

GRADE 4



Teacher's Guide (Ontario Edition)
Health & Physical Education

Learning Expectations

Canola: One Plant, Three Products

This lesson is intended to introduce students to canola.

Canola Oil is Everywhere!

Grade 4, Healthy Living - Making Connections for Healthy Living

Overall Expectation

Demonstrate the ability to make connections that relates to health and well-being – how their choices and behaviors affect both themselves and others, and how factors in the world around them affect their own and others' health and well-being.

Specific Expectation

Identify ways of promoting healthier food choices in a variety of settings and situations.

Healthy Oils & Fats In Your Daily Diet

Grade 4, Healthy Living - Understanding Health Concepts

Overall Expectation

Demonstrate an understanding of factors that contribute to healthy development.

Specific Expectation

Identify the key nutrients provided by foods and beverages, and describe their importance for growth, health, learning, and physical performance.



This Teacher’s Guide is designed to provide the teacher with a comprehensive resource that will assist students in learning about canola. The information provides a context for both teaching and learning. The student activities give the teacher direction for using the facts about this important crop in the Canadian economy.

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Overview of Lesson Package for Grade 4

General Information

Structure of the Unit

This package consists of an introduction (BLM 0), two lessons in Black Line Master format (BLM 1 and 2).

Contents Of This Package

- > Photocopy Ready Teacher Outline & Answer Pages, BLM 0 - BLM 2
- > Photocopy Ready Student Worksheets, BLM 3 - BLM 9

Structure of Student Lessons

1. Each student lesson is provided in BLM format.
2. Students should be able to progress through each lesson with minimal teacher guidance. It is suggested that a class discussion follow each lesson to wrap up any student questions.
3. The Guided Inquiry heading is a tool that should be used to guide your students towards asking these questions on their own.

You Don't Need to be an Expert

All the information you and your students really need is in this package. There's no need for the teacher to do extra research. At the same time, there is plenty of opportunity for students to do extra research.

You Don't Need a Lot of Preparation Time

We've tried to keep this teacher guideline as concise and concrete as possible, so you won't have to go through page after page to find what you're looking for. We've chosen the simplest possible language and the tightest possible format; the same is true of the Student Lessons.

You Decide How Much Class Time to Use

Children do not need the entire package to benefit. It's well worth while to do, say, the introduction and one lesson you think your students would most enjoy.

The Lessons are Meant for Independent Work

The lessons are designed to help students learn how to learn from reference materials, from reading, from working together to answer questions, from connecting the learning that takes place in one lesson to the next.



Teacher Outline - BLM 0

Canola: One Plant, Three Products

Expectation

To introduce students to canola.

Guided Inquiry

1. How do scientists make biodiesel fuel?
2. How is canola oil processed?
3. What are the benefits of using canola meal in animal feed?
4. What kinds of jobs can a person have in the canola industry?

Materials

1. Computers for student research.
2. Copies of BLM 3, 4, and 10.

Introductory Set

Canola is a crop that farmer's grow. Canola seeds are harvested from the plant at the end of every crop year. Farmer's sell their canola seeds to grain elevators or crushing plants. From the canola seeds, three products can be produced.

Teacher Background Info

Canola oil is made at a processing facility by crushing the canola seeds. Approximately 42% of a seed is oil. What remains is canola meal, a high quality animal feed. Canola is a key ingredient in many of the foods we eat. Its reputation as a healthy oil has created high demand in markets around the world. Canola oil has many non-food uses, and often replaces non-renewable resources in products including candles, lipsticks, newspaper inks, industrial lubricants, and bio fuels.

Canola meal is one of the most widely used protein sources in animal feeds, and is also used in specialty diets around the world. Most countries that import canola seed mainly do so for the oil, and after crushing the seed a coproduct is created called meal. It has an excellent amino acid profile and it's rich in vitamins and essential minerals.

