



Picture: Arienne Bergeron © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal

TEACHER'S SHEET ✦ SECONDARY SCHOOL

Water on the Move: The Youville Pumping Station

You will soon visit Pointe-à-Callière, Montréal Archeology and History Complex, with your students. The activity *Water on the Move: The Youville Pumping Station* will take place in an exceptional archeological and historical context. In contact with the remnants and artifacts left by the various human occupations that have followed one another on site, your students will discover the history and uses of water by Montréal's residents. Each era brings its best solutions to the challenges of wastewater management depending on the problems and available technologies. Young visitors will be part of a brand new experience of The Youville Pumping Station. Both participatory and educational, the exhibition is also an opportunity to broaden their horizons on environmental issues that concern them.

BEFORE THE VISIT

ACTIVITY 1 What are we?

During the visit, the students will be in contact with industrial, historical and archeological remnants giving evidence of the various uses but also various water sources over the centuries. This activity aims to introduce terms that will be deepened during the visit.

GOALS

- Assimilate vocabulary.
- Understand and differentiate terms (ex: aqueduct/sewer)

DEVELOPED SKILLS

- Learn definitions.
- Exploit information.

REQUIRED MATERIAL

- Sheet **Activity 1 – What are we?**

 **15 MINUTES**

The activity takes place in two stages.

- Students can work individually or in teams of two. Distribute the sheet **Activity 1 – What are we?**, and give them 10 minutes to answer the questions. They have to associate the right definition with the right term. You can help them by giving clues which you can find in the answer key.
- After reading each definition, ask a few students to provide their answers before giving them the correct one (available in the **answer key**).

The visit at the Museum will allow you to deepen comprehension of these terms. If questions persist, invite the students to ask questions to the guide hosts.

ACTIVITY 2 Uses and management of waters in Montréal: true or false

Invite the students to think of their water consumption by questioning them on their habits. This introduction will allow them to become aware of their own usage of water. Pointe-à-Callière is an archeological site which, through its remnants, testifies to the evolution of access to drinking water.

GOALS

- Think of our own water consumption.
- Become aware of the quantities consumed.

DEVELOPED SKILLS

- Interpret the change in a society and on its territory.
- Establish links of continuity with the present.

REQUIRED MATERIAL

- Sheet [Activity 2 – Uses and management of waters in Montréal](#).

 15 MINUTES

- Photocopy the sheet [Activity 2 – Uses and management of waters in Montréal](#) (one copy for two or three students) and distribute it to the teams. Invite them to exchange and think together on issues relating to water consumption.
- The activity can be done with the entire class. You can project the questionnaire on the whiteboard and proceed to a vote to answer the questions. You can ask the students to elaborate on the reasons for their choices. You will find detailed explanations for each answer in the [answer key](#) of the activity.

AFTER THE VISIT



ACTIVITY 1 A Water Story

During their visit at Pointe-à-Callière, your students had the chance to observe sites, objects and instruments witnessing various water uses. They discovered the first collecting sewer, aqueducts, the Youville Pumping Station, etc. The visit retraces the evolution of water access and shows how innovations changed our habits.

GOALS

- Review the visit at the Museum and remember the remnants, objects and installations that were seen.
- Place different historical facts on the timeline.
- Understand technological and health changes.

DEVELOPED SKILLS

- Interpret the change in a society and on its territory.
- Place the events in history.
- Question the social realities in a historical perspective.

REQUIRED MATERIAL

- Sheet [Activity 1 – A Water Story](#).

 30 MINUTES

- Animate a discussion about the visit at the Museum. Ask the students to give feedback. Did they enjoy their visit? What impressed them the most? What have they learned? Remind them about the discoveries they made.
Insist again on the importance of the remnants and artifacts to understand how people lived when access to drinking water was limited.
Review with them the instruments, objects and events seen during the visit.
- Distribute the sheet [Activity 1 – A Water Story](#) and present the activity to the students. The objective is to associate various historical facts with the proper date.
The activity can be done with the entire class. You can project the timeline on the board. Students can suggest dates for each event and share their thoughts. The answers are in the [answer key](#) of activity 1 back in class.

