Wolf Creek Public Schools
Creating Success For All Learners

Health in Action Project

Alberta Health Services

Nutrition and Disease

Pillar: Healthy Eating
Division: III
Grade Level: 7-9
Core Curriculum Connections: Language Arts

I. Rationale:

Throughout this lesson, students are introduced to the most effective way to have a positive impact on their overall health and longevity - making healthy food choices. Students will learn what constitutes a balanced diet and understand the health implications of an unbalanced diet. Nutritional excesses and deficiencies are associated with five out of ten leading causes of death. Students share their learning by creating media awareness campaigns to highlight the connection between good nutrition and good health to promote the importance of healthy eating habits to others. The goal of campaign is to convince teenagers to improve their eating habits by making clear connections between nutrition and its role in the prevention of disease.

II. Pillar Focus (Healthy Eating):

Students will be able to:

- describe the connection between eating patterns and dietary-related health problems (diabetes, obesity, some cancers, osteoporosis, anemia, dental caries, cardiovascular disease, and eating disorders etc.)
- recommend dietary adjustments to reduce the risk of developing a variety of diseases and disorders.

III. Curriculum Outcomes: Language Arts

Grades 7-9 ELA Outcomes	
2.4 Create Original Text **Generate ideas**	***3.3 Organize, Record and Evaluate*** **Organize information** **Record information**
3.1 Plan and Focus **Determine information needs** **Plan to gather information**	***3.4 Share and Review*** **Share ideas and information**
3.2 Select and Process **Use a variety of sources** **Access information**	***4.3 Present and Share*** **Present information** **Enhance presentation** **Use effective oral and visual communication**

IV. Materials:

- Photos or pictures of people with anorexia nervosa, bulimia, cancer, etc. for bulletin board display to show students as an introduction to the lesson.
- Poster making materials, OR Video camera, OR A tape recorder
- Teacher Background Reading:
  - Media and Children and Teens
  - Media Awareness Network

- International Food Information Council - How to understand and interpret food and health related scientific studies
- Alberta Nutritional Guidelines for Children and Youth
- Eating Well with Canada's Food Guide
- Eating Well with Canada's Food Guide: A Resource for Educators and Communicators
- "Food for Thought: Schools and Nutrition"

- Teacher Reference Sheets and students handouts(attached):
  - ✓ "Eat Smart: Nutrition Needs of Adolescents;"
  - ✓ "Eat Smart: Nutrition for Mental Performance;"
  - ✓ "Eat Smart: Nutrition to Reduce Risk of Cancer;"
  - ✓ "A Balanced Day's Eating;" "Dietary Guidelines for Americans."
  - ✓ "What's Wrong With This Picture?;"
  - ✓ *Healthy Eating and Active Living for 13 to 18 years*

V. Procedure:

i. Activating:

1. a. Show students pictures of people suffering from various chronic and acute diseases (cardiovascular disease, cancer, obesity, osteoporosis, dental caries, anorexia and bulimia, etc.) Use the following questions to guide discussion:
   - When you look at these people, what kinds of things to you notice?
   - What do you think all of these people have in common with one another? (all look unhealthy/sick)

   b. Explain that each person is suffering from a completely different condition, but one of the causes of their illnesses is the same: an unhealthy diet. Be sure to explain that although each disease can be caused by a variety of factors, good nutrition does play a key role in the prevention of many conditions.

ii. Acquiring:

2. Read the student and teacher reference sheets and use them to guide discussions about the nutritional needs of adolescence and to reinforce how diet affects the risk of contracting certain chronic and acute diseases. Be sure that students have sufficient background on this causal link so that they are prepared to conduct further research on a specific condition and how its causes can be rooted in nutritional deficiencies and excesses.

3. Distribute a copy of "What's Wrong With This Picture?" to all students.

4. Organize students into small groups (4-5 each) for discussion of possible chronic and acute problems promoted by this dietary intake over time.

