Ages: 8-12
Topic: Senses and Making Observations
Time: 1-2 class periods
Standards: This activity is aligned to national standards in science, technology, health and mathematics.
For example: **Next Generation Science Standards:** 3-5-ETS1-3 Plan and conduct an investigation, 4-LS1-2 Use a model for information through senses
Common Core State Standards: W.5.9 Draw evidence from literary or informational texts

Mission X: Train Like an Astronaut

TASTE IN SPACE

EDUCATOR SECTION (PAGES 1-6)
STUDENT SECTION (PAGES 7-15)

In this activity, students will investigate and discover variables that affect their own sense of taste.

The Expedition 37 crew are imitating the photo taken on Einstein's 72nd birthday in 1951, by United Press International photographer Arthur Sasse.

Background

For astronauts, all their food and drink needs to be carried to the International Space Station (ISS). Eating is an important part of crew morale and the one communal time when they share both a meal and talk with each other. From the early 1960s, astronauts found that their taste buds did not seem to be as effective when they were in space.

Why does this happen in space? This is because fluids in the body get affected by the reduced gravity conditions (also called fluid shift). On Earth, gravity acts on the fluid in our bodies and pulls it into our legs. In space, this fluid is distributed equally in the body.
This change can be seen in the first few days of arriving in space when astronauts have a puffy face as fluid blocks the nasal passages. The puffy face feels like a heavy cold and this can cause taste to be affected in the short term by reducing their ability to smell. After a few days the fluid shift evens out as the human body adapts. In the long term, it could also be that in the confines of such a small space like the space station, the food competes with other odours in the station (e.g. body odours, machinery) that could also 'dull' the sense of taste. The sense of smell is very important to tasting food.

But….
When food seems to lose its flavour, astronauts usually ask for condiments, such as hot sauces, to give food some intensity of taste. A variety of condiments are available for the crewmembers to add to their food such as honey, and sauces like soy sauce, BBQ, and taco.

Lesson Objectives. Students will:

- conduct an experiment to see where on the tongue they can identify 4 of the 5 basic taste sensations;
- conduct a series of taste experiments to appreciate the different senses which influence taste;
- learn how an astronaut experienced the changes in taste intensity before and during a mission;
- learn how reduced gravity affects the human body.

To use with student engagement section:
Some examples of opening questions for students may be: How do you feel when you try to taste something when you are ill and have a heavy cold? If something smells not so pleasant, are you likely to want to taste it? Think of a type of food in which this may have had an effect on you? Why do you think the smell of baking has a positive effect on your hunger?

Problem: Can I compare taste sensations on Earth and in space?

FOOD SAFETY!! Remind students of the importance of classroom and lab safety. Send home a letter with students to notify parents that food tasting will take place and any student with allergies will be given another task. Parents must grant authorization for their child to participate. Make sure to follow the district or school's food allergy management policy and use clean glassware or disposable containers. This activity is in 2 parts and requires proper clean-up. For guidelines and information about schools and food allergies please read http://www.cdc.gov/healthyyouth/foodallergies/index.htm.

Part 1 - Explore

Mapping your tongue and exploring taste buds!

Background: Receptors – how we taste

When you look at your tongue, you should be able to see small bumps – these are the taste buds (called papillae) which contain the taste receptors. There are four basic types of taste receptors for the following flavours: (1) sweet, as produced by table sugar; (2) sour, as produced by vinegar; (3) salty, as produced by table salt; and (4) bitter, as produced by caffeine or quinine. A fifth taste called umami (savory in Japanese) is identified in flavours such as soy sauce and miso soup.

The location on the tongue's surface of each of these taste receptors varies between people. While it was once hypothesized that the locations of the receptors were found in certain zones, the current understanding is that these locations somewhat overlap.

