Question One

I love to cook, but when the recipe calls for onions I cringe. Onions have many health benefits such as being loaded with nutrients and antioxidants. They also help to lower blood sugar and contain cancer fighting compounds, so why are they so irritating to the eyes? Simply put, unstable chemicals. When an onion is cut and your eyes start to water, you have fallen victim to a chemical called propanethial-S-oxide. It is an airborne chemical comparable to tear gas! When the chemical comes into contact with the eye itself, it triggers the nervous system for a response and causing tears to flush the irritant away. Interestingly enough, onions don't actually have propanethial-*S*-oxide. Only when the cells of the onion become damaged by cutting, the mixing of chemicals and a reaction of teary eyes happens. We cant really avoid onions, so here are some ways to save your eyes: Using a very sharp knife will damage fewer cells, and in turn cause less tears for you. Using a table fan, or the fan from the stove top will help blow the irritating fumes away from the eyes. Holding a lit match between your teeth can help with tearing up because the flame will consume the sulfuric compounds before they can irritate your eyes. Having a piece of bread in your mouth can also reduce eye discomfort because the bread will absorb the onion chemicals.

Question Two

Nothing ruins a delicious ice cream cone quite like brain freeze, or also known as the ice cream headache! Let us talk about why this happens. Brain freeze is an instant headache you get after you eat something super cold. Brain freeze occurs when something extraordinarily cold hits the roof of the mouth too fast. An intense rush of cold causes the blood vessels in your mouth to narrow (constrict), and a quick warming to the cold area causes those blood vessels to widen (vasodilate). These accelerated changes make the brain go haywire for a few seconds causing the

freezing sensation. The pain that is felt in the brain might not actually be in the brain at all! The pain could actually be from your face or at the lining of the brain. This is called referred pain. There are so many nerves within the body that connect to the brain, so that is why a pain in your brain can actually be somewhere else.

Brain freeze is annoying, but it is preventable! Eating and drinking cold things slowly will decrease the likelihood of brain freeze. Also, drinking a warm liquid or putting your tongue to the roof of your mouth will shorten the unpleasant frozen feeling from brain freeze.

Question Three

Yawning is contagious. Even saying or hearing the word yawn makes me do it! People yawn for many reasons. Some of those reasons include: being tired, bored, hungry, anxious, or simply because someone else around them is doing it. Yawning is an involuntary action of opening the mouth as wide as possible, taking in a long inhale through the mouth and nose, and releasing out a slow exhale. It is helpful with stretching and relaxing several muscles in the body. So, what is actually happening in the body when we yawn? The physiological side of a yawn is to cool the brain down when the blood flow becomes too much. During a yawn, the movement and relaxation of the facial muscles increases blood flow in the face which helps distribute heat though the veins. While inhalation is occurring, the cool air changes the temperature of the blood flowing from the lungs to the brain. Sometimes a yawn will cause the eyes to tear, and this is found to help dissipate heat from the skull.

As mentioned before, yawning is good for cooling the brain. A way to prevent a yawn is to literally chill out! In a 2019 study held by “Physiology & Behavior”, several people were asked to place a cold pack on their neck and it was found that they yawned far less than the people who

had a hot pack placed in their neck. Another way to prevent yawning is to grit your teeth. This will merely help you wait out a yawn. Even if you block a yawn from happening the urge will still be there. Yawning is impossible to stop completely, so it;s best to just let it happen.

Question Four

The brain and nervous systems work together to help alert our body from danger. For instance when we accidentally touch something very hot or cold we yank our hand away. This is called a reflex reaction and it keeps us from literally putting our hands into harms way. Reflex reactions are broken down into five arcs: sensor arc, sensory neuron, control center, motor neuron, and muscle. The sensor detects certain kinds of energy. Some are neurons and cast off impulses when stimulated. They are most always the nerve endings of the sensory neurons and also sends signals to them. The sensory neuron carries messages to the brain and spinal cord from other sensors such as the eyes, muscles, skin, ears and other parts of the body. Next up is the control center. This is where the neurons receive messages and decides if the stimulus is strong enough to warrant a command. The cerebral cortex process the messages and tell the inter neurons how to respond. The fourth arc is the motor neuron, or the output phase. Three things happen simultaneously during this phase. The nerve impulse and motor neuron travel out to whichever limb needs protecting. Then the nerve impulse is carried a short distance by an inter neuron to the motor neuron, and lastly, the message carried by the inter neuron reaches the cerebral cortex. The last part in this process is the muscle. In this stage the muscle is told how to react by the motor neurons.