UNIT 1:
WELLNESS & HOMEOSTASIS
KEEPING A BALANCE

Biology Notes 2

Mr. Yeung

WHAT IS HOMEOSTASIS?

- Homeostasis is defined as maintaining a "balance" within the body's internal environment.

- Maintaining a balance keeps our cells and bodies healthy even when there is an external influence/ factor.

WHY IS IT IMPORTANT TO MAINTAIN A STATE OF HOMEOSTASIS?

List all possible ideas that can lead a body to being imbalanced?

HOMEOSTASIS IN OUR BODY

- In order to maintain a constant internal environment, our body must monitor various variables that occur in both externally and internally

Temperature

Sugar levels

Blood pH

Hormones

And others…

- When these variables are off balance, the body must correct itself.

- Remember,

  - internal conditions in the body **ARE NOT** constant, they are always in a ***dynamic equilibrium***

- This means that variables are always changing back and forth **BUT** changing at the same **rate**.

2 WAYS OF MAINTAINING HOMEOSTASIS

Negative feedback loop

- Either decreases or increases what is needed

Positive feedback loop

- Increases what is needed at a fast rate

Both of these are feedback loops in which the body is *constantly* monitoring and se[illegible]ent and providing an effect[illegible]

Similar to a car that can drive itself

TRY THIS

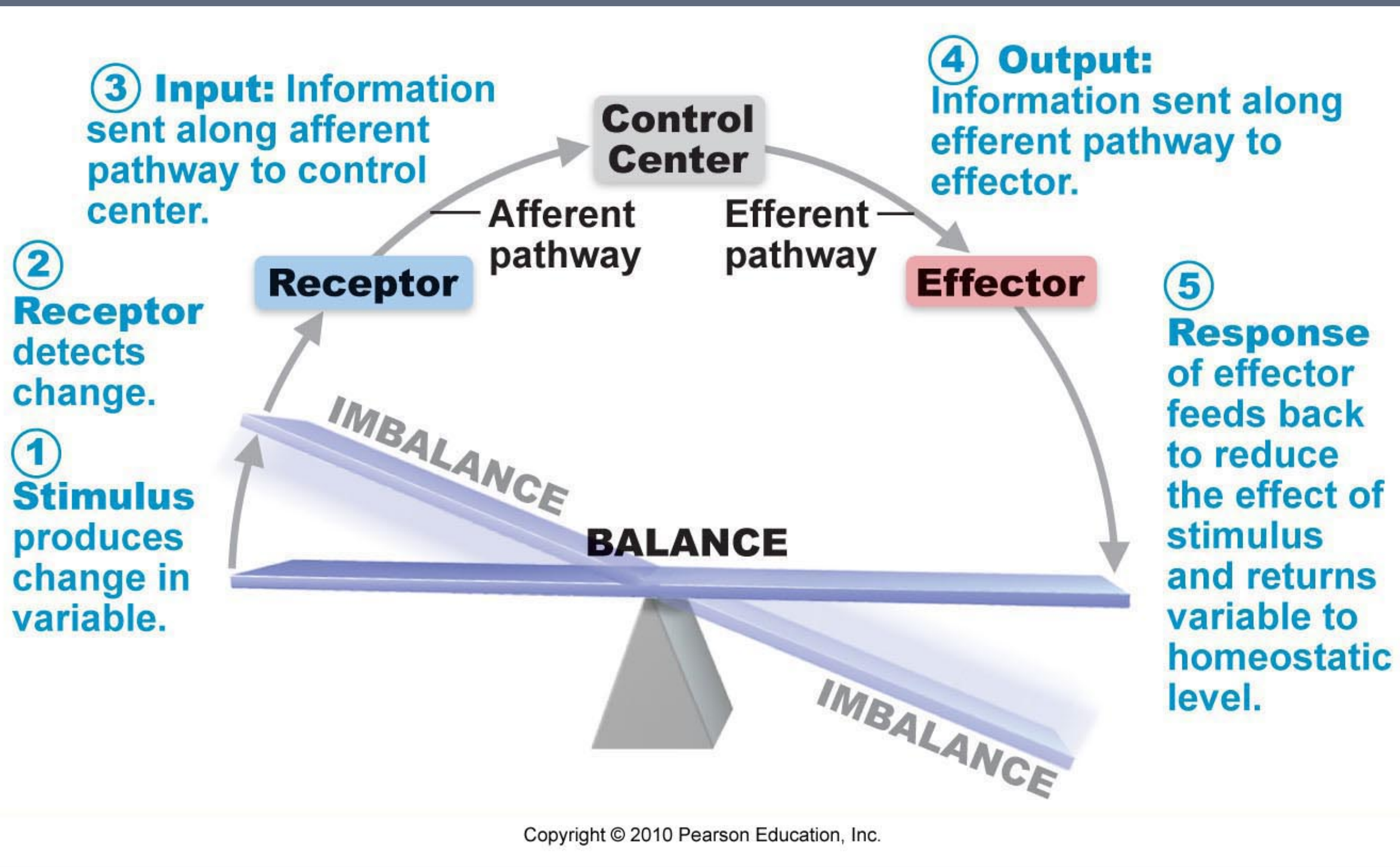
- With a partner, blind fold one person and have the person maneuver around several desks.

