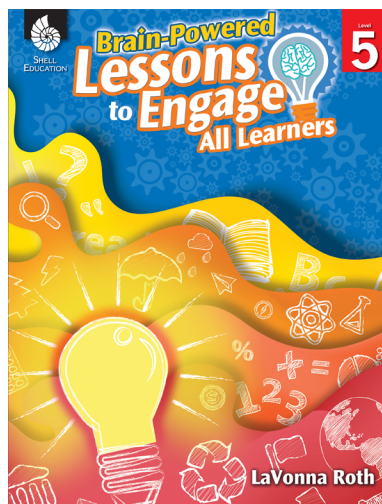




Sample Pages from

Brain Powered Lessons to Engage All Learners

Level 5



The following sample pages are included in this download:

- Table of Contents
- Introduction excerpt
- Lesson plan

For correlations to Common Core and State Standards, please visit <http://www.teachercreatedmaterials.com/correlations>

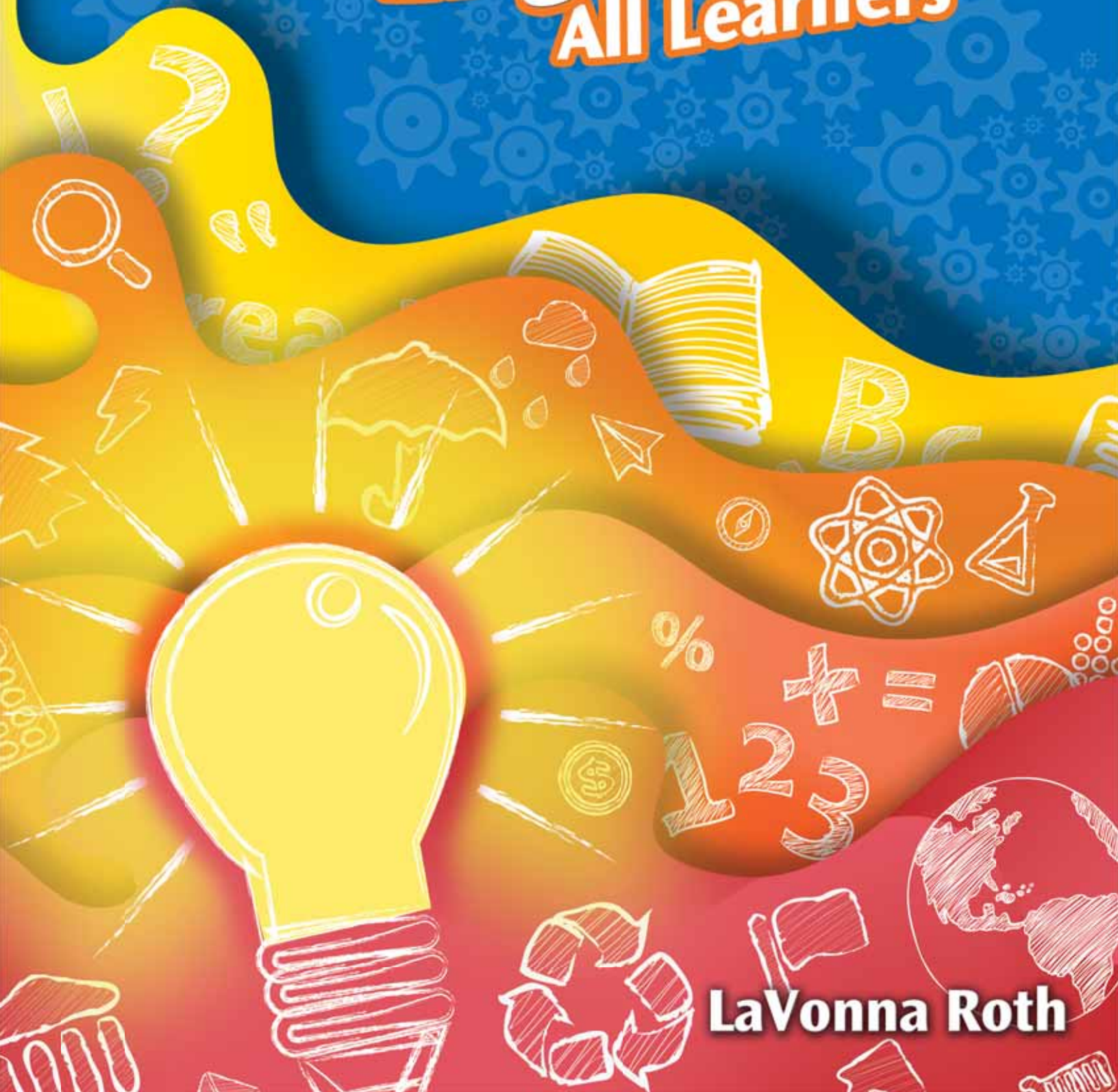


SHELL
EDUCATION

Brain-Powered Lessons to Engage All Learners

Level

5



LaVonna Roth

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The Power of the Brain

“What actually changes in the brain are the strengths of the connections of neurons that are engaged together, moment by moment, in time.”

—Dr. Michael Merzenich

The brain is a very powerful organ, one we do not completely understand or know everything about. Yet science reveals more and more to us each day.

As educators, we have a duty to understand how the brain learns so that we can best teach our students. If we do not have an understanding of some of the powerful tools that can help facilitate our teaching and allow us to better target the brain and learning, we lose a lot of time with our students that could be used to serve them better. Plus, the likelihood of doing as much reteaching will lessen.

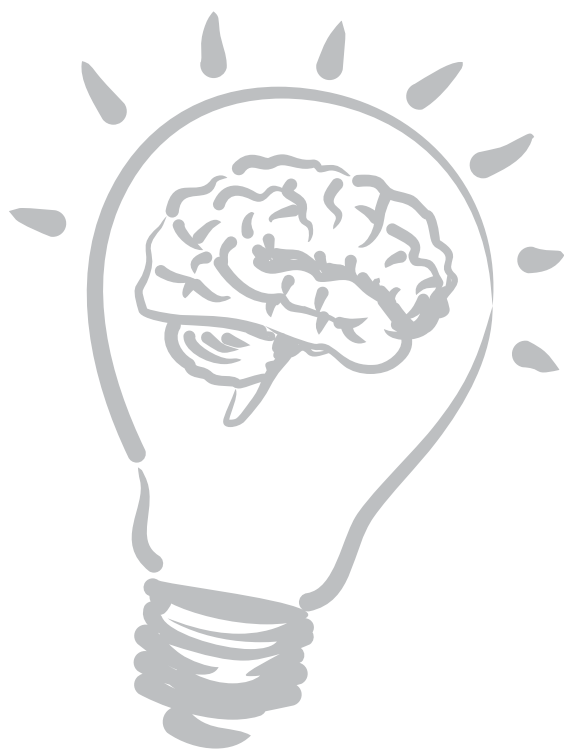
This is where *Brain-Powered Lessons to Engage All Learners* comes in! The eight strategies included within the lessons are designed around how the brain learns as a foundation. In addition, they are meant to be used as a formative assessment, include higher-order thinking, increase the level of engagement in learning, and support differentiation. For detailed information on each strategy, see pages 12–19.

What Makes the Brain Learn Best

