

Dye Another Day

OVERVIEW

By examining primary source documents and photos, students will learn about one of Lanark's pioneer women in science and also study the dyeing process used in textile mills as an example of global interconnectedness in 19th Century Mississippi Mills.

LEARNING OBJECTIVES

Students will be introduced to the principles of **historical thinking**. They will begin thinking critically about primary source documents and using background knowledge to draw conclusions from those sources.

CURRICULUM CONNECTIONS

- **Social Studies Inquiry Process Grades 1-6:** Collect relevant data, evidence, and/or information from primary sources, secondary sources, and/or field studies; determine if their sources are accurate and reliable; identify the points of view in the sources they have gathered.
- **Grade 8 History: A2.2:** Gather and organize information and evidence about perspectives of different groups and communities, including First Nations, Métis, and/or Inuit communities, on some significant events, developments, and/or issues that affected Canada and/or people in Canada during this period, using a variety of primary sources.

KEY VOCABULARY

- **Dye:** a coloured substance that chemically bonds to a material
- **Chemistry:** the branch of science that studies various elements and compounds and their interactions with other substances
- **Primary Source:** "Artefacts and oral, print, media, or computer materials created during the period of time under study"¹

BACKGROUND

For thousands of years, people have been using pigments to colour fabric. Early dyes were natural, made from plant or animal matter. Most natural dyes require the use of a mordant, a solution of metal salts such as aluminum or iron, to chemically bind the pigments to the fibres. Without a mordant, natural dyes generally wash out over time.

Early settlers in Lanark would typically have used natural dyes they could make themselves, with local materials such as walnuts, onion skins, and carrot tops. As transportation improved, it

¹ [THE ONTARIO CURRICULUM](https://www.ontario.ca/gov) | Social Studies, Grades 1 to 6; History and Geography, Grades 7 and 8 (gov.on.ca) p. 223

became easier to buy dyes from non-local material, such as the indigo plant (grown in India), cochineal beetle (Mexico), logwood (Central America), and the madder plant (from the Mediterranean). In the 1850s, the first aniline dyes were developed. These synthetic dyes were made using chemicals from coal tar, and led to a wide array of vibrant colour options, beginning with purples. The transition from natural dyes to chemical dyes was a gradual one, and by the late 1800s, most mills were using a combination of natural and chemical dyes. Continuing scientific research opened up new types of synthetic dyes: for instance, alizarin is a chemical compound found naturally in the root of the madder plant, but produced synthetically after 1869. The presence of these dyes in Mississippi Mills speaks to global interconnectedness and international trade, even in an era when communities were typically small and local.

Much of this scientific research took place in Germany. Germany, which did not unify into a nation state until 1871, did not have colonial outposts or access to as many natural resources as countries like England, France, or Russia. In a bid for increased influence and global power, Germany invested heavily in scientific research in the mid-19th Century. It was with the development of chemical dyes that chemistry (originally an academic and theory-heavy discipline) began to be studied for its commercial applications and use in industry.

Within the home, textiles (in the 19th Century, typically wool, cotton, and linen) were traditionally the women's work. Women would card the wool, spin it into yarn, and mix up dyes to colour it themselves. However, with the rise of commercial mills for processing textiles, more and more of the work became designated as men's work. While women still had clear roles within the mills (for instance, women often ran power looms and did finishing work), men generally operated the carding machines and spinning mules. As dyeing became not a home craft but an industrial scientific process, women were excluded from the work.

The photograph of Eleanor McMunn was taken by the renowned photographer Malak Karsh (1915-2001), an Armenian-Canadian who was born in present-day Turkey and immigrated to Canada in 1937. In 1945 or '46, he spent a week in Appleton, taking photos of the Collie Woollen Mill. This picture of Eleanor McMunn, one of Canada's earliest female dyers, is a rare portrait of an early woman in science.

LESSON OUTLINE

Begin by examining the photograph of Eleanor McMunn. Lead a discussion about how:

- a) we can make educated guesses about the context of a photograph or other primary source;
- b) the process of dyeing connects science, industry, and art;
- c) Eleanor McMunn was one of Lanark's pioneering women in science.

