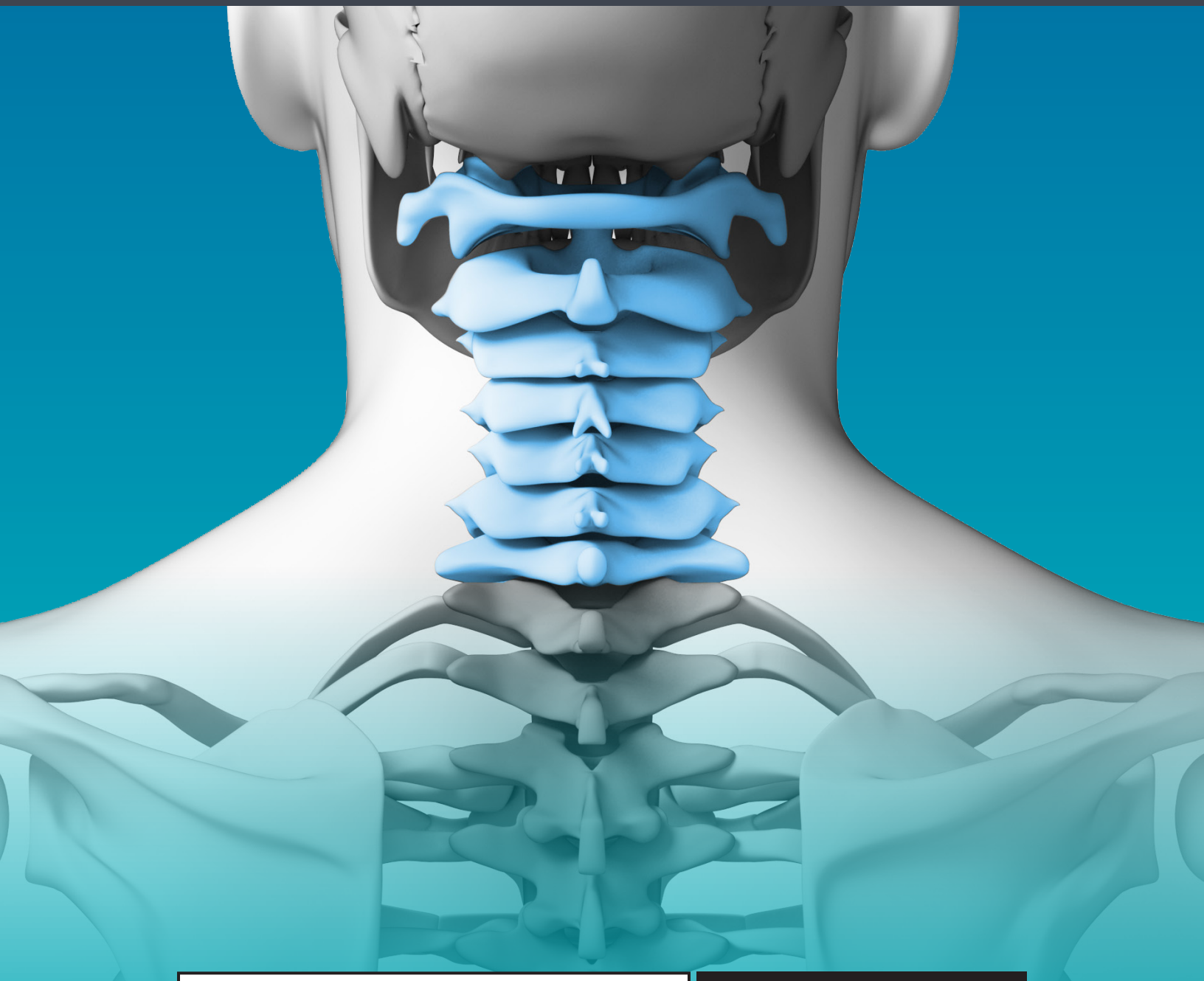
Shepherd Center

BRAIN AND SPINAL CORD INJURY



ANATOMY | CAREERS | INJURY PREVENTION

TEACHER MANUAL

Brought to you by our Injury Prevention Partners

BWF Butler, Wooten & Fryhofer LLP

MALONE LAW
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BRAIN AND SPINAL CORD INJURY

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TEACHER MANUAL

Developed by the Injury Prevention Program at Shepherd Center in collaboration with Cobb County (Ga.) Public Schools.

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Shepherd Center, located in Atlanta, Ga., is a private, not-for-profit hospital specializing in medical treatment, research and rehabilitation for people with spinal cord injury or brain injury. Founded in 1975, Shepherd Center is ranked by *U.S. News & World Report* among the top 10 rehabilitation hospitals in the nation and is a 152-bed facility. For more information, visit Shepherd Center online at shepherd.org.

Shepherd Center
INJURY PREVENTION

2020 Peachtree Road NW
Atlanta, GA 30309

shepherd.org

Dear Teachers,

You, along with your students, are about to embark on a fascinating and sometimes emotional journey to learn about what life is like for young people and their families after they have a brain or spinal cord injury. Every year, thousands of teens are injured doing things that seem perfectly normal – diving into a pool, riding in a car, riding a bicycle. But these activities can be very risky depending on the circumstances. Shepherd Center, a rehabilitation hospital in Atlanta, GA, serves many of these injured young people year after year. In October 2010, we brought together all of the patients who had been injured diving that summer. We asked them what might have prevented their injuries. Many of them said that if they had known how serious the injuries are and how life altering the consequences can be they might have behaved differently.

We have made it our mission to bring this information to your students, so they have a better understanding of traumatic injury and can make better, safer choices. We don't want them to stop living or doing things they love. We just want them to think before they act and minimize their risk. If we can stop just one person from being hurt, then all the hours and all the work that went into this curriculum will be worth it. But our true hope is that none of your students will ever have to experience a brain or a spinal cord injury. We hope you enjoy what you're going to teach and perhaps learn. We encourage you to pass on these important lessons to your friends and family.

Sincerely,

The Staff of Shepherd Center

Note About the Student Workbook:

This curriculum provides valuable information about traumatic injury that students are unlikely to encounter elsewhere during their education. The student workbook compiles this information in a single source that students can reference and share with others. We recommend keeping the pages intact as students utilize the workbook during instruction. If you choose to evaluate specific student tasks, you can collect the workbooks and review selected pages. Remember that you have copies of each workbook page, so single copies can also be made for students if you prefer the "handout" option.

During the course of this curriculum, prompt students to share the lessons and activities with siblings and parents. At the end of this study, encourage students to use the workbook as a traumatic injury reference and an injury prevention reminder.

BRAIN AND SPINAL CORD INJURY

ANATOMY | CAREERS | INJURY PREVENTION

TEACHER MANUAL

LESSON 1

The Reality of Accidents: Traumatic Spinal Cord and Brain Injury

Brainstorm prevention ideas
Develop TBI/SCI KWL chart

P. 1

LESSON 2

Get in the Know About Anatomy

Read & view TBI/SCI anatomy resources
Tasks 1-3: TBI/SCI anatomy packet

P. 6

LESSON 3

Traumatic Brain Injury (TBI) and Spinal Cord Injury (SCI)

Read & view TBI/SCI injury resources
Task 4: Brain Injury
Task 5: Spinal Cord Injury

P. 22

LESSON 4

TBI and SCI Case Studies: In the Trauma Center

Read case studies
Tasks 6-8: Complete case study injury packet
Create case study exhibit

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LESSON 5

Treating SCI and TBI - The Rehabilitation Team and Medical Careers

Read & view medical career resources
Task 9: Complete career interest activities

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LESSON 6

The Rehabilitation Experience

View Rehab "Fighters" video
Task 10: Complete video analysis chart
Sip and Puff activity
Continue case study exhibit

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LESSON 7

Return to Daily Living

Read impact on "Mom"
Task 11: Calculate cost of living with TBI/SCI
Continue case study exhibit

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LESSON 8

Traumatic Injury Exhibition

Presentation of case studies
Task 12: Disability Etiquette Activities

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LESSON 9

"You've Got a Friend in Me" - Being an Injury Prevention Advocate

Practice safety advocacy language
Develop and present safety advocacy skit
Task 13: Being an Injury Prevention Advocate

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LESSON 10

Promoting Injury Prevention In the Community

Task 14: Create and present injury prevention posters

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INJURY PREVENTION

LESSON 1

The Reality of Accidents: Traumatic Spinal Cord and Brain Injury

Learning Outcomes

Students will recognize risky behavior that can result in traumatic injury and life-altering consequences. Students will investigate the need for prevention and intervention to reduce traumatic injury.

Teacher Planning

Pre-Assessment: Administer the pre-assessment during the week prior to starting the unit if at all possible. If you are administering it the first day of the unit, be sure to do so before any discussion of traumatic injury occurs.

The "Truth or Fiction" activity presents the reality of traumatic injury in statistic form. It can be projected for students as they enter the room as an activator. Each of the statements are true but it can be interesting to see if students will think so. Be sure to project the correct document. The one titled "Truth or Fiction Sources" cites the sources for each statistic. A copy of the activity is also in the student workbook.

Students will be creating two "posters" to display in the classroom during the unit. Depending on wall space, you may need to find an appropriate way to store these during other class periods. Also, you might consider using color coding for posters so that each class period uses an assigned color for its posters and other exhibits that occur during the unit (see Lesson 4).

One poster will function as a KWL chart to guide the students' learning. KWL charts are three column-graphic organizers: the first column charts what the students already know (K) about a subject; the second column lists what the students think they want (W) to learn about a subject; the third column lists what students have learned (L) about a subject. These charts are useful summarizers that can be referenced at various learning points during the curriculum.

Preview Fox 5 news story video and consider questions students might raise about the video.

Explain to students how they will be evaluated to establish expectations for the day's work (see Evaluation at the end of the Activities section).

BIG TAKE AWAY: Ideas to emphasize with students during discussions and activities:

- Traumatic injuries happen unexpectedly
- They are often avoidable
- They often involve risky behavior

Materials Needed

- Unit Pre-assessment (unless previously administered)
- "Truth or Fiction" statistics activity (student workbook)
- Fox 5 Video (5 minutes)
- Projection equipment
- Chart paper and markers

Activities

Administer Unit Pre-Assessment (if not previously administered)

Engage

Project the "Truth or Fiction" statistics as students enter the room. Ask students to consider each statistic and decide if they think it is truth or fiction. They can mark responses on the "Truth or Fiction"page in their workbooks. Reveal the correct responses to each statement and have the students correct their responses as needed.

Briefly discuss the prevalence of traumatic brain and spinal cord injury.

Explain the purpose for this unit: To help students understand the consequences of traumatic brain and spinal cord injury and to inspire them to avoid risks that might lead to such injury.

Explain that students will learn about the injuries and people who experience them.

Explore

Students will watch the Fox 5 news story about a motor vehicle crash.
Have students write responses to the following questions before discussion:

1. Summarize what happened.
2. Who do you think was responsible for the crash?
3. Could the crash have been prevented? Describe how.

Allow students time to share reactions to the questions and discuss.
Suggested discussion questions:

1. Do you think the boys understood the risks involved in their behavior?
2. Describe how you think the crash could have been prevented.
3. If you were in the car, would you speak up to stop your friend from driving dangerously?
4. Most teens do not speak up. Why do you think that is so? What would help teens to do so?

Prevention Ideas Poster:
Have students in groups brainstorm prevention ideas. Have students select the best ideas and compile a class poster to display in the classroom. Students will be given specific opportunities to add ideas to this poster during later lessons in the unit; however, tell students they can add ideas whenever they occur as well.

Explain

Remind students that the news reports both teens suffered from serious, traumatic injury, one a spinal cord injury (SCI) and one a traumatic brain injury (TBI). Explain to students that during this unit they will learn about spinal cord injury and traumatic brain injury by following an actual patient through injury, rehabilitation, and return home. Ask students if they know anyone who has suffered from one of these traumatic injuries. Share stories.

Working in groups, students will create a KWL chart titled "Spinal Cord Injury (SCI) and Traumatic Brain Injury (TBI)." Groups should work on the K (Know) and W (Want to Know) columns.

Elaborate

Have groups share ideas with class. Then create a class KWL wall chart (chart paper) by compiling information. Post in the classroom for additions and reference throughout the unit.

Evaluate (completed as groups share)

KWL: Each group contributed at least three thoughtful ideas to the K and W columns.

Prevention Poster: Using a rating of 1-3, evaluate each group's poster contributions for effective communication, organization, and thinking skills.

Ticket Out:

Students respond to the following:

1. What do you think was most important about today's lesson and why?
2. What questions do you have about today's lesson?

Standards Addressed

Common Core Anchor Standards

W.CCR.10: Write routinely over extended time frames and shorter time frames for a range of tasks, purposes, and audiences.

SL.CCR.1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words, phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; ...

Read the following statements and indicate whether they are true or false by circling T or F. **All statements are true.**

1. TALKING ON THE PHONE WHILE DRIVING is the cause of 25% OF ALL MOTOR VEHICLE ACCIDENTS

   T or F

2. 2 MILLION HIGH SCHOOL ATHLETES ARE INJURED YEARLY

   T or F

3. EVERY 41 MINUTES a person in the US sustains a SPINAL CORD INJURY

   T or F

4. EVERY FIVE MINUTES SOMEONE will become PERMANANTLY DISABLED due to BRAIN INJURY

   T or F

5. PEOPLE WHO TEXT WHILE DRIVING ARE 23% MORE LIKELY TO GET INTO A CAR ACCIDENT

   T or F

6. SIX OUT OF EVERY TEN SKATEBOARD INJURIES occur among CHILDREN UNDER THE AGE OF 16

   T or F

7. MOTOR VEHICLE CRASHES are the leading cause of DEATH for U.S. TEENS

   T or F

Truth or Fiction "Sources"

TALKING ON THE PHONE WHILE DRIVING is the cause of 25% OF ALL MOTOR VEHICLE ACCIDENTS

www.cdc.gov

2 MILLION HIGH SCHOOL ATHLETES ARE INJURED YEARLY

www.cdc.gov

EVERY 41 MINUTES a person in the US sustains a SPINAL CORD INJURY

United Spinal Association

EVERY FIVE MINUTES ONE PERSON WILL DIE and another will become PERMANANTLY DISABLED due to BRAIN INJURY

www.thinkfirst.org

PEOPLE WHO TEXT WHILE DRIVING ARE 23% MORE LIKELY TO GET INTO A CAR ACCIDENT

www.cdc.gov

SIX OUT OF EVERY TEN SKATEBOARD INJURIES occur among CHILDREN UNDER THE AGE OF 16

www.thinkfirst.org

MOTOR VEHICLE CRASHES are the leading cause of DEATH for U.S. TEENS

www.cdc.gov

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LESSON 2 Get in the Know About Anatomy

Learning Outcomes

Students understand the basic anatomy of the spinal cord and brain.
Students define terminology used to describe the spinal cord and brain.