As you explore the strategies in this book, keep the following key ideas in mind.

The content being taught and learned must:

- ⊙ be engaging
- ⊙ be relevant
- ⊙ make sense
- ⊙ make meaning
- ⊙ involve movement
- ⊙ support memory retention



The Power of the Brain *(cont.)*

Be Engaging

In order for students to pay attention, we must engage the brain. This is the overarching theme to the rest of the elements. Too often, students are learning complacently. Just because students are staring at the teacher, with pencil in hand and taking notes, does not mean they are engaged. For example, we know that they are engaged when they answer questions or are interacting with the information independently with a teacher or another student. We don't always know when they are engaged just by looking at them. Sometimes, it's a simple question or observation of what they are doing that helps identify this. Body language can tell us a lot, but do not rely on this as the only point of observation. Many teachers may have not gone into teaching to "entertain," but entertaining is one component of being engaging. As neuroscience research has revealed, it was noted as early as 1762 that the brain does change (neuroplasticity) based on experiences (Doidge 2007). It rewires itself based upon experiences and new situations, creating new neural pathways. "Even simple brain exercises such as presenting oneself with challenging intellectual environments, interacting in social situations, or getting involved in physical activities will boost the general growth of connections" (HOPES 2010, §2). This is fantastic if we are creating an environment and lessons that are positive and planned in a way that fires more neurons that increase accurate learning.