Biodiesel fuel is a vegetable based diesel fuel. Diesel is a fuel used in a large number of vehicles. Diesel fuel is a fraction distilled from fossil crude oil, which on combustion, produces sulfur and carbon based gas emissions, gases known to contribute to the greenhouse effect. Biodiesel is produced from plants and animals, produces fewer emissions, and provides better lubrication than low sulfur diesel. Biodiesel is made from tri-glyceride oils found in plant oils, such as canola. Biodiesel is formed though a chemical process called "transesterification" that occurs when an alcohol (such as methanol or ethanol) is added to the plant oil together with an alkaline reactant such as caustic soda (sodium hydroxide) or potassium hydroxide - this acts as a catalyst. The glyceride molecule is "cracked" and replaced with an alcohol molecule, forming an alkaline ester chain. Therefore, biodiesel is the name given to fuels containing methyl or ethyl esters.

Activities

Students will work in groups of three to research the answers.

Assessment

Assess the student worksheet for correct answers and good teamwork skills.



Teacher Answers - BLM 0

Canola: One Plant, Three Products

GO!

Answers:

1. Picture A shows a part of the canola plant being fed to animals. What do you think this is called? Look through the glossary to find the name of this canola product.

It is called canola meal.

2. Picture B shows a part of the canola plant in a liquid form. What do you think this is called? Look through the glossary to find the name of this canola product.

It is called canola oil.

3. Picture C shows a part of the canola plant from the beginning of a process to the end of a process. What do this think the end product is called? Look through the glossary to find the name of this canola product.

It is called biodiesel fuel.

CROSS THE FINISH LINE

Answers:

1. Canola oil is the main product of canola seed since about 43% of the seed is oil.

TRUE or FALSE

2. The name “Canola” comes from “Can” (for Canary yellow, the color of the flower petals) and “ola” (for oil low acid).

TRUE or **FALSE**

The name “Canola” comes from “Can” (for Canada) and “ola” (for oil low acid).

3. Canola was originally naturally bred from rapeseed in Canada by two agricultural scientists, Keith Downey and Baldur R. Stefansson, in the early 1970's.

TRUE or FALSE



Teacher Outline - BLM 1

Canola Oil is Everywhere!

Overall Expectation

Demonstrate the ability to make connections that relates to health and well-being – how their choices and behaviors affect both themselves and others, and how factors in the world around them affect their own and others' health and well-being.

Specific Expectation

Identify ways of promoting healthier food choices in a variety of settings and situations.

Guided Inquiry

1. Why are restaurants, fast-food chains, and athletes making the switch to canola oil?
2. Why is canola oil a healthy alternative?
3. How can I use canola oil in my diet?

Materials

1. Computers for student research.
2. Student copies of BLM 5, 6, and 7.

Introductory Set

Many food chains are already using canola oil in their restaurants, because it is a healthy alternative to other cooking oils. Canola oil is light, clear, and easy to use. Canola oil's high smoke point is also ideal for deep frying and offers a lot more flexibility than other types of oils.

Teacher Background Info

High-oleic canola oil, and in some culinary applications, classic canola oil, is a great replacement for partially hydrogenated oils used in food products and food service. About 80 percent of trans fat in North America comes from processed food products and the food service industry. This number is decreasing as manufacturers choose oils containing no trans fat.

Canola oil is one of the healthiest oils in the marketplace with healthy monounsaturated and polyunsaturated fats, the lowest amount of saturated fat of all common culinary oils, and zero trans fat and cholesterol. Today, there are two types of canola oil: commodity or classic, which is sold at retail, and high-oleic or high-stability which is newer and sold almost exclusively to food companies and food service operations.

Both oils have the same low level of saturated fat and positive health attributes. The only difference between them is that high-oleic canola oil, as its name suggests, contains more oleic acid (a monounsaturated fat) and less polyunsaturated fats, namely alpha-linolenic acid and linoleic acid. This fat profile makes high-oleic canola oil more stable, allowing for greater heat tolerance and longer shelf life.

Activities

Students will work in groups of two to research the answers.

Assessment

Assess the student worksheet for correct answers and good teamwork skills.

Extension Activities

1. Incorporate words from this lesson plan into a spelling list (see BLM 7).
2. Book the Home Ec. classroom and bake cookies using canola oil (see BLM 6).



Teacher Answers - BLM 1

Canola Oil is Everywhere!

GO!

Answers:

1. Which fast food giant has made the switch to canola oil to ensure virtually all of the menu items have zero grams of trans fat?

