

## Unit 2

Power to Tame  
your Temper

## Mini-unit

A Peek Inside  
the Amazing  
Brain

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# Unit Description and Outline

**Power to Tame Your Temper** teaches the principle of neuroplasticity, with a focus on how to train the brain to facilitate learning. Students will be exposed to basic brain science to foster an understanding of their impulses and strategies in order to help them manage strong emotions, including anger, frustration, impatience, sadness, embarrassment, jealousy, and fear.

The Mini-unit offers a stand-alone version of Pure Power Unit 2, with introductory movement sequences. The content of the Mini-unit lessons aligns to the content of the lessons in Pure Power Unit 2. Because the Mini-unit offers a shortened version, the numbering of lessons is different in the Mini-unit than in Pure Power Unit 2.

## *Essential Questions*

What is mindfulness?

How can being mindful shape our experiences?

How can developing mindfulness influence our decision-making?

## **Enduring Understandings**

Mindfulness can help us make healthier decisions.

## **Learning Objectives**

Students will be able to do the following...

#### 1 A Peek Inside the Amazing Brain: How Habits Grow Your Brain

- Define neuroplasticity by interpreting the statement “Neurons that fire together wire together.”
- Identify and describe the basic function of a brain cell, including its dendrites and axon (either on a diagram or in their Reflection Journals).
- Identify specific actions they can practice to foster brain growth.

#### 2 Getting to Know Your Brain: Cerebrum, Cerebellum, Medulla (Part I)

- Locate and describe the primary functions of the cerebrum, cerebellum, and medulla.
- Describe how working with optical illusions may sharpen their focus and power of concentration.
- Explain how mindfulness practices train the brain to make fewer errors when filtering and interpreting incoming information from the senses.

#### 3 Getting to Know Your Brain: Hippocampus, Amygdala, Prefrontal Cortex (Part II)

- Identify whether the hippocampus, amygdala, or prefrontal cortex would be activated in several scenarios.
- Explain why the three mindful breaths strategy has the potential to prevent an overreaction to a stressful situation.
- Employ the three mindful breaths strategy to train their inner dragon (amygdala).
- Describe the reflexive “fight, flight, or freeze” reactions of the amygdala.

#### 4 Brain-Breath Connection

- Articulate and demonstrate how the breath can calm the amygdala so it may effectively communicate and work with the prefrontal cortex to make thoughtful, intelligent decisions.
- Identify and analyze the sensations and effects of strong emotions.

- Explain why the Three Mindful Breaths strategy has the potential to prevent an overreaction to a stressful situation.
- Employ the Three Mindful Breaths strategy to train their amygdalas.

#### 5 Mindful or Unmindful

- Define the difference between mindful and unmindful thoughts and actions.
- Practice alternate nostril breathing to calm the body and focus the mind.

#### 6 STOP Strategy: How to Tame Your Amygdala

- Apply the STOP strategy to everyday situations, both inside and outside the classroom.
- Memorize the STOP sequence.
- Practice 2-4 rounds of alternate nostril breathing to strengthen the mindfulness muscle.

#### 7 Name It To Tame It:<sup>1</sup> The Anger Iceberg

- Identify personal anger triggers and choose effective, constructive ways to cope with anger.
- Explain the importance of observing their emotions for both the STOP and Name It To Tame It strategies
- Broaden their emotional vocabularies.
- Describe the symptoms of anger and its related underlying emotions using the Anger Iceberg

#### 8 Give Your Brain a Break: Mindful Breathing Review

- Practice mindful breathing independently to give their brains downtime.
- Explain the importance of giving their brains downtime.

# Structuring Your Lesson

## 1 Connect

Remind students of the content from the previous lesson.

## 2 Movement

- Start with mindful breathing.
- Emphasize breath-movement connection throughout movement sequence.
- End with 3–4 minutes of guided rest.
- Optional postures are listed in *Italics*

## 3 Teach & Active Engagement

Share neuroscience lessons and mindfulness practices with students.

## 4 Link

Briefly Review what was taught today and set up the next lesson.

# Read-Aloud Books

**National Geographic Kids  
Brain Games: The Mind-  
Blowing Science of Your  
Amazing Brain**

by Jennifer Swanson

**My First Book About the  
Brain**

by Donald M. Silver and Patricia  
J. Wynne

**It's All in Your Head: A Guide  
to Understanding Your  
Brain and Boosting Your  
Brain Power**

by Susan L. Barrett

**Big Head! A Book About  
Your Brain and Your Head**

by Peter Rowan

**The Brain: All about our  
nervous system and more!**

by Seymour Simon

**Gross Anatomy (Crash  
Course: Games for Brains)**

by Susan Ring

**Anh's Anger**

by Gail Silver

**One Green Apple**

by Eve Bunting

**Look at Your Body: Brain &  
Nerves**

by Steve Parker

## Unit 2 Mini-unit Standards

### SEL

- 1A.2a.: Describe a range of emotions and the situations that cause them.
- 1A.2b.: Describe and demonstrate ways to express emotions in a socially acceptable manner.
- 2A.2a.: Identify verbal, physical, and situational cues that indicate how others may feel.
- 2A.2b.: Describe the expressed feelings and perspectives of others.
- 2B.2b.: Demonstrate how to work effectively with those who are different from oneself.
- 2D.2b.: Apply constructive approaches in resolving conflicts.
- 3A.2a.: Demonstrate the ability to respect the rights of self and others.
- 3A.2b.: Demonstrate the knowledge of how social norms affect decision making and behavior.
- 3B.2a.: Identify and apply the steps of systematic decision making.
- 3B.2b.: Generate alternative solutions and evaluate their consequences for a range of academic and social situations.

### NHES

- 1.5.1: Describe the relationship between healthy behaviors and personal health.
- 1.5.2: Identify examples of emotional, intellectual, physical, and social health.
- 4.5.1: Demonstrate effective verbal and nonverbal communication skills to enhance health.
- 4.5.3: Demonstrate nonviolent strategies to manage or resolve conflict.

- 5.5.5: Choose a healthy option when making a decision.
- 7.5.1: Identify responsible personal health behaviors.
- 7.5.2: Demonstrate a variety of healthy practices and behaviors to maintain or improve personal health.
- 7.5.3: Demonstrate a variety of behaviors to avoid or reduce health risks.
- 8.5.2: Encourage others to make positive health choices.

### National PE

- Standard 1: The physically literate individual demonstrates competency in a variety of motor skills and movement patterns.
- Standard 2: The physically literate individual applies knowledge of concepts, principles, strategies and tactics related to movement and performance.
- Standard 3: The physically literate individual demonstrates the knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness.
- Standard 4: The physically literate individual exhibits responsible personal and social behavior that respects self and others.
- Standard 5: The physically literate individual recognizes the value of physical activity for health, enjoyment, challenge, self-expression and/or social interaction.



## Vocabulary

Axon  
Cell  
Chemical  
Dendrite  
Mindfulness  
Network Neuron  
Neuroplasticity  
Rewire

## Lesson 1

# A Peek Inside the Amazing Brain

## HOW HABITS GROW YOUR BRAIN

### Overarching Learning Objective

Students will be able to define neuroplasticity by interpreting the statement “Neurons that fire together wire together.”

### Materials

- Unit 2 Reflection Journal: *Power To Tame Your Temper—Training Your Brain Grows Your Brain*
- Images or MRIs of neurons (present on printout, tablet, or SMARTboard)
- Pencils (one per student)



## Guiding Questions

- *What do you know about the brain?*
- *What does it mean to “grow” your brain?* (By the time we’re two years old, our brains are about 80 percent of their adult size. At birth, almost all of our neurons are present. However, our brains continue to grow, because as we think and learn, our neurons increase in size and thickness, filling in the spaces. Our neurons also continue to make many new connections throughout our lifetimes.)
- *How can you grow your brain?*
- *Is your brain always ready to grow?*
- *Is a larger brain a smarter brain? Defend your answer.* (A human brain weighs about three pounds, whereas one species of whale has a brain that weighs approximately eighteen pounds! A brain’s intelligence depends on its parts and how those parts communicate and work together. Humans have a large PFC, which helps us think, plan, and problem solve.)
- *What part of the brain cell grows when you practice something?*
- *How can your thoughts change your brain?*
- *How would you interpret the statement by Dr. Don Hebb, “Neurons that fire together wire together”?*
- *What are some other things in nature that grow because of how we care for them (e.g., trees, flowers, vegetable gardens)?*
- *How does the long, thin shape of the neuron help it do its job more effectively (compare to signals transmitted along telephone or computer wires)?* (fifth grade)



## Connect

*In this course, we will study the brain and understand what is happening in our brains and our bodies when we experience strong emotions. We will learn breathing exercises that can help us pay attention to how we are feeling, and help us calm down when we get upset. We are also going to learn some mindful movement exercises that will help us get stronger, more flexible, and improve our balance.*

Have students make two fists, side by side, to imagine the size and shape of their brains (about 6 inches/15cm long). Explain that each fist represents one of the brain's two hemispheres, which are connected by a band of nerve fibers called the corpus callosum. Teach students that a hard, bony helmet called the skull protects the brain. The brain can be compared to an egg: the yolk is the brain, the egg white is the cerebrospinal fluid and membranes (called meninges) that nourish and protect the brain, and the shell is the skull, which also serves to protect the brain.

The brain is an organ that is part of the nervous system. The brain and the spinal cord make up the central nervous system. The brain and spinal cord connect to nerves that travel throughout the entire body. Nerves act like reporters, sending messages from the senses to the brain to inform it about what's happening in the outside world. The brain also uses nerves to send messages to muscles to make the body move.

## Teach

*I have a mystery for you to solve.*

Display an image of a neuron (on a printout, tablet, or SMARTBoard).

*Give a thumbs-up if you think you can identify the image captured in the photo.*

Give students at least three seconds of “wait” or

“think” time. Then invite two students to share their predictions.<sup>1</sup>

*This is an image of a unique type of cell. Cells are the building blocks of all life on Earth. Every living thing is made up of cells, including every person, animal and plant. Your body is built from a trillion cells! We can't even imagine a number that large!*

*There are many different types of cells, and each type performs a different job. By dividing responsibilities among different groups of cells, your body can more easily survive and grow. The cell in this image is a brain cell, or neuron. Every brain is made up of neurons, which communicate by sending messages to one another. You are able to learn and remember things because your neurons are constantly making and strengthening connections with one another. Learning occurs as more and stronger connections are made between neurons.*

*Your brain is like a crowded train station or airport, bustling with nonstop conversations between neurons. Messages are passed on, or transmitted, from neuron to neuron through special chemicals called neurotransmitters. A neuron is similar to an on-off light switch. It is either “off” during its resting state, or “on” when it is sending, or transmitting, a message to neighboring neurons.*

*There is a saying by Dr. Donald Hebb, “Neurons that fire together wire together.” Each of your experiences, including your thoughts, feelings, and sensations, becomes rooted in the network of brain cells that produce that experience. The connection between these neurons is strengthened every time you repeat a particular thought or action. This is a good thing when you learn something useful, like remembering the route from your classroom to the bathroom, or your morning routine to get ready for school. The strengthening of neural connections is not so great when you repeat bad habits, such as being unkind to your classmates, being unkind to yourself through negative self-talk, or becoming super stressed out every time you have to take a test.*

1: Robert J. Stahl, “Using ‘Think-Time’ and ‘Wait-Time’ Skillfully in the Classroom, *ERIC Digest*, <http://www.ericdigests.org/1995-1/think.htm>.

