVITY ALSO
AVAILABLE IN
INTERACTIVE
WHITEBOARD
FORMAT!

cieau.org/fantastikeau

MINI-ACTIVITY B: THE WATER EXPERTS' REPORT

BACKGROUND

The Fantastik'eau crew invites you and your class to think about all the places where drinking water is consumed in your school. Become investigators and show everyone you're bona fide water experts!

INSTRUCTIONS FOR CYCLE 1 ELEMENTARY STUDENTS

1. YOUR TASK

Have a group discussion with your students about the ways you can save drinking water at school in the different locations you identified.

Now that your students are water experts, you can encourage them to raise awareness around them about conserving drinking water at school. They can also make recommendations to their school's administrators in relation to their findings or even create posters and make them available to all the students and staff of the school. The choice is yours!



THE WATER EXPERTS' REPORT

PLACES	SOURCES	SOLUTIONS
Washrooms	Sinks Toilets	
Cafeteria	Dishwasher Sink Drinking fountain	
Locker rooms/Gymnasium	Toilets Showers Drinking fountain	
Hallways	Drinking fountain	
School playground	Drinking fountain	

MINI-
ACTIVITY

B

Fantastik'eau

I love water. I take care of it!

THE WATER EXPERTS' REPORT



STUDENT WORKBOOK
CYCLE 1



BACKGROUND

The Fantastik'eau crew invites you to think about all the places where drinking water is consumed in your school. Become an investigator and show everyone you're a bona fide water expert!

YOUR TASK

Have a group discussion about the ways you can save drinking water at school in the different locations you identify.

THE WATER EXPERTS' REPORT

PLACES	SOURCES	SOLUTIONS

Now that you and your classmates are water experts, you can raise awareness around you about conserving drinking water at school. You can also make recommendations to your school's principals and administrators in relation to your findings, or even create posters and make them available to all the students and staff of the school. The choice is yours!

EXTRA
MISSION

03

Fantastik'eau

I love water. I take care of it!

WATER'S PATH, WHAT A MAZE!



IWB

ACTIVITY ALSO
AVAILABLE IN
INTERACTIVE
WHITEBOARD
FORMAT!

cieau.org/fantastikeau

CYCLE 1

EXTRA
MISSION

03

Fantastik'eau

I love water. I take care of it!

WATER'S PATH, WHAT A MAZE!



STUDENT WORKBOOK
CYCLE 1

BACKGROUND

The plans of the water network in Conscious Charlie and Wasteful Wally's town were lying on Crystal Clearwater's desk, but a gust of wind scattered everything. Join the Fantastik'eau crew and try to put the stages of the urban water cycle back in order.



JÉRÉMIE : Now that you're a water treatment expert, you can apply your new knowledge by doing other fun activities!



THIS IS A JOB FOR
**THE
FANTASTIK'EAU
CREW!**

**DO THIS ACTIVITY
WITH JÉRÉMIE**

Watch the short video featuring Jérémie, and do the activity with him! All of the Fantastik'eau content and videos are available on the C.I.EAU's website at:

www.cieau.org/fantastikeau

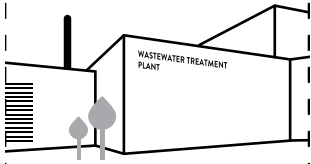
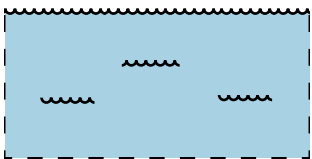
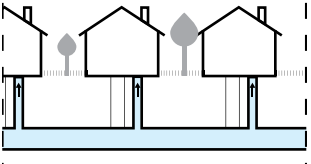
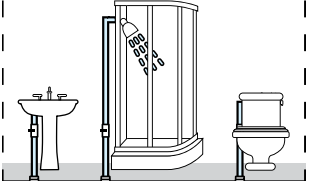

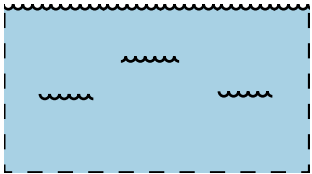
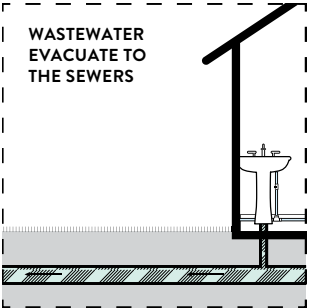
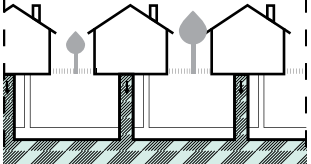
EXTRA MISSION
03

PUT THE IMAGES IN THE CORRECT ORDER

They must form a circle—like the urban water cycle!