Pre-lesson Preparation: The day of the lesson

- 4 clean containers, at least 1 L in size, labelled 1 to 4
- In container 1, mix 1 litre of water with 5 teaspoons salt to make a salty solution
- In container 2, mix 1 litre of water with 15 teaspoons of sugar to make a sweet solution
- In container 3 add commercial lemon juice
- In container 4 add commercial grapefruit juice
- A supply of drinkable water available in cups
- A small hand mirror and magnifying glass

Procedure:

1. Before starting the experiment ask each student to examine their tongue with the mirror and magnifying glass. Ensure the edges of the mirror and glass are not sharp. They should note what they see and feel.
2. Each group collects 4 cups, 4 droppers, and a black marker.
3. Label cups 1-4. Pour solutions from each container to the labelled cups.
4. One student in each group does the tasting and one can give the test solution. They can take turns being tasters keeping care not to cross contaminate the droppers.
5. Each taster sticks their tongue out, receives about 4 to 5 drops of the liquid on the tongue, and after a few seconds states what they can taste and where on the tongue the taste seems to be most strongly identified. This is marked on the map of the tongue on their student sheet.
6. Students should rinse out their mouth between each tasting.
7. At the end of the experiment discuss what tastes they were able to identify and where they seem to 'taste' them on the tongue.

Materials needed

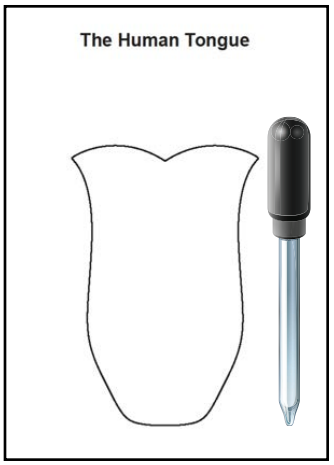
- 4 clean containers, at least 1 L in size, labelled 1 to 4
- Salt
- Sugar
- Lemon Juice
- Grapefruit Juice
- Drinkable water
- Plastic Cups

Per Group of 2

- 4 small disposable cups + water to rinse mouth
- 4 droppers
- 1 marker
- Student worksheets
- Small hand mirror and magnifying glass

Explain:

1. Fill out the tongue map for your results. [Answer: maps may vary between students.]
2. Which tastes could you identify? [Results will vary.]
3. Was there a difference in the intensity of the tastes? Use a scale of 0-10 to estimate the intensity of taste. (0 is no taste, 10 is maximum taste intensity) [Results will vary.]
4. Compare your results with other teams. [Results will vary.]



Student Data tables and tongue maps are located in the Student Section.
A sample is below:

Which tastes were you able to identify?

Liquid 1_____ Liquid 2_____

Liquid 3_____ Liquid 4_____

Record of the class results:

Taste	Bitter	Sour	Sweet	Salty
Describe where on tongue each flavour is tasted				

SUGGESTED PLACE TO STOP ACTIVITY. RESUME DURING NEXT CLASS.

Part 2 – Explore

How do I taste food? Is this the same as in reduced gravity?

Pre-lesson Preparation:

- Gather the following foods:
  - Applesauce
  - Mushroom soup
  - Blueberry/raspberry yogurt
  - Black coffee (can be decaffeinated) or grapefruit juice
  - Chocolate drink
  - Orange juice
- Place a sample of each food in a container and cover with lid. For safety, store foods such as yogurt and mushroom soup at refrigerated temperatures. When testing, use the food close to room temperature so temperature will not influence results.
- Label each container 1 to 6.
- Make sure students are not aware of the content or smell the food.

Allow 30 minutes for this task

Materials needed

Per class:

- Computer with Internet access
- LCD projector

Per Group of 2:

- 6 closed containers with food items
- 3 droppers or syringes plus 3 plastic spoons
- Water (to rinse out mouth)
- Blindfold
- Pair of disposable gloves (optional)
- Student sheet and data sheet for the activity

Procedure:

Divide the class into Crew A - tasters and Crew B - those who will help with the preparation of the food.

1. Ask students to form groups of 2 and to sit appropriate distances apart so tasting can begin.
2. One student wears the blindfold (Crew A) and one gives the food (Crew B) and can write down the observations.
3. Crew A, now blindfolded, pinches his/her nose and sticks out their tongue. A small amount of the food is placed on the top of the tongue and moved along the surface of the mouth. Immediately afterward, Crew A should release his or her nose. Crew A compares the intensity of the taste when the nose is pinched with when the nose is released. [Note: remind students to not swallow until after nose is released]
4. The observations are noted on the data sheet. The mouth is rinsed with water, swallowed and the next food item is offered.
5. For liquids, use a dropper to gently squirt 4 to 5 drops over the surface of the tongue or offer with a cup to take a sip.
6. The results can be compared between when the nose is open and nose is closed to draw conclusions about the relationship between the sense of smell and taste. Student comparisons can be made after filling in data for the entire class.