"Even simple brain exercises such as presenting oneself with challenging intellectual environments, interacting in social situations, or getting involved in physical activities will boost the general growth of connections" (HOPES 2010, §2).

The Power of the Brain *(cont.)*

As a reflection for you, think about the following with respect to student engagement:

- ⊙ What are the students doing during the lesson? Are they doing something with the information that shows they are into it? Are they asking questions? Are they answering?
- ⊙ What is their body language showing? Are they slumped, or are they sitting in a more alert position? Are their eyes glazed and half-closed, or are they bright, alert, and paying attention to where their focus should be?
- ⊙ Who is doing most of the talking and thinking? Move away from being the sage on the stage! Let the students be the stars. Share your knowledge with them in increments, but permit them to interact or explore.
- ⊙ What could you turn over to students to have them create a way to remember the content or ask questions they have? What could be done to change up the lessons so they are interacting or standing? Yes, parts of lessons can be taught by having students stand for a minute or so. Before they sit, have them stretch or high-five a few classmates to break up the monotony.

Be Relevant

Why should the brain want to learn and remember something that has no relevance to us? If we want our students to learn information, it is important that we do what we can to make the information relevant. An easy way to achieve this is by bringing in some background knowledge that students have about the topic or making a personal connection. This does not need to take long.

As you will note, the lessons in this book start out with modeling. Modeling allows learners to have an understanding of the strategy and it also takes a moment to bring in what they know and, when possible, to make a personal connection. Consider asking students what they know about a topic and have them offer ideas. Or ask them to reflect on a piece of literature that you read or to ponder a question you have provided. For English language learners, this strategy is particularly effective when they can relate it to something of which they have a foundational concept and can make a connection to what they are learning. The language will come.

Make Sense

Is what you are teaching something that makes sense to students? Do they see the bigger picture or context? If students are making sense of what they are learning, a greater chance of it moving from working memory to long-term memory will increase. Some students can be asked if the idea makes sense and if they clearly understand. If they are able to explain it in their own words, they probably have a good grasp on metacognition and where they are in their learning. Other students may need to be coached to retell you what they just learned.

The Power of the Brain (cont.)

Make Meaning

Once students have had an opportunity to make sense of what they are learning, provide an opportunity for them to make meaning. This means that they have a chance to apply what was learned and actually “play” with the skills or concepts. Are they able to complete some tasks or provide questions on their own? Are they ready to take the information to higher levels that demonstrate the depth of understanding? (Refer to Webb’s Depth of Knowledge for some additional insight into various levels of making meaning on pages 22–23.) For some students, simply asking a few questions related to what is being taught or having them write a reflection of what was just explained will allow you to check in on their understanding to see where they are before taking their thinking to a higher or a deeper level.

Involve Movement

This one is particularly important because of the plethora of research on movement. Dr. John Ratey wrote the book *Spark*, which documents how student achievement soars based on some changes made to students’ physical education program in which students achieved their target heart-rate zone during their physical education time. Movement, particularly exercise, increases brain-derived neurotrophic factors (BDNF) that increase learning and memory (Vaynman, Ying, and Gomez-Pinilla 2004).

Knowing that getting students to achieve their target heart rate zone is not always an option, do what you can. Have students take some brain breaks that heighten their heart rate—even if for just a minute.

Movement has strong retention implications in other ways. Students can create a gesture connected to the lesson concept, or they can stand and move while they make meaning from what they learned. Movement is multisensory, thus, various regions of the brain are activated. When multiple brain pathways are stimulated, they are more likely to enter long-term potentiation from activating episodic and semantic memories.

If you come across a model lesson in this book in which not much movement is shared, or you find your students have been sitting longer than you may wish (you will know because their body language will tell you—unfortunately, we should have had them moving before this point), my challenge to you is to think of what movement you can add to the lesson. It could involve a gesture, a manipulative, or physically getting up and moving. If you are concerned about them calming back down, set your expectations and stick to them. Keep in mind that often when students “go crazy” when permitted to move, it’s probably because they *finally* get to move. Try simple techniques to bring students back into focus. “Part of the process of assisting children in developing necessary skills is getting to the root of why they behave as they do” (Harris and Goldberg 2012, xiv).

