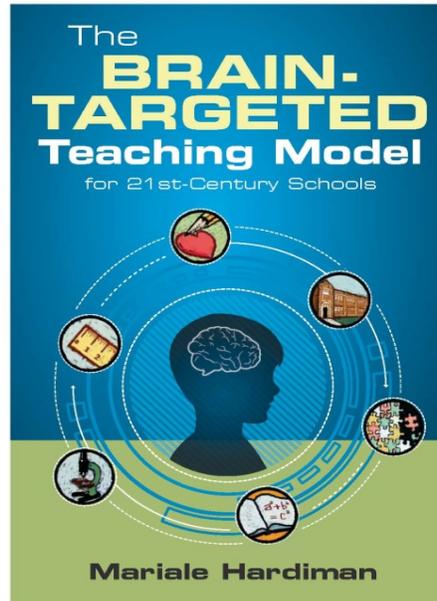


The Brain-Targeted Teaching® Model for 21st Century Schools

Reading Companion and Study Guide



By

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PREFACE

Organization of the Reading Companion and Study Guide

This guide is intended to supplement and expand the content presented in *The Brain-Targeted Teaching Model for 21st-Century Schools* (Hardiman, 2012).

The first section of the guide briefly summarizes each chapter of the book and provides a series of discussion questions that can be used in a variety of ways. They can be developed into prompts for online courses, discussion topics for face-to-face courses, activities for professional development, topics for reading circles, or simply they can enhance and expand the reader's experience. Embedded into this series of questions are "Stop & Jot" reflective writing prompts, which can be used by individuals or small groups to reflect and respond to the content they are learning through a written response, an artistic representation, or further discussion. In addition, this section includes links to many online text and video resources that extend and enrich the topics covered in the book.

The second section provides resources that teachers and administrators may find useful as they implement the Brain-Targeted Teaching® (BTT) Model in schools and classrooms. This section includes lists of strategies for each brain target in the *Instructional Activities and Strategies Charts*. Next, this section includes two templates for designing a BTT learning unit. The *Planning Templates* help teachers think about the key concepts of each target and brainstorm activities consistent with the features of the target. The next resource is the *BTT Unit Template* which can be used as the final plan for recording each section of the learning unit. Finally, the resource section includes a sample unit by Stephanie Novak, an author of this guide.

We hope this guide is a useful tool as you study the Brain-Targeted Teaching® (BTT) Model and design your own BTT learning units.

Chapter 1: Information from the Neuro- and Cognitive Sciences That Educators Should Know—Separating Neuromyth from Neuroscience



Chapter Overview

Chapter 1 describes general themes from the neuro- and cognitive sciences that should inform teaching practice, and dispels some common misapplication of research known as “neuromyths.” The chapter describes the origins of popular neuromyths and provides context and insight regarding their pervasiveness in the field of education. The chapter then highlights important themes from the brain sciences that should inform teaching practice and indicates where these themes are more deeply explored in upcoming chapters.

Discussion Questions

1. Why is it important for educators to have knowledge of neuromyths?
2. What neuromyths did you think were true? How might you have come to this information?
3. How might a teacher’s beliefs in neuromyths negatively impact teaching and learning?

Stop & Jot 1: Reflect on a time when one of the neuromyths had an impact on you (i.e. did you ever believe that you had all of the brain cells you would ever have?). How did debunking this neuromyth make you feel? What are the implications of this new understanding for your practice?

4. Briefly explain each of the areas from the text and how these areas inform teaching practice.

Plasticity:

Neurogenesis:

Emotion and Stress:

The Role of Attention in Learning:

Executive Function:

The Importance of Movement and Learning:

Arts and Learning:

Adolescents, Sleep, and Learning:
Creativity:

5. The text suggests that high-stakes testing has the potential to crowd out creativity in our schools. Describe appeals you might make to federal, state, and local policy-makers to address the need for accountability yet still give teachers support and time to be able to teach students in ways that allow for creative problem-solving.

Stop & Jot 2: Reflect on one of the themes from neuro- and cognitive sciences that should inform teaching practice. Which of these themes resonates with you and why? Why is this theme integral to your educational beliefs?

Chapter One Online Resources

PowerPoint/Side Show

For a Slide Show overview of neuromyths go
here: <http://www.slideshare.net/hullpgce/neuromyths>

Articles/Websites with Additional Information & References

For additional neuromyth references
visit: <http://amyalexander.wiki.westga.edu/file/view/neuromythologies-p.pdf>

To read the article “Neuromyths: Why Do They Exist and Persist?” in the journal *Mind, Brain, and Education* go to: <http://onlinelibrary.wiley.com/doi/10.1111/j.1751-228X.2012.01141.x/full>

Videos

To view a video of Dr. Daniel Willingham presenting his research showing that “Learning Styles” don’t exist click here: <http://www.youtube.com/watch?v=slv9rz2NTUk&feature=youtu.be>

For a historical overview of brain science view “The Past, Present, and Promise”
here: <http://www.learner.org/series/discoveringpsychology/01/e01expand.html>

Self-quiz

To take a quiz on neuroscience and neuromyths
visit: <http://ecologyofeducation.net/wsite/?p=4086>

<http://www.schoolleadership20.com/forum/topics/a-quiz-on-neuroscience-and-neuromyths>

Other Media

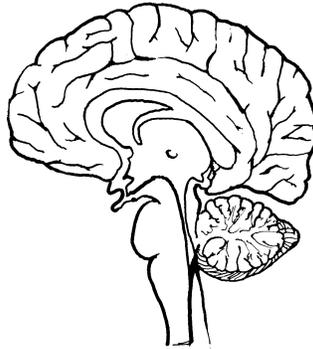
To gain daily insights about the brain on Twitter & Facebook go to: <http://www.brainfacts.org/>

iTunes Podcast> Psychology in Everyday Life Channel

Episode 90 “The Learning Styles Myth: An Interview with Dr. Daniel Willingham”

Episode 58 “The Mozart Effect: Is there Anything There?”

Chapter 2: Brain Structure and Function



Chapter Overview

Chapter 2 provides an overview of brain structure and function and explains why educators need a basic knowledge of the brain in order to better understand and incorporate findings from research from the brain sciences into teaching practices. The functions of brain cells are explained, as are the workings of the three major brain sections: the hindbrain, the limbic system, and the cerebrum.

Discussion Questions

(Pre-reading) Stop & Jot 1: Why might it be important for educators to understand brain structure and function?

1. What is the function of the Central Nervous System? What is the function of the Peripheral Nervous System? How are they related?
2. How do brain cells communicate? How do both neurons and glial cells support communication?

Stop & Jot 2: Why might a cerebellum that is reduced in size manifest in Attention Deficit Hyperactivity Disorder in children? What might an implication of this knowledge be for educators?

3. Which of the systems of the brain play a major role in emotional processing? What four structures support this processing?

Stop & Jot 3: According to the text, “the amygdala receives stimuli 40 milliseconds before the cortex. This finding indicates that fearful responses precede any conscious, thoughtful responses to stimuli” (22). What might an implication of this knowledge be for educators?

4. In which system of the brain is the frontal lobe located? What is the function of the frontal lobe?

Stop & Jot 4: Why might research addressing the development of the frontal lobe be of particular interest to educators?

5. With more information about the brain from chapter 2, but before we fully explore the Brain-Targeted Teaching Model, what teaching strategies might you change immediately to better enable students to learn in your classroom?

