Name: Period: Date:

Homeostatic regulation involves three parts: 1) the *receptor*, 2) the *control center* and 3) the *effector*.

The receptor receives information that something in the environment is changing. The control center or integration center receives and processes information from the receptor. And lastly, the effector responds to the commands of the control center by either opposing or enhancing the stimulus. This is an ongoing process that continually works to restore and maintain homeostasis. For example, in regulating body temperature there are temperature receptors in the skin, which communicate information to the brain, which is the control center, and the effector is our blood vessels and sweat glands.

In the space below, ***think*** of a variable (or two) for which humans maintain homeostasis. Use the AP biology textbook to determine the *receptor, control center,* and *effector*. (Do not get too detailed, just the basics!) Then you will ***pair*** up with another student so that you can compare your (hopefully) different examples. You may need to pair with several different students during this time. Finally, you will ***share*** your variables with the class and we will compile a list together.

|  |  |  |  |
| --- | --- | --- | --- |
| Example | Receptor | Control Center | Effector |
| Temperature | Temperature is sensed by the skin | Nervous system | Sweat glands release sweat if body is too hot, muscles shiver if too cold |
| Regulating metabolism | Nerves/receptors vary by metabolic component | Endocrine system | Glands release hormones to cause changes in the body |
| Maintaining constant pH | Blood absorbs excess acids/bases from surrounding body tissues | Respiratory and Excretory systems | Lungs excrete excess CO2  Kidneys filter and remove excess acids and bases |
| Regulating blood sugar (glucose) levels | Pancreas detects high (or low) glucose levels, releases insulin (or glucagon) | Endocrine system | Liver absorbs excess glucose (or releases more if it is too low) |
| Immunity | Antibodies in your blood cells recognize a pathogen | Immune system | Blood cells attach to identified pathogens and destroy them |
| Hunger | Nerves associated with digestive system can detect nutrients and/or fullness | Digestive and nervous systems | Contractions of the stomach cause the feeling of hunger |
| Breathing | Excess CO2 in blood causes it to become acidic | Nervous system (brain stem) | Diaphragm and chest muscles cause lungs to expand, bringing in air |
| Circulation | Nervous system detects changes in physical activity | SA node (pacemaker) of heart | Heart muscles increase their rate of contraction |