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First Grade Lesson Plan Example

Introduction

- Who are we?
- Where are we from?
- What are we doing/ Why are we here?

Brainstorming

- Where is your brain?
- What does your brain do?
- What does it look like?
- What do you want to learn?/ What questions do you have?

Separate into Three Groups

- Station 1: Pin the Function on the Brain
    - Introduction to lobes and general functions of each (as labeled on a poster with a lateral view)
    - Have construction paper with different functions, each student will pin the function in the appropriate area.
- Station 2: Overview of the lobes
    - Each student will get a balloon and draw the lobes on the balloon with a marker
    - Give each student the coloring book brain picture 1-1 from *The Human Brain Coloring Book* (Diamond, Scheibel & Elson, 1985)
    - Give general information about each lobe and the cerebellum
        - Frontal: future planning
        - Parietal: math and spatial reasoning
        - Temporal: hearing
        - Occipital: vision
        - Cerebellum: balance and coordination of movement
    - Show a poster of a homunculus
- Station 3: Wet Brain Viewing
    - Point out lobes and special characteristics
        - Gyrencephalic vs. lissencephalic
        - Brain at birth is very soft and 1/3 the adult size
        - Brain floats in the cranium in CSF
        - Contralateral directions of movement

Wrapping it Up, Come Back Together as a Group

Brain Communication

- Introduction to neurons (have a poster representation of a neuron)
- Make a human representation of neuronal communication
    - Have students hold hands in a circle and pass a hand-squeeze down the line
    - Show how the information travels

The Value of Your Brain

- Emphasis on “Use It or Lose It”
- Why helmets and protection are so important

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Second Grade Lesson Plan Example

Introductions

- Who are we?
- Where are we from?
- What are we doing/ Why are we here?

Check for Prior Knowledge

- What do they know about the brain already?
- Where is the brain?
- What does the brain do? How do you use your brain?
- How big is your brain?
- What is the texture of the brain?
- Do you think your brain is different from your friends' or are all our brains exactly the same?
- What color and shape is the brain?

Gross Brain Anatomy and Function

- Brain picture 1-1 from *The Human Brain Coloring Book* (Diamond, Scheibel & Elson, 1985)
- Each student gets their own copy of the picture
- Have the same picture on a large poster so we can color along with them
- Each lobe will be colored a different color while talking through the structures and functions
- Explains function of the lobe before we color and do a short activity that uses the particular lobe before we color it
    - Frontal lobe: What do you want to be when you grow up? (Future planning)
    - Parietal lobe: What is 2+2? (Math, spatial and reasoning tasks)
    - Temporal lobe: Telephone game – tell something to a student and have them pass the message around the circle. (Hearing)
    - Occipital lobe: Play "I Spy". (Vision)
    - Cerebellum: Play "Simon Says". (Coordinating movement)

Neurons

- Function: The way the body communicates with the brain
- Pass a ball around the circle to demonstrate how neurons communicate
- Make a candy model of a neuron
    - Cookie :: soma
    - Frosting :: cytoplasm
    - M&M :: nucleus
    - Licorice strings :: red-dendrites, black-axon

Wet Brain Viewing

- Break into two groups for wet brain
    - Group 1: Human Brain
        - Point out different lobes and what separates them
        - Review functions
    - Group 2: Animal Brain(s)
        - How is it different from the human brain (size, shape, texture, etc?)
        - What animal do you think this is from?

Question and Answer

- Emphasize the importance of the brain (use it or lose it) and keeping it safe (wearing a helmet, etc.)

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Third Grade Lesson Plan Example

Introductions

- Who are we?
- Where are we from?
- What are we doing/ Why are we here?

Exercise for Lissencephalic and Gyrencephalic Brains

1. Give each student a small paper cup and a sheet of paper that must be crumpled up in order to fit inside the cup
2. Talk about how it is not size that determines intelligence, but the amount of surface area
3. Explain the terms "gyrus" and "sulcus" and equate these terms to the bumps and crinkles in the sheet of crumpled paper
4. On a model of a brain, point out gyri and sulci

Brain Structures and Function

- Hand out coloring sheet 1-1 from *The Human Brain Coloring Book* (Diamond, Scheibel & Elson, 1985)
- Using a poster, define the locations and purpose of each area
    - Frontal lobe: forethought, planning, analysis of consequences
    - Parietal lobe: spatial abilities
    - Occipital lobe: vision
    - Temporal lobe: language and auditory information
    - Cerebellum: motor control
    - Brainstem/spinal cord: brain communication with body/muscles
- The students color the sheet as they are introduced to each area.

Homunculus

- With a large poster of a homunculus, ask for guesses about what it represents
- Talk about how more cortical area is devoted to hands and lips than legs and back
    - Epicritic Senses Demonstration: ask students to poke the palm of their hand simultaneously with two fingers, then do the same on their back (they may need to partner up for this exercise)
    - Explain epicritic sensations as it relates to the homunculus

Cerebrospinal Fluid

- Ask 2/3 of the students to make a large circle and the other 1/3 to make a smaller circle inside the larger one. One person can stand in the middle to represent the brain. The inner circle can be explained to represent the cerebrospinal fluid, while the outer circle represents the skull.