*Your brain continuously changes throughout your lifetime. Our experiences contribute to these differences. In every human brain there are as many neurons as there are galaxies in the known universe—about 100 billion! Neurons make trillions of connections with one another. These connections are not exactly the same in every brain. Messages can be sent along neurons at extraordinary speeds. Some messages travel up to 268 miles per hour!*

**Optional for fifth grade:** Share the metaphor below (offered by neuroscientist Alvaro Pascual-Leone in the book *The Brain That Changes Itself* by Norman Doidge) in your own words:

“The brain is like a snowy hill in winter. When we go down the hill on a sled, we can be flexible because we have the option of taking different paths through the soft snow each time. But should we choose the same path the second time or the third time, tracks will start to develop, and these tracks become really speedy and efficient at guiding the sled down the hill. It doesn’t take long to get literally stuck in a rut. Taking a different path becomes increasingly difficult, but, thanks to the brain’s wondrous capacity for learning and rewiring itself, it’s not impossible!”

Compare the sled’s tracks to the neural connections in the brain that become stronger the more a particular thought or action is repeated.

*Today we are going investigate what two parts of a brain cell look like and how your brain continues to change and grow. There is a special brain science word that describes your brain’s lifelong ability to change and grow: neuroplasticity. “Neuro” refers to the brain. “Plasticity” has the word “plastic” in it. Something that is plastic can be molded, or change shape. Neuroplasticity means that your brain slowly adapts and changes shape in response to your habits and experiences, which include what you learn, how you think, and how you act.*

*The more you practice something through repetition, like shooting a basketball, riding a bicycle, or memorizing facts for your social studies exam, the better you become at that task, because the neurons in your brain responsible for that skill form stronger connections to one another. You are training your brain to improve at a particular skill.*

## Active Engagement

Display the Reflection Journal page “Training Your Brain Grows Your Brain.” Explain how the branches, or dendrites, get thicker and stronger through repeated practice and experience. Define and discuss the images of dendrites growing from birth to three years old. For fifth grade, use the diagram to illustrate how a signal is transmitted along the axon and crosses the synapse to communicate with a neighboring neuron.

Distribute pencils and the handout “Training Your Brain Grows Your Brain.” Ask students to point out which part of the brain cell grows when they practice something. Invite children to connect the dots of the dendrites.

Share the following definition of mindfulness with students:

*Mindfulness means noticing what is happening as it is happening. Mindfulness is about paying attention on purpose, with a sense of kindness and curiosity. Anything can be done mindfully, including brushing your teeth, eating breakfast, walking to school, and even doing homework. Although mindfulness sounds simple, it is a skill that takes practice, because it requires our fully focused attention.*

Practice Mindful Breathing with students (see illustration). Have students notice if their attention wanders away from their breath. Instruct students to simply bring the attention back to the breath if the attention does wander.

## Movement

Mountain  
Mountain/Sunrise  
Big Toe  
Star into Triangle  
Tree  
Cat/Cow\*  
Rock\*  
Seated Mountain  
Guided Rest

\*Optional

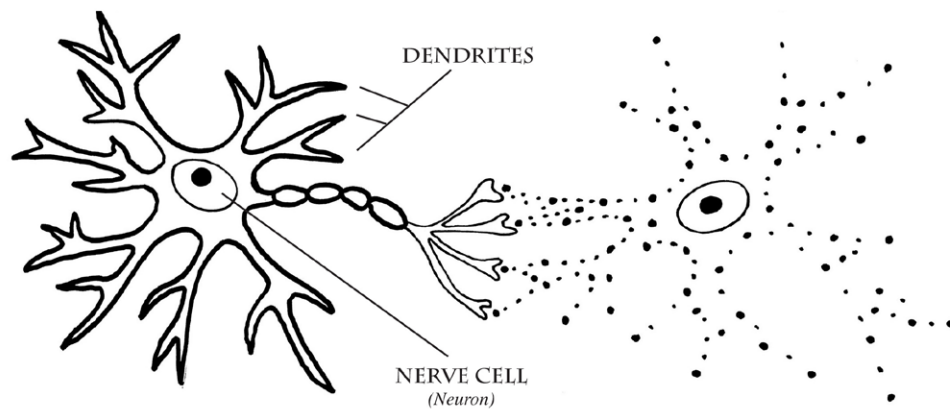
\*Dark blue denotes new postures for the lesson.

Ask students what they think will happen to the brain cells responsible for helping them focus when they practice Mindful Breathing. Explain that the focused attention they build through mindfulness helps improve their skills in other activities, whether it's learning a sport, a dance routine, or a musical instrument.

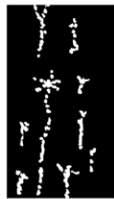
### Link

*Today we learned about training our brains through practice and repetition to help us become better at things we want to improve, such as learning how to skateboard or dive into a pool. Every moment is an opportunity to shape and grow your brains. Your habits and experiences, which include what you learn, how you think, and your behavior, gradually mold your brains, just like a sculptor molds clay. Mindfulness practice helps you take care of your brains and grow to your full potential by training your attention to focus on what you choose.*

## TRAINING YOUR BRAIN GROWS YOUR BRAIN!



AT BIRTH



3 MONTHS



15 MONTHS



3 YEARS





## Vocabulary

Brain stem  
Cerebellum  
Cerebrum  
Expectation  
Interpret  
Involuntary  
Medulla  
Optical Illusion  
Voluntary

## Lesson 2

### Getting to Know Your Brain CEREBRUM, CEREBELLUM, MEDULLA— PART I

#### Overarching Learning Objective

Students will be able to locate and describe the primary functions of the cerebrum, cerebellum, and medulla.

#### Materials

- Unlabeled brain diagram (includes cerebrum, cerebellum, medulla)
- 3 Post-its
- Optional:
  - Filter funnel
  - Brain model
- Unit 2 Reflection Journal



## Guiding Questions

- *What did the scientist Aristotle mean when he said, “Our senses can be trusted, but they can be easily fooled”?*
- *What is the difference between voluntary and involuntary movements? Provide an example of each.*
- *Why do we sometimes see patterns where there aren’t any? (fifth grade)*
- *How can mindfulness help the brain make fewer errors when filtering and interpreting incoming information from the senses? (fifth grade)*
- *How can practice with optical illusions sharpen your focus and power of concentration?*

## Connect

*Last time we worked together, we learned that training our brains through practice and repetition helps us become better at things we want to improve, such as learning how to skateboard or dive into a pool. We realized that every moment is an opportunity to shape and grow our brains. Our mindfulness practice helps us take care of our brains and grow to our full potential by training our attention to focus on what we choose.*

## Teach

*Although from the outside the brain looks like one big ball of wrinkly gray tissue (or an unshelled walnut) and has the consistency of soft tofu, it is actually made up of many different parts that communicate with one another through neurons. Today we will learn about the cerebrum, cerebellum, and medulla.*

Display the unlabeled brain diagram. Identify and define the primary functions of each:

**Cerebrum:** *The largest part of the brain. Its gray wrinkly surface is called the cerebral cortex. The folds increase its surface area, which increase the amount of information that the neurons, or brain cells, can process.*

*Different parts of the cerebrum deal with different voluntary processes you do each day, including vision, movement, hearing, language, and touch. “Voluntary” means that you choose to do something, such as waving hello to someone or kicking a soccer ball down the field. The cerebrum*

*uses neurons to send electrical messages out to your body to instruct a specific body part to do something. The cerebrum is divided (from front to back) into two nearly symmetrical, or equal parts, called hemispheres. Each hemisphere controls the opposite side of the body. This means that the right hemisphere controls the left side of the body and the left hemisphere controls the right side of the body. Optional: Define “surface area” using a model of the brain.*

**Cerebellum:** *The Latin word for “little brain.” It is located at the back and bottom of the brain. It is also divided into two symmetrical hemispheres. Although the cerebellum only takes up about 10 percent of the brain’s volume, it contains more than 50 percent of the total number of neurons in the brain! It interprets motor messages from neurons and responds to these messages by moving specific muscles. The cerebellum can learn coordinated movements with practice, allowing us to do cool stuff like master challenging postures, ride bicycles, and perform cartwheels. It also helps us maintain balance and move smoothly during these activities.*

*Which of the following activities would be difficult for a person with a damaged cerebellum?*

- a. *Dancing*
- b. *Singing*
- c. *Talking to a friend*
- d. *Listening to a friend*
- e. *Skiing*
- f. *Watching television*

*Answers: a, e*

**Medulla:** *Part of the brain stem, which sits at the base of the brain (in front of the cerebellum) and connects the brain to the spinal cord. The brain stem controls the flow of information between the brain and the rest of the body. It also controls movements that are usually involuntary, or happen*

*without us thinking about them, such as breathing, heart rate, blood pressure, digestion, sneezing, and swallowing.*

Invite three students to label the diagram with Post-its.

## Movement

Mountain  
Mountain/Sunrise  
Half Opening  
Sequence A x 3  
Big Toe  
Star into Triangle  
Tree  
Cat/Cow\*  
Pointing Dog\*  
Rock\*  
Seated Mountain  
Guided Rest

\*Optional

## Active Engagement

*We will also look at several optical illusions to sharpen our focus and power of concentration. An optical illusion is an image that fools our brains. We see, or perceive, an image that is different from reality. The information that our eyes gather is processed and made sense of in the brain. Sometimes the brain's interpretation does not represent what is actually presented in the image. Since the eyes take in more information than the brain can interpret at one time, the brain takes shortcuts, choosing the most likely interpretation of what we see. Our brains stitch together all the different information from our senses and fill in the gaps by using past experiences and expectations to make their best guesses to decode the information. Optical illusions help us notice and become more aware of these shortcuts, which usually go unnoticed.*

Display one optical illusion (either printed, on a tablet, or on a SMARTboard). Highlight how the brain may be fooled into seeing one image when there is also another image present.

Share several different types of optical illusions. Give students 5–10 seconds to view each optical illusion. Then have students compare what they see with their turn-and-talk partners.

*Many illusions are based on your expectations, or things that you have encountered in the past, which have become wired into your brain. These expectations influence how you experience and understand the world around you. For example, if you took many hikes in the forest growing up, you may have encountered snakes along the trails. If you then took a trip to a city and saw a piece of rope on the sidewalk from a construction site, your brain might mistakenly think the rope is a snake and trigger your brain's "fight, flight, or freeze" response. (Students will learn about the amygdala in the next lesson.) One shortcut our brains make is to always search for patterns. We see patterns in clouds, ink stains, and stars (constellations!). The brain is a pattern detective because one of its most important responsibilities is to make sense of the information that it receives through the senses. The brain filters information so you are only aware of what it considers to be important. This means that the information you receive may be incomplete.*

Explain how the brain's misinterpretation of information, and its inclination to fill in missing gaps of information, can lead to misunderstandings and angry overreactions. Mindfulness strategies can improve the power to tame your temper by reducing the amount of brain bloopers and angry outbursts.