Next, students will look at the other primary source documents (transcription included) and answer worksheet questions. *Alternatively, have students answer these questions as part of a class discussion, instead of using the worksheet.*

DISCUSSION:

- What is the first thing you notice about this photograph?
- Where/when do you think this photo was taken?
Clues: black & white picture, glass bottles instead of plastic, hair/makeup/clothing style
Location possibilities: Pharmacy? Science lab?
Answer: This photo was taken in Appleton's Collie Woollen Mill in the mid-1940s.
- What do you think this woman is doing?
This is a photograph of a lady called Eleanor McMunn, who was one of the first female dyers in Canada. She worked in the factory mixing and applying dyes to wool or cloth. This is a job that was very much based in an understanding of chemistry.
- Do you think it was common at this time for women to do this job? Why or why not?
No, we just said she was one of the first.
In this period in the past, men and women typically had gendered work. Some machines were only run by men, while others were generally only run by women. At this time, men were much more likely to have advanced education or training in science. Eleanor McMunn was unusual in her dyeing expertise in the 1940s. Today, lots of women are able to study and work with science, partly because of women like Eleanor McMunn who led the way.

DOCUMENT 1: READING COMPREHENSION QUESTIONS & ANSWERS

1. What type of document is this? When was it written?
This is a letter that was written in 1885.
2. Who wrote the letter? Who received it?
Frank Sherry wrote the letter to J.A. Teskey.
3. What problem was J.A. Teskey having?
He didn't have the right formula for dyeing cotton black.
4. Rewrite the steps for the dye, using your own words.
Example:
 1. *Combine the first six ingredients.*
 2. *Heat the mixture and bring to a boil.*
 3. *Add cotton to the mixture.*
 4. *Cover the container, let it soak.*
 5. *Combine chrome and sodash in another tub. Heat to 110°.*
 6. *Put the cotton in the tub with chrome and sodash.*
 7. *Stir for twenty minutes.*
 8. *Take the cotton out of the mixture and drain it.*

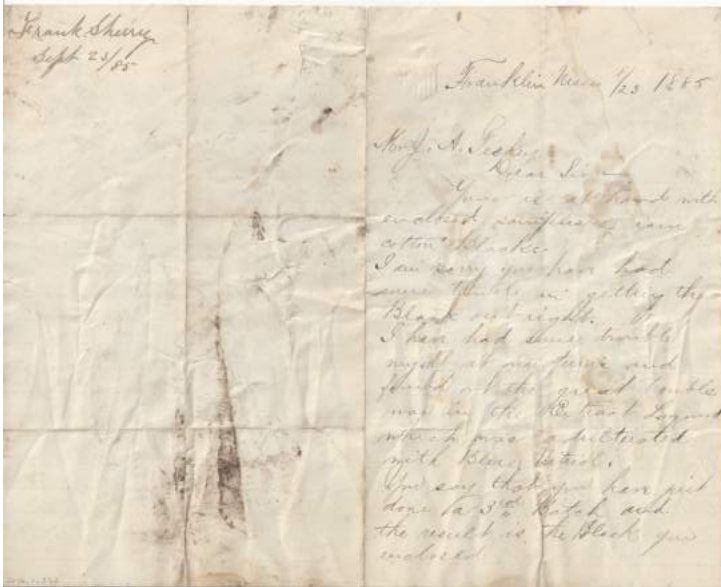
DOCUMENT 2: CRITICAL THINKING QUESTIONS & ANSWER

1. What is this document?
A list or inventory of dyeing materials at Teskey's mill, almost certainly from the late-19th Century (timeline based on the history of the Appleton mill and the dye, combined with the stationery that has a date printed "18--".)
2. Based on the names of these materials, where do you think they might have come from?
The names sound like chemicals. These are not home-grown dyes; they were produced for the textile industry. The natural and chemical dye matter came from all around the world: Asia, South America, chemicals from Germany, etc.
3. How would they have been transported around the world in the late 1800s?
They would probably have been moved by a combination of trains and ships. The rail line through Almonte was constructed in the 1850s, and was one of the area's most important means of transportation at that time. In an age before airplanes, ocean crossings would have been done by ship. Over the course of the 19th Century, steamships replaced sailing ships as the primary means of freight transportation for ocean crossings.
4. What connections do you see between this document and the photograph of Eleanor McMunn? Explain.
They both speak to the science and chemistry involved in the dyeing process. The names of the chemicals on the inventory sheet and the bottles of chemicals in the photo are reminders of the technical side of the industry.

2012.79.12.24



DOCUMENT 1: 2012.23.1.12



Franklin Mass 8/23 1885

Mr. J. A. Teskey

Dear Sir --

Yours is at hand with enclosed samples of raw cotton Blacks.

I am sorry you have had some trouble in getting the Black out right.

I have had some trouble myself at one time and found out the great trouble was in the Extract Logwood which was adulterated with Blue Vitriol.

