EXTRA MISSION 05

Fantastik'eau

I love water. I take care of it!

ALERT! THERE'S A LEAK!

CYCLE 2

C.I.EAU Centre d'interprétation de l'eau

Québec

EXTRA MISSION 05

Fantastik'eau

I love water. I take care of it!

ALERT! THERE'S A LEAK!

STUDENT WORKBOOK
CYCLE 2

C.I.EAU Centre d'interprétation de l'eau

Québec

EXTRA MISSION 05

BACKGROUND

Conscious Charlie and Wasteful Wally are late for a visit at the aquarium! Wasteful Wally leaves the house in a hurry, carrying Conscious Charlie on his back. He locks the door and rushes out. Walter, who happened to be passing by, notices the two companions forgot to fully turn off the tap of the kitchen sink, and it's slightly dripping! Conscious Charlie and Wasteful Wally are lucky that Walter happened to be there! Since he regularly waters their plants, Walter knew where they kept their spare key. He was able to get inside and close the tap. But what would have happened if no one had been there to turn the water off?

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
05

YOUR MISSION

Simulate a water leak and measure the amount of water wasted.

AQUA-MARY : Did you know that leaks can waste a lot of water? That's why it's important to detect and fix them as soon as possible.

DIRECTIONS

If a leaking faucet lets out one drop of water per second for an entire day (24 hours), how much water is wasted?

WALTER : 1 000 litres = 1 cubic metre. That's the volume occupied by a regular-sized fridge.

SUGGESTED MATERIALS, WITH ADULT SUPERVISION

- One 1 000 millilitres (1 litre) measuring cup
- One 250 millilitres glass made of clear and flexible plastic
- Scissors
- 1 cookie of your choice

METHOD

Do you have a leaky faucet at home? If so, it would give you the perfect opportunity to do this activity!

You can also simulate a leak by turning on the faucet of your sink very slightly, until only one drop per second comes out.

Place a measuring cup under the leak, and observe how much time it takes to fill it with 200 millilitres of water.

Before you get started, try to guess how much time it will take to reach 200 millilitres of water. It might be a lot quicker than you think!

WHAT'S THE COOKIE FOR?

If you want to make this activity even funnier, you can make a bet with a friend or family member. Place the cookie on a little stand you can make by cutting a plastic glass. Make sure this stand is the same height as the 200 millilitres line of your measuring cup.

Make two slits on the sides of your stand. This will allow the water to circulate and prevent the stand from tipping over.

The person whose estimation of how much time it takes the water to reach 200 millilitres is the furthest from the actual result must drink the glass of water containing a wet cookie!

EXTRA MISSION 05

You surely noticed that the time it takes to reach 200 millilitres of water, in the measuring cup with the cookie, can vary greatly from one experiment to another. The time it takes depends on the speed at which each drop of water falls.

CALCULATIONS

How do you calculate the amount of water wasted by a single leak?

Let's use the experiment you just did to calculate the amount of water wasted by an imaginary leak (but one that could be real!). Let's say we lose one drop of water per second and the water reaches the 200 millilitres line in 10 minutes:

How much water would be wasted in 1 minute (litres)? _____

How much water would be wasted in 1 hour (litres)? _____

How much water would be wasted in 1 day (litres)? _____

How much water would be wasted in 1 year (litres)? _____

Use the hints below to make your calculations.

HINT TO CALCULATE THE VOLUMES
1 000 ml = 1 L

HINTS TO CALCULATE THE TIME	
1 minute = 60 seconds	1 day = 24 hours
1 hour = 60 minutes	1 year = 365 days

