



MODULE C: NUTRITION

Specific Learning Outcomes

Introduction

Lesson 1: Energy Intake

Lesson 2: Energy Expenditure

Lesson 3: Energy Balance

Lesson 4: Food Safety

Lesson 5: Advertising and Marketing Strategy
Influences on Food Purchases

Lesson 6: Food and Nutrition Myths and
Misconceptions Related to Physical Activity
and Sport Performance

MODULE C: NUTRITION

Specific Learning Outcomes

- 12.NU.1 Demonstrate understanding of the difference between a portion of food and a Food Guide Serving.
- 12.NU.2 Evaluate personal food intake using *Eating Well with Canada's Food Guide*.
- 12.NU.3 Demonstrate understanding of the relationship between the energy spent in physical activity and healthy weight.
- 12.NU.4 Demonstrate the ability to estimate daily energy expenditure by analyzing personal physical activity participation.
- 12.NU.5 Explain factors that contribute to energy balance and healthy weight.
- 12.NU.6 Examine the relationship between maintaining healthy weight and the consumption of specific food substances.
Includes: sugar and fat
- 12.NU.7 Demonstrate strategies for making decisions about food and activity choices that contribute to good health and healthy weight.
- 12.NU.8 Examine the causes and symptoms of food-borne illness (food poisoning) and demonstrate understanding of ways to minimize the risk of food poisoning.
- 12.NU.9 Demonstrate understanding of food advertising and marketing strategies and their impact on food purchases.
- 12.NU.10 Demonstrate understanding of how food and nutrition myths and misconceptions can affect day-to-day physical activity participation and sport performance and overall health.

MODULE C: NUTRITION

Introduction

Food and beverage consumption is an essential part of our everyday lives. The food choices we make can either contribute to our overall health and well-being or lead to a variety of health concerns, such as cardiovascular disease, obesity, osteoporosis, cancer, and diabetes.

The lessons in Module C provide information and suggest strategies to help students understand the importance of maintaining lifelong balance of energy expenditure and food intake to achieve a healthy body weight. Healthy eating also involves understanding and practising safe food handling, preparation, and storage.

In this module students also investigate ways to make healthier food choices by developing their understanding of the language and marketing strategies employed by the food industry. Along the way, students examine some common myths and misconceptions associated with achieving this balance and explore their own eating habits.

Module C: Nutrition contains six lessons:

- Lesson 1: Energy Intake
- Lesson 2: Energy Expenditure
- Lesson 3: Energy Balance
- Lesson 4: Food Safety
- Lesson 5: Advertising and Marketing Strategy Influences on Food Purchases
- Lesson 6: Food and Nutrition Myths and Misconceptions Related to Physical Activity and Sport Performance

Resources to support the lessons are provided in the Resource Masters section of this document.

Lesson 1: Energy Intake

Introduction

In this lesson students have the opportunity to practise the self-assessment skills they have learned in previous years related to healthy eating. The suggested learning strategies facilitate a review of the information in *Eating Well with Canada's Food Guide* (Health Canada), including Food Guide Servings, and offer students the opportunity to develop a healthy eating goal.

REFERENCES



The following guides may be downloaded or ordered from the Health Canada website at www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php:

Health Canada. *Eating Well with Canada's Food Guide*. Ottawa, ON: Health Canada, 2007.

---. *Eating Well with Canada's Food Guide: First Nations, Inuit and Métis*. Ottawa, ON: Health Canada, 2007.

---. *My Food Guide*. 7 Jan. 2008.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at www.edu.gov.mb.ca/k12/cur/physlth/.



Specific Learning Outcomes

12.NU.1 Demonstrate understanding of the difference between a portion of food and a Food Guide Serving.

12.NU.2 Evaluate personal food intake using *Eating Well with Canada's Food Guide*.



Key Understandings

- Energy needs are higher during adolescence than at any other time of life.
- Commercial food portions have distorted consumer perception of reasonable food serving sizes.
- *Eating Well with Canada's Food Guide* (hereafter referred to as *Canada's Food Guide*) is a helpful resource to guide consumers in balanced eating.



Essential Questions

1. What is the difference between a portion of food and a Food Guide Serving?
 2. How is *Canada's Food Guide* used to evaluate food intake?
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Background Information

Making Healthy Food Choices with *Canada's Food Guide*

The food we eat supplies our bodies with the essential nutrients (carbohydrates, fats, proteins, vitamins, minerals, and water) needed for growth, health, and daily functioning. These fundamental needs change throughout life, from early childhood, through adolescence, and into every stage of adulthood. Nutrient and energy needs are at their highest during the adolescent years. Bone and tissue development during this period, along with the increased blood volume associated with rapid growth, contributes to the increased nutrient and energy needs during adolescence. Meeting these requirements with nutrient-dense foods supports proper growth and development. By learning to make healthy food choices early in life we can decrease the risk of future health problems.

Canada's Food Guide describes a pattern of eating (i.e., the type, amount, and quality of food to consume each day) based on changing needs of males and females throughout the life cycle. The eating patterns take into account energy and nutrients required to support growth, as well as calories/energy required at various ages to support healthy weight.

NOTE TO TEACHER

The eating patterns recommended in *Canada's Food Guide* are based on the energy needs of the majority of Canadians. Following this pattern is designed to support healthy weight throughout the life cycle.

Food Portions

North Americans suffer from “portion distortion.” A *food portion* (or *serving of food*) is the amount of food an individual chooses to eat. There is no *standard* amount for everyone. For example, a toddler’s food portion will be much smaller than an adult’s portion. An adolescent boy’s serving of food will likely be larger than that of an adult male.

As food portions have increased over the years, consumers have changed their expectations of a *reasonable* serving of food, both at home and away from home. Consequently, we are eating more than ever, without realizing it. It is increasingly important to understand how to use *Canada's Food Guide* effectively.

Food Guide Servings

Canada's Food Guide recommends different numbers of daily Food Guide Servings in each food group for males and females at various ages. A *Food Guide Serving* is a reference amount of food in each food group. It helps people compare how much they eat with what is recommended in *Canada's Food Guide*. Everyone two years of age or older should consume the recommended number of Food Guide Servings each day.

The recommended Food Guide Servings help us plan for and consume the right amount of energy and nutrients throughout the day as meals and snacks. Physical activity increases our energy and nutrient requirements. If we are very active, our extra caloric needs should ideally come from a choice of nutrient-dense foods (i.e., larger portions or a greater number of servings from the four food groups).

Foods to Limit

Canada's Food Guide encourages us to limit consumption of foods and beverages that are high in calories, fat, salt, or sugar, or those that do not contain significant amounts of nutrients. No recommended number or size of servings is identified for the diverse category of “foods to limit,” which ranges from soft drinks to potato chips. We are encouraged to consume fewer of these “less healthy choices.” Foods to limit are not a regular part of the eating pattern identified in *Canada's Food Guide*.



Suggestion for Instruction / Assessment

Identifying Food Guide Servings

This learning activity is designed to help students understand Food Guide Servings, using *Canada's Food Guide* as a reference. The menu items listed in RM 1–NU represent a day's food intake for someone between 14 and 18 years old.

Directions/Description

Provide each student with a copy of RM 1–NU. Ask students to

- indicate the number of Food Guide Servings and the food group(s) each menu item represents
- place an asterisk (*) in the Foods to Limit column when a food contains added high fat or high sugar components (e.g., salad dressing)
- calculate the total number of Food Guide Servings consumed from each food group
- enter the number of Food Guide Servings that males and females their age require from each of the four food groups



Refer to RM 1–NU: Food Guide Servings Analyzer.



Suggestion for Instruction / Assessment

Food Group Servings Are Not As Big As You Think

This learning activity gives students hands-on practice in measuring serving sizes. Select a few students to demonstrate this learning activity for the class. If time allows, have all students participate.

Materials Required

Set up a measuring station with the following items:

- measuring cups, bowls, plates, glasses
- food scale
- various foods and beverages from each of the four food groups (see following list for suggestions)
- a copy of RM 2-NU: A Guide to Food Guide Serving Sizes **OR** a copy of *Serving Size Poster* (Dairy Farmers of Manitoba)

Suggested Foods and Beverages to Measure			
Vegetables and Fruit	Grain Products	Milk and Alternatives	Meat and Alternatives
<ul style="list-style-type: none"> ▪ whole fruit or vegetables ▪ canned fruit or vegetables ▪ juice (water with food colouring may be substituted for this learning activity) 	<ul style="list-style-type: none"> ▪ two different cereals (e.g., puffed wheat and o-type cereal) ▪ dry pasta (e.g., rotini, macaroni) 	<ul style="list-style-type: none"> ▪ milk (water may be substituted for this learning activity) ▪ yogurt ▪ cheese 	<ul style="list-style-type: none"> ▪ canned beans ▪ canned meat or fish ▪ lunch meat (food model may be used)

Directions/Description

Have students

- serve food portions they *usually* eat (e.g., they pour the amount of cereal they normally eat into a bowl)
- estimate serving amounts (describe how many servings they *think* this amount represents)
- measure the amount by pouring the food or drink into a measuring cup

NOTE TO TEACHER

The intent of Food Guide Servings is **not** to limit portions of food at each meal to one Food Guide Serving. The measure is designed to help consumers understand how to meet the recommended amount of food consumption in each food group daily (e.g., the serving of potatoes on a plate may be two Food Guide Servings, or the large bowl of cereal eaten each morning may be three or four servings).

