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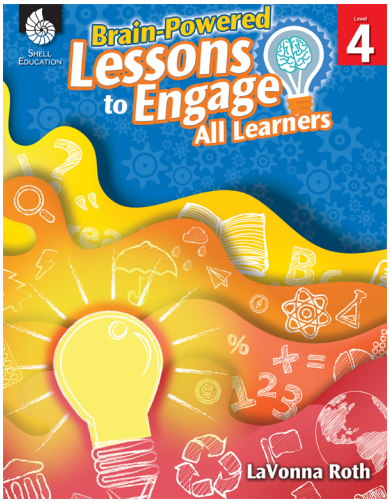
Sample Pages from

Brain Powered Lessons to Engage All Learners

Level 4



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

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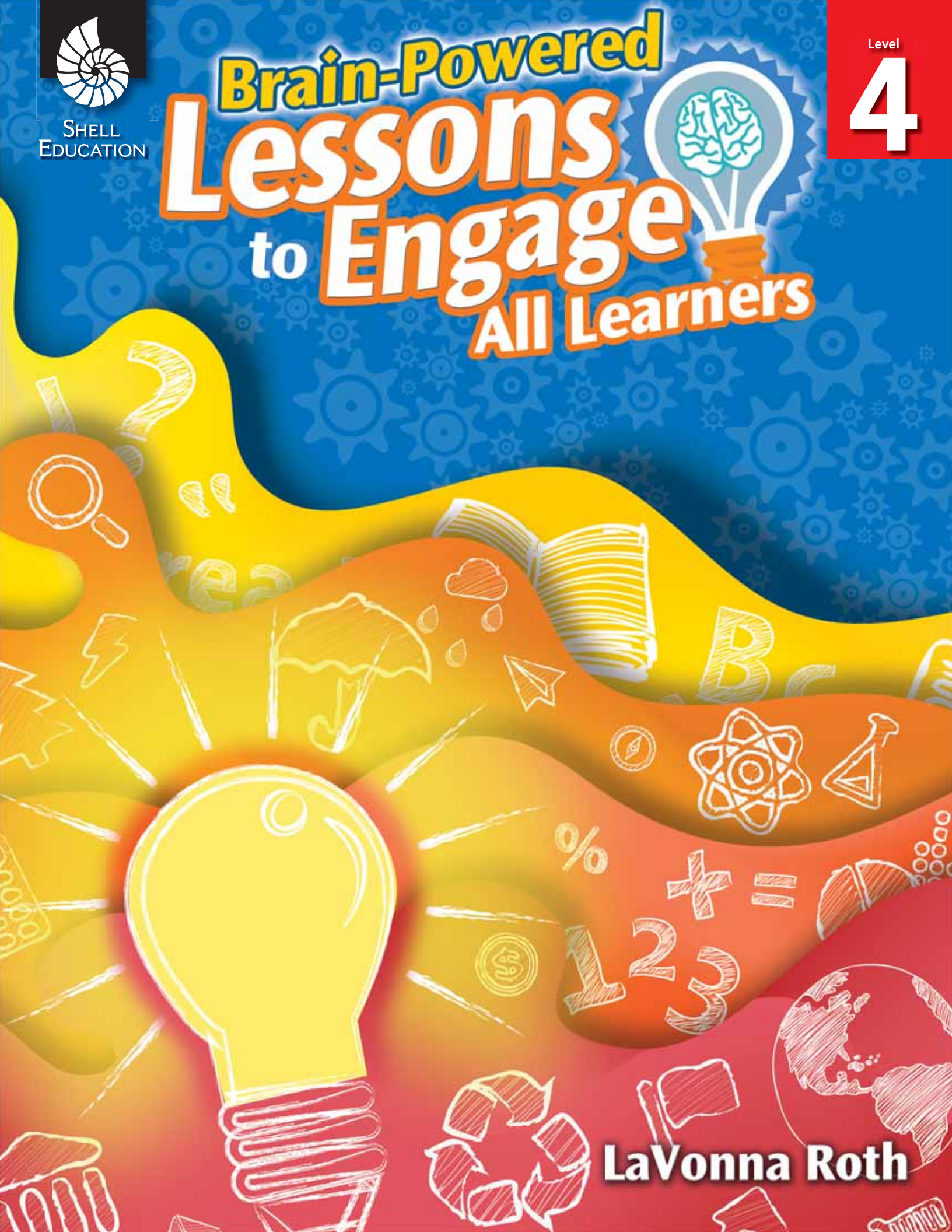