Chapter Two Online Resources

PowerPoint/Side Show

For a short Power Point presentation on “The Brain 101” go here:

<http://www.ddas.vermont.gov/ddas-policies/policies-tbi/policies-tbi-documents/tbi-trng-modules-workbks/training-module-1-brain-101>

Articles/Websites with Additional Information & References

This article includes a glossary of brain terms: <http://www.scribd.com/doc/7712627/Brain-Structure-Function>

Videos

To see an animated tour around the brain commissioned by Brain Awareness Week go to: <http://www.youtube.com/watch?v=9UukcdU258A&feature=related>

UCLA Brain Research Institute shares information about the general organization of the brain here: <http://www.youtube.com/watch?v=I5ao8mvMeFE&feature=related>

To bridge the gap between individual synapses and whole-brain learning & memory go to: <http://www.youtube.com/watch?v=4kRrarRR2kk>

If you want to extend your understanding of neuroscience, view this Stanford University introductory lecture: <http://www.youtube.com/watch?v=5031rWXgdYo&feature=related>

Self-quiz

Take a quiz about the inner workings of the

brain: <http://curiosity.discovery.com/topic/cognitive-neuroscience/brain-quiz.htm>

Other Media

iTunes Podcast> iTunes U> Seattle Pacific University> Brain Rules by John Medina Associated Webpage: <http://www.brainrules.net/>

How does brain structure relate to brain function? Participate in the MIT Open Courseware project here: <http://ocw.mit.edu/courses/brain-and-cognitive-sciences/9-00sc-introduction-to-psychology-fall-2011/brain-i/>

For a free comprehensive ebook describing the structure and function of “The Brain from Top to Bottom” click here: <http://thebrain.mcgill.ca/avance.php>

To have a 3-D interactive brain anatomy experience go to: <http://www.pbs.org/wnet/brain/>

For a very detailed look at the brain go to “The Whole Brain’s Atlas: <http://www.med.harvard.edu/aanlib/home.html>

Information on Topic for Students and/or Parents

For a series of interactive lessons about brain anatomy visit: <http://teachhealthk-12.uthscsa.edu/curriculum/brain/pa03pdf/Entire%20Lesson/0301-EntireLesson.pdf>

If you would like to introduce your students to neuroscience go to: <http://faculty.washington.edu/chudler/neurok.html>

Share this video about the brain with your students: <http://www.youtube.com/watch?v=cgLYkV689s4&feature=related>

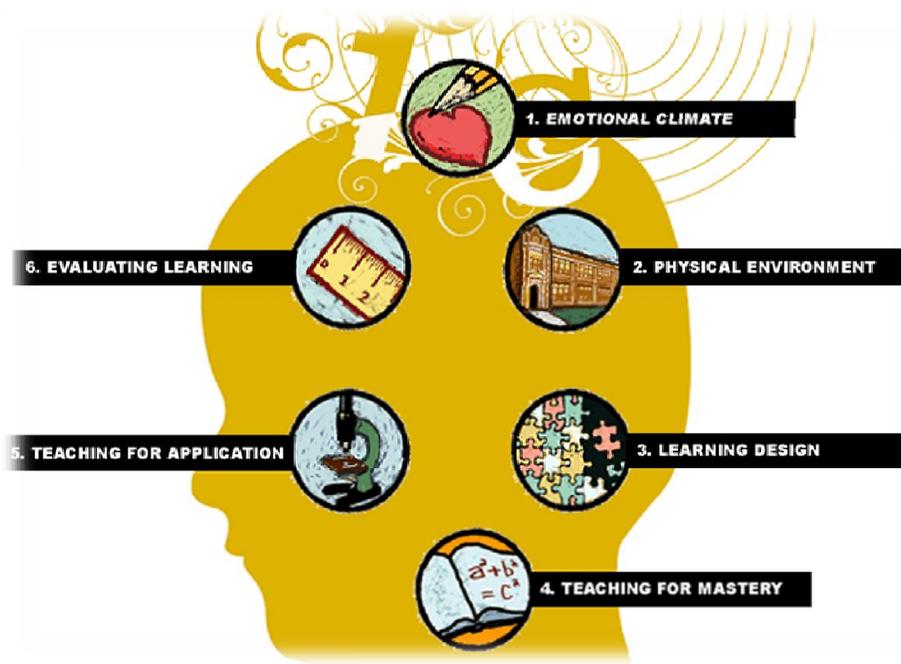
An excellent introductory video on the brain for students is here: <http://www.uwTV.org/video/player.aspx?mediaid=16205591>

A video introduction to the brain for younger children: <http://www.youtube.com/watch?v=CrSR-55xXD8&feature=related>

If the parents of your young students want to learn about the “brain science of parenting” you may want to direct them here: <http://www.parentingscience.com/>

Direct your students to Brainy Kids Online for some fun & challenging activities: <http://www.dana.org/resources/brainykids/>

Chapter 3: The Brain-Targeted Teaching Model for 21st-Century Schools



Chapter Overview

Chapter 3 suggests that, in order to facilitate the use of research in instructional practice, teachers need a framework to assist with planning, implementing, and assessing a sound program of instruction. The chapter presents the BTT model as a cohesive pedagogical framework that supports the implementation of Common Core State Standards and curriculum scope and sequences. The BTT model is not a curriculum or a packaged product; rather, it is the “how” of teaching (instruction) that supports the “what” of teaching (standards and content). This chapter provides a brief overview of the six components of the model, referred to as brain targets—that is, *teaching targeted* to how the brain thinks and learns. Although presented as separate components, the targets are interrelated and should be viewed as an organic system that guides and informs an approach to instruction both at the level of the classroom and as a unifying school-based system.

Discussion Questions

1. Describe how using the Brain-Targeted Teaching model might help in instructional planning and delivery.
2. How is the BTT model alike or different from instructional programs or activities you currently employ?

Stop & Jot 1: Why would providing a framework support teachers in applying neuro- and cognitive science research in practice?

3. How might this model inform an approach to instruction at the (a) classroom level, (b) the school-wide level, and (c) the district level?

4. After reading the summaries of the brain targets, which one(s) do you feel you use regularly; which do you feel you would like to incorporate more into your instructional program?

Stop & Jot 2: What supports do you need from both within the school and from the school district or community to implement the BTT model's components?

5. The components of the BTT model are interrelated (pg. 26). Describe which targets you think are most related and explain why.

Chapter Three Online Resources

Articles/Websites with Additional Information & References

What are 21st Century Skills? Click here to read articles answering this question: <http://www.ascd.org/publications/educational-leadership/sept09/vol67/num01/toc.aspx>

To visit Dr. Mariale Hardiman's Brain Targeted Teaching website go to: <http://braintargetedteaching.org/index.cfm>

Read online for free "Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century"
http://www.nap.edu/catalog.php?record_id=13398#description

Videos

To see Dr. Hardiman speaking at TED about Brain Targeted Teaching visit: <http://www.youtube.com/watch?v=ZUbyi5Acc2U>

For a video overview of Brain Targeted Teaching go to: <http://www.youtube.com/watch?v=lsf5TwsAhHU>

To hear Dr. Hardiman discuss the importance of Arts Integration visit: <http://thesciencenetwork.org/programs/newark-workshop-on-music-brain-and-education/study-on-arts-integration-and-creativity-in-the-classroom>

Chapter 4: Brain-Target One

Establishing the Emotional Climate for Learning



Chapter Overview

In-depth study of the Brain-Targeted Teaching Model begins with Chapter 4, which describes research associated with Brain-Target One, “Establishing the Emotional Climate for Learning.” The chapter begins by asking readers to reflect on a time when they were made to feel embarrassed in an academic setting and consider the implications of this incident. This reflection sets the stage for a chapter that closely examines connections between emotions and learning including the neural systems underlying emotion. It also examines research from the cognitive and psychological sciences that highlights the negative impact of stress on learning and the benefits of positive emotions on cognition and learning. The chapter provides readers with insights about how to establish emotional climates that support optimal student learning.

Discussion Questions

(Pre-reading) Stop & Jot 1: *(Derived from the original text)* Think of a time when you may have been publically embarrassed by an insensitive remark by a teacher or classmate. How did you feel immediately after the incident? How did this incident affect your ability to perform in class that day? Did this incident affect later academic performance? How so?

1. How do emotions play a role in learning?
2. What are some implications of this knowledge for struggling students?
3. Describe the relationship between poverty and stress. What are some implications for educators?

Stop & Jot 2: Why might it be important for educators to know and understand students’ emotional triggers? What are some ways to obtain this information from students?

4. How might teachers motivate students that are not typically motivated by achievement goals?

5. What is behavior-specific praise? Why might behavior-specific praise be more effective in reinforcing and shaping positive behaviors than generalized praise?

Stop & Jot 3: According to research, “children who were instructed to disengage performed better on educational tasks than those who were instructed to process their feelings or those who received no acknowledgement of the emotional event” (44). How might this look in practice? Describe how you might redirect a student entering class after an emotional event.

6. The use of control and choice in the classroom gives students a sense of agency and a feeling of ownership in their learning. How might a teacher offer control and choice in assignment and assessments and still manage instructional time (e.g. students’ time on task and the teacher’s preparation time)?

7. Teachers do not need to be yoga experts to bring mindfulness training to the classroom. What is mindfulness training and how would you incorporate it into the school day?