For grain products, one can often use weight/measure on food packages or labels to identify servings. For example, a loaf of bread may weigh 450 g and contain 16 slices:

$$450 \div 16 = 28 \text{ g or 1 serving}$$

(30 g = 1 serving of grain products)

- identify the actual number of Food Guide Servings by comparing the amount they usually eat with the amount recommended, using one of the following as a guide:
 - *Canada's Food Guide*
 - RM 2–NU: A Guide to Food Guide Serving Sizes
 - *Serving Size Poster* (Dairy Farmers of Manitoba)



Refer to RM 2–NU: A Guide to Food Guide Serving Sizes.

REFERENCE



The following poster is available from Dairy Farmers of Manitoba. The order form is available online at <www.milk.mb.ca/NutritionOrder/default.asp>.

Dairy Farmers of Manitoba. *Serving Size Poster*. Winnipeg, MB: Dairy Farmers of Manitoba, 2008.



Suggestion for Instruction / Assessment

How Do I Measure Up?

Working individually, students reflect on their personal food intake. Using RM 3–NU, students analyze their food intake relative to recommendations in *Canada's Food Guide*. After students have assessed their own food consumption for one day, they write a healthy eating goal in their Goal Manager (RM 4–FM).



Refer to RM 3–NU: How Do I Measure Up? and RM 4–FM: Goal Manager (Excel spreadsheet).

The Excel spreadsheet is available on the CD-ROM version of this document, as well as online at <www.edu.gov.mb.ca/k12/cur/physhlth/>.

Lesson 2: Energy Expenditure

Introduction

In this lesson students explore the energy expenditure of various levels of physical activity (from resting metabolism to vigorous activity) and the potential impact of physical activity on energy balance and healthy weight.

The human body is meant to move. The muscles, bones, heart, and brain improve through regular activities of daily living and exercise. Lack of regular physical activity puts our health at risk.

Decreased physical activity, coupled with an over-consumption of calories, allows the efficient human body to store surplus energy as fat. Any food intake that results in an excess of calories relative to how much the body burns off during the day through physical activity is stored as fat, whether it comes from carbohydrates, fats, or proteins.

Canada is facing an obesity epidemic. Overweight and obese populations in Canada are at increased risk for a variety of chronic health problems, and we are now beginning to see diseases that are found in adults appearing in children as well. Canadians can expect to see increasingly younger people suffering from heart disease, stroke, type 2 diabetes, and joint damage. A 2007 report by Canada's Standing Committee on Health states that "today's children will be the first generation for some time to have poorer health outcomes and a shorter life expectancy than their parents" (*Healthy Weights for Healthy Kids* 1).

REFERENCE



For additional information, refer to the following report:

Canada. House of Commons. Standing Committee on Health. *Healthy Weights for Healthy Kids: Report of the Standing Committee on Health*. Ottawa, ON: Standing Committee on Health, 2007. Available online at <http://cmte.parl.gc.ca/Content/HOC/committee/391/hesa/reports/rp2795145/hesarp07/05_Report-e.htm#part1> and on the National Library of Canada Electronic Collection website at <http://epe.lac-bac.gc.ca/100/200/301/hoc_cttee_reports-ef/health/healthy_weights-ef/hesarp07-e.pdf>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physlth/>.



Specific Learning Outcomes

12.NU.3 Demonstrate understanding of the relationship between the energy spent in physical activity and healthy weight.

12.NU.4 Demonstrate the ability to estimate daily energy expenditure by analyzing personal physical activity participation.



Key Understandings

- The body requires energy for various life-sustaining functions and activities of daily living.
 - Regular physical activity increases the amount of energy spent each day.
 - More energy is expended with vigorous activity than with low- and moderate-intensity activity.
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Essential Questions

1. In what ways are calories spent?
 2. What impact does the intensity of physical activity have on energy expenditure?
 3. What role does physical activity play in energy balance and healthy weight?
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Background Information

Energy

When we consume plant and animal products, the carbohydrates, fats, and protein (energy-containing macronutrients) are broken down during digestion, releasing energy and nutrients. Some of the energy from these foods is used immediately for various body functions, and some is stored as energy to be used at a later time.

The chemical energy provided by food is ultimately transformed into mechanical energy. *Mechanical energy* is the capacity to do work (e.g., muscle contraction). As the intensity of work increases, energy requirements also increase. For example, if we exercise at low intensity for 10 minutes, the amount of energy expended will be far less than if we exercise at high intensity for 10 minutes. The use of energy during work is referred to as *energy expenditure* (EE).

No energy is lost during the conversion of chemical energy into mechanical energy. For example, the chemical energy of carbohydrates and fats is converted into mechanical energy and heat energy. This process of converting food energy into mechanical work goes on continuously, maintaining the body's life-sustaining processes and keeping body temperature at 37°C. When we exercise, we use the energy in food to make the muscles contract, including the heart, and this requires energy. But since we are not perfectly efficient in converting energy into work, we also create heat. Muscle contraction during exercise increases our body temperature, which often makes us sweat to keep from overheating. During exercise, the energy demands of the body increase dramatically, often resulting in significant increases in body temperature.

Energy (Calories)

While it is important to be familiar with calories, it is essential that students understand the concept of energy consumed in food, energy spent being active, and the balance between the two.

Energy is measured in units called *calories*. Most of the food we eat contains energy, and everything we do (even sleeping) requires energy, resulting in caloric expenditure.

The eating patterns described for males and females of various ages in *Canada's Food Guide* are designed to meet the energy requirements, as well as nutrient needs, of most consumers. This means that individuals who follow the recommended eating patterns will consume an amount of energy that supports healthy weight, even if they are relatively inactive. Maintaining healthy body weight means, in general, that the energy consumed through food is approximately equal to the amount of energy expended. More active individuals should consume more Food Guide Servings to meet increased energy needs.

* Source: Health Canada. "Interactive Nutrition Label and Quiz." *Food and Nutrition*. 29 Mar. 2006. <www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php>.

NOTE TO TEACHER

The measure of the energy value in food and physical activity is expressed in several forms: kilocalorie (kcal) or Calorie (equal to 1000 calories).

$$1 \text{ kcal} = 1 \text{ Calorie} = 1000 \text{ calories}$$

In discussing energy value in food, it is uncommon to use calories (with a lower case *c*); most references to a specific number of calories actually refer to Calories.

The measure of the energy value contained on the Nutrition Facts panel on food labels is expressed in Calories. In fact, Calories must be listed on the Nutrition Facts panel, as shown in the following example.

Nutrition Facts *		
Per 1 cup (34 g) cereal		
Amount	Cereal	With 1/2 cup 1 % milk
% Daily Value		
Calories	110	170
Fat 0.5 g	1 %	3 %
Saturated 0 g + Trans 0 g	0 %	4 %
Cholesterol 0 mg		
Sodium 280 mg	12 %	15 %
Potassium 180 mg	5 %	11 %
Carbohydrate 27 g	9 %	11 %
Fibre 5 g	20 %	20 %
Sugars 4 g		
Starch 17 g		
Protein 4 g		
Vitamin A	0 %	8 %
Vitamin C	0 %	0 %
Calcium	2 %	15 %
Iron	30 %	30 %

This food item contains 110 Calories in 1 cup or 34 g serving.

Caution

Avoid focusing on calorie counting. Ensure that students understand that the eating patterns outlined in *Canada's Food Guide* and the "foods to limit" are designed to support healthy weight.

Energy balance refers to the relationship between energy in (food consumption) and energy out (physical activity).

- *Positive balance* refers to a situation where energy intake from food exceeds energy expenditure from activity (fat gain).
- *Negative balance* refers to a situation where energy expenditure from physical activity exceeds food intake (fat loss).

In the best scenario, we are able to expend lots of energy from physical activity, and then have to eat sufficient food to balance the energy output. Restricting our food intake when we have low physical activity levels is not a healthy lifestyle.

Storing Fat as Energy

Historically, the body's ability to store energy as fat was extremely useful. Our cave-dwelling ancestors may have spent several days stalking a meal before actually eating it. The energy they stored from consuming the catch of the last hunt was important to sustain them until their next meal.

Fat stores are still important today, as they help us to

- maintain body temperature
- build and maintain body tissue and cells
- protect internal organs
- fuel muscle movement

In our society, however, it is easy to over-consume food and store an excess of energy. In addition, we have systematically reduced physical activity in our daily lives through all the conveniences available to us (e.g., remote controls, elevators and escalators, cars to travel even short distances). This remarkable decrease in daily physical activity is a key factor in the obesity epidemic. An excess of stored energy (body fat), particularly around the abdomen, is associated with increased risk of many diseases.

Energy Expenditure

The human body spends energy for many different purposes, such as life-sustaining metabolic functions, digestion, and physical activity. Regardless of the purpose for which the body spends energy, the energy expenditure will fall within one of the following three categories:

- basal or resting metabolic rate (BMR or RMR)
- thermic effect of food (TEF)
- energy expenditure of activity (EEA)

$$\text{Overall Energy Expenditure} = \text{RMR} + \text{TEF} + \text{EEA}$$

A detailed description of each of these categories follows.

Basal or Resting Metabolic Rate

Basal or resting metabolic rate (BMR or RMR) is the amount of energy per minute the body uses to maintain a quiet resting state. This is approximately 1 Cal per minute. Over the course of the day (and night), a person will expend a substantial amount of calories just to maintain the body (1440 minutes in a day \times 1 Cal/min = 1440 Cal per day). Approximately 60% to 75% of the energy used every day is needed to maintain the essential body functions that sustain life. These functions include nervous system activity, breathing, heart function, maintenance of body temperature (thermoregulation), and hormone activity.

