

Brain & Behavior Class Activities



Enjoyed and completed with your learning pod



Ice Breaker: Neuroscience Art

The challenge: you will be asked to draw and sculpt something – what it is will be a surprise. Decide how you will tackle this as a team. Take pictures of your work. Then complete the activity form on Canvas as individuals.



Mirror Tracing

Using the computer and projected up on the screen for all to see, volunteers will be asked to trace within the lines of a shape (e.g. square, circle, star). Then we will reverse the image as if you are looking at a mirror. Can you trace the images now? Research the science behind this using peer reviewed articles. Working with your pod, create a slideshow with three “fun facts” slides to explain and/or elaborate on the phenomenon. Include the APA formatted references on the slide where they are used. Don’t forget to complete the activity form on Canvas as individuals.



Finger Confusion

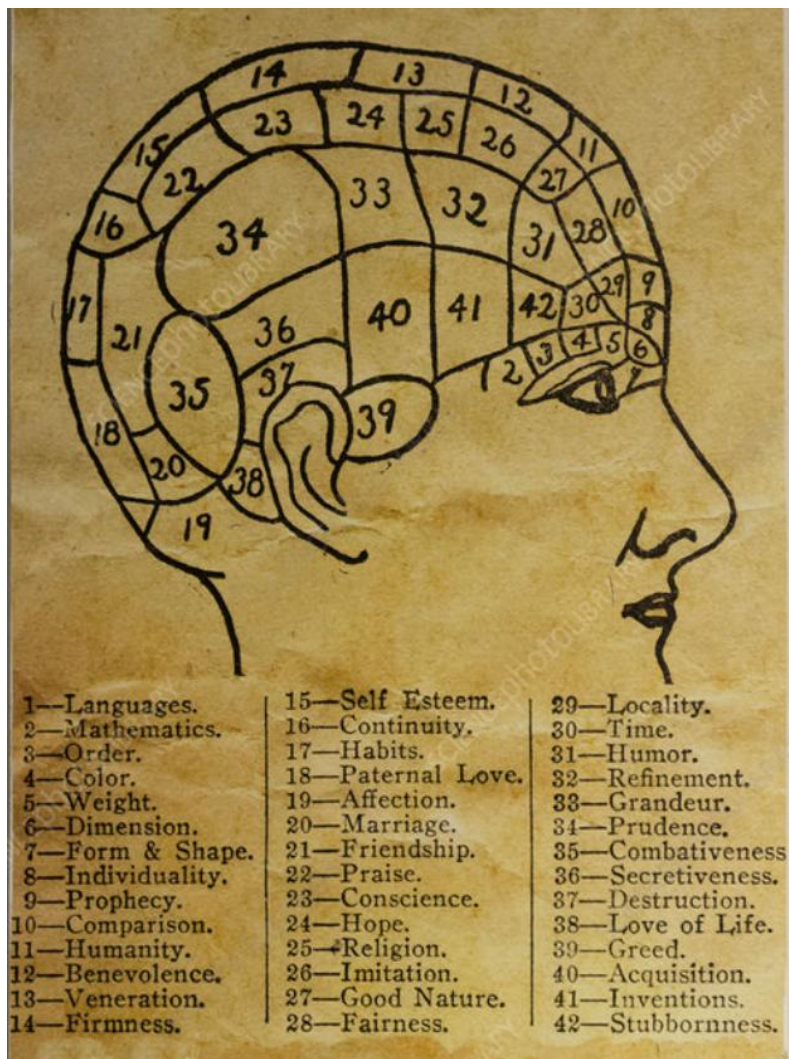
Step 1: Reach out both hands in front of you. Intertwine your fingers. Step 2: Your partner points to a finger (2, 3, or 4) on either your right or left hand. You need to wiggle the finger they point to. Step 3: Repeat and point to a different finger. Step 4: Reach both hands out in front of you. Cross your arms. Twist both thumbs so they are pointed down towards the floor. Intertwine your fingers. Rotate your hands towards your stomach and then up towards your chest. Step 5: Repeat steps 2 and 3. Step 6: If this was hard to do, have your partner touch the finger they want you to wiggle. Any easier?

Research “finger agnosia” using peer-reviewed articles. Working with your pod, create a slideshow with three “fun facts” slides to explain and/or elaborate on the phenomenon. . Include the APA formatted references on the slide where they are used. Don’t forget to complete the activity form on Canvas as individuals.