5. Ask student teams to select a specific chronic condition (heart disease, cancer, osteoporosis, diabetes, eye health, obesity, and eating disorders) and conduct further research. The learning task is to prepare a media campaign that highlights what can be done to reduce the risk of developing a certain chronic/acute disease. Remind students that their target audience is teenagers and the aim of their campaign is to convince their peers to improve their eating habits by making connections between nutrition and its role in the prevention of chronic diseases.

iii. Applying:

6. Although all students will be expected to design their campaign with the same message, they have the freedom to choose the media format and mode of delivery. An audio, visual, or oral campaign could be developed for television or radio, by writing and producing a 2-minute public service announcement or students could develop a visual campaign in the form of a poster or brochure.

7. Students should conduct their research with following information in mind:
   - What are the main vitamins and minerals necessary to support optimal health and development in the teen years?
   - Why is it so important to develop healthy eating habits in the teen years?
   - Describe the condition or disease?
     - ✓ Symptoms
     - ✓ Causes
     - ✓ Treatments
   - What nutritional deficiencies or excesses could contribute to the development of the condition?
   - To decrease the risk of developing the disease, what are some foods that should be eaten? Avoided?

8. Have the rest of the class provide constructive feedback to each group as they present their media campaigns.

9. Compile a top ten list of the 'healthiest foods' and 'unhealthiest foods' as they relate to the maintainance of optimal health and disease prevention.

VI. Extensions and Variations:

- Contact local radio stations and share service announcements.
- Brainstorm solutions to factors that interfere with teenagers eating a variety of foods and meeting their nutritional needs and post these in the classroom.

VII. Assessment Ideas:

- Use a rubric that assesses an oral presentation for the radio or TV broadcast.
- Use a rubric that assesses visual presentation for the poster.

- **Source of student reference sheets (Eat Smart):** Michigan Department of Education. (2000). *The Michigan model for comprehensive school health education.* Lansing, MI: Michigan Department of Education.

STUDENT AND TEACHER REFERENCE
EAT SMART: NUTRITION NEEDS OF ADOLESCENTS

Young people between the ages of 11 and 22 undergo rapid physical changes, including bone and muscle development, gains in height and weight, sexual maturation, brain and nervous system maturation, and hormonal fluctuations that impact mood and functioning. Adolescents are usually quite active, expending energy and burning calories at a high rate. This combination of biological changes and physical activity demands that teenagers and young adults eat well. Adolescence is a period of high nutrient needs.

What are the special nutritional needs of teenagers?
Adolescents need more Vitamin A, B-6, C and E than younger children. They need more protein, Vitamin D, thiamine, riboflavin, niacin, and the minerals calcium, iron, phosphorus and magnesium than adults.

Are teenagers' nutritional needs well met?
By and large, Canadian teenagers are healthy and well-fed. Their nutritional status is surprisingly good, considering that many teens don't always eat very healthfully. They can do better though, and their looks, performance and health can be enhanced by wise choices.

Are there any areas of nutrient deficiency common to teenagers?
Yes, numerous studies over a 20-year period have pinpointed teenagers as a group more likely to be low or deficient in the following important nutrients:

IRON - Males need it for increasing muscle mass and blood volume during their growth spurt. Females have a high need for iron to replace that which is lost monthly in menstruation. Iron also is needed for DNA and RNA synthesis. Iron deficiency causes chronic tiredness, lack of concentration, clumsy coordination, reduced athletic performance, and impaired long-term memory and learning ability. Yet teenagers are often iron deficient. *Lean meats, fish, eggs, whole grains, dried fruit, peas, beans and liver are all good dietary sources of iron.*

CALCIUM - Calcium is needed during adolescence for bone growth and for the development of lean body tissue. Approximately 45% of an adult's skeletal bone mass is formed during the teen years. In fact, there is evidence to suggest that inadequate calcium in adolescence predisposes older people to bone thinning and osteoporosis. Males tend to consume more calcium than females. Calcium is absorbed best in the presence of certain other nutrients, notably vitamin D, lactose and protein. Calcium absorption is interfered with if there is a high presence of phosphorus in the body. Since soft drinks and many processed foods that teenagers favor are high in phosphorus, many teenagers are calcium deficient. *Calcium is found in dairy products, including yogurt and cheese, and in vegetables like collards, kale, broccoli, spinach, and dried peas and beans. Four glasses of skim milk a day would meet the average adolescent's calcium requirements easily.*