Explain:

Sample data table is below. The full table is located in the student section.

Data sheet for Taste in Space

Name of Student:

Food Sample	**With nose closed** Taste description	**With nose closed** Intensity (0-10)	**With nose open** Taste description	**With nose open** Intensity (0-10)	**Identified food? (Yes/No)**
Container 1					

Show the students the video clip of Taste in Space (http://trainlikeanastronaut.org/media) and have them read the student reading section on page 11. Generate discussion about why the astronauts float in space and what happens to their body fluids, which can lead to changes in how they taste. Point out that everything on the ISS has to be attached (with hook and loop fasteners such as Velcro) – otherwise it would float away like the astronaut's water bottle.

1. What is known as "fluid shift?" [While on Earth, gravity causes most of the body's fluids to be distributed below the heart. In contrast, living in space with less gravity allows fluids in the body to spread equally throughout the body.]
2. Humans have been on the moon before, and space agencies are discussing sending humans to Mars. How might fluid shift be different between floating in the ISS and standing on the moon, Earth and Mars? [Mars has more gravity than the moon and thus fluid shift throughout the body will be less. For the strength of gravity at these locations, Earth has the most gravity, followed by Mars and then the moon. Mars has about 37% the gravity of Earth and the moon has about 16% the gravity of Earth. Astronauts on the ISS have no gravity effect so the fluid shift on ISS will be the most.]
3. You are asked to recruit students to participate in a taste test for a major food company in your country. Would you allow people to participate who had colds? Why or why not? [Answers will vary]

Evaluate:

1. How do the floating astronauts keep themselves and their food secure in the special weightless environment of space? [They use hook and loop fasteners, sliding their feet under bars attached to the station, etc.]
2. Explain the purpose of using a blindfold and pinching the nose before tasting. [Vision and smell affect taste.]
3. Suggest a reason for rinsing the mouth between each tasting. [Rinsing the mouth will help the previously tested flavour to not affect the other taste tests.]
4. Were you able to identify the flavours with the nose pinched or without? Why do you think this happens? [Answers will vary. Smell does influence the intensity of taste.]
5. In the video, was the astronaut able to identify any of the tastes? – remember this is normal astronaut food and drink so she would have eaten and drunk this every day while in space. What are some reasons why her taste was affected? [When first in space, fluid shift in the body creates a condition similar to having a closed, or stuffy, nose. This improves over time living in space. When the nose was pinched, astronauts could not taste the foods and this is similar to on Earth.]

Elaborate:

Look at the results of another astronaut who did the same testing of the foods while in space. The astronaut data is in the table below. Analysing the tongue map and the results from your class and astronauts, answer the following:

1. Are there any situations on Earth where your body may change that would influence how you taste? Would that simulate the changes the astronauts noticed? [Having a head cold, suffering from allergies, etc.]
2. Why are there differences in the intensity of the flavours when tasted by the astronaut on the ground and in space? [Fluid shift from being in space affects astronauts' sense of smell, which influences the intensity of the flavours.]
3. Your group is now made up of space scientists. What would you do differently to improve this scientific experiment? [Answers will vary.]
4. Do you use any condiments for your own food at home? Which ones, and why? Explain why most astronauts add condiments to their space food. [Answers will vary. Astronauts typically use condiments to add extra flavour to their food.]

Astronaut Taste Data

	Astronaut 1			Astronaut 1			Astronaut 2		
	Ground Tasting			Space Tasting			Ground Tasting		
	Identified? Yes/No	Flavour (salty, sweet, etc.)	Intensity (0=none, 10=max)	Identified? Yes/No	Flavour (salty, sweet, etc.)	Intensity (0=none, 10=max)	Identified? Yes/No	Flavour (salty, sweet, etc.)	Intensity (0=none, 10=max)
Applesauce	Y	Sweet	6	Y	Sweet and Fruity	4	Y	Apple sauce taste	5
Cream of Mushroom Soup	(Chicken soup)	Salty	6	N	Very salty	7	Y	Saltier	7
Blueberry/Raspberry Yoghurt	N	Hard to tell, slightly sweet	4	N	Smooth and bland	2	Y	Fruit yogurt	7
Chocolate Breakfast Drink	Y	Think chocolate due to sweetness	6	Y	Full-bodied and sweet	6	Y	High on sweetness	6
Black Coffee	(Green tea)	A sharp taste	10	N	Sharp and bitter, very unpleasant	8	Y	Little bitter	7
Orange Juice	(Citrus juice)	Tart	7	N	Guessed it as 'grapefruit juice'	4	Y	Fruity, not very sweet, bitter/sour taste	5