Chapter Four Online Resources

Articles/Websites with Additional Information & References

For detailed information about the how emotions influence learning and additional references on the topic

visit: http://www.udesa.edu.ar/files/programas/NEUROCIENCIAS/Brainresearch_learning_and_emotions_Hinton.pdf

Read the chapter “Mindfulness-Based Stress Reduction for School-Age Children”

here: <http://www.mindfuleducation.org/mbsrforchildren.pdf>

To learn why it might be a good idea to improve learning in your classroom by Incorporating laughter into your teaching go

to: <http://science.howstuffworks.com/environmental/life/inside-the-mind/emotions/laughter.htm>

For a series of high school units on

emotions: <http://www.apa.org/ed/precollege/topss/lessons/emotion.pdf>

How does “play” contour our brains, improve our competencies, and support our emotions?

Visit the website of The National Institute for Play to find out:

<http://www.nifplay.org/index.html>

Videos

To view the video “How the Body Works; Center of Emotion & Memory”
click: <http://www.youtube.com/watch?v=lZ4mdXAtnEs>

Visit this website to hear Neuroscientist Richard Davidson presents his research about the connection between emotions and learning: <http://www.edutopia.org/richard-davidson-sel-brain-video>

View “Feelings Count - Emotions and Learning” to learn how some teachers create emotionally safe classrooms: http://www.learner.org/courses/learningclassroom/session_overviews/emotion_home5.html

Learn about building kindness and resilience in children from Dr. Dan Siegel here: <http://dalailamacenter.org/blog-post/6-steps-build-kindness-and-resilience-children-dan-siegel>

Self-quiz

How well do you “read” people? What is your “EQ”? Take this quiz to find out: http://greatergood.berkeley.edu/ei_quiz/

Other Media

For an iPad App “What Did Your Parents Teach You about Emotions:” go here: <http://itunes.apple.com/us/app/what-did-your-parents-teach/id511555752?mt=8>

Listen to Dr. Michael Posner discuss how mindfulness can promote learning on NPR: <http://www.npr.org/templates/story/story.php?storyId=129324779>

Go to iTunes U to find the Edutopia podcast>Social and Emotional Learning

Information for Students and/or Parents

For activities on emotions for younger children go here <http://kidshealth.org/kid/feeling/>

Chapter 5: Brain-Target Two

Creating the Physical Learning Environment



Chapter Overview

Chapter 5 opens with a story about a student who moved from another city and was starting at a new school. The story focuses on the student's positive reaction to her new environment and highlights the features of the physical environment, including the gardens, sculpted fence, and playground, that elicited the positive response. This story leads the reader to an examination of how features of the physical environment can influence learning, including promoting student attention and engagement. The chapter explores how novelty in the environment influences the alerting and orienting systems and focuses on research that supports how lighting, sound, scent, and aesthetics can enhance the environment, giving child a "sense of place."

Discussion Questions

(Pre-reading) Stop & Jot 1: What does your school's external appearance communicate? Consider the physical appearance of your current school or place of work. What message is communicated by the physical appearance of the building? What physical features communicate this message?

1. What is novelty? How might novelty in the environment impact learning?
2. According to research, how does daylight impact student achievement? What are some implications of these findings for educators?

Stop & Jot 2: According to the text, sounds in classrooms can and should vary widely from the purposeful chatter that comes from cooperative learning or project-based learning tasks to the quiet necessary while students are engaging in learning a new skill that requires concentration, and from relaxing background sounds during routine tasks to periods of quiet that promote purposeful control and reflective practices (66). How will you balance sounds in your own classroom? What strategies will you use to ensure a wide range of auditory settings?

3. Why might scents produce such vivid memories?

4. Describe the impact of movement on attention. How can you incorporate movement into daily instructional practices and routines?

Stop & Jot 2: According to the text, learning is optimized when children are in environments that are free from clutter and are aesthetically pleasing. What are some obstacles that might hinder educators from achieving these clutter-free and aesthetically pleasing environments? How might educator overcome these obstacles?

5. How might the features of learning environment studied in this chapter be reinforced at home?

6. How might the features of the learning environment studied in this chapter be implemented in an online learning environment?

Chapter Five Online Resources

PowerPoint/Side Show

At this website you will find a PowerPoint presentation describing how to create a positive learning

environment: <http://www.ok.gov/octp/documents/Classroom%20Environment%201.pdf>

Articles/Websites with Additional Information & References

Explore how this teacher used the principles of feng shui in the classroom design

at: <http://www.edutopia.org/classroom-space-design-feng-shui>

Why can't kids be comfortable while they learn? Does the maxim "No Pain; No Gain" apply to our classrooms? Can the mind absorb while the seat can't endure? Go here to find

out: <http://www.edutopia.org/comfortable-truth>

Dr. John J. Ratey, M.D., an associate clinical professor of psychiatry at Harvard Medical School, has conducted extensive research on the positive connection between movement and brain function. Visit his website for information on this topic:

<http://www.johnratey.com/site/ViewArticles.aspx>

Videos

Can a classroom be “too busy”? Go here and find out: <http://www.youtube.com/watch?v=fK98v76WiPc&feature=related>

Check out the great classroom ideas this creative teacher shares as she gives a tour of her room: <http://www.projectidealonline.org/classMgmt3.php>

Self-quiz

Test your knowledge of positive classroom environments

here: <http://www.brighthubeducation.com/classroom-management/125480-take-the-quiz-on-creating-a-welcoming-classroom-environment/>

Other Media

Go here to view an interactive site for physically planning your classroom: <http://behavioradvisor.com/ClassroomDesign.html>

Chapter 6: Brain-Target Three Designing the Learning Experience



Chapter Overview

Chapter 6 underscores the importance of holistic planning and creating a visual “road map” for a unit of study. The text highlights the “big picture” approach, and argues that both teachers and students need a deep understanding of the unit goals as well as the connections within the unit to other concepts. This knowledge of outcomes and connections promotes deep conceptual understanding and guides overall instructional planning. The concept map, a graphic organizer explained in depth in this chapter, is one tool that teachers can use to organize their unit and share content and concept connections with students.

Discussion Questions

(Pre-reading) Stop & Jot 1: Why is it so important for educators to plan with the “big picture” in mind? Why might it be important to share this “big picture” with students?

1. What is a concept map? Why is the concept map a useful unit planning tool?
2. What is schema theory? What are some of the implications of schema theory for educators?

Stop & Jot 2: The text refers to an “inch deep and mile wide” approach to curriculum that does not allow for deep understanding through interactive learning. Yet, many teachers continue to teach their content with a focus on “coverage”. What are some of the reasons teachers may continue to teach with a focus on covering content rather than deep understanding? What are some ways educators can balance covering content while helping students develop deep and enduring understanding?

3. Why might graphic representations of unit goals, objectives, and content connections be useful to students? How might you incorporate a graphic representation of your unit in the content classroom?

4. How do you think the use of concept mapping can enhance memory for the content?

5. What other approaches to planning are you aware of that are similar to Brain-Target Three? What are the similarities and differences?

Stop & Jot 3: Design a simple concept map of a unit you are teaching or plan to teach. What information do you need to have before you begin? If you do not teach, create a simple concept map of the important ideas you have learned in the Brain-Targeted Teaching Model.

