

Multiplying Fractions

Activity Summary

- In this activity, students will:
- ♦ Practice multiplying fractions in a practical situation
 - ♦ Revise a recipe using multiplication of fractions
 - ♦ Create and bake a batch of cookies
 - ♦ Complete an **Essential Skills** cookie diagram



Prior Knowledge

- **Essential Skills**
- Basic knowledge of multiplying fractions



Teaching Planning Notes

- Review assignment including prior knowledge required and assessment and evaluation tools
- Arrange to work with Hospitality class or Family Studies class to bake cookies
- Discuss success of baking initiative and importance of accurate measuring techniques
- Discuss use of **Essential Skills** and justification for ranking
- Purchase ingredients necessary for activity
- Discuss classroom expectations in kitchen environment (i.e. safety, politeness, etc.)
- Invite Hospitality class to mentor class and assist in testing out recipes

Note 1: Community connection could be introduced by organizing students to deliver cookies to local daycare/nursery school or feeder school.

Note 2: Employer connection could be introduced by having a volunteer from the “baking industry” help supervise students in kitchen activity.

Assessment of Student Achievement

Task	Tool / Type
Multiplying Fractions	Shake ‘n’ Bake Increasing Recipes Activity Sheet A (Formative)
Increasing Recipes	Shake ‘n’ Bake Let’s Get Baking Activity Sheet B (Formative)
Baking Cookies	Shake ‘n’ Bake Activity Sheets C (Formative) and Easy Oatmeal Cookies Rubric (Summative)
Ranking Essential Skills	Shake ‘n’ Bake Essential Skills Activity Sheet D (Formative)

Activity and Assessment Materials

- Multiplying Fractions Assignment Sheet
- Increasing Recipes Activity Sheet A
- Let’s Get Baking Activity Sheet B
- Getting Ready to Bake Activity Sheets C1, C2 and C3
- Cookies and **Essential Skills** Activity Sheet D
- Easy Oatmeal Cookies Rubric

FOCUS ON LEARNING

Essential Skills:

Numeracy

All Activities

Document Use

Activity Sheets C

Reading Text

All Activities

Writing

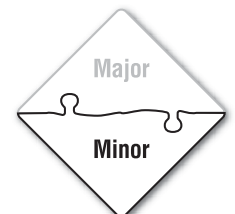
All Activities

Thinking Skills

All Activities

Working with Others

Activity Sheets C



Curriculum Linkages For Ontario Educators

Essential Skills truly are everywhere and as teachers we are always teaching students the **Essential Skills!** As subject teachers and specialists, we know that many of the curriculum expectations we are accountable to teach and assess, also address the **Essential Skills** and while the linkages are not always readily apparent, the linkages exist nonetheless.

While this activity connects to a variety of courses, it is most closely aligned to the following course(s):

- Locally Developed Compulsory Credit Course, Mathematics - Grade 9 - MAT 1L
- Hospitality and Tourism Technology - Grade 10 Open - TFJ 2O

To assist you, the teacher, in making more transparent linkages, we have identified the following curriculum linkages for this activity.

Locally Developed Compulsory Credit Course, Mathematics – MAT 1L

Coded Overall Expectations	Coded Specific Expectations
DPRV.01 – determine relationships among fractions, percentages, ratios and rates by constructing diagrams, building models and estimating measurements	DPR1.07 – multiply a fraction by a whole number
DPRV.02 – solve problems drawn from everyday situation involving percent, ratio, rate and fractions;	DPR2.01 – solve problems involving fractions and percentages in practical situations, by converting to decimals and using a calculator, where appropriate;

