Module 3: Sensation and Perception
Topic 4 Content: Smell, Taste, and Touch Notes

Introduction

The senses of smell, taste, and touch all play a vital role in how you experience the world. In this interactivity, click on each of the images to explore the senses of smell, taste, and touch.

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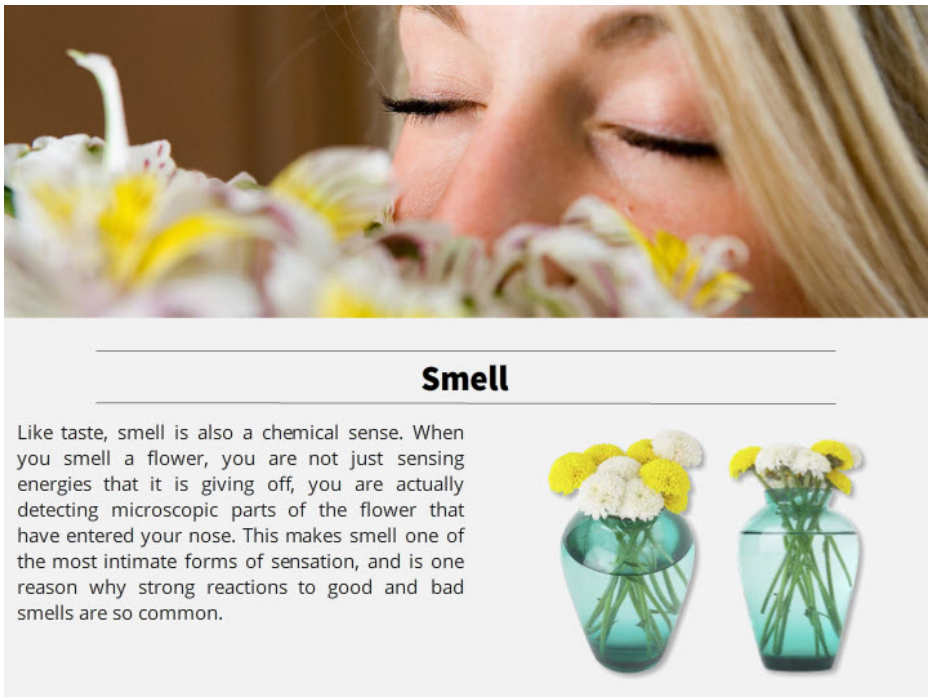
Smell



Like taste, smell is also a chemical sense. When you smell a flower, you are not just sensing energies that it is giving off, you are actually detecting microscopic parts of the flower that have entered your nose. This makes smell one of the most intimate forms of sensation, and is one reason why strong reactions to good and bad smells are so common.

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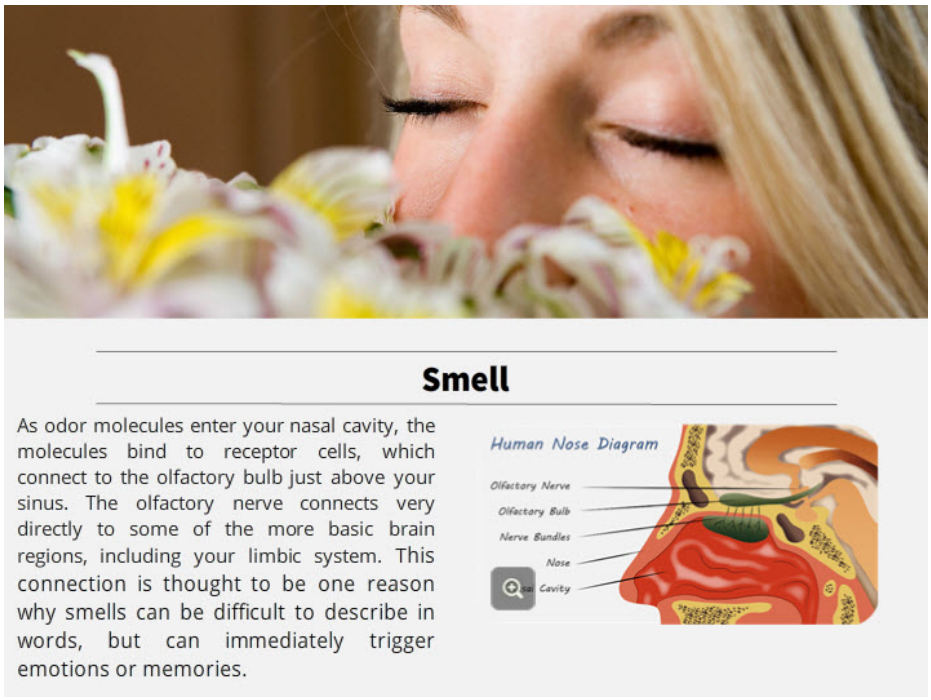
Smell



As odor molecules enter your nasal cavity, the molecules bind to receptor cells, which connect to the olfactory bulb just above your sinus. The olfactory nerve connects very directly to some of the more basic brain regions, including your limbic system. This connection is thought to be one reason why smells can be difficult to describe in words, but can immediately trigger emotions or memories.

