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National Standards for High School Psychology Curricula Standard Area: Biological Bases of Behavior Content standards - 1.3 Differentiate between the structures and functions of the various parts of the central nervous system. - 1.4 Describe lateralization of brain functions.	Lesson Objectives - Students will describe the location and functions of the different parts of the brain - Students will demonstrate their understanding of the function of different parts of the brain through applications to various scenarios
Background/Previous Knowledge - Students will have previously learned about the nervous system, neuron communication, and neurotransmitters - For homework, students will have watched a flipped video on the parts of the brain. The expectation is that student take notes on the video and be prepared to use the notes in class - Video link ** I run an entirely flipped classroom in AP Psychology. Students take all lecture notes at home through my videos and we discuss/do activities for the notes in class each day. By this time in the semester, they have been doing this for several weeks and are clear on the expectations.**	Materials need 1. Students bring in 1 orange/partner set 2. Candy (brain parts) separated into ziplock bags or each group 3. Toothpicks, plastic knife, and napkins for each partnership 4. Chromebooks/ipads 5. Flipgrid page set up (flipgrid.com) 6. Candy Brain worksheet *(Adapted from Tom Beebe at Hoffman Estates High School)* 7. Book of Awesome story and worksheet 8. Google slides presentation
Day 1- Students will - When entering the room, students will see a signup for Flipgrid on the board. They should complete this as they are sitting down/getting set up for class. - **Daily review/retrieval practice(5 min):** without their notes, students will "quiz" their partners with the neural communication process. Each partner will first write down the steps of the process on their own, then they will have to explain the process aloud to their partner. (Slide 3) - **Flipped notes review (10 min):** Students will have 10 minutes to review their brain flipped notes with the partner/trio of their choice for the candy brain activity. They will use the prompts on the board to guide their discussion (slide 4).	Day 1- The teacher will - Review daily agenda with students (slide 2) - Rotate around the room and listen to students explain the communication process. Provide clarification/correction when necessary. The teacher can also provide vocabulary to students who need it as scaffolding - While students review their notes, the teacher will hand out all materials needed for the candy brains to each group. At this time, the teacher will also check-in the flipped notes to make sure they completed the assignment and are ready to do the activity.

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- **<u>Candy Brain Application Activity (35 min)</u>**: students will construct an accurate brain model using the instructions and candy provided. They will also film a short video of them explaining the model and connecting each part of the brain to a theme they chose (i.e. “Beyonce’s Brain”). See pages 8-10 for the worksheet.

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- Rotate around the room to help students while they build their candy brains and answer questions.

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<u>Wrap up/Assessment</u>

- Students will post the video explanation of their themed candy brain on Flipgrid.

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<u>Day 2: Students will</u>

- **<u>Daily review/retrieval practice (10 min):</u>** Identify the parts of the brain and its function on several visual models without using their notes (slides 8-10)

- **<u>Candy Brain Application Activity (15 min)</u>**: Some groups of students may likely need time to finish the activity from the previous day. While those groups finish up, have students who are finished watch a short video on the teenage brain using their Chromebooks.

- **<u>Bio application practice (25 min):</u>** As a further application of their knowledge, students will read the story “ Sneaking Cheaper Candy into the Movie Theatre” from ***The Book of (even more) Awesome*** (pg 12-13 of the document), and apply different parts of the brain, nervous system, or neurotransmitters to the story. This will serve as a formative assessment of their understanding of the brain and a review of previous topics covered during the unit. See page 11 for the worksheet.

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<u>Day 2: The teacher will</u>

- Review daily agenda with students (slide 7)

- Ask students to share their answers aloud and provide clarification of incorrect answers we necessary

- Provide support to groups still working on their themed candy brain

- Work with student pairs, answer questions, and informally assess student understanding based on their work. Make sure students are focusing on using the SODAS acronym when writing to help them prepare for FRQs.

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<u>Wrap up/assessment</u>

- Students will submit their application practice. Class the next day will start with the teacher presenting some of the student responses with the part of the brain missing. Students will need to identify which part of the brain their peers were writing about.

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<u>Sources</u>

Pasricha, N. (2012). *The book of (even more) awesome*. New York: Berkley.

Names: _____ Theme for Your Brain: _____

CANDY BRAIN WORKSHEET

Make sure you have all the necessary tools before you begin. Make sure to communicate with your surgical partner.

You should all have your brain with you (Orange or Grapefruit)

Other parts of the brain:

- One JELLY BEAN
- Two CHOCOLATE RAISINS
- One GOOD AND PLENTY
- One ORANGE SLICE
- 8 wooden toothpicks
- 1 green, 1 red, 1 yellow, and 1 blue toothpick
- One strip of the PEEL AND PULL TWIZZLER
- One RED-HOT
- One DOT
- One SKITTLE
- Two SOUR and one REGULAR gummy worm

The Surgical Procedures are listed below. <u>MAKE SURE TO FOLLOW THE DIRECTIONS.</u>

<u>PART I</u>

1. Carefully peel the skull from the brain. You are now looking at the CEREBRAL CORTEX.

2. Break one wooden toothpick in half and use them to make two "eyes" with raisins. Be sure to put them on the "front" of the brain. (Similar to a face)



3. With your knife make a small incision around (<u>Gently pull two slices apart but do not rip the brain in half</u>), and write the responsibility of the CORPUS CALLOSUM.

