Meet the Human Brain Lesson Plan

Target Concepts

- Humans have complex brains to manage their complex lives.
- Humans have a *feeling brain* (i.e., limbic system) and a *thinking brain* (i.e., cortex).
- Myg and Buster are located in the *feeling brain*.
- Both Myg and Buster can be trained to react less impulsively through a variety of Taming Tool strategies: mindfulness, physical exercise, playing with friends, and practicing gratitude.

Lesson Preparation

- ✓ Read and/or review the video, script, lesson plan, and handouts
- ✓ Print "Animal Buster Bams in a Hat" review worksheet (one copy for instructor)
- ✓ Review and prepare "Mouse Brain/Human Brain" primer PowerPoint
- ✓ Print "Thinking Cap" worksheet (one per student)
- ✓ Print "Home Letter" and "Meet the Human Brain Book" (one per student)

Review

This review activity is designed to activate students' learning from the previous lesson. Students are asked to review the function of the basal structures and impulses/reactions that come from Buster Bams.

The following script is intended to provide a general guide for how you may choose to lead this activity:

- "Before we begin our new Brain Talk lesson, let's review what we remember about Buster and Buster Bams."
- [Individually, in pairs, or in small groups] "Discuss what you remember about Buster and its job in the brain."
- "When Buster senses an opportunity it thinks will be awesome, it creates a Buster Bam in the brain. A Buster Bam leads to a grab-and-gulp impulse, when the brain tells the body to react to get as much of the awesome thing as quickly as possible."
- "I am going to pull an animal out of this hat. I'll call on a student to tell me something that would give that animal a Buster Bam, and what its reaction might look like." (Use the provided animals from the "Animal Buster Bam in a Hat" review worksheet)
- "What other animals can you think of? What might give (target animal) a Buster Bam? What might its reaction look like?" (Class discussion to follow)

Primer

This primer activity is designed to prepare students for the lesson by activating known information to scaffold new learning. Students are shown pictures of both a mouse's brain and a human brain. Through guided discussion they are invited to consider similarities and differences between a mouse's brain and the human brain.

Included in the notes on the Mouse Brain/Human Brain powerpoint is a script to provide a general guide for how you may choose to lead this activity.

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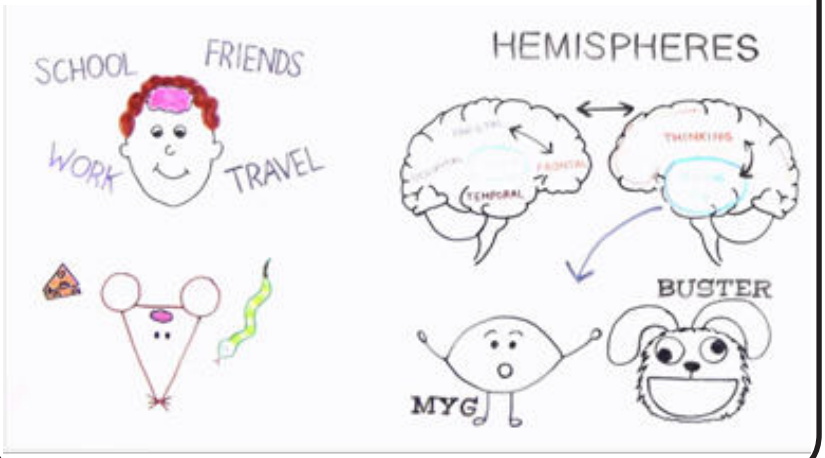
Watch Video:
Meet the Human Brain



Guided Instruction

Discussion Points:

Feeling Brain – Thinking Brain

- Humans have more complicated lives than simple mammals (such as a mouse), so they have more complex brains.
- Humans have a feeling brain, where Myg and Buster are located, and a thinking brain, which we can call the thinking cap.
- The thinking brain is really important for humans because it's the part of our brain that helps to solve tricky problems and come up with new ideas. The thinking brain is located right behind your forehead, and because it is so important we have certain inventions specially designed to help to protect that part of the brain.
- Talk about ways we protect our thinking caps from injury (e.g., seatbelt, helmet).
- Because you have a thinking cap in your brain, you can decide when to follow your Myg Moments and Buster Bams, and when to make a different choice.

