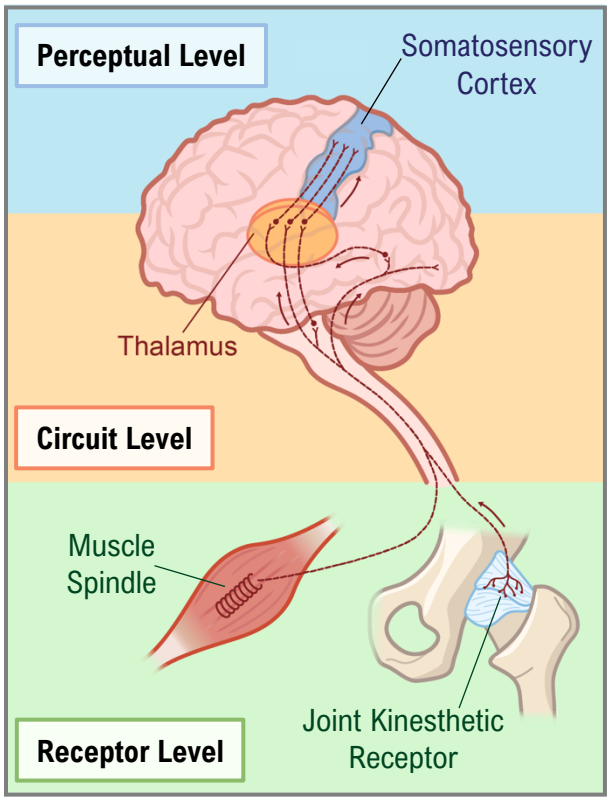
TOPIC: ORGANIZATION OF SENSORY PATHWAYS

- **Somatosensory System**: Part of the sensory system serving body wall and _____.
- **Special Senses:** Receptors located within complex sense organs.
  - Includes vision, hearing, equilibrium, smell, taste.
- **General Senses:** Majority of sensory _____ belong to general senses (simple receptors).
  - Includes touch, pain, temperature, vibration, pressure, proprioception.
- Somatosensory system operates at _____ levels of neural integration:
  - **Receptor Level**: _____ receptors.
  - **Circuit Level**: processing in _____ pathways.
  - **Perceptual Level**: processing in _____ areas.



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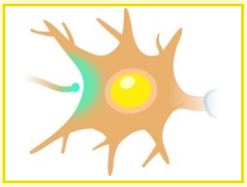
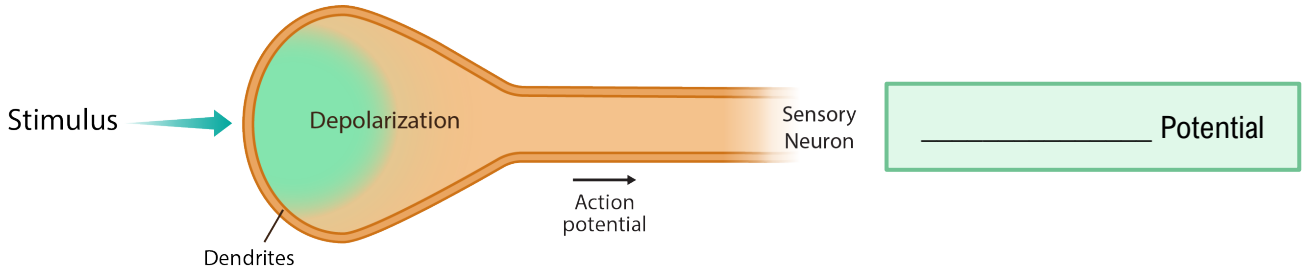
Receptor Level

