GRADE 4 & 6 LEARNING EXPERIENCE

Make Your Own Paper

Summary

Students will learn about the sustainability of Canadian forests and compare forestry practices in Canada and Brazil. They will establish a link between sustainability and recycling through a hands-on activity—making their own recycled paper.

Objective

To teach students that reusing and recycling paper is better for our forests, because it reduces the demand for tree harvesting.

Pre-Activity

DEFINITIONS

DIRECTIONS

FIND YOUR MATCH

Print two copies of the **Definitions Sheet (Appendix 1)** and cut out each **word** and **definition**. (Each sheet has eight words and eight definitions).

Give one **word** or **definition** to each student and ask them to find a person who has the matching word to their definition (or the reverse). If you have extra words and definitions, you can hand out the spares to any students who find their match quickly.

As students find their "match," ask them to write or tack the vocabulary word onto the board. The person with the definition can hold onto it for the time being.

Once all the words are written or tacked on the board, ask each pair of students to read the word, then the definition to the class.

Review the definitions with the class to clarify understanding.

MATERIALS
Appendix 1
Definitions sheet

Whiteboard
and marker

DURATION
10 mins

MAIN LEARNING OUTCOME

GRADE: 4 6

SUBJECT:

Social Studies (Gr 6)

Learners will compare sustainability practices between Canada and a selected country.

SKILLS
Investigate
Ask and revise questions; locate several relevant and dependable details to support an answer; organize and compare details; identify relationships, recognize represented perspectives, and communicate findings.

CROSS-CURRICULAR LINKS

Art (Gr 6)

Outcome 1
Students will explore the creative process using a range of materials and technology to create with respect and sensitivity.

Science (Gr 4)

Learners will analyze interconnectiveness of and within local habitats, inclusive of a Mi'kmaw perspective.

DEFINITIONS (cont'd)

DIRECTIONS

ARTICLE

Read the article **A Look at the Boreal Forest and the Amazon (Appendix 2)**. The article can be read as a class, in small groups or independently.

OPTION Watch videos on Boreal Forest & Amazon Rainforest

www.youtube.com/watch?v=_XjpzlVVdW8
(0:58 / Source: BorealConservation.org)

www.youtube.com/watch?v=zRB4q19wc04
(02:35 / Source: VirturalFieldtrips.org)

MATERIALS
Appendix 2
A Look at the Boreal Forest and the Amazon

DURATION
10 min

VENN DIAGRAM

With a partner, have students fill out the **Venn Diagram (Appendix 3)**. In the circles, ask students to write what is unique to Canada and what is unique to Brazil and what is the same when it comes to forestry practices.

Draw or project the Venn diagram on the board, and use students' input to fill it in. (Option to have students come up to the board and write it themselves.)

Go over the findings as a class.

MATERIALS
Appendix 3
Venn diagram

DURATION
10 min writing
10 min review findings

Activity
PAPER MAKING

DIRECTIONS

PREDICTIONS

In pairs, ask the class to make predictions on how paper is made. What materials are required? How long does it take?

DURATION
10 min

VIDEO

Watch the short video **How Paper Is Made**, then have students complete the **question sheet (Appendix 4)**.

www.youtube.com/watch?v=7IP0Ch1Va44

(02:15 / Source: YouTube video: MilesRose.net)

MATERIALS
Appendix 4
How Paper is Made question sheet

DURATION
10 min

HANDS-ON

Pair or group students to make recycled paper by following the directions in **How to Make Recycled Paper (Appendix 5)**.

MATERIALS
Appendix 5
How to Make Recycled Paper

DURATION
30 min

Post-Activity
RECYCLING MESSAGES

DIRECTIONS

Once the student-made recycled paper is dry, have the students write messages about the importance of recycling on their newly created paper.

Post messages in the classroom or around the school to promote paper recycling.

OPTION Opportunity to buddy up with younger grade class and share with them their newly made paper and the message around saving it.

MATERIALS

Student-made recycled paper

DURATION

15 min

Assessment

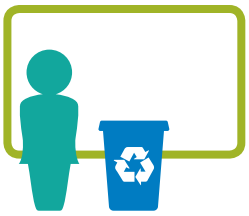
FORMATIVE Assess student understanding by observing their work at different stages throughout the lesson.