Teacher Planning

Assign students to groups using an appropriate selection method.

Student Activities: During this lesson, all students will complete three tasks:

Task 1 Spinal Cord Anatomy: Answering questions and labeling spine.
Task 2 Brain Anatomy: Answering questions and labeling brain.
Task 3 Anatomy Terminology: Creating Analogies

Lesson Resources: Each task has correlating resources that provide the information students will need to complete tasks.

Spinal Cord Anatomy resources: Video and Print (student workbook)
Brain Anatomy resources: Video and Print (student workbook)
Terminology: Anatomy Vocabulary Chart (student workbook)

The video content and the poster content for both spinal cord and brain anatomy stations are for the most part identical but presented in different formats. The videos are fast-paced and content- laden so are most effective as previews or reviews of the print resources.

Instructional Delivery: This lesson is written for stations but an alternate delivery method is described below.

Stations: Establish five stations around the classroom. Inform students of their learning goal at each station:

Station 1: Spinal Cord Anatomy video (preview or review of spine anatomy)
Station 2: Spinal Cord Anatomy print (read resource and complete Task 1)
Station 3: Brain Anatomy video (preview or review of brain anatomy)
Station 4: Brain Anatomy print (read resource and complete Task 2)

Create a station visit itinerary for each group so that all students visit all four anatomy stations during the instructional period; the order of station visits will vary for each group. The students' goal is to complete Tasks 1 and 2 during the visits to the anatomy stations. The video stations can be used for either content preview or content/task review depending on the order of the visit. The videos add value to the lesson by presenting visual images that make the content clearer. Note: The video content is very fast-paced so students would benefit from previewing Task 1 and 2 questions. Monitoring time at each station will be essential for completing the lesson.

Students can complete Task 3 at their tables after station visits or for homework.

Alternate Delivery - Circulating Resources: An alternate method would be to put print resources in folders and circulate resources around stationary student groups. If this method is selected, show the videos as previews to the entire class and then have student groups work to complete tasks using the print resources that circulate.

BIG TAKE AWAY: Ideas to emphasize with students during discussions and activities:

- The brain and spinal cord are designed to work together to help humans function
- Each structure has many parts that are vulnerable to traumatic injury

Materials Needed

- Student Workbook
  - A Tragic Accident" Case Study Introduction Activity
  - "Get in the Know About Anatomy" Task 1-3 handout - 1 per student
  - Spinal Cord Anatomy print resource
  - Brain Anatomy print resource
  - Spinal Cord and Brain Anatomy Terminology (vocabulary chart)
  - Spinal Cord and Brain Anatomy Terminology Magic Squares activity
- Spinal Cord and Brain Anatomy Terminology Magic Squares TEACHER KEY
- Lesson 2 Spinal Cord Anatomy video (2:47)
- Lesson 2 Brain Anatomy video (3:10)
- 2 Computers for video viewing stations
- Optional: color coded or numbered strips for organizing students into groups

Activities

Engage

Project "A Tragic Accident," which introduces students to the case study project. Students should read this as class settles and roll is taken. They can also read the copy in the student workbook. (Hint: As students enter the room, hand them a number or color that will sort them into groups.) Discuss "A Tragic Accident" briefly by providing students an overview of the unit. Explain that later they will be assigned a specific "neighborhood teen" who has either a spinal cord injury (SCI) or traumatic brain injury (TBI) but they don't yet know which one their neighbor has suffered. In order to prepare for that teen's case study and the tasks involved, they will learn about both types of injury. Today's focus is anatomy.

Explore

Project the "Spinal Cord and Brain Terminology" chart for students to preview. Ask students which terms they know and could define. Explain that during the lesson their goal is to learn about the anatomy and understand these terms. Leave the terms projected during the lesson so students are reminded of the anatomy focus.

Explain

Direct students to Tasks 1-3: Know Your Spine; Know Your Brain; Know Your Anatomy Terminology in student workbook. Tell students you will be evaluating their responses for accuracy, completeness and neatness by selecting a random sample of responses to evaluate, and students do not know which ones will be selected. Therefore, all work must represent their best efforts.

Preview Tasks 1 – 3 on the handout. Preview the resources at each learning station.

Assign each group a station itinerary indicating the order for visiting stations. Manage time as students move from station to station completing tasks.

Elaborate (Three Choices - 10 minutes)

A. Once groups are back at tables, turn to "Spinal Cord and Brain Anatomy Terminology Magic Square" in student workbook. Explain the rules of the Magic Square activity. Have groups "compete to complete". Provide a reward for the winning group. Review answers. Or assign as homework.

B. Once groups are back at tables, challenge them to complete Task 3 by creating analogies for the terms they have learned. Or students can complete for homework.

C. Students select one or two lobes of the brain. Using pictures from magazines, students make a collage of pictures that represent the brain functions controlled by their selected lobe(s).

Evaluate

Collect and review Tasks 1-3 and evaluate selected items (a random sample) for accuracy, completeness, neatness. Suggestion: Have students circle their most creative analogy from Task 3 to be evaluated.

Ticket Out

Students respond to the following:
What part of the spinal cord and brain anatomy do they find the most interesting and why?

Standards Addressed

Georgia Performance Standards – Science Grade 7

S7CS6. Students will communicate scientific ideas and activities clearly.

a. Write clear, step-by-step instructions for conducting particular scientific investigations, operating a piece of equipment, or following a procedure.
b. Write for scientific purposes incorporating data from circle, bar and line graphs, two-way data tables, diagrams, and symbols.
c. Organize scientific information using appropriate simple tables, charts, and graphs, and identify relationships they reveal.

S7CS7. Students will question scientific claims and arguments effectively.

a. Question claims based on vague attributions (such as "Leading doctors say…") or on statements made by people outside the area of their particular expertise.
b. Identify the flaws of reasoning that are based on poorly designed research (i.e., facts intermingled with opinion, conclusions based on insufficient evidence).
c. Question the value of arguments based on small samples of data, biased samples, or samples for which there was no control.
d. Recognize that there may be more than one way to interpret a given set of findings.

S7CS10. Students will enhance reading in all curriculum areas by:

a. Building vocabulary knowledge
    - Demonstrate an understanding of contextual vocabulary in various subjects.
    - Use content vocabulary in writing and speaking.
    - Explore understanding of new words found in subject area texts.

S7L2. Students will describe the structure and function of cells, tissues, organs, and organ systems.

a. Explain that cells take in nutrients in order to grow and divide and to make needed materials.
b. Relate cell structures (cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria) to basic cell functions.
c. Explain that cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.
d. Explain that tissues, organs, and organ systems serve the needs cells have for oxygen, food, and waste removal.
e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

Common Core Anchor Standards

R.CCR.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

L.CCR.4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

L.CCR.5: Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

R.CCR.7: Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.*

R.CCR.10: Read and comprehend complex literary and informational texts independently and proficiently.

W.CCR.8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

W.CCR.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

L.CCR.5: Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

One of the teens in your neighborhood has been seriously injured in a traumatic accident. Doctors say this teen may have a spinal cord and/or brain injury. Until testing and examination occur, you don't know which injury your neighbor has suffered. You are not sure what spinal cord injuries and brain injuries involve, so you decide to discover what they are and what such injuries mean for this teen's future. Think about this situation. Write down three things you think you will need to know to understand this teen's condition.

Brain and Spinal Cord Terminology

Thoracic Section

Brain Stem

Nerves

Sacral Section

Frontal Lobe

Central Nervous System

Left Hemipsphere

Vertebrae

Spinal Cord

Right Hemisphere

Parietal Lobe

Cerebellum

Occipital Lobe

Cervical Section

Lumbar Section

Temporal Lobe

Brain Anatomy

Brain Hemispheres

The Brain is divided into two halves working together to command feelings, thoughts, and behaviors.

Left Hemisphere Controls

- Movement of Right Side of Body
- Reasoning
- Speaking
- Writing
- Number Skills

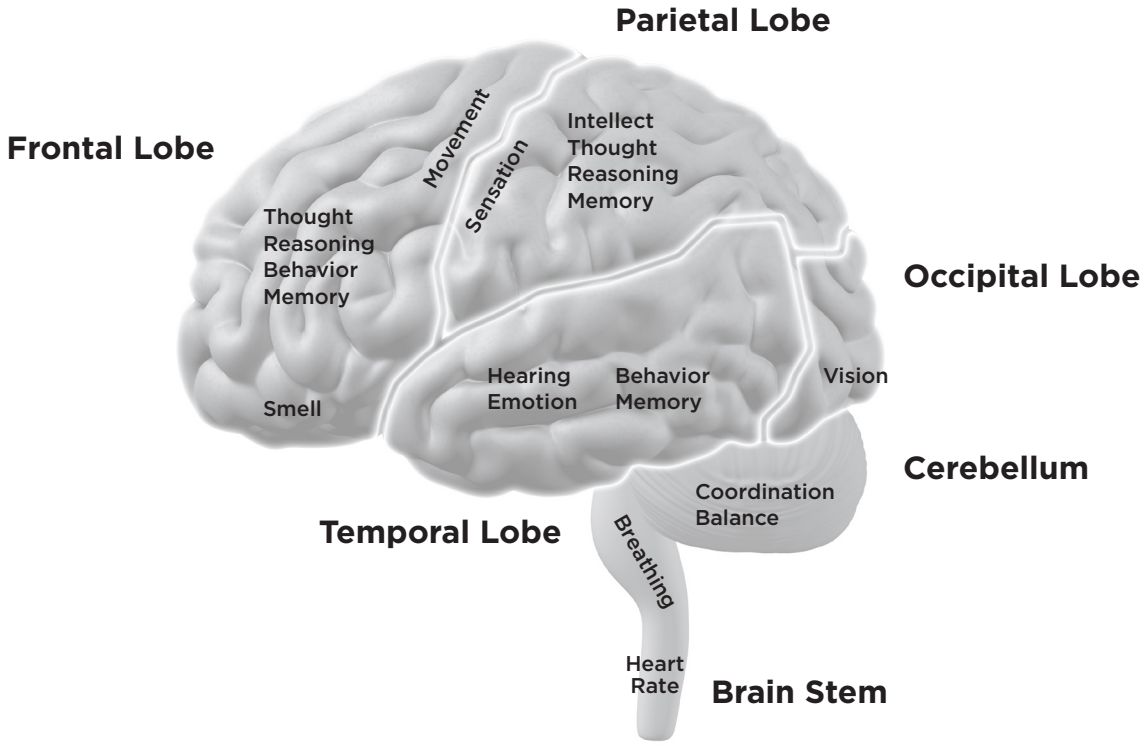
Right Hemisphere Controls

- Movement of Left Side of Body
- Insight
- Imagination
- Music/Art Skills
- Awareness of Three Dimensions

Brain Anatomy

Brain Lobes and Functions

Each hemisphere of the brain is divided into smaller sections called LOBES. Each LOBE is responsible for specific kinds of activity. Plus the base of the brain consists of two additional parts, the Cerebellum and the Brainstem. Notice that the Cerebellum resides underneath the lobes. The Brain Stem connects the spinal cord to the rest of the brain.

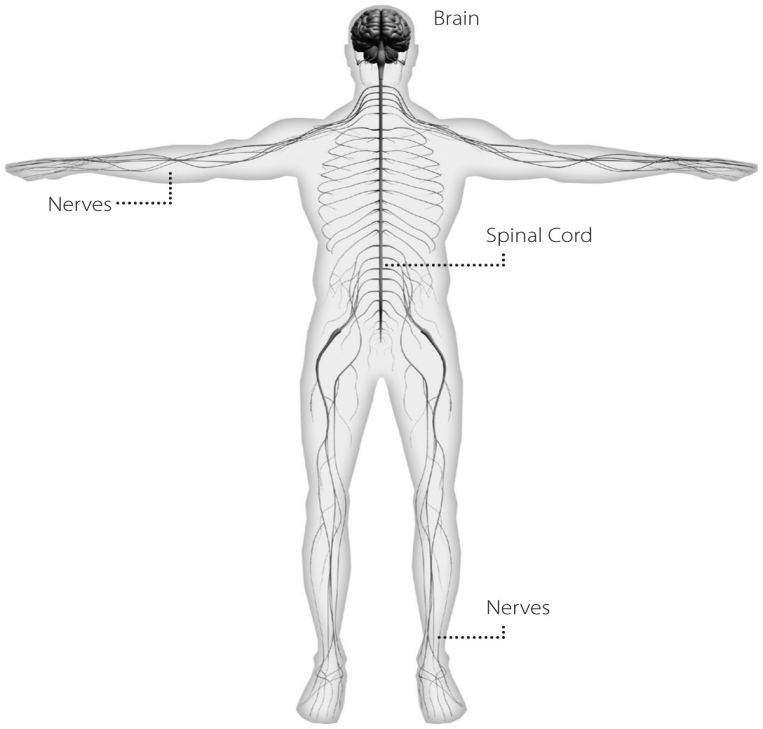


Cerebellum: resides underneath the lobes and is important for coordination and timing.

