Learning Guide

The Brain

We hope you enjoyed learning all about how our brains work. Extend your learning with this print-ready Learning Guide!

What's in this Learning Guide?

Get Set to Listen:
Check your knowledge before and after listening to the episode by determining if statements are TRUE or FALSE.

Vocabulary

Discussion Questions
CCSS.ELA-Literacy.SL.3-8.1; CCSS.ELA-Literacy.SL.3-8.3

Writing Prompts and Extension Projects
CCSS.ELA-Literacy.W.3-8.1; CCSS.ELA-Literacy.W.3-8.2; CCSS.ELA-Literacy.W.3-8.3; CCSS.ELA-Literacy.W.3-8.4; CCSS.ELA-Literacy.W.3-8.7; CCSS.ELA-Literacy.W.3-8.8

Game: "Pass the Signal" - Understanding Synapses
NGSS LS1.A & LS1.D: MS-LS1-3 & HS-LS1-2

Inside My Brain
NGSS: LS1.A & LS1.D: MS-LS1-3; CCSS.ELA-LITERACY.W.5.2

Brain Diagram

Upstairs & Downstairs Brain: Activity & Scenario Cards
NGSS: LS1.A & LS1.D: MS-LS1-3; NHES: Standards 1, 2, &5; CASEL: Self-awareness, Self-management, Responsible decision-making; CCSS.ELA-LITERACY.W.5.2

Calm Your Brain
NGSS: LS1.A & LS1.D: MS-LS1-3; NHES: Standard 2; CASEL: Self-awareness, Self-management

Additional Resources and Book & Film List

The Children's Hour
kids public radio

https://www.childrenshour.org/the-brain/

Get Set to Listen

1. Before listening!

Read each statement and write TRUE or FALSE based on what you already know.

2. After listening!

Based on what the experts said in the episode, write TRUE or FALSE.

Before Listening	TRUE or FALSE?	After Listening
	1. The left part of your brain tells the right part of your body what to do, and the right part of your brain tells your left side of the brain to do.	
	2. If someone has a brain injury, other parts of the brain can take over the function of the damaged parts.	
	3. As you grow, your brain develops more and more connections, but then in your teen years, your brain gets rid of some of those connections.	
	4. We only use 10% of our brains.	
	5. The wrinkles in your brain maximize what your brain is able to do. Mice don't have wrinkles in their brains the way humans do.	
	6. The brain uses electricity and chemicals to communicate with the body.	
	7. People stop being able to change their brains when they become adults.	

What did you learn?

_____

_____

_____

Get Set to Listen

Answer key

1. TRUE
2. TRUE
3. TRUE. The more you use a skill, the stronger the pathway gets. The pathways you don't use get weaker and weaker until they disappear. This is called "dendritic pruning" and allows for the pathways that remain to get faster and stronger, making you better at the things those pathways allow you to do.
4. FALSE. We use all of our brains, but sometimes certain parts of the brain are more or less active during different activities, like sleeping.
5. TRUE
6. TRUE
7. FALSE. Being able to change your brain, called **neuroplasticity**, can happen at any time in your life. However, the most important periods of neuroplasticity are when we're newborns, adolescents, and early to mid-adulthood.

Vocabulary

frontal lobe	Part of the brain that controls thinking, problem-solving, planning, decision-making, and self-control.
temporal lobes	Part of the brain that helps with hearing, understanding language, and memory.
occipital lobe	Part of the brain that processes what you see and helps you understand visual information.
amygdala *a.k.a. "lizard brain"*	Part of the brain that controls emotions, especially fear and anger.
brain stem	Connects the brain to the spinal cord and controls basic functions like breathing, heart rate, and digestion.
cerebellum	Part of the brain that controls balance, coordination, and movement.
parietal lobe	Part of the brain that processes sensory information, like touch, temperature, pain, body position, and spatial awareness.