SUMMATIVE (OPTIONAL) Option to correct the Venn diagram, the question sheet or the recycling message

ENVIRONMENTAL EVENTS

There are many great opportunities throughout the year to highlight the 3Rs in the classroom. Check out these annual events:

Waste Reduction Week	October (3rd week)
Earth Day	April 22
Compost Awareness Week	May (1st full week)
Environment Week	June (1st full week)



WASTE REDUCTION EDUCATORS

Divert NS provides funding to municipalities to deliver waste reduction education to schools across the province. Your local waste reduction educator(s) provides the following services, and more, free of charge!

- classroom presentations
- green team set up
- advice on bins and signage
- tours of local waste facilities
- school waste audits

To find out more, visit divertns.ca

divertNS.ca

Share on social media!
#NothingWasted

ABOUT DIVERT NS

Divert NS is a not-for-profit organization championing recycling in Nova Scotia. For over 20 years we've helped build a culture of recycling through environmental stewardship, education, and innovation. Divert NS operates the **Beverage Container Deposit–Refund Program** and the **Used Tire Management Program**. In addition, we work in collaboration with government, industry, and academia to divert waste-resources from landfill. Divert NS, in partnership with municipalities, delivers education and awareness programs to schools, businesses, and community groups. Divert NS also works to develop stewardship agreements and funds innovative research and development initiatives.

Toll-free 1.877.313.7732 • info@divertns.ca • divertNS.ca

divert NS
Nothing Wasted

APPENDIX 1:

MAKE YOUR OWN PAPER

Definitions

Print enough copies of this sheet to give each student either a word or a definition. Ask the students to find a person whose word they think matches their definition (or whose definition matches their word).

Sustainability	To maintain something forever. Human actions can sometimes be unsustainable because they threaten the ability of certain ecosystems or species to survive.
Natural Resources	Materials found in nature that can be used by people, such as water, plants, soil, stone, minerals, and fossil fuels.
Deforestation/ Clear Cutting	Clearing, or cutting down, of forests. The word is normally used to describe the actions of humans in removing forests from the planet.
Boreal Forest	Canada's largest vegetation zone, making up 55 per cent of the country's land mass. It extends from British Columbia in the west to Newfoundland and Labrador in the east.
Pulp and Paper Industry	Companies that convert woody plant material into a wide variety of pulps, papers and paperboards.
Rainforest	Forests with tall trees, warm climates, and lots of rain.
Paper recycling	Processing waste paper for reuse.
Timber	The wood of trees cut and prepared for use as building material or for making paper.

Definitions sourced or adapted from: *Sustainability* worldwide.org; *Natural Resources* kids.britannica.com/kids/article/natural-resource/399553; *Deforestation* www.britannica.com/science/deforestation; *Boreal forest* www.thecanadianencyclopedia.ca/en/m/article/boreal-forest/; *Pulp and paper* www.thecanadianencyclopedia.ca/en/m/article/pulp-and-paper-industry/; *Rainforest* kids.mongabay.com/elementary/001.html (2017)

APPENDIX 2:

MAKE YOUR OWN PAPER

A Look at the Boreal Forest and the Amazon

Canada's largest forest, the **Boreal Forest**, stretches from one end of Canada to the other and is, in fact, the largest forest in the world! Many different types of animals, such as lynx, moose and bears make their home among the spruce, fir and pine trees of this massive forest. The forest is also important to Canadians because it provides us with **natural resources**, such as **timber** which we use to build our homes and make the paper that we write on. In fact, the **pulp and paper industry** is worth $831 million in Nova Scotia alone!

Sadly, many of the companies which are part of the pulp and paper industry cut down ALL the trees in a specific area. We call this **deforestation** or **clear cutting**. When this happens, the animals of the forest lose their homes. It also, affects humans when this happens because the Boreal Forest filters millions of litres of water daily, and lowers the impact of climate change by storing carbon and producing oxygen.

Thankfully, when trees are cut down in the Boreal Forest, the law in Canada says that they have to be replanted. This is what we call **sustainability**, because it means that the forest will grow back so that future generations of humans and animals can experience it. Unfortunately, when companies replant trees, they only plant one type of tree so it will take hundreds of years for the forest to be full of many different types of trees, like it was before.