Extend: Social aspect of eating:

On the ISS there are astronauts from many different countries. Different countries have different cultures and that means the foods are varied, which adds to the variety of flavours. As the crew members are busy with many activities aboard the ISS it is important that they get together at least for meals. Think of your own lunch time and dinner times – what is important about these times for you? Is getting together and sharing, talking about what is happening in class/school etc. important to you? This time is also used to connect with friends. It makes us feel good to be part of a team/group. When we feel better, we can perform better.

Watch the video of astronaut Frank de Winne talk about the importance of dinnertime on the ISS and come up with your own reasons why this is important for you too.

Expedition 20 crewmembers share a meal in the Unity node of the International Space Station. Pictured from the left are Japan Aerospace Exploration Agency (JAXA) astronaut Koichi Wakata, flight engineer; cosmonaut Gennady Padalka, commander; cosmonaut Roman Romanenko and ESA astronaut Frank De Winne, both flight engineers.

Astronaut Frank de Winne talks about food on the ISS *[Scroll down the lesson to the video 'Eating and drinking on the ISS' in the link]:* http://www.esa.int/Our_Activities/Human_Spaceflight/Lessons_online/Life_in_Space

Useful Websites for Further Information

Eating in Space
http://www.esa.int/esaKIDSen/SEMBQO6TLPG_LifeinSpace_0.html
http://www.nasa.gov/centers/johnson/slsd/about/divisions/hefd/facilities/space-food.html

Supply ship to ISS: To learn about how food gets to the ISS
http://www.esa.int/Our_Activities/Human_Spaceflight/ATV
http://www.nasa.gov/mission_pages/station/structure/assembly_elements.html
http://www.spacex.com/dragon
http://www.jaxa.jp/projects/rockets/htv/index_e.html

Café ISS
http://spaceflight.nasa.gov/station/crew/exp7/luletters/lu_letter3.html
http://science.howstuffworks.com/nasa-space-food-research-lab.htm

This video on the NASA website can be located under Our World videos called Fluid Shift
http://www.nasa.gov/audience/foreducators/nasaeclips/search.html?terms=&category=1000

Mission X: Train Like an Astronaut

TASTE IN SPACE

Student Section

Did you know?
Taste intensity may vary for each person. For example, some of your friends may taste the bitterness of medication more intensely than others.
http://www.ncbi.nlm.nih.gov/pubmed/18712160

Problem: Can I compare taste sensations on Earth and in space?

Engage:

When you put some food into your mouth, think of all the senses that come into play before you taste the food.

- Discuss this with your group and make a list.
- What tastes can you identify from food?

Part 1 - Explore

Mapping your tongue and exploring taste buds!

With your group:
STAY HEALTHY!! Before handling any food products, please thoroughly wash your hands.
FOOD SAFETY!! Each member of the group can taste the liquids (unless you are allergic to some foods, in which case your teacher will assign you a different job).

LOOK AT ALL THE DIFFERENT TONGUES ON THESE ASTRONAUTS!

- WHAT DOES YOUR TONGUE LOOK LIKE?
- DOES IT LOOK LIKE ONE OF THE ASTRONAUTS' TONGUES?

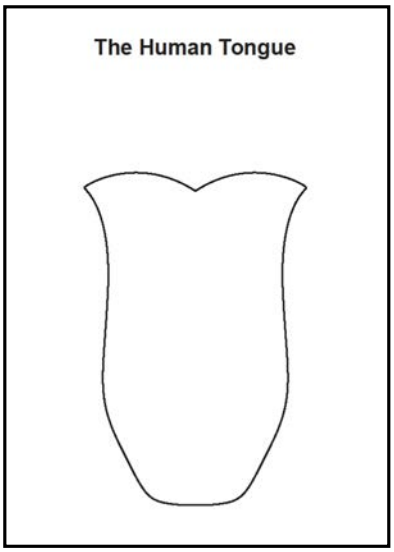
In this 2013 picture, the Expedition 37 crew are imitating the photo taken on Einstein's 72nd birthday in 1951, by United Press International photographer Arthur Sasse.