ZINC - Zinc is required in increased amounts in the teenage years for tissue growth and sexual maturation. It also plays a role in the sense of taste. *Zinc is found in foods like fish, shellfish, meat,green beans, lima beans, nuts, wheat germ and whole grain products.*

RIBOFLAVIN - Riboflavin is one of the B vitamins necessary for growth and high energy. It is needed for healthy skin and blood, and it aids in carbohydrate metabolism. *Riboflavin is found in whole grain breads and cereals, meat and dairy products.*

VITAMIN A - Vitamin A is needed for the formation of healthy bones, skin, teeth and mucous membranes. It also aids vision, especially night vision. One form of Vitamin A—beta carotene—is believed to be a cancer prevention substance. *Vitamin A is found in carrots, sweet potatoes, cantaloupes, peaches, apricots, winter squash, pumpkins, and other dark yellow and green leafy vegetables. It is also found in milk and liver.*

What factors interfere with teenagers eating a variety of foods and meeting their nutritional needs?

The main things that interfere with adolescent nutritional status include:
• meal skipping, especially breakfast;
• snacking on high-calorie, high-fat, high-sugar, high-salt foods like chips, dips, candy bars, granola bars, etc., which are low in nutrients;
• eating out at fast food restaurants, routinely selecting high-fat foods like cheeseburgers and french fries;
• adopting extreme or fad diets to gain or lose weight;
• alcohol use, which interferes with absorption of important nutrients, such as zinc and folic acid, often replacing food with empty calories, and possibly causing liver damage that impairs the body's ability to use vitamins A and B-12;
• use of other drugs, including tobacco, marijuana and oral contraceptives, which also affect nutrient intake and absorption;
• eating disorders, such as anorexia nervosa and bulimia;
• depression and other emotional problems;
• being poor; and
• advertising which promotes excessive thinness, or particular foods or regimens that are not healthy for developing bodies.

Why is it important for teenagers to be aware of nutritional needs and pay attention to their nutritional intake?

t is important for young people to know what their bodies need to grow and develop properly and to understand that food intake influences everything from energy, to mental alertness, to sports performance, to sexual maturation, to skin health, to name but a few. Moreover, eating patterns and everyday habits begun in the adolescent years carry over to adulthood. We are learning more every day about the role of diet in the long-term health of individuals. How one chooses to eat in the teen and early adult years may help or hinder future health. It's important to keep up with nutritional research and recommended practice, and make it a lifelong habit to eat smart!

Source: Michigan Department of Education. (2000). *The Michigan model for comprehensive school health education* (grade 8, model 4, lesson 10, p. 477-478). Lansing, MI: Michigan Department of Education.

STUDENT AND TEACHER REFERENCE

EAT SMART: NUTRITION FOR MENTAL PERFORMANCE

IF YOU WANT TO BECOME MORE CALM AND RELAXED:

Eat Carbohydrates. Carbohydrates spur production of serotonin, the calming natural chemical produced in the brain. If you need to be more calm and less stressed, reach for the sweet and starchy foods. Eat the carbohydrates alone, not with protein. The carbohydrates will help you become more focused and in control of your thoughts and feelings.

Select Low-Fat Carbohydrates. They are digested most quickly. (Fat is slow to digest and adds to many calories.) Low-fat carbohydrates, like breads, crackers, rice cakes, oat cereal, muffins, or bagels can offer relief in 30 minutes.

Drink Carbohydrates If You Can't Eat. A cup of herb tea with two tablespoons of sugar will calm you just as well as two or three crackers. Drinking tea or a caffeine-free soft drink will expedite the process of stress relief because liquids pass through the system faster than solid foods.