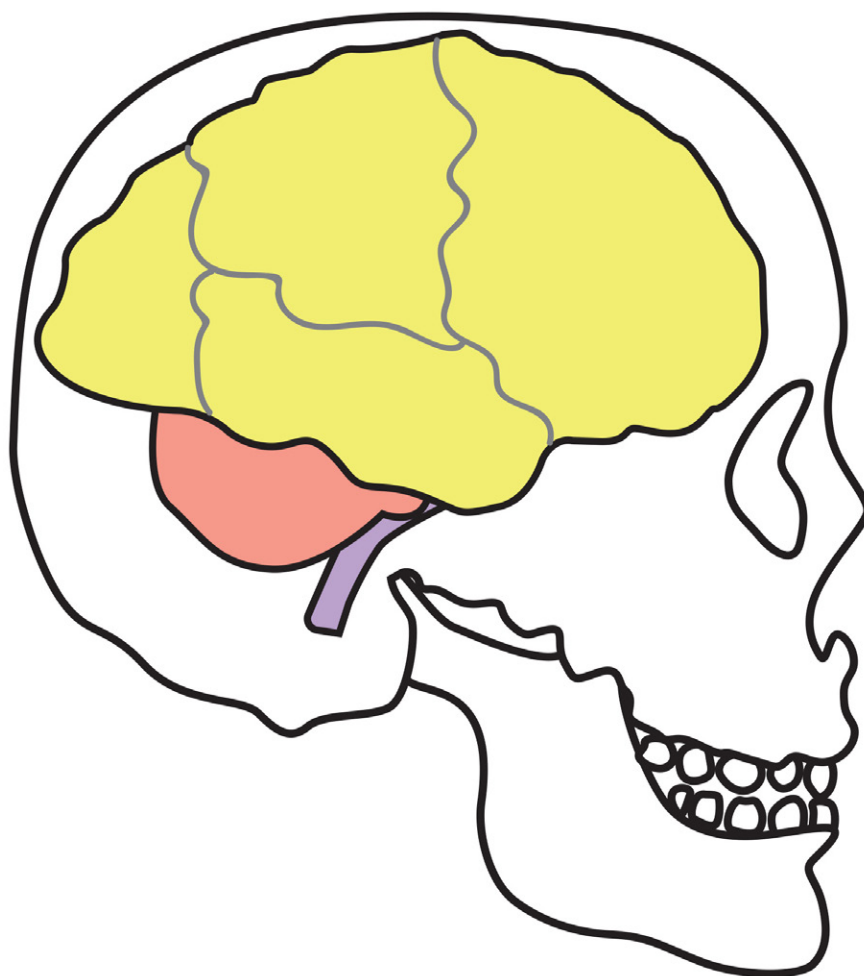
**Link**

*Today we learned about three major parts of the brain: the cerebrum, cerebellum, and medulla (which is part of the brain stem). We also worked with optical illusions to become aware of how the brain can be fooled and misinterpret information received by the senses. Mindfulness is a tool to slow down the mind so your brain can more accurately filter and interpret the information it receives. This slowing down allows you to make more intelligent, thoughtful decisions by strengthening the power to tame your temper.*

## Brain Diagram 2

Draw a line from the following names to the correct brain elements below:

- Cerebrum
- Cerebellum
- Medulla



## Vocabulary

Amygdala  
Decoder  
Hippocampus  
Judgment  
Prefrontal cortex  
Self-regulation

## Lesson 3

### Getting to Know Your Brain

#### HIPPOCAMPUS, AMYGDALA, PREFRONTAL CORTEX—PART II

##### Overarching Learning Objective

Students will be able to identify whether the hippocampus, amygdala, or prefrontal cortex would be activated in several scenarios.

##### Materials

- Unlabeled brain diagram (includes hippocampus, amygdala, and prefrontal cortex)
- 3 Post-its
- Unit 2 Reflection Journal



## Guiding Questions

- *What is the main responsibility of the hippocampus? Amygdala? Prefrontal cortex?*
- *What does it mean to have good judgment?*
- *Why is the prefrontal cortex sometimes referred to as the “thinking brain” or the “seat of good judgment”?*
- *How is it possible that different brains may perceive the same situation differently, even though all brains have an amygdala, prefrontal cortex, and hippocampus?*
- *How can memories affect the amygdala’s reaction to a potentially dangerous situation? (fifth grade)*
- *What does it mean to self-regulate?*
- *Why is self-regulation important?*
- *Do you think it is helpful to learn about the different parts of the brain involved in self-regulation? Why or why not? (fifth grade)*

## Connect

*Last time we worked together, we learned about three major parts of the brain: the cerebrum, cerebellum, and medulla (which is part of the brain stem). We also worked with optical illusions to become aware of how the brain can be fooled and misinterpret information received by the senses. Mindfulness is a tool to slow down the mind so your brain can more accurately filter and interpret the information it receives. This slowing down allows you to make more intelligent, thoughtful decisions by strengthening the power to tame your temper.*

## Teach

*Today we are going to learn about three more important parts of the brain: the hippocampus, amygdala, and prefrontal cortex (PFC for short!).*

Identify and define the primary functions of each:

**Hippocampus** comes from the Greek words “horse monster.” You have one seahorse-shaped hippocampus in each hemisphere of the brain. The hippocampus can be compared to the brain’s scrapbook or the hard drive of a computer. It stores information that you want (and sometimes don’t want) to remember, such as your multiplication tables, the names of your classmates and teachers, or an upsetting argument with a friend. The hippocampus transfers information from your short-term memory into your long-term memory. It also makes meaning out of stored memories. The hippocampus tries to make sense of new information by comparing it to stored memories. Whereas the amygdala stores emotional memories, like when you scored your first goal in a soccer tournament, the hippocampus stores factual memories, like the date of your best friend’s birthday. The hippocampus changes as you learn new things.

**Amygdala** comes from the Greek word “almond” because of its almond shape. You have one amygdala in each hemisphere. The amygdala helps keep you safe. It is constantly on the lookout for danger and reacts quickly, enabling you to run away, fight back, freeze, or collapse in fear. It is a master decoder of emotions and threatening stimuli. The amygdala focuses on emotional memories, like when you recall making a wish as you blew out your birthday candles, or when your pet dog passed away. When a memory is recalled from connections to the hippocampus, the associated emotions (whether positive or negative) are experienced with it. The amygdala helps create emotions that motivate you to move in response to what is happening in that moment. (Connect the word “emotion” with “motion.”)

**The prefrontal cortex**, often referred to as the PFC, is located at the front of the brain. (Highlight the word “front” in “prefrontal.”) It is involved in the final step of confronting danger. After the initial automatic emotional reaction, your PFC helps you plan the smartest way to get out of danger. It helps you solve complex problems and choose between right and wrong, even when faced with a challenging situation. The PFC acts like a shock absorber to make sure your actual response is sensible and acceptable. For example, when your teacher asks a question that you are excited to answer, your PFC guides you to raise your hand and wait to be called on instead of shouting out the answer. It controls intense emotions and impulses. It is sometimes referred to as the “seat of good judgment” or the “thinking brain,” because it allows you to pause and think before reacting. The PFC helps you self-regulate, or control your behavior, by guiding you to make thoughtful, intelligent decisions.

You can think of the amygdala as the brain’s inner dragon or security guard, the hippocampus as the memory bank, and the PFC as the kind leader or captain steering the ship at the front of the brain. Deep Belly Breathing helps activate the PFC’s power to think clearly and calm the amygdala’s impulsive emotional reactions.

Invite three students to label the brain diagram with Post-its.

## Movement

Mountain  
 Mountain/Sunrise  
 Half Opening  
 Sequence A x 3  
 Big Toe  
 Star into Triangle  
 Tree  
 Cat/Cow\*  
 Pointing Dog\*  
 Rock\*  
 Butterfly\*  
 Seal 1 & 2\*  
 Sleeping Crocodile\*  
 Seated Mountain  
 Guided Rest

\*Optional

## Active Engagement

Provide students with several scenarios in which they identify the part of the brain that would be activated. Have students justify their answer. Model the first example and then practice several scenarios as a class. Finally, have students discuss a few scenarios with their turn-and-talk partners before a whole-class share.

Sample scenarios:

1. *You are swimming in the ocean and see a jellyfish swimming near you. (Amygdala)*
2. *You have to memorize the words of a song for a chorus concert. (Hippocampus)*
3. *You need to plan what to pack for an overnight field trip. (PFC)*
4. *You jump up in fright when someone unexpectedly screams "Boo!" behind you. (Amygdala)*
5. *You need to organize the steps for solving a complex math problem. (PFC)*
6. *You need to remember the route to walk home from school. (Hippocampus)*
7. *You are being chased in a competitive game of freeze tag. (Amygdala)*
8. *You need to recall the route you have taken many times to your friend's house. (Hippocampus)*
9. *You have taken three mindful breaths and now must decide how to respond to an upsetting situation. (PFC)*
10. *You are folding an origami crane without any instructions. (Hippocampus)*

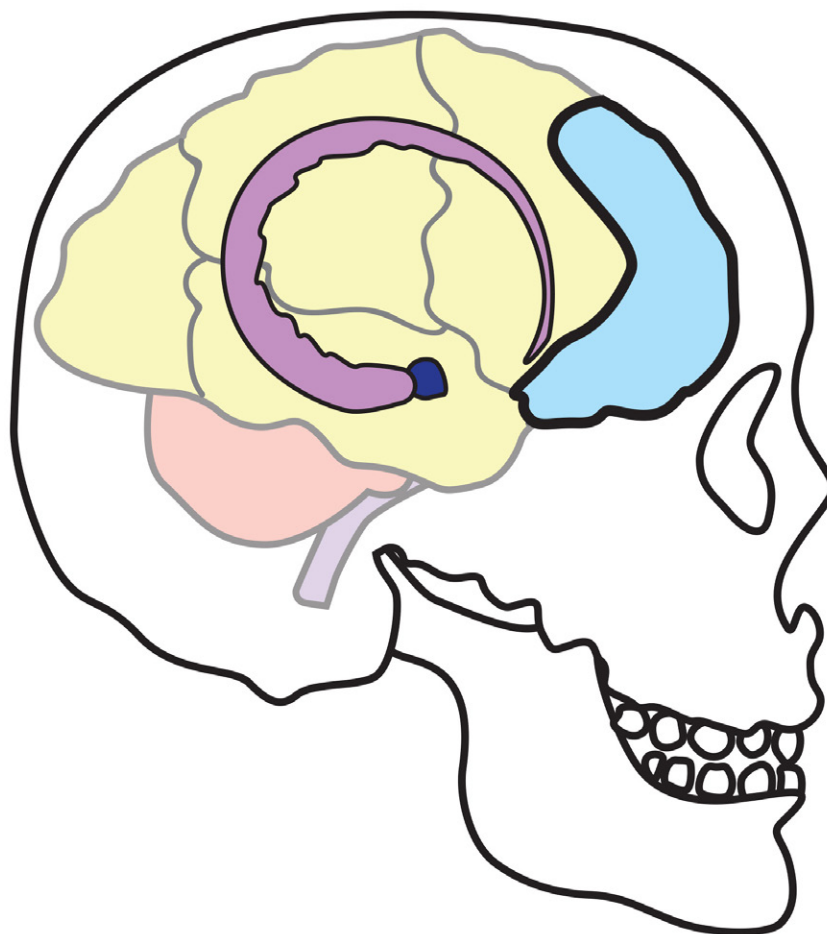
## Link

*Today we learned about the roles and relationships among three important parts of the brain: the hippocampus, the amygdala, and the prefrontal cortex. Although each part has different responsibilities, all three parts use neurons to communicate with one another. You can remember the hippocampus as a bank where memories are stored; the amygdala as the brain's inner dragon, security guard, or fire alarm, alerting us to potential danger; and the PFC as the kind, wise leader, who guides us to make thoughtful, intelligent decisions.*

## Brain Diagram 3

Draw a line from the following names to the correct brain elements below:

- Hippocampus
- Amygdala
- Prefrontal cortex





## Vocabulary

De-stress  
Observe

## Lesson 4

# Brain-Breath Connection

### Overarching Learning Objective

Students will be able to articulate and demonstrate how the breath can calm their amygdalas so they may effectively communicate and work with the prefrontal cortex to make thoughtful, intelligent decisions.