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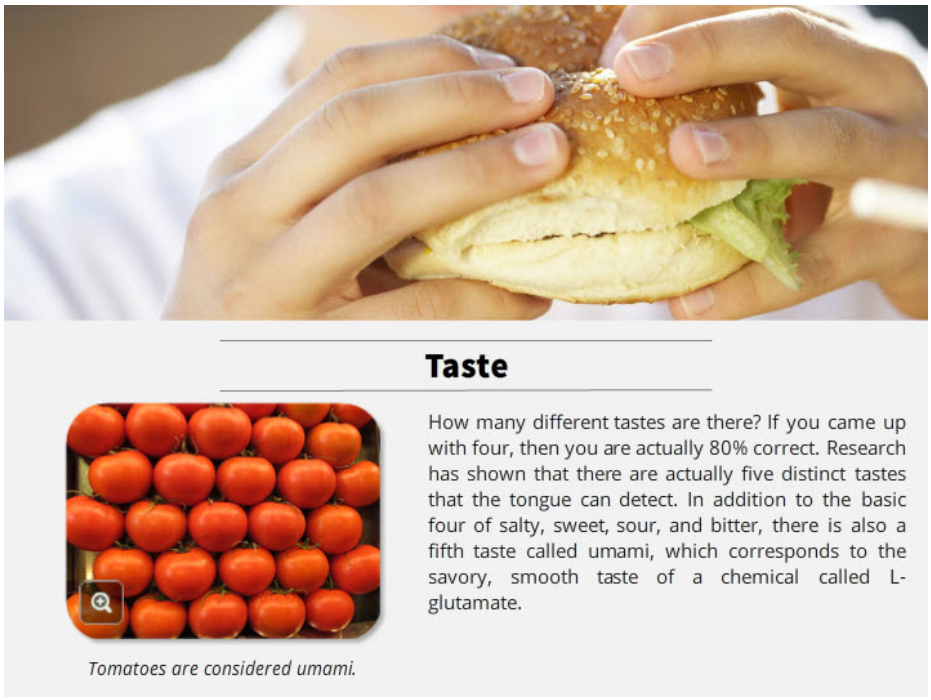
Taste



How many different tastes are there? If you came up with four, then you are actually 80% correct. Research has shown that there are actually five distinct tastes that the tongue can detect. In addition to the basic four of salty, sweet, sour, and bitter, there is also a fifth taste called umami, which corresponds to the savory, smooth taste of a chemical called L-glutamate.

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Taste

Taste has a clear biological function in that it attracts you to eat things that are nutritious or high in calories, which ultimately helps you survive. For this reason, humans are naturally attracted to sweet and salty tastes. Foods that are sour or bitter, on the other hand, are more likely poisonous, and for this reason, these are often acquired tastes.

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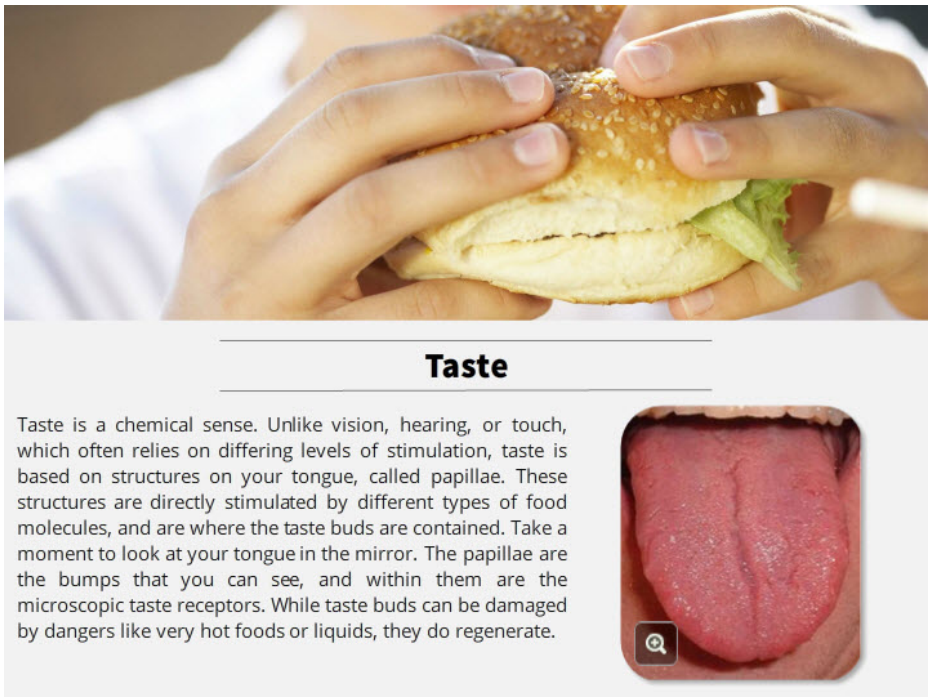
Taste



