BEHIND THE CURTAIN

A CREATIVE & THEATRICAL STUDY GUIDE FOR TEACHERS

Book by Linda Daugherty
Music & Lyrics by Nick Martin

AGES 12 AND ABOVE - Not Suitable for Young Children

FEBRUARY 24 - MARCH 4 STUDENT MATINEE
FEBRUARY 20 - MARCH 1 PUBLIC SHOWS

As part of DCT's mission to integrate the arts into classroom academics, the ***Behind the Curtain Resource Guide*** is intended to provide helpful information for the teacher and student to use before and after attending a performance. The activities presented in this guide are suggested to stimulate lively responses and multi-sensory explorations of concepts in order to use the theatrical event as a vehicle for cross-cultural and language arts learning.

Please use our suggestions as springboards to lead your students into meaningful, dynamic learning; extending the dramatic experience of the play.

Dallas Children's Theater

BEHIND THE CURTAIN

A Creative & Theatrical Resource Guide for Teachers

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Play.....TEEN BRAIN: THE MUSICAL
Book by.....Linda Daugherty
Music and lyrics by.....Nick Martin

Director of Production.....Nancy Schaeffer
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DALLAS CHILDREN'S THEATER, one of the top five family theaters in the nation, serves over 250,000 young people from 196 zip codes, 146 cities and 78 counties and 32 states each year through its main stage productions, touring, educational programming and outreach activities. Since its opening in 1984, this award-winning theater has existed to create challenging, inspiring and entertaining theater, which communicates vital messages to our youth and promotes an early appreciation for literature and the performing arts. As the only major organization in Dallas focusing on theater for youth and families, DCT produces literary classics, original scripts, folk tales, myths, fantasies and contemporary dramas that foster multicultural understanding, confront topical issues and celebrate the human spirit.

DCT is committed to the integration of creative arts into the teaching strategies of academic core curriculum and educating through the arts. Techniques utilized by DCT artists/teachers are based upon the approach developed in The Integration of Abilities and Making Sense with Five Senses, by Paul Baker, Ph.D.

DCT founder and Executive Artistic Director, Robyn Flatt defines the artistic mission and oversees the operations of the organization, consisting of twenty-five full time staff members and more than 200 actors, designers, theater artists and educators.

See page 21 for the TEKS that your field trip to Dallas Children's Theater satisfies!

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Curtains Up on the Role of the Audience

Watching a play is different from watching television or a sporting event. When you watch T.V., you may leave the room or talk. At a sporting event you might cheer and shout and discuss what you're seeing. Your role as a member of the audience in a play means you must watch and listen carefully because:

You need to concentrate on what the actors are saying.

The actors are affected by your behavior because they share the room with you. Talking and moving around can make it difficult for them to concentrate on their roles.

Extra noises and movement can distract other audience members.

Give this a try!

1. Write a letter to a cast member telling what you liked about the character he or she played.
2. Write how you think it might feel to be one of the actors. Are the actors aware of the audience? How might they feel about the reactions of the audience today? How would you feel before the play began? What about after the show ends?
3. Which job would you like to try? Acting, Directing, Lighting and Sounds, Stage Manager, Set designer, Costume designer, or another role? What skills might you need to complete your job?
4. Choose an issue you find important to teens and draw or use the computer to create a program cover design for a theatrical poster addressing the issue. You'll need to consider a title, characters, and design elements to convey through your poster.

Curtains Up After the Performance

Attending a play is an experience unlike any other entertainment experience. Because a play is presented live, it provides a unique opportunity to experience a story as it happens. Dallas Children's Theater brings to life stories though its performances. Many people are involved in the process. Writers adapt the stories you read in order to bring them off the page and on to the stage. Designers and technicians create lighting effects so that you can feel the mood of a scene. Carpenters build the scenery and make the place of the story become a real place, while costumers and make-up designers can turn actors into the characters you meet in the stories. Directors help actors bring the story to life and make it happen before your very eyes. All of these things make seeing a play very different from television, videos, computer games, or CDs and tapes of stories.

Teachers' Tip

Hold a class discussion when you return from the performance on the multi-sensory nature of a theater experience. Use the following questions as springboards to the discussion:

- What was the first thing you noticed when you entered the theater?
- What did you notice first on the stage?
- What about the set? What things do you remember? How vivid are they now? Did the set change during the play? How was it moved or changed?
- Was there any space besides the stage where action took place?
- How did the lights set the mood of the play? How did they change throughout? How do house lights differ from stage lights? Did you notice different areas of lighting?
- What did you think about the costumes? Do you think they fit the story? What things do you think the costume designers had to consider before creating the costumes?
- Was there music in the play? How did it add to the performance?
- What about the actors? Do you think they were able to bring the characters to life? Did you feel caught up in the story? What things do you think the actors had to work on in order to make you believe they were the characters?