Chapter Six Online Resources

Articles/Websites with Additional Information & References

For an article that offers a definition of graphic organizers, examples of different types and their applications, a discussion of the research evidence for their effectiveness, some useful Web resources, and a list of referenced research articles, go here:

http://aim.cast.org/learn/historyarchive/backgroundpapers/graphic_organizers;

Videos

To view the excellent RSA Animate video on the history and “The Power of Networks” go here:

<http://www.youtube.com/watch?v=nJmGrNdJ5Gw&feature=plcp>

To view a video tutorial on Inspiration describing how a teacher uses Inspiration software in her classroom, go here:

<http://www.youtube.com/watch?v=XTfo3EIZViM&feature=related>

Graphic Organizer Tools

The developers of “Gliffy” describe it to be “an online diagramming service that helps users communicate with a combination of shapes, text, and lines.” *Gliffy* is a “social, collaborative brainstorming wiki.” To check it out go here:

<http://www.gliffy.com/>

Several graphic organizers including Venn Diagrams, Essay Maps, Comparison and Contrast, Drama Maps, Graphic Maps and more from the IRA/NCTE:

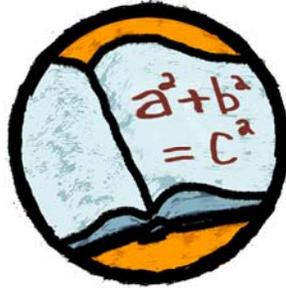
<http://www.readwritethink.org/classroom-resources/student-interactives/>

To create diagrams with online real-time collaboration, visit:

<https://caco.com/>

For an extensive list of graphic organizer tools go here: <http://www.mind-mapping.org/web-based-mindmappers/details.htm> *Other Media* iTunes U> Florida Department of Education>Florida Digital Educators> Graphic Organizer Tools

Chapter 7: Brain-Target Four Teaching for Mastery of Content, Skills, and Concepts



Chapter Overview

Chapter 7 focuses on instruction that promotes mastery of the content, skills, and concepts students should know for lifetime learning. The chapter explains that, “like twin stars, learning and memory are intricately connected’ (96). The chapter provides an overview of the brain’s memory systems and defines types of memory processes, including sensory memory, short-term and working memory, and long-term memory. The chapter demonstrates the information processing model and draws connections between research on memory and implications for instruction. Specifically, arts integration is shown as a way for to enhance memory for content by providing opportunities for elaborations of information and repeated rehearsals. Several strategies for integrating art into instruction are explained, and connections between these strategies and long-term memory are discussed. Finally, “expert teachers” provide insights into how they incorporate this brain target into their classroom instruction.

Discussion Questions

1. Describe the reciprocal relationship between memory and learning.

Stop & Jot 1: Create a concept map that visually represents memory processes using the following terms:

- Memory
- Sensory Memory
- Short-term Memory
- Long-Term Memory
- Explicit Memory
- Episodic Memory
- Semantic Memory
- Implicit Memory
- Procedural Memory

2. What is consolidation? What is the role of consolidation in long-term memory?

Stop & Jot 2: Reflect on a time when you were asked to convey information in an artistic form. What was the task? How did the completion of this task impact your understanding of the content? Why might this be?

3. According to research, “when people are not just provided information in written or oral form, but rather generate that information themselves in response to some kind of prompt, their recall of that information is significantly improved” (107). What are some implications of this information for instructors?

4. How is art education different from arts integration? How would you integrate the arts into a middle-school algebra class?

4. Consider the following memory strategies listed in the text:

- Repeated Rehearsal
- Elaboration
- Generation
- Enactment
- Production

How might you utilize one of the above strategies in your instruction and especially with arts infused learning tasks? What instructional task or activity might you develop to support deep understanding of content?

5. The text discusses several memory aids, including mnemonics, desirable difficulties, chunking, and interleaving. Describe how one or more of these memory aids could be incorporated into your content instruction.

Chapter Seven Online Resources

Articles/Websites with Additional Information & References

“LDonline” presents some great information on memory strategies for teachers “Making It Stick: Memorable Strategies to Enhance Learning” <http://www.ldonline.org/article/5602/>

To find out more about “How Human Memory Works” go to: <http://science.howstuffworks.com/environmental/life/inside-the-mind/human-brain/human-memory.htm>

At this webpage you’ll find an overview of Information Processing Theory, implications for Instruction, and a bibliography:

<http://www.education.com/reference/article/information-processing-theory/>

In this interesting article the authors describe a 21st century method for improving retention and automaticity via Repeated Rehearsals/Distributed Practice. They argue that “game-based learning which indicates that the engaging elements of games make them effective tools for learning (Sitzmann, 2011) and when properly designed and incorporated into a curriculum can provide improvements in student performance.”

http://www.pearsoned.com/wpcontent/uploads/Kapp_Combined_Research_into_Practice_Briefs.pdf

An article describing recent memory research with suggestions on how these findings can be applied in the classroom. Four Principles of Memory Improvement: A Guide to Improving Learning Efficiency

http://www2.fiu.edu/~schwartzb/Schwartz_21-2_.pdf

To read two articles written for teachers that define working memory, explain how it is measured, and offer suggestions describing how we can support children with working memory problems, go here:

<http://www.york.ac.uk/res/wml/Classroom%20guide.pdf>

http://www.thepsychologist.org.uk/archive/archive_home.cfm/volumeID_21-editionID_160-ArticleID_1342-getfile_getPDF/thepsychologist%5C0508gath.pdf

For more information on “Long Term Memory” go here:

<http://thelearningcoach.com/learning/long-term-memory-and-learning/>

Videos

To view the BBC show “How Your Memory Works” go here:

<http://www.youtube.com/watch?v=T-xN0-0mepc>

Learn “How to Train Your Memory” by viewing this BBC video:

<http://www.youtube.com/watch?v=V8S8V9VEFyl&feature=related>

To see a video explaining the relationship between elaboration, review, memory and learning go to: http://www.youtube.com/watch?v=AlEgA_U2FnY

To view teachers demonstrating strategies that enhance student long term memory, go here:

<http://www.youtube.com/watch?v=NYMztp-157w>

Although some commercial enterprises state that their computer games improve memory, their claims are have come under question. Recently a study published in PNAS, a respected scientific journal, reports that a particular memory task called dual n-back may actually improve working memory and fluid intelligence.

<file:///C:/Users/Sherry/Desktop/Past%20DESKTOPS/DESK%207.2.2011/My%20ABCMotor%20Research/Brain%20Workshop%20-%20a%20Dual%20N-Back%20game.htm>

Self-quiz

Take a quiz about the inner workings of the

brain: <http://curiosity.discovery.com/topic/cognitive-neuroscience/brain-quiz.htm>

Other Media

APPS in iTunes for iPad/iPhone on memory:

Memory Matches> <http://itunes.apple.com/us/app/memory-matches/id380007120?mt=8>

Memorizer> <http://itunes.apple.com/us/app/memorizer-free-hd/id380129014?mt=8>

Facebook: <https://facebook.com/brainbuddies/>

Information for Students and/or Parents

View “How Does My Brain Learn?” a video for kids here:

<http://www.youtube.com/watch?v=cgLYkV689s4>

Find a video on “Memory and Concentration” techniques for high school/college students here:

<http://www.youtube.com/watch?v=mGFE8GtcMms&feature=related>

Here is a website with information for students about mnemonic strategies:

<http://www.fun-with-words.com/mnemonics.html>

Here is a short activity that your students can use to “test” their own short term memory”: <http://faculty.washington.edu/chudler/stm0.html>

Check out these two websites each with comprehensive lists of memory games for young students here:

<http://www.easysurf.cc/menu.htm>

<http://www.neok12.com/games.htm>

Chapter 8: Brain-Target Five

Teaching for the Extension and Application of Knowledge



Chapter Overview

In the Brain-Targeted Teaching Model, once students master content, skills, and concepts, instruction of a learning unit topic is not complete. This chapter explains that lasting learning occurs when students can apply knowledge in real-world tasks that require creative thinking and problem-solving. Chapter 8 opens with a story from Cory, a seventh-grade student who is not regularly engaged in school; he cites lectures, textbooks, handouts, and questions as the culprits for his disengagement. Cory does, however, discuss one instructional task in which he was fully engaged. In one class, he was asked to create a community survey, compile data, and use the data in authentic, persuasive writing. Cory's experience underscores the main idea of the chapter - learning must provide students with the opportunity to "think creatively by applying skills and content in meaningful, active, real-world problem solving tasks" (126). The chapter sites the need for this type of thinking as twenty-first century skills evolve, and argues that creativity should be regularly and explicitly taught in the classroom. The chapter provides examples of activities that support students in extending and applying knowledge.

Discussion Questions

1. What is divergent thinking? How might incorporating tasks that require divergent thinking enhance creative problem-solving?
2. According to research, how does the brain respond to explicit instruction in creativity? What are some implications of this research for educators?
3. Describe the role of improvisation in creativity.

Stop & Jot 1: Reflect on the following quote from Ulrich Kraft: “Fresh solutions result from disassembling and reassembling the building blocks in an infinite number of ways. That means the problem solver must thoroughly understand the blocks” (135). How does this quote connect to classroom instruction?

3. Why might an instructional shift that promotes divergent and creative thinking be “uncomfortable” for some educators?

4. When students become accustomed to teaching that emphasizes the recall of “right” answers and a focus on high-stakes testing, they may be resistant to engaging with curriculum that teaches creative problem-solving, knowledge generation, and critical thinking. How can teachers guide the resistant student?