Brainstem: connects the spinal cord to the rest of the brain and controls functions like breathing, blood pressure, and arousal (ability to respond to senses)

Spinal Cord Anatomy

Central Nervous System



The nervous system includes the BRAIN, SPINAL CORD, and NERVES. The spinal cord is a long column of nerves, and like the brain, is the consistency of a ripe banana. The spinal cord is much like a highway system: the nerves are like lanes of traffic and there are millions of lanes of traffic on the spinal cord. The brain sends and receives messages by way of the spinal cord and nerves (just like cars traveling north and south on a highway). The main messages are MOTOR and SENSORY. MOTOR messages help you do things like move your arms/legs, dance and balance. SENSORY messages help you feel things like pain, pressure, differentiate between hot and cold or rough and smooth. When someone sustains a spinal cord injury, it is like a wreck on the highway that closes down the system.

The spinal cord is surrounded by rings of bone called VERTEBRAE. Vertebrae are grouped into four sections alone the spine.

Spinal Cord Anatomy

Cervical Section

7 Vertebrae

8 Pairs of Nerves

Nerves exiting from the cervical section control:

- Neck
- Face
- Diaphragm
- (Muscles Controlling Breathing)
- Elbows
- Wrists
- Fingers

An injury at the cervical level may also impact function to the nerves that exit below on the spinal column. An injury at the cervical level may also impact: function in the chest and abdomen, the hips, knees, legs and bowel and bladder control. The higher the injury on the spinal column, the more severe the impact for the patient.

Thoracic Section

12 vertebrae

12 pairs of nerves

Nerves exiting for the thoracic section control:

- Chest
- Abdomen
- Back Muscles

An injury at the thoracic level may also impact function to the nerves that exit below on the spinal column. An injury at the thoracic level may also impact: function in the hips, knees, legs and bowel and bladder control.

Spinal Cord Anatomy

Lumbar Section

5 vertebrae

5 pairs of nerves

Nerves exiting from the lumbar section control:

Hips
Knees
Feet (movement upward)
Toes

An injury at the lumbar level may also impact function to the nerves that exit below on the spinal column. An injury at the lumbar level may also impact: function in the feet and bowel and bladder control.

Sacral Section

5 fused vertebrae

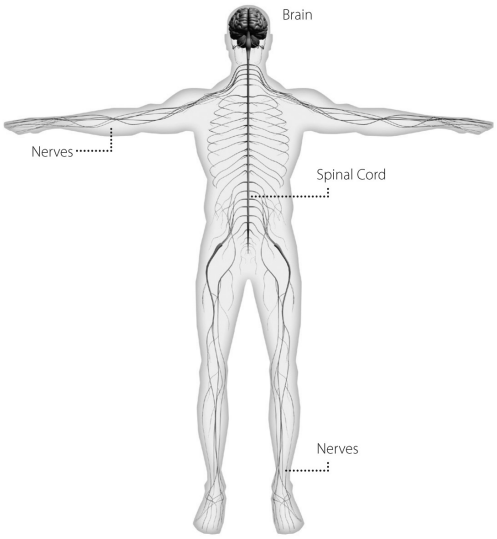
5 pairs of nerves

Nerves exiting from the sacral section control:

Feet (movement downward)
Bowel and bladder control

Task 1: Know Your Spine

Teacher Key



1. What three parts of the body comprise the central nervous system?

   Brain, spinal cord, and nerves

2. The brain sends and receives two kinds of messages. Describe what each kind of message helps the body to do:

   A. Motor messages: **Helps body move its parts like arms, legs, helps body balance and engage in activities like dancing.**

   B. Sensory messages: **Helps body feel pain, pressure, differentiate hot/cold/rough/smooth**

3. The spinal cord is like a highway system.

   It carries the messages to and from the **brain** . Its consistency is mushy like a **banana** .

4. Nerves within the spinal cord are much like traffic lanes on a highway.

   How many of these "traffic lanes" exist within the spinal cord? **Millions**

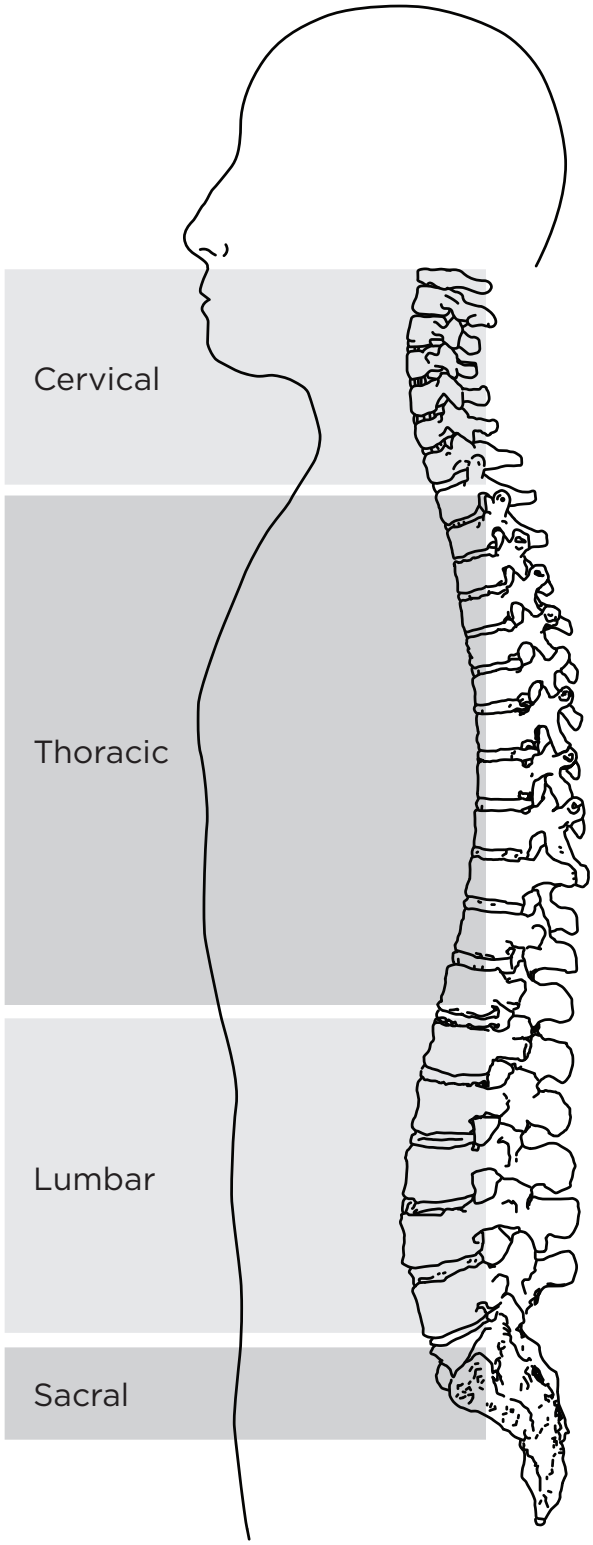
5. The messages carried by the nerves are like **cars** traveling north and south along the highway.

6. A spinal cord **injury** is much like a car wreck on the highway because it

   Stops the messaging between the brain and the body just like a wreck stops the traffic.

7. The rings of bone that surround the spinal cord are called **vertebrae** .

On the right side of the chart below, label the four sections of the spinal cord, number the ***vertebrae*** within each section, and then list the main body parts affected by spinal cord injury within that section.



Cervical – C1-C7

Thoracic T1-T12

Lumbar L-1-L5

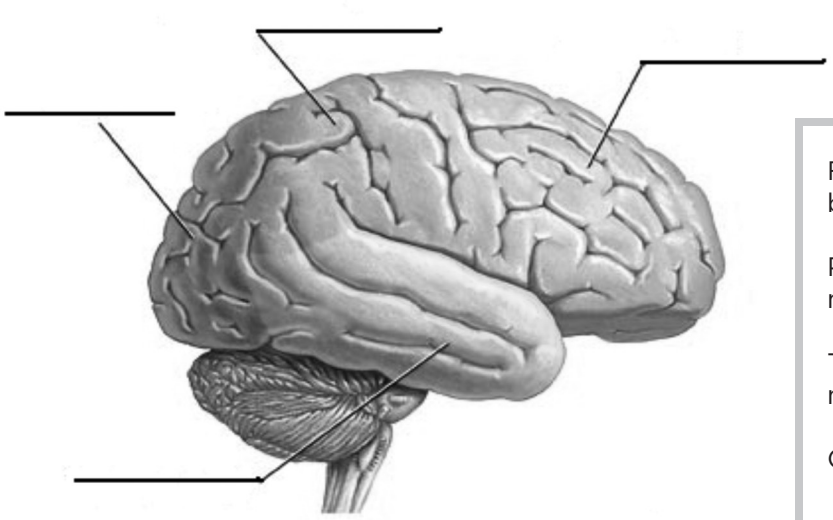
Sacral S1-S5

1. The brain is divided into two halves. What is each half called and what general functions does each control?

   LEFT HEMISPHERE = movement on right side of body, reasoning skills, speaking, writing, number skills.

   RIGHT HEMISPHERE = movement on left side of body, insight, imagination, music/art skills, and awareness of three dimensions.

2. Each brain is divided further into smaller sections called ***lobes***. Label each lobe in the brain illustration below. Beside the illustration, describe the primary function of each lobe.



FRONTAL = thought, reasoning, behavior, memory, smell, and movement

PARIETAL = intellect, thought, reasoning, memory, sensation

TEMPORAL = hearing, emotion, behavior, memory

OCCIPITAL = vision

3. Where is the ***cerebellum***, and what function does it perform?

   It resides under the lobes and is important for coordination and timing.

4. Where is the ***brain stem***, and what does it control?

   It connects the spinal cord to the rest of the brain and controls functions like breathing, blood pressure and arousal (ability to respond to senses).

Task 3: Know Your Anatomy Terminology

Teacher Key

Review the 16 terms that describe brain and spinal cord anatomy. Be sure you have the correct definition for each term.

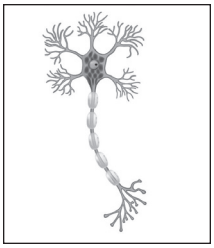
Analogy Challenge

Analogy: An analogy is a comparison between two things that at first may seem very different from each other but actually share similarities. The job of the analogy is to explain that similarity.

Verbal Analogy: Create a sentence that explains your comparison.

Example: *Nerves are like **UPS men** because they both deliver, the nerves deliver messages, the UPS men deliver packages.*

Visual Analogy: Draw pictures that represent your comparison. Then explain how they are alike.



Both
Deliver
Either
Messages or
Packages

Your Challenge: Select 3 brain or spinal cord terms and create a visual or verbal analogy modeled after the examples above:

Be as creative as possible. Surprise your classmates with comparisons they would not expect.

Analogy 1:

Analogy 2:

Analogy 3:

Spinal Cord and Brain Anatomy Terms
Magic Square

(16) A	(2) B	(3) C	(13) D
(5) E	(11) F	(10) G	(8) H
(9) I	(7) J	(6) K	(12) L
(4) M	(14) N	(15) O	(1) P

Directions: Match the word to its definition by placing the correct number of the definition in the square with the letter that represents the term it defines. When the magic square is correctly completed, each row, column and diagonal will add to the number 34.

Medical Terms

A. Brain Stem
B. Central Nervous System
C. Cerebellum
D. Cervical Section
E. Frontal Lobe
F. Left Hemisphere
G. Lumbar Section
H. Nerve
I. Occipital Lobe
J. Parietal Lobe
K. Right Hemisphere
L. Sacral Section
M. Spinal Cord
N. Temporal Lobe
O. Thoracic Section
P. Vertebrae

Definitions

1. Rings of bone surrounding the spinal cord
2. Brain, spinal cord and nerves; controls and coordinates activities of the body
3. Brain part that controls coordination and timing
4. About 18" long; the communication system between brain and body; carries messages that allow us to move and feel
5. Brain part that mainly controls memory, judgment, behavior
6. Brain half responsible for insight, imagination, music/art skills and awareness of three dimensions
7. Brain part that controls sensation, movement, sense of space
8. Each has a special job for movement and feeling; tell body parts how and when to move; also carry messages to the brain
9. Interprets what we see
10. Five (5) vertebrae in lower back; affect hips and legs
11. Brain half that controls reasoning skills, speaking, writing, and number skills
12. Comprised of 5 vertebrae at the end of the spinal column
13. Comprised of 8 vertebrae in the neck; affect arms, hands, trunk and legs
14. Brain part that controls language, emotion, memory skills
15. Twelve (12) vertebrae in the mid-back; affect trunk and legs
16. Connects brain to spinal cord; controls breathing, blood pressure and arousal

Shepherd Center
INJURY PREVENTION

LESSON 3

Traumatic Brain Injury (TBI) and Spinal Cord Injury (SCI)

Learning Outcomes

Students will define medical terminology used to describe SCI and TBI injuries.
Students will understand how doctors categorize SCI and TBI injury levels.
Students will understand the general impacts associated with SCI and TBI.

Teacher Planning

This lesson will take several class periods. The first will focus on traumatic brain injury; the second, on spinal cord injury. The order of these lessons can be switched (teacher preference) but the reading skills are sequential so their order should not be switched.

Part One - Traumatic Brain Injury

The first part of the lesson will be conducted as a class so no groups are necessary.

The Lesson 3: Traumatic Brain Injury video is clear, concise and presents basic information about TBI, so it serves as a good preview.

Review the "Introduction to Brain Injury" print resource and "Know How Doctors Talk About TBI" Task 4 document (both in student workbook) to prepare to guide students through the reading activity and task completion.

Be prepared to instruct students to use pre-reading strategies before reading the introduction to TBI resource. Review strategies familiar to them or use the following:

- Point out structural organizers
- Notice charts and images
- Preview vocabulary
- Establish a purpose for reading

Be sure to preview the injured and normal brain images power point slide presented at the end of the lesson. Read the teacher notes at the bottom so that you can point out the physical details that determined the injury.

Note: The "Introduction to Brain Injury" print resource in the student workbook will be used again in Lesson 4.

Part Two - Spinal Cord Injury

Students should be placed into groups prior to the start of class. Ideally group sizes should be 4 to 5 (see below).

During this lesson students will have an opportunity to practice the reading skills they used in Part One of the lesson by independently reading the "Introduction to Spinal Cord Injury" print resource.