Curtains Up on the Authors

LINDA DAUGHERTY
Playwright
Linda Daugherty's plays have been produced internationally in professional and community theaters, schools, and colleges. She received the 2011 National Award from the Society for Adolescent Health and Medicine for her plays dealing with teen issues: *The Secret Life of Girls* (bullying), *Eat (It's Not About Food)* (eating disorders), *dont u luv me?* (teen dating violence) and *hard 2 spel dad* (learning differences) (written with Mary Rohde Scudday) which were most recently produced by Dallas Children's Theater in repertory during its 2010-11 season. In 2009, Ms. Daugherty received the first Elisa Project Star of Hope Award for her work in promoting awareness of eating disorders. Along with Dr. Susan Sugerman, Ms. Daugherty is a Dallas Morning News arts staff 2011 nominee for Texan of the Year. Her play *Bless Cricket, Crest Toothpaste, and Tommy Tune* is a winner of the Bonderman / Indiana University / Purdue University / Indiana Repertory Theatre Playwriting Competition, the Dallas-Ft. Worth Theater Critics Forum Award for New Plays, and the Southwest Theatre Association's Coleman A. Jennings Award for Best Children's Script. Ms. Daugherty has received the Southwest Theatre Association's Playwright Award for Best New Children's Script, the Orlin Corey Outstanding Playwright Award and five Dallas Theatre League nominations for Outstanding New Play. She is playwright-in-residence at Dallas Children's Theater and a member of the Dramatist Guild of America.

NICK MARTIN
Composer / lyricist
Nick Martin is a composer and lyricist based in Dallas, TX. He has been involved with DCT since was 5 years old, when he was a gnome in Linda Daugherty's *Cinderella, Or Everyone Needs A Fairy Godmother.* His most recent musical, *The Milford Project*, won Best of Fringe at the Hollywood Fringe Festival in 2011. Nick is pursuing a graduate degree in business at TCU.

Curtains Up on Discussion

Susan Sugerman, MD, MPH, Girls to Women Health and Wellness

TEEN BRAIN: THE MUSICAL

Identify the "decision points" that set up the crisis moment in the story.

- How did different characters contribute to the crisis?
- What do you think any of the characters could have done to cause a different outcome?
- Would you expect those actions to be easy or hard to do in real life? Explain your answer.

Put it in context

What is the purpose of adolescence?

1. To experience acne.
2. To drive parents crazy.
3. To keep people available who can teach grown-ups how to operate remote controls and other new technology.
4. To allow for brain development while learning and practicing life skills necessary for adulthood.

How long does adolescence typically last? Does any of the information presented in the chart surprise you?

Boys and girls progress through the stages of adolescence at different ages. Identify some potential implications of this (in theory or from your own experience).

Due to advances in the understanding of brain science, we now understand that the brain does not reach full adult capacity until the early to mid-twenties. Why does this matter?

Mixed-up Moving Parts

Not all areas of the brain develop at the same time or at the same speed. A teenager can be more like a middle teen in some areas of development and more like a young teen in others. These inconsistencies in maturity can contribute to a lot of confusion about your own feelings. Furthermore, when peers transition through different stages at different times, it can get really hard for them to understand and relate to each other. Understanding where you are in relationship to your peers sometimes can help you make sense of what is happening around you.

Consider the following:

Cody has changed clothing sizes 3 times in the past 18 months. He prefers multi-player video games with historical themes. His parents were proud of the paper he wrote about standing up to peer pressure but surprised when he was caught at a party where alcohol was being served to minors. Cody is most likely in which stage of adolescence?

a. Early
b. Middle
c. Late

Katelyn is invited to a slumber party. She begs her mother for new pajamas because all the ones she owns look "weird." She offers to do all the dishes for a week if her mom will get them for her. When they go shopping, her mother is surprised that Katelyn doesn't want her to come back to the dressing room. Katelyn is most likely in which stage of adolescence?

a. Early
b. Middle
c. Late

Ben is getting worried about college. His GPA is pretty good, but he needs to do better on his standardized testing to get into his favorite schools. Until recently, he has always been happy to stay out late partying with friends instead of studying. Lately, he has been coming home earlier so he can get up to study in the mornings on Saturday. His friends are getting a little frustrated with losing their best "designated driver."

What parts of Ben's brain are maturing the most during this period of time?

a. Brain stem (basic neurologic control of the body)
b. Limbic system (emotions, gut responses, pleasure, reward seeking)
c. Prefrontal cortex (executive functioning)
d. Corpus callosum (connection between brain hemispheres)

Which parts of his friends' brains are more active in this situation?

a. Brain stem (basic neurologic control of the body)
b. Limbic system (emotions, gut responses, pleasure, reward seeking)
c. Prefrontal cortex (executive functioning)
d. Corpus callosum (connection between brain hemispheres)

Why don't we let 12-year-olds drive cars? Can you think of things teens and young adults may be allowed to do before they are developmentally "competent"? Explain your answers.

The Romance of Risk

Research suggests that heightened risk-taking in young people results from an imbalance in the development of areas in the brain that control emotions or impulses ("I feel," or "I want") compared to areas that control higher level thinking and problem solving ("I understand the complexity of this situation," or "I can figure out what to do to create the best possible outcome"). The same studies show that the teen brain pays even more attention to social and emotional factors (over rational thought and decision making) when peers are present or in situations where emotions run high.

- Define the word "risk" (e.g. reaching beyond your "comfort zone" to try something new with a potentially uncertain outcome).
  - Are all risks necessarily "bad"?
  - Give some examples of appropriate risks teenagers might take (e.g. trying a new sport, running for student council, reaching out to a new friend, etc.).
  - Give some examples of negative or unhealthy risks.

• Some people say teenagers tend to be "impulsive" and "thrill-seeking."
    - Define "impulsive" (e.g. acting on a thought or suggestion hastily without thinking it through).
    - Give some examples of a situation in which a teen may behave impulsively.
    - What types of "thrills" tend to be attractive to teens?
    - Why do you think some teenagers are tempted to do these things?

• Using the chart on page 9 as a reference, discuss how normal brain development might affect decisions teenagers make about potentially dangerous behaviors?

