Rachel Chapman, Freedom High School (Orlando, FL)
Recipient of a 2019 APA TOPSS Charles T. Blair-Broeker Excellence in Teaching Award

Lesson Plan, AP Psychology
Unit 4: Sensation and Perception, Day 1

Topics Covered	Standard(s)
• Absolute Threshold • Difference Threshold (JND) • Weber's Law	**Standard Area: Sensation and Perception** **Content Standard 1:** The processes of sensation and perception 1.2 Explain the concepts of threshold and adaptation
Materials Required	Success Criteria
• Blindfolds, 1 per group • Scales set up for grams, 1 per group • Plastic cups, 3 per group, one marked • Bag of rice, 1 per group • Lab sheets, one per student.	By the end of the lesson, my students will be able to ✓ Explain the concepts of absolute thresholds, difference thresholds, and Weber's law. ✓ Differentiate between absolute thresholds, difference thresholds, and Weber's Law ✓ Apply their learning to real world scenarios.

Introduction/Hook

To begin, introduce the concept of absolute thresholds by using a quick demonstration.

Have students place their heads down on their desk where they can't see their peers. Tell them to raise their hands once they hear the sound you are playing.

Play a sound clip. This can be anything from a youtube clip that specifically changes the decibel of a sound, or you can play a straight tone clip and you gradually increase the volume. Notate how many students raise their hands at which point.

Once a majority of the students have raised their hands, share what you saw, taking note at what decibel different students raised their hands.

Make sure to explain how this is an imperfect demo, and have students in pairs hypothesize some variables that would have affected the results. Share out with the class.

Then, introduce the concept of difference thresholds or JND.

Lesson Steps

1. Each student needs a copy of the Thresholds Lab sheet.
2. Have them summarize the introduction discussion on the top of the sheet in their own words.
3. Read the directions on the lab sheet aloud with the students, making sure to clear up questions before you they begin.
4. Set a timer for 20 minutes. This timer is to help them focus on completing Part 1 of the lab.
5. While they are working on Part 1, monitor their progress and intervene as necessary.
6. Questioning: Focus on the students that struggle and question them on what they are learning in the moment so that misconceptions can be cleared up. Spend some one on one time with those students.
7. When the timer goes off, direct them to move on to part 2. Set another 20 minute timer.
8. Continue steps 5 and 6 for Part 2 of the lab.

Wrap Up

Have a student complete this prompt in their reflection logs:

With a partner, create an example of the difference threshold and of Weber's Law you may experience every day. Then, explain how those two real world examples fit the concepts using facts and details you have learned from this activity.

Name: _____

Thresholds Lab

Period: _____ Date: _____

After the class discussion, explain the following in your own words:

- **Absolute threshold-**

- **Difference threshold** (also called *just noticeable difference, or **JND***)**-**

Part 1

Your task is to test a difference threshold for someone in your group. Choose a volunteer. Blindfold them and make sure they cannot see. **READ ALL OF THE DIRECTIONS BEFORE YOU BEGIN!**

Step 1: Weigh three plastic cups. Add rice to cups as needed to make each cup weigh 30 grams. Place the three plastic cups in front of the volunteer. Have the volunteer pick them up, one at time with their dominant hand, to see that they are the same weight. They must do this quickly! Lift, put down.

Step 2: After they place the cups back down, put one gram of rice in the cup marked with an X. Make sure that they don't notice which cup you are adding to. Ask them to quickly pick each cup up and put it back down, and then ask if they can tell If a cup is heavier, and if it is which one. It is important that they ***do not guess***! They need to honestly say if they can tell. They should only respond if they are CERTAIN. They should only lift for a moment and then put them back down. If they cannot tell, go to step 3.

Step 3: Repeat step 2, increasing the rice in the same cup by one gram, until they notice a change in weight, making sure to mix the cup positions. Record the data on the chart below. Recommendation: Do not always put a rice in! Check to see if they really notice a difference by not changing the number of rice and see if they still choose the cup that previously had more rice.

Determine the difference threshold for two participants. The difference threshold should be measured grams (how many grams of rice were added until they noticed a difference in weight).

Participant Name	Difference Threshold (in grams)

Participant Name	Difference Threshold (in grams)

1. Explain how this activity tested difference thresholds.

2. Critique the activity. There are several ways that it is an imperfect example of determining difference thresholds for participants (including confounding variables). Explain at least one shortfall/confounding variable.

3. Create recommendations for this activity that would overcome the shortfall/confounding variable you explained above.

Part 2

The next part of this activity revolves around **Weber's Law**. You will need to blindfold another participant in order to complete this activity. Make sure that they cannot see which container you are filling with rice!

Step 1: Place three empty plastic cups in front of the volunteer. Make sure that each cup weighs 15 grams. Have the volunteer pick them up to see that they are the same weight.

Step 2: After they place the cups back down, put one more gram of rice in the marked cup. Make sure that they don't notice which cup you are adding to. Ask them if they can tell which cup is heavier.

Step 3: Repeat step 2, increasing the number of grams of rice in the same cup by one, until they notice a change in weight, making sure to mix up the location of the cups. (It shouldn't take long)

Step 4: With the same participant, try this again but this time starting with 60 grams of rice in each cup. Add one gram of rice to the marked cup until they are able to notice a difference in weight.