Kentucky Fried Chicken (KFC)

2. Which fast food chain is “lovin’ ” their transition to canola oil?

McDonald’s

3. Which popular restaurant pizza chain has switched to using canola oil?

Boston Pizza

4. Which CFL team converted their stadium popcorn oil and topping to canola based popcorn topping?

The Saskatchewan Roughriders

Cross the Finish Line

Bonus Questions:

Answers:

1. Name another restaurant that uses canola oil.

Taco Bell or Red Lobster

2. Name a former Olympic champion that uses canola oil for its nutritional values.

Joan McCusker or Janet Evans



Teacher Outline - BLM 2

Healthy Oils & Fats in Your Diet

Overall Expectation

Demonstrate an understanding of factors that contribute to healthy development.

Specific Expectation

Identify the key nutrients provided by foods and beverages, and describe their importance for growth, health, learning, and physical performance.

Guided Inquiry

1. Why is canola oil better than, say, olive oil?
2. Why should I avoid trans fat?
3. What kinds of foods use canola oil?
4. I'm just a kid, why do I need to worry about my fat intake now? How could my choices now affect my health later on in life?

Materials

1. Computers for student research.
2. Student copies of BLM 8, 9, and 10.

Introductory Set

In addition to the four food groups on the Canada Food Guide, there is a new recommendation for the daily amount of oils and fats a person should consume.

Teacher Background Info

Dietary fat plays an important role in daily nutrition; however, we only need a small amount of fat to keep the body healthy. Fat performs the following functions:

- > Stores energy for life processes
- > Cushions the vital organs
- > Insulates the body
- > Transports some of the vitamins and minerals
- > Adds flavor to foods helping to stimulate the appetite
- > Forms part of the cell membrane

Some lipids (fats and oils) are better for you than others. The more solid a fat is the less healthy it is because it is more saturated.

Liquid fats such as canola oil are healthier for your body because they are unsaturated fats. Trans fat is artificially formed when liquid vegetable oils are turned into solid fat using a process called partial hydrogenation.

Extension Activities

1. Check out the "Meet the Fats" link on this website: http://www.heart.org/HEARTORG/GettingHealthy/HealthierKids/ActivitiesforKids/Activitiesfor-Kids_UCM_304155_SubHomePage.jsp

Activities

Students will work in groups of three to research the answers.

Assessment

Assess the student worksheet for correct answers and good teamwork skills.



Teacher Answers - BLM 2

Healthy Oils & Fats In Your Diet

GO!

Answers:

1. If a recipe calls for 1 cup of solid fat, how much canola oil would you need to use as a substitute?

3/4 cup

2. According to the glossary, name a fat that you should avoid.

Trans fat

3. According to the glossary, name a fat that should be eaten in moderation.

Saturated fat

4. According to the glossary, name two heart healthy fats.

***Monounsaturated fat and
Polyunsaturated fat***

5. How much unsaturated fat does the Canada Food Guide recommend daily?

2 to 3 tablespoons

6. According to the glossary, what is cardiovascular disease?

A disease that affects the heart or blood vessels (arteries or veins)



Student Worksheet - BLM 3

Canola: One Plant, Three Products

Farmer's Corner:

Canola is a crop that farmer's grow. Canola seeds are harvested from the plant at the end of every crop year. Farmer's sell their canola seeds to grain elevators or crushing plants. From the canola seeds, three products can be produced.

Warm Up

- > Work in a group of three: one person for each photo copy below. Choose (1) A Farmer (2) A Hired Help (3) A Farm Equipment Mechanic.

Are You Ready?

Each group needs three photocopies:

1. This Farmer's Corner Page
2. Canola: One Plant, Three Products Picture Page
3. Canola Terms Glossary

Get Set

1. On the Picture Page, locate Picture A, Picture B, and Picture C.
2. Glance at the Glossary.

Go!

- > Get the Farmer to read these rules and questions aloud.
- > Get the Mechanic to keep an eye on the Glossary.
- > Let the Hired Help be the writer.
- > Make sure everyone agrees on what to do.

Question #1: Picture A shows a part of the canola plant being fed to animals. What do you think this is called? Look through the glossary to find the name of this canola product.

Answer #1:

Question #2: Picture B shows a part of the canola plant in a liquid form. What do you think this is called? Look through the glossary to find the name of this canola product.