Vocabulary

stroke	When blood flow to the brain is blocked or a vessel bursts, causing brain damage that can affect movement, speech, or memory.
neuroplasticity	The brain's ability to change and adapt by forming new connections between neurons, especially after learning or injury.
neuroimaging	The use of technology to take pictures of the brain to study its structure and activity, such as MRI or CT scans.
neurons	The nerve cells that send and receive messages in the brain and nervous system.
synapses	The tiny gaps between neurons where signals are passed from one neuron to another using chemical or electrical messages.

Discussion Questions

1. What do you think the brain's main job is?
2. What might happen if part of your brain stopped working properly?
3. How does your brain communicate with the rest of your body?
4. Why do different people react differently to the same situation?
5. What happens in your brain when you feel happy, sad, or scared?
6. Can you think of ways to keep your brain calm when you feel stressed?
7. How does practice help your brain learn new skills?
8. What can you do every day to keep your brain healthy?
9. If you could design a "super brain," what special abilities would it have?
10. What do you think your brain is doing right now as you answer these questions?

Group Discussion Strategies

Think Pair Share:
1. Individually, student writes down their answer to a question.
2. Students pair up and tell each other their answers.
3. Teacher calls for volunteers to share with the whole class their answer (and/or their partner's answer). Teacher notes key words/phrases on board.

Round Robin:
1. Teacher poses one question (written on top of a large page) to students, who are assembled into small groups of 3 or 4.
2. Students take turns brainstorming the answers. The recorder of the group writes down all answers.
3. The leader reads the group's ideas to the entire class. Teacher moderates.

Writing Prompts

Narrative Prompts

1. Imagine you could shrink down small enough to travel inside your own brain. What would you see and experience on your journey?
2. You wake up one morning and discover you can read people's thoughts! What happens next?
3. Write from the point of view of your brain — what would it say about you and your daily habits?

Extensions:

- Draw a "map" of your brain adventure.
- Create a short comic showing how neurons send messages.

Informative/Explanatory Prompts

1. Explain how the brain controls different parts of your body.
2. Describe what happens in the brain when you learn something new.
3. Write about how sleep, food, and exercise affect your brain's health.
4. Explain how memory works and how you can strengthen it.
5. Describe the different parts of the brain and what each one does.

Extensions:

- Label a brain diagram with the parts and their functions.
- Research a famous neuroscientist or brain discovery and share your findings.
- Conduct a simple "memory experiment" with classmates and write about your results.

Opinion/Persuasive Prompts

1. Should students have more recess or brain breaks during the school day?
2. Do you believe your brain gets stronger from mistakes? Defend your opinion.

Extensions:

- Create a poster or infographic encouraging "brain-friendly" habits.
- Write a letter to your principal suggesting new activities to help students' brains stay healthy.

Game: “Pass the Signal!” Understanding Synapses

Play this fun game to learn how neurons send messages through synapses using electrical and chemical signals.

Materials

- Ping pong balls, pom-poms, or small paper balls (to represent neurotransmitters)
- Hula hoops, rope circles, or floor spots (to represent neurons)
- Signs or labels for: Dendrite, Axon, Synapse, Neurotransmitter
- *Optional: colored string or tape to connect neuron stations*

Setup

Create a “neural pathway” on the floor with several “neuron stations” (hula hoops or circles).
Each station represents one neuron, and the space between them is the synapse.
Place a few “neurotransmitters” (ping pong balls or pom-poms) in each neuron’s “axon end.”

How to Play

Divide the class into small groups—each group will form a neural network.
Within each group:

- One student is the axon terminal (sender).
- One is the dendrite (receiver).
- The others can help “transport” the message.

When the teacher says “Send the signal!”, the first neuron passes a “neurotransmitter” (ball) across the synapse to the next neuron.
You can toss or roll the ball (chemical signal) carefully from one circle to the next.
The next neuron catches it and shouts “Signal received!”, then sends it on.
Continue until the message travels through all neurons to the end of the pathway.