### Materials

- Brain diagram (includes amygdala and prefrontal cortex)
- Unit 2 Reflection Journal page “Castle Breathing”
- Optional: Snow globe

## Guiding Questions

- *What is a strong emotion?*
- *What does a strong emotion feel like?*
- *Where can strong emotions be felt in the body?*
- *Does everyone experience strong emotions? How do you know?*
- *What is stress?*
- *How might knowing how stress affects the body help you deal with your stress?*
- *How do strong emotions affect your reactions in different situations?*
- *Does everyone react to strong emotions in the same way?*
- *Describe a situation when you became very upset with someone and reacted in a way you wish you had not.*
- *In retrospect, how would you choose to respond, now that you have had time to reflect?*
- *How do strong emotions affect your ability to learn something new at school? To play a sport?*
- *Why is it important to be able to make decisions with focused attention?*
- *What tools do you have to calm your amygdala and train it not to overreact?*
- *Why has the PFC earned the nickname “leader of the brain”?*

## Connect

*Last time we worked together, we learned about the roles and relationships among three important parts of the brain: the hippocampus, the amygdala, and the prefrontal cortex. Although each part has different responsibilities, all three parts use neurons to communicate with one another.*

- *The hippocampus is like a bank where memories are stored.*
- *The amygdala is like the brain's inner dragon, security guard, or fire alarm, alerting us to potential danger.*
- *The PFC is like the kind, wise leader, who guides us to make thoughtful, intelligent decisions.*

## Teach

*Today we are going to learn more brain science, including strategies to tame your amygdala, so you can listen to the advice of your kind, inner leader—the PFC.*

*Have you ever experienced your protective amygdala sound off its alarm and react to a situation, to later discover that it made a mistake and overreacted?*

Provide an example. Explain how when we're calm, the amygdala sends information to the PFC (the brain's reasoning center). Highlight how the PFC is responsible for thinking about and focusing our thoughts, predicting the outcome of our actions, and deciding what is right or wrong. The PFC also supports our learning and our ability to work toward achieving our goals.

Describe how when we practice mindful breathing, we have the power to override the body's stress response and use our PFC to Plan with Focus and Care. The amygdala is programmed to react quickly and impulsively when we are frightened, angry, or stressed. If we can stop and take three mindful breaths, it gives the amygdala a



chance to settle down and communicate with the PFC, which can decide if the situation warrants such a fearful or angry response. It gives us an opportunity to think before we react.

Optional: Take out your snow globe and shake it.

*Put a thumb up if you have ever seen a snow globe shaken up so that the snow inside the globe blocks the view of the scenery inside. The chaotic blizzard inside the snow globe is like your mind's whirling thoughts when it is stressed out. To de-stress and see things more clearly, you need to allow the snow to settle to the ground. You can help slow down or stop the blizzard in your mind by practicing mindful breathing.*

Have students softly focus their gazes on the snow swirling around inside the snow globe as they take slow, mindful breaths until all of the snow has settled to the bottom.

## Active Engagement

*Although the amygdala's job is to keep us safe, it sometimes thinks we are in danger when we are not. If it senses a threat, the amygdala sends oxygen to our arms and legs in preparation for a "fight, flight, or freeze" response, which means less oxygen for our PFC, the thinking part of our brain. Less oxygen to the PFC makes it difficult to think clearly and make smart decisions.*

*What might be a possible solution to get more oxygen to our brain? Breathing!*

Display the Reflection Journal's "Castle Breathing" page. Use the diagram to model Castle Breathing by outlining the castle walls with your finger as you inhale and exhale. Discuss how the speed of the breath is correlated with the speed of your finger tracing the castle walls. Highlight how there is a brief pause between each inhale and exhale. Have students independently practice Castle

## Movement

Mountain  
Mountain/Sunrise  
Half Opening  
Sequence A x 3  
Big Toe  
Star into Triangle  
Tree or Forest  
Sandwich\*  
Table\*  
Butterfly\*  
Seal 1 & 2\*  
Sleeping Crocodile\*  
Rock  
Seated Mountain  
Guided Rest

\*Optional

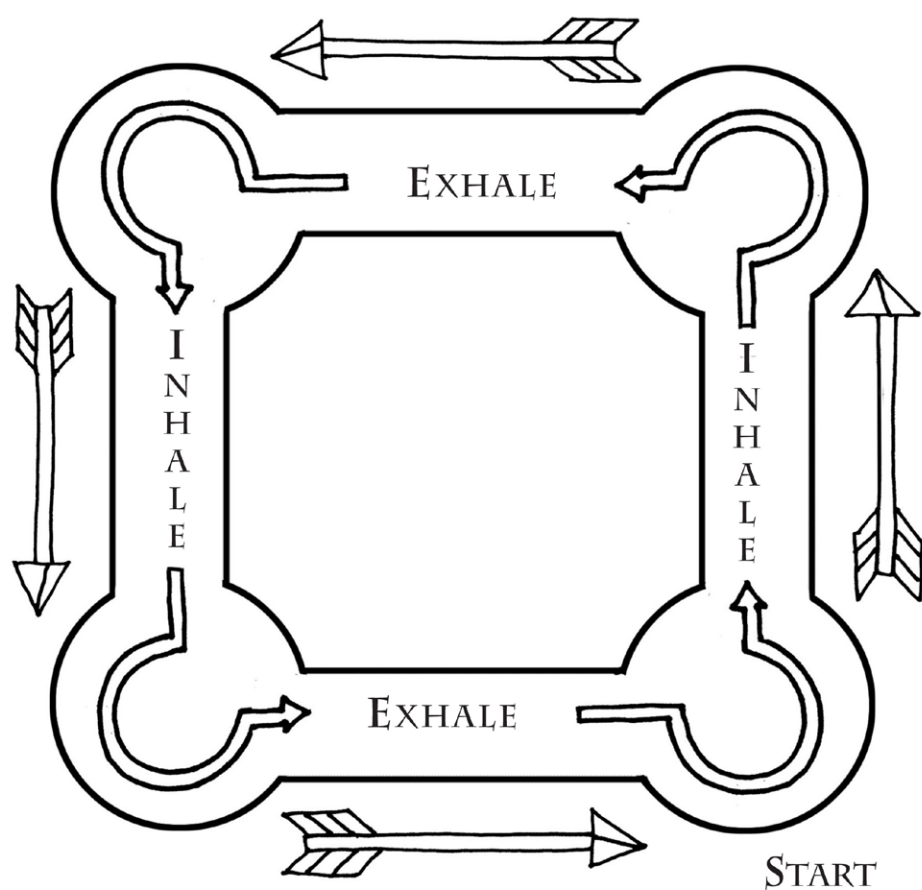
Breathing for one minute. Explain that students do not need the diagram to practice Castle Breathing. They may simply use their fingers to trace a square in the air, or close their eyes and trace a square in their mind's eye.

#### Link

*Today we journeyed deeper into the brain to examine how the prefrontal cortex influences our ability to plan and make intelligent decisions, even when faced with a difficult situation. We discovered that through mindful breathing, we can ignite our power to tame our temper. With consistent practice, over time, the brain can learn to be less reactive and instead respond more thoughtfully in challenging situations so your kind leader, or PFC, can successfully guide you.*

# CASTLE BREATHING

EVEN INHALE AND EVEN EXHALE





## Vocabulary

Advantages  
Alternate  
Judgmental  
Moment  
Openness  
Pause  
Perspective  
Scenario

## Lesson 5

### Mindful or Unmindful

#### Overarching Learning Objective

Students will be able to define the difference between mindful and unmindful thoughts and actions.

#### Materials

- Unit 2 Reflection Journal
- Marker
- Scenario of unmindful behavior (different from examples cited in the Reflection Journal)

## Guiding Questions

- *What does a mindful choice look like?*
- *What does an unmindful choice look like?*
- *What strategies can you practice to start making more mindful choices?*
- *What are some possible advantages of acting mindfully?*
- *Does everyone have unmindful moments? Why?*
- *Can you be both mindful and unmindful in the same day? Give an example.*

## Connect

*Last time we worked together, we journeyed deeper into the brain to examine how the prefrontal cortex influences our ability to plan and make intelligent decisions, even when faced with a difficult situation. We discovered that through mindful breathing, we can ignite our power to tame our temper. With consistent practice, over time, the brain can learn to be less reactive, and instead respond more thoughtfully in challenging situations, so your kind leader can successfully guide you.*

## Teach

*Today, we are going to explore the difference between mindful and unmindful thoughts and actions. Before we come up with examples, let's review what it means to be mindful. Mindfulness is when we purposefully pay attention to what's happening as it's happening, with a sense of kindness and curiosity. Mindfulness is about paying close attention without judgment. This means that you stop and take time to carefully consider the situation from different perspectives, or different points of view, before forming an opinion.*

*When you learn about mindfulness, you can become a scientist, observing your thoughts, feelings, and actions. Like all scientists, you must experiment to discover new things. For example, you might discover ways to calm yourself down when you are feeling angry, or ways to be kinder to yourself and others. You may also learn interesting facts about your brain and how it can help you improve your mindfulness skills.*

*Remember, everyone has unmindful moments, even grown-ups! The good news is that each new moment is an opportunity to use your mindfulness tools to choose a more mindful response.*

Make a T-chart with the column headings “Mindful” and “Unmindful.” Provide an example for each column. Then have students generate examples. If they provide an example of something unmindful, have them revise the example to make it mindful (and vice versa).