In Brazil, they have the Amazon **Rainforest**, which is also home to many different animals such as monkeys, sloths and toucans. As well as being home to these animals, it also helps humans. We call the Amazon "the lungs of the world," because it provides us with more than 20% of the world's oxygen. Just like in the Boreal forest, there is deforestation happening in the Amazon. The difference is that a lot of the trees that are cut or burnt down are not replanted. There are many reasons for this including lack of law enforcement and the fact that many of the trees are cut down to make space to grow crops such as coffee or to raise livestock such as beef. This is not sustainable, because it means the trees won't grow back for future generations of humans and animals.

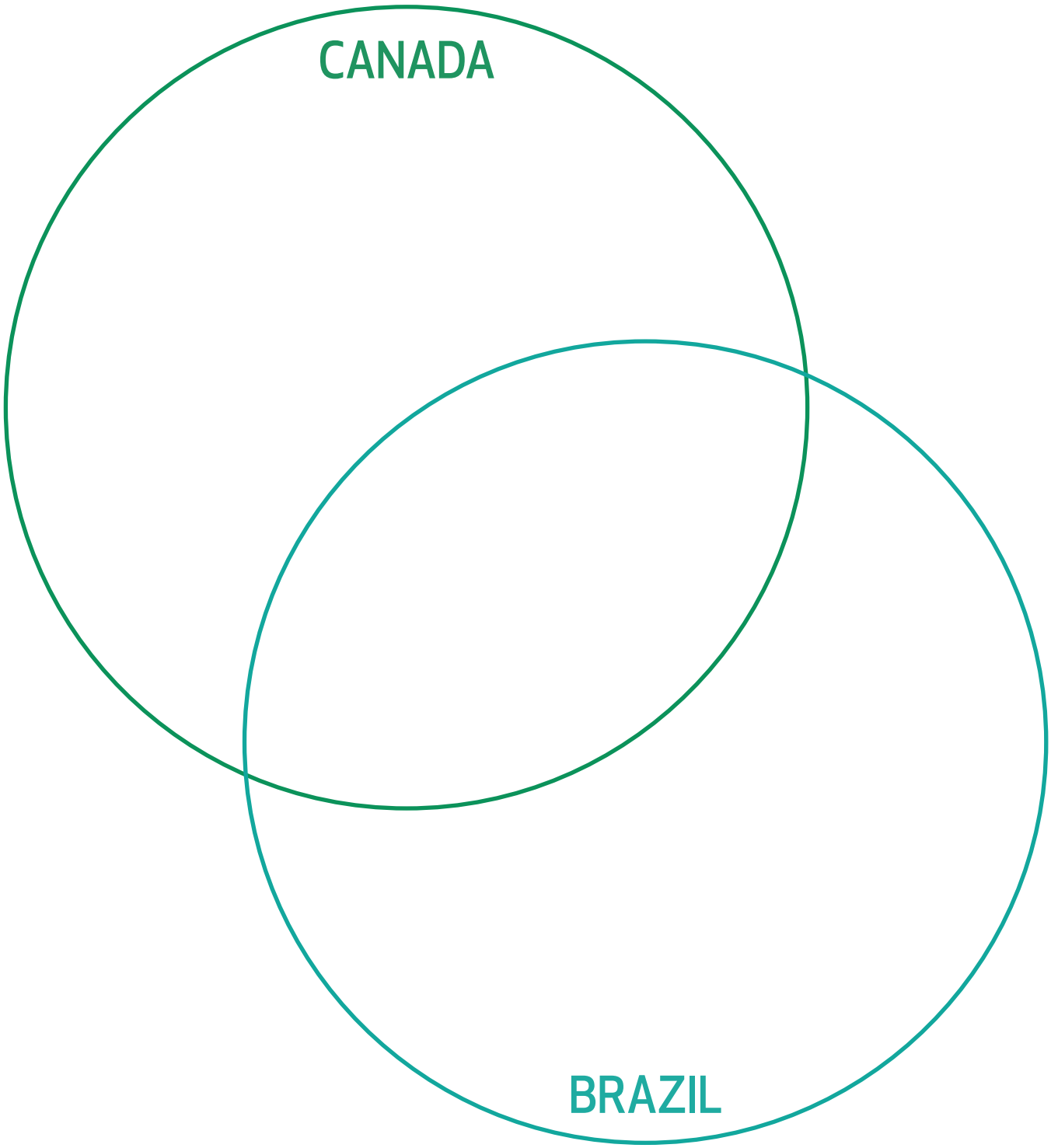
One thing we can all do is to make sure that we **recycle** any paper we use, to reduce the number of trees that are cut down.