Add Challenges

Inhibitors: Have one student block the signal (representing drugs, fatigue, or stress).
Exciters: Add extra neurotransmitters to speed up the message.
Brain Tasks: Each time the message passes through, call out a “brain function” (move a muscle, remember a word, feel an emotion).

Discuss

- *“What happened when the message didn’t pass across the synapse?”*
- *“How does this compare to what happens in the real brain?”*
- *“What helps our brains send messages faster or more clearly (sleep, nutrition, practice)?”*

Extensions

- Draw a diagram of what happened in the game, labeling dendrites, axons, and synapses.
- Write a short paragraph explaining how neurons “talk” to each other.
- Create a class “neural network” mural showing how signals travel through the brain.

Inside My Brain

Learn

Watch the video [The Brain for Kids: How Does the Brain Work?]
Listen to [*The Children's Hour* episode "The Brain"].
Listen to the song ["I Love You with All My Brain" by Taylor Woodward].
Study the "Brain Diagram" in this Learning Guide.

Create

Think of an activity you enjoy doing. Use the "Inside My Brain" activity diagram to map out what is happening in each of the parts of the brain when you are doing that activity.

Example

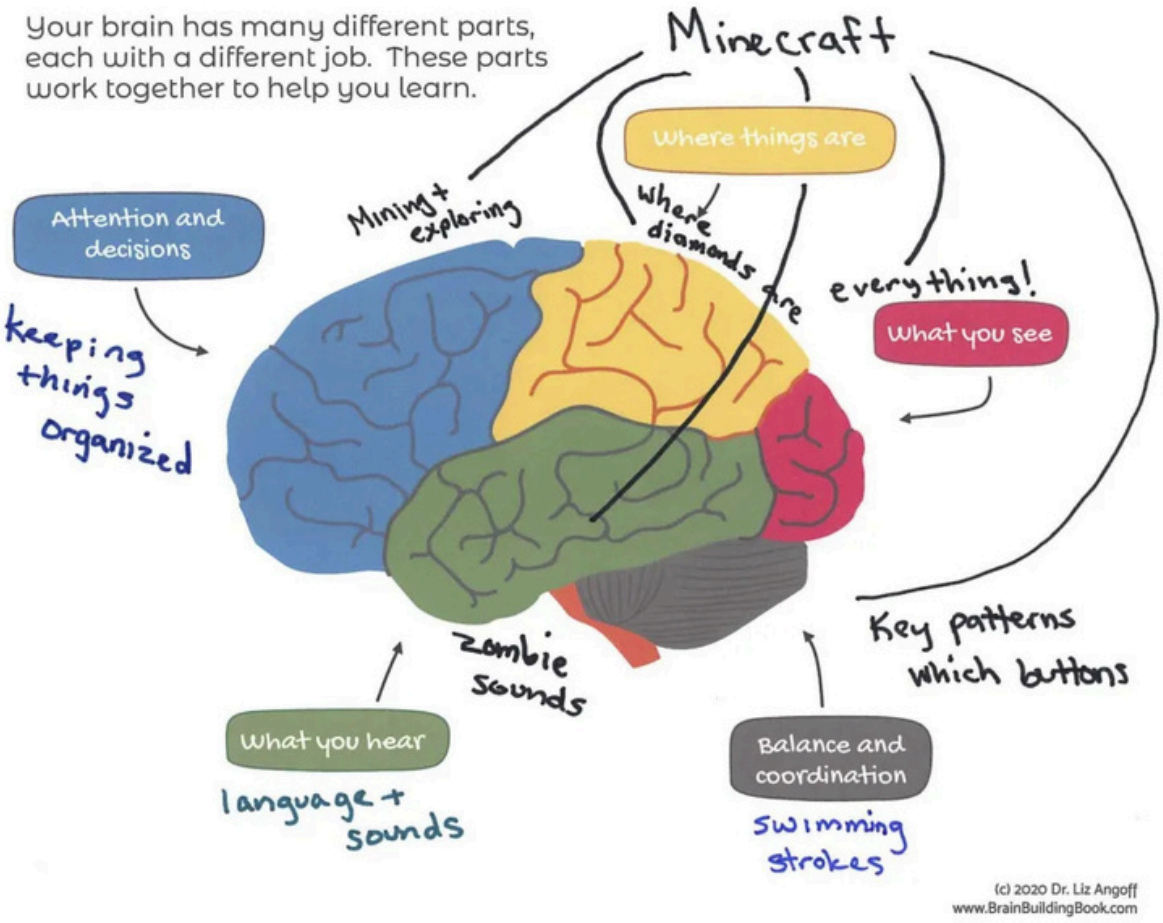


Image [source]

Inside My Brain

What's going on in my brain?

An **activity** I enjoy doing is _____.

Label each part of the brain and **describe** what is happening in each part of the brain when you are doing that activity. Use the brain diagram, example, and other resources.

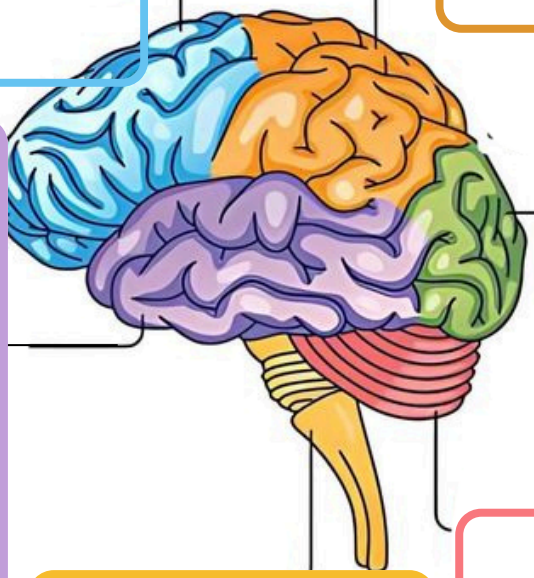
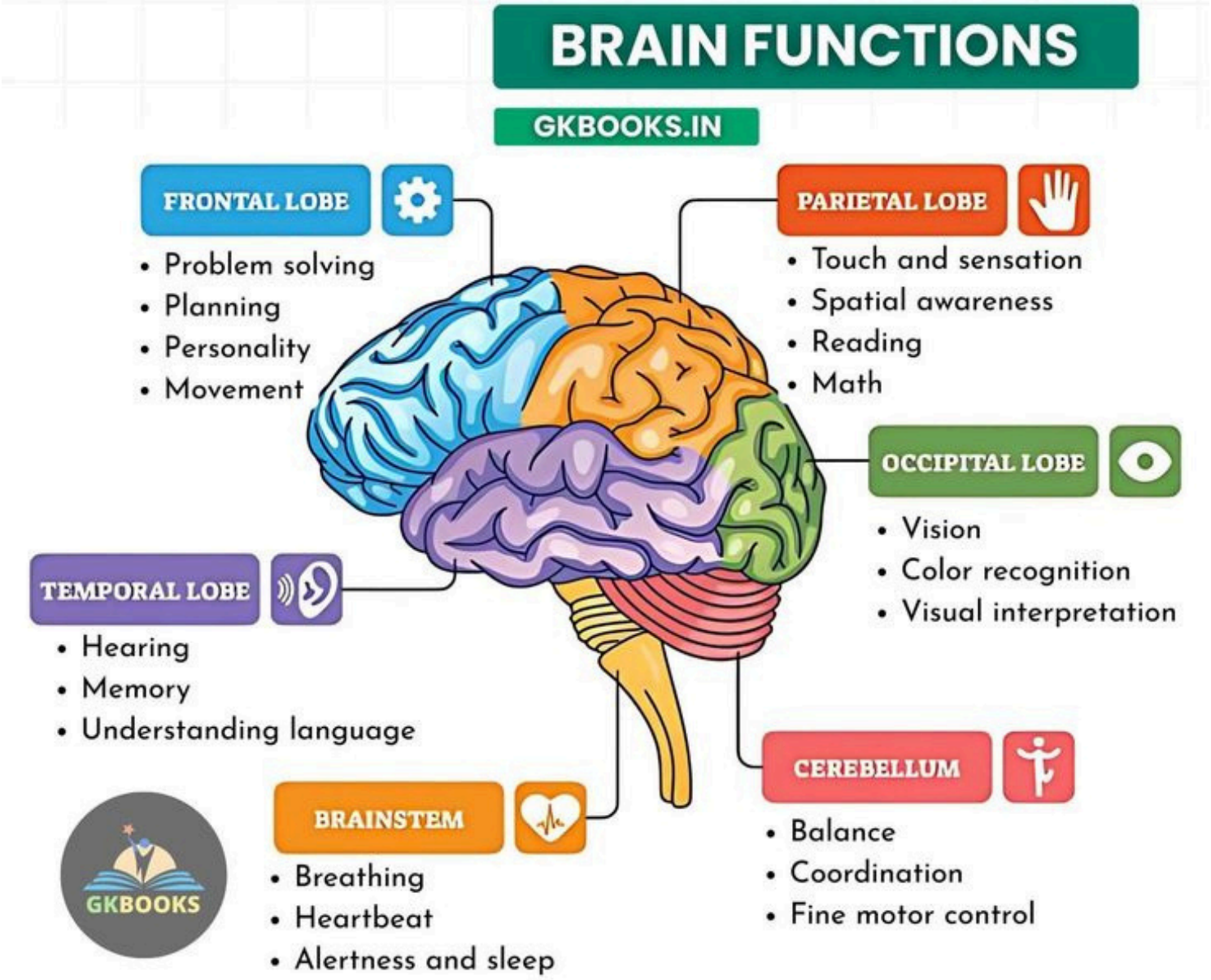