Mindful	Unmindful
Carefully listening to a friend’s side of a disagreement without immediately making a judgment.	Refusing to respectfully listen to a friend’s side of an argument and making judgments before you fully understand their point of view or perspective.
Slowly chewing and savoring each bite of your lunch.	Gobbling your lunch without properly chewing or taking the time to appreciate and enjoy it.
Waking up a few minutes early to give yourself plenty of time to get ready for school without feeling hurried or stressed.	Waking up late and having to rush to get ready for school, not leaving enough time to pack your homework in your backpack or eat breakfast.
Taking the time to plan ahead and prepare a healthy after-school snack.	Not planning ahead, instead grabbing a bag of chips or a candy bar for your after-school snack.
Being open to trying something new, such as listening to a different style of music, trying a new cuisine, or learning a new language.	Being unwilling to trying new things or experiences.
Placing your dirty dishes in the dishwasher or washing them.	Leaving your dirty dishes stacked in the kitchen sink for someone else to clean.

## Movement

Mountain  
Mountain/Sunrise  
Half Opening  
Sequence A  
Big Toe  
Star into Triangle  
Tree  
Stork  
Sandwich\*  
Table\*  
Butterfly\*  
Flower\*  
Seal 1 & 2\*  
Rock\*  
Seated Mountain  
Guided Rest

\*Optional

## Active Engagement

Teach students how to mindfully breathe by modeling the alternate nostril breathing technique.

1. Sit in a comfortable position with a tall spine.
2. Make a “pincher” with the right hand by extending the index finger and thumb, placing index finger on left nostril and thumb on right nostril.
3. Close the eyes softly.
4. Gently close the right nostril with the thumb. Inhale through the left nostril, as if slowly sipping air through a straw.
5. After inhaling fully, close the left nostril with the index finger. Release the right thumb from the right nostril. Exhale and then inhale through the right nostril.
6. Close the right nostril with the thumb. Release the index finger from the left nostril. Exhale and inhale through the left nostril.

This is one round. Each round starts with an inhale through the left nostril and ends with an exhale through the left nostril. Repeat 2–4 rounds. Once students are familiar with the instructions, a simple verbal cue is to say “Inhale left, close. Exhale right. Inhale right, close. Exhale left.” Have students notice the sensation of the air moving up into their nostrils and down into their lungs, the temperature of the air as it enters the nostrils, and precisely where the air enters along the nostrils.

Have students work on slowing down the breath to a snail’s pace. Their exhales may be a bit longer than their inhales. Once they have completed the exercise, instruct students to return their breath to its regular pace.



**Link**

*Today, we compared mindful and unmindful scenarios. We learned that if we have an unmindful moment, there's always the next moment to choose a more mindful response. It is important to realize that mindfulness is a choice that we have the power to make.*

*One way to improve our mindfulness is through our breath. Today we learned a new breathing exercise called alternate nostril breathing to help us slow down, relax, and allow our brains to be in a more mindful place so they can make thoughtful, intelligent decisions.*

*Next time, we will learn another strategy called STOP, which is another tool for learning how to act more mindfully, even when dealing with difficult situations or strong emotions.*



## Vocabulary

Adjective

Awareness (fifth grade)

Perceptive

Proceed

Strategy

## Lesson 6

### STOP<sup>1</sup>

#### HOW TO TAME YOUR AMYGDALA

##### Overarching Learning Objective

Students will be able to apply the STOP strategy to everyday situations, both inside and outside the classroom.

##### Materials

- “30-Second Look” image (see Active Engagement)
- Paper (one piece per student)
- Pencil (one per student)
- Hard surface to write on (e.g., clipboard) (one per student)
- Unit 2 Reflection Journal

## Guiding Questions

- *What did you notice when you took three mindful breaths?*
- *How did you feel before you took three mindful breaths? During? After?*
- *How did your three mindful breaths compare to the breaths you normally take?*
- *Do you think you should always be mindful of your breath? Why or why not?*
- *What does it mean to observe?*
- *How can your five senses be used to make observations?*
- *What sense(s) do you use to observe your breath?*
- *What adjectives, or descriptive words, could you use to describe the quality of your breath?*
- *What is the difference between thinking and awareness? (fifth grade)*

## Connect

*Last time we worked together, we compared mindful and unmindful scenarios. We learned that if we have an unmindful moment, there's always the next moment to choose a more mindful response. It is important to realize that mindfulness is a choice that we have the power to make.*

*One way to improve our mindfulness is through our breath. We learned a new breathing exercise called alternate nostril breathing to help us slow down, relax, and allow our brains to be in a more mindful place so they can make thoughtful, intelligent decisions.*

## Teach

*Today we are going to learn a simple strategy to tame your amygdala, or “inner dragon,” when you feel those flames of strong emotion running hot throughout your body.*

Display the Reflection Journal's illustration of the STOP strategy. Introduce students to each step of STOP and the importance of the sequence of steps.

The first step, **Stop!**, teaches students to form the habit of taking a pause when they notice they are feeling a strong emotion.

The second step, **Take three mindful breaths**, will help them calm the amygdala and increase communication between the amygdala and the PFC. Mindful breathing can be belly or balloon breathing, castle breathing, or any form of slow, calming breath that we will learn in this unit. Unless otherwise specified, it is best to breathe in and out the nose.

To explain the third step, **Observe the feelings in your body**, guide students to notice what they are feeling in their bodies. Try to get students to be detailed in their observations. It will help for you to model this for students. (Share any personal example. Here are a few samples).

- I notice my palms are sweating a little, and my heart is beating fast. I think I must be nervous because we have a visitor in the room watching me teach!

- My heart feels warm and my mouth wants to smile.
- My knee hurts where I fell down yesterday, I feel warm, and my brain is thinking of all the things we have to do this afternoon

The fourth step of STOP, **Proceed with Focus and Care**, is there to help students integrate mindfulness into good decision making. Once they have calmed themselves through taking three mindful breaths, and taken in the information about their feelings from their observations, they will be able to make more mindful choices about how to move forward when they experience strong emotion.

The lesson's main focus is to hone their observation skills to help them make more mindful choices. Remind students that the things they notice are called "observations."

The more adept they become at making perceptive observations, the more easily they will be able to respond mindfully to strong emotions and challenging situations.

Launch an inquiry into how we are affected both physically and emotionally by the quality of our breath. For example, a long exhalation, such as a sigh, induces a calmer mindset, heralding the PFC for mindful decision-making. Ask students to verbalize how the quality of their breath changes when they are hysterically laughing, sobbing, anxious, frightened, angry, relaxed, surprised, or startled.



Practice STOP a few times with students. Ask for one or two volunteers to share their observations from the third and fourth step for the group.

Underscore three important features of mindfulness practice:

1. Daily, consistent practice.
2. Learn from unmindful moments, without being too harsh on yourself. Every moment is an opportunity to be more mindful.
3. Fifth Grade: Thinking is different from awareness. Thinking is when your mind creates thoughts about a situation. Awareness is when your attention is focused on the situation, simply observing with your senses, without judgment. You are aware through what you see, hear, smell, taste, and touch.

## Movement

Mountain  
Half Opening  
Sequence A x3  
Mountain/  
Chair Sequence  
Big Toe  
Star into Triangle  
Surfer into Reverse  
Wave into Wave  
Sandwich\*  
Table\*  
Slide\*  
Butterfly\*  
Flower\*  
Bridge\*  
Knees into Chest\*  
Seated Mountain  
Guided Rest

\*Optional

## Active Engagement

Challenge students to take a “30-second look” using an image (e.g., photograph, map, work of art, etc.). Project or distribute the image. Ask students to observe as many details as possible for 30 seconds, without taking notes or collaborating with classmates. When the timer sounds, hide the image. Hand out scrap paper and pencils. Ask students to independently record all of the details they recall on paper. As a class, compare and discuss observations. Note conflicting or missing details before observing the image again.

Connect this activity to the first three steps of STOP.

1. *Why is it important to stop and take time when making observations?*
2. *Which sense did you rely on for this type of observation?*
3. *What is an example of a situation when it would be advantageous to use more than one sense to make an observation (e.g., when speaking with someone, using our eyes to notice facial expressions and body language and our ears to listen)?*

Point out that many of our observations are a combination of information from more than one of our senses.

**Link**

*Today, we discovered that the breath is the most powerful tool we have to calm and focus our bodies and minds. We investigated how the quality of our breath—fast, slow, deep, shallow, jagged, even, held, with sound—affects how we feel. Taking the time to slow down our breath slows down our racing minds, helps us think clearly, and enables us to make more accurate observations and smarter decisions. With consistent practice, over time, your brain can be taught to be less reactive, and instead respond more thoughtfully, awakening your Kind Leader during difficult moments.*

Review the four steps of STOP.

## Vocabulary

Body Language

Cope

Empathy

Manage

Posture

Symptom

Synonym

Vent

## Lesson 7

### Name It To Tame It

#### THE ANGER ICEBERG<sup>1</sup>

##### Overarching Learning Objective

Students will be able to identify personal anger triggers and choose effective, constructive ways to cope with anger.

##### Materials

- Chart paper
- Markers
- Two full-body images (one of a person expressing anger and the second of a person expressing another strong emotion)
- “Anger Iceberg” chart: Includes an outline of an iceberg with 10 percent of it above the water’s surface. Write the word “ANGER” in the portion above the water, a boat, and a fish [so students can clearly discern above and below the water’s surface].



## Guiding Questions

- *Does everyone experience strong emotions?  
How do you know?*
- *Does everyone react to strong emotions in the same way?*
- *Can you see emotions? If so, what do they look like?*
- *Can you feel emotions? If so, what do they feel like?*
- *What parts of the body are used to express emotions? Describe.*
- *How is body language used to express anger? Sadness? Embarrassment? Fear? Happiness? Excitement? Impatience? Disgust?*
- *How do strong emotions affect how you react in different situations?*
- *How do strong emotions affect your ability to learn something new at school?*
- *How do strong emotions affect your ability to make and keep friends?*
- *Explain the meaning of the following statement (from Daniel Siegel): “As you practice a specific state (e.g., anxious, angry, joyful, grateful) it can become a trait”?*

## Connect

*Last time we worked together we discovered that the breath is the most powerful tool we have to calm and focus our bodies and minds. We investigated how the quality of our breath—fast, slow, deep, shallow, jagged, even, held, with sound, etc.—affects how we feel. Taking the time to slow down our breath slows down our racing minds, helps us think clearly, and enables us to make more accurate observations and smarter decisions. With consistent practice, over time, your brain can be taught to be less reactive, and instead respond more thoughtfully during difficult moments.*

## Teach

Share a full-body image of a person expressing a strong emotion (other than anger). Demonstrate how you can make detailed observations from the person's facial expression and overall body language to infer how that person might feel. Demonstrate how you carefully think about and analyze your observations, since some emotions (e.g., anger, jealousy, embarrassment, hurt, frustration, betrayal) may appear similar and can be difficult to differentiate based on observation alone. Share how observations precede naming the emotion.