The “science” of Phrenology

Step 1: using the list below, write down 5 personality traits or skills that you believe you have and 5 that you know you don't have **Step 2:** pair up with a pod mate **Step 3:** systematically feel for bumps and indentations on your scalp. When you find one, your partner circles the corresponding area on the phrenology map below. **Step 4:** compare what the phrenology exam says about you compared to what you wrote about you. What can you conclude? **Step 5:** Each of you research “phrenology” and find a peer-reviewed article. Describe a fun fact from the article. Write down the APA-formatted reference. Don't forget to complete the activity form on Canvas as individuals.



Note: bumps mean you have the trait, depressions mean you do not have this trait



Neurotransmission Extravaganza!

Part 1: Demonstration of the cell threshold for the action potential, failed attempts, temporal summation of EPSPs, and a very strong EPSP

Your pod will be given some “toys”. The challenge: brainstorm how to use these to demonstrate the concepts above.

Part 2: Acting out the action potential sweeping down the axon: myelinated and non-myelinated – saltatory conduction, nodes of Ranvier

The class is divided in half, leaving two students out. Two columns of students are formed to represent two axons. **Unmyelinated:** students stand about three feet apart (the gap represents the Na and K channels). **Myelinated:** Three students stand in a row, locking arms (they are a segment of myelin). Then there is a ~3 ft gap followed by another group of three students etc... The two columns of students must be of equal length. The 2 students who were left out need to have a race to see who can reach the end of the axon the fastest. Each student must enter each gap by having both feet cross into the gap. This represents the influx of Na into the cells. Next, they exit the gap. This represents K leaving the cell.

Part 3: Properties of the action potential

Your pod will be given a three-ring binder, a ruler, and the thick rim of a Styrofoam cup. With the binder rings open, one student holds the Styrofoam between an open set of rings. Another student snaps the rings shut – note how once a threshold is reached, the closing of the rings cannot be stopped. The depth the rings penetrate into the foam is observed. Repeat this several times, each time, try to change the force at which the rings close by closing them fast or slowly. What do you observe about the depth at which each attempt penetrates?

Part 4: Properties of postsynaptic potentials (PSP)

Your pod will be given a set of identical elastics, one for each pod member. You will be given a small, light ball to place on the floor. This ball represents the axon hillock and the elastics represent PSPs. Each of you stand at various distances from the hillock and stay there. The challenge: figure out how to demonstrate that stronger potentials and those closest to the axon hillock are most likely to reach it and have an effect.

Once you finish all 4 parts – complete the activity form on Canvas as individuals.



Mock Stereotaxic Surgery

In this activity, you will learn some basic facts about the rat brain, how to use a stereotaxic atlas and the stereotaxic instrument, how to read vernier scales, and what radio frequency lesions do and look like. Finally, you will learn about the other ways we have to manipulate the brain with the help of a stereotaxic. You will then individually complete the activity form on Canvas after reflecting on the following:

Was there anything you learned that "shocked or amazed" you?

Was there anything you learned that "disappointed or discouraged" you?

Was there anything you learned that changed the way you think about something?

Did you learn something that you think will help you to grow, personally or professionally?

What questions did this activity generate for you?





Animal Lab Field Trip

For this activity, you will learn about the animal care facility, the elevated plus maze, the inhibitory avoidance chamber, the tail flick test, the three-chamber test, the tube test, the runway maze, the step-down test, and the paradigm for measuring blood glucose responses to restraint stress. Afterward, I want you to summarize and reflect on what you learned and complete the activity form on Canvas as individuals.

When it comes to the reflection part, consider these sorts of things:

Was there anything you learned that "shocked or amazed" you?

Was there anything you learned that "disappointed or discouraged" you?

Was there anything you learned that changed the way you think about something?

Did you learn something that you think will help you to grow, personally or professionally?

What questions did this activity generate for you?

Reflections can long or shortish. What is important is that you clearly give them time and effort. Note: Too short "might" mean you haven't given your reflection enough thought.

You will also need to be able to answer the following questions.

Why is the animal care facility securely locked at all times?

For each of the different apparatus used to test behavior, explain which behavior they are commonly used to test for?

What is considered a normal blood glucose response to restraint stress at 30 minutes and 60 minutes post-baseline?

Reflect on your overall animal field trip experience