Note: Student will not be able to distinguish the difference between the two images of spinal cord injury on page 3 of the resource unless that page is printed in color. Thus, it will be best to project the power point slide displaying those two images for the class to reference as they read that section of the SCI resource.

The suggested reading activity employs a jigsaw within the groups to accomplish the reading task. The "Introduction to Spinal Cord Injury" can most easily be divided into 5 reading assignments:

1. Level of Injury
2. Damage to the Spinal Cord
3. Extent of Paralysis
4. The ASIA Scale Score
5. Impacts of a Spinal Cord Injury

If groups consist of only 4 members, the impacts section can be divided up and assigned as an extra reading.

Jigsaw explained: Jigsaw activities divide a reading assigned in to sections so that group member read only an assigned portion of the reading assignment. Once all members have read their assignments, members take turns "teaching" the others what they have read.

Assist students to utilize pre-reading strategies as they preview the "Introduction to Spinal Cord Injury" resource.

- Point out structural organizers
- Notice charts and images
- Preview vocabulary
- Establish a purpose for reading

The Lesson 3: Spinal Cord Injury video provides a brief recap of the information they learned from the reading and is suggested as summarizer. The visual images will enhance student understanding SCI.

Note: The "Introduction to Spinal Cord Injury" print resource will be used again in Lesson 4.

Big Take Away – Ideas to emphasize with students during discussions and activities
- Traumatic injuries can cause serious and lasting damage
- Every injury is different and every patient's experience is different

Materials Needed

Part One:
- Student Workbook:
  - "Introduction to Traumatic Brain Injury" print resource
  - "Know How Doctors Talk About Traumatic Brain Injury" Task 4 handout
- Lesson 3: Traumatic Brain Injury (TBI) video (3:06)
- Normal and TBI brain images power point slide
- Projection equipment for video, word document, and brain images power point slide
- Normal and TBI brain images – teacher key.

Part Two:
- Complete and Incomplete SCI image power point slide
- Student Workbook:
  - "Introduction to Spinal Cord Injury" print resources
  - "Know How Doctors Talk About Spinal Cord Injury" Task 5
- Lesson 3: Spinal Cord Injury video (2:52)
- Projection equipment for power point slide and video

Activities - Part One

Engage

Have students recall the news video about the two boys in the car accident (Lesson 1). Remind them that one suffered a traumatic brain injury and one suffered a spinal cord injury. Ask students to speculate about which injury, spinal cord or brain, presents the greatest challenge to the patient. Students must justify their choice. Provide time for a Think-Pair-Share or other brief discussion activity.

Explain that over the next two days they will explore both types of injury and can reevaluate their responses after they have learned more.

Explore

Introduce the Lesson 3: Traumatic Brain Injury video by explaining that it presents basic information about traumatic brain injury. After viewing video, give students time to write down two or three questions they have about TBI. Make sure students recognize that the abbreviation "TBI" is the way medical professionals refer to traumatic brain injury.

Explain

Explain they will now study TBI in more detail and most likely have their questions from the video answered.

1. Project the "Introduction to Brain Injury" print resource for the class to view and instruct students to look at their copy of the resource. Using the introduction to TBI resource, model with the class the selected pre-reading strategies. Then have students look at the "Know How Doctors Talk About TBI" Task 4 document. Be sure students recognize that "Introduction to Traumatic Brain Injury" and the Task 4 document are following the same content order.
   Explain that students will be reading the introduction document section by section and completing the corresponding items in Task 4.
2. Guide students through the print resource reading section by section using a preferred reading strategy. Stop after each section to allow students to work on the Task 4 items. This can be done individually or with a partner.
3. Once Task 4 is completed, offer students an opportunity to reflect upon what they have learned about TBI and encourage them to add to the class KWL chart and Injury Prevention Posters developed in Lesson 1.

Elaborate

Project the two brain images to the class without disclosing what they depict. Challenge them to determine which is injured and which is normal and justify their choice by indicating details from the image that contributed to their choice. Give students (individually) a few minutes to make their determinations. Share and discuss. Be sure students recognize the physical details that indicate injury to the brain.

Evaluate and Ticket Out

Review Task 4 and select random items to evaluate for accuracy, completeness, and neatness.

Activities - Part Two

Students will be working in groups during this lesson.

Engage

Project the power point slide showing the unlabeled complete and incomplete spinal cord injury images. Have students study the images as they enter and write down what they think the images show and what questions they have about the images. Explain that during the day's lesson they will find out about spinal cord injury and these images. At the end of the lesson, they can check their guesses and see if their questions have been answered. Be sure students understand that medical professionals refer to spinal cord injury with the abbreviation "SCI."

Explore

Have students preview the "Introduction to Spinal Cord Injury" resource by working individually or with a partner in their group. Students should be encouraged to engage in appropriate pre-reading strategies. Remind them they practiced these strategies during the TBI part of this lesson. Review these strategies as needed with the students to prepare them for the reading assignment.

Also, preview "Know How Doctors Talk About SCI" Task 5 showing students the items they will be completing after reading the introduction resource.

Explain

1. Read the introductory paragraph and "What is a Spinal Cord Injury?" sections of the "Introduction to Spinal Cord Injury" as a class. Briefly discuss, emphasizing the nervous system/ highway analogy.
2. Point out the rest of the sections in the resource and assign one to each student in the group using the jigsaw method. Instruct students to read their assigned section carefully and prepare to explain the information to the other members of their group.
3. Instruct group members to "teach" their assigned section following the same order presented in the SCI introduction resource. After each section, students should work collaboratively to respond to the items in Task 5 that correlate to the section presented.

Monitor progress and assist students as needed.

Elaborate

Summarize SCI injury by showing Lesson 3: Spinal Cord Injury video and answer student questions. Provide students time to add to the class KWL chart and Injury Prevention Poster.

Evaluate

Review Task 5 and select random items to evaluate for accuracy, completeness, and neatness.

Ticket Out

Have students review their written responses to the images displayed at the beginning of class. They should correct their guess if it was incorrect and check off which of their questions were answered during the lesson. Then write any questions they still have.

Standards Addressed

Georgia Performance Standards – Science Grade 7

S7CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.

a. Observe and explain how parts can be related to other parts in a system such as predator/prey relationships in a community/ecosystem.
b. Understand that different models (such as physical replicas, pictures, and analogies) can be used to represent the same thing.

S7CS6. Students will communicate scientific ideas and activities clearly.

a. Write clear, step-by-step instructions for conducting particular scientific investigations, operating a piece of equipment, or following a procedure.
b. Write for scientific purposes incorporating data from circle, bar and line graphs, two-way data tables, diagrams, and symbols.
c. Organize scientific information using appropriate simple tables, charts, and graphs, and identify relationships they reveal.

S7CS10. Students will enhance reading in all curriculum areas by:

a. Reading in All Curriculum Areas
    - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
    - Read both informational and fictional texts in a variety of genres and modes of discourse
    - Read technical texts related to various subject areas
b. Discussing books
    - Discuss messages and themes from books in all subject areas.
    - Respond to a variety of texts in multiple modes of discourse.
    - Relate messages and themes from one subject area to messages and themes in another area.
    - Evaluate the merit of texts in every subject discipline.
    - Examine author's purpose in writing.
    - Recognize the features of disciplinary texts.
c. Building vocabulary knowledge
    - Demonstrate an understanding of contextual vocabulary in various subjects.
    - Use content vocabulary in writing and speaking.
    - Explore understanding of new words found in subject area texts.
d. Establishing context
    - Explore life experiences related to subject area content.
    - Discuss in both writing and speaking how certain words are subject area related.
    - Determine strategies for finding content and contextual meaning for unknown words.

S7L2. Students will describe the structure and function of cells, tissues, organs, and organ systems.

a. Explain that cells take in nutrients in order to grow and divide and to make needed materials.
b. Relate cell structures (cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria) to basic cell functions.
c. Explain that cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.
d. Explain that tissues, organs, and organ systems serve the needs cells have for oxygen, food, and waste removal.
e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

Common Core Anchor Standards

R.CCR.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

R.CCR.5: Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

R.CCR.7: Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

R.CCR.10: Read and comprehend complex literary and informational texts independently and proficiently.

W.CCR.8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

W.CCR.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

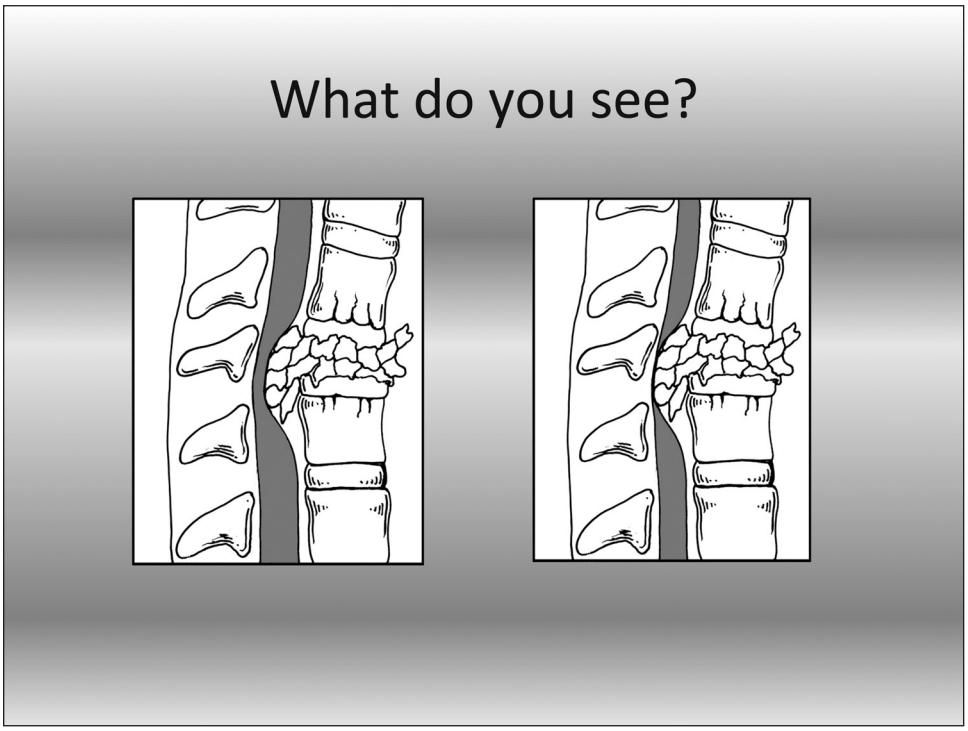
L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

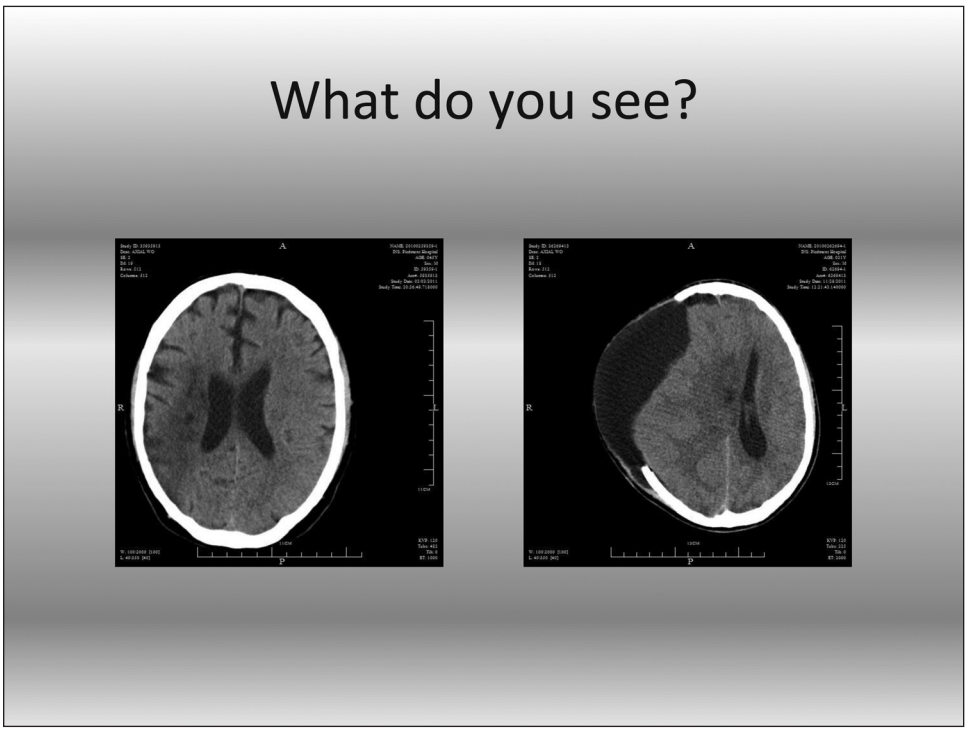
L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

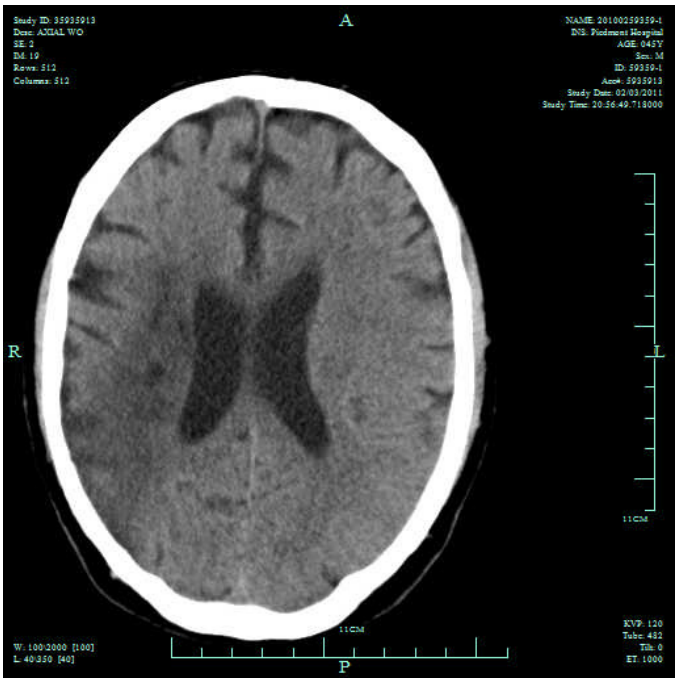
L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

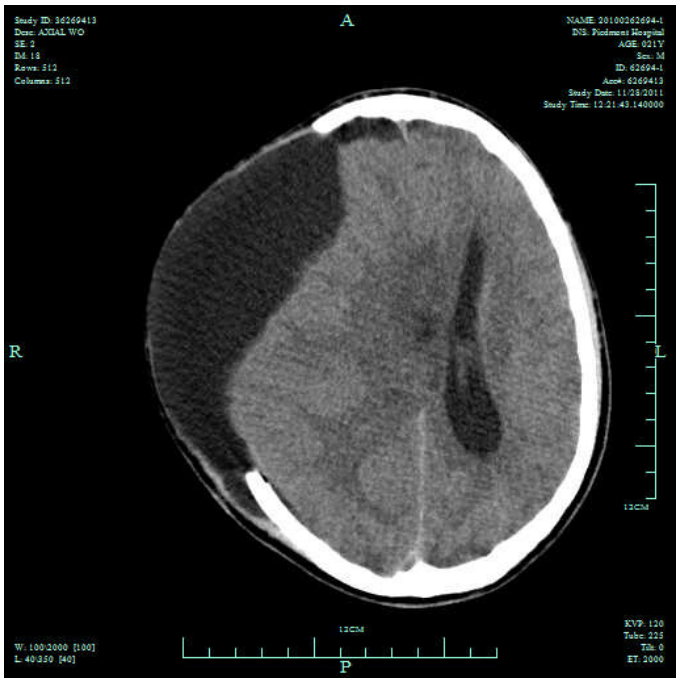
Images of Powerpoint slides for Lesson 3.