Eat Slowly In Relaxed Surroundings. This prevents overeating. It also is good to change your pace and environment for a few minutes to make it easier for the serotonin to work to calm you.

IF YOU WANT TO BECOME MENTALLY ALERT AND FOCUSED:

Eat Protein. Protein packed foods spur production of dopamine and norepinephrine, the brain's natural alertness chemicals. When these chemicals are in good supply, your wits will be at their sharpest. Eat the protein alone, not with carbohydrates. (Or eat the protein before adding vegetables and fruits, which are good for you, but do not alter alertness or mood.) Excessive consumption of protein is not necessary. In fact, it will slow the process. Three to four ounces of lean protein is all that is required to produce the effect.

Eat low-fat protein. Choose proteins that have the least amount of fat. Best bets are chicken without the skin, shellfish, fish, veal and lean beef. You can also get mental energy from low-fat cottage cheese, yogurt, lentils and dried peas and beans. (While egg whites are almost pure protein, the yolks are very fatty, so eat eggs in moderation.)

Always eat a well-balanced breakfast. Choose breakfast foods that are high in protein and low in fat. People who eat little or no breakfast tend to eat a lot and go for high-calorie carbohydrates at lunch. This results in an afternoon of diminished alertness. By eating the right foods at the right times, you can be alert, chipper and ready to think, or be calm, relaxed and mellow. Which do you need to be and when? That is up to you and your understanding of your body, moods and peak performance times. Eating some foods at certain times can dull your wits or make your nerves more jangled than they already are. Don't expect any miracles, but to a surprising degree, perhaps you can enhance your mental performance and moods with carefully
chosen, healthful foods.

Sources: Wurtman, J. (1999). *Managing your mind and mood through food*. New York: Harper and Row. *The Harvard Medical School Mental Health Letter* (1987, February).

STUDENT AND TEACHER REFERENCE

EAT SMART: NUTRITION TO REDUCE RISK OF CANCER

Based upon hundreds of research studies, the National Cancer Institute estimates that about one-third of all cancers are in some way linked to what we eat. In fact, the most encouraging news from the cancer research front in this decade has been the emerging evidence that we may have more control than we thought in reducing our risk of cancer by selecting certain foods to eat, and avoiding others. Of course, it isn't simply food that matters; smoking, heredity, exposure to toxic chemicals, alcohol consumption, and other factors can predispose an individual to cancer. Still, knowing some foods that are possible protectors, and knowing some foods that may be contributors to the development of cancer, can help us to EAT SMART.

Can certain foods caused or prevent cancer? Guide your food choices:

Diet and Cancer

Can certain food prevent or cause cancer? The answer, so far, is maybe. This chart outlines the smart choices.

Substance	Major Dietary Sources	Suspected Role In Cancer	Comment
Possible Protectors			
Beta carotene (transformed into vitamin A by the body)	Yellow, orange, and green leafy vegetables and fruit, such as carrots, cantaloupe, broccoli, yams, spinach	Deficiency may increase risk of lung, stomach, cervical, bladder and other cancers.	This antioxidant is thought to be more anti-carcinogenic than dietary vitamin A. Extra carotene is stored in most tissue for future use. Not toxic.
Vitamin A	Liver, butter, milk, cheese, egg yolk, fish oil	Deficiency may cause abnormal cell growth, possibly leading to cancerous tumors.	Much of its protectiveness is due to beta carotene (above). Avoid vitamin A supplements–megadoses can be toxic.
Vitamin C	Citrus fruits, tomatoes, broccoli, strawberries, potatoes, peppers, kale (C is destroyed by improper storage or long cooking)	Deficiency of this antioxidant may increase risk of cancer of stomach and esophagus. May block conversion of nitrites and nitrates to cancer-causing agents.	Adult DV is 60 milligrams, supplied by 4 ounces of fresh orange juice. Unused C is excreted. Megadoses (over 1 gram daily) can cause diarrhea and may result in kidney stones.
Vitamin E	Nuts, vegetable oils, liver, margarine, whole grains, wheat germ, dried beans	An antioxidant. Shown to protect lab animals against some cancers.	Adult DV is supplied by one tablespoon of margarine.
Selenium	Seafood, liver, meats, grains, egg yolks, tomatoes	An antioxidant. Shown to protect lab animals against some cancers.	No DV. Plentiful in most diets. Supplements can be extremely dangerous.
Fiber	Found only in plant foods, such as fruits, vegetables, whole grains	Promotes healthy bowel function. May lower risk of colon and rectal cancer.	Choose whole-grain breads and cereals. Eat fruit and vegetables with skins when possible.
Cruciferous vegetables	Vegetables of the cabbage family, *e.g.*, broccoli, kale, brussels sprouts, cauliflower	Contain antioxidants that may block production of potential cancer-causing agents in lab animals.	Eat at least 2-3 servings each week. Excellent sources of fiber, minerals, and vitamins.

