ScratchJr Coding Brain

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Goal

The goal of this 3 day lesson plan is to introduce children to the basics of neuroscience and psychology in a fun and creative way, while also strengthening their ScratchJr skills.

Summary

Lesson 1: The Brain Parts
Children learn about the 4 main lobes of the brain and begin their ScratchJr brain project

Lesson 2: The Brain in Action
Children learn about some of the functions associated with each lobe of the brain and think about different actions that elicit different types of brain activity

Lesson 3: The Brain Activated
Children learn how brain activity is measured and get to see examples of different types of brain activity

Optional Resources

Slide deck:
https://docs.google.com/presentation/d/1GWQ1ui_LBjTYj9nFTtUflQxV-Q2qe_ApGF1zvwbZias/edit?usp=share_link

Starter project:
https://drive.google.com/file/d/1vp0iEyXPAOMHpUzvoehXHVuP8nuYfVep/view?usp=share_link

Printable ScratchJr Blocks: http://scratchjr.org/pdfs/blocks.pdf

Lesson 1:

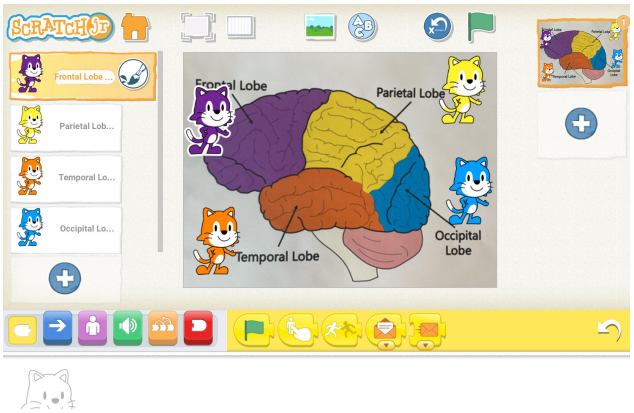
Warm up (5 minutes)
Ask children what they think their brain helps them do? You can get the ball rolling by giving examples such as talking, dreaming, or juggling! Write down each child's idea to make a list of things we think our brain does.

Discussion (10 minutes)

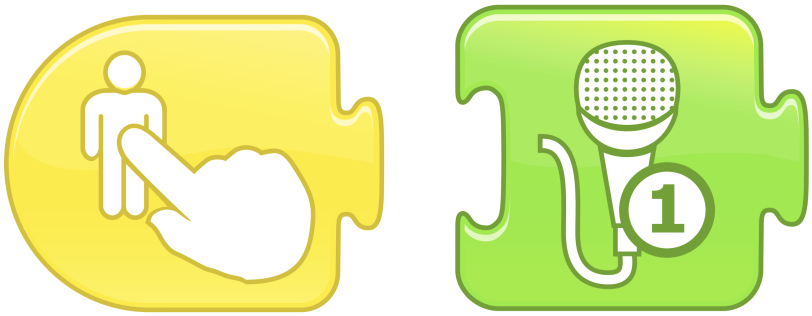
- Review the list you've just made as a class and acknowledge that the brain helps us do many things.
- Explain that the brain can do so many things because it has many different parts. Describe the brain as a team of parts that work together. Rather than one person doing everything, the brain is more like a bunch of people in charge of different things and they work together to tell the body what to do.
    - Ask the class: What helps a team work together?
        - Talking to one another! The same is true with the brain: all the parts talk to each other and work together to make things happen.
    - Give an example: When you are **writing,** your brain controls the movement of your hand, remembers which letters you want to write, and plans out the words you want to say.
- Tell the children that the different parts of the brain are called **lobes**. Introduce the four main lobes: Frontal, Parietal, Temporal, Occipital
    - Display a picture of the lobes highlighted
    - Give children time to practice saying each of the names
    - Let the children guess what they think each lobe might do, tell the children that in the next class they'll get to see if their guesses are correct.