Hospitality and Tourism Technology – TFJ 2O

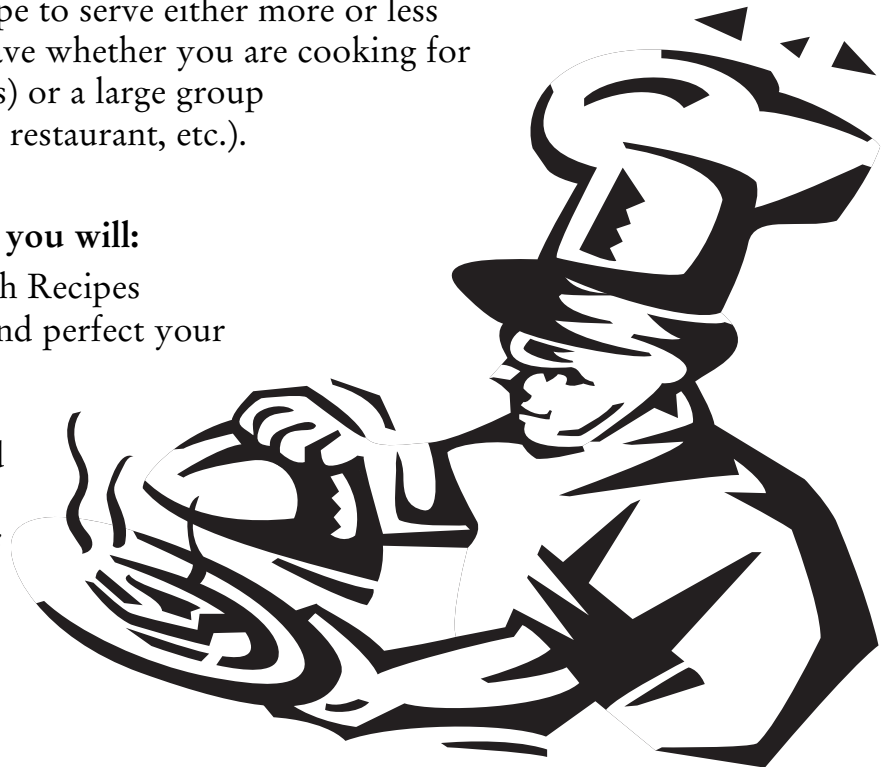
Coded Overall Expectations	Coded Specific Expectations
SPV.05F – demonstrate understanding of the importance of communication, time-management, and teamwork skills	SP1.02 – operate kitchen, baking and confectionary equipment
	SP1.06F – demonstrate a range of teamwork, organizational, and communication skills
	SP1.07F – understand the importance of accurate measurement techniques

Shake 'n' Bake

Baking is one example of where we use fractions in everyday life. Knowledge of how to alter a recipe to serve either more or less people, is an important skill to have whether you are cooking for a small group (e.g., family, friends) or a large group (e.g., catering a banquet, chef in a restaurant, etc.).

For this multi-part assignment, you will:

- Practice Multiplication with Recipes
- Choose your own recipe and perfect your multiplication skills
- Choose an oatmeal cookie recipe, triple the recipe and make some cookies!
- Complete an *Essential Skills* Cookie Diagram



Shake 'n' Bake Increasing Recipes Activity Sheet A

This activity will prepare you for Parts 2 through 4. Using this Activity Sheet, you will practice multiplying fractions, to increase recipes.

Using your knowledge of multiplication, increase the following recipes. Show all of your work.

1. a) Increase the following recipe to serve 24 people. (multiply the ingredients by ____)

Sponge Cake (serves 12)

1 cup flour _____ 1 cup sugar _____

1 cup self-rising flour _____ 4 large eggs _____

1/4 cup cornstarch _____ 1/2 cup milk _____

1 cup butter _____

- b) Circle which measuring cup and indicate how many of the measuring cups are needed for each ingredient listed in the NEW recipe.

i) flour

			
1 CUP _____	1/2 CUP _____	1/3 CUP _____	1/4 CUP _____

ii) self-rising flour

			
1 CUP _____	1/2 CUP _____	1/3 CUP _____	1/4 CUP _____

iii) cornstarch

			
1 CUP _____	1/2 CUP _____	1/3 CUP _____	1/4 CUP _____

iv) butter

			
1 CUP _____	1/2 CUP _____	1/3 CUP _____	1/4 CUP _____

v) sugar

			
1 CUP _____	1/2 CUP _____	1/3 CUP _____	1/4 CUP _____

vi) milk

			
1 CUP _____	1/2 CUP _____	1/3 CUP _____	1/4 CUP _____

Shake 'n' Bake

2. a) Increase the following recipe to serve 36 people. (multiply the ingredients by _____)

Yummy Cupcakes (serves 12)