5. Why might a student who has been less successful in generating the right answer benefit from activities that require divergent thinking? How could divergent thinking activities boost confidence and learning for the student with special learning needs?

Stop & Jot 2: How is the content of this chapter related to other initiatives you have experienced in education (e.g. problem-based learning, experiential learning, expeditionary learning)?

Chapter Eight Online Resources

Articles/Websites with Additional Information & References

Go her for an excellent literature review that synthesizes recent research on 21st century learning skills. <http://www.ksbe.edu/spi/PDFS/21%20century%20skills%20full.pdf>

“ArtsEdge” is the Kennedy Center’s free digital resource for teaching and learning in, through, and about the arts. <http://artsedge.kennedy-center.org/educators.aspx>

Go to The President’s Committee on the Arts and the Humanities website to learn about the initiative “Reinvesting in Arts Education: Winning America’s Future through Creative Schools” <http://www.pcah.gov/>

Edutopia has long supported innovation educational practices. Go here for a wealth of information on the topic: <http://www.edutopia.org/project-based-learning>

Go here for the NEA Review of Project based Learning:
<http://www.nea.org/tools/16963.htm>

The Buck Institute for Education (BIE) focuses its work on Project Based Learning. Excellent information about PBL can be found here: http://www.bie.org/about/what_is_pbl/

To find the Dana Foundation Report on Learning, Arts, and the Brain visit:

<http://www.dana.org/news/publications/publication.aspx?id=10760>

Videos

Here is Sir Ken Robinson in an RSA Animate video speaking about “Changing Education Paradigms”

<http://www.youtube.com/watch?v=Zokqijly77Y&feature=related>

A cutting-edge advertising agency, Common Craft, created this short animated video that explains in clear language the essential elements of Project Based Learning (PBL).

<http://www.youtube.com/watch?v=LMCZvGesRz8>

“Spotlight” is an initiative funded by the MacArthur Foundation. It investigates the intersections of technology and education and shows how digital media can be used in and out of classrooms to expand learning. View students as they describe their projects:

<http://spotlight.macfound.org/studentspeak/>

Go here to view a short video on the 21st Skills our students will need to be successful in the future: <http://www.youtube.com/watch?v=c0xa98cy-Rw&feature=related>

The short video “Engage Me” is a message from some “digitally native students” to their teachers: <http://www.youtube.com/watch?v=Zokqijly77Y&feature=related>

Find out how Middle School 223 in the South Bronx is incorporating the arts to transform their school: <http://www.youtube.com/watch?v=u9WSOyPU-Uk>

To view a video describing the big hippocampi of London taxi drivers go here:

<http://video.nationalgeographic.com/video/science/health-human-body-sci/human-body/london-taxi-sci/>

Other Media

“MindShift explores the future of learning in all its dimensions – covering cultural and technology trends, groundbreaking research, and innovations in education.” Follow Mind/Shift on Facebook: <https://www.facebook.com/MindShift.KQED/info>

For a Webinar “Education for Life and Work: Deeper Learning and Twenty-First-Century Skills” presented by The Alliance for Excellent Education go here:

<http://media.all4ed.org/webinar-sep-12-2012>

Information for Students and/or Parents

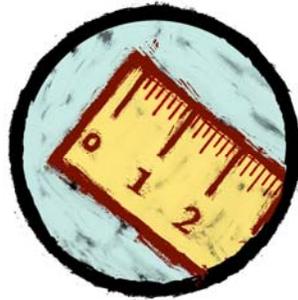
Information for parents and communities about 21st Century learning skills

<http://www.edutopia.org/blog/21st-century-learning-students-parents-suzie-boss>

<http://www.p21.org/tools-and-resources/parents-and-communities>

This website offers parents activities and ideas to teach creativity in their home:

Chapter 9: Brain Target Six Evaluating Learning



Chapter Overview

In Chapter 9 evaluation is shown to be a valuable technique for learning and not merely a tool to determine how much students have learned. Brain target six focuses on techniques to provide feedback to increase student learning. Frequent and timely feedback is identified as one of the best ways to promote student achievement. Moreover, the chapter highlights that students who are told that they will be receiving timely feedback tend to perform better than students who know that feedback will be delayed. Additionally, active retrieval of information is identified as a critical way to benefit long-term retention. Spacing effects are defined and the chapter provides guidelines for optimal intervals to revisit previously taught material to support student retention. Finally, three kinds of assessments (portfolios, student journals, and performance assessments) are described.

Discussion Questions

(Pre-reading) Stop & Jot 1: What was the most powerful or important feedback that you have ever received? What made this feedback so powerful? How might this experience inform your instruction?

1. What is scaffolded feedback? Why might scaffolded feedback produce better long-term retention than other types of feedback?
2. Describe how performance is linked to the proximity of feedback. What are some implications of this research for educators?

Stop & Jot 1: What are some obstacles to providing timely feedback to students? How might educators overcome these obstacles to ensure all students get meaningful and timely feedback?

3. What is the difference between active retrieval of information and studying? Why might active retrieval result in better retention?

4. What is the spacing effect? What are some implications of research on the spacing effect for educators?

Stop & Jot 2: Think of a performance task that you have implemented in your class. How can the task become an assessment of performance with the use of rubrics? How is an assessment rubric similar to a concept map?

Chapter Nine Online Resources

Articles/Websites with Additional Information & References

Read online for free “Assessing 21st Century Skills: Summary of a Workshop”

http://www.nap.edu/catalog.php?record_id=13215

What is portfolio assessment? At this website you’ll find answers:

<http://www.teachervision.fen.com/assessment/resource/5942.html>

Look here for a compendium of ideas and strategies on portfolio assessment:

<http://jfmuller.faculty.noctrl.edu/toolbox/portfolios.htm>

For a tutorial on rubric creation go here:

http://health.usf.edu/publichealth/eta/Rubric_Tutorial/default.htm

“RubiStar” is a free tool to help teachers create quality rubrics.

<http://rubistar.4teachers.org/index.php>

Look here for a huge compendium of rubrics for every subject and activity:

<http://www.rubrics4teachers.com/>

If you’re interested in “Game-Based Learning to Teach and Assess 21st Century Skills,” find out about it here:

<http://www.edutopia.org/blog/game-learning-21st-century-skills-andrew-miller>

Videos

View a video on 21st Century Skills Assessment

<http://www.youtube.com/watch?v=HiyaQ2WbBVU>

Here is a unique 21st Century digital presentation on 21st Century Assessment

Chapter 10: Implementing Brain-Targeted Teaching in a School and Classroom; Appendices I and II



Chapter Overview

Chapter 10 offers some concrete strategies for implementing the Brain-Targeted Teaching Model in a school and classroom. The text emphasizes the importance of buy-in on the part of the instructional leadership, the need for standards-based curriculum, and the value of collaborative planning. The chapter provides a “Look For” list for each target that assist readers in conceptualizing what effective implementation of the model looks like. The chapter closes with a story of how Gordon Porterfield, a faculty associate at Johns Hopkins University School of Education, implements the BTT model in his class and ends with a lovely poem by Emily Dickinson, *The Brain is Wider Than the Sky*.

Discussion Questions

1. The Brain-Targeted Teaching Model can be used as an overarching framework to provide consistency, structure, and cohesion among various seemingly unrelated school programs and activities. Could this model assist your school in unifying various initiatives? How would you go about using the model in this way?
2. What are the challenges of implementing the BTT model in any school? How could the school benefit?
3. How would an administrator address a faculty member who wants to continue to maintain only a traditional style of teaching?

Stop & Jot 1: Consider the implications for implementation of the Brain-Targeted Teaching Model in your school. What is your school already doing well? Where would your school need

to improve? What actions would you take to ensure effective implementation of the Brain-Target Teaching Model

See also:

Appendix I: Alignment of Brain-Targeted Teaching with Cognitive Taxonomies, Teaching Standards, and Learning Frameworks.

Appendix II: Brain-Targeted Teaching Implementation Checklist

Resources for the Brain-Targeted Teaching® Model

- 1. Instructional Activities and Strategies Charts**
- 2. BTT Planning Templates**
- 3. BTT Learning Unit Template**
- 4. Sample BTT Learning Unit**

The first resource provided in this document are charts titled **Instructional Activities and Strategies**. The charts highlight practices that can support teachers in the effective implementation of each of the targets in the model. Because the components of the six brain targets are related, many of the instructional activities and strategies overlap. The lists are not intended to be exhaustive; they were compiled from instructional activities and strategies used by many teachers over the years. Teachers may add to these lists as they develop Brain-Targeted Teaching learning units and increase their instructional repertoire.

