



## FUTUREFIT PROJECT

### SUPER SENSES! EXPLORING THE 5 SENSES

#### HOW TO USE THIS TEACHING GUIDE

- **Prepare (2-5 minutes):** Short opening activities to start class.
- **Present (5-20 minutes):** Deliver new subject material and project information, and to model instructions or activity
- **Produce (5-30 Minutes):** Use this portion of the lesson to allow students to work independently or in small groups on activities and other project elements.
- **Participate (5-30 Minutes):** Use this portion of the lesson to allow students to share out any project, research or presentation materials.
- **Practice (5-30 minutes):** Use this optional portion of the lesson, if desired, to give students homework activities.

## DAY 1

### PREPARE

5 Minutes

Explain to students that they will be participating in a 5-day lesson investigating how the brain interprets sensory information. The five senses will be explored, and at the end of the week the students will be assigned the task of creating a comic strip starring themselves as a superhero with a “super sense” of their choice. Day 1 of the project will be the exploration of Touch.

Invite students to participate in a skin sensitivity test. You will need 1 quarter for every pair of students.

- Have students pair up, and roll up their sleeve past the elbow. Other student takes the rough edge of a quarter and touches their partner starting above the elbow down to the fingertips of the inner arm. Trade and repeat.
- The nerves in our fingertips are more numerous than in our forearms. Therefore, students should notice that the quarter feels rougher and rougher as it travels down the arm and reaches the hand and then the fingers.

### PRESENT

5-10 Minutes

If necessary, review the sense of Touch with students using the PowerPoint slides from the "Sense Organs: Skin, Nose, Tongue" mini-lesson. Save the slides about nose and tongue for later lesson activities,

- **[Skin, Nose, Tongue Mini-Lesson -- PowerPoint Slideshow](#)**

### PARTICIPATE

20-25 Minutes

Students will conduct an experiment called “Map Your Homunculus” to determine the sensitivity of different areas of the body.

Using the Skin, Nose, Tongue slides, show the students the picture of the sensory homunculus.

- A homunculus is a little man... but with different parts larger than they should be.
- What do the larger parts show? The larger parts are areas that are more sensitive than others.

Print and cut out the experimental “poker” tools from [The Homunculus Mapper](#) website. The instructions for the activity are found on the site. If desired, you can also print the “How to Map Your Homunculus” and “Map Your Homunculus” worksheets for this lesson back-to-back, which the students can use to record their results.

Allow students to work in pairs to test each other and record results.

- [How to Map Your Homunculus Student Experiment Guide](#)



- [Map Your Homunculus Student Experiment Data Sheet](#)



- [How to Map Your Homunculus Student Experiment Guide](#)



#### PRODUCE

5-10 Minutes

Students should enter the data they collected into the Homunculus Mapper website and build their own homunculus.

- [How to Map Your Homunculus Student Experiment Guide](#)



#### PRACTICE

5-15 Minutes

Have students read the Insect Senses article to get a perspective for how other organisms process sensory information.

- [Insect Senses](#)

## DAY 2

### PREPARE

5 Minutes

Just before class, pop some microwave popcorn, put the popcorn in a bowl out of sight but in a location where the smell will be noticed by the students when they enter the classroom.

Ask students what they are thinking about right now...movies? A memory from long ago? A special person?

Discuss the following question with the class: Have you ever smelled something that has triggered a memory? Share a personal example with the students.

### PRESENT

15-20 Minutes

Discuss the sense of smell using the Sense Organs: Skin, Nose, Tongue Mini Lesson PowerPoint Slides. The information is presented on slides 4 and the beginning of slide 5. Save slide 6 for the next lesson on taste.

Information to highlight regarding smell:

- The senses of smell and taste are closely linked. In both cases, molecules from the object must detach and float into our nose or be put into our mouth. Then the molecules dissolve, bind to and stimulate receptor cells in the nose and/or mouth. The receptors cells transmit the message to the part of the brain that perceives odors and tastes.
- The sensation of taste and smell work together, especially during eating. Much of what we believe is taste is actually aroma from our food.
- Taste and smell are also connected to areas of the brain that control emotions and form certain types of memories. That is why a smell can trigger a memory that you may have forgotten about.

As a prelude to the next section of the lesson, cover the background information in "Super Sniffer Activity Guide" worksheet.

- [Super Sniffer Activity Guide](#)



- [Skin, Nose, Tongue Mini-Lesson -- PowerPoint Slideshow](#)

## PARTICIPATE

15-20 Minutes

Lead students through the Super Sniffer group activity using the Super Sniffer Activity Guide.

- [Super Sniffer Activity Guide](#)



## PRODUCE

5 minutes

Individually or as a group, have students answer the Discussion Questions in the Super Sniffer Activity Guide.

- [Super Sniffer Activity Guide](#)



## PRACTICE

5-15 Minutes

As a take-home or independent study activity, have students complete the Insect Activities: Staying in Touch worksheet (encourage them to use the Insect Senses article from the previous class for reference).