Answer #2:

Question #3: Picture C shows a part of the canola plant from the beginning of a process to the end of a process. What do this think the end product is called? Look through the glossary to find the name of this canola product.

Answer #3:

Cross the Finish Line

- > Get the Mechanic to research information on the internet about canola to find out whether the statements below are true or false.

1. Canola oil is the main product of canola seed since about 43% of the seed is oil.

TRUE or FALSE

2. The name "Canola" comes from "Can" (for Canary yellow, the color of the flower petals) and "ola" (for oil low acid).

TRUE or FALSE

3. Canola was originally naturally bred from rapeseed in Canada by two agricultural scientists, Keith Downey and Baldur R. Stefansson, in the early 1970's.

TRUE or FALSE



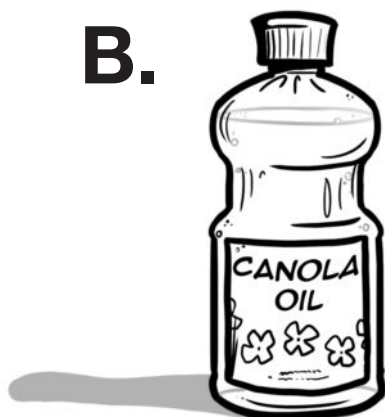
Student Worksheet - BLM 4

Canola: One Plant, Three Products

A.



B.



C.



Student Worksheet - BLM 5

Canola Oil is Everywhere!

Farmer's Corner:

Many food chains are already using canola oil in their restaurants. Canola oil is a healthy alternative to other cooking oils. Canola oil is light, clear, and easy to use. Canola oil's high smoke point is also ideal for deep frying and offers a lot more flexibility than other types of oils.

Warm Up

- > Work in groups of two: one person for each photocopy below. Choose (1) A Farmer (2) A Hired Help

Are You Ready?

Each group needs two photocopies:

1. This Farmer's Corner Page
2. Canola Oil is Everywhere! Website Links Page

Get Set

- > Get the farmer to read these rules and questions aloud.
- > Let the Hired Help be the writer.
- > Make sure each of you agrees on what to do.

Go!

Question #1: Which fast food giant has made the switch to canola oil to ensure virtually all of the menu items have zero grams of trans fat?

Answer #1:

Question #2: Which fast food chain is "lovin'" their transition to canola oil?

Answer #2:

Question #3: Which popular restaurant pizza chain has switched to using canola oil?

Answer #3:

Question #4: Which CFL team converted their stadium popcorn oil and topping to canola based popcorn topping?

Answer #4:

Cross the Finish Line

Bonus Question #1: Name another restaurant that uses canola oil.

Bonus Answer #1:

Bonus Question #2: Name a former Olympic champion that uses canola oil for its nutritional values.

Bonus Answer #2:

Helpful Reminder

The source of an oil or fat can tell us if it is likely to have cholesterol. If an oil comes from a seed, it doesn't have cholesterol. If a fat comes from an animal, it has cholesterol.

If it doesn't have a face, it doesn't have cholesterol.



Student Worksheet - BLM 6

Canola Oil is Everywhere!

Monster Cookies

Ingredients

- > 1/2 cup canola oil
- > 1/2 cup canola margarine
- > 1 cup brown sugar
- > 1 cup granulated sugar
- > 3 eggs
- > 1 tbsp vanilla
- > 2 1/2 cups all purpose flour
- > 1/2 tsp salt
- > 2 tsp baking soda
- > 1 1/2 cups rolled oats
- > 1 cup Smarties or M&M's
- > 3/4 cup chocolate chips

Directions

1. Preheat oven to 350 degrees Celsius. Beat canola oil, margarine, brown sugar, white sugar, eggs, and vanilla until light and fluffy.
2. In a separate bowl, combine flour, salt and baking soda, then add to egg mixture. Fold in the oatmeal, Smarties or M&M's and chocolate chips. Drop by spoonful and bake for 10 minutes or until golden brown.

Yield

3 dozen cookies.

Website Links

- <http://www.docstoc.com/docs/9842960/McDonalds-Canada-Canola-Oil-Blend-Conversion-Media-Statement>
- <http://www.saskcanola.com/community/index.html>
- http://www.canolainfo.org/news/latest_news.php?detail=46
- http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20061030/transfat_nyc_061030/20061030?hub=CanadaAM



Student Worksheet - BLM 7

Canola Oil is Everywhere!