*Notice how I observed clues from this person's facial expression and posture, or body language, before I named the emotion s/he might be experiencing. You too need to stop, take three mindful breaths, and observe the sensations in your own body before you can fully understand what you are feeling. For example, there are times when I think I am angry, but when I stop, take three mindful breaths, and observe the sensations in my body, I realize that I am feeling something different, like embarrassment or fear.*

*To better prepare us to make intelligent, mindful decisions in response to a strong emotion, we need to "Name It to Tame It." This means that we first must identify and name our emotion before we calm, or tame it.*

Share a second full-body image, this time of a person expressing anger. Have students go through the same process you demonstrated in order to name the emotion that they infer the person may be feeling. Students must justify why they chose a particular emotion. Discuss the physical symptoms of anger (e.g., fast heartbeat and breath, sweating, clenched fists or jaw, headaches, stomachaches, tight muscles, scowling, red face, difficulty focusing, irritability, shouting).

### Active Engagement

After a consensus is reached that the emotion expressed in the second image is anger, pose the following question:  
*What is anger?*

Anger is a strong emotion. Emphasize that there are no right or wrong emotions. It is okay to feel angry. However, actions can be right or wrong. It is never okay to hurt others or ourselves. It is never okay to take something that isn't ours, or to destroy someone's property.

—*Where does anger come from?*

—*What are synonyms for anger (frustration, fury, rage, outrage, irritation, resentment, crossness)?*

—*What are examples of healthy ways to cope, or deal with, anger?*

Chart responses.

*The first step is to recognize your anger triggers and the early warning signs of anger rising inside of you. The second step is to practice positive responses until they are wired in your brain and become healthy coping habits.*

Some examples of healthy ways to cope with anger include writing in a journal, releasing anger through physical activity (e.g., dance or sports), talking to someone, taking three mindful breaths, or walking away and dealing with the situation once you have calmed down.

### Movement

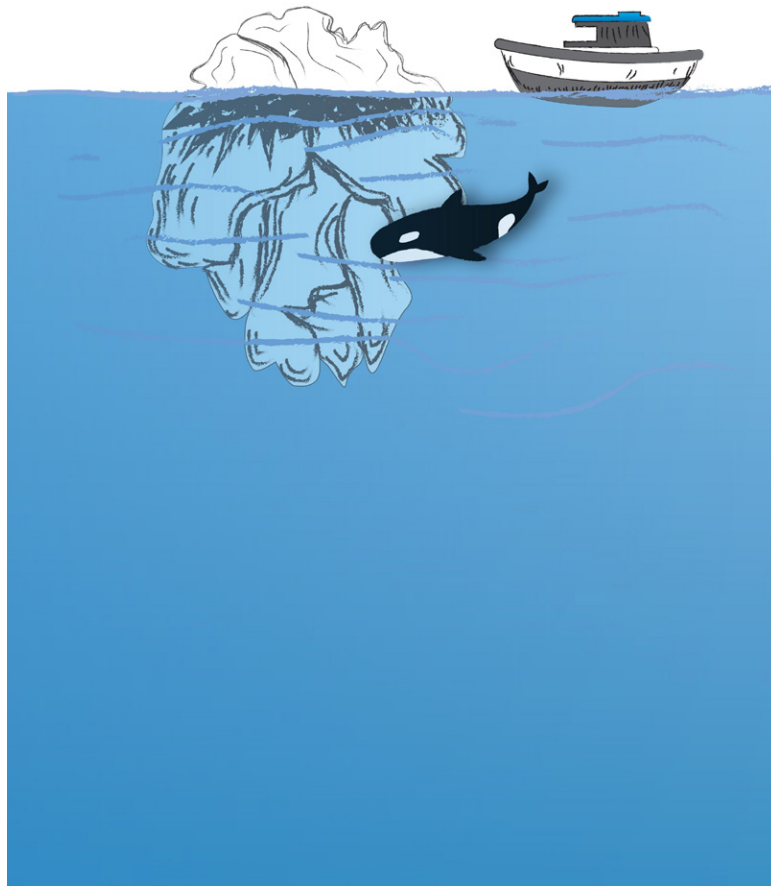
Mountain  
Half Opening  
Sequence A x3  
Mountain/  
Chair Sequence  
Big Toe  
Star into Triangle  
Surfer into  
Reverse Wave  
into Wave  
Stork  
Butterfly\*  
Flower\*  
Half Boat x3\*  
Seated Tree\*  
Bridge\*  
Knees into Chest\*  
Seated Mountain  
Guided Rest

\*Optional

*What are examples of unhealthy ways to react to, or vent, anger?*

- Breaking something
- Stealing something
- Hurting someone physically or emotionally
- Hurting yourself
- Bottling up emotions inside

Display the “Anger Iceberg” chart.



*An iceberg is an enormous piece of floating ice found in the coldest parts of the ocean. Only the top 10 percent of an iceberg can be seen above the surface, which means that the majority of it is hidden from view. Anger can be compared to an*

*iceberg. Many times, our anger represents only a small part of what we are actually feeling. It is a surface emotion, with the deeper emotion(s) hiding below the surface. When experiencing anger, it is important to ask yourself, "What am I feeling other than anger?"*

Feelings that may be concealed beneath the surface include humiliation, guilt, fear, jealousy, anxiety, frustration, worry, insecurity, rejection, helplessness, and feeling disrespected. Share one of these possible deep emotions and then have students contribute their own. Record answers on the "Anger Iceberg" chart (on the portion of the iceberg submerged in water).

*Since everyone experiences different underlying emotions, each person's Anger Iceberg might be different. Learning about these deeper emotions not only makes you more aware of your own feelings, but of the feelings of others, which teaches compassion and empathy.*

*It is more difficult to become angry with someone when you understand that they may be expressing anger out of another, deeper emotion, such as fear, insecurity, jealousy, or hurt.*

## Link

*Today we explored the importance of observing the feelings in our bodies before naming the emotion we are experiencing. We call this strategy "Name It To Tame It." Naming the emotion empowers you to tame, or manage, it before the strong emotion takes control of you. Sometimes a strong emotion like anger is only the tip of the iceberg, with deeper emotions hidden beneath the surface. Remember, as you practice a specific state, such as anger or calm, it becomes a trait.*



## Vocabulary

Consolidate  
Downtime  
Productive  
Recharge  
Reenergize

## Lesson 8

### Give Your Brain a Break MINDFUL BREATHING REVIEW

#### Overarching Learning Objective

Students will be able to practice mindful breathing independently to give their brains downtime.

#### Materials

- Tone bar
- Unit 2 Reflection Journal

## Guiding Questions

- *How can you take care of your brain?*
- *What is downtime?*
- *Why is downtime important?*
- *How does mindful breathing give your brain downtime?*
- *Is daydreaming considered “wrong” in mindfulness practice? Explain.*
- *Does it work to “force” your brain to pay attention? Why or why not?*
- *Since we have started working together, have you noticed any changes in your ability to be less distracted and stay with the breath during mindful breathing practice? Describe any changes.*
- *What do you say to yourself when your attention wanders?*
- *What does the expression “flip your lid” mean?*
- *Explain the following quote: “You have power over your mind—not outside events. Realize this, and you will find strength.” (Marcus Aurelius, Meditations) (fifth grade)*

## Connect

Last time we worked together we explored the importance of observing the feelings in our bodies before naming the emotion we are experiencing. We call this strategy “Name It To Tame It.” Naming the emotion empowers you to tame, or manage, it before the strong emotion takes control of you. Sometimes a strong emotion like anger is only the tip of the iceberg, with deeper emotions hidden beneath the surface.

## Teach<sup>1</sup>

*Today we are going to learn the importance of giving our brains downtime with mindful breathing. Give a silent thumbs-up if your brain has ever felt so full of new learning that it needed a break, or downtime.*

*Just like your body needs vitamins from food, your brain needs downtime to recharge and reenergize. Your brain needs breaks so it can better remember, learn, and come up with creative ideas. To be productive, your brain requires downtime during the day.*

*When your brain is not actively learning something new, it has time to combine, or consolidate, the most important parts of the information it learned. Downtime has similar benefits to a good night’s sleep. For example, if you get a good night’s sleep before a spelling test, the next day you have an easier time recalling how to spell even the most challenging words. Your brain needs rest to store what you learn into your long-term memory.*

Teach students Dr. Dan Siegel’s “handy” model of the brain to review the amygdala, hippocampus, and PFC. In this model, one fist represents both hemispheres of the brain. Students each raise one hand, palm facing them, with the thumb curled into the palm. The thumb represents the limbic system (our “mammalian brain”

1: “Why Your Brain Needs More Downtime,” from *Scientific American*, <http://www.scientificamerican.com/article/mental-downtime/>.



that is responsible for our basic emotions), and the tip of the thumb represents the amygdalas. The hippocampus is also part of the limbic system. All four fingers, which represent the cerebral cortex, fold to cover the thumb, forming a fist. The fingernails represent the PFC. The wrist is the base of the skull and the forearm is the spinal cord. When we are overcome with anger, stress, or anxiety, we may “flip our lid,” or lose self-control. This can be demonstrated by pointing the four fingers straight up and keeping the thumb where it is.<sup>1</sup>

*Since mindful breathing gives our brains downtime, we are going to practice teaching one another mindful breathing in groups of three. The mindful breathing is exactly the same as we have practiced in our previous sessions.*

### Active Engagement

*Before we divide up into groups, we will practice mindful breathing as a class.*

Lead the class by following the steps listed on page 22 of the Reflection Journal, “Mindful Breathing.” Remind students that when they notice their attention wandering away from their breath, they are practicing mindfulness. The act of noticing and consciously bringing their attention back to the breath is an example of a mindful moment. Explain that daydreaming is not bad. The goal is to become aware of when they daydream so they can choose where to focus their attention.

*Continue to notice your distractions. Gently invite your attention back to the breath to strengthen your brain’s power to choose its focus. If you catch yourself daydreaming during an important math lesson, you can choose your focus and bring your attention back to the lesson. You have the power to choose your focus.*

### Movement

Mountain  
Half Opening  
Sequence A x3  
Mountain/Chair  
Sequence  
Big Toe  
Star into  
Triangle Surfer into  
Reverse Wave into  
Wave  
Figure Four  
Sandwich\*  
Table\*  
Slide\*  
Seated Tree\*  
Half Boat x3  
[or Boat x3]\*  
Bridge\*  
Knees into Chest\*  
Seated Mountain  
Guided Rest

\*Optional

1: <https://www.psychalive.org/minding-the-brain-by-daniel-siegel-m-d-2/>

Divide students into groups of three to lead one another through the steps of mindful breathing. Allow one minute for each student to lead within each group. Ring the tone bar to signal a rotation of roles.

**Student 1:** Leads mindful breathing.

**Student 2:** Practices mindful breathing with eyes closed; raises one finger each time s/he notices his/her attention wander.