BMR and RMR measurements are taken under different conditions:

- **BMR measurements** are typically taken in a darkened room upon waking after 8 hours of sleep and 12 hours of fasting (to ensure that the digestive system is inactive), with the subject resting in a reclining position.
- **RMR measurements** are typically taken under less restricted conditions than BMR measurements, and do not require the subject to spend the night sleeping in the test facility prior to measurement. As a result, RMR has become the more popular measure, and BMR is not often measured anymore.

Factors Affecting BMR/RMR

BMR/RMR, primarily related to lean tissue/fat-free mass, is influenced by a number of factors working in combination, including the following:

- **Age:** Metabolism slows with age (2% to 3% per decade after 30 years of age), primarily due to a loss in muscle tissue due to inactivity, but also due to hormonal and neurological changes.
- **Gender:** Generally, men have a faster metabolism than women because they tend to be larger and have more muscle tissue.
- **Body size:** Larger adult bodies have more metabolically active tissue, which leads to a higher BMR/RMR.
- **Body composition:** Muscle tissue uses more calories than fat, even at rest.
- **Genetic predisposition:** Metabolic rate may be partly determined by genes.
- **Growth:** Infants and children have a higher BMR/RMR related to the energy needs of growth and maintenance of body temperature.
- **Hormonal and nervous controls:** Hormonal imbalances can influence how quickly or how slowly the body burns calories.
- **Environmental temperature:** If temperature is very low or very high, the body has to work harder to maintain a normal temperature; this increases the BMR/RMR.
- **Infection or illness:** BMR/RMR increases if the body has to build new tissue or create an immune response to fight infection.
- **Crash dieting, starving, or fasting:** Eating too few calories encourages the body to conserve through a potentially significant decrease in BMR/RMR. There can also be a loss of lean muscle tissue, which further contributes to reducing BMR/RMR.
- **Physical activity:** Hard-working muscles require extra energy during activity. Regular exercise increases muscle mass, which increases energy consumption, even at rest.
- **Stimulants:** Use of stimulants (e.g., caffeine) increases energy expenditure at rest. However, this is not a healthy way to lose weight.

Thermic Effect of Food

Thermic effect of food (TEF) is the energy required to process the food we eat. Approximately 10% of the calories in a meal are used to digest, metabolize, and store the food just eaten. The energy expenditure is directly related to the size of the meal and the food composition (i.e., the amount of protein, fat, and carbohydrate). Energy is also used for storing carbohydrates and fat as energy in body tissue.

Energy Expenditure of Activity

Energy expenditure of activity (EEA) is the amount of energy needed to fuel body movement as it occurs in activities of daily living, including exercise. Muscle tissue consumes approximately 20% of this energy at rest, but during vigorous exercise, the rate of energy consumption by muscle tissue may go up 50 times or more. Physical activity can have a dramatic impact on a person's daily energy expenditure. During heavy physical exertion (vigorous activity), the muscles may burn as many as 1200 Cal per hour in a very fit individual. An unfit person may only be able to expend 200 Cal per hour. Involuntary movements such as fidgeting and posture control (called NEAT: non-exercise activity of thermogenesis) also contribute to EEA.

Exercise is an extremely important variable in the daily energy expenditure equation and the maintenance of energy balance. Not only is exercise the most changeable component during a 24-hour period, but it is also the one component that is completely under voluntary control (for most people).

In addition to increasing caloric expenditure, exercise has many other benefits, including building more muscle, better bones, and a better heart.

REFERENCES



For additional information, refer to the following resources:

- American College of Sports Medicine (ACSM). *ACSM's Advanced Exercise Physiology*. Ed. Charles M. Tipton. Philadelphia, PA: Lippincott Williams & Wilkins, 2006.
- . *ACSM's Metabolic Calculations Handbook*. Ed. Stephen Glass and Gregory B. Dwyer. Philadelphia, PA: Lippincott Williams & Wilkins, 2007.
- . *ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription*. Ed. Leonard A. Kaminsky, et al. 5th ed. Baltimore, MD: Lippincott Williams & Wilkins, 2006.

The Cost of Being Sedentary

The rising rates of obesity are due as much to reduced energy expenditure (associated with the Canadian population's decreasing levels of physical activity) as to over-consumption of calories. Canadian adolescents are spending more time on computers, playing video games, and watching television than ever before. The 2007 report of the Standing Committee on Health states: "On average, adolescents in Canada spend almost 35 hours a week in front of a screen, representing more time than in the classroom over the course of the year" (*Healthy Weights for Healthy Kids* 4). Combining classroom and screen time does not leave much time for active living. In fact, in 8- to 18-year-olds, the average amount of time per day spent using media is at least 6 hours and 21 minutes a day (Rideout, Roberts, and Foehr 36). This amount of time does not include time spent sitting in class.

Another report indicates that more than half the young people ages 5 to 17 are not active enough for optimal growth and development (Canadian Fitness and Lifestyle Research Institute). The term *active enough* is equivalent to an energy expenditure of at least 8 kilocalories per kilogram of body mass per day.

Canada's Physical Activity Guide for Youth (Public Health Agency of Canada) recommends that young people participate in at least 90 minutes a day of moderate to vigorous physical activity.

It is generally accepted that moderate physical activity expends between 3.5 Cal/min and 7 Cal/min and vigorous physical activity expends over 7 Cal/min. It is important to understand that these are approximations only. An accurate calculation of the energy expended is dependent on the body weight of the individual. If two people completed the same physical activity for the same duration at the same heart rate, the individual with a higher body weight would expend more Cal/min.

Below is an example of approximately how much energy would be expended if an individual were to meet the minimum physical activity guidelines:

- **Moderate physical activity:** 60 min at 6 Cal/min = 360 Cal
- **Vigorous physical activity:** 30 min at 9 Cal/min = 270 Cal

With the addition of 90 minutes a day of physical activity, the total daily energy expenditure can be increased by 630 Cal.

NOTE TO TEACHER

By following the eating patterns described in *Canada's Food Guide*, individuals will meet the daily energy (caloric) requirement for the average sedentary person. As students become more active, they should choose (consume) the extra energy required from more Food Guide Servings.

REFERENCES



For additional information, refer to the following reports:

Canada. House of Commons. Standing Committee on Health. *Healthy Weights for Healthy Kids: Report of the Standing Committee on Health*. Ottawa, ON: Standing Committee on Health, 2007. Available online at

<http://cmte.parl.gc.ca/Content/HOC/committee/391/hesa/reports/rp2795145/hesarp07/05_Report-e.htm#part1>.

Canadian Fitness and Lifestyle Research Institute. "Kids Fatter, Not Active Enough." *Tips for Being Active*. 6 June 2006. <www.cflri.ca/eng/lifestyle/1997/kids_fatter.php>.

Public Health Agency of Canada. *Canada's Physical Activity Guide for Youth*. Ottawa, ON: Public Health Agency of Canada, 2002. Available online at <www.phac-aspc.gc.ca/pau-uap/fitness/downloads.html>.

Rideout, Victoria, Donald F. Roberts, and Ulla G. Foehr. *Generation M: Media in the Lives of 8–18 Year-Olds*. Menlo Park, CA: The Henry J. Kaiser Family Foundation, March 2005. The full report is available online at <www.kff.org/entmedia/upload/Generation-M-Media-in-the-Lives-of-8-18-Year-olds-Report.pdf>. The executive summary is available at <www.kff.org/entmedia/upload/Executive-Summary-Generation-M-Media-in-the-Lives-of-8-18-Year-olds.pdf>.

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Suggestions for Instruction / Assessment

Energy Expenditure of Physical Activities

Determining Resting Metabolic Rate (RMR)

This learning activity is designed to help students understand the large energy expenditure associated with life-sustaining metabolic processes as a part of daily energy expenditure. Health Canada suggests males ages 17 to 18 need between 2450 and 2900 Cal each day. Females of the same age need between 1750 and 2100 Cal each day. These are estimates of the combined effects of resting metabolic rate and daily living activities, including moving around at home or school, as well as moderate exercise (Health Canada, "Estimated Energy Requirements").

BMR/RMR can be estimated by adding a "zero" to body weight in pounds (e.g., for an individual weighing 140 lbs. [63.5 kg], BMR/RMR is *approximately* 1400 Cal).

BMR/RMR can also be calculated by using the following equations (Livingston and Kohlstadt):

$$\text{RMR (Female)} = 248 \times m^{(0.4356)} - (5.09 \times a)$$

$$\text{RMR (Male)} = 293 \times m^{(0.4330)} - (5.92 \times a)$$

- Where: m = body mass in kg; a = age in years.
- This equation will yield the number of Calories required for a 24-hour period.

NOTE TO TEACHER

- Remember to use the order of operations where exponents are dealt with before multiplication.
- In performing the calculations, m is to the power of 0.4356 for women, or 0.4330 for men, and NOT multiplied by.

Have students calculate female and male RMRs using RM 4–NU.



Refer to RM 4–NU: Resting Metabolic Rate (RMR) Calculator (Excel spreadsheet).

The Excel spreadsheet is available on the CD-ROM version of this document, as well as online at www.edu.gov.mb.ca/k12/cur/physlth/.