1 cup flour _____ 3/4 cup sugar _____

1/4 tsp. salt _____ 1 egg _____

1 tsp. baking soda _____ 1/4 cup milk _____

1/4 cup margarine _____ 1/2 tsp. vanilla extract _____

b) Circle which measuring cup and indicate how many of the measuring cups are needed for each ingredient listed in the NEW recipe.

i) flour  _____  _____  _____  _____

ii) margarine  _____  _____  _____  _____

iii) sugar  _____  _____  _____  _____

iv) milk  _____  _____  _____  _____

Shake 'n' Bake

3. a) Increase the following recipe to serve 48 people. (multiply the ingredients by ____)

Angel Food Cake (serves 12)

1 cup flour _____ 12 egg whites _____

1-1/2 cup sugar _____ 1-1/4 tsp. cream of tartar _____

1/4 tsp. salt _____ 1-1/4 tsp. almond extract _____

b) Circle which measuring cup and indicate how many of the measuring cups are needed for each ingredient listed in the NEW recipe.

i) flour

 _____
  _____
  _____
  _____

ii) sugar

 _____
  _____
  _____
  _____

4. a) Increase the following recipe to serve 24 people. (multiply the ingredients by ____)

A Poppy-Seed Cake (serves 8 people)

1/3 cup poppy seeds _____ 3/4 cup milk _____

3/4 cup butter _____ 1-1/2 cups sugar _____

1-1/2 tsp. vanilla _____ 2 cups flour _____

2-1/2 tsp. baking powder _____ 1/4 tsp. salt _____

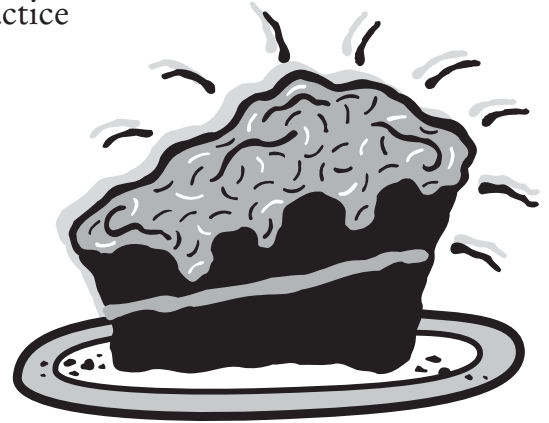
4 egg whites, beaten _____

Shake 'n' Bake Let's Get Baking

In this activity you will choose your own recipe and practice multiplying fractions to perfect your skill!

For this assignment, you will need the following:

- a pair of scissors
- a glue stick/tape
- a copy of the Let's Get Baking Activity Sheet B
- a magazine that has recipes



Using your magazine, you will:

- 1) Find a dessert recipe that has a minimum of 4 fractions in it. Try to find a recipe that has a picture!
- 2) Use the scissors to cut out your recipe and paste it on the front side of the handout.
- 3) Find a recipe for a main course that has a minimum of 4 fractions in it. Try again, to find a recipe that has a picture!
- 4) Use the scissors to cut out your recipe and paste it on the back side of the handout.
- 5) Beside each of the recipes you have chosen, you are going to practice your multiplying fraction skills again, by increasing each recipe by a factor of 5.
Be sure to:
 - Show all of the necessary steps.
 - Re-write the ingredient name with its new measure.
 - State how many people OR how many servings your new recipe will serve.
- 6) Think about the **Essential Skills** that you have used in this activity.

Shake 'n' Bake Getting Ready To Bake! Activity Sheet C1

Group Members: _____

For this activity, you will be working in groups of three.

In your group you will:

- 1) Work as a team to triple the recipe. Check and re-check each other's mathematics.
- 2) Hand in one copy of the group's recipe to be checked by your teacher.

Classic Oatmeal Cookies © Canadian Living

Used with permission from Canadian Living.

Makes approximately 12 cookies.

Increase the following recipe to serve 36. (multiply each ingredient by _____)

Base Recipe:

2/9 cup of softened butter _____	1/3 cup of packed brown sugar _____
1/3 of an egg _____	1/9 tbsp. vanilla _____
1/3 tsp. cinnamon _____	1/2 cup rolled oats _____
1/3 cup of flour _____	1/6 tsp. baking powder _____
1/6 tsp. baking soda _____	1/12 tsp. salt _____

Add-Ins:

1/3 cup raisins or Chipits _____

In a large bowl, beat the butter with brown sugar until fluffy. Beat in egg and vanilla and cinnamon. In a separate bowl, mix rolled oats, all-purpose flour, baking powder, baking soda and salt. Stir into butter mixture. Mix in raisins or Chipits.