- Try to observe the *feedback* that you get to successfully maneuver around the desks…

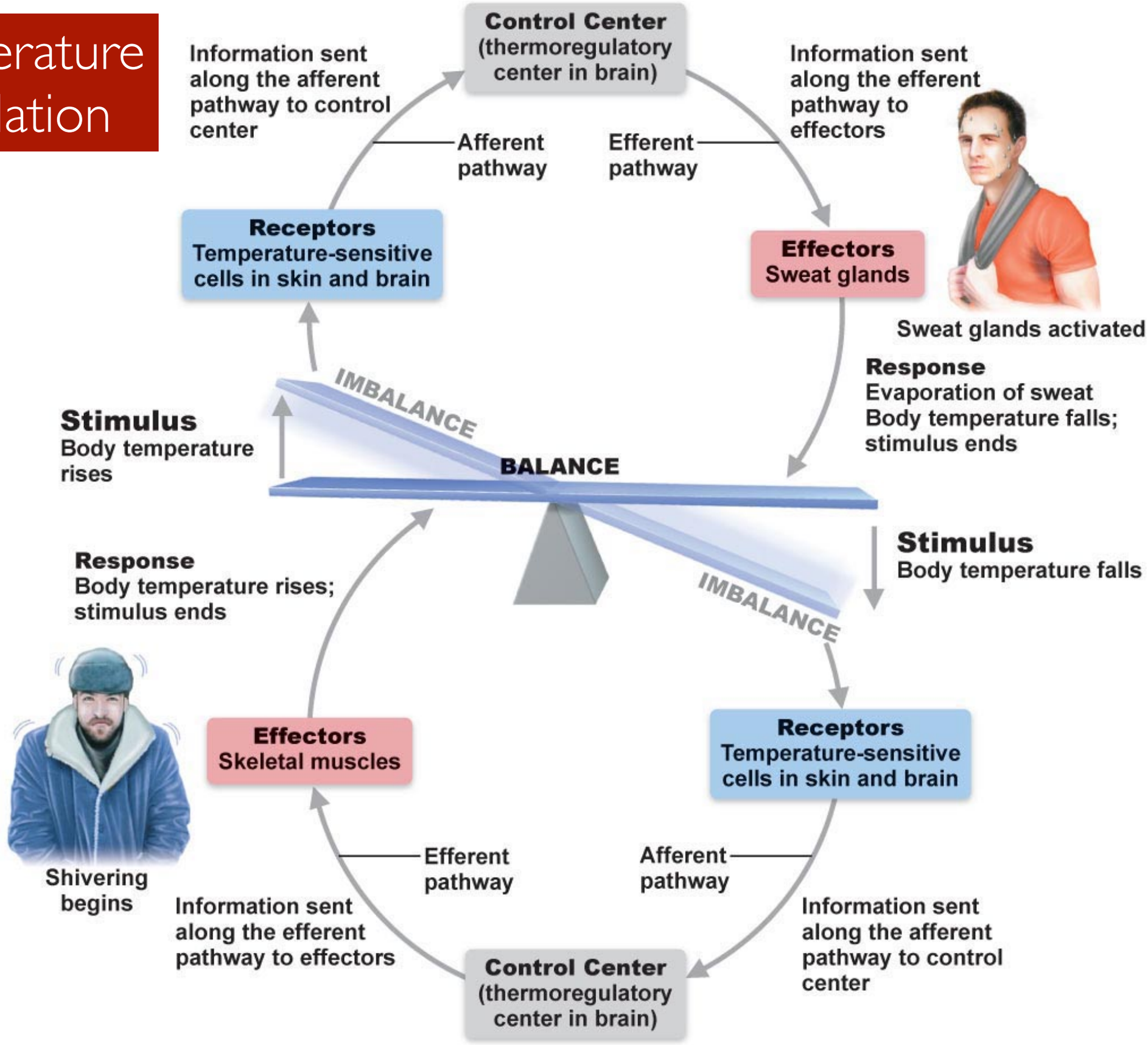
- Every feedback loops contain several components…
  - **Receptor** (an input system - sensing the environment around)
  - **Control centre** (sets the desired environment)
  - **Effector** (the response to change the environment)