Spelling List:

canola

oil

body

healthy

fats

diet

good

nutrient

daily

food

SPELLING



Student Worksheet - BLM 8

Healthy Oils & Fats in Your Diet

Farmer's Corner:

In addition to the four food groups on the Canada Food Guide, there is a new recommendation for the daily amount of oils and fats a person should consume.

Warm Up

- > Work in a group of three: one person for each photo copy below. Choose (1) A Farmer (2) A Hired Help (3) A Farm Equipment Mechanic.

Are You Ready?

Each group needs three photocopies:

1. This Farmer's Corner Page
2. Healthy Oils & Fats in Your Diet Information Page
3. Canola Terms Glossary

Get Set

1. Get the Farmer to read the rules and questions aloud.
2. Get the Mechanic to keep an eye on the Glossary.
3. Let the Hired Help be the writer.
4. Make sure everyone agrees on what to do.

Go!

Question #1: If a recipe calls for 1 cup of solid fat, how much canola oil would you need to use as a substitute?

Answer #1:

Question #2: According to the glossary, name a fat that you should avoid.

Answer #2:

Question #3: According to the glossary, name a fat that should be eaten in moderation.

Answer #3:

Question #4: According to the glossary, name two heart healthy fats.

Answer #4:

Question #5: How much unsaturated fat does the Canada Food Guide recommend daily.

Answer #5:

Question #6: According to the glossary, what is cardiovascular disease?

Answer #6:

Website Link

<http://www.canolainfo.org/heartsmart/index.php?page=72>



Student Worksheet - BLM 9

Healthy Oils & Fats in Your Diet

Oils and fats supply calories and essential fats and help our bodies absorb fat-soluble vitamins A, D, E and K. The type of fat consumed is as important for health as the total amount consumed.

Fats are composed of smaller units called fatty acids. These fatty acids can be saturated, trans, or unsaturated (polyunsaturated and monounsaturated). The main type of fatty acids that a fat or oil contains is used in its description. For example, canola oil is described as a **unsaturated fat** because of its low level of saturated fats and high levels of **monounsaturated fat** and **polyunsaturated fat**.

A number of foods contribute to the total amount of fat in a person's diet. A large amount, however, comes from oils and fats that are added to foods.

A diet low in **saturated fat** and **trans fat** can help reduce the risk of **cardiovascular disease**. People should consume mostly unsaturated fats.

The Canada Food Guide recommends that people *include a small amount - 30 to 45 mL (2 to 3 tablespoons) - of unsaturated fat each day. This includes oil used in cooking, salad dressings, margarine, and mayonnaise.*



Dietary Fat	Comparison of Dietary Fats		
Canola Oil	7	21	11
Olive Oil	15	9	1
Coconut Oil	91		2
	Saturated Fat	Polyunsaturated Fat	Monounsaturated Fat
		linoleic acid (an omega-6 fatty acid)	oleic acid (an omega-9 fatty acid)
		alpha-linoleic acid (an omega-3 fatty acid)	

SOURCE: PHS PILLOT PLANT CORPORATION



Glossary - BLM 10

Biodiesel:

A vegetable oil based diesel fuel.

Canola Meal:

A protein supplement in dairy, beef, swine, and poultry rations.

Canola Oil:

A commonly used cooking oil.

Cardiovascular Diseases:

A disease that affects the heart or blood vessels (arteries and veins).

Monounsaturated Fat:

A heart healthy fat.

Polyunsaturated Fat:

A heart healthy fat.

Saturated Fat:

A fat that should be eaten in moderation. Canola oil contains the lowest amount of saturated fats.

Trans Fat:

A fat that you should avoid.



For More Information

There are many websites where you can find more information about canola in Canada:

SaskCanola
www.saskcanola.com

Agriculture in the Classroom
www.aitc.ca

Canola Council of Canada
www.canolacouncil.org

CanolaInfo
www.canolainfo.org

SaskCanola would like to thank Ellen Hinz for her work in developing this Grade 4 Lesson Package.

Additional copies of this Grade 4 Lesson Package can be obtained from SaskCanola.

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Thanks for taking the time to learn about canola.