Note that Brain-Target Three, which applies specifically to the planning component of the model, is not represented in the Instructional Activities and Strategies Charts. The next two resources address that target by providing tools to assist with planning a BTT learning unit.

The second resource included in this section are BTT Planning Templates help teachers view the key components of the model and take notes about strategies related to each target. The third resource is the BTT Learning Unit Template that is typically used to compile activities that address each of the targets. Finally, a sample unit is included that was designed by Stephanie Novak, one of the authors of this study guide.

Brain-Target One: Establishing the Emotional Climate for Learning

Instructional Activities and Strategies

- | | |
|--|--|
| <ul style="list-style-type: none">▪ Anticipation Guides▪ Artifacts▪ Book Pass▪ Book Talk / Meet The Author▪ Class Calendar▪ Class Celebrations▪ Classroom Library▪ Cold Call Protocol / Student Popsicle Sticks▪ Conflict Resolution Role Play▪ Data Charts/ Class Progress Charts▪ Diagnostic Assessments▪ Do Now / Warm-Up / Bell Ringers▪ Emotional Inventory/ Temperature Check▪ Individualized Learning Goals▪ Journal Prompts / Writing Prompts▪ K-W-L, B-K-W-L-Q▪ Literature Circles▪ Meditation▪ Morning Message▪ Movement Exercises▪ Multiple Assignments▪ Positive Language | <ul style="list-style-type: none">▪ Posted Class Values / Expectations▪ Posted Objectives / Unit Goals▪ Procedure Posters▪ Real-World Observations▪ See Three Before Me▪ Sharing Essential Question▪ Specific Commands▪ Story Impression / Predict-o-Gram▪ Student Avatars▪ Student Collages▪ Student Conferences▪ Student Discussion▪ Student Folders▪ Student Interest Survey▪ Student Office/ Student Supply Corner▪ Student Rewards/ Recognition Events▪ Student Roles/ Classroom Jobs▪ Student-friendly Rubrics▪ Student-Selected Groups▪ Tableau▪ Think-Pair-Share▪ Tic-Tac-Toe Assignments▪ Video Clip/ Film Clip▪ Work Stations |
|--|--|

Brain-Target Two: Creating the Physical Learning Environment

Instructional Activities and Strategies

- | | |
|--|--|
| <ul style="list-style-type: none">▪ Artifacts▪ Artwork▪ Banners/ Borders▪ Bean Bags▪ Blinds / Curtains▪ Bulletin Board▪ Circular Seating / Group Discussion Seating▪ Class Mural▪ Classroom Announcements Board▪ Classroom Makeover (newsroom, courtroom, etc.)▪ Color-Coded Word Wall▪ Concept Map▪ Dance Explorations/ Movement Exercises▪ Fishbowl▪ Furniture Placement▪ Gallery Walks▪ Hot Seat▪ Interactive Concept Map▪ Lamps / Natural Lighting▪ Maps▪ Meditation / Mindfulness Exercises▪ Music | <ul style="list-style-type: none">▪ Musical Instrument▪ Nature Walks▪ Nature Walks/ Real World Observations▪ Need It, Got It Wall▪ Oils/ Natural Aromas▪ Outdoor Learning Experiences▪ Painted Walls / Wall Coverings▪ Pillows▪ Posted Essential Questions▪ Posted Expectations / Procedures▪ Posted Plot Lines▪ Posted Timelines▪ Posted Unit Objectives▪ Process Charts▪ Quote of the Day▪ Rubric Poster▪ Socratic Seminar Seating / Inner Circle-Outer Circle▪ Student-created posters▪ Table Groups▪ Transition Music/ Instrument▪ Unit / Period Artwork▪ Wind Chimes▪ Word Wall |
|--|--|

Brain-Target Four: Teaching for Mastery of Content, Skills, and Concepts

Instructional Activities and Strategies

- | | |
|--|---|
| <ul style="list-style-type: none">▪ Analogies▪ Anticipation Guide▪ Artifacts▪ Book Pass▪ Book Talk / Meet The Author▪ Brainstorming▪ Class Discussion▪ Comic Book / Graphic Novel▪ Concept Mapping▪ Cornell Notes▪ Data Collection▪ Experiment Design▪ Fieldtrips▪ Film▪ Fishbowl▪ Flip Books▪ Hot Seat▪ Illustration▪ Jigsaw▪ Journal Prompts / Writing Prompts▪ Journals▪ K-W-L, B-K-W-L-Q▪ Lab Experiment▪ Literature Circles▪ Memorize a song / passage / poem | <ul style="list-style-type: none">▪ Mock Trial▪ Posted Objectives / Unit Goals▪ Practice Quizzes▪ Predicting▪ Questioning▪ Read Aloud▪ Real-World Observations▪ Research▪ Sharing Essential Question▪ Socratic Seminar▪ Story Board▪ Story Impression / Predict-o-Gram▪ Student Collages▪ Student Conferences▪ Student Discussion▪ Student Surveys▪ Survey Design▪ Tableau▪ Text Annotation▪ Think Aloud▪ Think-Pair-Share▪ Venn Diagram▪ Video Clip/ Film Clip▪ Visualizing▪ Vocabulary Maps / Frayer Models▪ Writing Process |
|--|---|

Brain-Target Five: Teaching for the Extension and Application of Knowledge

Instructional Activities and Strategies

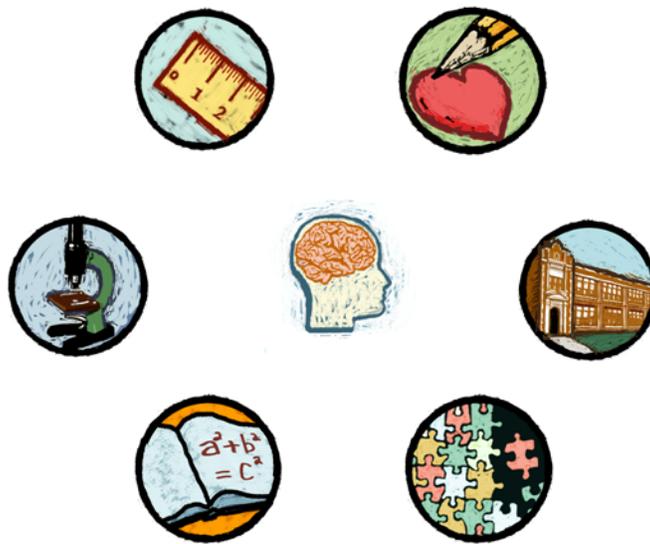
- | | |
|---|--|
| <ul style="list-style-type: none">▪ Analogies▪ Author Study▪ Brochure▪ Class Discussion▪ Class Mural▪ Comic Book / Graphic Novel▪ Concept Mapping▪ Data Collection▪ Debate▪ Design a Product▪ Dioramas▪ Experiment Design▪ Fieldtrips▪ Film▪ Flip Book▪ Illustration▪ Interviews▪ Lab Experiment▪ Learning Map▪ Literature Circles▪ Memorize a song / passage / poem▪ Mock Trial | <ul style="list-style-type: none">▪ Model Design▪ Museum / Exhibit Design▪ Newscast▪ Poem Writing▪ Poetry Portfolio▪ Poetry Slam / Spoken Word▪ Poster Presentation▪ PowerPoint▪ Presentation▪ Prezi▪ Public Service Announcement▪ RAFT Writing▪ Research▪ Script Writing▪ Shadow Box▪ Socratic Seminar▪ Song Writing▪ Story Board▪ Student Collages▪ Student Conferences▪ Survey Design▪ Tableau▪ Writing Process |
|---|--|