Drop by heaping tablespoonfuls about 2 inches apart onto a greased or parchment paper-lined baking sheet.

Bake in top and bottom thirds of 375°F oven, switching and rotating pans halfway through, for 10 minutes or until golden. Let cool on pans on rack for about 2 minutes. Transfer to rack; let cool completely.



Shake 'n' Bake Getting Ready To Bake! Activity Sheet C2

Group Members: _____

For this activity, you will be working in groups of three.

In your group you will:

- 1) Work as a team to triple the recipe. Check and re-check each other's mathematics.
- 2) Hand in one copy of the group's recipe to be checked by your teacher.

Chocolate Pecan Oatmeal Cookies © Canadian Living

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Makes about 12 cookies.

Increase the following recipe to serve 36. (multiply each ingredient by _____)

Base Recipe:

2/9 cup of softened butter _____	1/3 cup of packed brown sugar _____
1/3 of an egg _____	1/3 tsp. orange rind _____
1/2 cup rolled oats _____	1/3 cup flour _____
1/6 tsp. baking powder _____	1/6 tsp. baking soda _____
1/12 tsp. salt _____	

Add-Ins:

1/4 cup of Chipits of your choice _____	1/6 cup of pecans _____
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In a large bowl, beat the butter with brown sugar until fluffy. Beat in egg and orange rind.

In a separate bowl, mix rolled oats, all-purpose flour, baking powder, baking soda and salt. Stir into butter mixture. Mix in Chipits and nuts.

Drop by heaping tablespoonfuls about 2 inches apart onto a greased or parchment paper-lined baking sheet.

Bake in top and bottom thirds of 375°F oven, switching and rotating pans halfway through, for 10 minutes or until golden. Let cool on pans on rack for about 2 minutes. Transfer to rack; let cool completely.

Teacher's Signature _____

Shake 'n' Bake Getting Ready To Bake! Activity Sheet C3

Group Members: _____

For this activity, you will be working in groups of three.

In your group you will:

- 1) Work as a team to triple the recipe. Check and re-check each other's mathematics.
- 2) Hand in one copy of the group's recipe to be checked by your teacher.

Butterscotch Crisp Oatmeal Cookies © Canadian Living

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Makes about 12 cookies.

Increase the following recipe to serve 36. (multiply each ingredient by _____)

Base Recipe:

2/9 cup of softened butter _____	1/3 cup of packed brown sugar _____
1/3 of an egg _____	1/3 tsp. vanilla _____
1/2 cup rolled oats _____	1/3 cup flour _____
1/6 tsp. baking powder _____	1/6 tsp. baking soda _____
1/12 tsp. salt _____	

Add-Ins:

1/3 cup rice crisp cereal _____	1/6 cup of rolled oats _____
1/6 cup of butterscotch chips _____	

In a large bowl, beat the butter with brown sugar until fluffy. Beat in egg and vanilla.

In a separate bowl, mix rolled oats, all-purpose flour, baking powder, baking soda and salt. Stir into butter mixture. Mix in rice crisp cereal, rolled oats and butterscotch chips.

Drop by heaping tablespoonfuls about 2 inches apart onto a greased or parchment paper-lined baking sheet.

Bake in top and bottom thirds of 375°F oven, switching and rotating pans halfway through, for 10 minutes or until golden. Let cool on pans on rack for about 2 minutes. Transfer to rack; let cool completely.

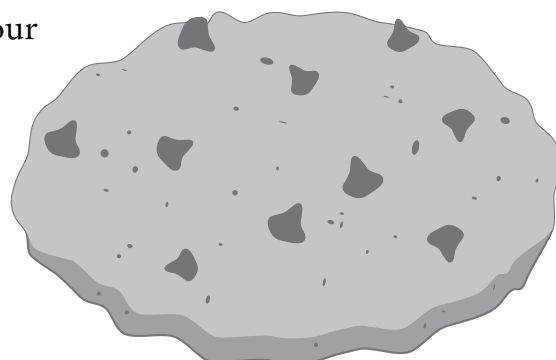
Shake 'n' Bake Cookies and Essential Skills Activity Sheet D

As your group sits down to enjoy your cookies, discuss some of the **Essential Skills** that you have used in completing this activity.