Taste is a chemical sense. Unlike vision, hearing, or touch, which often relies on differing levels of stimulation, taste is based on structures on your tongue, called papillae. These structures are directly stimulated by different types of food molecules, and are where the taste buds are contained. Take a moment to look at your tongue in the mirror. The papillae are the bumps that you can see, and within them are the microscopic taste receptors. While taste buds can be damaged by dangers like very hot foods or liquids, they do regenerate.

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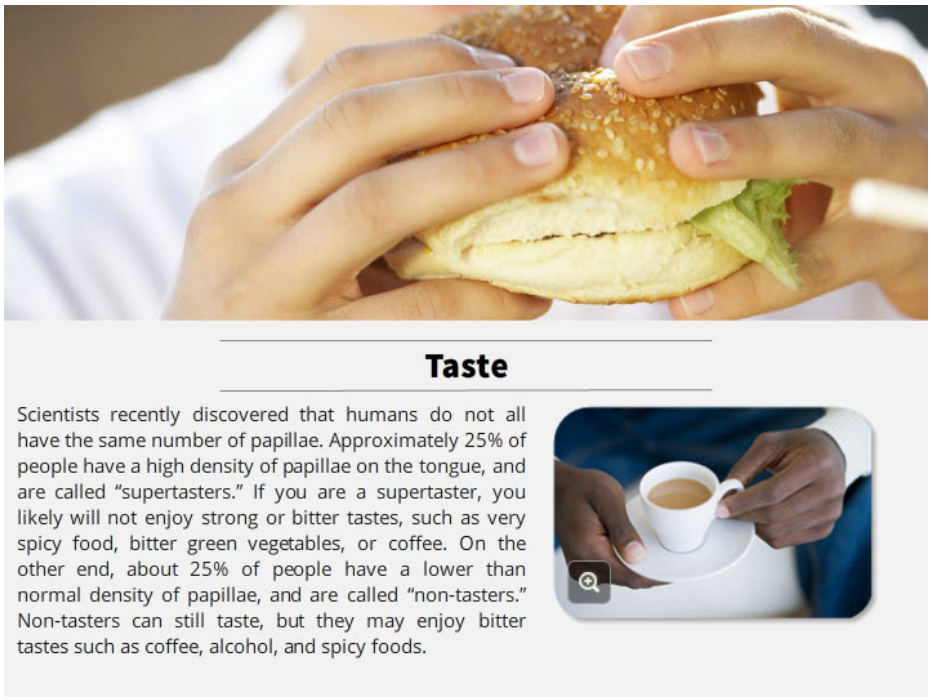
Taste



Scientists recently discovered that humans do not all have the same number of papillae. Approximately 25% of people have a high density of papillae on the tongue, and are called “supertasters.” If you are a supertaster, you likely will not enjoy strong or bitter tastes, such as very spicy food, bitter green vegetables, or coffee. On the other end, about 25% of people have a lower than normal density of papillae, and are called “non-tasters.” Non-tasters can still taste, but they may enjoy bitter tastes such as coffee, alcohol, and spicy foods.

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Touch

Did you know that skin is the largest organ in your body? Although you might not think of skin as an organ, it is actually your main protection from the outside world, and one of your main connections to the outside world.

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Contained within the skin are the different types of receptors that make up the sense of touch. Certain receptors are sensitive to pressure, while others are sensitive to movement. Some sensations, such as the feeling of wetness, are actually a combination of pressure and cold.

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Touch

Touch

Pain is enabled by the presence of nociceptor throughout the body. While at first glance, you might wish that you had no pain receptors, the truth is that pain is one of the most important signals you receive from your body, and is critical to survival. Although extremely rare, a small number of individuals are born without pain receptors. Life for these individuals is extremely dangerous, because they do not receive feedback from their bodies about damage it may have suffered. Burns, twisted ankles, cuts, or bits of dust in the eye can all go unnoticed, and cause more severe damage if left untreated.

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