The Power of the Brain *(cont.)*

Support Memory Retention

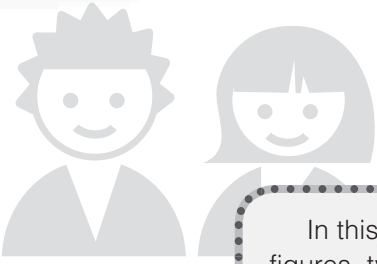
If we want our students to retain what we teach them, then it is important that we keep in mind what causes our brains to retain that information.

Key Elements to Memory Retention	Why
Emotions	We can create an episodic memory when we connect emotions to our learning.
Repetition	Repetition increases memory as long as there is engagement involved. Worksheets and drill and kill do not serve long-term memory well.
Patterns/Organization	When our brains take in messages, they begin to file the information by organizing it into categories.
Personal connection	Linking learning to one's self is a powerful brain tool for memory. This, too, can be tied to emotion, making an even stronger connection.
Linking new and prior knowledge	Taking in new information automatically results in connecting past knowledge to what is new.

(Roth 2012)

As you explore the strategies and lessons throughout this book, note how many of them incorporate the keys to memory retention and what engages our students' brains. As you begin to explore the use of these strategies on your own, be sure to keep the framework of those important components.

The bottom line—explore, have fun, and ask your students how they feel about lessons taught. They will tell you if they found the lesson interesting, engaging, and relevant. So get in there, dig in, and have some fun with your students while trying out these strategies and lessons!



It Takes Two

Strategy Overview

In this strategy, students compare and contrast two topics (e.g., stories, historical figures, types of clouds and shapes) using a T-chart and sticky notes. The goal is for students to analyze each topic and create a chart that represents their thinking. Thereafter, another group of students will evaluate whether it agrees with the original group's thoughts or, if not, if it is going to propose another way to think about the topic. The goal is for students to be able to think at a higher level by justifying either what each sticky note says and where each one is placed or if it qualifies to be on the T-chart at all.

Strategy Insight

Organization and thinking critically are key components in this strategy. Since we organize ideas in our brains systematically and create a neural pathway as more modalities are used, students increase their learning by seeing the information, sorting through what is important, organizing the facts by what is similar and what is different, and adding another level of value through student interaction (Van Tassell 2004). Each of these components plays an integral part in student engagement and retention (Covington 2000). It is another way for students to work with content at a level that is minds-on and hands-on.

Using sticky notes during this activity is important (as opposed to recording the similarities and differences on a sheet) because students' thinking will shift as they discuss and learn more. The sticky notes allow the graphic organizer to become manipulative, and it is a new way for them to see if they agree or disagree with their classmates and adjust accordingly.

Teacher Notes

- ⦿ It is imperative that teachers observe during all stages of the lesson. This provides the feedback we need to determine the next direction of instruction. In addition, it allows an opportunity to guide students in their thinking, as some may struggle with concepts at a higher level. **Note:** Do not guide too much. A large part of learning is struggling through the process with a small amount of frustration but not so much that students give up.
- ⦿ During discussions, students will likely discover that there can be more than one answer. That is where collaboration and cooperation pay off.
- ⦿ For younger students, reconvene as a whole group and model the evaluation steps, using one group's chart.

How to Use This Book

Lesson Overview

The following lesson components are in each lesson and establish the flow and success of the lessons.

Icons state the brain-powered strategy and one of the four content areas addressed in the book: language arts, mathematics, science, or social studies.

Each lesson revolves around one of the eight **brain-powered strategies** in this book. Be sure to review the description of each strategy found on pages 12–19.

Vocabulary that will be addressed in the lesson is called out in case extra support is needed.