What does it mean when the developing adolescent brain is referred to as "plastic?" Discuss this in relation to the effects of:

- Use of alcohol and other mind-altering drugs
- Stress or trauma
- Tackling positive challenges

With Friends Like These…Peer Pressure

A study shows that "just having friends nearby doubles the number of risks adolescents take."

- What do you think this statement means?
- Do you believe it? Why or why not?

We know that, in adolescents, "a part of the brain is activated by the presence of peers."

- Does this excuse teenagers from succumbing to peer pressure?
- Why or why not?

Most teenagers like to think they are not influenced by "peer pressure."

- Can you think of some examples where teens may behave differently than they would if their friends or other teenagers were not around?
- Why is it sometimes difficult to do the "right thing" when friends are around?

Discuss any examples where friends influence each other to

- Avoid a risky situation (before something bad happens)
- Correct a potentially dangerous situation even after a "bad decision" has been made

Alex and four other friends are studying together for a major test. One of the friends pulls out a copy of the test stolen from the teacher's desk earlier that day with all the answers listed and offers to share it with the group. The other kids seem interested, but Alex feels very uncomfortable with the situation and doesn't want to get in trouble for cheating.

- Why might some of the kids be interested in seeing the test with the answers?
- Which is harder—going along or standing up to do the right thing?
- How might Alex respond in a way to keep from feeling like a "loser" but not risk getting in trouble for cheating?
    - Role Play: Show what happens depending on how Alex responds.
    - Examples
        - Alex stands up and says, "This is not right. I'm calling my mommy!"

- Alex makes a defiant speech to his friends about cheating.
- Alex e-mails the teacher about what's going on.
- Alex uses humor to distract or dissuade the group into doing something else.
- Alex politely finds an unrelated excuse to leave.
- Other ideas? Be creative……!

Stepping in when others are choosing "risky" behavior can be very hard to do in real-life situations.

- Come up with your own "skit" showing different ways teenagers can help influence their peers in positive ways when faced with pressure to do something risky or dangerous.

Take it Personally

Can you think of any potentially risky or dangerous situations you and your friends may have gotten yourself into in the past? (You do NOT have to share your answers.)

- Do you think you might have done something differently if your friends (or peers) were not around?
- Do you think you learned something from that experience? What would you do differently if something similar ever comes up again?

Use Your Grown-Ups

Given what you've learned about the teen brain, what do you think the role of parents or adults should be in monitoring or supervising teen behavior?

- Write a "letter to the editor" giving your "advice" about how you think parents or other adults can help teenagers grow up to be strong, independent adults who are capable of protecting their health, their safety, and their futures.

Developmental Changes in Adolescence

Early Adolescence Females 11–14, Males 13–15	Middle Adolescence Females 15–17, Males 16–19	Late Adolescence Females 18–25, Males 20–26
Physical Growth		
• Changes in height, weight, endocrine system	• Adult height by 14–15 (girls), 16–17 (boys)	• "Late bloomers" get taller • Weight increases then stabilizes
Sexuality (physical transformation, thoughts, feelings)		
• Pubertal changes begin • Increased body image awareness, concern for privacy • Increasing curiosity about relationships, sex	• Pubertal changes continue • More sexual awareness (e.g. clothes, language, jokes) • Interest in physical relationships	• Final physical pubertal maturation have been achieved • More secure sense of sexuality • More genuine intimacy skills
Emotions (feelings) / Identity ("Who am I?")		
• Hormonal moodiness (boys *and* girls!) • Concern with appearance • Still identify with values and activities of parents	• Maturity fluctuations • Impulsivity • Self–conscious, self–centered • Need for identity distinct from parents	• More consistent, mature reasoning • Improved self-acceptance • May return to parents' values
Relationships / Intimacy (friendship, love, community)		
• Parents primary source of value, self-worth • More interest in peers and media for information/advice • Reluctant to seem different from peers	• Separate more from family • Rely more on peers for affection / love • Work on relationship skills (friendships, early romance)	• More adult relationships with parents • Improved capacity for long-lasting mutual relationships • Peers less important role in behavior
Cognitive / Intellectual (thinking, problem-solving)		
• Growth of frontal lobes resumes (self-control, judgment, planning) • Concrete thought dominates over abstraction (e.g., harder to see how different events or situations relate to each other, difficulty understanding sarcasm)	• Limbic system, temporal lobe very active (emotion / impulsivity / reward), dominates frontal lobes (reasoning) • Transitioning from concrete to more abstract thought (e.g. better understanding of subtle humor, complex math, social nuances)	• Corpus callosum (self–awareness), prefrontal cortex (judgment) mature fully in mid–20's • Able to apply abstract concepts more skillfully to own problem–solving • More mature/aware of consequences and personal limitations
Vocational / Moral (role in society)		
• Shift from play to academic focus at school • Can handle increased responsibilities • Fairly black / white re: moral choices	• Begin considering future careers • Increased understanding of complex issues (e.g. war, poverty), subtleties of moral choices	• Prepare for adult career goals and responsibilities • Advancing sense of morality based on personal values and critical thinking

Susan Sugerman, MD, MPH, 2013

Overview of Teen Brain Development

Adapted from: http://www.hhs.gov/opa/familylife/tech_assistance/etraining/adolescent_brain/index.html

Re-wiring the Brain

The brain "rewires" itself over the course of adolescence, from the onset of puberty well into the 20's, especially in the prefrontal cortex. The rewiring is accomplished by two mechanisms: neural pruning (cleaning out unused nerve connections) and myelination (which optimizes transfer of information throughout the nervous system). Over the course of adolescence, connections between different areas and structures of the brain increase and strengthen, allowing for multi-tasking, better ability to solve problems and greater capacity to process increasingly complex information.