Hint : Start with the river, which provides the water, and finish with the river that receives the treated wastewater.

✂

<p>WASTEWATER TREATMENT PLANT</p> 	<p>RIVER RECEIVING TREATED WATER</p> 	<p>DRINKING WATER DISTRIBUTION SYSTEM</p> 	<p>HOMES (TAPS, SHOWERS, TOILETS, ETC.)</p> 
<p>DRINKING WATER TREATMENT PLANT</p> 	<p>RIVER SUPPLYING WATER</p> 	<p>WASTEWATER EVACUATE TO THE SEWERS</p> 	<p>SEWERS</p> 

EXTRA MISSION
03

PUT THE IMAGES IN THE CORRECT ORDER

They must form a circle—like the urban water cycle!

Hint : Start with the river, which provides the water ...
and finish with the river that receives the treated wastewater.

THE URBAN WATER CYCLE

The puzzle consists of eight empty square boxes arranged in a circle around the central text. Each box contains a small circle with a number from 01 to 08. The boxes are positioned as follows: 01 (top), 02 (top-right), 03 (right), 04 (bottom-right), 05 (bottom), 06 (bottom-left), 07 (left), and 08 (top-left).



JÉRÉMIE : Do you know where the drinking water treatment plants are located in your town or city? A quick Web search should help you find out!



DIVING DEEPER

The drawing above represents the cycle that drinking water goes through in an urban environment. You can print the page and, using a pencil, draw a line representing the path that the water must follow to get to your home. Here's a hint to help you with this exercise: your line must start and end at the river.

Look at the drawing and identify the following:

- 1 – the drinking water treatment plant
- 2 – the wastewater treatment plant
- 3 – the river that receives the treated water
- 4 – the river that provides the water
- 5 – the drinking water distribution system
- 6 – the wastewater evacuate to the sewers
- 7 – the sewers

MAKE A SCALE MODEL

Using the picture above for inspiration, take the time to create your own scale model! In your classroom or at home, you can design a scale model of the drinking water distribution system. To create it, use what you find at home or in your recycling bin: milk cartons, cardboard paper towel tubes, or anything that inspires you! On your model, make sure you locate:

- the drinking water treatment plant
- the wastewater treatment plant
- your home!

QUESTIONS

The wastewater that leaves a house flows into the sewers. Does it go directly to the river? If not, where does it travel?

In which water system does water flow faster? The drinking water distribution system or the sewer system? Does water flow at the same speed in both systems?

Firefighters often use drinking water to put out fires. Why?

EXTRA
MISSION

03

Fantastik'eau

I love water. I take care of it!

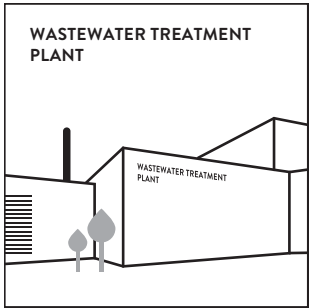
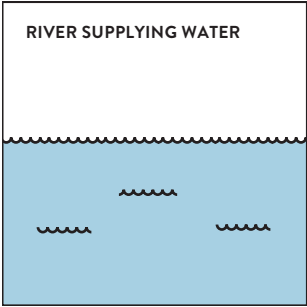
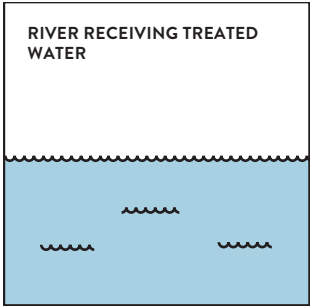
WATER'S PATH, WHAT A MAZE!