The Neuron

- Show a large poster representation of a neuron
- Ask the students what they know about neurons
- Use poster and explain each part and function (soma=body, axon=sends info, dendrites=receive info)
- Organize the students into a representation of two neurons with dendrites, soma and an axon. Pass a ball from dendrites to soma, down the axon, then to the dendrites to the next neuron

Wet Brain Viewing

- Review structures and functions.
- Show animal brains and examine differences.
- Answer any questions

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Fourth Grade Lesson Plan Example

Introductions and Nametags

- Who are we?
- Where are we from?
- What are we doing/ Why are we here?

Myth or Fact Jeopardy

- See Myth/Fact Sheet for questions

Brain Structure and Function

- Include a large poster representation of the four cerebral lobes
- Demonstrate the location by having a student volunteer wear a swim cap, on which the lobes, cerebellum and brainstem are drawn
    - Frontal lobe: forethought, planning, analysis of consequences
    - Parietal lobe: spatial abilities
    - Occipital lobe: vision
    - Temporal lobe: language and auditory information
    - Cerebellum: motor control
    - Brainstem/spinal cord: brain communication with body/muscles
- Explain contralateral control

The Neuron

- Introduce the neuron with a large poster representation
    - Axons: send information
    - Dendrites: receive information
    - Soma: cell body
    - Synaptic transmission: a general overview of how it occurs
        - Synapse activity: Organize the students into a representation of neurons with a few student dendrites, one student soma and a couple students for the length of the axon (per neuron). Pass a ball from dendrites to soma, down the axon, then to the dendrites to the next neuron
- Myelination: explain its purpose in speedy synaptic transmission
- Drug effects on transmission: too much or too slow, depending on the drug

Hands on Stations

- Separate into three groups
    - Station 1: Visual Adaptation demonstration – using prism goggles, see how long it takes the brain to adapt to a shifted visual field
    - Station 2: Balance demonstration (visual inputs to vestibular system) – spinning and balancing on one foot
    - Group 3: Wet Brain Viewing
        - Review the lobes and their functions
        - Talk about the difference between lissencephalic and gyrencephalic brains, examine differences between the human brain and animal brains
        - Discuss safety, consistency of live tissue, and why it is important to wear a helmet

Conclusion

- Review the Myth/Fact Sheet
- Reiterate safety
- Answer questions

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Fifth Grade Lesson Plan Example

Introductions and Nametags
- Who are we?
- Where are we from?
- What are we doing/ Why are we here?

Myth or Fact Jeopardy
- See Myth/Fact Sheet for questions

Brain Structure and Function
- Include a large poster representation of the four cerebral lobes
- Demonstrate the location by having a student volunteer wear a swim cap, on which the lobes, cerebellum and brainstem are drawn
    - Frontal lobe: forethought, planning, analysis of consequences
    - Parietal lobe: spatial abilities
    - Occipital lobe: vision
    - Temporal lobe: language and auditory information
    - Cerebellum: motor control
    - Brainstem/spinal cord: brain communication with body/muscles
- Explain contralateral control
- Consider including a picture of a medial view and discussing the limbic lobe

Homunculus
- With a large poster of a homunculus, ask for guesses about what it represents
- Talk about how more cortical area is devoted to hands and lips than legs and back
    - Epicritic Senses Demonstration: ask students to poke the palm of their hand simultaneously with two fingers, then do the same on their back (they may need to partner up for this exercise)
    - Explain epicritic sensations as it relates to the homunculus and cortex

The Neuron
- Introduce the neuron with a large poster representation
    - Axons: send information
    - Dendrites: receive information
    - Soma: cell body
    - Synaptic transmission: a general overview of how it occurs
        - Synapse activity: Organize the students into a representation of neurons with a few student dendrites, one student soma and a couple students for the length of the axon (per neuron). Pass a ball from dendrites to soma, down the axon, then to the dendrites to the next neuron
- Explain and show the difference between grey and white matter (cell bodies vs cell axons)
- Myelination: explain its purpose in speedy synaptic transmission
- Drug effects on transmission: too much or too slow, depending on the drug
- Developmental stages in spines on dendrites: show slides that demonstrate the difference between a young brain, an old brain, and an Alzheimer's brain

Hands on Stations
- Separate into three groups
    - Station 1: Visual Adaptation demonstration – using prism goggles, see how long it takes the brain to adapt to a shifted visual field

- Station 2: Balance demonstration (visual inputs to vestibular system) – spinning and balancing on one foot
- Group 3: Wet Brain Viewing
  - Review the lobes and their functions
  - Talk about the difference between lissencephalic and gyrencephalic brains, examine differences between the human brain and animal brains
  - Talk about safety, the consistency of live tissue, and why it is important to wear a helmet
  - Show major sulci
  - Explain and show Wernicke's and Broca's areas
  - Talk about the layers protecting the brain as well as cerebrospinal fluid

Conclusion

- Review the Myth/Fact Sheet
- Reiterate safety
- Ask them why it might be important to understand your brain
- Answer questions

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