The Role of Experience

An adolescent brain is very "plastic," meaning nimble and adaptable to environmental challenges and experiences. This is how the brain consolidates learning. This implies that to some extent adolescents can influence the wiring of their own brains by the activities they engage in, the experiences they seek and the things they spend their time doing. Adolescent brain plasticity offers an abundant opportunity to develop talents and life-long interests, like playing a musical instrument, film production, or leading community service projects. Conversely, trauma, chronic stress, substance use, and even sedentary activities such as watching television or playing video games may have greater negative effects when experienced during this sensitive period of brain development.

Action in the Limbic System

The limbic system, sometimes referred to as the "emotional brain," is a group of brain structures located deep within the cerebrum. It is composed of the amygdala, the hippocampus, and the hypothalamus. These three structures are involved in the expression of emotions and motivation, particularly those related to survival. Such emotions include fear, anger, and the "fight or flight" response. The limbic system is also involved in feelings of pleasure that reward behaviors related to species survival, such as eating and sex. In addition, limbic system structures have functions related to memory storage and retrieval, particularly memories related to events that invoked a strong emotional response.

Because of the prominent role of the limbic system in adolescents, teens are more likely than adults to be swayed by their emotions. In addition, adolescents often "read" others' emotions incorrectly. Teens rely more on the emotional region of their brains when reading other's emotions or actions (as opposed to more logical or measured interpretation).

An understanding of what is going on in the limbic system (and what is not going on in the prefrontal cortex – described more thoroughly in the next section) during adolescence helps provide a partial explanation for some characteristic and familiar adolescent behaviors such as: quickness to anger, intense mood swings and making decisions on the basis of "gut feelings." Adolescents' brains are still rooted in the "emotional brain" making it challenging to make what adults consider to be logical and appropriate decisions.
Maturation of the Prefrontal Cortex

The prefrontal cortex, the part of the frontal lobes lying just behind the forehead, is often referred to as the "CEO of the brain." This brain region is responsible for cognitive analysis and abstract thought and the moderation of "correct" behavior in social situations. This brain region gives an individual the capacity to exercise "good judgment" when presented with difficult life situations. The prefrontal cortex is one of the

last regions of the brain to reach maturation, usually not until about age 25. This delay may help to explain why some adolescents act the way they do.

The so-called "executive functions" of the human prefrontal cortex include:

- Focusing attention
- Organizing thoughts and problem solving
- Foreseeing and weighing possible consequences of behavior
- Considering the future and making predictions
- Forming strategies and planning
- Ability to balance short-term rewards with long term goals
- Shifting/adjusting behavior when situations change
- Impulse control and delaying gratification
- Modulation of intense emotions
- Inhibiting inappropriate behavior and initiating appropriate behavior
- Simultaneously considering multiple streams of information when faced with complex and challenging information

During adolescence, white matter increases in the corpus callosum, the bundle of nerve fibers connecting the right and left hemispheres of the brain. This allows for enhanced communication between the hemispheres and enables a full array of analytic and creative strategies to be brought to bear in responding to the complex dilemmas that may arise in a young person's life. Once again the role of experience is critical in developing the neural connectivity that allows for conscious cognitive control of the emotions and passions of adolescence. Teens who take risks in relatively safe situations exercise the circuitry and develop the skills to "put on the brakes" in more dangerous situations.

With an immature prefrontal cortex, even if teens understand that something is dangerous, they may still go ahead and engage in the risky behavior. Recognizing the asynchrony of development of the regions of the brain helps us to see adolescent risk-taking in a whole new light.

Adolescent Angst: 5 Facts About the Teen Brain

From http://www.livescience.com/21461-teen-brain-adolescence-facts.html

They are dramatic, irrational and scream for seemingly no reason. And they have a deep need for both greater independence and tender loving care.

There is a reason this description could be used for either teens or toddlers. After infancy, the brain's most dramatic growth spurt occurs in adolescence.

"The brain continues to change throughout life, but there are huge leaps in development during adolescence," said Sara Johnson, an assistant professor at the Johns Hopkins Bloomberg School of Public Health who reviewed the neuroscience in "The Teen Years Explained: A Guide to Healthy Adolescent Development" (Johns Hopkins University, 2009) by Clea McNeely and Jayne Blanchard.

And though it may seem impossible to get inside the head of an adolescent, scientists have probed this teen tangle of neurons. Here are five things they've learned about the mysterious teen brain.

1. New thinking skills

Due to the increase in brain matter, the teen brain becomes more interconnected and gains processing power, Johnson said. Adolescents start to have the computational and decision-making skills of an adult – if given time and access to information, she said.

But in the heat of the moment, their decision-making can be overly influenced by emotions, because their brains rely more on the limbic system (the emotional seat of the brain) than the more rational prefrontal cortex, explained said Sheryl Feinstein, author of "Inside the Teenage Brain: Parenting a Work in Progress" (Rowman and Littlefield, 2009).

"This duality of adolescent competence can be very confusing for parents," Johnson said, meaning that sometimes teens do things, like punch a wall or drive too fast, when, if asked, they clearly know better.

2. Intense emotions

"Puberty is the beginning of major changes in the limbic system," Johnson said, referring to the part of the brain that not only helps regulate heart rate and blood sugar levels, but also is critical to the formation of memories and emotions.

