**Learning to Learn Workshop Materials**

**5 min**: Introductions

* *Welcome, everyone! My name is Kyle Trenshaw and I am a postdoc in the Science Center. I’d like to ask you to go around and briefly introduce yourselves with what discipline you are most interested in studying. I’ll start: I’m Kyle, and I did my PhD and postdoctoral work on engineering education topics.*

**2 min**: Mythbuster Hook

* **Preparation: Write the question below on the board.**
* By a show of hands, which of the following do you think matters MOST when you are studying?
  1. Being motivated to learn what you are studying
  2. How much total time you spend studying
  3. What you think about while studying
  4. Staying focused and not getting distracted while studying
  5. Studying in ways that match your own learning style (e.g., visual learner)

**20 min**: Shallow vs. Deep Studying

* **8 min**: Perceptual Judgment Tasks
  + **Preparation:**
    - **Print enough handouts for all students to get one of each.**
    - **Stick two different colors of sticky notes to the handouts to denote which directions are which.**
    - **Print the words to read.**
    - **Set a timer for 30 seconds on your phone.**
  + Split the students in half and give each half a different handout.
  + Read the first set of words
  + Give the students 30 seconds to write down as many as they can remember and write the total number on the corresponding sticky note.
  + Give each half the opposite handout and read the second set of words.
  + Give the students 30 seconds to write down as many as they can remember and write the total number on the corresponding sticky note.
  + Ask students to compare their two sticky notes and then hold up the one with the larger number in their hand.
  + Ask students to answer the question: *What are some hypotheses for why most of you are holding up the sticky notes that went along with the “pleasant” directions?*
* **2 min**: Mythbuster Resolution
  + Ask students to raise their hands again for the answer they think matters MOST.
  + Introduce shallow and deep processing.
* **10 min**: Deepening Your Study Habits
  + Ask students to call out some ways that they commonly study.
  + Once a list of 8 to 12 study habits have been generated, ask students to help categorize them as either shallow or deep studying.
  + Ask students to choose one of the deep studying techniques they do not currently use to try out in the future.
  + *Another important deep studying technique that we have not talked about yet is estimation, which brings us to our next activity.*

**15 min**: Estimation

* **5 min**: Form students into teams of three (if possible) to answer the following question: *What percentage of all undergraduate degrees in America are from Brown?*
* **5 min**: Ask students to share their estimates (if they have them) and then walk through my process for answering the question.
* **5 min**: Discuss how estimation can benefit students in their coursework and in their day-to-day life.
  + Estimating on homework problems or exam questions can provide a check so that you know to look back over the question.
    - Example: In a short-answer problem you are asked a plumbing question involving filling a bath tub. You estimate that the flowrate of water into the bath tub should be on the order of 10 gallons per minute in order to fill quickly, but you calculate it to be 0.3 gallons per minute. Because you estimated, you know you should probably go back through the problem and look for errors in either your thought process or calculations, and you consequently get a better understanding of the problem (and a better grade)!
  + Many interviewers will ask job candidates to solve estimation problems as a show of their critical thinking skills.
  + Estimating parameters during your co-op work can mean that you notice a problem before it gets out of hand.
  + Estimating in general helps you build the cognitive skills to understand questions rather than just search for an equation to solve. For example, “The flow rate of this stream needs to be on the order of 50 m3/s if the process is supposed to make a profit,” rather than, “I need this equation from the book to calculate the flow rate of this stream.”

**3 min**: Wrap-up/Feedback

* *Today we covered some effective learning strategies and also made a commitment together to try out at least one new deep studying method for your first exams of the semester.*
* Participants are asked if they have any remaining questions and to fill out a feedback survey about the workshop.