Image modified from this source

Brain Diagram



● **Frontal Lobe** – Responsible for problem solving, planning, personality, and movement.

● **Parietal Lobe** – Controls touch and sensation, spatial awareness, reading, and math.

● **Temporal Lobe** – Involved in hearing, memory, and understanding language.

● **Occipital Lobe** – Handles vision, color recognition, and visual interpretation.

● **Cerebellum** – Maintains balance, coordination, and fine motor control.

● **Brainstem** – Regulates breathing, heartbeat, alertness, and sleep.

● The brain works as an integrated system where different lobes coordinate for higher functions and survival activities.

Image source

Upstairs & Downstairs Brain

Sometimes our emotions can take over and make it hard to think clearly or make good choices. In this lesson, we'll learn about the "Upstairs Brain" — the part that helps us think, solve problems, and show kindness — and the "Downstairs Brain" — the part that controls our strong feelings and reactions. By understanding how our brains work, we can recognize when our Downstairs Brain is in charge and practice ways to calm down and bring our Upstairs Brain back online.

Watch

the video **Brain Science for Kids: Thinking and Feeling** to learn about the "upstairs brain" and "downstairs brain," which show how different brain parts control our emotions and reactions.

Create

Write or draw what happens in your upstairs and downstairs brain on the "Upstairs and Downstairs Brain" activity sheet.
Use **this Upstairs and Downstairs Brain resource**, or make your own.

Practice Scenarios

Read or act out the "Scenario Cards". Demonstrate with your hand which brain is in charge:

Discuss

- *"How does it feel when the Downstairs Brain takes over?"*
- *"What could you do to get your Upstairs Brain back online?"*

Calm Your Brain

Brainstorm and model ways to calm the Downstairs Brain.
Use the activity sheet to share your ideas with us at *The Children's Hour!*

Extensions

- Write about a time you flipped your lid. What helped you calm down?
- Make a poster displaying "Ways to Help Our Upstairs Brains Stay in Charge"
- Students act out a short scene showing a problem and how they used their Upstairs Brain to solve it.