ACTIVITY 2 **The Debate**

Over history, Montréalers adopted different technical means to protect public health while meeting the needs of a growing population. It was important to ensure access to drinking water and make sure that wastewater was not a nuisance to the health of the city's residents. Today, we need to think about environmental issues, i.e. water scarcity that affects different countries.

GOALS

- Communicate an opinion and defend it.
- Work in a team to find arguments.
- Think of environmental issues.

DEVELOPED SKILLS

- Communicate verbally.
- Encourage the student to adopt a reflexive approach in the development of healthy lifestyles.
- Find answers or solutions to problems.
- Co-operate.
- Pass a critical judgment.

REQUIRED MATERIAL

- Sheet **Activity 2 – The Debate**.
- Sheet **Corrigé – Activity 2, The Debate: for teacher use**.

 **60 MINUTES**
PROCEDURE

- Read the statement of the debate with the students on the sheet **The Debate** (you can project it on the board or provide a copy per team). Then, assign to each student a role that is required for the good process of the debate.

President: he manages the debate, gives the parole and ensures that time is respected.

Team “in favour”: two teams of seven-eight students

Team “against”: two teams of seven-eight students

Judges: five students

- Give the following instructions:

After the presentation of the debate's subject, each team will have five minutes of consultation. You can help them by using the sheet **Answer key – Activity 2, The Debate: for teacher use**. You will give them five minutes to explain their positions and suggest solutions. A 5-minute counter-argument will then take place so the groups can exchange their different viewpoints. The team “in favour” will start; the team “against” will continue and so on.

The judges will have five minutes to discuss and render their verdict. They will decide who wins the debate based solely on the quality of the arguments and not their positions.

- Make a recap:

After the verdict of the judges, it is important to give a summary of the arguments that were presented. You can discuss with students contemporary issues regarding access to drinking water. The visit at the Museum allowed us to learn about the historical process that leads us today to have access to drinking water in large quantities. During the 17th century, every Montréaler used between 10 and 17 litres of water per day. Today, it is 262 litres per person per day.

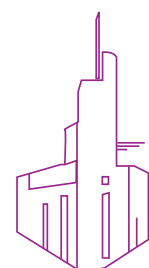
Access to it is a real issue; some countries suffer from water shortage. Access to drinking water and to sanitation has been a human right since 2010, but, according to UNICEF; today, nearly 2.2 billion humans do not have access to water (15.4% of the world population—one person in seven).

Today, several water-related challenges affect us, whether it is drinking water access for everyone, water contamination/pollution that might affect our health or the decrease of freshwater reserves. What is the future of water in this 21st century? The past may provide food for thought.

Through a partnership with:



Pointe-à-Callière is thanking you for your visit and your trust. We hope to see you again soon for more educational activities.





POINTE-À-CALLIÈRE

Picture: Arienne Bergeron © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal

STUDENT'S SHEET ✦ SECONDARY SCHOOL

Water on the Move: The Youville Pumping Station

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BEFORE THE VISIT

ACTIVITY 1 What are we?

Complete the sentences with the following words:

- drinking water
- wastewater
- aqueducts
- sewers
- miasma
- filtration
- groundwater
- permeability

- 1 _____ : action of separating liquids from waste in water.
- 2 _____ : pipes designed for the transportation of wastewater.
- 3 _____ : property of an environment that is penetrated by water.
- 4 _____ : water reserves found in the soil, they notably supply the wells.
- 5 _____ : waters that are filtered and treated, they can be consumed by humans.
- 6 _____ : pipes designed for the transportation of drinking water.
- 7 _____ : gases that come from detritus. Before the discovery of bacteria, we thought they were the cause of diseases.
- 8 _____ : dirty waters transported by sewers, they cannot be consumed by humans.