Function: _____

Left Hemisphere jobs: Right Hemisphere jobs:

4. Using your Good and Plenty (MEDULLA) and Jelly bean (PONS) create a BRAIN STEM in the lower portion of your brain. <u>Both the MEDULLA and PONS will go on the same toothpick, make sure to pay attention to the correct order!</u> Place the toothpick with both parts into the correct part of the brain.

MEDULLA

Function: _____

Relation/application to theme: _____

PONS

Function: _____

Relation/application to theme: _____

5. Directly on top of the brain stem, attach the Orange Slice for the CEREBELLUM. It should be on either side of the brain stem. (use a toothpick to attach it)

Function: _____
Relation/application to theme: _____

6. Now, divide the brain into LOBES. Break the color toothpicks in half and stick them in the brain to label the lobes. Remember to mark the lobes in BOTH hemispheres and break the toothpicks in two putting them on both sides of the brain!!!

OCCIPITAL LOBE (green)
Function: _____
Relation/application to theme: _____

FRONTAL LOBE (red)
Function: _____
Relation/application to theme: _____

PARIETAL LOBE (yellow
Function: _____
Relation/application to theme: _____

TEMPORAL LOBE (blue)
Function: _____
Relation/application to theme: _____

7. Using the Sour Gummy Worm (SENSORY CORTEX) and the regular gummy worm (MOTOR CORTEX), attach the MOTOR CORTEX and SENSORY CORTEX. You will have to cut the regular gummy in half so that both strips are represented in both hemispheres. (Use one of your toothpicks to attach them)

SENSORY CORTEX
Function: _____
Relation/application to theme: _____

MOTOR CORTEX
Function: _____
Relation/application to theme: _____

******Stop here and get the teacher signature BEFORE YOU FILM****Teachers Signature _____**

After you have created the cerebral cortex of the brain, you will need to create a short video of you and your partner explaining all the parts, their function, and how they impact the theme you picked using the FLIPGRID app on your phone. This app will allow you to start and stop your recording, so when you are finished hit stop. **You have 5 minutes total to record for both the inside and outside of the brain, so be prepared, concise, and clear!**

ONCE YOU HAVE RECORDED AND EXPLAINED YOUR BRAIN, YOU CAN CUT IT OPEN AND WORK ON THE INSIDE!!

PART II

8. NOW, SPLIT YOUR BRAIN APART SO WE CAN FOCUS ON THE INSIDE OF THE BRAIN

What structures make up the limbic system?

_____

9. Using one strip of the PULL-AND-PEEL-TWIZZLER, place the HIPPOCAMPUS inside the brain.

Function: _____
Relation/application to theme: _____

10. Using a RED HOT, place the AMYGDALA in the brain.

Function: _____
Relation/application to theme: _____

11. Using a SKITTLE, place the HYPOTHALAMUS in the brain.

MOTOR CORTEX
Function: _____
Relation/application to theme: _____

12. Using the DOT, place the THALAMUS in the brain.

Function: _____
Relation/application to theme: _____

******Stop here and get the teacher signature BEFORE YOU FILM****Teachers Signature _____**

After you have created the limbic system of the brain, you will need to create a short video of you and your partner explaining all the parts, their function, and how they impact the theme you picked using the FLIPGRID app on your phone. This app will allow you to start and stop your recording, so when you can add to your previous video. **You have 5 minutes total to record for both the inside and outside of the brain, so be prepared, concise, and clear!**

When you are finished, please submit the video for my evaluation of your surgical expertise!

Activity adapted from Tom Beebe at Hoffman Estates High School in Hoffman, IL

Book of Awesome: FRQ Practice

Directions: Read the story from The Book of Awesome and apply how you would connect 3 different parts of the brain, nervous system, or neurotransmitters to each "step" of the story. Make sure your answer follows SODAS! Focus on DEFINING the part of the brain and then APPLYING it to the story in a SPECIFIC way. Each part of the brain should have a different explanation of how it applies to the story.

Step 1: Bag Up

Example: Sensory Cortex is a part of the brain in the parietal lobe that controls your sense of touch. It would be used to help you sneak candy into the movie theatre in step one by feeling the large backpack you would need to carry stuffed with Reeses.

Step 2: Food Up

Step 3: Walk Up

Step 4: Eat Up

Sneaking cheaper candy into the movie theater

Contraband candy tastes better.

Here's how to make the magic happen:

Step 1: Bag Up. Large purses come in handy here. Ladies, pull out the fattest potato sack you got and sling it across your shoulder with pride. For everyone else, you can try a bulky backpack or shopping bag. Business folks can pull off the classy briefcase. Moms can use the false bottom of a diaper bag. The only thing to avoid are *Matrix*-style trench coats with burrito dents in all the inside pockets.

Step 2: Food Up. Stuff that puppy with gummy worms, bubble tape, and cinnamon buns. If you're feeling risky, throw in a couple cold and slippery cans of soda, a bag of microwave popcorn, or a pocket flask. Know your limits, though. Steamy meatball subs and hot soups in thermoses are for experts only.

Step 3: Walk Up. Confidence is everything. Hold your head high, strut a mean strut, and you'll be