

- All sensory receptors are neurons: true or false? Explain your answer.

- In order to convey information about the outside world to the brain, a sensory system must convert some external _____ into a _____ signal.
- The two kinds of electrosensory system are _____, used by sharks, and _____, used by weakly electric elephant nosed fish.
- Why do all animals immersed in water generate electrical signals? What is it about their physiology that creates this electrical field?

- What kind of signal does the shark detect (be much more specific than just “an electrical signal”)? What type of sensory receptor does this use? What is the general structure of this receptor?

- Why can sharks find live prey buried in the sand? Why can they find dead prey hidden under an agar chamber?

- What kind of signal does the weakly electric elephantnose fish detect (again be specific)? What receptor type do they use? What are the two subtypes of this form of electrosensation? What aspects of this signal do organisms who use this type of electroreception pay attention to to build a map of their surroundings?

- Two kinds of mechanosensory receptor channels were mentioned in class. Name them, and describe how one of them works.

- Receptor cells can respond in two different ways to prolonged stimuli: _____ responses, aka _____ adapting, and _____ responses, aka _____ adapting. Define each response, mentioning how the amount of receptor firing changes over time.

- How do mechanosensory systems encode information about the intensity of a stimulus? (Hint: explain frequency coding).
- What does it mean if a stimulus is “below the threshold”? If it is “within the dynamic range”? What does it mean if the receptor has “reached saturation”?
- How many orders of mechanosensory processing are there? Diagram them as a signal moves through the body.
- Do signals travel at the same time through the same interneuron or in parallel in different interneurons? Why is this important?
- Define a receptive field. Where in the receptive field would a stimulus need to occur to cause the greatest receptor firing? The least? Do receptive fields overlap? Explain how these concepts allow the brain to localize where a stimulus has occurred.
- Define and explain the process of lateral inhibition. Why is it important for spatial processing? Which orders of processing does it occur at? What special interneurons are involved, and what do they do?
- What are the two kinds of human skin?
- You should be able to name six kinds of mechanoreceptors, the stimulus they respond to, and the type of response (phasic/tonic) that they produce.