YOUR CALCULATIONS

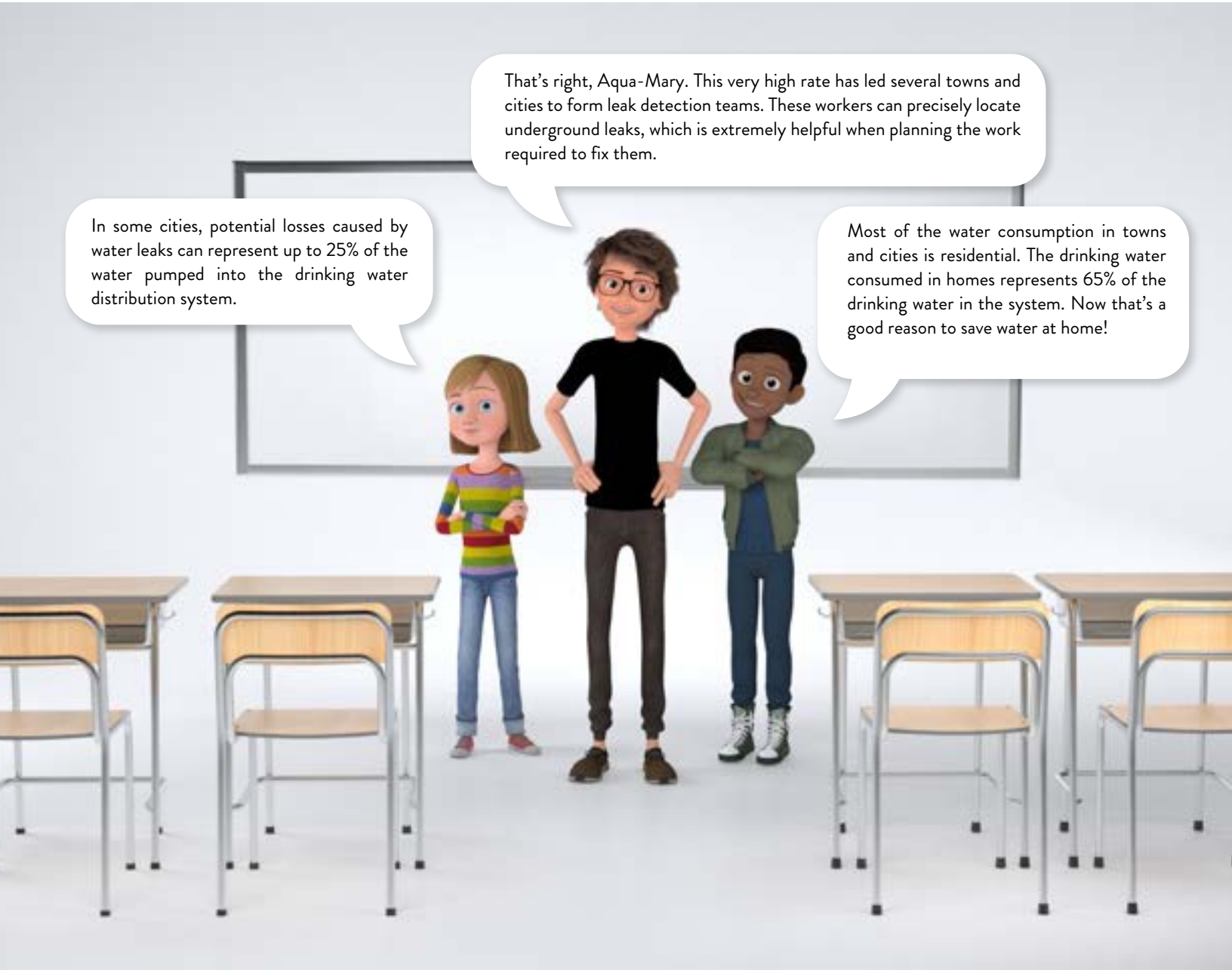
Use this space to show how you made your calculations.

EXTRA MISSION 05

CONCLUSION

At home, you won't always have someone to check that the faucets are properly turned off. Make sure you do it after using them!

USEFUL TO KNOW



EXTRA MISSION 05

Fantastik'eau

I love water. I take care of it!

ALERT! THERE'S A LEAK!

ANSWER KEY
CYCLE 2

C.I.EAU Centre d'interprétation de l'eau

Québec

EXTRA MISSION 05

ANSWER KEY

Your students probably noticed that the time it takes to reach 200 millilitres of water, in a measuring cup with a cookie, can vary from one experiment to another. Depending on the speed at which each drop of water falls, the time required may vary!

CALCULATIONS

How do you calculate the amount of water wasted by a single leak?

Let's use the experiment you just did to calculate the amount of water wasted by an imaginary leak (but one that could be real!). Let's say we lose one drop of water per second and the water reaches the 200 millilitres line in 10 minutes:

To simplify calculations, we start by finding the quantity of water wasted per minute, then convert it into litres. We also calculate the time using decimal values. Once this is done, we must always go back to the answer of the previous question to make the following calculation:

Amount of water wasted in one minute (litres)

Calculations:

1. Find the volume of water wasted in millilitres:
   200 ml of water ÷ 10 minutes = 20 ml of water per minute.
2. Calculate the volume in litres:
   [20 ml of water ÷ 1 000 ml x 1 L] = 0.02 L in 1 minute.

ANSWERS

Quantity of water wasted in 1 hour (litres)

[Quantity of water wasted in 1 minute] X 60 minutes

Answer: 0.02 L x 60 minutes = 1.2 L per hour

Quantity of water wasted in 1 day (litres)

[Quantity of water wasted in 1 hour] X 24 hours

Answer: 1.2 L x 24 hours = 28.8 L of water per day

Quantity of water wasted in 1 year (litres)

[Quantity of water wasted in 1 day] X 365 days

Answer: 28.8 L x 365 days = 10 512 L of water per year

EXCERPT FROM:

Fantastik'eau! I love water, I care for 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

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

Ministère des Affaires municipales et de l'Habitation (MAMH). *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.

C.I.EAU
Centre d'interprétation de l'eau

Québec