ACTIVITY 2 Uses and management of waters in Montréal: true or false

Circle the right answer.

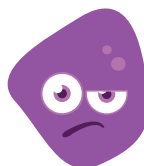
- | | | | |
|---|---|------|-------|
| 1 | Currently, our water consumption in Québec is 60 litres per resident per day. | TRUE | FALSE |
| 2 | During the 17th century, the daily water consumption in Montréal was less than the equivalent of one toilet flush today (around 20 litres). | TRUE | FALSE |
| 3 | Sewers were created in Montréal during the city foundation in 1642 by Paul de Chomedey de Maisonneuve and Jeanne Mance. | TRUE | FALSE |
| 4 | Before being filtered and treated, Montréal's drinking water is taken from the St. Lawrence River. | TRUE | FALSE |
| 5 | The Youville Pumping Station is the first in Montréal to use electric power. | TRUE | FALSE |
| 6 | The Youville Pumping Station transformed wastewater into drinking water. | TRUE | FALSE |
| 7 | Today, wastewater is directly discharged in the St. Lawrence River. | TRUE | FALSE |
| 8 | The concept of sponge city offers solutions to absorb, store and reuse rainwater from the installation of permeable soils. | TRUE | FALSE |



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Picture: Ariane Bergeron © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal





POINTE-À-CALLIÈRE

Picture: Arienne Bergeron © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal

Picture: René Bouchard © Collection : Réserve des collections archéologiques de la Ville de Montréal, BIF-4-2070; BIF-4-2096

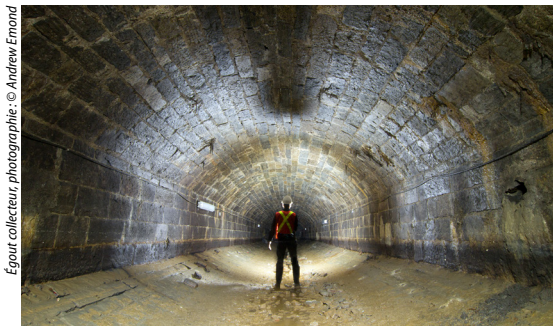
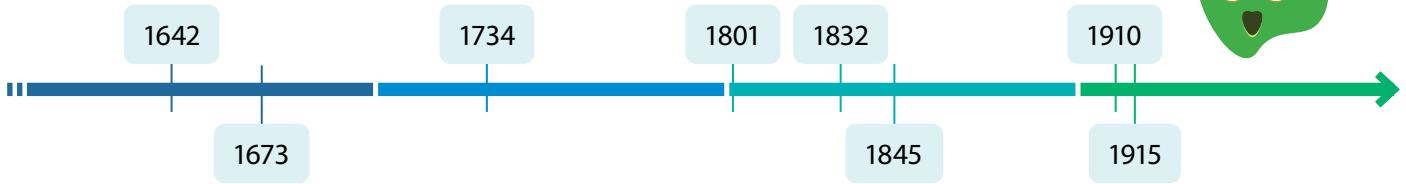
AFTER THE VISIT

Student's Sheet



ACTIVITY 1 A Water Story

During your visit, you discovered Montréal's water history and the technological progress that enabled access to drinking water and wastewater management in an urban environment. This activity retraces the highlights of the history of Montréal's waters. For every historical fact, find the corresponding date on the timeline and write your answer in the box.



Egout collecteur, photographie: © Andrew Emond

Epidemics strike the city. Miasma found in the Petite rivière is suspected. We begin the construction of a stone vault. The first collecting sewer was created in North America.



Picture: Alain Vandael, don de M. André Aubin © Collection Pointe-à-Callière, 2008.4

The city manages the aqueduct system and forces the owners to connect to it in exchange for a fee.



Première messe à Ville-Marie, photographie de Jean Gagnon.