Part of the limbic system, the amygdala is thought to connect sensory information to emotional responses. Its development, along with hormonal changes, may give rise to newly intense experiences of rage, fear, aggression (including toward oneself), excitement and sexual attraction.

Over the course of adolescence, the limbic system comes under greater control of the prefrontal cortex, the area just behind the forehead, which is associated with planning, impulse control and higher order thought. [Top 10 Mysteries of the Mind]

As additional areas of the brain start to help process emotion, older teens gain some equilibrium and have an easier time interpreting others. But until then, they often misread teachers and parents, Feinstein said.

"You can be as careful as possible and you still will have tears or anger at times because they will have misunderstood what you have said," she said.

3. Peer pleasure

As teens become better at thinking abstractly, their social anxiety increases, according to research in the Annals of the New York Academy of Sciences published in 2004.

Abstract reasoning makes it possible to consider yourself from the eyes of another. Teens may use this new skill to ruminate about what others are thinking of them. In particular, peer approval has been shown to be highly rewarding to the teen brain, Johnson said, which may be why teens are more likely to take risks when other teens are around.

"Kids are really concerned with looking cool – but you don't need brain research to tell you that," she said.

Friends also provide teens with opportunities to learn skills such as negotiating, compromise and group planning. "They are practicing adult social skills in a safe setting and they are really not good at it at first," Feinstein said. So even if all they do is sit around with their friends, teens are hard at work acquiring important life skills.

4. Measuring risk

"The brakes come online somewhat later than the accelerator of the brain," said Johnson, referring to the development of the prefrontal cortex and the limbic system respectively.

At the same time, "teens need higher doses of risk to feel the same amount of rush adults do," Johnson said.

Taken together, these changes may make teens vulnerable to engaging in risky behaviors, such as trying drugs, getting into fights or jumping into unsafe water. By late adolescence, say 17 years old and after, the part of the brain responsible for impulse control and long-term perspective taking is thought to help them reign in some of the behavior they were tempted by in middle adolescence, according to McNeely and Blanchard. [10 Easy Paths to Self Destruction]

What is a parent to do in the meantime? "Continue to parent your child," Johnson said. Like all children, "teens have specific developmental vulnerabilities and they need parents to limit their behavior," she said.

(Research on the different rates of brain function development during adolescence was published in the journal Developmental Review in 2008.)

5. 'I am the center of the universe'

The hormone changes at puberty have huge effects on the brain, one of which is to spur the production of more receptors for oxytocin, according to research detailed in a 2008 issue of the journal Developmental Review.

While oxytocin is often described as the "bonding hormone," increased sensitivity to its effects in the limbic system has also been linked to feeling self-consciousness, making an adolescent truly feel like everyone is watching him or her. According to McNeely and Blanchard, these feelings peak around 15 years old.

While this may make a teen seem self-centered (and in their defense, they do have a lot going on), the changes in the teen brain may also spur some of the more idealistic efforts tackled by young people throughout history.

"It is the first time they are seeing themselves in the world," Johnson said, meaning their greater autonomy has opened their eyes to what lies beyond their families and schools. They are asking themselves, she continued, for perhaps the first time: What kind of person do I want to be and what type of place do I want the world to be?

Until their brains develop enough to handle shades of gray, their answers to these questions can be quite one-sided, Feinstein said, but the parents' job is to help them explore the questions, rather than give them answers.

"Under Construction"

Use the following questions to initiate students' investigations into the brain and how it works.

1. What are the three major parts of your brain? What is the function of the cerebrum? The cerebellum? The brain stem?
2. What are the four lobes of the brain? What is the function of the parietal lobe? The occipital lobe? The temporal lobe? At what age do doctors generally agree the brain stops growing?
3. What are some ways that drugs damage the brain? Is the damage permanent? Explain your answer.

Divide the group into three sections and assign each group further investigation into the developmental stages of the brain with specific regard to infant/child, teenager, and adult brains and how they work.

Allow each group to present their findings in a class discussion on the development of the brain. Provide students with a copy of the "Under Construction" reproducible (pg 18) to record the findings of each group for contrast and comparison.

Use What You've Learned

You will need:
A preferred art medium with which to construct your brain 'model'. Possibilities might include any of the following:

Construction paper in multiple colors
Markers, crayons or colored pencils
Clay or play dough in multiple colors
Poster paints or watercolor paints

Here's how:

Use the information you gathered from the preceding investigation to construct a 'model' of the human brain. Your model should have labeled the cerebellum, cerebrum, brain stem and four lobes of the brain. Include the primary functions of each lobe.

Curtains Up on Writing

A "Stress Free" Self-Reflection Poem

First, write freely for five minutes about how you are feeling. Do not erase anything, and try not to edit yourself mentally while you are writing. Do not worry about grammar, spelling or even clarity. Just let your thoughts flow through your fingers onto the paper.

Use the following instructions to help you organize your thoughts once you have finished the free writing stage. Draw a circle on a piece of paper and write a word that best describes how you feel in it. Draw lines that extend from the circle and pull phrases from your free writing exercise that would fit best in your web. Watch for a pattern in words and phrases.

Draft your poem. Select details from your organizational web that you think will best convey your emotion to a reader.

Leave your poem for a day or two and then come back and look at it again. When you're not in the heat of the emotion, can you feel the emotion anyway as you read what you wrote? Revise your poem accordingly.

Curtains Up on Art

"A Work in Progress!"