Shell Education
Brain-Powered
Lessons
to Engage
All Learners
Level
4
LaVonna Roth

Table of Contents

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.

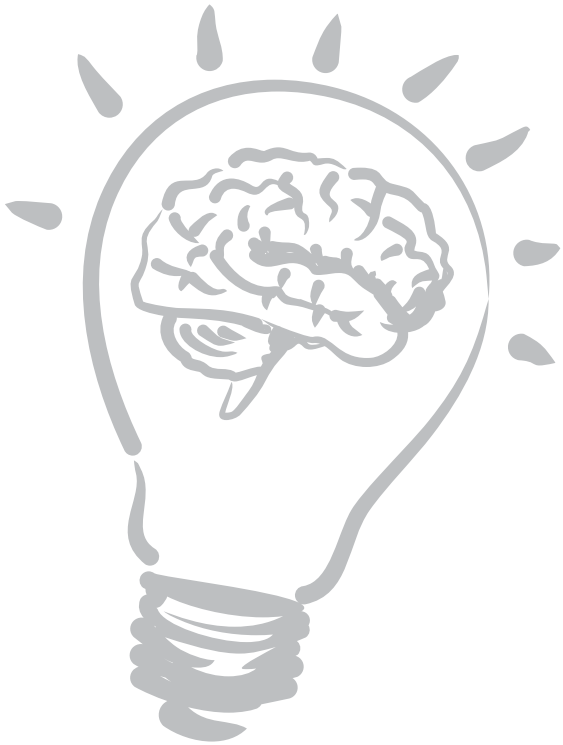
This is where *Brain-Powered Lessons to Engage All Learners* comes in! The eight strategies included within the lessons are designed around how the brain learns as a foundation. In addition, they are meant to be used as a formative assessment, include higher-order thinking, increase the level of engagement 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

> "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).

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.

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!

Response Cards
Strategy Overview

This strategy allows the teacher to receive a response from each student within a short time frame, and it provides the feedback you need to drive instruction. Once students have responded, they discuss their thinking with partners. This is the teacher's opportunity to listen in on their conversations. If they got the answer right, was it for the right reason? If it was wrong, where did their thinking go astray?

Post higher-order thinking question stems around the room. Teach students how to use these stems to ask questions. If teachers want to raise the level of inquiry and understanding, students need the resources to do so, which includes modeling how to ask a question that taps into thinking and then allowing them to question (Hunter 1993). By doing this, students become more metacognitively aware by figuring out the connections they made (Baker 2009). What did they know beforehand that helped them connect the question asked to their response? If they were struggling between two answers, what were they thinking that caused them to choose one answer? Another great technique to encourage depth of thinking is to ask open-ended questions, such as "Why?" or "How do you know?" (Sprenger 1999; Willis 2006). When students provide answers followed up by *why* or *how do you know*, their initial reaction may be that they are wrong, which sends them into a thinking mode to figure out where they went wrong. Share with students that they may not be wrong; encourage them to think their answers through.

Strategy Insight

Response Cards are an alternate way to formatively assess students' thinking without using whiteboards. Since our brain's attention piques with novelty, Response Cards allow students to give teachers feedback in a different way. Students think independently, respond, and then show their answers. Students receive premade Response Cards that have answers on them, or older students can write the answers themselves. Answers on the response cards should be written in the same location so they can quickly be seen and checked for accuracy.