Simple Example (17-Year-Old Female at 56 kg)		
Energy Expenditure	Energy Intake	
The body spends energy on various types of activity. “Activity” includes the movement we choose to do, as well as energy required to stay alive (e.g., metabolic activity such as heart beat, breathing, and maintaining body temperature). Estimated energy requirements are based on age, gender, and body weight.	The food we eat is important to supply nutrients and energy for health and to fuel activity. The more active we are, the more energy we spend each day. For example, the number of Calories needed to maintain energy balance for a 17-year-old female is between 1750 Cal (sedentary individual) and 2400 Cal (with 60 minutes of moderate daily activity).	
<p>Resting Metabolic Rate (17-Year-Old Female)</p> <p>Energy Required to Sustain Life</p> <p>Energy is required for breathing, nervous system activity, maintaining body temperature, heart function, and hormone activity.</p> $248 \times m^{(0.4356)} - (5.09 \times a)$, 56 kg, 17 years old Energy Required to Sustain Life (per day) = 1350 Cal <p>+</p> <p>Energy Required for Activities of Daily Living</p> <p>Energy is required for daily activities, such as brushing teeth and hair, eating, sitting in class, sitting at a computer, texting, and so on.</p> <p>Activities of Daily Living = Approximately 400 Cal</p> <p>+</p> <p>Active Living</p> <p>Walking Time</p> <p>5 min walk to school 5 min walk back from school 3 min of walking (4 classroom changes with walk between classes) 15 min walk at lunch Walking Time = 28 min x 3 Cal/min = 86 Cal</p> <p>Running Time</p> <p>20 min run on treadmill at home Running Time = 20 min x 11.5 Cal/min = 230 Cal</p> <p style="text-align: right;">Total 316 Cal</p>	<p>Energy Intake to Meet Energy Expenditure</p> <p>Breakfast</p> <p>½ plain bagel with 1 tbsp peanut butter 195 Cal 1 large banana 105 Cal 1 cup milk (1%) 100 Cal 400 Cal</p> <p>Lunch</p> <p>1 slice pepperoni pizza 290 Cal 1 cup chocolate milk (1%) 160 Cal 1 granola bar (26 g) 110 Cal 1 small apple 47 Cal 607 Cal</p> <p>Dinner</p> <p>2 cups spaghetti with meatballs and tomato sauce 520 Cal 200 g garden salad with 1 tbsp oil and vinegar dressing 109 Cal 1 cup milk (1%) 100 Cal ¼ cantaloupe 48 Cal 777 Cal</p> <p style="text-align: right;">Total 1784 Cal</p> <p>Snacks</p> <p>175 g cherry yogurt (175 g = some small containers) 100 Cal 1 chocolate chip cookie 138 Cal 16.8 g (3 cups) microwave popcorn 78 Cal 316 Cal</p> <p style="text-align: right;">Total 2100 Cal</p>	<p>Food Guide Servings</p> <p>Vegetables and Fruit = 6</p> <p>banana (large) 2 apple (small) 1 tomato sauce 1 salad 1 cantaloupe 1</p> <p>Grain Products = 6</p> <p>bagel 1 pizza crust 1 granola bar 1 spaghetti 3</p> <p>Milk and Alternatives = 4</p> <p>milk (3 cups) 3 yogurt 1</p> <p>Meat and Alternatives = 2</p> <p>peanut butter ½ pepperoni ½ meatballs 1</p> <p>Foods to Limit = 3</p> <p>popcorn chocolate chip cookie granola bar</p>
Total Energy Expenditure = 1350 Cal + 400 Cal + 316 Cal = 2066 Cal for the day as described	Total Energy Intake = Approximately 2100 Cal per day	

Determining the Energy Expenditure of Various Physical Activities

This learning activity is designed to help students understand the relationship between the intensity of a physical activity and the corresponding energy required to perform that activity. Each student will need to know his or her body weight.

Directions/Description

- Students identify several activities from their physical activity plan (or other comparable activities) and locate them in RM 5–NU, which lists physical activities in alphabetical order, as well as by intensity.
- Where a physical activity is listed more than once, students note the different levels of intensity and select the level that best reflects their participation.
- Students then write a journal entry comparing and contrasting energy expenditure associated with activities at different levels of intensity.



Refer to RM 5–NU: Energy Expenditure of Physical Activities (Excel spreadsheet).

The Excel spreadsheet is available on the CD-ROM version of this document, as well as online at <www.edu.gov.mb.ca/k12/cur/physhlth/>.

Determining Relative Energy Expenditure through Daily Physical Activity Intensities

In this learning activity, students gain a greater understanding of their personal daily energy expenditure by examining their daily physical activities and categorizing them by intensity level.

Directions/Description

- Students first determine the amount of time they spend engaged in physical activities in various intensity categories over a three-day period using RM 6–NU. Daily estimates will be more accurate if students first identify the number of hours spent sleeping (resting), and then the time spent in vigorous or moderate activity, and finally the time spent in very light or light activity. Activity descriptions are provided in RM 6–NU. The total time must equal 24 hours.
- Students will use the 24-hour account of activities for the culminating Final Tally activity in Module C, Lesson 3, where they will analyze physical activity by intensity and food consumption habits and use the information to create a daily energy balance plan.



Refer to RM 6–NU: Determining Daily Physical Activity Intensities.

REFERENCES



For additional information, refer to the following websites:

CyberSoft, Inc. "Exercise Calorie Expenditures." *NutriBase*.
<www.nutribase.com/exercala.htm>.

Health Canada. "Estimated Energy Requirements." *Food and Nutrition*. 5 Feb. 2007.
<www.hc-sc.gc.ca/fn-an/food-guide-aliment/basics-base/1_1_1-eng.php>.

Livingston, Edward H., and Ingrid Kohlstadt. "Simplified Resting Metabolic Rate-Predicting Formulas for Normal-Sized and Obese Individuals." *Obesity Research* 13.7 (July 2005): 1255-62. The BMR equation is cited online at
<<http://cat.inist.fr/?aModele=afficheN&cpsidt=17018417>> (27 Oct. 2008).

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at
<www.edu.gov.mb.ca/k12/cur/physhlth/>.

Lesson 3: Energy Balance

Introduction

As discussed in Module C, Lesson 2, energy expenditure is half of the energy balance equation. To maintain a steady body weight, the energy spent should approximately equal the energy consumed. Daily variations occur, but over time calories out and calories in should be approximately equal.

Energy balance refers to the relationship between energy in (food consumption) and energy out (physical activity).

- *Positive balance* refers to a situation where energy intake from food exceeds energy expenditure from activity (fat gain).
- *Negative balance* refers to a situation where energy expenditure from physical activity exceeds food intake (fat loss).

In this lesson students examine the impact of lifestyle choices (food intake and physical activity) on energy balance and healthy weight.

Almost everything we eat and drink (except water) contains energy in the form of calories. Human beings need energy to maintain body structures and functions, to grow, and to be active. If less energy is spent in activity than is consumed in food, the body is able to store extra calories in the form of body fat. Reduced levels of physical activity and/or over-consumption of food create *energy imbalance*.

A review of personal food and activity habits will help students identify their own degree of energy balance and make plans for positive change, if appropriate.

REFERENCE



To view a PowerPoint presentation entitled *Finding the Right Balance*, please visit the MPETA website:

Manitoba Physical Education Teachers Association (MPETA). "Nutrition: Energy Balance." *MPETA Resources*. PowerPoint presentation. <www.mpeta.ca/resources.html>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.



Specific Learning Outcomes

- 12.NU.5** Explain factors that contribute to energy balance and healthy weight.
- 12.NU.6** Examine the relationship between maintaining healthy weight and the consumption of specific food substances.
Includes: sugar and fat
- 12.NU.7** Demonstrate strategies for making decisions about food and activity choices that contribute to good health and healthy weight.
-



Key Understandings

- Different food components provide different amounts of energy.
 - The balance between *energy expenditure* and *energy intake* supports a healthy body and a healthy body weight.
-



Essential Question

1. How is energy balance achieved and maintained?
-



Background Information

Energy Balance

As noted in Module C, Lesson 2, Health Canada suggests males ages 17 to 18 need between 2450 and 2900 Cal each day. Females of the same age need between 1750 and 2100 Cal each day (Health Canada, “Estimated Energy Requirements”).

The *macronutrients* in food provide the body with calories: carbohydrates and proteins each supply 4 kcal per gram, and fat provides 9 kcal per gram (alcohol provides 7 kcal per gram but should not be considered a positive energy source). The recommended intake for each of these nutrient categories for 14- to 18-year-olds is as follows (Health Canada, *Eating Well with Canada’s Food Guide: A Resource for Educators and Communicators 4*):

- **Protein:** 10% to 30% of daily energy intake
- **Fat:** 25% to 35% of daily energy intake
- **Carbohydrate:** 45% to 65% of daily energy intake

An Acquired Taste

Many people like the taste of sugar and the taste and texture of fat. This is why snack foods and fast foods appeal to many people. It is important for both teenagers and adults to be aware of their intake of high fat and/or sugar-laden (empty calorie) foods, and to have a plan to change the level of consumption, if appropriate.

Sugar Surprise

Sugar occurs naturally in food, and it may be added as an ingredient. Health Canada encourages consumers to limit the intake of foods high in sugar, as they are often also a source of *empty calories* in the diet (i.e., energy without nutrients). In addition, individuals with high sugar consumption are more likely to have relatively poor intake of other important nutrients.