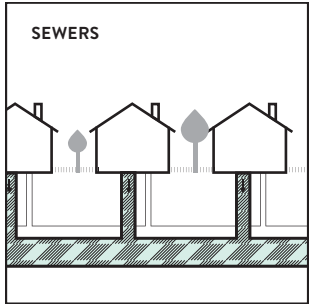
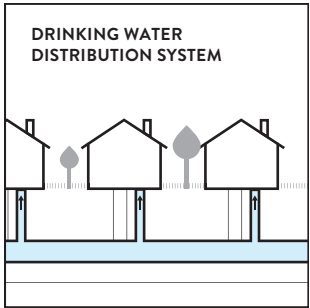
ANSWER KEY
CYCLE 1

EXTRA MISSION
03

ANSWER KEY



THE URBAN WATER CYCLE



DIVING DEEPER



- | | |
|---|---|
| 1 Drinking water treatment plant | 5 Drinking water distribution system |
| 2 Wastewater treatment plant | 6 The wastewater evacuate to the sewers |
| 3 River that receives the treated water | 7 Sewers |
| 4 River that provides the water | |

QUESTIONS

The wastewater that leaves a house flows into the sewers. Does it go directly to the river? If not, where does it travel?

Answer: To the wastewater treatment plant.

In which water system does water flow faster? The drinking water distribution system or the sewer system? Does water flow at the same speed in both systems?

Answer: The sewer system. In some cities, the sewer systems are designed, in whole or in part, to also receive part of the rainwater and snowmelt. This water significantly increases the flow rate at the wastewater treatment plant because it is added to the water polluted by residential, commercial, institutional (e.g. schools and hospitals), or industrial uses.

Firefighters often use drinking water to put out fires. Why?

Answer : Because of the pressure. The fire hydrants you see along streets are connected to the water supply distribution system (aqueduct). In fact, a fire hydrant is like a huge tap that stands three metres high and looks like a person. The visible portion of the fire hydrant is that person's head, and a nut is used to open or close the mechanism in the person's foot (located underground). When the mechanism is opened, water rises to the head and comes out of the ears! The water comes out at full speed because it is pushed by the drinking water treatment plant's high-pressure pumps.

The following is a list of books, websites, pages, and publications dealing directly with the subjects covered in the Fantastik'eau educational package.

BIBLIOGRAPHY

American Water Works Association. *The Water Dictionary*, 2010, 717 pages.

Réseau Environnement. *Le contrôle des fuites*, 1999, 54 pages.

Canadian Mortgage and Housing Corporation. *Household Guide to Water Efficiency*, 2005, 77 pages.

WEBOGRAPHY

All links associated with the references in this webography were functional on November 24, 2021.

American Water Works Association. Organization dedicated to water resource management. www.awwa.org

Centre d'interprétation de l'eau (C.I.EAU) www.cieau.org

Centre d'information sur l'eau. Les ressources en eau dans le monde.

www.cieau.com/les-ressources-en-eau/dans-le-monde/ressources-en-eau-monde

Eau Secours - *Comment l'eau est utilisée à l'échelle de la planète ? L'eau en chiffres*. eausecours.org/leau-en-chiffres

EnviroCompétences – *Étude sur la main-d'œuvre de la filière eau*.

www.envirocompetences.org/media/publications/RapportEnviroComptences-tudesurlamaindoeuvredanslesecteureau-VF.pdf

Québec Ministry of Municipal Affairs and Housing (MMAH). *2019–2025 Québec Strategy to Save Drinking Water (French only)*

www.mamh.gouv.qc.ca/fileadmin/publications/grands_dossiers/strategie_eau/strategie_eau_potable.pdf

Québec Ministry of Education and Higher Education of Québec. Programs of Study.

www.education.gouv.qc.ca/en/teachers/programs-of-study

Québec Ministry of Sustainable Development, Environment, and Fight Against Climate Change.

Directory of drinking water distribution systems, groundwater supplied (French only):

www.environnement.gouv.qc.ca/eau/potable/production/index_st.asp

Québec Ministry of Sustainable Development, Environment, and Fight Against Climate Change.

Directory of drinking water distribution systems, freshwater supplied (French only):

www.environnement.gouv.qc.ca/eau/potable/production/index.asp

Réseau Environnement - *PEXEP-T Programme d'excellence en eau potable - Traitement*

reseau-environnement.com/secteurs/eau/programmes/programme-dexcellence-en-eau-potable-traitement-pexep-t

Safe Drinking Water Foundation. *Bottle Water Fact Sheet*.

www.safewater.org/fact-sheets-1/2017/1/16/bottled-water

Fantastik'eau

I love water. I take care of it!



**ENJOYED THE EXPERIENCE? VISIT THE C.I.EAU'S WEBSITE
FOR EVEN MORE EDUCATIONAL CONTENT:**

CIEAU.ORG

SPECIAL THANKS

This project was made possible thanks to the support of the Ministry of Municipal Affairs and Housing.