You say that you have just done a 3rd batch and the result is the Black you enclosed. Follow the following receipt this is for the 4th Batch of

100 lbs Cotton

7 ½ lbs Cutch

13 " Extract Logwood

2 ¼ " Blue Vitriol

5 " Sumac

1 ½ " Sodash

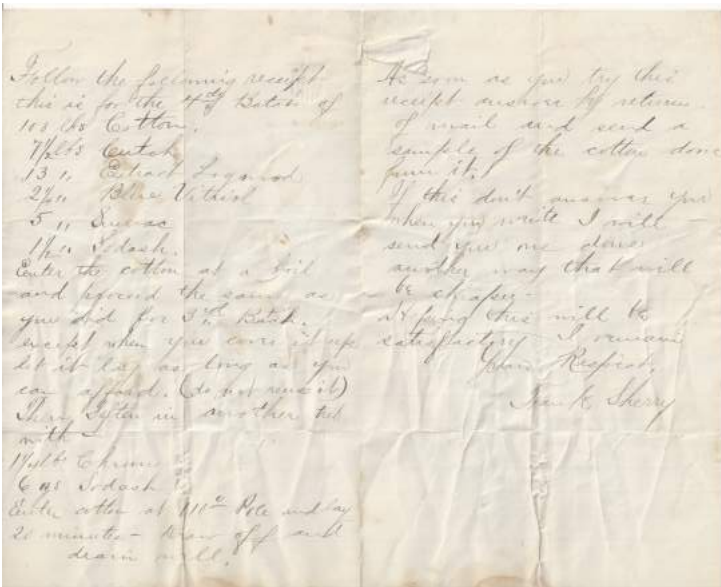
Enter the cotton at a boil and proceed the same as you did for 3rd Batch, except when you cover it up let it lay as long as you can afford. (do not reuse it)

Then soften in another tub with

1 ¼ lbs Chrome

6 oz Sodash

Enter cotton at 110°, Pole and lay 20 minutes - Draw off and drain well.



As soon as you try this receipt answer by return of mail and send a sample of the cotton done from it.

If this don't answer you when you write I will send you one done another way that will be cheaper.

Hoping this will be satisfactory I remain

Yours Respect,

Frank Sherry

DOCUMENT 2: 2012.55.145.59

Mississippi Woollen Mills		(ESTABLISHED 1862.)	
Appleton, Ont.,		18	
<i>Summary of Dyestuffs</i>			
In account with J. A. TESKEY.			
300 lbs	Union Navy Blue, Not sold	300	65 19 50
2 3/4	Alkali Violet	200	5 50
1/2	Alkali Blue	150	75
2 3/4	Catechu Brown	110	3 03
1 1/2	Neutral Grey	140	2 10
3 1/2	Nyanza Schwang	100	3 50
2	Dark Brown	95	1 90
1/4	Direct Blue	100	25
4 3/4	Methyl Violet	140	6 65
6 3/4	Alizarine Cyanine	65	4 40
100	Alizarine Blue Liquid	10	10 00
5	Alizarine Powder	60	3 00
8 1/2	Morin Yellow B	20	1 70
7	Solar Black	45	4 05
1/4	Alizarine Blue	100	25
14	Cudbear	5	20
12	Shumach	3/4	9
80	Carbonate of Soda 1/2 Bth	8 1/2	6 80
13	Cutch	18	2 34
3	Alizarine Paste	32	96
2 1/2	Alizarin Scarlet	50	1 25
500	Yellow Dye	2	10 00
	Ground Fustic & Hypons		7 65
	Baile Compound 1/2 Barrel		1 00
	Caristic & others		98 87

Mississippi Woollen Mills
 (Established 1862)
 Appleton, Ont. 18--
 Inventory of Dyestuffs

- Union Navy Blue
- Alkali Violet
- Alkali Blue
- Catechu Brown
- Neutral Grey
- Nyanza Schwang [?]
- Dark Brown
- Direct Blue
- Methyl Violet
- Alizarine Cyanine
- Alizarine Blue Liquid
- Alizarine Powder
- Morin Yellow B
- Solar Black
- Mazarine Blue
- Cudbear
- Shumach
- Carbonate of Soda 1/2 Bth
- Cutch
- Alizarine Paste
- Alizarin Scarlet
- Yellow Dye
- Ground Fustic Hypons [?]
- Baile [?] Compound 1/2 Barrel

DOCUMENT 1: READING COMPREHENSION QUESTION

1. What type of document is this? When was it written? _____

2. Who wrote this document? Who received it? _____

3. What problem was J.A. Teskey having? _____

4. Rewrite the steps for the dye, using your own words.

DOCUMENT 2: CRITICAL THINKING QUESTIONS

1. What is this document? _____

2. Based on the names of these materials, where do you think they might have come from?
Explain your reasoning. _____

3. How do you think they would have been transported around the world in the 19th
Century? _____

4. What connections do you see between this document and the photograph of Eleanor
McMunn? Explain. _____