Information on food labels helps consumers to identify sugar in food. The Nutrition Facts table on food labels lists both natural and added sugar as *Sugars* under the heading *Carbohydrate* (see example). The Ingredients list on food labels helps distinguish between added and natural sugars. If there are no sugar items on the Ingredients list, no sugar has been added, and any sugar listed under Carbohydrate on the Nutrition Facts label is present naturally in the food (e.g., grains, fruit, milk, legumes). Items on the Ingredients list ending in *ose* (e.g., sucrose, glucose, fructose) are added sugars, as are syrup, molasses, and so on. Ingredients closer to the beginning of a list are present in larger amounts by weight than those appearing later in the list.

In addition to checking food labels for sugar content, look at the Eat Well box on the back of *Canada's Food Guide* for a list of foods to limit, many of which are high in sugar.

Nutrition Facts *		
Per 1 cup (34 g) cereal		
Amount	Cereal	With 1/2 cup 1 % milk
% Daily Value		
Calories	110	170
Fat 0.5 g	1 %	3 %
Saturated 0 g + Trans 0 g	0 %	4 %
Cholesterol 0 mg		
Sodium 290 mg	12 %	15 %
Potassium 180 mg	5 %	11 %
Carbohydrate 27 g	9 %	11 %
Fibre 5 g	20 %	20 %
Sugars 4 g		
Starch 17 g		
Protein 4 g		
Vitamin A	0 %	8 %
Vitamin C	0 %	0 %
Calcium	2 %	15 %
Iron	30 %	30 %

* Source: Health Canada. "Interactive Nutrition Label and Quiz." *Food and Nutrition*.
<www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php>.

REFERENCES



For additional information, refer to the following resources:

- Health Canada. *Eating Well with Canada's Food Guide*. Ottawa, ON: Health Canada, 2007. Available online at <www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html>.
- . *Eating Well with Canada's Food Guide: A Resource for Educators and Communicators*. Ottawa, ON: Health Canada, 2007. Available online at <www.hc-sc.gc.ca/fn-an/alt_formats/hpfb-dgpsa/pdf/pubs/res-educat-eng.pdf>.
- . "Estimated Energy Requirements." *Food and Nutrition*. 5 Feb. 2007. <www.hc-sc.gc.ca/fn-an/food-guide-aliment/basics-base/1_1_1-eng.php>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.



Suggestion for Instruction / Assessment

Sugar Surprise: How Many Cubes?

For this learning activity, have students use the information on food labels, or nutrition information from restaurants and/or websites, to identify the grams of sugar in various popular large-size beverages and several sweet snack foods.

Directions/Description

- One teaspoon (a cube) of sugar is equal to 4 g, and 1 g equals 4 Cal. With this in mind, students create a graphic representation (e.g., poster, display) of a food item with high sugar content. Have them include
 - the food container, accompanied by a statement of the calories and grams of sugar the food contains
 - the appropriate amount of sugar in a container (e.g., plastic bag) or number of sugar cubes glued below the product
- Students then review the difference in the calorie and sugar content of the super-size version of a product (e.g., a slushy beverage) and a smaller size of the same product.
- Using the Think-Pair-Share learning strategy (see Appendix E), students look at the serving size listed on the Nutrition Facts label of selected snack foods or beverages and compare it to the size of the container. Consider having student answer questions such as the following:
 1. Does the serving size reflect the whole package, or would one consume several servings if one ate the content of the whole package?
 2. Do you think you (consumers) would usually eat only one serving, or would you likely eat the whole thing?
 3. Do you think the serving size listed on snack foods and beverages could mislead consumers? Explain.



Background Information

Fat . . . in Moderation

Fat is an integral part of healthy eating for everyone. It is a source of fat-soluble vitamins (i.e., Vitamins A, D, and E) and essential fats. Fat is part of every cell in the body and helps absorb important nutrients.

Health Canada and the Canadian Paediatric Society encourage a transition from the higher-fat intake of childhood to a pattern of lower-fat eating at the “end of linear growth” or when adult height has been achieved after puberty (Waldron 137). Healthy eating for teenagers should focus on a wide variety of food from all four food groups, with a limited intake of *added fat* (e.g., deep-fried food and snack foods, donuts, pastries, sauces, gravies). For adults, lower-fat eating has been associated with good health.

Essential Fats

Canada's Food Guide recognizes the importance of consuming *essential fats*. These fats must come from food, as our bodies cannot produce them. They are necessary to manufacture and repair cell membranes throughout the body, especially brain and nerve cells and eyes. Consuming a small amount (30 to 45 mL) of oil, such as canola, olive, or soybean oil, each day (e.g., in stir-fries, salad dressing) ensures a source of these important fats for our bodies.

Trans Fats

Trans fats occur naturally in foods and are created artificially in commercial processing of oils into solid fat through a process called *hydrogenation*. Consuming industrially created trans fats increases the risk of heart disease, as it increases the *bad* low-density lipoprotein (LDL) cholesterol in the blood, and decreases the *good* high-density lipoprotein (HDL) cholesterol in the blood. The report of the Trans Fat Task Force (Health Canada) recommends limiting trans fat consumption.

Amount	Cereal	With 1/2 cup 1 % milk
% Daily Value		
Calories	110	170
Fat 0.5 g	1 %	3 %
Saturated 0 g	0 %	4 %
Trans 0 g	0 %	4 %
Cholesterol 0 mg		
Sodium 290 mg	12 %	15 %
Potassium 180 mg	5 %	11 %
Carbohydrate 27 g	9 %	11 %
Fibre 5 g	20 %	20 %
Sugars 4 g		
Starch 17 g		
Protein 4 g		
Vitamin A	0 %	8 %
Vitamin C	0 %	0 %
Calcium	2 %	15 %
Iron	30 %	30 %

* Source: Health Canada. "Interactive Nutrition Label and Quiz." *Food and Nutrition*. <www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/quiz1-eng.php>.

NOTE TO TEACHER

Small amounts of trans fat occur *naturally* in animal-based foods, such as dairy products, beef, and lamb. These naturally occurring fats are excluded in the Trans Fat Task Force recommendations.

REFERENCES



For additional information, refer to the following resources:

Health Canada. *TRANSforming the Food Supply: Final Report of the Trans Fat Task Force*. Ottawa, ON: Health Canada, June 2006. Available online at <www.hc-sc.gc.ca/fn-an/nutrition/gras-trans-fats/tf-ge/tf-gt_rep-rap-eng.php>.



Joint Working Group of Canadian Paediatric Society (CPS) and Health Canada. *Nutrition Recommendations Update: Dietary Fat and Children*. Ref. No. N94-01. Approved by CPS Board of Directors 1994, reaffirmed March 2004.

Waldron, Sheridan. "Dietary Education and Outcomes for Young People with Type 1 Diabetes." *Canadian Journal of Diabetes* 29.2 (2005): 133–41. Available on the Canadian Diabetes Association website at <www.diabetes.ca/Files/Waldron--FINAL.pdf>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.



Suggestion for Instruction / Assessment

Find the Fat

Snack foods, pastries, gravies, sauces, and food-preparation methods (e.g., deep frying) add fat to our diets every day, often without our realizing how much.

The information on the Nutrition Facts table on food labels helps consumers make decisions about food. Each food label must identify a serving size and a list of nutrients present in that amount of the food, including fat.

To help students identify common sources of high-fat snacks and foods, have them compare different types of foods and different serving sizes of the same foods, and record their results using RM 7–NU.

Examples of foods to compare:

- commercial French fries and oven-baked fries
- varieties of air-popped popcorn
- potato chips and other snack foods (baked and fried)
- battered deep-fried chicken and broiled or baked chicken
- donut and small bagel or English muffin

For this food-comparison task, have students use the information from

- Nutrition Facts labels
- comprehensive nutrient tables (e.g., see Health Canada, *Nutrient Value of Some Common Foods*)
- websites of individual fast food restaurants



Refer to RM 7–NU: Find the Fat.

NOTE TO TEACHER

Consider having students visit a supermarket to give them an opportunity to investigate a variety of food products in different sizes, with different preparation methods (e.g., baked, not fried).

REFERENCE



For additional information, refer to the following resource:

Health Canada. *Nutrient Value of Some Common Foods*. Ottawa, ON: Health Canada, 2008. Available online at <www.hc-sc.gc.ca/fn-an/nutrition/fiche-nutri-data/nutrient_value-valeurs_nutritives-eng.php>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.



Background Information

The Balancing Act

Canadian adolescents and adults are finding it increasingly difficult to maintain a healthy body weight. With easy and constant access to food and a decreasing need to move while accomplishing daily activities, energy output and input are frequently out of balance, making it easy to store extra body fat.

Factors Associated with Energy Imbalance	Ideas to Fix Energy Imbalance
<p>Over-consumption of food related to</p> <ul style="list-style-type: none">▪ availability of super-size portions of fast foods▪ taste for flavour of foods high in sugar and fat▪ availability of fatty, overly sweet, low-nutrient snack foods▪ abundance, convenience, visibility, and attractive packaging of foods▪ food promotions and advertising▪ role models and influences▪ lack of understanding about energy content of foods▪ eating while doing something else (e.g., watching TV)	<p>Ideas for reasonable food consumption</p> <ul style="list-style-type: none">▪ avoid choosing super-size portions▪ enjoy tasty food in reasonable portions▪ eat nutritious snack foods▪ be aware of food packaging and promotions and their purpose (e.g., to increase the amount or size of the food items we chose to buy)▪ check the energy content on food labels▪ avoid eating while doing something else (e.g., homework)
<p>Lack of physical activity related to</p> <ul style="list-style-type: none">▪ time spent watching TV, using computers, doing other on-screen activities, sitting in class▪ time management—too busy to exercise (e.g., “need” to work)▪ concern about personal safety▪ transportation (e.g., I used to walk to school, now I drive every day)▪ other activities and responsibilities▪ lack of motivation▪ shortage of money (e.g., can't afford to register for hockey league)	<p>Ways to become more active</p> <ul style="list-style-type: none">▪ set a limit to TV and computer time▪ walk rather than drive, if possible▪ find an activity you enjoy, and do it regularly▪ play with children if you babysit or have younger siblings▪ find a friend to be active with▪ try to avoid choices that, over time, significantly change energy balance (e.g., driving regularly instead of walking)▪ participate in free or low-cost activities



Suggestions for Instructions / Assessment

The Balancing Act

As students move into young adulthood, they may not realize how changes in their day-to-day routines affect opportunities for food intake and energy expenditure. The following learning activities are intended to help students recognize personal energy imbalance, reflect on what caused the imbalance, and identify realistic opportunities for improvement.