Normal and Traumatic Brain Injury CT Images





Introduction to Traumatic Brain Injury

What is a Traumatic Brain Injury?

Traumatic brain injury (TBI) is caused by a blow to the head or violent movement of the head. No open head wound or skull fracture or loss of consciousness is required for an injury to be classified as a TBI.

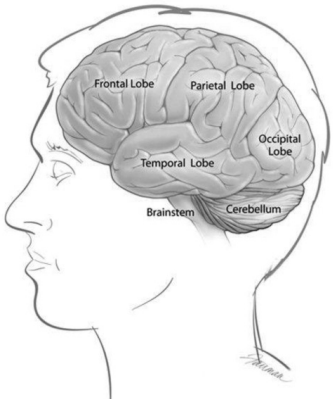
How Do Doctors Explain the Severity of a TBI?

Three factors help doctors explain the severity of a traumatic brain injury to patients and their families:

A. Location of the injury
B. Loss of consciousness
C. Level of response

A. Location of Injury

Injury can occur to any part of the four brain lobes, the cerebellum or the brain stem. The injury may result in brain bleeding, swelling, tearing of the nerve tissue, compression of the nerve tissue and increased intracranial pressure in the injured area.



B. Loss of Consciousness

Doctors classify traumatic brain injury as **Mild, Moderate, or Severe**. To determine the classification, doctors consider the length of time the patient lost consciousness and the mental status of the patient once consciousness is regained.

The chart below details these classifications.

TBI Classifications	Description
Mild TBI	Often Called A Concussion Injured Person Experiences Any Of The Following: Loss Of Consciousness For 15 Minutes Or Less Any Memory Loss Feeling Dazed, Disoriented, Or Confused
Moderate TBI	Loss Of Consciousness For 15 Minutes To A Few Hours Days Or Weeks Of Confusion
Severe TBI	Loss Of Consciousness For 6 Hours Or Longer May Be In A Coma

C. Level of Response

The Glasgow Coma Score (GSC) measures the responses or lack of responses of a person experiencing traumatic brain injury (TBI). The information this test provides also helps doctors determine the level of a brain injury.

Glasgow Coma Score (GCS)

Body Function	Patient Response	Patient Score
Best Eye Response (earn a score of 1 to 4)	1. No eye opening 2. Eye opening to pain 3. Eye opening to verbal command 4. Eyes open spontaneously	
Best Verbal Response (earn a score of 1 to 5)	1. No verbal response 2. Incomprehensible sounds 3. Inappropriate words 4. Confused 5. Oriented (knows time, date, location, and who you are, etc)	
Best Motor Response (earn a score from 1 to 6)	1. No motor response 2. Extension to pain 3. Flexion to pain 4. Withdrawal from pain 5. Localizing pain 6. Obeys commands	
	Total	

The patient's response in each category is given a point value. These numbers are added together to get the patient's total score. The total score is interpreted using the following scale:

13 or higher = Mild

9-12 = Moderate

8 or less = Severe

The GCS score combines with loss of consciousness (LOC) information to determine the patient's TBI level.

GCS and LOC Prediction of Severity

Severity Rating	GCS Score	LOC
Mild	13 or higher	15 minutes or less
Moderate	9 to 12	Over 15 minutes to a few hours
Severe	8 or less	6 hours or more

What are the Impacts of a Traumatic Brain Injury?

Traumatic brain injury patients experience a wide range of impacts. Each patient is different; each injury produces different results. The list below provides a general descriptions of potential impacts. Patients do not necessarily experience all the impacts listed.

It is important to remember that, regardless of which specific impacts patients experience, the impacts of traumatic brain injury are serious and lasting.

Physical:

- Difficulty with
  - Movement
  - Speaking
  - Swallowing
  - Balance
  - Walking
- Regulations of vital signs –heart rate, blood pressure, breathing
- Difficulty with sensory perception
- Headaches
- Blurred vision/double vision
- Seizures
- Difficulty with bowel and bladder control – typically related to "aphasia," meaning an inability to process information due to brain injury memory
- Changes in sleep patterns

Emotional:

- Lack of insight and understanding about the injury
- Depression
- Anger
- Anxiety
- Agitation/impatience
- Personality changes
- Mood swings

Cognitive:

- Confusion
- Memory impairments/forgetfulness
- Difficulty forming sentences/finding vocabulary
- Difficulty thinking logically/reasoning/focusing
- Difficulty concentrating

Daily Living/Behavioral:

- Socially inappropriate behavior
- Impulsivity
- Poor social skills
- Excessive talking
- Dependent on others for help and care

Task 4: Know How Doctors Talk About Traumatic Brain Injury

Teacher Key

1. What causes a brain injury? **A blow to the head or violent movement of the head**

2. In order to have a brain injury there must be an open head wound or skull fracture. True or **False**

3. What three factors help doctors explain the severity of a TBI?

A. **Location of the injury** B. **Loss of consciousness** C. **Level of Response**

4. Doctors classify TBI as mild, moderate or severe. The length of time an injured person loses consciousness is one factor that helps determine the level of severity. What is the LOC (loss of consciousness) time for each of the three levels?

   - Mild: **15 minutes or less**
   - Moderate: **15 minutes to a few hours**
   - Severe: **6 hours or longer**

5. The Glasgow Coma Score evaluates three kinds of responses for TBI patients. List the three kinds of responses tested:

   A. **Eye response**

   B. **Verbal response**

   C. **Motor response**

6. Consider the condition of the two patients described below. Identify the level of TBI for each. Remember to look at both the loss of consciousness time (LOC) and the Glasgow Coma Score to make this determination.

   A. John lost consciousness for 1 hour and has a GCS Score of 11. Is his TBI level mild, moderate, or severe?

   Moderate

   B. Mary lost consciousness for 8 hours and has a GCS Score of 5. Is her TBI level mild, moderate, or severe?

   Severe

7. **TBI Impacts:** Consider the physical, emotional, cognitive and daily living/behavioral impacts for TBI. Which ones do you think present the greatest challenges to patient with a TBI? Select one challenge from each category and explain your choices.

Physical:

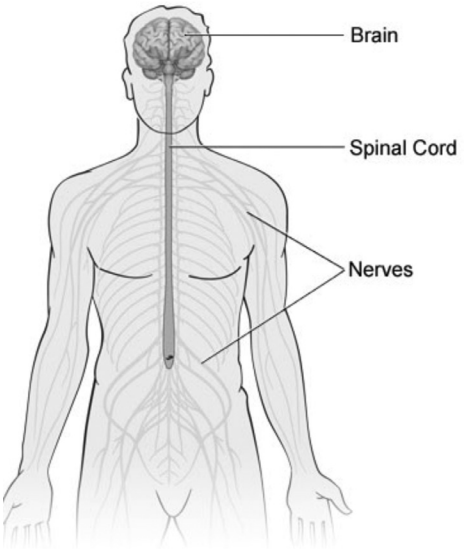
Student responses will vary. Be sure selections are from correct category and that explanations are thoughtful.

Explain that bowel/bladder issues with TBI are typically due to "aphasia," meaning an inability to process information due to brain injury. With SCI, the bowel/bladder issues are due to blocked nerve messages.

Emotional:

Cognitive:

Daily Living/Behavioral:



Introduction to Spinal Cord Injury

The nervous system includes the BRAIN, SPINAL CORD, and NERVES. The spinal cord is a long column of nerves, and, like the brain, is the consistency of a ripe banana. The spinal cord is much like a highway system, the nerves are like lanes of traffic and there are millions of lanes of traffic on the spinal cord. The brain sends and receives messages by way of the spinal cord and nerves (just like cars traveling north and south on a highway). The main messages are MOTOR and SENSORY. MOTOR messages help you do things like move your arms/legs, dance and balance. SENSORY messages help you feel things like pain, pressure, differentiate between hot and cold or rough and smooth. When someone sustains a spinal cord injury, it is like a wreck on the highway that closes down the system.

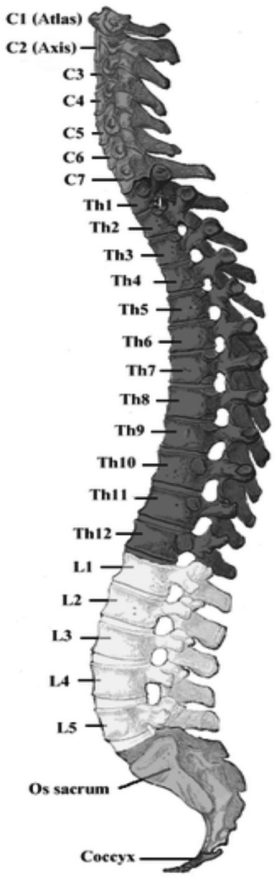
What is a Spinal Cord Injury?

Spinal cord injury is any damage to the spinal cord which blocks communication between the brain and the body. Because of the injury (like a wreck on the body's highway system) sensory messages are not able to reach the brain and the brain cannot tell the muscles below the injury (or wreck) how or when to move.

How Do Doctors Explain the Severity of a SCI Injury?

Four descriptions of the patient's injury help doctors explain the severity of a spinal cord injury to patients and their families:

A. The level (location on the spine) of the injury
B. The amount of damage to the spinal cord
C. Extent of paralysis
D. The ASIA Scale score



A. Level of Injury

The level of an injury is described according to the section of the spine where the damage occurs. This description consists of two details about the injury: 1) section of the spinal column; 2) number of the affected spinal nerve/vertebrae. *Doctor Speak: Doctors describe an injury near the 3rd vertebrae/nerve as a "C3 cervical injury."*

Two important facts about vertebrae and nerves

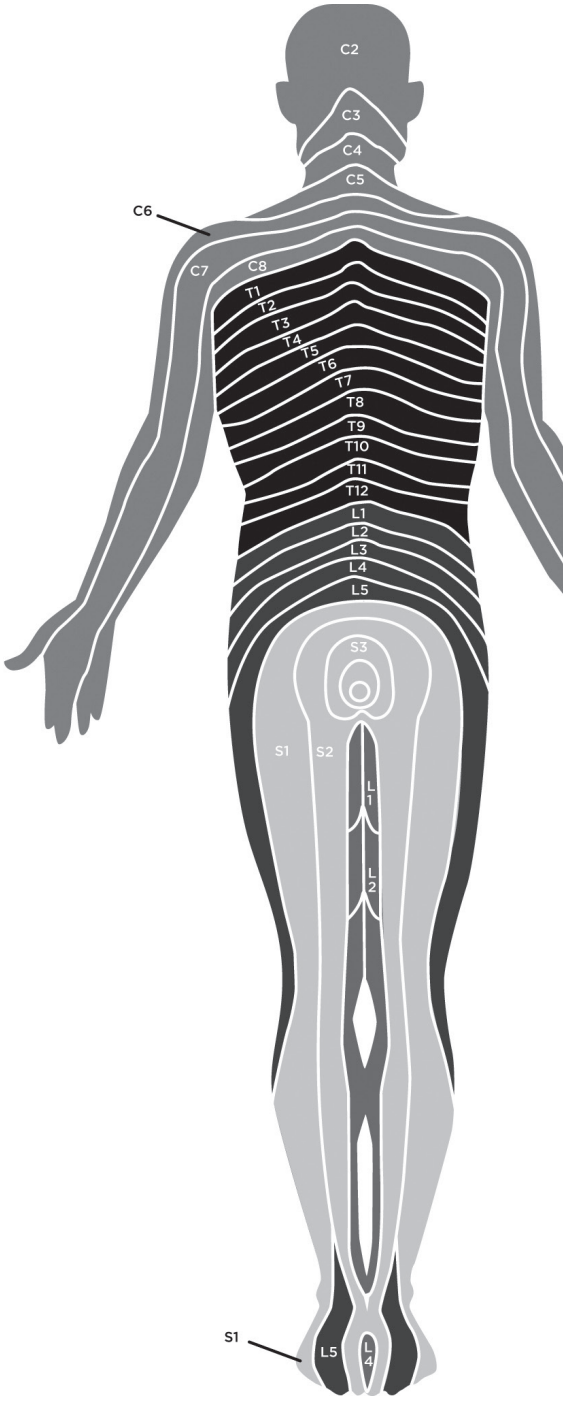
1. Vertebrae and nerve numbering: The spinal nerves branch out from each side of the vertebrae and these pairs of nerves are numbered according to the "vertebrae from which they extend. Each section of the spinal has an equal number of vertebrae and nerves except for the cervical section which has 8 pairs of nerves for its 7 vertebrae.