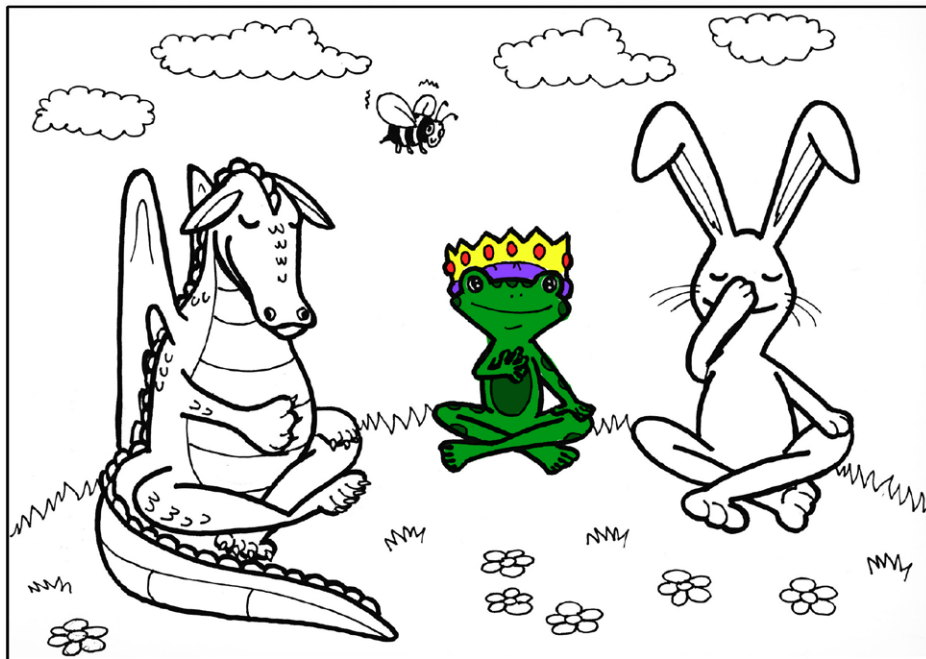
**Student 3:** Counts Student 2's distractions.

Students within each group share their observations and how it feels to notice their attention come and go, just like the breath.

#### Link

*Today we learned the importance of giving our brains downtime to recharge, just like we need to recharge a phone or iPad. Since you can't be plugged into the wall to recharge, you need to sleep at night and give your brain downtime during the day. Mindful breathing is a fantastic way to reenergize and refresh your brain. Overworking your brain makes it difficult to learn new information or develop creative ideas. You perform at your best and are more productive when you give your brain the space and time it needs to absorb new information and grow its creativity.*

# MINDFUL BREATHING



1. SIT DOWN AND GET COMFORTABLE.
2. REST YOUR HAND ON YOUR CHOSEN BREATHING SPACE:  
TUMMY, CHEST OR YOUR NOSE.
3. SILENTLY REPEAT YOUR ANCHOR WORDS,  
BREATHING IN...BREATHING OUT...
4. WHEN YOUR ATTENTION WANDERS LIKE AN UNTAMED  
DRAGON, GENTLY BRING IT BACK TO YOUR BREATHING SPACE.  
REPEAT BREATHING IN...BREATHING OUT...
5. CAN YOU BE MINDFUL OF YOUR BREATHING FOR 5 BREATHS?  
FOR 1 MINUTE? SET A GOAL AND INCREASE THE NUMBER OF  
BREATHS, OR AMOUNT OF TIME YOU PRACTICE EACH DAY.



## Mini-unit

# Movement Objectives

**Students will be able to do the following...**

- 1 A Peek Inside the Amazing Brain: How Habits Grow Your Brain**
  - Demonstrate the breath and movement patterns of Sunrise/Mountain.
- 2 Getting To Know Your Brain: Cerebrum, Cerebellum, Medulla (Part II)**
  - Demonstrate the breath and movement patterns of Opening Sequence A.
- 3 Getting to Know Your Brain: Hippocampus, Amygdala, Prefrontal Cortex (Part II)**
  - Independently demonstrate the breath and movement patterns of Closing Sequence.

#### **4 Brain-Breath Connection**

- Independently demonstrate the breath and movement patterns of Opening Sequence A.

#### **5 Mindful or Unmindful**

- List three benefits of standing postures.

#### **6 STOP Strategy: How to Tame Your Amygdala**

- Identify and apply strategies to help maintain physical balance in at least one standing balance pose.

#### **7 How Emotions Move Through the Body**

- Demonstrate and describe how mindful breathing in Closing Sequence activates their power to be kind and calm.

#### **8 Give Your Brain a Break: Mindful Breathing Review**

- Apply principles of cooperation and trust with another student in a partner pose.

# Mini-unit Posture Guide

This posture guide provides a basic overview of the postures included in the Mini-unit.

## Big Toe

Standing /  
Forward Fold



## Butterfly

Seated



## Boat

Strength



## Cat

Warm-up



## Bridge

Backbend



## Chair

Standing



**Cow**  
Warm-up



**Flower**  
Seated



**Figure Four**  
Standing



**Forest  
(Partner Tree)**  
Standing / Balance



**Guided Rest**  
Rest



**Half Boat**  
Strength



### Knees-Into-Chest

Supine



### Pointing Dog

Balance



### Mountain

Standing



### Reverse Wave

Standing



### Rock

Rest



### Partner Figure Four

Balance



### Sandwich

Seated/Forward Fold





**Seal 1**  
Backbend



**Seated Tree**  
Seated/  
Forward Fold



**Seal 2**  
Backbend



**Sleeping  
Crocodile**  
Rest



**Seated  
Mountain**  
Cooldown



**Slide**  
Strength



**Star**  
Standing



**Stork**  
Standing/  
Balance



**Sunset**  
Standing/  
Forward Fold



**Sunrise**  
Standing



**Surfer**  
Standing



**Table**  
Strength



**Triangle**  
Standing



**Tree**  
Standing/  
Balance



**Wave**  
Standing



### Half Opening Sequence A



### Mountain-Chair Sequence



### Surfer into Reverse Wave in to Wave



# Mini-unit

## Glossary

### A

**Achievable:** able to be brought about or reached successfully

**Action plan:** an organized series of steps to be taken in order to achieve a goal

**Adapt:** to make something suitable for a new use or purpose

**Adjective:** a word or phrase that describes a person, place, or thing

**Advantage:** a condition or circumstance that puts one in a favorable position

**Alternate:** to occur in turn repeatedly

**Amygdala:** a roughly almond-shaped mass of gray matter inside each cerebral hemisphere that is involved with the experiencing of emotions

**Awareness:** perception of a situation or fact

**Axon:** the long threadlike part of a nerve cell along which impulses are conducted from the cell body to other cells

**Axon terminal:** the end of a branch of an axon

### B

**Balance:** an even distribution of weight that enables someone or something to remain upright and steady

**Benchmark:** a standard or point of reference against which things may be compared or measured

**Body language:** the conscious or unconscious gestures and movements used to communicate nonverbally

**Brain-body connection:** the bi-directional physiological feedback loop within the human body

**Brain stem:** the central trunk of the mammalian brain

### C

**Cell:** the smallest structural and functional unit of an organism

**Cerebellum:** the part of the brain at the back of the skull in vertebrates

**Cerebrum:** the principal and most anterior part of the brain in vertebrates, located in the front area of the skull

**Character trait:** an aspect of a person's behavior and attitudes

**Chemical:** of or relating to chemistry or interactions of substances

**Confidence:** the feeling or belief that one can rely on someone or something

**Confident:** feeling or showing self-assurance

**Consolidate:** to make something stronger or more solid

**Cope:** to deal effectively with something difficult

**Corpus callosum:** a broad band of nerve fibers joining the two hemispheres of the brain

### D

**De-stress:** to relax after a period of work or tension

**Decoder:** a device capable of deciphering signals or patterns

**Dendrite:** a short, branched extension of a nerve cell

**Downtime:** a time of reduced activity or effort

## E

**Efficiency:** the ability to perform an action or task with minimal time or effort

**Empathy:** the ability to understand and share the feelings of another

**Estimate:** to roughly judge the value, number, quantity, or extent of

**Expectation:** a strong belief that something will happen in the future

**External:** belonging to or forming the outer surface or structure of something

## F

**Filter:** a porous device for removing impurities or to divide parts from a whole

## G

**Goal:** the object of a person's ambition or effort; an aim or desired result

## H

**Habit:** a settled or regular tendency or practice—usually one that is difficult to give up

**Hemisphere:** each of the two parts of the cerebrum in the brain

**Hippocampus:** the elongated ridges on the floor of each lateral ventricle of

the brain, thought to be the center of emotion, memory, and the autonomic nervous system

## I

**Impulsive:** to act or to have acted without forethought

**Infer:** to derive information from reasoning rather than from explicit statements

**Interference:** an interruption or disruption in a course of events

**Internal:** of or situated on the inside

**Interpret:** to explain the meaning of (information, words, or actions)

**Involuntary:** done without will or conscious control

## J

**Judgment:** the ability to make considered decisions or come to sensible conclusions

**Judgmental:** having or displaying an excessively critical point of view

## L

**Lobe:** a somewhat round and flat part of something

**Localized:** to be restricted to a particular place

## M

**Manage:** to be in charge of

**Maturing:** a person in the process of becoming mature (physically, emotionally, intellectually, and/or socially)

**Measurable:** able to be measured

**Medulla:** the inner region of an organ or tissue

**Metaphor:** a figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable

**Moment:** a brief period of time

**Monitor:** an instrument or device used for observing, checking, or keeping a record

**Motivation:** the reason or reasons one has for acting in a particular way

## N

**Nervous system:** the network of nerve cells and fibers that transmit impulses throughout the body

**Network:** an arrangement of intersecting lines or parts

**Neuron:** a specialized cell transmitting nerve impulses

**Neuroplasticity:** the brain's capacity to change and rewire according to environment and experience

**Neurotransmitter:** a chemical substance released at the end of a nerve fiber by the arrival of a nerve impulse

## O

**Observe:** to watch carefully; to notice or perceive a person, object, or scene

**Obstacle:** a thing that blocks someone's way and hinders or prevents progress

**Openness:** lack of restriction or limit

**Optical illusion:** an experience of seeing something that does not exist or that is other than it appears

**Organ:** a typically self-contained and vital part of an organism

**Outcome:** the result of a series of events or actions

## P

**Pattern:** a repeated or decorative design

**Pause:** a temporary ceasing in action or speech

**Perceive:** to be aware, to realize, or to understand

**Perceptive:** having or showing sensitive insight

**Perspective:** a particular attitude toward or way of regarding something

**Posture:** a position of a person's body when standing or sitting

**Prefrontal cortex:** the cerebral cortex that covers the front part of the frontal lobe

**Priority:** one thing that is regarded as more important than another

**Proceed:** to begin or continue a course of action

**Procrastination:** the action of delaying or postponing something

**Productive:** achieving or producing a significant amount or result

**Progress:** forward or onward movement toward a destination

**Pruning:** to trim or cut away

## R

**Realistic:** having or showing a sensible and practical idea of what can be achieved or expected

**Recharge:** to restore power or energy

**Record:** a documentation of experience or events

**Reenergize:** to give or gain vitality or enthusiasm

**Reflect:** to think deeply or carefully about

**Resource:** a stock or supply of useful or valuable assets

**Rewire:** to rearrange a configuration of wires

## S

**Scenario:** a postulated sequence or development of events

**Self-awareness:** conscious knowledge of one's own character, feelings, motives, and desires

**Self-defeating:** counterproductive thoughts or actions that prevent the achievement of a goal

**Self-regulation:** the ability to activate or move oneself

**Signal:** a gesture, action, or sound that is used to convey information or instructions

**Skull:** a framework of bone protecting the brain of a vertebrate

**Specific:** clearly defined or identified

**Stimulus:** a thing or event that evokes a specific functional reaction

**Strategy:** a plan of action or policy designed to achieve a major or overall aim

**Stress:** pressure or tension exerted on a material object

**Success:** the accomplishment of an aim or purpose

**Surface area:** the outside part or uppermost layer of something

**Symptom:** a sign of the existence of something

**Synapse:** a junction between two nerve cells

**Synonym:** a word or phrase that means exactly or nearly the same thing as another word or phrase

## T

**Tame:** to encourage or facilitate cooperation

**Temper:** a person's state of mind seen in terms of their being very angry or calm

**Temperature:** the degree or intensity of heat present in a substance or object

**Timely:** done or occurring in a favorable amount of time

**Track:** a course of action or way of proceeding, or to follow the trail of someone or something

**Trigger:** an event or circumstance that is the cause of a particular action, process, or situation

## V

**Vent:** the expression or release of a strong emotion

**Voluntary:** acting of one's own free will; acting under the conscious control of the brain



# Introduction

## Pure Edge, Inc.

Pure Edge, Inc. offers children and adolescents a chance at happy, healthy lives by bringing health and wellness practices to schools and communities.