Energy Imbalance

Ask students how they think energy imbalance happens in teenagers' lives. Initially, imbalances can be small and unnoticed, but over months and years, they can add up to weight gain and the many health problems that plague so many Canadians today.

Ask students to identify factors that contribute to energy imbalance and potential weight gain in themselves, family members, friends, and society in general. The factors can be either food related or activity related (see examples provided in Teacher Background). Record student comments on the left side of an overhead projection of RM 8–NU. The right side will be completed in *Fixing Energy Imbalance* (see below). This information will be used in Final Tally (see next page).

NOTE TO TEACHER

Treat the topic of potential weight gain with sensitivity, as issues of body image and self-esteem may arise. Potentially sensitive content is to be treated in ways that are appropriate for the local school, school division, and community context.



Refer to RM 8–NU: Some Lifestyle Choices Can Lead to Energy Imbalance—How Does It Happen?

Fixing Energy Imbalance

Now that factors associated with energy imbalance have been identified and recorded, ask students how they think this imbalance can be overcome (e.g., How can teenagers spend more energy being active, or make food choices that better reflect daily energy needs?). Encourage students to make suggestions they think are realistic for *them*. Record student comments on the right side of RM 8–NU.



Refer to RM 8–NU: Some Lifestyle Choices Can Lead to Energy Imbalance—How Does It Happen?

Final Tally

Students will refer to information and assessments from previous lessons and generate a personal plan to modify energy imbalance, if appropriate.

Provide each student with a copy of RM 9–NU: My Lifestyle Choices and Energy Balance. Students work individually in completing this RM.

■ *Food Consumption*

- Working individually, students review their record of food intake and accompanying healthy eating goal, as noted in RM 3–NU: How Do I Measure Up? (see Module C, Lesson 1). They also consider what they learned about their own food choices in the Sugar Surprise and Find the Fat learning activities suggested earlier in this lesson.
- Students identify food habits (or factors related to how/why they choose foods) that may contribute to energy imbalance, listing the factors on the left side of RM 9–NU. (Students may refer to the class list from RM 8–NU to help generate their own list.) On the right side of RM 9–NU, students identify an action that will help them counter the impact of each factor they recorded related to food choices, if appropriate.

■ *Physical Activity*

- Students review the average number of hours they spent per day in activities of moderate and vigorous intensities, as calculated in step 4 of RM 6–NU: Determining Daily Physical Activity Intensities (see Module C, Lesson 2). Remind students that *Canada's Physical Activity Guide for Youth* (Public Health Agency of Canada) recommends 90 minutes of daily physical activity (at least 60 minutes of moderate activity and 30 minutes of vigorous activity).
- On the left side of RM 9–NU, students identify factors that may contribute to energy imbalance with respect to lack of physical activity, keeping in mind the goal identified in *Canada's Physical Activity Guide for Youth*. (Students may refer to the class list from RM 8–NU to help generate their own list.) On the right side of RM 9–NU, students identify an action that will help them counter the impact of each factor they recorded related to physical activity, if appropriate. These actions may be linked to the OUT-of-class activities students choose for their physical activity plan.

NOTE TO TEACHER

Of the 90 minutes of physical activity, 30 minutes should be of vigorous intensity and 60 minutes should be of moderate intensity. This activity does not have to come from one bout of exercise, but can be accumulated from brief intervals throughout the day (e.g., climbing stairs, walking to and from school). The accumulation of more physical activity time per day may require setting shorter-term goals that work toward more physical activity and less “non-active” time.

- *A Personal Plan*
 - Students reflect on their personal learning in Module C, Lessons 1 to 3, and the solutions generated in Food Consumption and Physical Activity on the previous page.
 - Students write a paragraph at the bottom of RM 9–NU, outlining what they have learned about themselves and energy balance and reflecting upon positive changes they can realistically implement in their daily lives with respect to food choices and physical activities. They indicate where they can make positive changes and what they plan to do.



Refer to the following RMs:

RM 3–NU: How Do I Measure Up?

RM 6–NU: Determining Daily Physical Activity Intensities

RM 8–NU: Some Lifestyle Choices Can Lead to Energy Imbalance—How Does It Happen?

RM 9–NU: My Lifestyle Choices and Energy Balance

REFERENCE



For additional information, refer to the following resource:

Public Health Agency of Canada. *Canada's Physical Activity Guide for Youth*. Ottawa, ON: Public Health Agency of Canada, 2002. Available online at <www.phac-aspc.gc.ca/pau-uap/fitness/downloads.html>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.

Lesson 4: Food Safety

Introduction

As students become more independent, their responsibility for purchasing and preparing their own food also increases. Whether they choose prepared or pre-packaged food, cook food from scratch, or bring leftovers home from a restaurant meal, students need to know how to handle and store food properly to ensure the food they eat is safe.

Canada has one of the best and safest food supplies in the world. Food safety is multi-faceted, involving all stages of food handling, from production to distribution. The Canadian government has established an agency that enforces policies and standards, set by Health Canada, governing the safety and nutritional quality of all food sold. The Canadian Food Inspection Agency (CFIA) is authorized to direct industry to remove potentially harmful food products from shelves. The agency also educates the public about the safe storage, handling, and preparation of food.

Despite all the precautions taken to ensure safe food, “public health experts estimate that there are 11 to 13 million cases of food-borne illness in Canada every year,” costing over \$1 billion in health care costs, legal fees, and lost wages (CFIA). In most cases, the pathogenic organism is present because the food was not handled or stored properly. Most cases of food-borne illness can be prevented with safe food-handling practices. That is the focus in this lesson.

REFERENCE



For additional information, refer to the following website:

Canadian Food Inspection Agency (CFIA). “Causes of Food Borne Illness.” *Food*. 2 Aug. 2006. <www.inspection.gc.ca/english/fssa/concen/causee.shtm>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.



Specific Learning Outcome

12.NU.8 Examine the causes and symptoms of food-borne illness (food poisoning) and demonstrate understanding of ways to minimize the risk of food poisoning.



Key Understandings

- There are many causes of food-borne illness.
 - Different foods have different levels of risk of contamination.
 - Proper food handling by consumers from the time of purchase to consumption reduces the risk of food-borne illness.
-



Essential Questions

1. What are the causes of food-borne illness?
 2. What are the best ways to keep food safe?
-



Background Information

As students become increasingly independent, it is essential that they have the proper skills to handle, prepare, and store food, and are aware of the potential for food contamination.

Causes of Food-Borne Illness

According to the Centers for Disease Control and Prevention, more than 250 known illnesses can be transmitted through food. Unknown or undiscovered agents cause a high percentage of all food-borne illnesses and related hospitalizations. Many people do not report their illness because they suffer mild symptoms and recover quickly.

Food usually becomes contaminated through improper consumer handling, preparation, or storage (e.g., individuals who do not wash their hands after using the washroom or have infections themselves often cause contamination). Given the right conditions, the harmful organisms can multiply to millions in a very short period of time.

Sickness caused by contaminated food is referred to as *food-borne illness* or *food poisoning*. The organisms that cause food-borne illness are too small to see, they don't smell, and they don't have a taste.

The symptoms of food poisoning range from mild stomach cramps to nausea, vomiting, diarrhea, and fever, which can be life-threatening to very young children, seniors, pregnant women, and people whose immune systems are already weakened. Some people may become ill after ingesting only a few harmful organisms, while others may remain symptom-free after ingesting thousands.

High-Risk Foods

All foods can cause food-borne illness, and contamination can occur in the production, processing, or packing of food. Foods that can easily support the growth of harmful organisms are known as *high-risk foods*.

Examples of high-risk foods are

- meat and poultry such as chicken and turkey (raw and cooked)
- fish and seafood
- eggs
- prepared salads such as coleslaw, pasta salads, and rice salads that contain mayonnaise
- dairy products
- cooked rice
- cooked pasta
- prepared fruit salads
- processed meats such as salami and ham

Low-Risk Foods

Low-risk foods do not require refrigeration until opened. These foods tend to be high in sugar, salt, or acid, and/or low in water content.

Examples of low-risk foods are

- bread and most baked goods
- jam and preserves
- syrups and vinegars
- hard cheese
- peanut butter
- nuts, seeds, and dried fruit
- fresh fruit and vegetables (they can become contaminated after cutting and should always be washed before eating)

REFERENCES



For additional information, refer to the following websites:

Australia. State of Victoria. "Food Safety." *Better Health Channel*.

<www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/hl_foodsafety?OpenDocument>.

Centers for Disease Control and Prevention. "Frequently Asked Questions." *Foodborne Illness*. 10 Jan. 2005.

<www.cdc.gov/ncidod/dbmd/diseaseinfo/foodborneinfections_g.htm#consumersprotect>.