2. Nerve function: After an injury all nerves below the level of the injury are unable to communicate with the brain and can no longer do their work.

A. Level of Injury, continued

This figure at left shows the areas of the body affected by damage to each section of the spinal cord. Remember this *damage is both motor and sensory.*

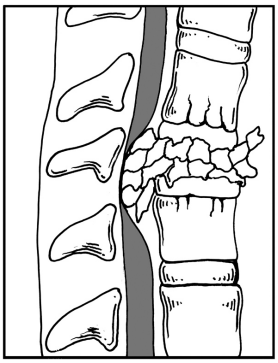
The chart below describes the movements affected by an injury each of the vertebrae in the spinal column. Remember the injury level (location) affects everything below that level. Notice the significant amount of movement affected by an injury at the cervical level.



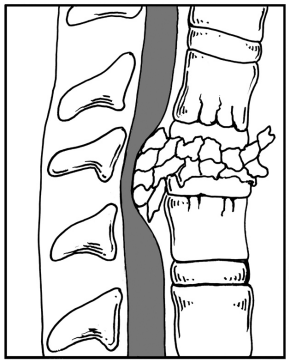
INJURY LEVEL	AFFECTED MUSCLES/MOVEMENT
C-1 to C-2 (Cervical)	Neck and face movement
C-3 to C-4	Diaphragm movement (breathing muscle)
C-5	Elbow bending
C-6	Wrist extension (bending wrist upward)
C-7	Elbow straightening
C-8	Finger movement
T-1 to T-12 (Thoracic)	Control of chest, abdomen (stomach area) & back muscles
L-1 to L-2 (Lumbar)	Hip bend (flex)
L-3	Knee straightening
L-4	Bend foot upward
L-5	Extends toes
S-1 (Sacral)	Bend foot down toward floor
S-2 thru S-4	Areas for urinating & bowel movements

B. Damage to the Spinal Cord

Doctors describe the amount of damage to the spinal cord using two terms: **COMPLETE** or **INCOMPLETE**.



COMPLETE



INCOMPLETE

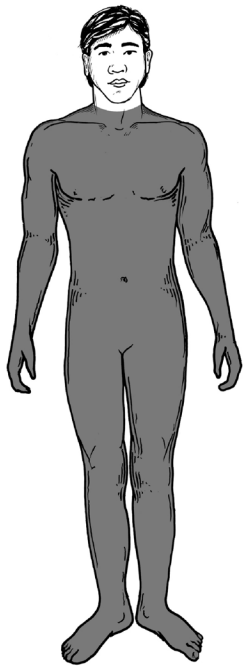
Complete Injuries: Complete injuries cause damage that extends through the entire spinal cord. This would be like a wreck that shuts down ALL lanes of traffic. No messages are able to get around the injury. This type of injury means the patient has no movement (motor ability) or feeling (sensory ability) below the injury, and is unable to control bowel or bladder.

Incomplete Injuries: Incomplete injures cause partial damage to the spinal cord. This would be like a wreck on the highway that shuts down a few lanes of traffic, but not all. Some messages may be able to get around the injury. This type of injury means the patient may have some movement or feeling below the injury. Incomplete injuries vary greatly from patient to patient depending on the degree of damage to the spinal cord.

Example of injury differences: *Two patients can have an incomplete injury at the same location, perhaps at C3. The first patient may be able to walk, use their hands and control their bladder and bowel while another patient with an incomplete C3 injury may have no feeling or movement below their neck. Again, it depends on which "lanes" in the spinal cord "highway" are closed down completely.*

Paralysis

Paralysis is defined as loss of voluntary movement as a result of damage or injury. Spinal cord injuries result in two types of paralysis.



Tetraphegia/Quadraplegia:
An injury to the cervical region will result in tetraplegia/quadraplegia. This will result in loss of movement and sensation in both arms and both legs, and loss of control over bowel and bladder.

The areas of the body that are affected are shaded.

Paraplegia:
An injury to the thoracic, lumbar, or sacral region will result in paraplegia. This will result in loss of movement and sensation in both legs, and loss of control over bowel and bladder.

The areas of the body that are affected are shaded.

D. The ASIA Scale Score

The American Spinal Cord Injury Association (ASIA) has five classifications describing the extent of spinal cord injury described by the chart below

These classifications are called an ASIA Scale score. The patient's motor and sensory functions determine the patient's score on the scale. Patients with the most severe injury have a score of " A." Patients with no injury have a score of "E."

ASIA SCALE

Asia A	The patient has no feeling or movement below the level of the injury	Classified as a Complete Spinal Cord Injury
Asia B	The patient has some feeling below the level of the injury but no ability to control movement.	Classified as an Incomplete SCI
Asia C	The patient has feeling or movement in less than 50% of the body below the level of the injury.	
Asia D	The patient has feeling or movement in more than 50% of the body below the level of the injury.	
Asia E	The patient has ability to feel and move throughout the body	

Describing a Spinal Cord Injury – Looking at real cases:

1. When doctors talked to a young girl named Mary and her parents, they explained that Mary had a complete C3 Cervical injury classified as an ASIA A level. They said that Mary's injuries have resulted in tetraplegia. Her condition is not likely to change for the rest of her life.

2. When doctors talked with a young man named Max and his parents, they explained that Max had an incomplete T7 Thoracic injury classified as an ASIA C. Thus, Max's injuries have resulted in paraplegia; however, the doctors said they cannot predict how much functional improvement Max might experience.

Notice: Each explanation above references the four conditions that describe spinal cord injuries.

A. The level (location on the spine) of the injury
B. The amount of damage to the spinal cord
C. Extent of paralysis
D. The ASIA Scale score

What are the Impacts of a Spinal Cord Injury?

Spinal cord injury patients experience a wide range of impacts. Each patient is different; each injury produces different results. The list below provides a general list of potential impacts. Patients do not necessarily experience all the impacts listed.

Impacts can be categorized as physical, emotional, and daily living.

It is important to remember that, regardless of which specific impacts patients experience, the impacts of spinal cord injury are serious and lasting.

Physical:

- Paralysis – inability to control motor and sensory function
- Weakened muscles above the location of the injury
- Weakened breathing or inability to breathe without a machine called a ventilator
- Inability to cough – must have assistance to do so
- Inability to control bowel and bladder – must have assistance to do so
- Inability to control body temperature and blood pressure – requires constant monitoring

Emotional:

- Depression
- Anger
- Anxiety

Daily Living:

- Requiring a wheelchair for the rest of life
- Dependent on others for personal grooming and toilet use
- Dependent on others for dressing
- Dependent on others for food

Task 5: Know How Doctors Talk About Spinal Cord Injury

Teacher Key

1. A spinal cord injury is caused by any damage that blocks **communication between the brain and the body**

2. **Level of injury** is described using a letter and a number. Explain what the letter and number represent in each of the following examples.

   C-5 **Cervical section Vertebrae 5**

   T-8 **Thoracic section Vertebrae 8**

3. The **level of injury** also affects the patient's ability to move below that level. Use the Injury Level/Affected Movement chart to respond to the following:

a.	C4 injury will affect the patient's ability to breathe.	**True**	or	False
b.	T5 injury will affect the patient's ability to bend at the hips.	**True**	or	False
c.	L5 injury will affect the patient's ability to move the fingers.	True	or	**False**
d.	All injuries will affect the patient's bowel and bladder function.	**True**	or	False

4. Doctors also describe the **degree of injury** to the spinal cord. Describe the difference between the two types of spinal cord damage.

   Complete **causes damage that extends through the entire spinal cord. No messages are able to get around this injury. The patient has no movement or feeling below the injury and is unable to control bowel or bladder.**

   Incomplete **cause partial damage to the spinal cord. Some messages may be able to get around the injury. The patient may have some movement or feeling below the injury. Incomplete injuries vary greatly from patient to patient depending on the degree of damage to the spinal cord.**

5. The extent of the paralysis is described as either ***tetraplegia*** or ***paraplegia***.

   Tetraplegia results when the injury is to the **cervical** sections of the spinal cord. Patient's with tetraplegia experience:

   Loss of movement and sensation in both arms and both legs, and loss of control over bowel and bladder.

   Paraplegia results when the injury is to the **thoracic, lumbar or sacral** section or lower in the spinal cord. Patient's with paraplegia experience:

   Loss of movement and sensation in both legs,and loss of control over bowel and bladder.

6. The **ASIA Scale Score** has five levels of classification describing the extent of motor and sensory impairment.

   All patients with a complete spinal cord injury have an ASIA grade of **A** . This grade means the patient has no **feeling or movement below the level of the injury.**

   Patients with an incomplete spinal cord injury could have an ASIA grade from **B** to **E** .

   Explain the difference between a grade B and a grade C on the ASIA:

   B = some feeling(sensory) below the level of the injury but no ability to control movement (motor)

   C= has feeling or movement in less than 50% of body below level of injury

7. SCI impacts. Consider the physical, emotional, and daily living impacts for SCI. Which ones do you think present the greatest challenges to SCI patients. Select one challenge from each category and explain your choices.

   Physical:

   Student responses will vary. Be sure selections are in the correct category of impacts and that the explanations are thoughtful.

   Emotional:

   Daily Living:

Shepherd Center
INJURY PREVENTION

LESSON 4

TBI and SCI Case Studies: In the Trauma Center

Learning Outcomes

Students will read and respond to their assigned spinal cord injury or brain injury case study.
Students will analyze the descriptions of their patient's injuries and physical condition and determine the severity and level of injury by applying their knowledge of SCI and TBI injury.
Students will create an exhibit about their case study patients.

Teacher Planning

Assign students to groups for Lessons 4, 5, 6, 7, and 8.

Each group will be assigned one SCI or TBI case study that involves a fictional teen who "lives in the neighborhood." The groups will follow their case studies by reading the teen's injury story and medical status (Lesson 4), the status in rehab (Lesson 6), the return to daily living (Lesson 7). In Lesson 8, groups will present their case study to the rest of the class. During each lesson, students will add information to their case study presentation to prepare for the exhibit in Lesson 8.

There are five SCI case studies (Names: Kendrick, Rico, Morgan, Levi, and Jared) and three TBI case studies (Names: Caylee, Trey, Maya) for a total of eight case studies to choose from as you make group assignments.

During this lesson students will have three tasks:

1. Reading their case study injury story and creating a written response.
2. Determining the patient's level of injury
3. Creating the first stage of their case study exhibit for presentation during Lesson 8

For this lesson, each case study is divided into two parts: "Here's What Happened," describing the story of the teen's injury event, and "What the Doctors Found," describing the injuries and medical condition of the teen in the trauma center. Students will read these at different points during the lesson so they will need to cover up the "What the Doctor Found" section with a piece of paper until they finish their predictions about the injury event.

Students will need to refer to the "Introduction to Spinal Cord Injury" and "Introduction to Traumatic Brain Injury" resources used in Lesson 3 to complete Task 6, which requires students to evaluate their patient's injuries.

The "Traumatic Injury Sequence of Events" and Task 8 can be homework assignments or extension activities depending on instructional time.

Big Take Away: Ideas to emphasize with students during discussions and activities.

- Reinforce the factors that doctors consider when assessing the severity of SCI and TBI from Lesson 3 and make sure students understand the complexity of these injuries.

Materials Needed

TBI Groups:
- Student Workbook:
  - Assigned case study (Caylee, Trey, and Kendrick)
  - Traumatic Brain Injury Tasks 6-8
  - "Introduction to Traumatic Brain Injury" resource from Lesson 3
  - "Traumatic Injury Sequence of Events" Activity

SCI Groups:
- Student Workbook:
  - Assigned case study (Kendrick, Rico, Morgan, Levi, Jared)
  - Spinal Cord Injury Tasks 6-8
  - "Introduction to Spinal Cord Injury" resource from Lesson 3
  - "Traumatic Injury Sequence of Events" Activity

Chart paper, markers, scissors and other available art supplies for creating "patients" for exhibit

Activities

Engage

Refer students to their assigned case study documents located in the student workbooks. Each student should have a copy. Instruct students to cover the bottom portion entitled "What the Doctors Found." Students should individually read "Here's What Happened" describing the story of the patient's injury. Have them write responses by selecting from the following list:

1. How serious do you think the injuries are?
2. Predict:
   - Will the injuries affect body functions, like speech, vision, movement, etc. If so which ones?
   - Can the patient recover?
   - How long do you think recovery might take?
   - Could this injury have been prevented? If so, explain how.
   - Could this injury have happened to you? Why or why not

Provide time for students to share responses within groups and/or with the class.

Take time for each group to add their prevention ideas to the class Prevention Poster created in Lesson 1. Additionally, have students add to the KWL chart created during that lesson.

Explain

Point out that people involved in traumatic injury are treated in trauma centers. The job of the doctors working in these centers is to determine the extent of the injuries, provide treatment, and stabilize the patient so they can eventually go to a rehabilitation hospital. During this lesson their "patients" will be in the Trauma Center.

1. Review Task 6 for TBI and SCI groups. Briefly review the introduction to TBI and SCI resources used in Lesson 3. Explain that students will be applying what they learned in Lesson 3 about TBI and SCI.
2. Instruct students to read the "What the Doctors Found" section of their case studies which explains their patient's injuries and condition as reported by the doctors in the trauma center.
3. Students complete Task 6 using the injury and condition information for their patient as reported in "What the Doctors Found." Remind them to refer to the print resources for TBI or SCI that they used in Lesson 3 as they complete each item of Task 6.

Elaborate

Students create the first stage of a case study exhibit that will be presented to the class during Lesson 7. Using chart paper to cut out a body outline, students will create an image that represents their patient. Suggest that one student lie on the paper and have his body outline drawn to make a life-size image. This image will now represent their patient. Encourage students to give their "patient" a personality reflecting the actual person in their case study (details like name, hair, eyes, etc.). Students should use additional chart paper or other art supplies to provide information about their patient's story and condition. Encourage students to be as creative as possible in designing their exhibit.

