

Making Sense Assessment **Answer Key**

Now that you have drawn a homunculus and understood how specific areas of the brain are responsible for specific muscle functions, it's time to expand your knowledge and reflect on what you've learned. Use the science and engineering skills you've learned to answer the following questions:

1. Multiple sclerosis (MS) is an autoimmune disease wherein the myelin sheath on the neurons is destroyed, and the signal is not transmitted across the synapse. Explain how a medication helping MS would solve this problem.

Potential answer:

A medication for MS would help stop the immune system from attacking the myelin sheath. This would protect the nerves so signals from the brain can still travel to the muscles. Some medicines might also help fix the damaged myelin so the signals go faster and smoother. This is important because we learned that certain parts of the brain control different body parts, and if the signals don't get through, the muscles won't move right. The medicine helps keep the communication working between the brain and the muscles.

2. Drug addiction is becoming an issue with teens in America. Explain addiction based on the physiology of the synapse.

Potential answer:

Addiction happens when drugs change how the synapse works in the brain. Normally, messages are sent between neurons using chemicals called neurotransmitters. When someone uses a drug, it can make the brain release way more of these chemicals, especially ones that make you feel good, like dopamine. Over time, the brain gets used to the extra chemicals and stops making as much on its own or removes some receptors. This means the person needs more of the drug to feel the same effect, which leads to addiction. The brain becomes dependent on the drug to send messages across the synapse.