Procedure:

1. Before you begin tasting, examine your tongue using the magnifying glass and mirror. Make a note of what you see and feel.
2. Collect 4 cups, 4 droppers, and a black marker.
3. Label cups 1-4. Pour solutions from each container to the labelled cups.
4. One student in each group does the tasting and one can give the test solution. Take turns being tasters keeping care not to cross contaminate the droppers.
5. Each taster sticks their tongue out and receives about 4 to 5 drops of the liquid on the tongue. After a few seconds, describe what you can taste and where on the tongue the taste seems to be most strongly identified. This is marked on the map of the tongue on your student sheet.
6. Rinse out your mouth with water between each tasting.
7. At the end of the experiment, discuss what tastes you were able to identify and where they seem to 'taste' on the tongue.

Explain:

Mapping of tongue: Label on the tongue where you tasted each flavour.



1. Which tastes were you able to identify?

Liquid 1_____ Liquid 2_____

Liquid 3_____ Liquid 4_____

2. Record of the class results:

Taste	Bitter	Sour	Sweet	Salty
Describe where on tongue each flavour is tasted				

Part 2 – Explore

How do I taste food? Is this the same as in reduced gravity?

In this lesson, you will try to identify foods (similar to the ones tried by astronauts) by first pinching your nose and then releasing your nose. The tasting will be done blindfolded. Remember in Part 1 you were able to identify 4 of the basic tastes: salty, sour, sweet and bitter.

Materials needed Per Group:

- 6 covered containers labelled 1 to 6
- 3 droppers or syringes and 3 plastic spoons
- Water (to rinse out mouth)
- Blindfold
- Pair of disposable gloves (optional)
- Student sheet and data table for the activity

Procedure: If possible, work in groups of two people

1. One student wears the blindfold (Crew A), one gives the food (Crew B) and can write down the observations.
2. Crew A: When you are ready, put on your blindfold. Pinch your nose and stick out your tongue.
3. Crew B: Place a small amount of food on the top of Crew A's tongue, and gently move it along the surface of the mouth.
4. Crew A: Once the food is in your mouth, release your nose and describe what you taste and how intense is the taste with your nose open and closed. *Use a scale of 0-10 to estimate the intensity of taste. (0 is no taste, 10 is maximum taste intensity)*
5. Note the observations on the data sheet. The mouth is rinsed with water, swallowed and the next food item is offered.
6. For liquids, use a dropper to squirt gently 4 to 5 drops over the surface of the tongue or offer with a cup to take a sip.
7. When Crew A has tasted all the items, look at the results with the nose open and closed. Collect the class results and draw a bar graph or other graph to show the results.
8. Comment on any differences you notice in taste when the nose was pinched and suggest reasons for the differences.

Data sheet for Taste in Space

Name of Student:

Food Sample	**With nose closed** Taste description	**With nose closed** Intensity (0-10)	**With nose open** Taste description	**With nose open** Intensity (0-10)	**Identified food? (Y/N)**
Container 1					
Container 2					
Container 3					
Container 4					
Container 5					
Container 6					

Class Results:

Food Sample	**With nose closed** Taste description	**With nose closed** Intensity (0-10)	**With nose open** Taste description	**With nose open** Intensity (0-10)	**Identified food? (Y/N)**
Container 1					
Container 2					
Container 3					
Container 4					
Container 5					
Container 6					

Student reading section:

For astronauts, all their food and drink needs to be carried to the International Space Station (ISS). Eating is an important part of crew morale and the one communal time when they share both a meal and talk with each other.

The reduced gravity conditions on the ISS and the confined space means that there are physiological and environmental effects when it comes to being able to enjoy the taste of food.

From the early 1960s astronauts found that their taste buds did not seem to be as effective when they were in space. Why does this happen in space? This is because fluids in the body get affected by the reduced gravity conditions (also called fluid shift). On Earth, gravity acts on the fluids in our bodies and pulls it into our legs. In space, this fluid is distributed equally in the body.

This change can be seen in the first few days of arriving in space as astronauts have a puffy face as fluid blocks the nasal passages and reduces their ability to smell. After a few days the fluid shift evens out as the human body adapts.

The puffy face feels like a heavy cold and this can cause taste to be affected in the short term. But in the long term, it could be that in the confines of such a small space like the space station, the food competes with other odours in the station (e.g. body odours, machinery). This could also 'dull' the sense of taste. The sense of smell is very important to tasting food.