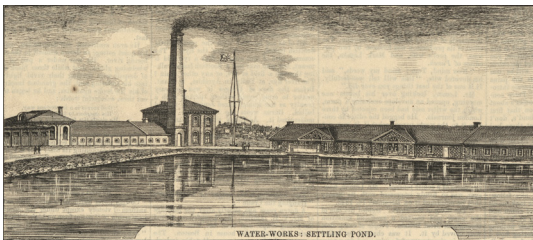
Montréal city is founded by a group led by Paul de Chomedey de Maisonneuve and Jeanne Mance.

Salle des moteurs, Station de pompage D'Youville, Anonyme Bergson, © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal.



The Youville Pumping Station is put into service. It is the first electric pumping station in Montréal and is used to transport wastewater. It will remain in service until 1990.

L'aqueduc de Montréal, Bassin de décastration, 1879, © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal, 2010/13



That year, the first aqueduct system was inaugurated. However, its access is done by subscription and allows only a minority of Montréalers access to clean waters.

James Pattison Cockburn, Hôtel-Dieu, Montréal, 1829, don de S.H. Boyls © Musée McCord, M19684

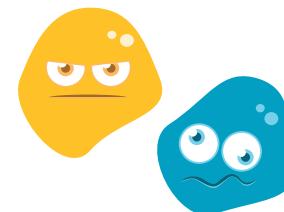


A fire breaks out in Montréal: 45 houses and the Hôtel-Dieu were destroyed by the flames. Fires are real threats to the inhabitants since they require large quantities of water near dwellings. Later, cisterns will be installed to deal with the risk of fire.

Eau de la Ville sous microscope, 10 septembre 1870, don de Mme G. M. Butler © Musée McCord, M1941.104.1.3.161



We discover that diseases are transmitted by bacteria in water. Chlorine treatments are recommended to purify water. We understand the need to filter and treat water to make it drinkable.



Latrines de Papineau, photographie: Pierre Saint-Jacques, © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal.



Population increase leads to a waste production increase in the water. The Governor General of New France requires the construction of latrines to palliate the polluted rivers.

ACTIVITY 1 What are we?, p. 4



Picture: René Bouchard © Collection: Réserve des collections archéologiques de la Ville de Montréal, B/JF-4-2070; B/JF-4-2096

Picture: Anne Bergeron © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal

STUDENT'S SHEET ✦ SECONDARY SCHOOL

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BEFORE THE VISIT

ACTIVITY 1 What are we?

Complete the sentences with the following words:

drinking water

wastewater

aqueducts

sewers

miasma

filtration

groundwater

permeability

- 1 filtration : action of separating liquids from waste in water.
- 2 sewers : pipes designed for the transportation of wastewater.
- 3 permeability : property of an environment that is penetrated by water.
- 4 groundwater : water reserves found in the soil, they notably supply the wells.
- 5 drinking water : waters that are filtered and treated, they can be consumed by humans.
- 6 aqueducts : pipes designed for the transportation of drinking water.
- 7 miasma : gases that come from detritus. Before the discovery of bacteria, we thought they were the cause of diseases.
- 8 wastewater : dirty waters transported by sewers, they cannot be consumed by humans.

ACTIVITY 2 Uses and management of waters in Montréal: true or false, p. 5

ACTIVITY 2 Uses and management of waters in Montréal: true or false

Circle the right answer.