Health Canada. "Safe Food Handling." *Food and Nutrition*. <www.hc-sc.gc.ca/fn-an/securit/handi-manipul/index-eng.php>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.



Suggestion for Instruction / Assessment

What's Bugging You?

Working alone or in small groups, students research any **three** food-borne pathogens from the list provided. As a result of their research, students should be able to answer the following questions related to each selected pathogen:

1. What are the common food sources of the pathogen?
2. Describe the symptoms and/or effects related to the pathogen.
3. Outline the time it takes for the onset of symptoms and the duration of the illness caused by the pathogen.
4. Describe any preventive measures that can be taken to reduce and/or prevent illness from the pathogen.
5. Explain why people need to be concerned about the illness caused by the pathogen.

FOOD-BORNE PATHOGENS

- Bacillus cereus
- Campylobacter jejuni
- Clostridium botulinum
- Clostridium perfringens
- Cryptosporidium parvum
- Escherichia coli 0157:H7 (E. coli)
- Giardia lamblia
- Hepatitis A
- Listeria monocytogenes
- Norovirus or Norwalk virus
- Salmonella
- Shigella
- Staphylococcus aureus
- Toxoplasma gondii
- Vibrio
- Yersinia

REFERENCES



For additional information about food-borne pathogens, refer to the following websites:

Canadian Partnership for Consumer Food Safety Education. "Fact Sheets." *Food Safety Tips*. <www.canfightbac.org/cpcfse/en/safety/safety_factsheets/>.

U.S. Food and Drug Administration (FDA). Center for Food Safety and Applied Nutrition. *Bad Bug Book: Foodborne Pathogenic Microorganisms and Natural Toxins Handbook*. 28 Dec. 2007. Available online at <www.foodsafety.gov/~mow/intro.html>.

---. "Foodborne Illness: What Consumers Need to Know." *Food Safety Education*. Sept. 2001. <www.foodsafety.gov/~dms/fsefborn.html>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.



Background Information

Contamination Protection and Food Safety

Consumers can help protect themselves from food-borne illness by learning more about the growth and spread of organisms/micro-organisms and by practising effective preventive measures.

▪ **What do organisms/micro-organisms need in order to grow and multiply?**

Organisms/micro-organisms need the following conditions to multiply:

- **Food:** Food is a basic requirement for growth.
- **Moisture:** Many micro-organisms will not grow in dry food. High salt, acid (vinegar), or sugar content will inhibit growth in moist foods.
- **Temperature:** Optimal temperature for the growth of micro-organisms is between 4°C and 60°C. This temperature range is known as the *food danger zone*.
- **Air:** Most micro-organisms (but not all) require oxygen to grow. Botulism is one exception and thrives in anaerobic environments.
- **Time:** When the above conditions are ideal, micro-organisms can grow rapidly.

▪ **How are micro-organisms transferred/spread?**

Micro-organisms may be present naturally in foods or transferred on people's hands, through coughs, other foods, utensils, equipment, water, or pests.

▪ **How can the growth of micro-organisms be prevented?**

We can prevent food-borne illness by following these simple steps:

- Prevent micro-organisms from spreading by protecting food from contact with contaminated objects. This includes people, dirty equipment, utensils, and possibly other foods.
- Stop micro-organisms from growing by eliminating conditions that encourage growth. The most effective way to keep micro-organisms from multiplying is to keep food out of the danger zone. Keep cold foods below 4°C and hot foods above 60°C.
- Finally, destroy the micro-organisms. Most micro-organisms cannot survive temperatures above 75°C for 30 seconds. We can make food safe by cooking it. The temperature that makes and/or keeps food safe is also used to sanitize dishes and equipment. Certain chemicals (such as bleach) also kill micro-organisms. These sanitizing agents are the best means to clean countertops and large equipment.

Everyone has a responsibility to help keep food fresh and safe by following safety guidelines related to handling, preparing, cooking, serving, and storing food.



Refer to RM 10–NU: Safe Food Guidelines.

REFERENCE



For additional information about preventing food-borne illness and food safety, refer to the following website:

Manitoba Agriculture, Food and Rural Initiatives. "Handling Food at Home." *Consumer Food Safety*. Nov. 2005. <www.gov.mb.ca/agriculture/foodsafety/consumer/cfs01s04.html>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.



Suggestion for Instruction / Assessment

Food Safety Errors: Case Studies

Provide students with an opportunity to read the case studies of food safety errors presented in RM 11–NU. Students determine what the errors were and identify steps that could have been taken to keep food safe. They can use the safety information from RM 10–NU to assist them.



Refer to RM 10–NU: Safe Food Guidelines and RM 11–NU: Food Safety Errors: Case Studies.



Suggestion for Instruction / Assessment

Food Safety Game

Consider having students develop questions and answers for a food safety game. Sample questions and answers related to food safety are available online.

REFERENCE



For sample questions and answers related to food safety, refer to the following website:

Canadian Food Inspection Agency. "Food Safety Wheel Game: Questions and Answers."
Food: Consumer Centre. 3 May 2004.

<www.inspection.gc.ca/english/corpaffr/educ/gamejeu/safsale.shtml>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at

<www.edu.gov.mb.ca/k12/cur/physhlth/>.

Lesson 5: Advertising and Marketing Strategy Influences on Food Purchases

Introduction

In this lesson students investigate the diverse and complex advertising and marketing strategies that the food industry uses to entice consumers to purchase products. While some strategies are very obvious, others are subtle, and often exploitive.

This lesson provides students with an opportunity to identify advertising and marketing ploys through hands-on experiences. They also determine the impact of food marketing strategies on their own consumer practices.



Specific Learning Outcome

12.NU.9 Demonstrate understanding of food advertising and marketing strategies and their impact on food purchases.



Key Understandings

- Food producers and advertisers use a range of strategies to influence consumers' food purchases.
 - Understanding marketing strategies helps individuals to be informed consumers.
-



Essential Questions

1. What are some common food advertising and marketing strategies?
 2. What can individuals do to be more informed consumers?
-



Background Information

Television is the primary medium used for food advertising, followed by magazine advertising. Canadian radio and television advertising must comply with the Food and Beverage Clearance Section of Advertising Standards Canada (ASC). Currently, no federal legislation is applied to print advertising for food and beverages (print advertisements may be voluntarily submitted for review to the Canadian Food Inspection Agency's Food Labelling Information Service).

REFERENCES



For more detailed information regarding food and beverage advertising, refer to the following websites:

Advertising Standards Canada (ASC). "ASC Bulletin: Strengthening the Framework for Regulating Children's Advertising." *ASC Clearance Service*.

<www.adstandards.com/en/clearance/strengtheningTheFramework.asp>.

Canada Business: Services for Entrepreneurs. *Food Labelling*.

<www.canadabusiness.ca/servlet/ContentServer?cid=1081944198739&lang=en&pageName=CBSC_FE%2Fdisplay&c=Regs>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at

<www.edu.gov.mb.ca/k12/cur/physhlth/>.



Suggestion for Instruction / Assessment

What Does the Package Say?

Make available to students, or have students bring to class, a variety of food packages (e.g., common or uncommon food, healthy or "less healthy" food). Ensure that the cost of each item is available or marked on the product.

As an activating strategy, facilitate a class discussion about the food packages. Have students address questions such as the following:

1. What key messages are found on the various food packages?
2. Do the products make any nutrition claims? Explain.
3. Which demographics do you think are the primary targets for the products?
4. What features would draw consumers' attention to the products (e.g., wording, colour, images)?
5. Which product has the most appealing package to attract consumers? Explain.
6. Which product is the most nutritious? least nutritious?
7. Which product is the most expensive? least expensive?



Background Information

Nutrient Content Claims

Many food labels are now making *nutrient content claims* in response to consumer health concerns. Food packages often make nutrient content claims by including words or phrases such as *0 trans fats, light, low calorie, good source of fibre, reduced fat*, and so on. What do these phrases really mean, and are they regulated?

In Canada, manufacturers must include *nutrition facts* on most pre-packaged food. *Nutrient content claims* do not have to appear on food packages; however, when they are included, they generally appear on the front of the food packages to draw attention to a specific aspect of the food. When food packages include nutrient content claims, consumers can be reassured that the claims made meet specific government criteria.

Consumers concerned about healthy eating can examine the Nutrition Facts label and list of ingredients on food packages, as well as explore what the nutrient content claims mean.



To review some common Canadian nutrient content claims, refer to RM 12–NU: Food Label Dictionary.

REFERENCES



For additional information on food and nutrition labelling, visit the following websites:

Canadian Food Inspection Agency. "Chapter 7: Nutrient Content Claims." *2003 Guide to Food Labelling and Advertising*.

<www.inspection.gc.ca/english/fssa/labeti/guide/ch7e.shtml#7.1>.

Health Canada. "Factsheet Listing." *Nutrition Labelling—Get the Facts!* 16 Jan. 2008.

<www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/educat/te_background-le_point-eng.php>.

---. *Nutrition Labelling—Get the Facts!* 16 Jan. 2008. <www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/educat/te_background-le_point-08-eng.php>.

International Food Information Council. "Lesson 3: Label Talk!" *The New Food Label: A Food Label Education Program for High School Students*. 1 July 1994.

<www.ific.org/publications/other/tnfiles3.cfm>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at

<www.edu.gov.mb.ca/k12/cur/physhlth/>.