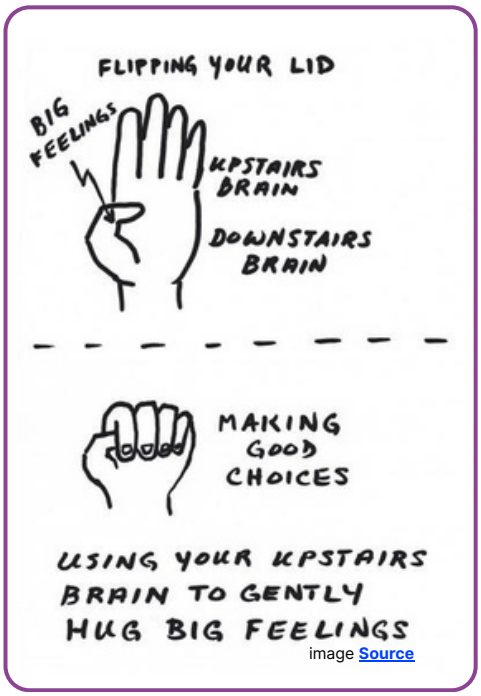


image Source

Activity inspired by concepts from *The Whole-Brain Child: 12 Revolutionary Strategies to Nurture Your Child's Developing Mind* by Daniel Siegel & Tina Bryson Payne