- | | | | |
|---|---|------|-------|
| 1 | Currently, our water consumption in Québec is 60 litres per resident per day. | TRUE | FALSE |
| 2 | During the 17th century, the daily water consumption in Montréal was less than the equivalent of one toilet flush today (around 20 litres). | TRUE | FALSE |
| 3 | Sewers were created in Montréal during the city foundation in 1642 by Paul de Chomedey de Maisonneuve and Jeanne Mance. | TRUE | FALSE |
| 4 | Before being filtered and treated, Montréal's drinking water is taken from the St. Lawrence River. | TRUE | FALSE |
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| 7 | Today, wastewater is directly discharged in the St. Lawrence River. | TRUE | FALSE |
| 8 | The concept of sponge city offers solutions to absorb, store and reuse rainwater from the installation of permeable soils. | TRUE | FALSE |

- 1 FALSE. In Québec, we consume approximately 262 litres of water per person and per day. Sixty litres of water is the quantity used for a shower of 5 to 10 minutes.
- 2 TRUE. Every Montréaler was using between 10 and 17 litres of water per day.
- 3 FALSE. The first collecting sewer in Montréal was built from 1832 to 1838 to cover the Petite rivière. Today, it is possible to visit a part of this sewer at Pointe-à-Callière.
- 4 TRUE. Montréal's waters come from the St. Lawrence River and are redirected towards treatment plants that make them drinkable.
- 5 TRUE. The Youville Pumping Station, set up in 1915, was equipped with three pumps operated by electric power.
- 6 FALSE. The Youville Pumping Station was used to pump wastewater through the collecting sewer to divert it away from the port to another sewer.
- 7 FALSE. Wastewater goes through a treatment plant that filters, treats and dumps water into the river.
- 8 TRUE. This concept is a solution of the future for the cities. It allows them to face environmental challenges such as floods or water management.

ACTIVITY 1 A Water Story, p. 6



Picture: René Bouchard © Collection: Réserve des collections archéologiques de la Ville de Montréal, B/J/4-2070; B/J/4-2096

Picture: Anne-Bégin © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal

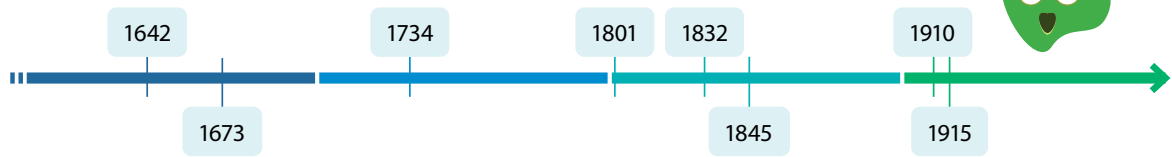
AFTER THE VISIT

Student's Sheet



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Egout collecteur, photographie: © Andrew Emond

1832

Epidemics strike the city. Miasma found in the Petite rivière is suspected. We begin the construction of a stone vault. The first collecting sewer was created in North America.



Picture: Alain Vendail, don de M. André Aubin © Collection Pointe-à-Callière, 2008, 4

1845

The city manages the aqueduct system and forces the owners to connect to it in exchange for a fee.



Première messe à Ville-Marie, photographie de Jean Gagnon.

1642

Montréal city is founded by a group led by Paul de Chomedey de Maisonneuve and Jeanne Mance.

ACTIVITY 1 A Water Story (continued), p. 7

SECONDARY STUDENT'S SHEET

AFTER THE VISIT

POINTE-À-CALLIÈRE

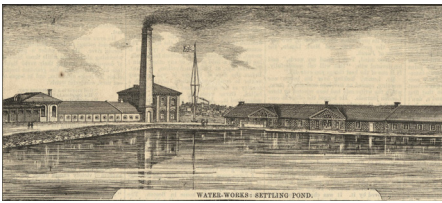
Salle des moteurs. Station de pompage d'Youville. Armand Bergeron. © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal.



1915

The Youville Pumping Station is put into service. It is the first electric pumping station in Montréal and is used to transport wastewater. It will remain in service until 1990.

L'aqueduc de Montréal. Bas-relief de céramique, 1879. © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal, 2017/25



1801

That year, the first aqueduct system was inaugurated. However, its access is done by subscription and allows only a minority of Montréalers access to clean waters.