Step 5: Repeat with other participants if there is time.

1. How many grams of rice did you need to add to the 15 gram cups in step 1 before they noticed a difference?

2. How many grams of rice did you need to add to the 60 gram cups before they noticed a difference?

3. Predict why a participant would need a higher number of rice to notice a difference if there are already a large number of rice in the cup, than when the cup is empty.

Weber's Law states that the amount of stimulus needed to notice a change doesn't depend on the amount or strength of the stimulus change, but that it depends on how proportionate the change is from the strength of the original stimulus. If a room is dark and you turn on one light, then you will most definitely notice a difference in light. That is because, proportionally, the change is great. However, if you have six lights on in a room, and you turn on one more, you are less likely to notice a change in brightness. The proportion in change is smaller because the room is already bright.

- Using several resources, create your own definition of Weber's Law.

- Compare Weber's Law to the results in this activity.

- Critique the activity! Using similar guidelines from Part 1, explain how this is an imperfect testing of Weber's Law, and come up with recommendations for improvement.

Lesson Plan, AP Psychology
Unit 4: Sensation and Perception, Day 2

Topics Covered	Standard(s)
• Sensory Adaptation • Sensory Habituation	**Standard Area: Sensation and Perception** **Content Standard 1:** The processes of sensation and perception 1.2 Explain the concepts of threshold and adaptation
Materials Required • Popcorn, one bag per class period • Microwave • Copies of response sheets, 1 per student	**Success Criteria** By the end of the lesson, my students will be able to ✓ Explain the concepts of sensory adaptation and sensory habituation. ✓ Differentiate between sensory adaptation and habituation. ✓ Create real world applications of sensory adaptation and habituation.

Introduction/Hook

Before the students come in the room, pop a bag of popcorn. This can be done during the passing time between classes. Before students come in, be sure to open the bag and walk the open bag around the room to ensure optimal smell distribution.

Pass out the response sheets as students come in the room.

Once students are in the room, have them answer the introduction prompts at the top of the response sheets.

Lesson Steps

1. Tell the students to share their predictions for number 2 with their partners.
2. Discuss sensory adaptation and habituation with the students, allowing them to take notes. Make sure to discuss the following:

Sensory Adaptation	Sensory Habituation
• Neural or sensory receptors change/reduce their sensitivity to a continuous, unchanging stimuli. • This occurs in the body. • The sense receptors become less sensitive to unchanging stimuli (fatigue.) • The individual must leave the environment and then return in order to sense the stimuli again. • We have no conscious control over it. • We cannot force ourselves to notice the stimuli again. Examples: smell in a room, darkness level in a room, temperature in a pool	• Pattern of decreased response to a stimulus after frequently repeated exposure. • Occurs in the brain. • Brain stops noticing unchanging stimulus. • If the individual shifts their attention back to the stimuli, then they can recover the perception of the stimuli. • During habituation, we have some conscious control over whether we notice something to which we have become habituated. Examples: noticing your glasses, hearing a fan or background music, feeling your clothes

chart adapted from https://www.youtube.com/watch?v=PnKSA6fGp6w

3. After the students take their notes, have them share what their notes with their partners to see if there was any information that they missed. They can then revise their notes.
4. After the notes, it is time for them to process the new information. First, they are to find similarities and differences between the two with their partner.
5. Next, on their own they are to come up with real word examples for each. Once they have examples and explain how they fit, they are to receive feedback from their partner and give feedback in return.

Wrap Up

With their quads, they are to complete the extension and reflection piece. During this time, circulate in order to check on the target students and quiz them on what they should have learned so that misconceptions can be addressed on a one-on-one basis.

Name: _____ Period: _____ Date: _____

Sensory Adaptation & Habituation

Introduction: Answer the following prompts before we begin our lesson.

1. Describe what you smelled as you came into the room. _____
2. We are going to be discussing sensory adaptation and habituation. Predict the differences between the two.

Notes:

Sensory adaptation and sensory habituation are very similar, yet distinctly different. After discussing the two, take notes that describe each in the chart below.

Sensory Adaptation	Sensory Habitation

Process:

On your own, compare and contrast sensory adaptation and sensory habituation and mark your thoughts in the chart below. Then, when instructed, compare your responses with your partner. Discuss the differences, and revise as needed.

Sensory Adaptation Only	Similarities	Sensory Habituation Only

Now, create a real-world examples of sensory adaptation and sensory habituation. When instructed, pass your paper to your partner and explain your examples. Give constructive feedback about your partner's examples by stating one way each example helps you, and ask one question about their chosen example.

Sensory Adaptation Example	Sensory Habitation Example
Partner Feedback:	Partner Feedback:

Extend and Reflect:

1. Do you still smell the odor from when you came into the room at the same intensity? _____

2. Most people cannot smell the odor at the same intensity, or they cannot smell it at all after time. Explain whether this is adaptation or habituation and justify your response using what was learned today.

3. Explain how the following psychological perspectives might explain why sensory adaptation and sensory habituation occur.
    a. Evolutionary Perspective

    b. Biological Perspective

    c. Cognitive Perspective