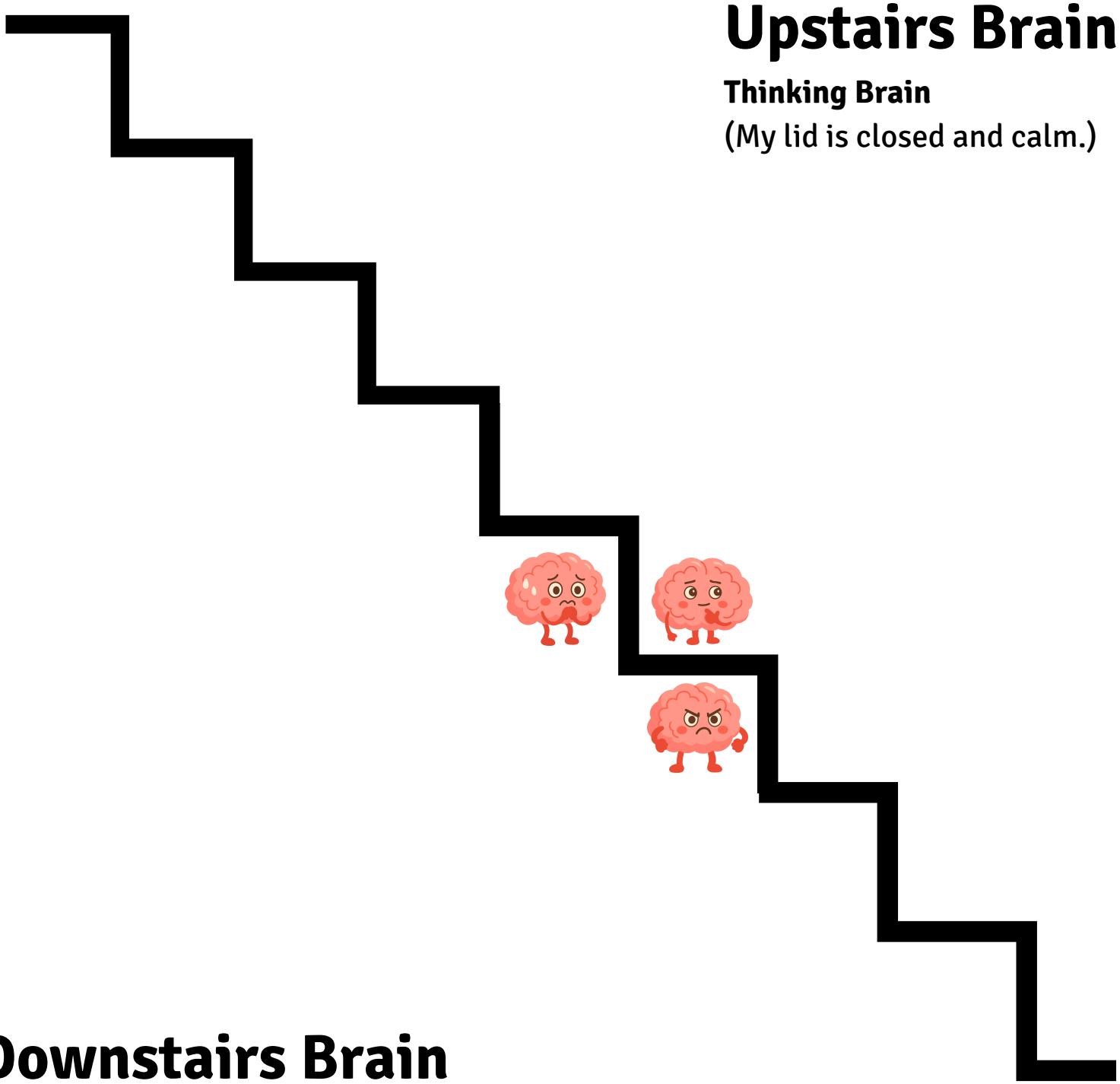
Activity: Upstairs & Downstairs Brain

Directions: Write or draw what happens in your upstairs and downstairs brain.

Upstairs Brain

Thinking Brain

(My lid is closed and calm.)



Downstairs Brain

Emotional and Survival Brain

(My lid is flipped.)

Activity inspired by concepts from *The Whole-Brain Child: 12 Revolutionary Strategies to Nurture Your Child's Developing Mind* by Daniel Siegel & Tina Bryson Payne

Activity: Upstairs & Downstairs Brain

Directions: Write or draw what happens in your upstairs and downstairs brain.

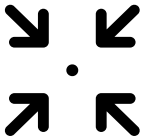
Upstairs Brain

Thinking Brain State

(My lid is closed and calm.)

decision making

organizing



creativity

focus

empathy

survival and safety

problem solving

calm

planning

big emotions

fear

ready to learn

threat

fight, flight, or freeze

worry

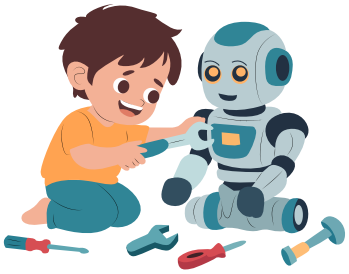
Downstairs Brain

Emotional and Survival Brain State

(My lid is flipped.)

Activity inspired by concepts from *The Whole-Brain Child: 12 Revolutionary Strategies to Nurture Your Child's Developing Mind* by Daniel Siegel & Tina Bryson Payne

Scenario Cards: Upstairs & Downstairs Brain

You are building a robot. 	A classmate cuts in line. 
You are working on a tricky math problem. 	Your friend won't play your game. 
Someone pushes you, and you accidentally spill someone's drink. 	You win a game at recess. 

Activity inspired by concepts from *The Whole-Brain Child: 12 Revolutionary Strategies to Nurture Your Child's Developing Mind* by Daniel Siegel & Tina Bryson Payne

Calm Your Brain

Brain scientists Ingrid Lane and Nick Aase from the Mind Research Network talk about the importance of having a calm brain in ***The Children's Hour's "The Brain" episode*** *(segment 31:38-32:34).*

Practice these calming strategies to activate your upstairs thinking brain:

- Deep breathing ("Smell the flower, blow out the candle")
- Counting slowly to 10
- Taking a break or getting a drink of water
- Talking to a trusted adult
- Moving your body (stretch, walk, squeeze a stress ball)

Share

What are some other ways you can calm your brain so that you can think, learn, and make good choices?

Upload your ideas to our Instagram **@tchradio**, TikTok **@thechildrenshourradio**, and **Facebook page**, and check out others' ideas!