You will need:
Large sheets of bulletin board or similar paper
Overhead projector or directional lamp
Black marker or dark pencil
Scissors
Glue
Magazines and newspapers suitable for cutting pictures and words

Pin a sheet of paper to a blank wall or white board. Place a chair facing sideways so that students may sit in silhouette directly in front of the paper. You will probably need to adjust the heights of the paper and the seat to accommodate students.

Shine the lamp at the wall and use a dark pencil or marker to trace the student's head.

Allow students to cut their silhouettes out for decorating. Provide them magazines and newspapers from which they can cut words and pictures that describe their self-images. Encourage them to cover both sides with images that describe strengths and weaknesses they see in themselves. Display the finished works by hanging them with string or yarn from the classroom ceiling.

The Lighter Side of Perception

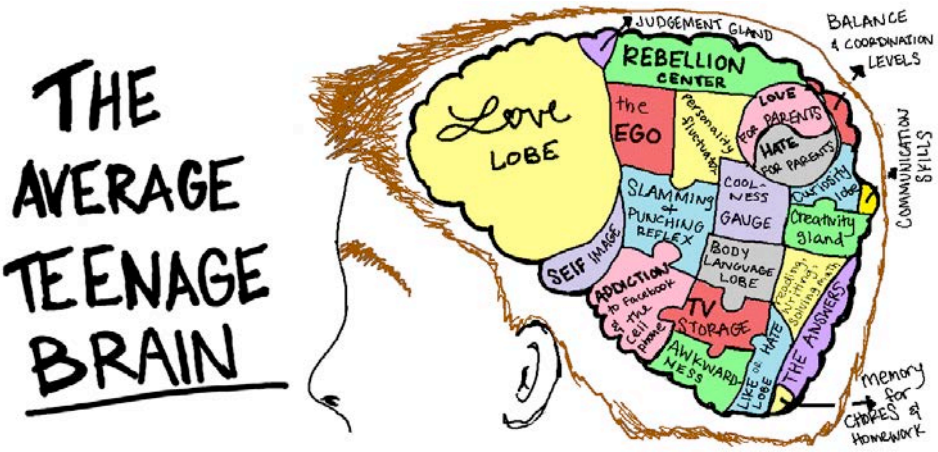
You will need:

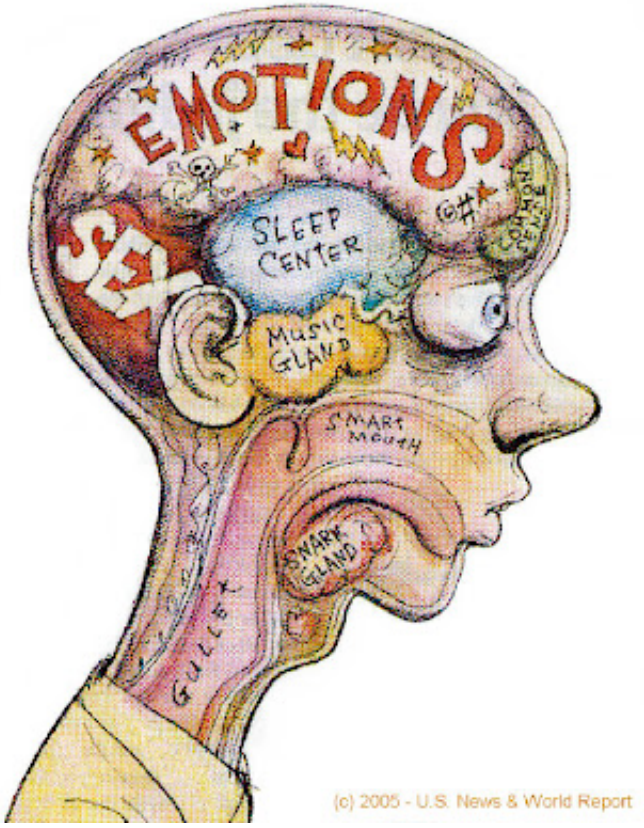
Colored pencils, markers, or crayons
Brain Outline Template (pg 17)
Copies of the teenage brain images for use as examples

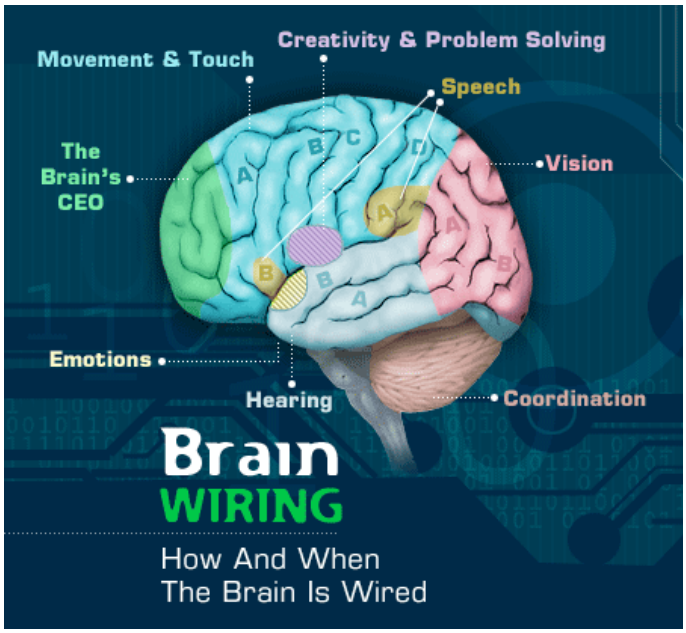
Here's How:

