

## Activity: Touch of Genius!

### Materials needed:

- Blindfold (one per group)
- Earplugs (one set per student)
- Respiratory mask (one per student)

### Introduction:

The sense of touch is very important for how living things interact with the outside world. Touch or somatosensation (also called tactition), is a perception resulting from activation of neural receptors, generally in the skin including hair follicles, tongue, throat, and internal skin linings. A variety of pressure receptors respond to variations in pressure (firm, brushing, sustained, etc.). The touch sense of itching caused by insect bites or allergies involves special itch-specific receptors in the skin and spinal cord.

The loss or impairment of the ability to feel anything touched is called ***tactile anesthesia***. Paresthesia is a sensation of tingling, pricking, or numbness of the skin that may result from nerve damage and may be permanent or temporary.

In this experiment students will demonstrate how the tactile sense works and how it helps us familiarize ourselves with our surroundings and objects.

### Procedure:

1. Students stand in the center of an empty or cleared room, wearing the blindfold, ear plugs and a mask. This eliminates the senses of sight, hearing, and smell.
2. The students will be led into a blocked off room and randomly placed in front of a table with objects spread out.
3. No other movement or sounds should be made by others to give an indication of which objects are found in the room. The room must remain quiet.
4. The student should use their hands to feel the object and eventually determine what it is exactly.
5. The student will be timed and is expected within 30 second to identify as many objects as possible by touch.
6. After the session, they will be led out of the secluded room still blindfolded, plugged and masked.
7. Each student will write down the identity of the objects touched.
8. The students will take turns doing this activity to avoid crowding the room.

After completing this activity, be sure to answer the questions under “Touch Of Genius” on the **Senses Activities Recording Sheet**.

## Activity: I See the Light

### Materials needed:

- Blindfold
- Dark room
- Light sources (such as 4 or 5 flashlights)

### Introduction:

Sight or vision is the capability of the eye(s) to focus and detect images of visible light on photoreceptors in the retina of each eye that generates electrical nerve impulses for varying colors, hues, and brightness. There are two types of photoreceptors: rods and cones. Rods are very sensitive to light but do not distinguish colors. Cones distinguish colors but are less sensitive to dim light.

The inability to see is called **blindness**. Blindness may result from damage to the eyeball, especially to the retina, damage to the optic nerve that connects each eye to the brain, and/or from stroke. Temporary or permanent blindness can be caused by poisons or medications.

People who are blind from degradation or damage to the visual cortex, but still have functional eyes, are actually capable of some level of vision and reaction to visual stimuli but not a conscious perception; this is known as blindsight.

In this activity we will be exploring our ability to detect light waves. Can you detect light even when you are blindfolded or close your eyes? What sensory processes are involved in your ability to see light waves?

### Procedure:

1. Students stand in the center of an empty or cleared room, wearing the blindfold. This eliminates the senses of sight. The idea is to see how many can detect light waves and what direction it is coming from while blindfolded.
2. The students will be led into the middle of a dark room
3. A number of other students will be randomly placed in this room with light sources prior to the student entering the room. No other movement or sounds should be made by others to give an indication of where the students are found in the room. The room must remain quiet.
4. The students with the light sources will systematically flash their lights for about 10 seconds towards the blindfolded students.
5. The student will be expected to identify the direction of the flash and if there is light by turning towards the source. The aim is to identify as many sources as possible.
6. After the session, they will be led out of the dark room still blindfolded.
7. They will then record the number of sources and what direction the light came from.

After completing this activity, be sure to answer the questions under “I See the Light” on the **Senses Activities Recording Sheet**.

## Tasty treats

### Materials needed:

- Treats
- Bowls
- Blindfolds

### Introduction:

The sense of taste is very important for how living things survive. It relies mainly on chemical interaction and is strongly correlated with our perception of like or dislike. Taste or gustation is one of the traditional five senses. It refers to the capability to detect the taste of substances such as food, certain minerals, and poisons, etc.

The sense of taste is often confused with the "sense" of flavor, which is a combination of taste and smell perception.

Flavor depends on odor, texture, and temperature as well as on taste. Humans receive tastes through sensory organs called taste buds, or gustatory calyculi, concentrated on the upper surface of the tongue.

There are five basic tastes: ***sweet, bitter, sour, salty and umami***. There are other tastes but these have yet to receive widespread acceptance. The inability to taste is called ***ageusia***.

In this experiment students will demonstrate how the taste sense works and how it helps us familiarize ourselves with objects we consume.