Mail your ideas to:
The Children's Hour
PO Box 70236
Albuquerque, NM 87197

Record a Voice Message
This might be used on The Children's Hour!

Additional Resources

What is the Brain? wiki
An article and collection of activities and resources for teaching kids about the brain from Twinkl.

22 Brain Exercises to Improve Memory, Cognition, and Creativity
Check out this list published in *Medical News Today*.

13 Brain Exercises to Help Keep You Mentally Sharp
This list from *Healthline* has a few more exercises to improve memory, focus, and daily functionality.

Physical Activity Boosts Brain Health
This article from the CDC explains the guidelines and recommendations.

Brain-Building Through Play: Activities for Infants, Toddlers, and Children
This collection of articles from the Center on the Developing Child from Harvard University describes games to play with children of all ages.

12 Revolutionary Strategies to Nurture Your Child's Developing Mind, Survive Everyday Parenting Struggles, and Help Your Family Thrive

Videos

How Your Brain Works? - The Dr. Binocs Show from Peekaboo Kidz
A short animated video for younger kids about what the brain is and how it works.

The Brain for Kids: How Does the Brain Work?

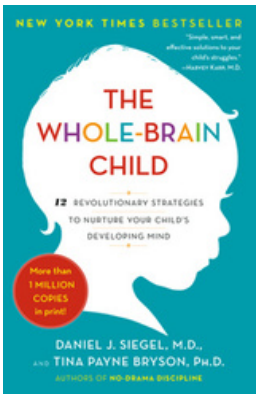
How to Draw The Human Brain Step by Step from Super Easy Drawings
And just for fun, learn how to draw the brain!

10 Brain Gym Exercises to Improve Memory, Focus, and Strengthen Your Mind
These fun body-brain exercises make a great brain break for kids or adults.

The Science of Emotional Regulation: How Our Brains Process Emotions
This video explains the science behind how our brains process information that leads to emotional responses.

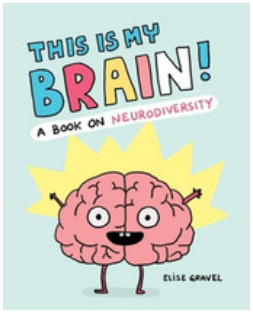
What Are Emotions? by Bluejack Kids
A great tool for helping young kids recognize different emotions.

Book & Film List



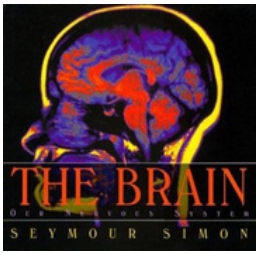
The Whole-Brain Child: 12 Revolutionary Strategies to Nurture Your Child's Developing Mind
by Daniel J. Siegel and Tina Payne Bryson

Practical strategies to help parents use brain science to turn children's emotional outbursts into opportunities for healthy emotional and intellectual growth.
a book for adults about kids



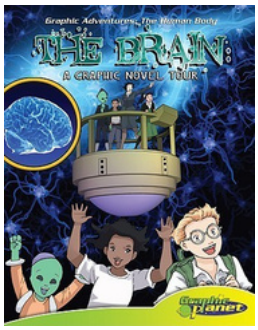
This is My Brain! A Book on Neurodiversity
by Elise Gravel

A hilariously informative book about the brain! Award-winning author-illustrator Elise Gravel explores the amazing ways humans think in a comic-style nonfiction book for curious kids.
ages 8-12



The Brain: Our Nervous System
by Seymour Simon

A classic non-fiction book that provides a detailed look at the nervous system.
ages 3-12



The Brain: A Graphic Novel Adventure
by Joeming Dunn, illustrated by Rod Espinosa

Travel through the nervous system and the brain to discover how neurons work and all the amazing functions of the human brain.
Available on **Epic!**
ages 8-10

Inside Out
by Pixar Studios

Inside Out follows the emotions—Joy, Sadness, Anger, Fear, and Disgust—inside a young girl's mind as they guide her through life's challenges and help her navigate change and growing up.
PG