Brain-Target Six: Evaluating Learning

Instructional Activities and Strategies

- | | |
|--|--|
| <ul style="list-style-type: none">▪ Blog Posts / Online Discussion▪ Book / Publication▪ Brochure▪ Class Discussion▪ Class Mural▪ Comic Book / Graphic Novel▪ Concept Mapping▪ Critical Analysis▪ Data Collection▪ Debate▪ Design a Product▪ Dioramas▪ Essay▪ Experiment Design▪ Flip Book▪ Illustration▪ Interviews▪ Lab Experiment▪ Learning Log▪ Learning Map▪ Literature Circles▪ Memorize a song / passage / poem▪ Mock Trial▪ Model Design▪ Multiple Choice Assessments | <ul style="list-style-type: none">▪ Museum / Exhibit Design▪ Music Video▪ Newscast▪ Newsletter▪ Peer Evaluation▪ Poem Writing▪ Poetry Portfolio▪ Poetry Slam / Spoken Word▪ Portfolio▪ Poster Presentation▪ PowerPoint▪ Presentation▪ Prezi▪ Public Service Announcement▪ Quizzes▪ Reflection Survey▪ Reflective Journal▪ Research▪ Script Writing▪ Self-Evaluation▪ Shadow Box▪ Socratic Seminar▪ Song Writing▪ Story Board▪ Student Film▪ Unit Test |
|--|--|

Brain-Targeted Teaching[®] Model



Planning Templates

Brain Target 1

#1 Setting the Emotional Climate for Learning

#2 *Creating the Physical Learning Environment*

#3 *Designing the Learning Experience*

#4 *Teaching for mastery of skills, content & concepts*

#5 *Teaching for Extension and Application of Knowledge*

#6 *Evaluating Learning*

Features:

- Predictability/routines**
- Personal connection between teacher and student**
- Personal connection between content and student**
- Trust and acceptance**
- Warm and supportive environment**
- Control and choice**
- Humor**
- Music, visual art, dance, drama, creative writing**
- Celebration**
- Family and community connections**

- How does a positive climate encourage a sense of industry and competence?
- What are some factors that create a negative climate in the classroom and what are the consequences of that climate?
- How can teachers create a positive emotional climate?
- What routines in the classroom offer a sense of security and order?
- How can teachers use behavior-specific praise of effort throughout the unit?

BT #1 ACTIVITIES

Brain Target 2

#1 Setting the Emotional Climate for Learning

#2 Creating the Physical Learning Environment

#3 Designing the Learning Experience

#4 Teaching for mastery of skills, content & concepts

#5 Teaching for Extension and Application of Knowledge

#6 Evaluating Learning

Features:

- Novelty: Change displays often**
- Aesthetics: Visually appealing classroom, color and design**
- Sensory: Sound, lighting, scents**
- Order: Establish class routines**
- Movement: Facilitate organized movement**
- Inviting Surroundings: Bulletin boards, lamp light, plants, furniture, multicultural themes, master art work, photography**
- Display students' work attractively**

- How can the environment help learning?
- What sensory conditions in a classroom can foster attention or inattention?
- How can the teacher balance novelty and consistency in the classroom?
- What elements of the physical environment can block learning?

BT #2 ACTIVITIES

Brain Target 3

#1 *Setting the Emotional Climate for Learning*

#2 *Creating the Physical Learning Environment*

#3 *Designing the Learning Experience*

#4 *Teaching for mastery of skills, content & concepts*

#5 *Teaching for Extension and Application of Knowledge*

#6 *Evaluating Learning*

Features:

- Use of **Common Core State Standards** and curriculum scope and sequences
- Articulation of key learning goals and objectives
- Assessment of prior knowledge
- Design of concept map through graphic organizer that demonstrates overarching content and concepts; employs tenets of mind mapping, non-linguistic structures, and curriculum mapping
- Demonstration of connections among concepts
- Design of “big-picture” activities
- Promotion of students’ personalized learning goals
- Activities that align with summative assessments

- What **Common Core State Standards** are to be taught during the learning unit?
- What **learning goals** can develop from the content standards?
- What **main concepts** can derive from the learning goals?
- How can **concept mapping** promote a global understanding of the main concepts?
- How can mapping help the teacher determine the students’ **prior knowledge** of those concepts?
- How can mapping give a preview of what is to come in the instruction?
- How can mapping use familiar concepts/terms to relate to new concepts/terms?
- How can mapping give concepts in general terms before presenting the specifics?

BT #3 Concepts Maps and Learning Goals

Brain Target 4

#1 *Setting the Emotional Climate for Learning*

2 *Creating the Physical Learning Environment*

#3 *Designing the Learning Experience*

#4 *Teaching for mastery of skills, content & concepts*

#5 *Teaching for Extension and Application of Knowledge*

#6 *Evaluating Learning*

Features:

- Emotional connection to content
- "Big Picture "concepts
- Repeated rehearsals
- Elaboration through arts integration: Visual arts, Music, Theater, Dance, Creative writing
- Spacing time for consolidation of learning
- Varied and novel learning activities
- "Chunk" and space learning tasks
- Mnemonics
- Summarize/ rephrase
- Student choice in activities
- Meaningful movement integration
- Technology integration

- Based on content standards, learning goals and main concepts, what **content, skills and concepts** must students **master** in this learning unit?
- What **instructional objectives** will facilitate mastery of the content, skills and concepts?
- What **activities** will facilitate learning?
- What **variety** of activities will allow for repeated rehearsal and allow for elaboration of learning

BT #4 Objectives and Activities

1. OBJECTIVE:

-ACTIVITIES

2. OBJECTIVE:

-ACTIVITIES

**Brain
Target 5**

- #1 *Setting the Emotional Climate for Learning*
- #2 *Creating the Physical Learning Environment*
- #3 *Designing the Learning Experience*
- #4 *Teaching for mastery of skills, content & concepts*
- #5 *Teaching for Extension & Application of Knowledge*
- #6 *Evaluating Learning*

- Features:
- Comparisons**
 - Classifications**
 - Divergent thinking tasks**
 - Creative application of content**
 - Analysis and synthesis**
 - Metaphors and analogies**
 - Cause and effect**
 - Investigations**
 - Experiments**
 - Problem-solving using real-world contexts**

- What learning goal(s) will be selected for students to **apply knowledge** in real-world problem-solving?
- What activities can promote **divergent thinking**?
- What activities promote **investigation and experimentation**?
- What learning goals will allow students to **design and solve** problems?

BT #5

1. OBJECTIVE:
-ACTIVITIES

2. OBJECTIVE:
-ACTIVITIES

Brain Target 6

#1 *Setting the Emotional Climate for Learning*

#2 *Creating the Physical Learning Environment*

#3 *Designing the Learning Experience*

#4 *Teaching for mastery of skills, content & concepts*

#5 *Teaching for Extension and Application of Knowledge*

#6 *Evaluating Learning*

Features:

- Immediate, frequent, relevant feedback**
- Feedback that verifies correct responses**
- Feedback that requires students to extend thinking**
- Tasks that require students to actively retrieve information**
- Spacing of evaluation probes at appropriate intervals**
- Authentic performance assessment**
- Anchor papers; models of exemplary response**
- Rubrics, scoring tools**
- Self-reflection and journals**
- Task revisions**
- Formative and summative assessments**

Base your evaluation on the numbered objectives in Target #4 and #5

BT #6 ACTIVITIES

1. Evaluation Activities

2. Evaluation Activities

3. Evaluation Activities

UNIT TEMPLATE: BRAIN-TARGETED TEACHING MODEL

Source: <http://www.braintargetedteaching.org/sampleunits.html>

Teacher:

Dates:

Unit Topic:/Title:

Grade Level:

Content Standard(s):

Brain Target #1: Emotional Climate

Emotional Connection:

Brain Target #2: Physical Environment

Brain Target #3: Learning Design



Concept Map / Advanced Organizer:

Learning Goals:

Introductory “Big Picture” Activity/Assessment of Prior Knowledge

Brain Target #4: Teaching for Mastery

Activities for Teaching for Mastery:

Brain Target #5: Teaching for Application

Activities for Extension and Application of Knowledge

Brain Target #6: Evaluating Learning

Evaluation Methods:

SAMPLE UNIT: BRAIN-TARGETED TEACHING MODEL

Teacher: S. Novak

Dates: Fall 2012

Unit Topic: What Are the Advantages and Disadvantages of Conforming?

Unit Text: *The Crucible* by Arthur Miller

Grade Level: 11

Content Standard(s):

CCSS Reading Literature

RL.11–12.4: Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)

RL.11–12.9: Demonstrate knowledge of eighteenth-, nineteenth-, and early twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics.

CCSS Reading Informative

RI.11–12.6: Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.