Common Advertising Strategies

Advertising is all around us. Every day we are bombarded with advertising, in every form of media, related to many different products. Food is, of course, an extremely popular and frequently advertised commodity. All producers are in competition trying to entice consumers to buy their products with a variety of advertising strategies.



Suggestion for Instruction / Assessment

Food Advertising Strategies

As a class, examine some misleading or deceptive advertising strategies, sometimes called *hidden persuaders*, which are intended to convince consumers to buy products. Discuss how these strategies affect our food choices.

The Media Awareness Network website, for example, offers a variety of media education resources, including information about food advertising strategies.

REFERENCES



For additional information on advertising strategies, visit the following websites:

Berger, Arthur Asu. "How to Analyze an Advertisement: Finding Ads' Hidden Messages." *Media & Values* 37 (Fall 1986): n.p. Available on the Center for Media Literacy website at <www.medialit.org/reading_room/article227.html>.

Center for Media Literacy. *Common Advertising Strategies: Student Handout*. Media Awareness Network. <www.media-awareness.ca/english/resources/educational/handouts/advertising_marketing/common_ad_strats.cfm>.

Media Awareness Network. *Food Advertising Strategies: Student Handout*. <www.media-awareness.ca/english/resources/educational/handouts/advertising_marketing/food_ad_strategies.cfm>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.

Journal Entry

Have students record a journal entry in which they respond to questions such as the following:

1. What is your favourite food commercial? Describe it.
2. What makes that commercial memorable?
3. Where do you see and/or hear food advertising that captures your attention (e.g., on the Internet, on billboards, on television, on radio, in magazines, on shopping carts, on clothing, on race cars, on buses in larger cities, at movies)?
4. What strategies were used to make the advertising effective/attractive?
5. Do you see food advertisements in school? If so, indicate where and for what types of food.

Brainstorming

Ask students to brainstorm the reasons why advertisers for food products would want to target teens.

Answers might include the following:

- Teens often give parents a wish list of groceries they want.
- Teens watch a lot of television and pressure parents to buy what they see advertised.
- Teens sometimes do grocery shopping for themselves and for their families.
- Teens have disposable income (e.g., from allowances and/or part time jobs).
- The advertisers want to build brand loyalty in consumers at an early age.

Based on the student responses provided, discuss what conclusions can be made.



Background Information

Marketing Tricks of Grocery Stores

Ongoing market researchers ensure that purchasing opportunities are maximized when individuals are in grocery stores/supermarkets. Grocery retailers rely on shoppers spending more than they intended, buying more than is on their shopping list, and being convinced to purchase items that appear to be on sale (Stone).

If shoppers are aware of advertising and marketing techniques commonly used by grocery stores/supermarkets, and are well organized and prepared in advance for their grocery shopping, they can better avoid being influenced by marketing tricks.



Suggestion for Instruction / Assessment

Marketing Tricks and Strategies

In a group brainstorming session, have students respond to the following questions:

1. What marketing tricks do grocery stores/supermarkets use to appeal to the senses?
2. What other strategies do grocery stores/supermarkets use to get shoppers to part with their money (e.g., product placement, wait times)?

REFERENCES



For additional information on marketing strategies, refer to the following websites:

CityFood Magazine. "Sneaky Supermarket Tricks." *Shop*. 23 Oct. 2006.
<www.cityfood.com/EN/shop/sneaky_supermarket_tricks/>.

Stone, Sidney. "The Marketing Tricks of Grocery Stores." The Budget Chef.
<www.thebudgetchef.com/marketing-tricks-of-grocery-stores.html>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at
<www.edu.gov.mb.ca/k12/cur/physhlth/>.



Suggestion for Instruction / Assessment

Buyer Beware

Provide students with an opportunity to identify advertising and marketing strategies used to influence food purchases by organizing a field trip to a local grocery store/supermarket. Divide the class into groups of no more than four or five students. To avoid congestion for the regular shoppers, ask each group of students to start in a different department/area of the store (e.g., bakery, produce), if applicable.

Directions/Description

Ask each group to do the following during their visit to the grocery store:

- Identify how many of the previously discussed advertising strategies and/or marketing tricks are visible, implemented, or identifiable at the store.
- Identify nutrient content and health claims for selected products found in the department/area in which they started. Identify the product's name, the claim, and the Nutrition Facts that support the claim. Health claims will be harder to find and fewer in number.

NOTE TO TEACHER

Remind students that fresh fruit and vegetables, meat, poultry, and seafood may have nutrition information nearby, but not directly on the packaging.

Once students are back at school, have each group report their findings to the class.



Suggestion for Instruction / Assessment

Food Buying Tips

This learning activity is designed to help students be more informed and better prepared consumers in a grocery store/supermarket environment, using the information from this lesson.

Using the Carousel Brainstorming strategy (see Appendix E), assign students to one of the following three stations:

- Before Shopping
- While Shopping
- After Shopping

Ask each group to prepare a list of grocery shopping tips suitable for the assigned station (using the information they learned from their examination of advertising and marketing strategies). The tips should include suggestions for helping consumers avoid being influenced by advertising and marketing strategies.

REFERENCE



For additional information on grocery shopping tips, refer to the following website:

The Frugal Shopper. "Grocery Shopping Tips." *Frugal Household Tips and Hints*.
<www.thefrugalshopper.com/tips/grshopping.shtml>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at
<www.edu.gov.mb.ca/k12/cur/physhlth/>.

Lesson 6: Food and Nutrition Myths and Misconceptions Related to Physical Activity and Sport Performance

Introduction

In this lesson students examine food and nutrition myths and misconceptions, and how they affect day-to-day physical activity participation and sport performance, as well as overall health. By investigating these myths, students will increase their ability to make fact-based decisions about food (including fluids) and add to their skills as educated and informed physical activity participants.



Specific Learning Outcome

12.NU.10 Demonstrate understanding of how food and nutrition myths and misconceptions can affect day-to-day physical activity participation and sport performance and overall health.



Key Understandings

- Myths and misconceptions about food and nutrition relate to many areas of life, including physical activity and sport performance.
 - Food choices based on accurate, current nutrition information are likely to support good health and physical activity performance.
 - Food and nutrition myths are often cited or suggested in consumer publications (e.g., magazines, newspapers) by special interest groups, by poorly informed writers, or to sell specific products.
-



Essential Questions

1. What are some common food and nutrition myths related to physical activity and sport performance?
 2. Where can reliable and accurate food and nutrition information be obtained?
 3. Why do food and nutrition myths persist?
-



Background Information

There are numerous myths and misconceptions about food and nutrition related to health and physical activity and sport performance. They result in misunderstandings about the nutrient value of, and the potential benefits or harm derived from, certain foods and fluids.

It is important to understand that the nutritional needs of individuals participating in physical activity will depend on a variety of factors, such as

- the type of physical activity
- the duration of the activity session
- the intensity of the activity
- the age and gender of the participant
- the environment in which the activity takes place (e.g., air temperature, humidity, time between sessions)



Suggestion for Instruction / Assessment

Sport Nutrition Investigation: Myth, Fact, or Not Sure?

Some common myths or misconceptions about food and nutrition related to physical activity and sport performance are presented in RM 13–NU. The myth and fact statements may be placed on index cards for this learning activity.

Directions/Description

- Divide the class into several groups.
- Divide the cards provided in RM 13–NU evenly among the groups.
- Assign one person in each group to read aloud the statements on the cards to the group. After hearing a statement, the group places the card under one of the following headings: Myth, Fact, or Unsure.
- Once each group has placed each of their cards under one of the three headings, allow the class to review the placement of the cards, and provide a final opportunity to change any of the cards to a different heading.

NOTE TO TEACHER

Reword some of the myth statements into fact statements.

Students may suggest other myths. They may also ask for clarification from various sources. Be cautious of where answers to these queries come from. Use information from a reliable medical source, registered dietician, or nutritionist. Do not direct students to diet or weight-loss websites, journals, or magazines.

- Now have three students (one per heading) reveal to the class each card placed under the respective headings by reading aloud the description on the back of the card. For the Unsure group, have the class use either a show of hands or the Opinion Lines strategy (see Appendix E) to determine the applicable location (Myth or Fact) of each card, and then read the description on the back of the card.
- After all the descriptions have been read, lead a class discussion to clarify any information on the myths or misconceptions about food and nutrition related to physical activity and sport performance.



Refer to RM 13–NU: Sport Nutrition Investigation: Myth or Fact?

REFERENCES



For additional information, refer to the following resources:

Coaching Association of Canada. "Sport Nutrition Resources." *Sport Nutrition*. 2005. <www.coach.ca/eng/nutrition/resources.cfm>.

Gatorade Sport Science Institute. "Nutrition and Performance." *Sports Science Library*. 2007. <www.gssiweb.com/Article_List.aspx?topicid=2&subtopicid=108>.

Health Canada. *Eating Well with Canada's Food Guide*. Ottawa, ON: Health Canada, 2007. Available online at <www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html>.

Livestrong.com. "Eat Well." *Diet and Nutrition*. 2008. <www.livestrong.com/eat-well/>.

PowerBar: Power to Push. *Nutrition and Training*. <<http://engage.powerbar.com/ca/NutritionResource/Default.aspx>>.

Public Health Agency of Canada. *Canada's Physical Activity Guide for Youth*. Ottawa, ON: Public Health Agency of Canada, 2002. Available online at <www.phac-aspc.gc.ca/pau-uap/fitness/downloads.html>.

For website updates, please visit Websites to Support the Grades 11 and 12 Curriculum at <www.edu.gov.mb.ca/k12/cur/physhlth/>.