- [Insect Activities: Staying in Touch](#)

## DAY 3

### PREPARE

5 Minutes

Tell students you are going to say a food item, and you want them to shout out the first thing that comes to mind:

- Cake
- Pumpkin Pie
- Popcorn
- Hot Cocoa
- Cotton candy

(Add or substitute additional foods based on location, diversity, and background of your students.) These foods are typically associated with pleasant memories. Ask students: Are there any foods that remind you of unpleasant memories? Allow students to share.

Let students know that today they will be learning about the sense of smell and its association with memory.

### PRESENT

5 Minutes

Discuss the sense of taste using slide 6 of the Sense Organs: Skin, Nose, Tongue PowerPoint Slides.

- [\*\*Skin, Nose, Tongue Mini-Lesson -- PowerPoint Slideshow\*\*](#)

### PRODUCE

5-10 Minutes

Give students a copy of the “Tongue Taste Map” worksheet and the following food samples (check for food allergies and dietary restrictions first!):

- Bitter: Unsweetened chocolate (baker’s chocolate)
- Sour: Sour candy
- Sweet: Sweet candy
- Salty: Salty food such as pretzel or potato chip

As students sample each food, they should think about which part of the tongue is experiencing the flavor and label the type of flavor on their Tongue Taste Map.

Give students a copy of the “Test Your Taste Buds” worksheet to compare their observations.

- [\*\*Tongue Taste Map \(image\)\*\*](#)
- [\*\*Test Your Taste Buds\*\*](#)

## PARTICIPATE

25-30 Minutes

Lead the class through the Super Tasty Activity using the Super Tasty Activity Guide and the Super Tasty Activity Student Data Sheet.

- [Super Tasty Activity Guide](#)



- [Super Tasty Activity Student Data Sheet](#)



## PRACTICE

5-15 Minutes

As a take-home or independent study exercise, ask students to complete the Sense Organs: Skin, Nose, Tongue Word Power worksheet.

- [Sense Organs: Skin, Nose, Tongue Word Power](#)

## DAY 4

### PREPARE

5 Minutes

Ask students: Why do most animals have 2 eyes? (Answer: To see distances accurately.)

- Explain that each eye sees a slightly different view. The brain, not the eye, combines the two views so that we see depth.
- Seeing with both eyes is called “binocular vision” – it allows organisms to see very accurate depth and distance.

Ask students: Why do animals have 2 ears? (Answer: Sound localization.)

## PRESENT

5-10 Minutes

Using the slides in the Sense Organs: Eyes and Ears PowerPoint, give students an overview of sight and hearing (if necessary).

- [\*\*Sense Organs: Eyes and Ears Mini-Lesson -- PowerPoint Slideshow\*\*](#)

## PARTICIPATE

20-25 Minutes

Engage students in 2 activities illustrating the importance of having 2 eyes and 2 ears:

To illustrate importance of binocular vision:

- Have students outstretch one arm full-length in front of them and hold up their “pointer” finger.
- Tell students to line up this finger with something in the background and then close one eye while continuing to stare at their finger and the background chosen.
- What happens? (The background will shift.)
- Have students close the other eye... what happens? (The background shifts again.)

Sound localization activity:

- Ask students to form a circle, choose one student to stand in the middle, blindfolded.
- Give one of the students in the circle a bell or other noise maker.
- Gently spin the blindfolded student several times.
- Signal the student with the bell to ring the bell several times and then pause, and ring the bell several times and pause while the blindfolded student in the center tries to determine where the noise is coming from.
- When the blindfolded student is confident they know where the bell is, ask him or her to point in the right direction, and allow him or her to take off the blindfold.
- Repeat until all students have had the opportunity to be in the center of the circle.



## PRACTICE

5-15 Minutes

As a take-home or independent study activity, have students complete the Sense Organs: Eyes and Ears Word Power worksheet.

- [\*\*Sense Organs: Eyes and Ears Word Power\*\*](#)

## DAY 5

### PREPARE

5-10 Minutes

As a review, show students the video "Healthy Bodies 9: Nervous System and Senses."

- [Healthy Bodies 9: Nervous System and Senses](#)

### PRESENT

5-10 Minutes

Explain the concluding project to the students: They will be making a comic strip starring themselves as a superhero that has a "super" sense. They should choose their super sense, a name for their character, and a short story to tell. Students will need to use their own computers and have access to the internet.

In preparation for the project, spend some time playing around with the website [MakeBeliefsComix.com](http://MakeBeliefsComix.com). If necessary, give students a brief demo on the use of the website.

- [MakeBeliefsComix.com \(website\)](http://MakeBeliefsComix.com)

### PRODUCE

25-30 Minutes

Students should use the [MakeBeliefsComix](http://MakeBeliefsComix.com) website to create their superhero comic strips. When finished, have them print their comic and share it with you and with the class!

- [MakeBeliefsComix.com \(website\)](http://MakeBeliefsComix.com)



### PRACTICE

5-15 Minutes

As a take-home or independent study activity, have students complete the What Are Sense Organs? worksheet.

- [What Are Sense Organs?](#)