

# WHAT'S ON YOUR PLATE

**75 MINUTES**

SNC1D, SNC1P, SNC2D,  
SNC2P, SBI3C, SBI3U,  
SCH4U, SCH4C

A high school lesson plan provided by the University of Guelph

This activity will allow students to explore the various aspects of food production to gain a better understanding of where their food comes from. Organic food, genetically modified food and food science will be investigated through group discussions and interactive activities!

## Curriculum Alignments and Expectations

- Identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields
- Assess the impact of human activities on the sustainability of terrestrial and/or aquatic ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impacts
- Evaluate some social, ethical, and environmental implications of genetic research and related technologies
- Demonstrate an understanding of concepts, processes and technologies related to the transmission of hereditary characteristics
- Identify and describe careers related to the fields of science under study, and describe the contributions of scientist, including Canadians, to those fields
- Demonstrate and understanding of concepts related to molecular genetics and how genetic modification is applied in industry and agriculture
- Investigate the molecular shapes and physical properties of various types of matter

## Learning objectives

- Gain knowledge of less familiar parts of food production
- Build understanding on breeding methods used in food production
- Improve understanding of human perception of food
- Explore careers and educational pathways related to the agriculture and food industry

## Assessment Strategies and Success Criteria

- Open-ended questions
- Think-pair-share
- Group summary and debrief
- Quiz

## Cross Curricular Links

- Career Studies – Identifying Trends and Opportunities
- Exploring Technologies – Communications Technology Fundamentals
- Environmental Science – Human Health and the Environment
- Geography – Human Impacts on Natural Spaces and Species

## Materials

- Organic vs. Non-organic food samples
- Representations of common foods (i.e. photos, empty packages)
- Jelly beans, preferably authentically flavored (i.e. jelly belly brand)
- Smelling samples
- Complimentary presentation or handout

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## TEACHER NOTES

1. Begin the lesson with an introduction of the farm to fork continuum.

A relatively simplified continuum includes the primary producers, processing/product development, transportation and sale to the consumer.

2. Discuss what is classified as an organic food.

Simplifying organic standards can be a helpful way to articulate the differences between organic and conventional food. Organic standards can be found in additional resources section

Note: Ensure that students understand that this is the requirements to be certified organic; however, 'conventional' farmers may be doing some of these things as well

3. **Activity 1: Does Organic Food Actually Taste better?**

Required materials: Organic and non-organic sample of the same food (use 1-3 different items)

Have all students or a small group do a blind taste test both organic and non-organic samples. Have them vote on the one they prefer and the one they believe to be organic before revealing which is which.

4. Define GMO.

Genetically: The DNA responsible for the characteristics of a living thing

Modified: To change or alter something to

be different than the original

Organism: Any living thing, including plants and animals

GMOs are created by genetic engineering. Techniques are used to alter the molecular or cell biology of an organism by means that are not possible under natural conditions or processes. Genetic engineers may make artificial changes to the DNA of an organism to incorporate the genes of another organism.

5. Discuss the possible benefits and drawbacks of GMO production.

Pros: Increase food supply and availability (cost), addition of vitamins and minerals to foods, decrease pesticide and herbicide spraying

Cons: Debate over long-term testing, development of weeds and pests that are stronger and herbicide and pesticide resistant

6. **Activity 2: Can you spot the GMO?**

Required materials: Food cut outs of common foods (see handout on back of package)

Give a representation of common food items (i.e. cut outs) and ask students to sort them into GMO and Non GMO groups. Ask students to explain their reasoning of why they chose which item for which group.

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Explain labelling of food products in relation to GMOs. In Canada and the United States we do not label GMOs, however can label Non GMOs by the following labels. Therefore the food items they sorted may or may not be a GMO food

7. Introduce food science and the role of a food scientist to your students.

**Food Science:** Food science combines a diverse range of subjects including chemistry, microbiology, and aspects of law, health, nutrition, and security. Food scientists fill the gap between the production of the farm goods and consumers. Food scientists work in all levels of food processing and technical aspects of food including packaging, food safety and quality assurance and product development.

Food scientist's creations include:

- Ice cream
- Cheese
- Potato chips
- Freeze dried fruit

8. Food Scientists that specialize in product development utilize sensory perception of food.

**Food Sensory Perception:** The use of the human senses to measure food characteristics.

What knowledge of sensory perception and food experience your students already have?

Do they know all five senses and what body

system they are a part of?

Have they ever had compromised sensory experience? (Decreased sense of taste and smell while ill with a head cold)

## 9. Sensory Activity 1: What's that smell?

Required materials: Smell test bottles or markers (unmarked)

Have students sniff the scented item (bottle or marker) with no associated label, colour or shape. Students can guess individually or as a group to what aroma is captured within the bottle/marker. By isolating student's sense of smell, the relationship between different sensory systems, especially the olfactory system and gustatory system (taste) is demonstrated. Repeat with 4-6 different aromas.

**Fun Fact:** Our sense of smell often confuses some aroma due to the similarity in the shape of the odor molecules!

## 10. Sensory Activity 2: Can You Pass the Taste Test?

Required materials: Authentically flavored jelly beans (i.e. jelly belly brand)

Have students close their eyes (removing sight, such as colour visual cues), plug their nose, and eat an authentically flavored jelly bean. After placing the jelly bean in their mouth students can open their eyes but **MUST** keep their nose plugged. Allow students to individually or as a group guess what flavor they taste.

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Repeat with 3-6 different flavors.

Note: Be cautious of allergies, dietary restrictions and preferences (i.e. jelly beans often contain gelatin derived from animals).

## Additional Resources

- Canadian Food Inspection Agency. (2018). Organic Products. Retrieved from <http://www.inspection.gc.ca/food/organic-products/eng/1300139461200/1300140373901>

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