Food seems to lose its flavour, which may be due to the competing odours and fluid shift so astronauts usually ask for condiments such as hot sauces to give the food some intensity of flavour. A variety of condiments are available for the crewmembers to add to their food such as honey, and sauces like soy sauce, BBQ, and taco.

Explain:

1. What is known as "fluid shift?"

2. Humans have been on the moon before, and space agencies are discussing sending humans to Mars. How might fluid shift be different between floating in the International Space Station and standing on the surface of the moon and Mars?

3. You are asked to recruit students to participate in a taste test for a major food company in your country. Would you allow people to participate who had colds? Why or why not?

Evaluate:

1. How do the floating astronauts keep themselves and their food secure in the special weightless environment of space?

2. Explain the purpose of using a blindfold and pinching the nose before tasting?

3. Suggest a reason for rinsing the mouth between each tasting.

4. Were you able to identify the flavours with the nose pinched or without? Why do you think this happens?

5. Was the astronaut able to identify any of the tastes? – remember this is normal astronaut food and drink so she would have eaten and drunk this every day while in space. What are some reasons why her taste was affected?

Elaborate:

Look at the set of results of another astronaut who did the same testing of the foods before they went into space. You will notice that just like your class results, everyone tastes differently depending on the sensitivity of their taste buds. We all have taste receptor distributions which are varied for the majority of the population - your tongue maps will show this.

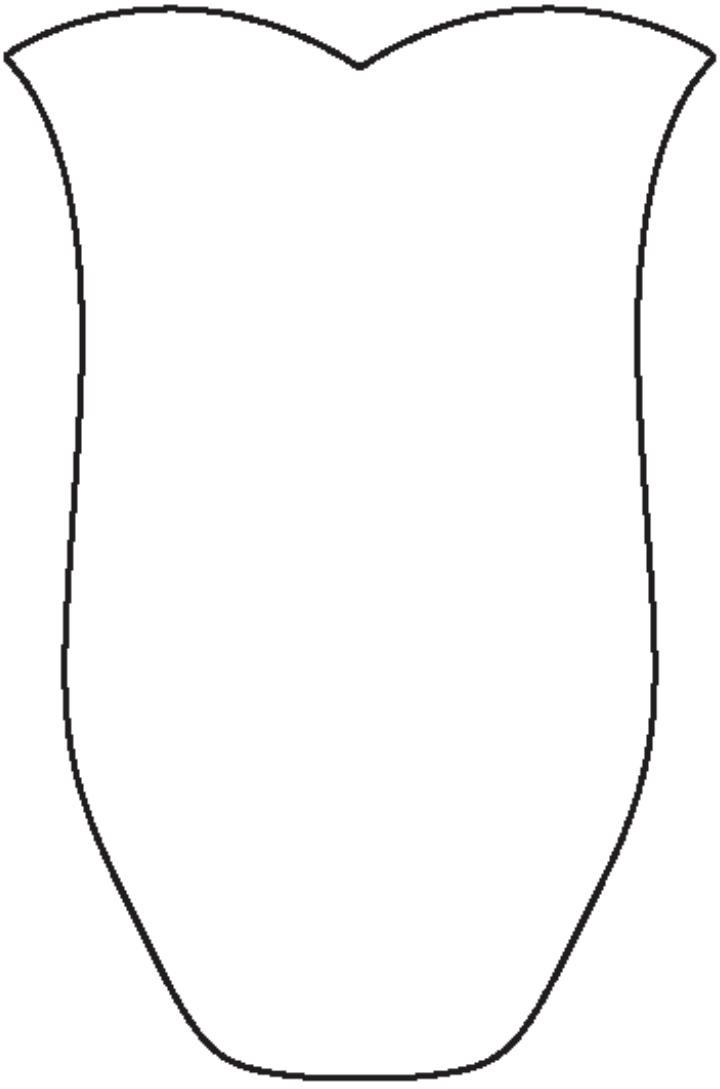
1. Are there any situations on Earth where your body may change that would influence how you taste? Would that simulate the changes the astronauts noticed?

2. Why are there differences in the intensity of the flavours when tasted by the astronaut on the ground and in space?

3. Your group is now space scientists. What would you do differently to improve this scientific experiment?

4. Do you use any condiments for your own food at home? Which ones, and why? Explain why most astronauts add condiments to their space food.