### Procedure:

1. Students stand in the center of an empty or cleared room, wearing the blindfold. This eliminates the senses of sight.
2. The students will be led into a blocked off room and randomly placed in front of a table with several treats spread out.
3. The student should determine the taste of each treat provided to them. Tastes can only be described as sweet, sour, bitter, salty, or umami.
4. If need be, the student will be provided with water to rinse their mouths after every treat eaten.
5. After the session, they will be led out of the secluded room still blindfolded.
6. Each student will write down the possible identity and taste of the treat eaten.
7. Also, students will be asked to make an educated guess of the treat tasted and its color.
8. The students will take turns doing this activity to avoid crowding the room.

After completing this activity, be sure to answer the questions under "Tasty Treats" on the **Senses Activities Recording Sheet**.

## Bells and Whistles

### Materials needed:

- Blindfold (one per group)
- Bells and whistles

### Introduction:

Hearing, or auditory perception, is the ability to perceive sounds by detecting vibrations and changes in the pressure of a medium through time. The ear is the main sensory organ for audition. Sound may be heard through all 3 forms of matter. It is one of the traditional five senses; In humans and other vertebrates, hearing is performed primarily by the auditory system and involves the detection of mechanical waves which are transduced into nerve impulses that are perceived by the brain's temporal lobe. Hearing and touch essential have similar mechanisms.

The swimming pool game, Marco Polo, demonstrates our ability to localize sound. With eyes closed we hear "Marco" then swim towards its direction. This ability is only possible with two ears. Although we can hear with just one ear we can't distinguish the location of its source. A single ear can process the amplitude (loudness) and frequency (pitch) of a sound wave. But, together, both ears detect sound location through minute differences in timing.

Partial or total inability to hear is called hearing loss. There are several different types of hearing loss based on severity: Conductive hearing loss, sensorineural hearing loss and mixed types.

In this experiment students will demonstrate how ears help us move through an obstacle using sounds.

### Procedure:

1. Students will be put into groups of 3 for this activity. One student will be the blindfolded subject and the other 2 will have to lead the student through a maze course using hand claps, bells and whistles.
2. Each group should strategize on how to achieve this the fastest possible way. It may help to develop a signaling system of when to use the bell, the whistle, or the clap sounds.
3. With the blindfold placed over the eyes prior to entering the course station, the student must navigate through this course with the help of their team mates.
4. Leader placements will vary by team, but the leader should not stand directly in front of the subject.
5. The blindfolded student should follow the direction they think the sound is coming from. Continue this sequence until the student successfully moves through the course.
6. Record the time it takes for each team to complete the course.

After completing this activity, be sure to answer the questions under "Bells and Whistles" on the **Senses Activities Recording Sheet**.

## Activity

### Fee-fi-fo-fum, I smell...

#### Materials needed:

- Blindfold (one per group)
- Various natural and man-made fragrances and scents (or objects with distinct fragrances)

#### Introduction:

The sense of smell is also known as olfaction. It has many purposes and plays a major role in our ability to perceive and detect hazards, pheromones, and food. It is one of the senses involved in our perception of flavor. It occurs when odorants bind to specific sites on olfactory receptors located in the nasal cavity. The signals from these receptors are transmitted to the olfactory bulb, where the sensory input interacts with portions of the brain responsible for smell identification, memory, and emotion. Thus, emotions are closely tied to our abilities to smell. Some organisms rely on this sense more than others. Pets such as dogs and cats use their sense of smell to create emotional attachments to their owners. In the wild, social structures and belonging to a group is dependent on this sense for many animals.

The inability to smell is known as **Anosmia**. There are several other olfactory such as: hyperosmia (abnormally acute sense of smell), hyposmia (decreased ability to smell), presbyosmia (decline in the sense of smell with aging), dysosmia (distortion in the sense of smell), parosmia (distortion in the perception of an odor), phantosmia (hallucinated smell), and heterosmia (inability to distinguish odors)

Terminology used to describe smells vary but usually are associated with emotional interpretation of the stimuli. Words such as: soft, strong, weak, hard, gross, putrid, bitter, noxious, sweet, euphoric, etc., are typically used. In this experiment we will test your ability to identify different fragrances and scents from natural and man-made sources.

#### Procedure:

1. This activity needs to be conducted in a well aerated space or room. If possible the use of fans to quickly disperse the scent is encouraged.
2. Students stand in the center of an aerated room, wearing the blindfold. This eliminates the senses of sight.
3. The students will be led into a blocked off room and randomly placed in front of a table with labelled or numbered fragrances and scents laid out in a pattern.
4. The student should determine and describe the smell of each provided to them using some emotional connection to the smell.
5. If need be, the student will be provided with a fan to clear their nostrils after every whiff.
6. It is important that the fragrance and scents not be sprayed directly or towards the individual.  
Please use fragrance tester etiquette for this experiment
7. After the session, they will be led out of the room still blindfolded.
8. Each student will write down the possible identity and smell.
9. The students will take turns doing this activity to avoid crowding the room.