



UNIVERSITY OF
NEW ENGLAND

Center for Excellence
in the Neurosciences

Elementary Neuroscience

Grades K-2

Driving Question: Why is our brain important and how can we protect it?

Objectives: Students will be able to...

- Explain the importance of wearing a helmet.
- Demonstrate proper helmet fitting with the Rule of Two's.
- Describe the five senses and relate them to the brain.

Next Generation Science Standards:

- K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- 2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials based on their observable properties.

Materials:

- Franklin's Bicycle Helmet Book
 - Find the book here: <http://www.amazon.com/Franklins-Bicycle-Helmet-Franklin-Storybook/dp/1550747282>
 - Alternative: Watch the YouTube video (10 min): <https://www.youtube.com/watch?v=oo-y1Osk3tY>
- Helmet

- Brain Lobe Coloring Pages

Procedure:

Engage:

- Where is your brain?
- What does your brain look like?
- Draw a picture of something your brain helps you do.

Explore:

- Read Franklin's Bicycle Helmet
- Helmet Safety (Fitting and Melon Drop)
- Human Senses (using brain lobe coloring pages)

Explain:

- Franklin's Bicycle Helmet
 - Read the book aloud and throughout the book ask the students questions such as:
 - Why does Franklin need a bicycle helmet?
 - How do we know Franklin's old helmet does not fit?
 - How does Franklin stay safe while riding on the road?
- Helmet Safety/Fitting
 - Rule of Two's: two fingers should fit snug under the chin, should be the distance from the bottom of the ear to the helmet strap corner, and the distance from the eyebrow to the helmet brim.
 - Ask for a volunteer to demonstrate proper helmet fitting.
- Melon Drop Demonstration
 - Show the class the melon and draw a face on it. Strap the melon in the helmet and ask for a volunteer. The volunteer should say the Rule of Two's to the class then allow him or her to lift the helmet with the melon in it and drop it, helmet first. There should be little to no damage to the melon.
 - Ask for another volunteer and repeat that activity; ask them to announce the Rule of Two's except this time ask them to drop the melon without a helmet (place plastic on the floor to prevent a mess).
- Human Senses

- Use the brain lobe coloring pages. Allow the students a minute or two to color the lobe before discussing it. Don't allow the students to color the whole picture at once because they will lose interest and understanding as you move through each lobe. Also, when speaking about the lobes, basic terminology may need to be used because the anatomical terms could be too difficult to pronounce or remember.
- Frontal lobe (front part): movement
 - Standing in a circle, lead the students in a game of Simon Says or recite the Hokey Pokey.
- Parietal lobe (top part): touch
 - Allow each student to close his/her eyes and touch the sensory box to guess what is inside.
- Temporal lobe (side parts): hearing
 - Use the song you did not use for the Frontal Lobe and sing.
- Occipital lobe (back part): sight
 - Use the optical illusions
 - Duck-Rabbit Illusion: Allow half the class to close their eyes while you show one half the illusion that portrays a duck. Allow the students to reverse roles and show the other half the illusion that portrays a rabbit. You can give the students a silent hint by moving your hand like a duck or rabbit. Allow the students to announce what image they saw and explain how our eyes can play tricks on us.

Elaborate:

- Helmet Safety
 - As you demonstrate the Rule of Two's with the student volunteer explain that a helmet should not be used after it has been in an accident. Ask what may happen if the helmet is too loose, too tight, too forward, set back too far, etc.
 - Discuss the design of the helmet. Investigate each part and how it works together as a whole. Compare it to a turtle shell to describe how helmets are similar for protection.
- Melon Drop
 - After the drop with the helmet explain that the helmet was there to protect the melon, also known as the model human brain.

- Even though damage was not shown, there could be internal damage that we cannot see and that is why you should go to the doctor to get your head checked after an accident.
- After the drop without the helmet there will most likely be damage. Notice the seeds that may have fallen out of the melon and show seeds inside the melon. This is an opportunity to introduce cells. If there is no noticeable damage done to the melon refer to the above bullet and talk about internal damage.
- Human Senses
 - Sometimes our brain need to process more than one sense at the same time. Think back to the Hokey Pokey (or Simon Says). What senses were you using when we sang those songs?
 - What senses are you using when you are in the classroom?
 - What senses are you using when you are eating a meal?

Evaluate:

- Did the CEN Outreach volunteer teach the student objectives?
- Did the CEN Outreach program reach the goals of the teacher?
- Did the CEN Outreach program reach it's own goals/objectives?

NGSS Description:

- K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Students will demonstrate K-2-ETS1-2 in the beginning of the module when they draw a picture of a helmet. The structure and function of the helmet is discussed throughout Franklin's Book.

- 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Students will demonstrate 1-LS1-1 when they watch the helmet drop demonstration. The design of the helmet is discussed as well as compared to a turtle shell for protection.

- 2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials based on their observable properties.

Students will demonstrate 2-PS1-1 when they investigate helmets during the helmet drop demonstration and during the reading of Franklin's Bicycle Helmet.