NEGATIVE FEEDBACK LOOP

- Negative feedback loops **reverses** a change in the body's internal environment
- Ex. Body temperature, hormones, blood sugar etc…

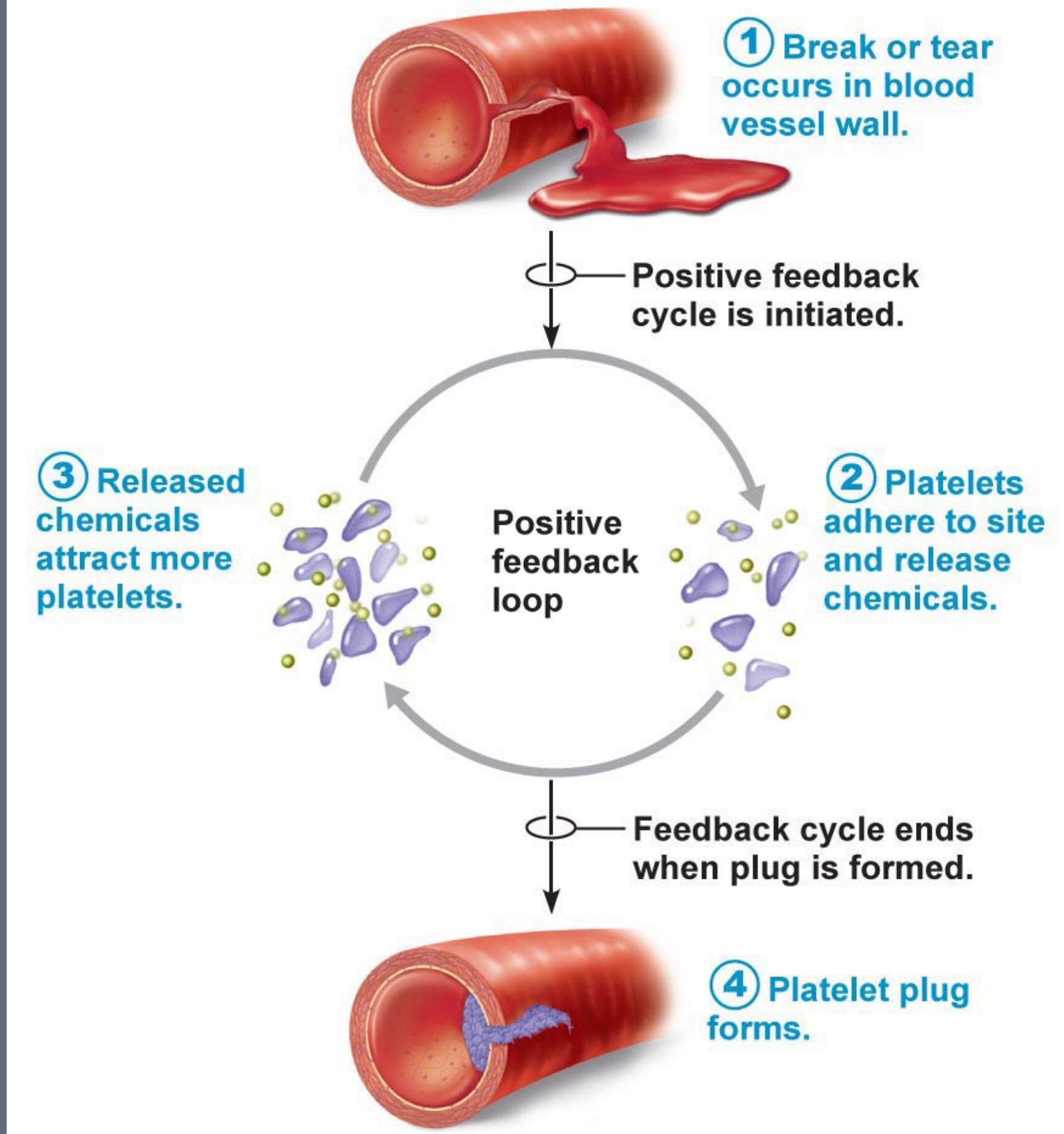


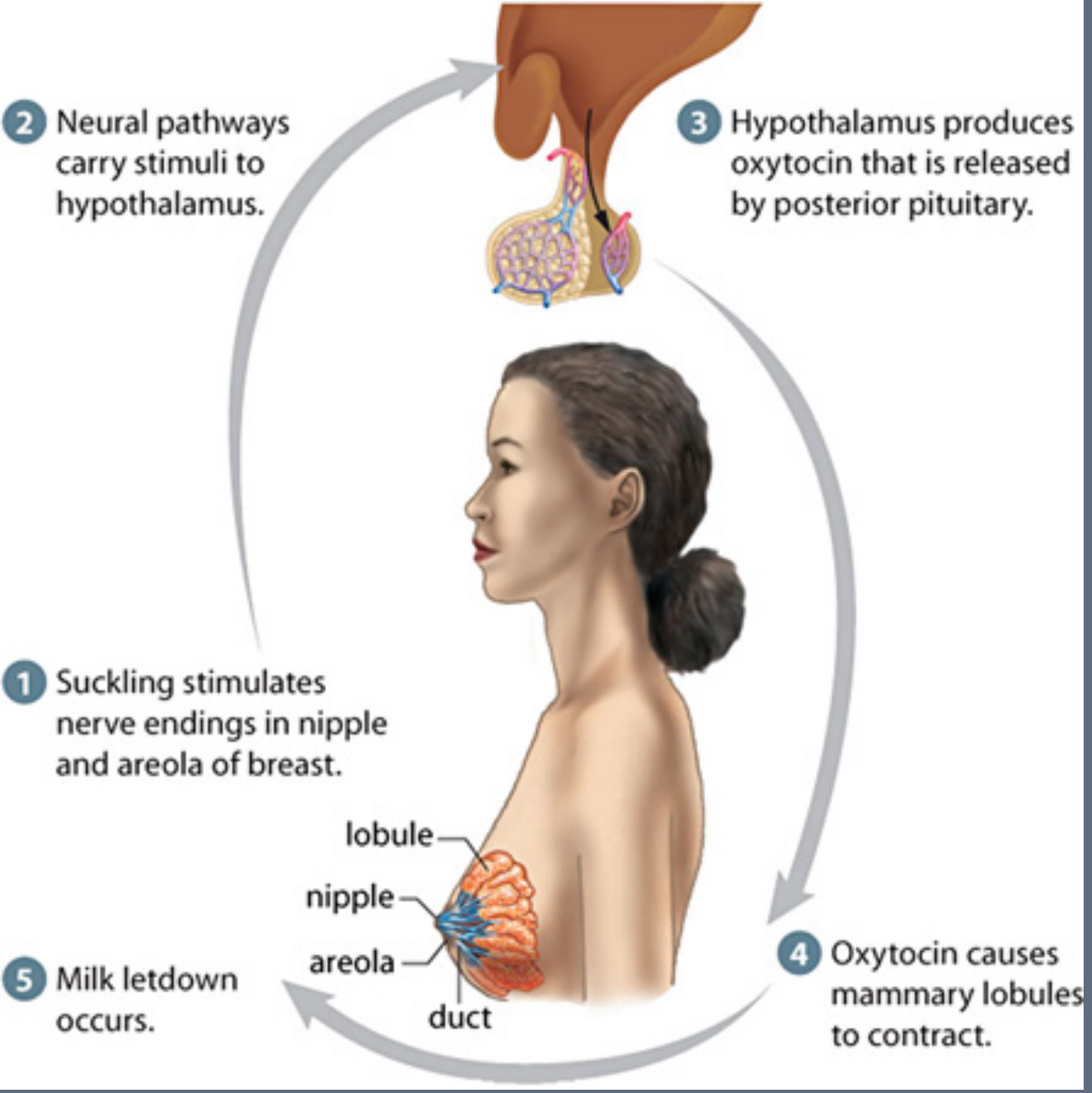
Temperature regulation



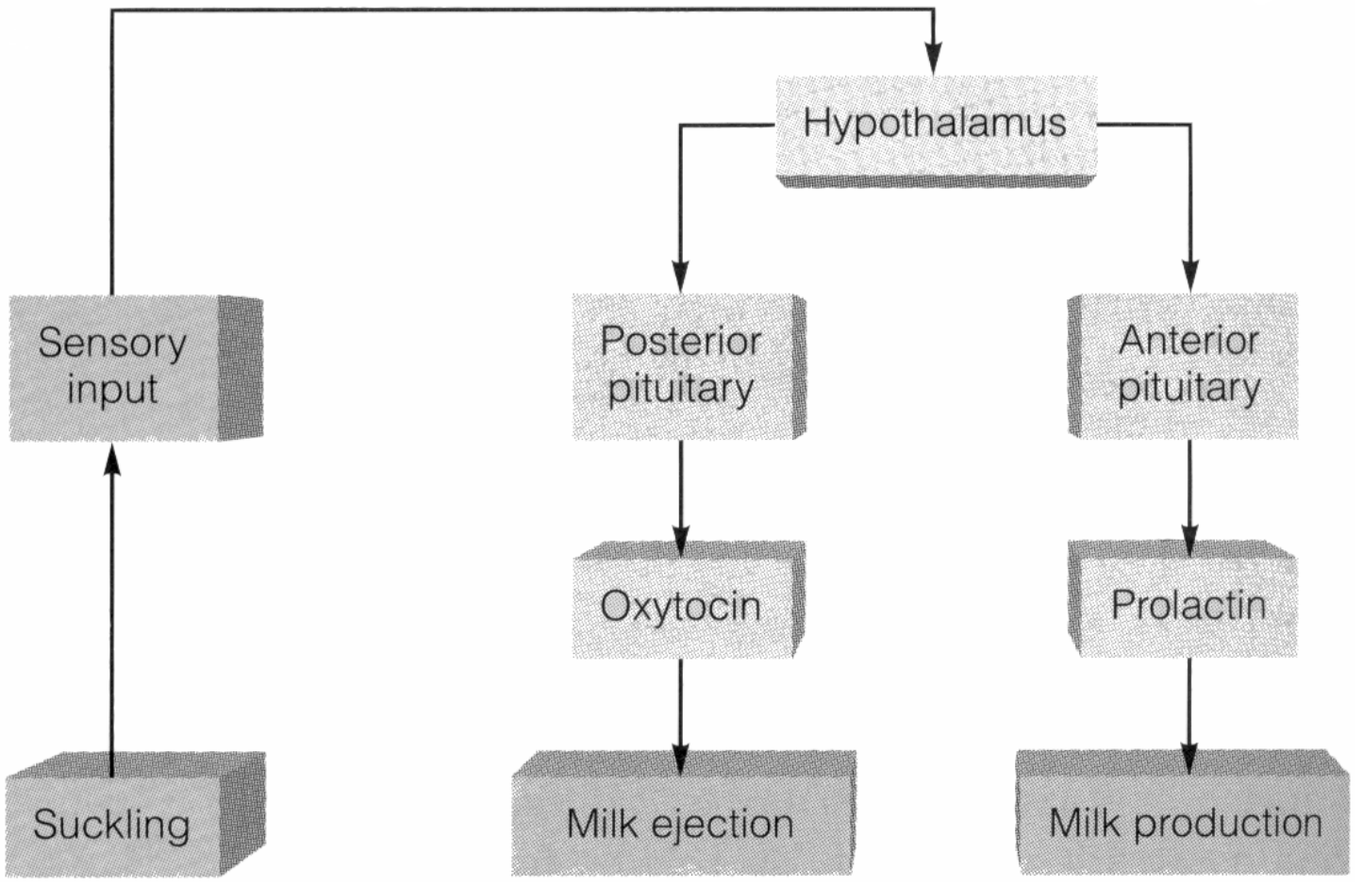
POSITIVE FEEDBACK LOOP

- Increases / amplifies the amount of the desired effect at a fast rate.
- Typically moves away from its equilibrium state.
- Similar to a *snowball effect*.
- Ex. Blood clotting, breast milk production





- Suckling of baby stimulates nerves in the areola of breast
- This stimulates the pituitary to release *prolactin* and *oxytocin*
- the **prolactin** initiates milk production and moves milk into ducts
- **oxytocin** causes weak contractions in the breast to move the milk out.



Stimulus **Responses**

Hearing a baby cry releases oxytocin start to move milk "milk let down"