When students share their answers, it is important they justify their thinking. This allows them to make connections and take the strategy to a higher level. The teacher should listen to students as they talk with others to see if their thinking is correct. This gives teachers an insight into their thinking. Plus, knowing teachers hold them accountable helps with classroom management.

Teacher Notes

- When students share their thinking with partners, it is important to listen in to see if there are any misconceptions or to find out who is struggling with the concept.
- Encourage students to know it is acceptable to question authority in a respectful manner. Just because something is said by an authority figure does not mean it is always right.

How to Use This Book

Lesson Overview

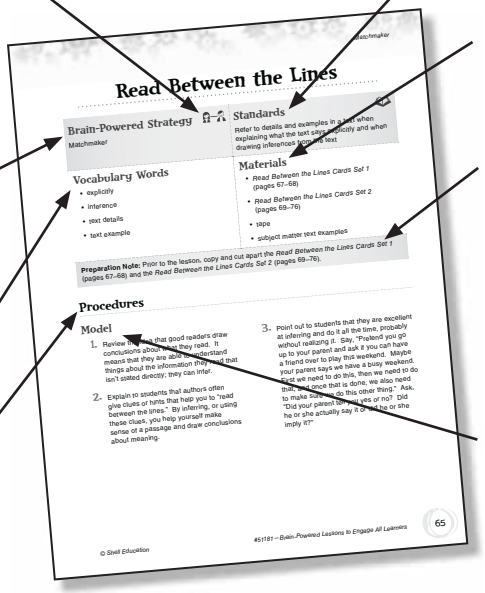
The following lesson components are in each lesson and establish the flow and success of the lessons.

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.


Matchmaker

Read Between the Lines

Brain-Powered Strategy
Matchmaker

Standards
Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

Vocabulary Words
- explicitly
- inference
- text details
- text example

Materials
- *Read Between the Lines Cards Set 1* (pages 67–68)
- *Read Between the Lines Cards Set 2* (pages 69–76)
- tape
- subject matter text examples

Preparation Note: Prior to the lesson, copy and cut apart the *Read Between the Lines Cards Set 1* (pages 67–68) and the *Read Between the Lines Cards Set 2* (pages 69–76).

Procedures

Model

1. Review with students that good readers draw conclusions about what they read. It means that they are able to understand things about the information they read that isn't stated directly; they can infer.
2. Explain to students that authors often give clues or hints that help you to "read between the lines." By inferring, or using these clues, you help yourself make sense of a passage and draw conclusions about meaning.
3. Point out to students that they are excellent at inferring and do it all the time, probably without realizing it. Say, "Pretend you go up to your parent and ask if you can have a friend over to play this weekend. Maybe your parent says we have a busy weekend. First we need to do this, then we need to do that, and once that is done, we also need to make sure we do this other thing." Ask, "Did your parent say yes or no?" Did he or she actually say it or maybe or she imply it?"

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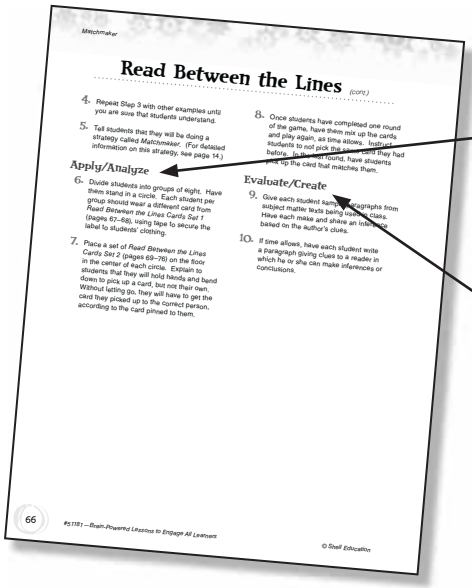
The **standard** indicates the objective for the lesson.