Pure Edge, Inc. Power Curriculum provides young people with skills that minimize stress, lower incidence of bullying and violence, and improve school attendance and academic performance. Program offerings consist of best practices in health and wellness, including exercises based on yoga, mindfulness practices, and nutrition education.

Through partnerships with educators, Pure Edge, Inc. supports parents, teachers, and community leaders in their efforts to provide students with the tools they need to gain success through focus.

## Philosophical Orientation

The full Pure Edge, Inc. curriculum reflects the philosophical orientation and instructional recommendations advocated by the Joint Committee on National Health Education Standards and best practices for health and wellness, including exercises, physical therapy, mindfulness, and nutrition.

Effective health and wellness education promotes critical thinking in students and encourages them to make connections between concepts around healthy living and personal experience. Young people need to be reflective decision-makers. They must learn to identify and analyze how culture, media, and technology shape their everyday physical, mental, and emotional health.

Taught through a sequential, coordinated, and interdisciplinary curriculum, this program addresses a variety of topics aligned with national standards, and can be tailored to meet any state standards. In addition, it can be adjusted to degrees of complexity appropriate to students' developmental levels as they move from middle childhood to adolescence and then to young adulthood. The health and wellness instructor is trained to define the intellectual level and depth of instruction most appropriate for students.

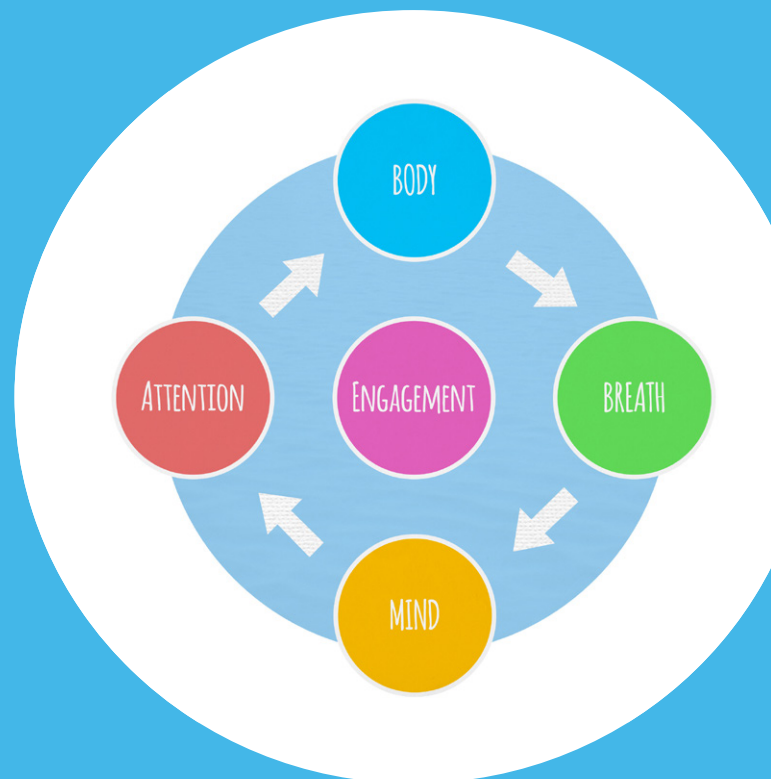
Research completed by the National Association for Sport and Physical Education (NASPE) and Centers for Disease Control and Prevention (CDC) reveals that there is a direct relationship between academic achievement and fitness. Movement and exercise enhance the learning state for memory retention and retrieval. Therefore, physical activity is a catalyst for learning in all content areas and should be an essential element of students' daily routines.

The knowledge that students gain through this program enhances their own health and wellness, as well as the health and wellness of their peers and community. The program promotes a supportive environment where individuals' similarities and differences are acknowledged and accepted.

# The Five Principles of Health and Wellness

Our philosophical orientation is put into practice through the application of our Five Principles of Health and Wellness.

1. **Body:** Through wellness exercises, we teach the abilities to energize, strengthen, and stretch the body.
2. **Breath:** Through regulated breathing exercises, we teach the ability to calm the nervous system through impulse control, ways to identify stressful situations, and coping mechanisms.
3. **Mind:** By observing the mind, we teach the skill of “slowing down” so that students are able to reduce stress, identify habits, and navigate strong emotions.
4. **Attention:** Through the use of coordinated practices of body, breath, and mind, we teach the ability to focus in a coherent direction. We often ask students to “pay attention,” but they don’t know what attention is, or where to pay it. Attention is not a thing; attention is a state. In an active state of attention, students can steer their actions in the direction of their
5. **Engagement:** Through the achievement of relaxation and attention, we teach students how to engage with their own decision-making processes and improve their aptitude for perceiving the most beneficial choices with regard to the demands of education, as well as the demands of life at home and in social situations. Full engagement may allow improvement in handling stressful experiences, such as test-taking or peer pressure.



The exercises used within the Pure Edge, Inc. Health and Wellness Program are based on tested practices. Yoga-based exercises have been shown to have many benefits for young people, including reduction of stress and anxiety;<sup>1-3</sup> increase in self-regulatory capacities,<sup>4</sup> including decreased anger;<sup>5,6</sup> increased ability to maintain focus;<sup>7</sup> reductions in negative affect,<sup>1,3</sup> depression,<sup>5</sup> and body dissatisfaction,<sup>8</sup> and reduction of negative behaviors.<sup>5</sup> Physically, yoga has been shown to enhance cardiovascular fitness,<sup>9-11</sup> balance,<sup>12,13</sup> and grip strength.<sup>14</sup> At least one study has shown that the position we hold our bodies in has a direct correlation to raising levels of confidence, risk-taking, and competence, lowering cortisol levels, and configuring the brain to sensibly cope with stressful situations.<sup>15</sup>

While participating in this program, children will exercise and connect with their own bodies while increasing their connection to and understanding of the world around them. The simple, regulated breathing exercises help students relax by focusing on their breath and the simplicity of the moment. Each session includes relaxation, which gives students a break from their full, and often stressful, school days and lives.

## References

1. West J, Otte C, Geher K, Johnson J, Mohr DC. Effects of Hatha yoga and African dance on perceived stress, affect, and salivary cortisol. *Annals of behavioral medicine: a publication of the Society of Behavioral Medicine*. 2004;28(2):114-8. Epub 2004/09/30.
2. Platania-Solazzo A, Field TM, Blank J, Seligman F, Kuhn C, Schanberg S, et al. Relaxation therapy reduces anxiety in child and adolescent psychiatric patients. *Acta paedopsychiatrica*. 1992;55(2):115-20. Epub 1992/01/01.
3. Noggle JJ, Steiner NJ, Minami T, Khalsa SB. Benefits of yoga for psychosocial well-being in a US high school curriculum: a preliminary randomized controlled trial. *Journal of developmental and behavioral pediatrics: JDBP*. 2012;33(3):193-201. Epub 2012/02/22.
4. Mendelson T, Greenberg MT, Dariotis JK, Gould LF, Rhoades BL, Leaf PJ. Feasibility and preliminary outcomes of a school-based mindfulness intervention for urban youth. *Journal of abnormal child psychology*. 2010;38(7):985-94. Epub 2010/05/05.
5. Berger BG, Owen DR. Mood alteration with yoga and swimming: aerobic exercise may not be necessary. *Perceptual and motor skills*. 1992;75(3 Pt 2):1,331-1,343. Epub 1992/12/01.
6. Khalsa SB, Hickey-Schultz L, Cohen D, Steiner N, Cope S. Evaluation of the mental health benefits of yoga in a secondary school: a preliminary randomized controlled trial. *The journal of behavioral health services and research*. 2012;39(1):80-90. Epub 2011/06/08.
7. Peck HL, Kehle TJ, Bray MA, Theodore LA. Yoga as an intervention for children with attention problems. *School psychology review*. 2005;34:415-424.
8. Scime M, Cook-Cottone C. Primary prevention of eating disorders: a constructivist integration of mind and body strategies. *The International journal of eating disorders*. 2008;41(2):134-42. Epub 2007/10/25.
9. Bera TK, Rajapurkar MV. Body composition, cardiovascular endurance and anaerobic power of yogic practitioner. *Indian journal of physiological pharmacology*. 1993;37:225-8.
10. Moorthy AM. Survey of minimum muscular fitness of the school children of age group 6 to 11 years and comparison of the influence of selected yogic exercises and physical exercises on them. *Yoga mimamsa*. 1982;21:59-64.
11. Bagga OP, Gandhi A. A comparative study of the effect of Transcendental Meditation (T.M.) and Shavasana practice on cardiovascular system. *Indian heart journal*. 1983;35(1):39-45. Epub 1983/01/01.
12. Berger DL, Silver EJ, Stein RE. Effects of yoga on inner-city children's well-being: a pilot study. *Alternative therapies in health and medicine*. 2009;15(5):36-42. Epub 2009/09/24.
13. Dhume RR, Dhume RA. A comparative study of the driving effects of dextroamphetamine and yogic meditation on muscle control for the performance of balance on balance board. *Indian journal of physiology and pharmacology*. 1991;35(3):191-4. Epub 1991/07/01.
14. Dash M, Telles S. Improvement in hand grip strength in normal volunteers and rheumatoid arthritis patients following yoga training. *Indian journal of physiology and pharmacology*. 2001;45(355-360).
15. Carney DR, Cuddy AJ, Yap AJ. Power posing: brief nonverbal displays affect neuroendocrine levels and risk tolerance. *Psychological science*. 2010;21(10):1363-8 Epub 2010/09/22. ion of eating disorders: a constructivist integration of mind and body strategies. *The International journal of eating disorders*. 2008;41(2):134-42. Epub 2007/10/25.



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