APPENDIX 3

MAKE YOUR OWN PAPER

Venn Diagram

In the circles below, write what is unique to Canada and what is unique to Brazil, when it comes to forestry practices. In the overlapping area, write what is the same in both countries.



APPENDIX 4

MAKE YOUR OWN PAPER

How is Paper Made?

Name: Answer key

Answer the questions below.

1. What is paper made of? trees

2. How many trees can be saved by recycling **one ton** of paper? 17
   Fun fact: A cow weighs about one ton.

3. Write the following steps in the correct order to make paper.

The tree bark is removed.	1. Trees are brought to a factory.
Chemicals are added to the paste.	2. The tree bark is removed.
The tree is chopped into wood chips.	3. The tree is chopped into wood chips.
The wood chips are mixed with water and turned into a paste.	4. The wood chips are mixed with water and turned into a paste.
The flattened paste dries and becomes paper.	5. Chemicals are added to the paste.
Trees are brought to a factory.	6. The paste is flattened to squeeze the water out.
The paste is flattened to squeeze the water out.	7. The flattened paste dries and becomes paper.

4. Fill in the blank:
   Instead of using wood chips, paper can be recycled into new paper!

5. In your opinion, why is recycling paper better than creating paper from trees?

APPENDIX 4

MAKE YOUR OWN PAPER

How is Paper Made?

Name: _____

Answer the questions below.

1. What is paper made of? _____

2. How many trees can be saved by recycling **one ton** of paper? _____
   Fun fact: A cow weighs about one ton.

3. Write the following steps in the correct order to make paper.

The tree bark is removed.	1.
Chemicals are added to the paste.	2.
The tree is chopped into wood chips.	3.
The wood chips are mixed with water and turned into a paste.	4.
The flattened paste dries and becomes paper.	5.
Trees are brought to a factory.	6.
The paste is flattened to squeeze the water out.	7.

4. Fill in the blank:
   Instead of using wood chips, _____ can be _____ into new paper!

5. In your opinion, why is recycling paper better than creating paper from trees?

APPENDIX 5:

MAKE YOUR OWN PAPER

How to Make Your Own Recycled Paper

MATERIALS

- Newspaper or used paper
- Blender
- Metal coat hangers
- Nylon pantyhose
- Large mixing bowls
- Paper towels
- Warm water

STEP 1

Pair or group students, and give each group a coat hanger and one leg cut from a pair of pantyhose.

STEP 2

Have a student from each group bend the coat hanger into a diamond shape and place the coat hanger inside the pantyhose leg.

STEP 3

Give each group a pile of used paper and have them rip it into small pieces and put those pieces into a large mixing bowl.

STEP 4

One by one, have each group give you their bowl of paper. Place the pieces of paper in the blender and pour in warm water (about a half-cup at a time), running the blender after each pour. Stop adding water when it becomes a soupy pulp with no big pieces of paper left. Try not to add too much water; super-wet pulp will take a long time to dry into paper.

STEP 5

Have students place the hanger-and-hose screen they made over the mixing bowl. The teacher can carefully pour the contents of the blender evenly over the screen so that the liquid drains out below into the bowl and most of the pulp stays on top.

STEP 6

Once most of the liquid has drained into the bowl, the students can gently place a paper towel over the screen and press it down to even out the pulp (smooth out any lumps and close any holes) and absorb some of the water.

STEP 7

Pick the screen up and place it on a couple of layers of paper towel. Place two more paper towels on top of the screen and gently press out some of the excess moisture.

STEP 8

Let the screen sit between the paper towels for 24 hrs. Carefully remove the paper towel and peel the recycled paper off the screen.

CONGRATULATIONS! NOW YOU HAVE HOMEMADE RECYCLED PAPER!