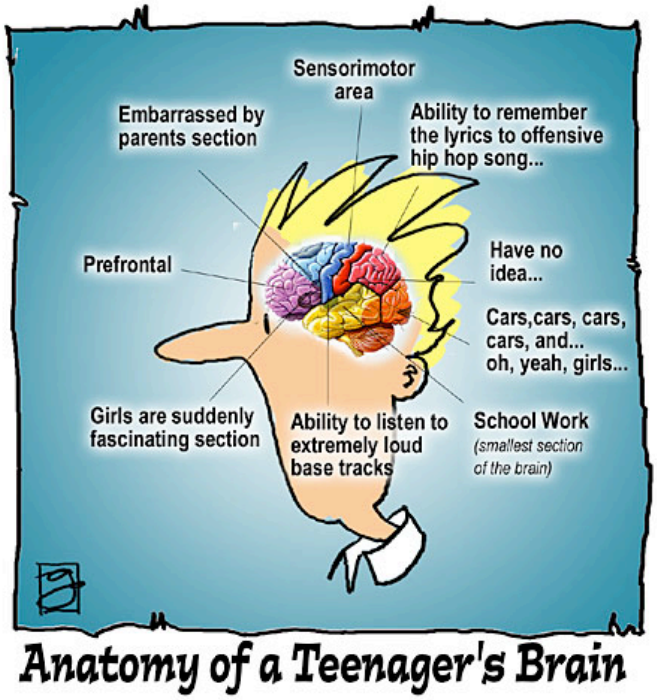
Provide students with a copy of the Brain Outline and instruct them to 'divide' the brain into its major parts. Using what they have learned about the functions of the parts of the brain, students should "illustrate" their brains in the 'language' of their peer group. Encourage them to use both words and images that convey the way it 'feels' to be a teen or how they think teenagers are perceived by others.

Use the images on the next page to help them visualize the goal of the activity.