Be sure to review exhibit criteria (see below) with students prior to this activity so that they are clear about what to produce. Tell students they will have an opportunity to add more information later in the unit.

1. Name
2. Summary of injury story
3. Description of patient's injuries and condition. Injury location could be depicted on the "patient."
4. Statement describing the level and severity of injury using appropriate medical terms and descriptions. SCI groups wrote this statement earlier in the lesson in Task 5 item E. TBI groups should indicate if the injury was mild, moderate or severe. They determined this earlier in the lesson in Task 5 item C.

Extension Activities/Homework/Ticket Out

1. Students complete "Traumatic Injury Sequence of Events" individually, in pairs, or in a group.
2. Students complete Task 8

Standards Addressed

Georgia Performance Standards – Science Grade 7

S7CS6. Students will communicate scientific ideas and activities clearly.

a. Write clear, step-by-step instructions for conducting particular scientific investigations, operating a piece of equipment, or following a procedure.
b. Write for scientific purposes incorporating data from circle, bar and line graphs, two-way data tables, diagrams, and symbols.
c. Organize scientific information using appropriate simple tables, charts, and graphs, and identify relationships they reveal.

S7CS10. Students will enhance reading in all curriculum areas by:

a. Reading in All Curriculum Areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
   - Read both informational and fictional texts in a variety of genres and modes of discourse
   - Read technical texts related to various subject areas

b. Discussing books
   - Discuss messages and themes from books in all subject areas.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

c. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

d. Establishing context
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

S7L2. Students will describe the structure and function of cells, tissues, organs, and organ systems.

a. Explain that cells take in nutrients in order to grow and divide and to make needed materials.
b. Relate cell structures (cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria) to basic cell functions.
c. Explain that cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.
d. Explain that tissues, organs, and organ systems serve the needs cells have for oxygen, food, and waste removal.
e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

Common Core Anchor Standards

R.CCR.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

R.CCR.10: Read and comprehend complex literary and informational texts independently and proficiently.

W.CCR.2: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

W.CCR.3: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

W.CCR.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

W.CCR.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Caylee's Story - TBI Case Study

Here's What Happened

Caylee was an eighth grader who lived half a mile from her best friend Britney. After school and on the weekends Caylee and Britney often rode bikes to each other's houses to study, hang out or ride around the neighborhood. Caylee had a helmet and was supposed to wear it whenever she rode her bike, but she hated wearing it. It looked stupid and always messed up her hair. She would die if she ever ran into any of the guys she knew while she had the helmet on. When she was going out to ride, she would make a show of wearing the helmet in front of her parents, but took it off once she was off their street. She would then buckle the helmet to the seat of her bike and leave it there till she was almost back home.

One Thursday she headed out to Britney's after school. They were going to ride around for a little while and then watch TV at Britney's house. Caylee didn't have to pretend to wear her helmet that day. Her mom was out running errands and her dad was at work. She rode towards the bottom of her street. There was a two way stop at the intersection, and she slowed her bike as she approached. She didn't see any cars coming, so she kept on through the intersection without stopping. But there was a car coming that was obstructed by a parked car. Caylee missed it when she looked. The car struck the front of her bike and Caylee was thrown on to the street. Her face and head hit the pavement and she was knocked unconscious. The driver of the car called 911. An ambulance came quickly and took Caylee to the nearest trauma center.

Caylee's Condition - What The Doctors Found

1. Caylee was unconscious for 90 minutes.

2. Caylee had injured both the frontal and temporal lobes on both sides of her head. There was bleeding in her brain in both of these areas.

3. Caylee was tested for three kinds of responses and here are the results:

    - Eye Response = Caylee opens her eyes when someone tells her to do so.
    - Verbal Response = When asked questions her responses were inappropriate with words that made no sense.
    - Motor Response (Movement) = She could obey verbal commands. When her mom asked her to give a thumbs up she could do it.

4. Caylee could breathe on her own.

5. Caylee has the physical ability to eat and go to the bathroom normally, but did not remember that she needs to do these things or how to do them. If she was not taken to the bathroom every two to three hours, she would have an accident. Someone had to help her eat every meal.

6. Caylee was often agitated and confused. She sometimes had outbursts and aggressive behavior that she did not ever have before she was hurt.

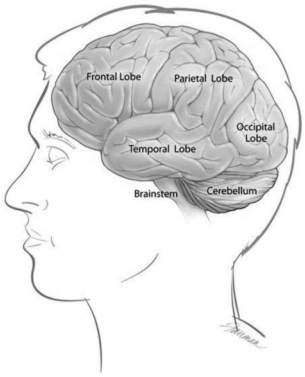
7. Caylee has the physical ability to walk, but would easily get lost and would not know how ask for directions. She was very unsteady and had to be in a wheelchair unless nurse, therapist, or family member was with her.

8. Caylee had difficulty recognizing certain family members.

Task 6. Determining Severity of TBI Injury

A. Location of the injury: Indicate where the patient's injury is located on the lobes image below by drawing arrows to the site of the injury. Remember more than one lobe may be involved. Then list the injured lobes beside the image:

Caylee injured frontal and temporal lobes on both sides



B. Loss of consciousness: Describe the patient's loss of consicousness reported from the trauma center.

Caylee lost consciousness for 90 minutes

C. GCS Score: Using the results described "What the Doctors Found" in the case study, circle the description in each category that matches the patient's reported condition and then enter the number of that description in the Patient Score column. Then add the numbers to derive the total GCS score.

Glasgow Coma Score (GCS)

Body Function	Patient Response	Patient Score
Best Eye Response (earn a score of 1 to 4)	1. No eye opening 2. Eye opening to pain **3. Eye opening to verbal command** 4. Eyes open spontaneously	**3**
Best Verbal Response (earn a score of 1 to 5)	1. No verbal response 2. Incomprehensible sounds **3. Inappropriate words** 4. Confused 5. Orientated	**3**
Best Motor Response (earn a score from 1 to 6)	1. No motor response 2. Extension to pain 3. Flexion to pain 4. Withdrawal from pain 5. Localizing pain **6. Obeys commands**	**6**
	Total	**12**

A. Level Diagnosis: To determine the level of brain injury, follow the calculations explained in the chart below. Notice that doctors consider both the patient's Glasgow Coma Score (GCS) and loss of consciousness data (LOC). Using the chart below and your patient's GCS score and LOC time, determine the level of your patient's injury.

GCS and LOC Prediction of Severity

Mild	13 or higher	15 minutes or less
Moderate	**9 to 12**	**Over 15 minutes to a few hours**
Severe	8 or less	6 hours or more

Level of Traumatic Brain Injury = **Moderate**

Task 7. Case Study Exhibit

Create a case study exhibit that you will use to present your patient to the class later in the unit. Use colored chart paper to cut out a life-sized body outline which will represent your assigned patient. Give the "patient" appropriate physical details such as hair, eyes, etc. Use available materials and creatively present the following information.

1. Patient's name
2. Brief outline of the injury story
3. Summary of medical condition including level of injury (injuries could be drawn on the "patient")

Note: You will have opportunities to add information to this exhibit later in the unit.

Task 8. "Here's What Happened" – Change The Story

A. Re-read your patient's injury story. Think about what happened to cause the injury and consider if the injury could have been prevented. If so, how could events be changed so that the injury does not occur. In the space below, rewrite the injury part of the story so that the injury is prevented. Be sure to add any prevention ideas to the class Injury Prevention Chart.

Trey's Story - TBI Case Study

Here's What Happened

Trey was a seventh grader who everyone knew was a daredevil. He was an avid skateboarder who always did the hardest tricks and did them well. One Saturday afternoon he was at the skate park with a few older kids. One of them, Aiden, had a 4-wheeler that he had gotten for his birthday. He rode around on the paved paths by the skate park while the other guys skated. When Trey saw Aiden driving around, he had an idea. "Hey Aiden!" he yelled. "Pull me on my board!"

Aiden stopped the 4-wheeler and waited for Trey to catch up to him. The 4-wheeler had a tow rope in its storage compartment. They tied it up and Trey grabbed the other end. Aiden pulled out of the dirt and onto the paved pathway. Trey hooted and hollered as the ATV picked up speed. As they came to a bend in the path, the ATV was going too fast and Trey couldn't hold on to the rope anymore. The 4 wheeler went one way, and Trey flew off the path into the embankment. He hit his head hard on the ground when he landed. It was clear to everyone that he was badly hurt and appeared unconscious. He had a bleeding head wound. Several people called 911. The paramedics showed up within minutes and took Trey away in an ambulance to the ER.

Trey's Condition - What The Doctors Found

1. Trey was unconscious and in a coma for 25 days.

2. Trey had injured his occipital lobe and his brain stem. There was bleeding in his brain (subdural hematoma). There was extensive swelling in his brain (edema). His skull was fractured. He required an ICP (intracranial pressure) monitor.

3. Twenty-five days after his accident, Trey started to show some response. He was tested for three kinds of responses and here are the results:

    a. Eye Response = His eyes opened only to pain.
    b. Verbal Response = No verbal response.
    c. Motor Response (Movement) = His arm extended when a painful area was touched (Extension to pain).

4. Trey was unable to breathe on his own so a machine called a ventilator helped him breathe.

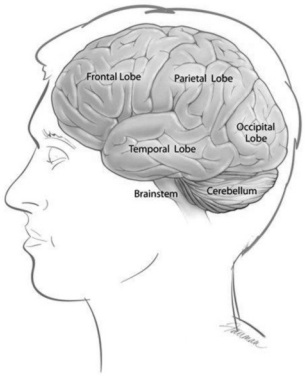
5. Trey could not chew and swallow food so he had to be fed through a tube.

6. Trey could not control his bowels or bladder. He required adult diapers.

Task 6. Determining Severity of TBI Injury

A. Location of the injury: Indicate where the patient's injury is located on the lobes image below by drawing arrows to the site of the injury. Remember more than one lobe may be involved. Then list the injured lobes beside the image:

Trey injured his occipital lobes and his brain stem



B. Loss of consciousness: Describe the patient's loss of consicousness reported from the trauma center.

He was in a coma for 25 days.

C. GCS Score: Using the results described "What the Doctors Found" in the case study, circle the description in each category that matches the patient's reported condition and then enter the number of that description in the Patient Score column. Then add the numbers to derive the total GCS score.

Glasgow Coma Score (GCS)

Body Function	Patient Response	Patient Score
Best Eye Response (earn a score of 1 to 4)	1. No eye opening **2. Eye opening to pain** 3. Eye opening to verbal command 4. Eyes open spontaneously	**2**
Best Verbal Response (earn a score of 1 to 5)	**1. No verbal response** 2. Incomprehensible sounds 3. Inappropriate words 4. Confused 5. Orientated	**1**
Best Motor Response (earn a score from 1 to 6)	1. No motor response **2. Extension to pain** 3. Flexion to pain 4. Withdrawal from pain 5. Localizing pain 6. Obeys commands	**2**
	Total	**5**

A. Level Diagnosis: To determine the level of brain injury, follow the calculations explained in the chart below. Notice that doctors consider both the patient's Glasgow Coma Score (GCS) and loss of consciousness data (LOC). Using the chart below and your patient's GCS score and LOC time, determine the level of your patient's injury.

GCS and LOC Prediction of Severity

Mild	13 or higher	15 minutes or less
Moderate	9 to 12	Over 15 minutes to a few hours
Severe	**8 or less**	**6 hours or more**

Level of Traumatic Brain Injury = **Severe**

Task 7. Case Study Exhibit

Create a case study exhibit that you will use to present your patient to the class later in the unit. Use colored chart paper to cut out a life-sized body outline which will represent your assigned patient. Give the "patient" appropriate physical details such as hair, eyes, etc. Use available materials and creatively present the following information.

1. Patient's name
2. Brief outline of the injury story
3. Summary of medical condition including level of injury (injuries could be drawn on the "patient")

Note: You will have opportunities to add information to this exhibit later in the unit.

Task 8. "Here's What Happened" – Change The Story

A. Re-read your patient's injury story. Think about what happened to cause the injury and consider if the injury could have been prevented. If so, how could events be changed so that the injury does not occur. In the space below, rewrite the injury part of the story so that the injury is prevented. Be sure to add any prevention ideas to the class Injury Prevention Chart.

Maya's Story - TBI Case Study

Here's What Happened

Maya was a seventh grader who always worked hard to stay ahead in school. She knew she wanted to be a doctor one day and her teachers all told her that meant she had to always get good grades in every class. She had been able to maintain an "A" average for as long as she could remember and just knew she'd get into the best college one day. She also didn't mind going to school like some of the other kids she knew. She liked seeing her friends and liked learning new things.

Maya lived in a neighborhood just across the street from her school. Because she lived so close, she always walked to school. There is a crosswalk from the intersection of her street that leads right to the front of the school and Maya always used it.

One day she was heading out of school toward home, and was texting one of the girls in her history class about a project they were doing together. She saw the light turn green, looked back down at her phone and started to walk forward into the crosswalk. But she didn't see that a car was coming too quickly from the other direction, trying to make it through a yellow traffic light. The car struck Maya and she was thrown into the street.

She had cuts and scrapes, but was not bleeding from her head. However, she was not conscious and was not moving. An ambulance came and took Maya to the hospital.

Maya's Condition - What The Doctors Found

1. Maya was unconscious for 3 hours.

2. Maya had injured the frontal, parietal and temporal lobes on the right side of her head. There was bleeding in her brain in all three of these areas. She had a closed head injury; however, the doctors had to drain blood from the inside of her skull and had to remove part of it on the right side to relieve pressure on her brain.

3. Maya was tested for three kinds of responses and here are the results:

    a. Eye Response = Maya opened her eyes spontaneously. No one had to tell her to open her eyes.
    b. Verbal Response = She had no verbal response.
    c. Motor Response (Movement) = She could sometimes obey verbal commands. When doctors ask her to give a thumbs up, she could do it most days.

4. Maya could not breathe on her own at first. She had to be placed on a ventilator but was able to stop using it after about two weeks.