James Patison Cockburn, Hôtel-Dieu, Montréal, 1829, don de S.M. Bayle. © Musée McCord, M16484



1734

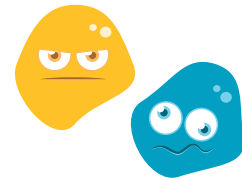
A fire breaks out in Montréal: 45 houses and the Hôtel-Dieu were destroyed by the flames. Fires are real threats to the inhabitants since they require large quantities of water near dwellings. Later, cisterns will be installed to deal with the risk of fire.

Usin de la Ville sous microscope, 10 septembre 1870, don de Mme G. M. Butler © Musée McCord, M994.1041.3.161



1910

We discover that diseases are transmitted by bacteria in water. Chlorine treatments are recommended to purify water. We understand the need to filter and treat water to make it drinkable.



Latrines de Papineau, photographie: Pierre Saint-Jacques. © Pointe-à-Callière, Cité d'archéologie et d'histoire de Montréal.



1673

Population increase leads to a waste production increase in the water. The Governor General of New France requires the construction of latrines to palliate the polluted rivers.

ACTIVITY 2 The Debate, p. 8


 + SECONDARY
 STUDENT'S SHEET

AFTER THE VISIT

ACTIVITY 2 The Debate

 IN FAVOUR

- + The right to water is a human right: since 2010, access to drinking water and sanitation has been a human right.
- + It is a global issue that concerns everyone: help is essential to face global warming since the consequences come from the great powers.
- + Implement measures to ensure water's sustainability: avoid waste, fix a threshold allowing water to renew itself without draining the source.
- + United Nations goals: "To achieve international co-operation in solving international problems of an economic, social, cultural, or humanitarian character, and in promoting and encouraging respect for human rights and for fundamental freedoms for all without distinction as to race, sex, language, or religion," Article 1, Chapter 1, United Nations Charter.
- + Humanitarian aid is needed. It is important to help the international community in this environmental chaos.
- + It is an important economic opportunity since water is a scarce commodity.

 AGAINST

- It is important to keep this resource for the city's inhabitants only. We must ensure to put the social good of our community before the one of the world. It is the last place where water is drinkable. Could we risk losing it?
- The city is one of the last known places on Earth where we can find a large amount of drinking water for the inhabitants. It is important to keep it for our population (local interests).
- We do not want to change our habits: populations have become accustomed to this modern lifestyle by using a lot of water for all kinds of activities. By restricting this excessive use, we could save drinking water and it would be easier to manage.
- The cost: sharing water around the world would be very expensive. It is inevitable that only a few countries could afford it. Some means are less expensive than others to have water access, i.e. desalination of seawater.
- Risk of injustice: if we decide to share water, some countries will always be asking for more, they will be more and more greedy, and this will create injustice.
- We can help in other ways: providing equipment for water treatment, distribution and desalination.
- Suggest sustainable solutions in connection with the concept of sponge city: increase green spaces, water waste reduction, environmental sanitation.

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 We hope to see you again soon for more educational activities.


8

For further information

Introductory video to drinking water problems: Info or Mytho?

[Pourquoi n'y a-t-il pas assez d'eau potable dans le monde ? \(EP. 706\) - 1 jour, 1 question](#) – YouTube

[La crise de l'eau illustrée en 5 graphiques](#) – lemonde.fr

[La crise mondiale de l'eau c'est quoi ?](#) – Eau Secours

Sources

[L'incendie du 10 avril 1734](#) – Mémoires des Montréalais (montreal.qc.ca)

[Chapitre I : Buts et principes](#) (Articles 1-2) – Nations Unies

[La crise mondiale de l'eau c'est quoi ?](#) – Eau Secours

[Chapitre I : Buts et principes](#) (Articles 1-2) – Nations Unies

[Tout savoir sur l'accès à l'eau dans le monde](#) – Action contre la Faim

[Eau, assainissement et hygiène](#) – UNICEF France

[Les grands enjeux de l'eau](#) – Centre d'information sur l'eau (cieau.com)

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