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.


Matchmaker

Read Between the Lines (cont.)

4. Repeat Step 3 with other examples until you are sure that students understand.
5. Tell students that they will be doing a strategy called *Matchmaker*. (For detailed information on this strategy, see page 14.)

Apply/Analyze

6. Divide students into groups of eight. Have them stand in a circle. Each student per group should wear a different card from *Read Between the Lines Cards Set 1* (pages 67–68), using tape to secure the label to students' clothing.
7. Place a set of *Read Between the Lines Cards Set 2* (pages 69–76) on the floor in the center of each circle. Explain to students that they will hold hands and bend down to pick up a card, but not their own. Without letting go, they will have to get the card they picked up to the correct person, according to the card pinned to them.
8. Once students have completed one round of the game, have them mix up the cards and play again, as time allows. Instruct students to not pick the same card they had before. In the next round, have students pick up the card that matches them.

Evaluate/Create

9. Give each student learning paragraphs from subject matter texts being read in class. Have each make and share an inference based on the author's clues.
10. If time allows, have each student write a paragraph giving clues to a reader in which he or she can make inferences or conclusions.

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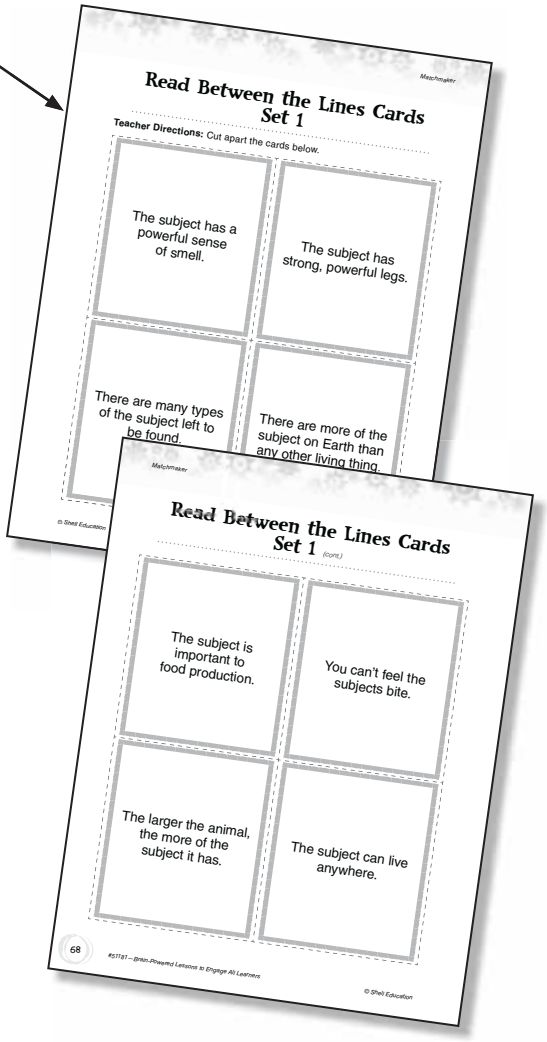
The **apply/analyze** section of the lesson provides students with the opportunity to apply what they are learning as they analyze the content and work toward creating a personal connection.

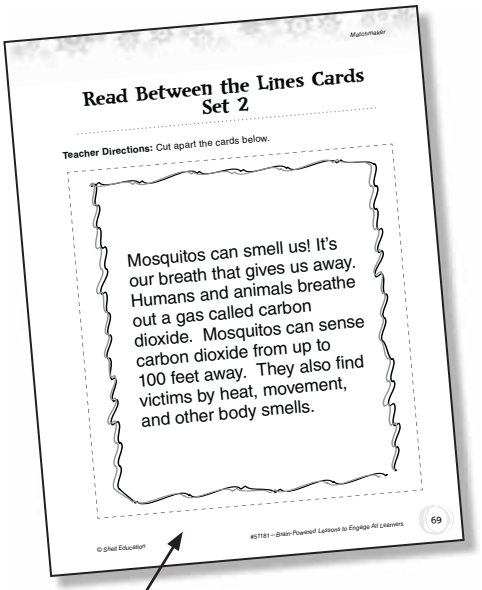
The **evaluate/create** section of the lesson provides students with the opportunity to think critically about the work of others and then to take ownership of their learning by designing the content in a way that makes sense to them.