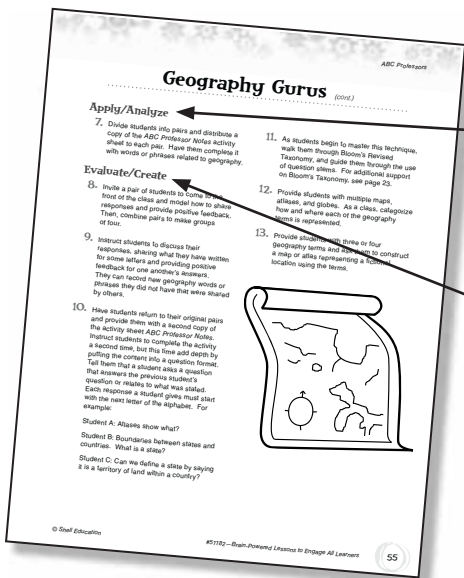
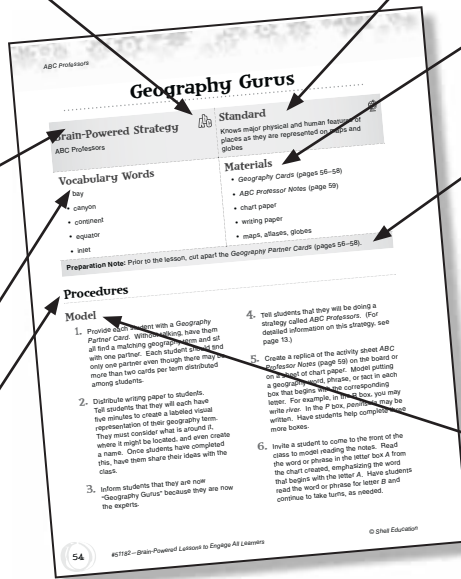
The **procedures** provide step-by-step instructions on how to implement the lessons successfully.

The **standard** indicates the objective for the lesson.

A **materials** list identifies the components of the lesson.

Many lessons contain a **preparation note** that indicates action needed prior to implementing the lessons. Be sure to review these notes to ensure a successful delivery of the lesson.

The **model** section of the lesson provides teachers the opportunity to model what is expected of students and what needs to be accomplished throughout the lesson.



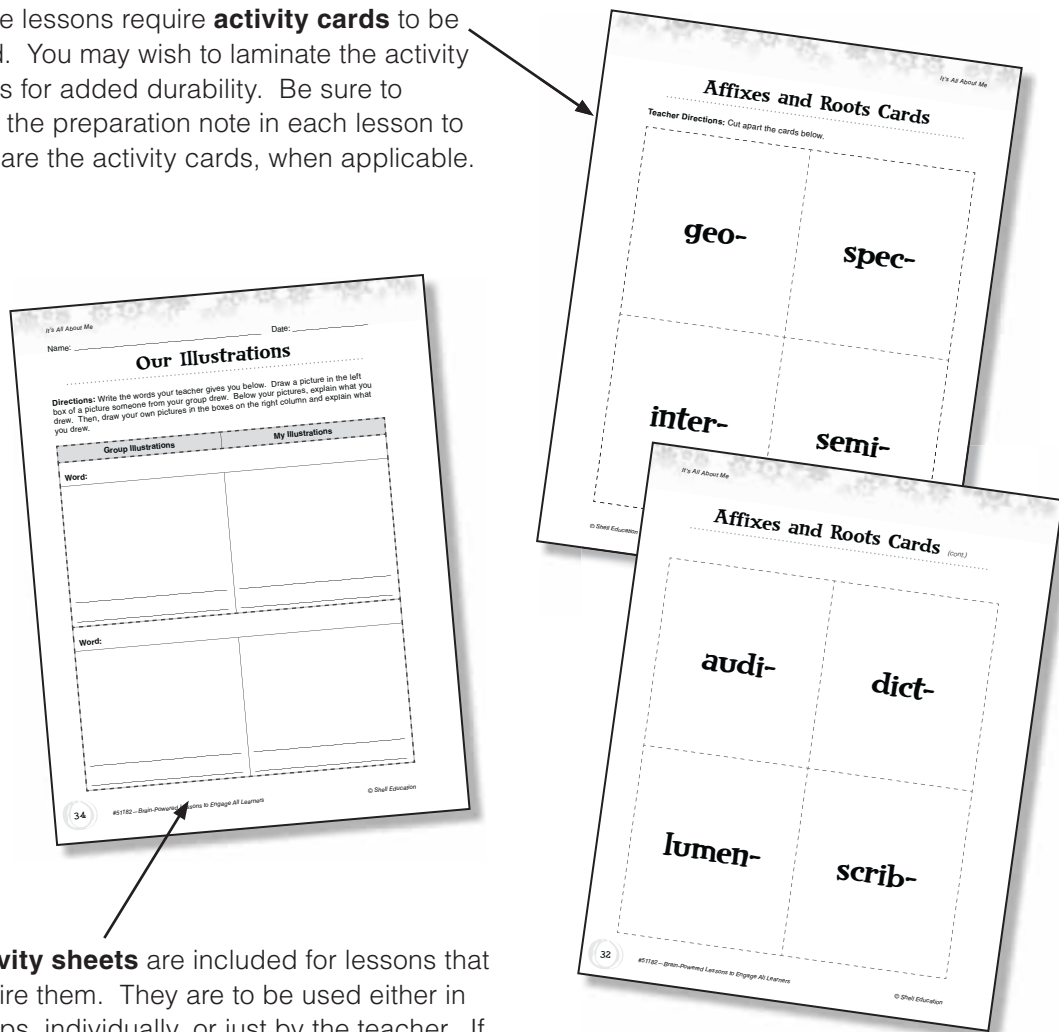
The **apply/analyze** section of the lesson provides students with the opportunity to apply what they are learning as they analyze the content and work toward creating a personal connection.