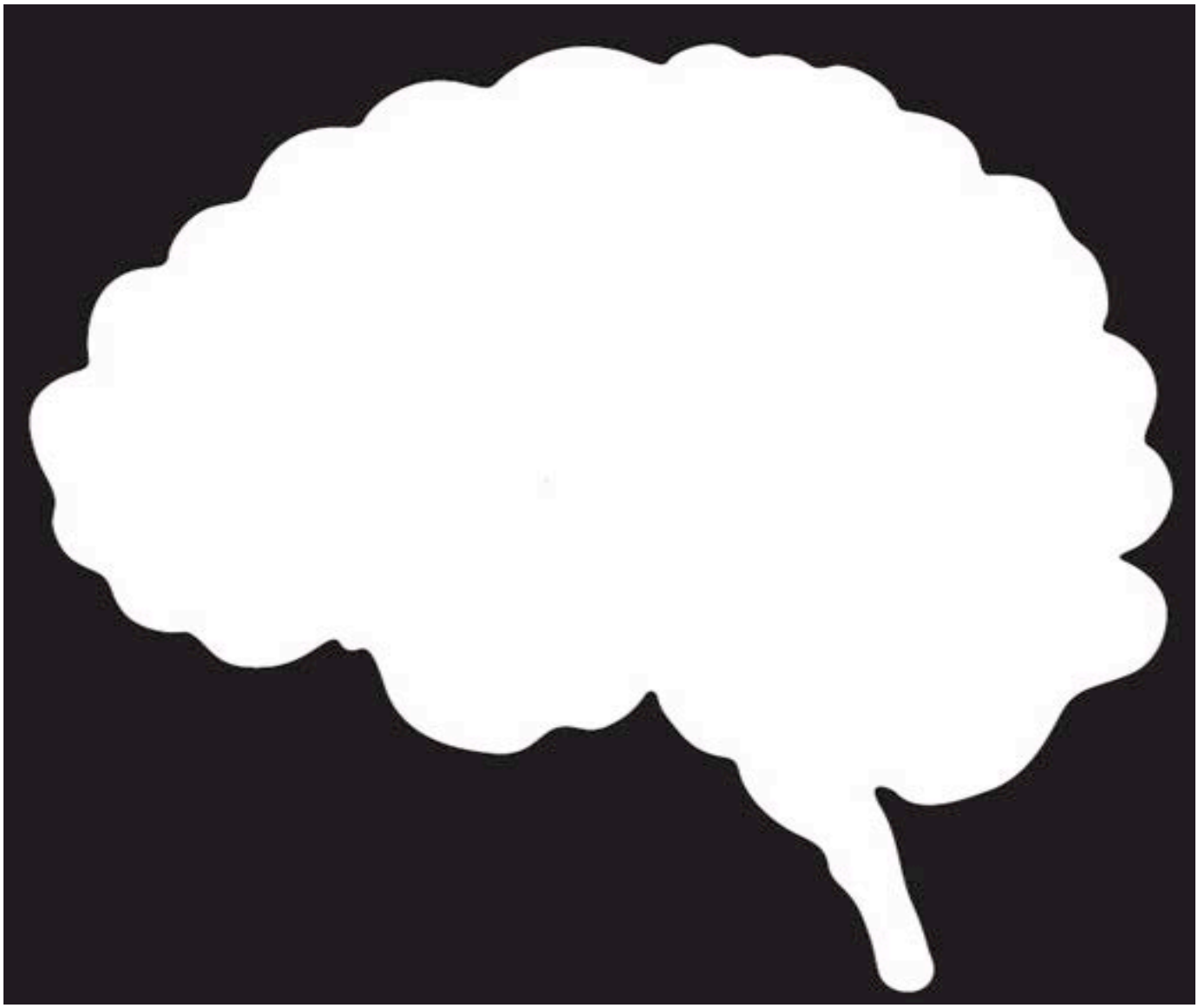

THE AVERAGE TEENAGE BRAIN
JUDGEMENT GLAND
BALANCE & COORDINATION LEVELS
REBELLION CENTER
Love LOBE
the EGO
personality structure
LOVE FOR PARENTS
HATE FOR PARENTS
COMMUNICATION SKILLS
SLAMMING or PUNCHING REFLEX
COOLNESS GAUGE
Curiosity lobe
Creativity gland
SELF IMAGE
ADDICTION to Facebook & the Cell phone
BODY LANGUAGE LOBE
TV STORAGE
AWKWARDNESS
LIKE or HATE LOBE
THE ANSWERS
memory for CHORES & HOMEWORK


EMOTIONS
SEX
SLEEP CENTER
MUSIC GLAND
SMART MOUTH
SMART GLAND
GULLET
(c) 2005 - U.S. News & World Report


Movement & Touch
Creativity & Problem Solving
Speech
The Brain's CEO
Vision
Emotions
Hearing
Coordination
Brain
WIRING
How And When
The Brain Is Wired


Sensorimotor area
Embarrassed by parents section
Ability to remember the lyrics to offensive hip hop song...
Prefrontal
Have no idea...
Cars,cars, cars, cars, and... oh, yeah, girls...
Girls are suddenly fascinating section
Ability to listen to extremely loud base tracks
School Work
(smallest section of the brain)
Anatomy of a Teenager's Brain

BRAIN OUTLINE TEMPLATE



UNDER CONSTRUCTION

INFANT BRAIN	TEENAGED BRAIN	ADULT BRAIN

Additional Resources

http://www.hhs.gov/opa/familylife/tech_assistance/etraining/adolescent_brain/additional_resources/index.html

Adolescent Growth and Development

Virginia Polytechnic Institute Publication 350 – 850, 2008
http://www.ext.vt.edu/pubs/family/350-850/350-850.html
This website, created by the Virginia Cooperative extension which exists as a partnership between Virginia Tech and Virginia State University, explores adolescent growth and development in three different areas: physical development, cognitive development and psycho-social development.

Developing Adolescents: A Reference for Professionals

American Psychological Association, 2002
http://www.apa.org/pi/cyf/develop.pdf
This professional reference, prepared by the American Psychological Association, takes an in depth look at many areas of Adolescent Development, including physical, cognitive, emotional, social and behavioral development.

The Adolescent Brain: A Work in Progress

National Campaign to Prevent Teen Pregnancy
http://www.teenpregnancy.org/resources/reading/pdf/BRAIN.pdf
Written by the National Campaign to Prevent Teen Pregnancy, this online document focuses on the Adolescent Brain and includes information on the physical changes the brain experiences during Adolescent development.

Brain Basics: Know Your Brain

National Institute of Neurological Disorders and Stroke
http://www.ninds.nih.gov/disorders/brain_basics/know_your_brain.htm
This illustrated website takes an in-depth look at the human brain and covers topics ranging from brain geography to a more specific look at the individual parts of the brain and their function.

Anatomy of the Brain

American Association of Neurological Surgeons
http://www.neurosurgerytoday.org/what/patient_e/anatomy1.asp
This in-depth, online resource from the American Association of Neurological Surgeons, covers brain anatomy by listing all of the brain's parts and discussing their roles within the brain.

Brain Facts: A Primer on the Brain and Nervous System

Society for Neuroscience
http://www.sfn.org/skins/main/pdf/brainfacts/brainfacts.pdf
Steinberg L. Risk Taking in Adolescent: What Changes and Why? Ann NY Acad Sci 1021:51-58, 2004.
This document, prepared by the Society for Neuroscience, examines the human brain. It covers the anatomy of the brain, the health problems found in the brain and the diagnostic methods that have been found to treat those challenges, among other things.

Building a Better Teenager: A Summary of What Works in Adolescent Development

http://www.childtrends.org/Files/Child_Trends-2002_11_02_RB_BuildBetterTeens.pdf

This Child Trends research brief summarizes "what works" in adolescent development by examining the influences of their peer group and family during adolescence.

Ways to Promote Positive Development of Children and Youth

http://www.childtrends.org/Files/Child_Trends-2008_02_27_PositiveYouthDev.pdf

This Child Trends Research to Results Brief explores ways to promote the positive development of children and youth by examining the "5 Cs of positive youth development."

T.E.K.S. satisfied by TEEN BRAIN: THE MUSICAL

117.37 - Theatre, Grade 7.
7.5 - Response/evaluation. The student responds to and evaluates theatre and theatrical performances.
A - Identify and demonstrate appropriate audience behavior at various types of performances.
D - Compare career and avocational opportunities in theatre.
117.40 - Theatre, Grade 8.
8.5 - Response/evaluation. The student responds to and evaluates theatre and theatrical performances.
A - Analyze and practice appropriate audience behavior at various types of live performances.
D - Compare career and avocational opportunities in theatre.
117.64 - Theatre, Level I.
5 - Response/evaluation. The student responds to and evaluates theatre and theatrical performances.
A - Analyze and apply appropriate behavior at various types of live performances.
D - Select career and avocational opportunities in theatre and describe the training, skills, self-discipline, and artistic discipline needed to pursue them.