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**.

It's Your Right!

Brain-Powered Strategy

Response Cards

Standard

Understands the basic principles of American democracy

Vocabulary Words

- equality
- liberty
- limitations
- majority
- self-determination

Materials

- *Rights Response Card* (page 129)
- *My Questions and Answers* (page 130)
- chart paper
- clothespins

Preparation Note: Prior to the lesson, you may wish to precut and laminate a *Rights Response Card* (page 129) for each student for extra durability.

Procedures

Model

1. Explain to students that just like the United States Constitution, your state's constitution has a declaration of rights (sometimes called a *Bill of Rights*) that protects individual liberties. Discuss how these declarations of rights inspired the first 10 amendments to the United States Constitution called the *Federal Bill of Rights*. Once the Federal Bill of Rights was adopted, it then influenced the texts of the individual state constitutions.

2. Have students brainstorm a list of protections and note them on the board or on a sheet of chart paper. Discuss the meaning of each. Explain to students how these protections limit government and protect them every day. Assist students in listing all the protections, if they need it. As a class, brainstorm what life might be like without these protections.

3. Explain to students that they will be using a strategy called *Response Cards*. (For detailed information on this strategy, see page 18.)

4. Show students the *Rights Response Card*, and model for them how to place the clothespin to indicate their responses. Ask, "Which protection allows people the right to get together in a large group?" Proceed by placing the clothespin on the correct answer.

5. Repeat Step 4 with other questions until students understand how to use the *Rights Response Card* properly.

6. Model another example, but think through the process incorrectly and ask students to explain to partners if the answer shown is correct or not and why.

It's Your Right! (cont.)

Apply/Analyze

7. Distribute a *Rights Response Card* and a clothespin to each student.

8. Ask students questions to which they must respond by placing the clothespin on the answers they choose. Sample questions are as follows:

   - Which protection allows people to write or speak their opinion, even if others don't agree?
   - Which protection allows people to work or be friends with the people they choose?
   - Which protection protects people from the government reading their emails or listening to their phone calls without the court's permission?

Evaluate/Create

9. Divide students into pairs. Have them discuss their answers and explain why they chose their answers, even if they chose the same one. This is an opportunity to learn what others think, which could be different from their own thinking, even if they match answers. Listen in to students' discussions.

10. Invite students to share their reasoning with the class for the answers they chose. They may also share what their partners said. Then, discuss any differences in thinking.

11. Distribute the *My Questions and Answers* activity sheet (page 130) to students. Instruct students to work independently to create their own questions that have the same answers as are shown on their *Rights Response Card*.

12. In their original pairs, have students take turns sharing a question from the list they created on their activity sheet. Using his or her *Rights Response Card*, have the other student place a clothespin on the answer he or she feels is correct and explain why he or she made that choice. Have partners discuss their thinking with each other.

Rights Response Card

Teacher Directions: Cut out the card below.

freedom of movement	freedom of religion	right to peaceably assemble	right to bear arms
due process of law	**Rights Response Card**		right to privacy
liberty			pursuit of happiness
self-determination	freedom of thought	freedom of expression	freedom of association

Name: _____ Date: _____

My Questions and Answers

Directions: Write at least five questions that use the same answers as shown on your *Rights Response Card*. Use the bottom of the activity sheet to create the answer key.

My Questions

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

My Answer Key

1. _____ **4.** _____

2. _____ **5.** _____

3. _____