You have had the opportunity to think about and discuss some of the **Essentials Skills** that you have used in these activities. Using a freshly baked **Essential Skills** Cookie and the legend provided, rank the **Essential Skills** from most to least important and then colour each piece of the cookie to illustrate your conclusions. Be prepared to justify your reasoning!

You will need:

- pencil crayons, crayons or markers
- **Essential Skills** Cookie Worksheet



Step 1: This is a freshly baked **Essential Skills** Cookie.

Think about the ingredients used to make it by listing the 9 **Essential Skills** on the lines below.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Shake 'n' Bake

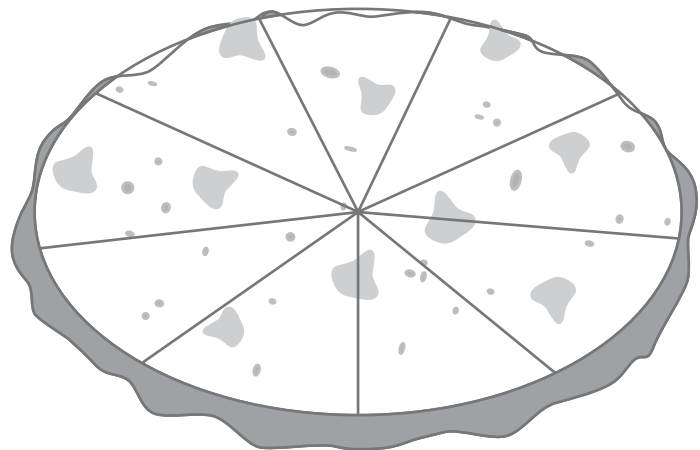
Step 2: Consider the **Essential Skills** that you used when reformulating the Oatmeal Cookie and making them. Rank the 9 **Essential Skills** from most important to least important by using the colour legend below.

- #1 Red (most important) _____
- #2 Orange _____
- #3 Yellow _____
- #4 Green _____
- #5 Light Blue _____
- #6 Dark Blue _____
- #7 Purple _____
- #8 Brown _____
- #9 Black (least important or never used) _____

Step 3: Now colour in each piece of the cookie using the above legend, to illustrate your thoughts.

Colour Key Legend

COLOUR	ESSENTIAL SKILL
	Writing
	Continuous Learning
	Computer Use
	Thinking Skills
	Numeracy
	Working With Others
	Document Use
	Oral Communication
	Reading Text



Shake 'n' Bake Easy Oatmeal Cookies Rubric

CATEGORIES/ CRITERIA	LEVEL 1 (50-59%)	LEVEL 2 (60-69%)	LEVEL 3 (70-79%)	LEVEL 4 (80-100%)
<p>Knowledge and Understanding Demonstrates understanding of multiplying fractions).</p>	Limited Understanding	Some Understanding	Considerable Understanding	Thorough Understanding
<p>Thinking Effectively solves problems when working with fractions. Effectively uses decision making skills when working with equipment in the kitchen.</p>	Limited Effectiveness Limited Effectiveness	Some Effectiveness Some Effectiveness	Considerable Effectiveness Considerable Effectiveness	High Degree of Effectiveness High Degree of Effectiveness
<p>Communication Demonstrates a range of organizational and oral communication skills while working with group, in the kitchen.</p>	Limited Effectiveness	Some Effectiveness	Considerable Effectiveness	High Degree of Effectiveness
<p>Application Operates baking equipment effectively. Demonstrates an understanding of connections between accurate mathematical measurement techniques and baking a tasty cookie</p>	Limited Effectiveness Limited Effectiveness	Some Effectiveness Some Effectiveness	Considerable Effectiveness Considerable Effectiveness	High Degree of Effectiveness High Degree of Effectiveness

Note: A student whose achievement is below Level 1 (50%) has not met the expectations for this assignment or activity.