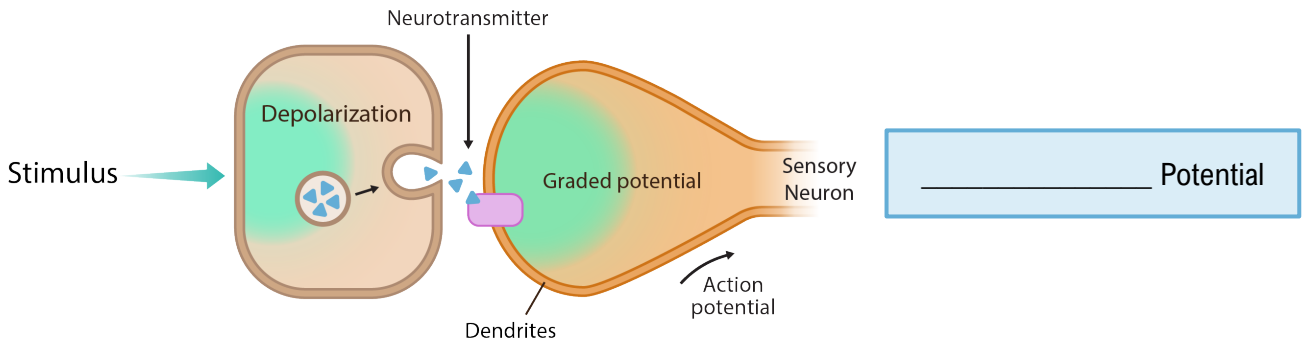
- Sensation requires: 1) Stimulus excites a receptor. 2) An action potential reaches the CNS.
- Requirements for signal generation:
  - Stimulus _____ matches specificity of receptor.
  - Stimulus applied within _____ field (area the receptor monitors).
  - Graded potential reaches threshold.
- Receptors can produce _____ types of graded potentials:

Recall: Graded Potentials



Type	Generator Potential	Receptor Potential
Receptor Region	Part of a _____ neuron	A separate cell
Location	_____ Sense Receptors	_____ Senses
Result	Generates action potential in sensory neuron.	Changes _____ of neurotransmitter released by cell onto sensory neuron.





EXAMPLE: The retina of the eye contains specialized photoreceptor cells (rods and cones). When light hits these cells, it creates a _____ potential.

a) Generator.

b) Receptor.

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PRACTICE: How does the strength of a sensory stimulus affect the generator potential in sensory receptors?

a) Stronger stimuli result in smaller generator potentials.

b) The strength of a stimulus is correlated with the strength of the receptor potential.

c) Stronger stimuli result in larger generator potentials.

d) Generator potentials are not influenced by stimulus strength, just by the presence of a stimulus.

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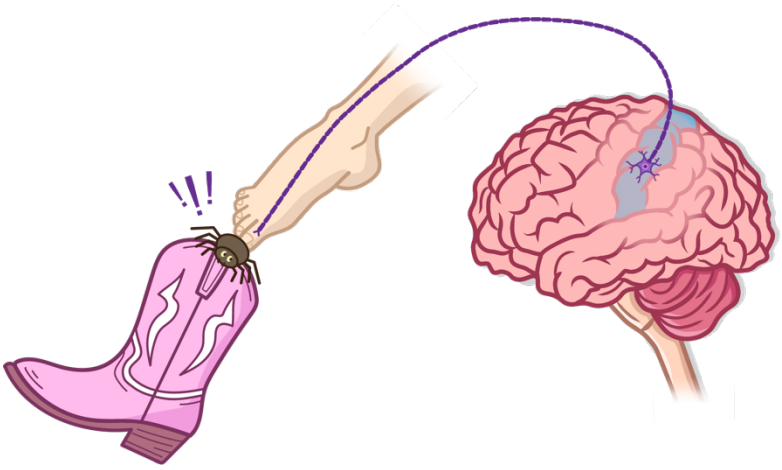
Circuit Level & Perceptual Level

- **Circuit level:** _____ delivered to the appropriate region of the cerebral cortex.
  - This ascending pathway consists of _____.
- **Perceptual Level:** sensory input processed and _____ by the cortex.
  - We become consciously aware of:
    - Location of _____.
    - Intensity of stimulus.
    - Properties of stimulus (e.g., concrete is hard and rough).



EXAMPLE: A reflex can be defined as a rapid, automatic response to a stimulus. Which of the 3 levels of processing does not necessarily need to occur for a reflex to be carried out?

a) Receptor level.

b) Circuit level.

c) Perceptual level.

d) None; all 3 levels must be completed before a reflex can occur.

PRACTICE: Spatial discrimination is the ability to distinguish between and precisely identify two or more stimuli. In terms of touch, which of these body parts do you think would have the lowest degree of spatial discrimination?

a) Tongue.

b) Lower back.

c) Fingertips.

d) Lips.