The Human Tongue



Extend: Social aspect of eating:

On the ISS there are astronauts from many different countries. Different countries have different cultures and that means the foods are varied, which adds to the variety of flavours. As the crew members are busy with many activities aboard the ISS it is important that they get together at least for meals. Think of your own lunch time and dinner times – what is important about these times for you? Is getting together and sharing, talking about what is happening in class/school etc. important to you? This time is also used to connect with friends. It makes us feel good to be part of a team/group. When we feel better, we can perform better.

Watch the video of astronaut Frank de Winne talk about importance of dinner time on the ISS and come up with your own reasons why this is important for you too.

Expedition 20 crewmembers share a meal in the Unity node of the International Space Station. Pictured from the left are Japan Aerospace Exploration Agency (JAXA) astronaut Koichi Wakata, flight engineer; cosmonaut Gennady Padalka, commander; cosmonaut Roman Romanenko and ESA astronaut Frank De Winne, both flight engineers.

Astronaut Frank de Winne talks about food on the ISS *[Scroll down the lesson to the video to 'Eating and drinking on the ISS']:* http://www.esa.int/Our_Activities/Human_Spaceflight/Lessons_online/Life_in_Space

Thank you to our Contributors:
- The European Space Agency (ESA)
- NASA Human Research Program Engagement and Communications
- Dr. Scott Smith, NASA Nutritional Biochemistry Laboratory
- Vickie Kloeris, NASA Space Food Systems Laboratory

For more information:

The Nutritional Biochemistry Lab at Johnson Space Center in Houston, Texas is responsible for promoting astronaut health by determining the nutritional requirements for spaceflight. For example, the lab is responsible for determining the number of calories, vitamins and nutrients that are needed to maintain optimum health while in space. This information is then provided to the Space Food Systems Lab Food scientists who will design, develop and test a food system meeting these requirements (among other spaceflight requirements).

Scott M. Smith is the lead for the Nutritional Biochemistry Laboratory at Johnson Space Center. Image Credit: NASA

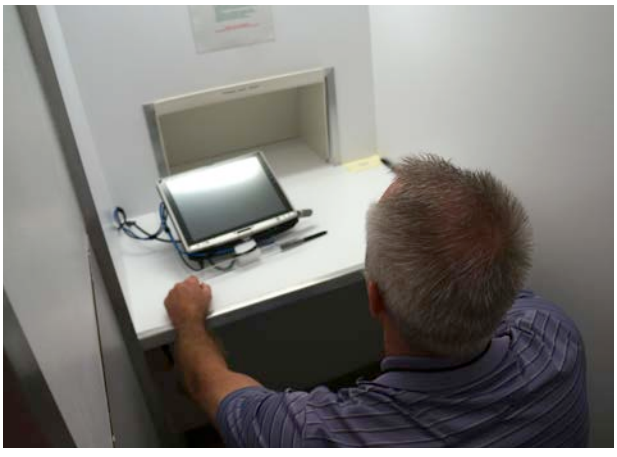
"We do essentially two types of work," Smith explained. "We do what we call operational work, which is more clinical-type assessment where we evaluate the nutritional status of crewmembers before and after flight. Then we also conduct research to better understand how the body reacts to flight and how nutrient needs of the body change in weightlessness."

You can read more about Dr. Smith and Nutritional Biochemistry here:
http://www.nasa.gov/audience/foreducators/stseducation/stories/Scott_Smith_Profile.html

The NASA Space Food Systems Laboratory at Johnson Space Center in Houston, Texas is responsible for creating great tasting food that meets the nutritional and flight requirements for the space program. In her current position as Manager of the Space Food Systems Laboratory, Vickie Kloeris is responsible for the operation and continuing development of the ISS food system.

Vickie Kloeris is the manager of the Space Food System Laboratory at NASA's Johnson Space Center.

The team at the Space Food Systems Laboratory has created more than 12 new freeze-dried items and 50 new thermostablized foods, which are foods that have been processed with heat to destroy microorganisms and enzymes that can cause spoilage. To test the taste of these products, a sensory booth (pictured) is used to isolate the subject from other evaluators and from other external distractions.



NASA sensory booth used to test food tastes. The food is passed through the slot to the tester and results are recorded on the computer.

You can find out more about NASA food science and the Space Food System Laboratory here: http://www.nasa.gov/centers/johnson/slsd/about/divisions/hefd/facilities/space-food.html