CCSS Writing

W.11–12.2: Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

CCSS Speaking and Listening

SL.11–12.1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

CCSS Language

L.11–12.3: Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Brain Target #1: Emotional Climate

Emotional Connection:

Predictability

- Daily use of “Do Nows” to begin each class
- Posted daily agenda and objectives with homework

Praise and Specificity

- Positive language in the form of praise (“Thank you for taking out your notebook and getting started on the Do Now”)
- Explicit directions and instructions delivered in declarative sentences
- Declarative objectives (“Today, you will...”)

Brain Target #2: Physical Environment

Instructional Environment

- Posted Essential Question, Unit Objectives, and Unit Concept Map
- Interactive Word Wall (Student Created) with correlating symbols and situations for each word
- Student posters

Sensory Environment

- Use of lavender essential oils to create an overall sense of calm
- Removal of the blinds to allow in as much natural light as possible
- Use of lamp lighting to decrease the presence of the fluorescent lighting
- Use of folders and work stations to organize space and reduce clutter

Brain Target #3: Learning Design

Concept Map / Advanced Organizer:



The Crucible by Arthur Miller
What are the advantages and disadvantages of conforming?

Literary
Analysis

- Characterization
- Setting
- Conflict
- Theme

Historical
Context

- McCarthyism
- Puritans

Skill
Development

- Speaking and Listening: Act Out a Scene
- Writing: Analytical Essay

Learning Goals:

By the end of the unit, students will:

- Identify emerging themes in early American literature, such as a "new Eden," "salvation," and "cooperation and conflict."
- Compare and contrast the experiences of America's earliest settlers, as conveyed through primary source documents and literature of the Colonial period.
- Identify and explain elements of Puritan literature.
- Explain the role of religion in early American life.

Introductory "Big Picture" Activity/Assessment of Prior Knowledge

Essential Question: What are the advantages and disadvantages of conforming?

Activity: Scenario Analysis (attached)

Students will consider the advantages and disadvantages of conforming through completing a scenario analysis. Students will read through several scenarios and reflect on whether or not conforming is the best option. They will then discuss their opinions with a partner, and then share out with the class.

Through this class discussion, the teacher can assess student knowledge of the term "conformity," and guide the discussion to the unit text. For example, one question that the teacher may pose to students might be "Why might it have been more difficult not to conform during the Puritan Era?" Teachers could assess prior knowledge based on student responses.

Brain Target #4: Teaching for Mastery

Activities for Teaching Declarative/Procedural Knowledge

Activity 1:

Strategy: Modified K-W-L (K-L-Q) (attached)

Students will complete a K-L-Q (K=What I Know, L=What I Learned, Q=What Questions Do I Still Have?) chart at the beginning of the unit.

Student will fill out the K section with any background knowledge they have with regards to the Salem Witch Trials. Then, the class will view a film clip about the witch trials and take notes in the L section of their chart. The teacher will review what we now know after watching the clip. Then, students will complete the Q section with questions that they still have about the Salem Witch Trials prior to reading *The Crucible*.

Activity 2:

Strategy: Character Facebook Page

Students will demonstrate understanding of characterization through creating a Facebook page for a main character from *The Crucible*. Students will have to use textual evidence to determine the character's likes and dislikes, as well as what they would say to other characters in the play. Students may choose to create these Facebook profiles individually or with partners. They may use chart paper or an electronic template. Facebook pages will be posted to enhance the learning environment.

Activity 3:

Strategy: Act Out a Key Scene / Key Scene Tableau

Students will select a key scene from *The Crucible*. In small groups, students will determine whether they would like to act out the scene or create a tableau for the scene.

Option 1: Act Out a Key Scene

Students will be responsible for memorizing the lines from the play. Their scene should be no less than five minutes in length. They may choose to film themselves and show a video to the class. They will be scored according to the performance rubric (attached).

Option 2: Students will be responsible for creating a tableau scene from *The Crucible*. They will present their tableau to the class. They will be responsible for explaining the reasoning behind their tableau placement. They will be scored using a modified performance rubric.

Activity 4:

Strategy: RAFT Writing (Role-Audience-Format-Topic)

Students will be writing an obituary for Giles Corey using the RAFT writing format:

Role: A member of the Puritan Community who deeply respected Giles Corey

Audience: The Puritan Community, including those who sympathize with Corey, and those who agree with the high court.

Format: Obituary

Topic: The Honorable Death of Giles Corey

Task: Students will write an obituary celebrating the life and death of Giles Corey. They will use knowledge gained from the text to inform their writing. One of the goals of the obituary should be to persuade those who killed Mr. Corey that they were wrong in their assessment.

Brain Target #5: Teaching for Application

Activities for Extension and Application of Knowledge

-Socratic Seminar: Was John Proctor's decision honorable or foolish? (Speaking and Listening)

-Research Project: McCarthyism and its connection to the Salem Witch Trials (Research Paper or Class Presentation)

-Public Service Announcement: What have we learned?

Brain Target #6: Evaluating Learning

-Typed Analytical Essay: What are the advantages and disadvantages of conforming? After reading *The Crucible*, write an essay that addresses the question and support your position with evidence from the text.

-Unit Test (Multiple Choice and In-Class Writing/ Passage Analysis)

Materials: (Attached below)

Name: _____

Date: _____

To Conform or Not To Conform: That Is the Question



Directions: Read the following scenarios closely. Then, decide whether the character in the scenario should conform or not conform to his or her surroundings. Finally, explain your reasoning in the space provided.

1. Shelby has been studying for the past two weeks for her final in chemistry. Her grade in the class is much lower than it should be, and her mother has warned her to improve it or there will be consequences. Shelby has done a lot to prepare for the exam; she has declined party invitations, restricted time with friends, and spent hours in the library.

On test day, Shelby sits next to her friends at lunch. She notices that friends are creating cheat sheets and hiding them in their back packs. Shelby is confident in her ability to do well on the test, but considers that she might do better if she had a cheat sheet as well. What should Shelby do? Should she **conform** to her group and create a cheat sheet? Why or why not?

2. David was always a responsible young adult in high school. He worked hard for good grades, and participated in sports. He never drank or did drugs. This paid off, and David was accepted into a prestigious college. He told himself he would not drink until he was 21 and it was legal.

However, now that David is 18-years-old and in college, he finds himself surrounded by friends who drink regularly even though they are not 21. David re-thinks his promise to himself. He doesn't intend to do anything dangerous when drinking, just have a couple beers when he goes out with his new friends. Is there really a problem? Should he **conform** to his group and drink before he turns 21? Why or why not?

Name:

Date:

K-L-Q

What do I Know about the Salem Witch Trials?	What did I learn about the Salem Witch Trials from the video clip?	What questions do I still have about the Salem Witch Trials that I want the text to answer?

PRESENTATION RUBRIC

Student Name: _____

Total Score: _____

Grade: _____

CATEGORY	4	3	2	1
Speaks Clearly	Speaks clearly and distinctly all (100-95%) the time, and mispronounces no words.	Speaks clearly and distinctly all (100-95%) the time, but mispronounces one word.	Speaks clearly and distinctly most (94-85%) of the time. Mispronounces no more than one word.	Often mumbles or cannot be understood OR mispronounces more than one word.
Memorization	Part is completely memorized. The student does not need support during the performance.	Part is mostly memorized. Student may forget one or two lines.	Part is somewhat memorized. Student forgets more than two lines.	Part is not memorized. Student must read or be given lines.
Preparedness	Student is completely prepared and has obviously rehearsed.	Student seems pretty prepared but might have needed a couple more rehearsals.	The student is somewhat prepared, but it is clear that rehearsal was lacking.	Student does not seem at all prepared to present.
Volume	Volume is loud enough to be heard by all audience members throughout the presentation.	Volume is loud enough to be heard by all audience members at least 90% of the time.	Volume is loud enough to be heard by all audience members at least 80% of the time.	Volume often too soft to be heard by all audience members.
Enthusiasm	Facial expressions and body language generate a strong interest and	Facial expressions and body language sometimes generate a strong interest and	Facial expressions and body language are used to try to generate enthusiasm, but seem	Very little use of facial expressions or body language. Did not generate much

	enthusiasm about the topic in others.	enthusiasm about the topic in others.	somewhat faked.	interest in topic being presented.
Artistic Interpretation	Student has made the piece “their own.” They are comfortable and believable in the role they are playing.	Student is fairly comfortable and believable in the role they are playing.	Student is somewhat uncomfortable in the role. The audience may have some difficulty believing in their role.	Student is very uncomfortable in the role. The audience has difficulty believing in their role.