STUDENT AND TEACHER REFERENCE

EAT SMART: NUTRITION TO REDUCE RISK OF CANCER (Continued)

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Possible Villains			
Fats	Meats, poultry skin, whole milk and milk products, vegetable oils	Excess consumption of fats may contribute to cancers of the digestive and reproductive systems and to obesity, another risk factor for cancer.	Choose low-fat dairy products and lean meats; trim all visible fat and discard poultry skin; don't fry meats. Eat fish. Avoid high-fat processed foods.
Alcohol	Beer, wine, liquor	Heavy drinking, especially combined with smoking, contributes to cancers of the mouth, throat, liver and bladder. May also be a factor in breast cancer.	Drink only in moderation, if at all: no more than 2 drinks a day.
Nitrites	Used to preserve cured meats, such as bacon, hot dogs, sausages, ham	Promotes cancers of stomach and esophagus in lab animals.	Avoid eating cured meats habitually. Use low-temperature cooking methods. Microwaved bacon, e.g., is lower in carcinogens, especially if you drain the fat.
Aflatoxins	Poisons formed in moldy peanuts, peanut butter, seeds, corn, and other crops	If eaten in large amounts can cause liver cancer, a rare disease in this country.	Discard moldy, shriveled, discolored peanuts. Refrigerate freshly ground peanut butter; discard entire jar if moldy.
Browned foods	Meats grilled, barbecued, or fried at high temperatures	These cooking methods create cancer-causing agents. Most dangerous when cooking fatty meat over a heat source.	As often as possible, choose other cooking methods–steam, bake, roast, or microwave. Scrape off charred material.

Source: University of California, Berkeley, School of Public Health. (1987, October). Diet and cancer: What we know now. *Wellness letter*.

STUDENT HANDOUT

"WHAT'S WRONG WITH THIS PICTURE?"

DAILY FOOD INTAKE OF
Ned Willbedead

Ned Willbedead is a 13-year-old male in eighth grade. He considers himself to be very healthy because he is able to play on his soccer team and doesn't get sick very often. He had shots when he was young to prevent him from getting measles, mumps, tetanus and whooping cough. However, he did get chicken pox when he was in second grade. He doesn't think he is overweight or underweight, but feels he eats the right amount to help him grow and keep up his physical activities.

Ned's dietary intake for three days looks like this.

	TUESDAY	WEDNESDAY	THURSDAY
BREAKFAST:	nothing	2 frozen waffles with syrup and margarine	cold cereal with 2% milk
SNACK:	diet soda bag of chips		
LUNCH:	hamburger lg. french fries lg. soda	2 sl. pepperoni pizza lg. french fries med. apple lg. soda	lg. french fries cupcake lg. soda
SNACK:	candy bar	bag of chips	
DINNER:	2 pcs. baked chicken 1/2 c. corn 1c. salad with dress-ing	lg. beef burro 3/4 c. refried beans diet soda	spaghetti with sauce 2 sl. bread Fudgsicle ice water
SNACK:	2 choc. chip cookies	2 choc. chip cookies 1 med. banana	Fudgsicle