

April | Activity of the Month

The Science of What We Eat: Can you find the chemistry in food?

What's it about:

What do vitamins, minerals (like calcium and iron), proteins, and carbohydrates (like sugar and starch) have to do with what you eat? Chemistry of course! Chemistry is everywhere, and these are all chemical substances making up the food you eat. Humans need food to survive. Just as our cars won't run without fuel, our bodies won't function either if we don't eat. Food gives us energy (from our bodies breaking down the proteins, fats and sugars in food) to be active, play sports, do our school work, and to hang out with friends. Even when we sleep our bodies are using energy to keep our hearts and other organs working. Food keeps our bones, skin, nails and hair strong and healthy, it builds muscles, and feeds our immune systems to keep us from getting sick. Some chemists, like [Fraser Hof](#) at the University of Victoria, help find solutions to improve human health. Others like [Reg Mitchell](#) (as Dr. Zonk), bring the fun and daily relevance of chemistry to thousands of students.

Let's check out the chemistry (and ingredients) in food, and explore the differences between "processed" foods (food that has been altered or transformed usually to make them keep longer and look attractive to you) and "natural" foods (foods that are grown and eaten without being modified). Ok, let's go find your favorite foods!

What you need:

- Snack activity sheet
- Pencil

What to do:

Identify your favourite snacks:

1. Get together with some friends or family members, print off a Snack activity sheet for each of you, and write your name on it.
2. Ok, now indulge yourself and think about your favorite snacks. Yum! Choose the five that are your absolute favourites and list them on the sheet.
3. Now use the table to sort your favourite snacks into ones that are **natural** (grown and eaten raw without being modified e.g. an apple or banana) and ones that are **processed** (altered or manufactured from raw ingredients, often in factories, by processes like canning, preserving, drying, and then packaged for the grocery store supermarket). An easy way to think of the difference is to ask yourself if your snack could be found growing in a garden, natural area, or on a farm just as it is. If not, it is probably processed.
4. Which snacks do you and your friends or family prefer, natural or processed?

Investigate the differences between natural and processed snacks:

5. Now that we have our list of favourite snacks separated into natural and processed, let's look at each snack more carefully. Find out how many ingredients are in each snack and write the number in the table. An apple has one, for chips - count the number of ingredients listed on the package.
6. What did you notice? Which type of food has more ingredients overall: processed or natural foods? Processed foods often require chemical preservatives and/or artificial colors and flavors so that they last well and taste good. Some of these have been linked to health problems and allergies, but the preservatives and processing can also keep you safe from natural microorganisms that can occur in foods especially if you eat the food long after it was



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harvested. Compare with your friends' or family's lists - which of the snacks has the most ingredients of all? The least?

7. How many of the processed snacks have added sugar and or salt? How many have ingredients listed that you don't recognize?
8. Check out the nutrition facts tables on your snack packaging. See how the different foods compare in terms of fats, vitamins, sugar etc? If it is a natural snack, you may need to do some research on the internet to find out this information.

The bottom line is that it is important to be aware of what is in the food we eat, that way we can choose a good balance between all the different kinds of food we enjoy. And remember, it's all chemistry!

What's Going on?

These days many foods are processed so that they don't spoil so quickly and can be transported long distances. Processing can make food quicker to prepare, and can reduce the incidence of food borne disease as well as making some foods taste better.

Natural food (e.g. grapes, apples) usually have more vitamins, fiber and minerals than the same food after it has been processed (like raisins, or canned fruit) because vitamins for example will break down during drying and storage. Processed food often has added sugar and salt (to both change the flavour and help preserve the food) as well as flavourings and colouring, or even additives that change the texture of the food. From the seeds in your gardens and the fresh corn you pick, to the grocery store or the farmers market shelves, chemistry is an integral part of the food we eat.

Did you know?

Health Canada publishes food guidelines that can help you make healthier choices when it comes to the types and amounts of food you consume? You can access the guide at: www.hc-sc.gc.ca/fn-an/food-guide-aliment/order-commander/index-eng.php.

Here are some of their suggestions for really healthy snacks. Enjoy!

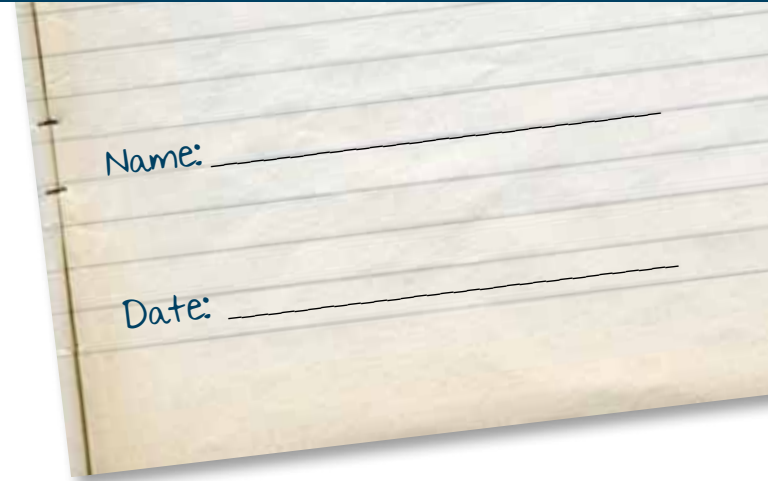
fresh fruit or vegetables, nuts or seeds, trail mixes.
popsicles with 100% juice, yogurt with fruit, plain popcorn,
whole wheat breads, small fruit or vegetable salad



Snack Activity Sheet

List 5 of your favorite snacks:

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____



Are your snacks processed foods or natural foods?

Use the table to help you sort each type of snack you chose.

Natural Foods				Processed Foods			
Foods that are generally grown on farms and/or found naturally in the wild. Examples include fruits, vegetables and nuts.				Foods that have been chemically modified in some way. For example with preservatives, food coloring or other artificial ingredients. Examples include chips, cookies, and sodas.			
Snack	Number of Ingredients	Added sugar?	Added salt?	Snack	Number of Ingredients	Added sugar?	Added salt?

Which foods have more ingredients? Why?

Did you find any surprises in the relative amounts of different ingredients in your favorite snacks? For example: Where do sugar and salt fit into the ingredient list?