MISSION PLANS FOR GRADES 4-5

MISSION 1

EXPLORING BODY FUEL

Students explore the roles of key nutrients including carbohydrates, fats and proteins and the need for a healthy variety of foods from the four food groups in Canada's Food Guide.

Adventures in learning, created by Canadian dietitians

Learning Expectations:

1. Identify the different roles of carbohydrates, fats and proteins.
2. Understand the need for a healthy variety of foods from the four food groups in *Canada's Food Guide.*

Subject Links:

Health, Science, Language, Physical Education

Materials & Resources:

- *Canada's Food Guide* Visit www.healthcanada.ca/foodguide or call 1-800 O CANADA
- A large glass jar with a lid, 30 mL (2 tbsp) lemon juice, 200 mL (3/4 cup) water , 5 mL (1 tsp) sugar, 2 crackers, 1 slice of bread, a handful of high fibre cereal, 1 slice of luncheon meat, 1 slice of cheese (Incredible Food Processor Experiment)
- Electric kettle, water, glass bowl, cup, egg, fork (Stringy Soup Experiment)
- Small samples of a variety of foods and brown butcher paper or brown paper bags (non-waxed) (Fat Finding Experiment)

See the Teacher Notes at the back of this resource (on pages 23-26) for more information on this mission.

Class Discussion:

Our bodies need food energy for our brains to think, for our muscles to work, for our heart to beat and our lungs to breathe. The following scenarios can help students appreciate how eating well and being active can help them feel good. Ask them how they think they would feel if:

- They woke up late and skipped breakfast before school?
- They forgot to bring a lunch to school or gave it away?
- They spent the day sitting at their desk with no movement or activity?

Teaching Tip:

Following *Canada's Food Guide* helps to provide a healthy balance of the three macronutrients that supply food energy - carbohydrates, fats and proteins. Use the *Teacher Notes* to review the role of each of these nutrients as you do the experiments outlined in this unit.

Activities:

The *MISSION NUTRITION** Team wants to know about how humans get energy from the food we eat. The following food experiments explore how the body uses carbohydrates, the structural role of proteins and which foods supply fat. Whenever experiments with food are undertaken in the classroom, sensitivity to allergies, customs and religious orientation is necessary for the safety and wellbeing of class members.

1. Incredible Food Processor Experiment (Carbohydrates)
   This experiment demonstrates how carbohydrates are the body's preferred source of food energy. Provide small groups of students with the materials to conduct this experiment (each group will need the materials listed for this experiment under *Materials and Resources*) or demonstrate it for the whole class. In the large glass jar, mix the lemon juice and water. This acidic liquid helps to break down food to simulate digestion by stomach juices. Cut or break food samples into small bits. This step is like the job that teeth do before breaking foods into smaller pieces that are easier to digest. Add each food in turn to the juices in the jar and seal with a lid. Have students observe and record the appearance of each sample after 1, 5 and 15 minutes. Ask them to note which foods changed the most and which changed the least.

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Continued

Students should observe that carbohydrate rich foods are broken down quickly and foods that contain a lot of protein or fat are broken down more slowly. Empty the contents of the jar into a toilet to discard them at the end of this experiment.

2. Stringy Soup Experiment (Proteins) Make a batch of this 'stringy soup' to illustrate the primary structural role of protein which provides the building blocks for tissue growth and maintenance. Boil two cups of water in an electric kettle. Pour the water into the glass bowl and wait for the bubbles to subside. While you wait, break an egg into a cup and beat it with a fork. Then slowly trickle the egg into the water in a thin stream and swirl the 'soup' gently with the fork as you pour. Observe what happens to the egg. You should see long stringy strands of protein. Explain that eggs are made up of a bunch of twisted proteins, like a ball of string that's all curled up. Heat untwists the proteins and they form long stringy strands. Discard the 'soup' when students have finished observing.

3. Fat Finding Experiment (Fats) Find the fat in a variety of foods with this simple fat finding test. Explain that we all need fat - for energy and to help absorb some important nutrients. Collect small samples of a variety of foods from each food group to test. Choose:
   - Vegetables and Fruit such as carrots, bananas and french fries.
   - Grain Products such as cereal, bread, muffins and crackers.
   - Milk and Alternatives such as regular fat cheese and lower fat cheese.
   - Meat and Alternatives such as lentils, ham and hot dogs.
   - Snack foods that are higher in fat such as chips, cookies and chocolate.

   Divide the class into 5 groups to test these different foods. Provide each group with a piece of brown butcher paper or brown paper bag and some food samples to test. Ask them to place the samples on the paper and write the food name under each sample.

After 10 minutes, students remove each sample and observe whether it left a spot on the paper. Hold the paper up to a light source to see if light shines through it. Explain that the more light showing through, the more fat the food contains. Within each group students can then determine which foods have the most and least fat and share their results with the class.

Allergy Awareness: To ensure safety, always check with students and their parents for any food allergies before activities that involve bringing foods or food packaging into the classroom. The ingredient list found on food labels is especially useful for identifying ingredients that may cause an allergic reaction.

Allergy and Anaphylaxis Resources:
- Calgary Allergy Network - School Related Resources www.calgaryallergy.ca/Article.html#school
- Allergy and Asthma Information Association: www.aaia.ca
- Anaphylaxis Canada: www.anaphylaxis.ca or ph: 1-866-785-5660

Student Mission 1: What's In It For Me?
Ask students to complete the *What's In It For Me*? activity sheet after conducting the carbohydrate, protein and fat experiments and discussing the roles of each. Their mission is to identify the different roles of carbohydrates, fat and protein.

Home Connection:
Creating a "Healthy Living" brochure can help students communicate some of their ideas for healthy eating and activity with their family.

In Class: Have students create a brochure that promotes healthy eating and physical activity. The brochure could include:
- how eating well and being active helps you feel good
- the importance of a healthy variety of foods from the four food groups
- suggestions for enjoying a variety of foods
- ways to be active and stay fit

At Home: Students can share their "Healthy Living" brochures with their family.

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