ScratchJr Time (15 minutes):

- Introduce the ScratchJr Interface to the children by going through an interface guide together
- Explain that today, they will be working on a Coding Brain Project in ScratchJr, to help them remember what they are learning about the brain
- Assist each child on importing the ScratchJr Coding Brain Starter project (Starter projects will need to be sent to children's devices ahead of time)



- Introduce the two ScratchJr blocks the children will be using today:



- For the first page of their project, children will practice saying each lobe name, by programming the corresponding cat to say that name when tapped on. If children wish to use their spelling and typing skills, you can have the children use the “Say” block rather than the record block.

Project Time (15 minutes):

- Give the children time to start their projects. Make sure each child creates a program for each cat, once done, they can use the rest of the time to customize their project however they’d like.

Lesson 2:

Warm up (5 minutes)

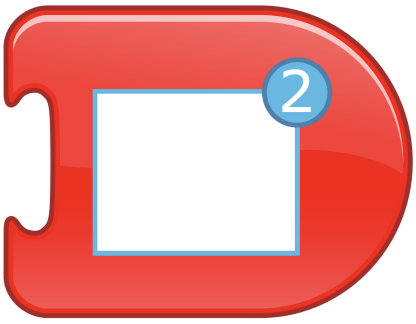
- Ask the children what they remember from the last lesson:
  - What do you think your brain does?
  - What are the parts of the brain called?
  - What were their guesses for what each part of the brain does?

Discussion (15 minutes):

- Tell children that today, we are going to learn what each part of the brain does!
    - Remind the children that the brain parts are a team and they all work together.
- Go through the different functions associated with each lobe, giving examples and asking the children to think of examples throughout.
    - Frontal: Talking, Moving, Planning, Making Decisions, Concentrating
    - Parietal: Touching/Feeling
    - Temporal: Listening, Learning, Memory
    - Occipital: Seeing

ScratchJr Time (5 minutes):

- Explain to children that today they will be programming the actions that the brain controls!
- They will be adding new pages to their ScratchJr projects, so that when they tap on a brain area, it will say the name of the brain area, and then go to a page that shows an action that the brain area controls.
    - For example, when they tap the Frontal Lobe, it will say “Frontal Lobe” and then take them to a page that has a character dancing, because the frontal lobe controls movement.
- Review how to add a page and connect the pages with a program using the go-to page block



Project Time (15 minutes):

- Give the children time to start their projects. Make sure each child creates at least one additional page. If they finish, have them program more pages and/or add a voice recording to their additional pages describing the action they are showing on that page.
    - Example: Page 2 has a character dancing, and a voice recording that says “The frontal lobe controls movements like dancing”

Sharing Time (5 minutes):

- Have the children share the page of their project that they worked on. Have each child share one they like about their own project, and a different thing they like about someone else's project.
- Tell the children that next class, they will be finishing their projects and presenting them in a Project Showcase

Lesson 3:

Warm up (5 minutes)

- Ask the children what they remember from their projects and what they would like to add today!

Discussion (15 minutes):

Brain Activity

- Remind the children that last time, they learned about which parts of the brains control different actions. Today, they will be learning about how neuroscientists figured that out!
    - **Neuroscientists** are scientists that study the brain
- The way neuroscientists study the brain is to look at brain activation when people do different actions
    - **Brain activation** means when your brain is active or working!
- Neuroscientists can tell which parts of the brain control for different actions, based on how active the different parts are during the actions
- How do they see activity? Have all the children practice flexing their muscles. Explain that when your muscles are active, a lot of blood goes to them to help them work, which makes them big and hard when you flex them!
- The same is true for the brain, when you are doing an action, there will be more blood in the most active parts of the brain.

Measuring Brain Activity

- Explain to children that we have different tools to measure how much blood is in the brain, one is fMRI - which is sort of like an X-ray for your brain, and will show you how much blood is in each part.
- Show children images of different activated areas

Project Time (15 minutes):

Give children time to continue working on their brain projects. Encourage children to add more pages for different parts of the brain and to add voice recordings to explain what each page is showing.

Project Showcase (10 minutes):
Conclude the class with a Project Showcase, where each child can display their work for their peers. Invite other children, teachers, or family members as the setting permits. Encourage guests to ask children questions about why they made their projects the way they did and to ask them what they are most proud of from the project.