The **evaluate/create** section of the lesson provides students with the opportunity to think critically about the work of others and then to take ownership of their learning by designing the content in a way that makes sense to them.

How to Use This Book *(cont.)*

Lesson Overview *(cont.)*

Some lessons require **activity cards** to be used. You may wish to laminate the activity cards for added durability. Be sure to read the preparation note in each lesson to prepare the activity cards, when applicable.



Activity sheets are included for lessons that require them. They are to be used either in groups, individually, or just by the teacher. If students are working in groups, encourage them to create a group name to label the activity sheet.

All of the activity sheets and additional teacher resources can be found on the **Digital Resource CD**.



Evaluating Revisions

Brain-Powered Strategy



It Takes Two

Standard



With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach

Vocabulary Words

- editing
- planning
- revision

Materials

- *Compare and Contrast Revisions* (page 68)
- *Our Feedback* (page 69)
- chart paper
- two different colors of sticky notes
- student writing and revised samples

Preparation Note: Prior to the lesson, create a two-column T-chart on a sheet of chart paper. Write *Similarities* in the left column and *Differences* in the right column.

Procedures

Model

- Write the following two versions of the same sentence on the board:
 - Version 1: The dog walked along the beach.
 - Version 2: One foggy morning, the dog crawled along the beach sniffing for starfish.
- Tell students that they will be doing a strategy called *It Takes Two*. (For detailed information on this strategy, see page 14.)
- Distribute two sticky notes to each student. Divide students into groups of four and ask them to compare the two sentences by recording a similarity on one and a difference on the other.
- Model for students how to place the sticky notes on the chart in the appropriate columns. Have students practice placing the sticky notes they create on the chart.
- Discuss the placement of the sticky notes and ask students to consider if any of the sticky notes should be moved. If so, why?

Evaluating Revisions (cont.)

Apply/Analyze

6. Divide students into four groups. Provide each group with a different piece of student writing and its revision. Have a student in each group read the piece aloud.
7. Distribute the *Compare and Contrast Revisions* activity sheet (page 68) to each group as well as two stacks of sticky notes (two different colors—one for each column).
8. Have students discuss the revisions and record their ideas, one per sticky note, and place them in the appropriate column on their *Compare and Contrast Revisions* activity sheet. Have students continue until the designated time is up or the task is considered complete.
11. Allow groups to synthesize the feedback provided on their original activity sheets and make revisions as necessary. They should discuss as a group how their thinking has changed based on the feedback from others in the class.
12. Debrief with students and ask what they learned from the lesson.
13. Have students independently look at their own drafts and revisions to see if the revisions improved their focus and elaboration.

Evaluate/Create

9. Have groups stand, leaving their activity sheets at their desks. At your signal, have groups rotate clockwise and sit to examine another group's chart.
10. Distribute the *Our Feedback* activity sheet (page 69) to each group. Allow students time to analyze another group's work and complete the activity sheet. If there are disagreements or recommendations for changes, students should note the difference on a different colored sticky note to add to a deeper discussion. Students should consider the following questions:
 - Do you agree or disagree with your classmates' choices? Explain.
 - Do you feel the revisions the author made strengthened the writing? If so, how? If not, why?
 - Would you recommend any additional revisions or changes that would strengthen the writing?

Name: _____ Date: _____

Compare and Contrast Revisions

.....

Directions: After reading the draft and the revision, use sticky notes to write your ideas. Place each sticky note in the appropriate column.

Similarities	Differences

Our Feedback

Directions: Discuss another group's chart. Record your group's responses below.

**What We Agree With,
and Why**

**What We Disagree With,
and Why**