Activity:

- "Thinking Cap" worksheet

Background Information

- Compared to the primitive nervous system of invertebrates, the brain of vertebrates is a well-developed, highly interconnected organ.
- The human brain has evolved from earlier primitive vertebrate brains, and has retained many structural features of these simpler brains. This has resulted in a layered structure with more recent parts built on top of the more primitive parts.
- The part of our brain which produces our emotional states is called the *limbic system*. This area evolved with the earliest mammals, and is similar in all mammals. In Brain Talk we call this lower part of the brain our *feeling brain.*
- The brains of humans and other mammals have an outer layer of neural tissue called the cerebral cortex. In large mammals, the cerebral cortex is folded, allowing for much greater surface area in the confined volume of the skull.
- The main distinction between human and other mammalian brains is the size and density of the cortex, and particularly of the frontal lobe. The cerebral cortex is the part of the brain responsible for the traits that make us uniquely human: complex thought, conscious judgement, and self-reflection. In Brain Talk we refer to the cerebral cortex as our *thinking brain* or *thinking cap.*

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Guided Instruction

Discussion Points:

Making Choices

- When is a Myg Moment helpful? When is a Myg Moment harmful?
  - Helpful example: "If a charging rhino is coming towards you, your Myg tells you to RUN!"
  - Harmful example: "If your brother or sister breaks your favorite toy, your Myg might tell you to yell or hit."
- When is a Buster Bam helpful? When is a Buster Bam harmful?
  - Helpful example: "If you get an ice cream cone on a hot day, your Buster tells you to eat it now so it doesn't melt."
  - Harmful example: "If you see a really cool scooter at the park (and it doesn't belong to you), your Buster might tell you to start riding it before asking for permission."
- Myg and Buster are important structures in the human brain; they are helpful when quick reactions are needed. However, in the complex human world more thoughtful responses are often needed. In order for you to have time to choose a thoughtful response, rather than simply react, Myg and Buster need to pause.
- Humans can train Myg and Buster to be less reactive through a variety of Taming Tool strategies: mindfulness, physical exercise, playing with friends, and practicing gratitude.

Activity:

- Choose a taming tool domain to explore: mindfulness, physical exercise, positive social interaction, and practicing gratitude.
  - See Teacher Notes for some example activities.
  - (Optional) Print out the Upper Elementary "Taming Tools Menu" worksheet for additional ideas.

Background Information

(continued)

- The formal name for the brain is the cerebrum.
- The average adult human brain weighs about 3 lbs. and is comprised of approximately 1.1 trillion cells.
- The human brain is divided into two cerebral hemispheres: a right hemisphere and a left hemisphere. Each hemisphere appears to be specialized for some behaviors. The hemispheres communicate with each other through a thick band of nerve fibers called the corpus callosum.
- There are four main lobes on the exterior of the human brain. While they are in constant communication with each other, each is known for specialized functions: frontal (thoughts), temporal (smell and sound), parietal (sense processing) and occipital (sight). A fifth lobe, the insula, is folded deep within the fissure separating the temporal lobe from the parietal and frontal lobes. The function of the insula is complex and is still being studied. It is understood to be involved in consciousness, and plays a role in diverse functions usually linked to emotion or the regulation of the body's internal conditions. It is so inter-connected with the limbic system that some scientists consider it part of it.

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Teacher Notes

- Author and child psychologist, Daniel Siegel, has developed a helpful model for explaining how the brain functions when someone loses their temper: “Flipping Your Lid.” You can explore his model here:
  - https://www.youtube.com/watch?v=G0T_2NNoC68
- This unit of Brain Talk briefly introduces tools and activities that help develop self-regulation skills: Mindfulness, exercise, positive social interactions, and practicing gratitude. Help students develop understanding of these strategies by exploring one or more of the following taming tool domains. Example activities include:
  - Mindfulness: Practice slowly breathing in through the nose as if smelling a flower and out through the mouth as if blowing out a candle. Repeat five times.
  - Exercise: Practice class-wide stretching, running in place, and/or take a freeze dance break.
  - Spending time with friends: Practice positive social interactions by allowing students to complete a short “turn and talk” with a peer.
  - Gratitude: Practice gratitude by having students share one or two things for which they are grateful.

Taking it Further

- For hands-on examination of a mammalian brain, you can order sheep brains from an educational supply company:
  - Carolina Biological Supply Company: www.carolina.com
  - Home Science Tools: www.hometrainingtools.com
- Mindfulness has been well-researched in building brain areas that support self-regulation and effective decision making. By including mindfulness practices in your classroom, you can proactively support these skills while teaching lessons in paying attention and inserting a pause into a reactive moment. You can learn more about incorporating mindfulness into your classrroom at:
  - www.mindfulschools.org