5. Maya had to have a feeding tube. The doctor's think she will physically be able to eat in the future, but may still need help to remember how and when to do it.

6. Maya was often agitated and confused. She sometimes had outbursts and aggressive behavior that she did not ever have before she was hurt.

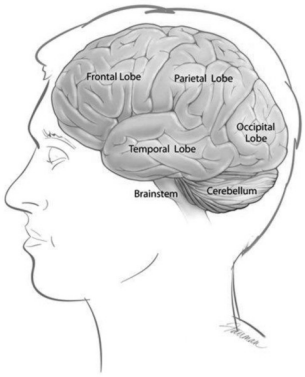
7. Maya has the physical ability to walk, but could easily get lost and would not know how ask for directions.

8. Maya had difficulty recognizing certain family members.

Task 6. Determining Severity of TBI Injury

A. Location of the injury: Indicate where the patient's injury is located on the lobes image below by drawing arrows to the site of the injury. Remember more than one lobe may be involved. Then list the injured lobes beside the image:

Maya injured frontal,parietal and temporal lobes on the right side



B. Loss of consciousness: Describe the patient's loss of consicousness reported from the trauma center.

Maya lost consciousness for 3 hours

C. GCS Score: Using the results described "What the Doctors Found" in the case study, circle the description in each category that matches the patient's reported condition and then enter the number of that description in the Patient Score column. Then add the numbers to derive the total GCS score.

Glasgow Coma Score (GCS)

Body Function	Patient Response	Patient Score
Best Eye Response (earn a score of 1 to 4)	1. No eye opening 2. Eye opening to pain 3. Eye opening to verbal command **4. Eyes open spontaneously**	**4**
Best Verbal Response (earn a score of 1 to 5)	**1. No verbal response** 2. Incomprehensible sounds 3. Inappropriate words 4. Confused 5. Orientated	**1**
Best Motor Response (earn a score from 1 to 6)	1. No motor response 2. Extension to pain 3. Flexion to pain 4. Withdrawal from pain 5. Localizing pain **6. Obeys commands**	**6**
	Total	**11**

A. Level Diagnosis: To determine the level of brain injury, follow the calculations explained in the chart below. Notice that doctors consider both the patient's Glasgow Coma Score (GCS) and loss of consciousness data (LOC). Using the chart below and your patient's GCS score and LOC time, determine the level of your patient's injury.

GCS and LOC Prediction of Severity

Mild	13 or higher	15 minutes or less
Moderate	**9 to 12**	**Over 15 minutes to a few hours**
Severe	8 or less	6 hours or more

Level of Traumatic Brain Injury = **Moderate**

Task 7. Case Study Exhibit

Create a case study exhibit that you will use to present your patient to the class later in the unit. Use colored chart paper to cut out a life-sized body outline which will represent your assigned patient. Give the "patient" appropriate physical details such as hair, eyes, etc. Use available materials and creatively present the following information.

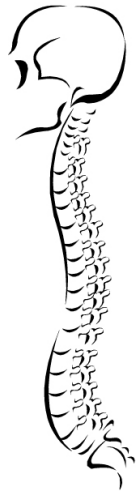
1. Patient's name
2. Brief outline of the injury story
3. Summary of medical condition including level of injury (injuries could be drawn on the "patient")

Note: You will have opportunities to add information to this exhibit later in the unit.

Task 8. "Here's What Happened" – Change The Story

A. Re-read your patient's injury story. Think about what happened to cause the injury and consider if the injury could have been prevented. If so, how could events be changed so that the injury does not occur. In the space below, rewrite the injury part of the story so that the injury is prevented. Be sure to add any prevention ideas to the class Injury Prevention Chart.

Kendrick's Story - SCI Case Study



Here's What Happened

Kendrick was a 14 year old eighth grader who was a good student and never got into trouble. He played on the basketball team and ran track. In his free time he loved to ride his dirt bike with his friends in a place they called "The Dunes" where there were lots of dirt hills for jumps and tricks. Kendrick was one of the best at tricks – a real natural. He always seemed in control of his bike and had a lot of fun riding.

One Saturday Kendrick met two of his friends to ride the Dunes. Kendrick never wore a helmet when he rode because he felt like he knew what he was doing and would be fine without it. Today was no exception. The boys had only been riding for a few minutes when Kendrick decided to go for some freestyle jumps. He started at the top of a small hill, revved his bike and sped toward a much bigger hill to make a jump. He sailed into the air, but as he came back down something went wrong. Instead of a clean landing, Kendrick came back at an angle, landing in the dirt and ending up with his bike on top of him. He didn't get up after he hit the ground and his friends knew something was wrong. They ran to him and he told them he couldn't move anything and he struggled to breathe. His friends called 911 and kept him talking. Some of his teeth had been knocked out in the fall. Soon a helicopter arrived and the paramedics carefully stabilized Kendrick's neck and transported him to the hospital.

Kendrick's Condition - What The Doctors Found

1. Kendrick never lost consciousness.
2. Kendrick fractured his spine at C3 and C4 vertebrae.
3. Kendrick had a complete C3-4 spinal cord injury.
4. Kendrick could not feel or move anything below his shoulders at the level of his injury.
5. Kendrick went into respiratory failure shortly after his accident and had to be put on a ventilator.
6. Kendrick had to have a feeding tube because he couldn't swallow properly.
7. Kendrick could not control his bowels or bladder.

Task 6. Describing the Injury

A. Record the patient's level of injury in the space below.

Spinal Column Section	Vertebra(e)
Cervical	Vertebrae 3 and 4

B. Review the description of the injury. Does the description of the injury indicate that the damage to the spinal cord is

Complete or Incomplete (circle one)

C. Based upon the patient's level of injury, is this patient' condition classified as

Paraplegia or **Tetraplegia/Quadraplegia** (circle one)

D. Record the patient's ASIA Scale Score? **ASIA A** . Explain what this score means:

He has no feeling or movement below the level of his injury

E. Write a brief description (in complete sentences) of the patient's spinal cord injury using the correct terminology. Look at the examples in Lesson 3, "Introduction to Spinal Cord Injury" under "Describing a Spinal Cord Injury."

Write as if you are the doctor explaining the patient's condition to the family. Be sure your description includes

- Level of the injury (location on the spinal cord)
- The amount of damage to the spinal cord
- Extent of paralysis
- ASIA Scale Score

Kendrick has a spinal cord injury at the cervical section vertebrae 3 and 4 on his spinal column. The damage to the spinal cord in complete. He has an ASIA score of A. His injury has resulted in tetraplegia.

Task 7. Case Study Exhibit

Create a case study exhibit that you will use to present your patient to the class later in the unit. Use colored chart paper to cut out a life-sized body outline which will represent your assigned patient. Give the "patient" appropriate physical details such as hair, eyes, etc. Use available materials and creatively present the following information.

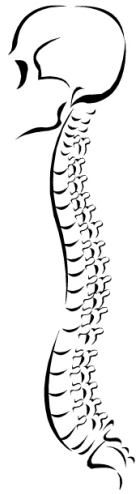
1. Patient's name
2. Brief outline of the injury story
3. Summary of medical condition including level of injury (injuries could be drawn on the "patient")

Note: You will have opportunities to add information to this exhibit later in the unit.

Task 8. "Here's What Happened" – Change The Story

A. Re-read your patient's injury story. Think about what happened to cause the injury and consider if the injury could have been prevented. If so, how could events be changed so that the injury does not occur. In the space below, rewrite the injury part of the story so that the injury is prevented. Be sure to add any prevention ideas to the class Injury Prevention Chart.

Rico's Story - SCI Case Study



Here's What Happened

Rico, a high school freshman, had been training since August for this year's wrestling season; running 2 miles a day, eating all the high protein foods Coach recommended, lifting weights and focusing on improving his speed on the mat during matches. His win/loss record for matches was gradually improving, and he was proud of his record! Although he was technically on the JV team, he was sometimes selected to wrestle a varsity opponent if there was no varsity wrestler from his team available in his weight class. He was looking forward to the school's annual invitational wresting tournament the following weekend, since many of his friends, family and girlfriend, Susanna, would be there to cheer for him and his teammates.

It was his second match of the day, and he would be wrestling as a varsity member of the team. His opponent, Joe, was a senior, obviously with more experience on the mat. They each took neutral positions and started the footwork, moving in circles. Suddenly Joe grabbed Rico's legs below the knees and forced him down to the mat. Rico managed to get onto all fours, literally carrying Joe, and fought to keep his face up, as his coach kept urging him to do. Joe worked to get Rico back onto his back, to pin him as quickly as possible. The ref circled the boys, on his knees, checking to see if Rico's shoulders were indeed touching the mat, the requirement for a "pin." Rico arched his back, forcing Joe to push his chest into Rico's. The crowd roared and both coaches shouted words of encouragement. Rico was giving it his all against his more experienced opponent. Using all the upper body strength he could muster he managed to reverse his position with Joe's, earning the first point of their match!

Joe was surprised and incensed as they began the second two-minute round of the match. Once again he managed to force Rico to the mat within seconds. This time Joe locked his hands around Rico's neck, in order to force Rico onto his back. The ref was about to call the illegal move, but before the ref could make the call Joe thrust Rico onto the mat, chin first, forcing his neck to move past the normal range of motion. His neck had been hyper extended. The crowd's enthusiastic shouting gradually stopped as everyone realized Rico was not moving. Both coaches sprinted to the mat. Rico's mother came rushing down to the gymnasium floor, calling for Rico to respond.

Rico's Condition - What The Doctors Found

1. Rico had a fracture at his C-7 vertebra and had significant swelling of his spinal cord.
2. Rico was able to breathe on his own.
3. Rico was unable to move anything below his level of injury but he had some sensation in his bottom and legs.
4. Rico could feel and move his arms but not move his fingers or lift his arms above his head. He could not move any part of his legs.
5. Rico could not control his bowels or bladder.
6. Rico would probably be able to use a manual wheelchair once he became stronger.

Task 6. Describing the Injury

A. Record the patient's level of injury in the space below.

Spinal Column Section	Vertebra(e)
Cervical	Vertebra 7

B. Review the description of the injury. Does the description of the injury indicate that the damage to the spinal cord is

Complete or **Incomplete** (circle one)

C. Based upon the patient's level of injury, is this patient' condition classified as

Paraplegia or **Tetraplegia/Quadraplegia** (circle one)

D. Record the patient's ASIA Scale Score? **ASIA B** . Explain what this score means:

Rico has some feeling (sensation) below the level of injury but no ability to control movement.

E. Write a brief description (in complete sentences) of the patient's spinal cord injury using the correct terminology. Look at the examples in Lesson 3, "Introduction to Spinal Cord Injury" under "Describing a Spinal Cord Injury."

Write as if you are the doctor explaining the patient's condition to the family. Be sure your description includes

- Level of the injury (location on the spinal cord)
- The amount of damage to the spinal cord
- Extent of paralysis
- ASIA Scale Score

Rico has a spinal cord injury at the cervical section vertebra 7. The amount of damage to the spinal cord is incomplete. He has an ASIA score of B. His injury has resulted in tetraplegia.

Task 7. Case Study Exhibit

Create a case study exhibit that you will use to present your patient to the class later in the unit. Use colored chart paper to cut out a life-sized body outline which will represent your assigned patient. Give the "patient" appropriate physical details such as hair, eyes, etc. Use available materials and creatively present the following information.

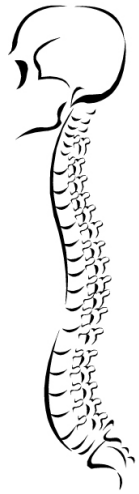
1. Patient's name
2. Brief outline of the injury story
3. Summary of medical condition including level of injury (injuries could be drawn on the "patient")

Note: You will have opportunities to add information to this exhibit later in the unit.

Task 8. "Here's What Happened" – Change The Story

A. Re-read your patient's injury story. Think about what happened to cause the injury and consider if the injury could have been prevented. If so, how could events be changed so that the injury does not occur. In the space below, rewrite the injury part of the story so that the injury is prevented. Be sure to add any prevention ideas to the class Injury Prevention Chart.

Morgan's Story - SCI Case Study



Here's What Happened

Morgan was a cheerleader in 10th grade who was very pretty and loved fashion. She was very social and considered one of the nicest people at school. Just like every other morning, Morgan was heading to school in the SUV her parents had helped her buy just three months ago. She was still in her quiet neighborhood, where there was virtually no traffic at this early hour. Morgan was in the habit of buckling her seat belt just before she left the residential streets, to pull onto the four lane road outside her neighborhood.

It was Friday, and Morgan and her friends had plans to attend the football game after school. They had discussed at length what they would wear, and Morgan was delighted that it was finally cold enough for her to wear her new boots! She remembered that they had not yet figured out where they would meet up immediately after school … It was a tradition with her circle of friends that they grab a bite to eat at a local fast food restaurant before the game. She would see her friends once she arrived at school but was excited and wanted to make the plans. This was the perfect time to send off a quick text to her friends to nail down a place to meet. Morgan's parents, her driver's education instructor, the local billboards, and television commercials had all warned her about the dangers of texting and driving, but Morgan knew she was an amazingly fast texter. She smiled as she thought about how painfully slow her mother was at this mindless task!
As she approached the intersection, a lawn maintenance truck pulling a trailer overloaded with mowers and leaf blowers, came careening around the corner, wandering over into her lane. But Morgan was looking at her phone, so she did not see what was coming toward her. The vehicles collided. Although she was not going that fast, the sudden impact made her SUV swerve and roll over. Morgan was thrown from her vehicle. The lawn maintenance truck was damaged, and the workers, who had been belted in, were shaken up, but not severely injured. As soon as they realized what had happened, they called 911, and went to help Morgan as best they could. Morgan was breathing, but dazed and just barely able to speak. Her body lay twisted in an unnatural pose. Even to the medically untrained lawn crew, it seemed obvious that this beautiful young girl's life was to be forever changed.

Morgan's Condition - What The Doctors Found

1. Morgan had a fracture at her T-9 vertebra and had significant swelling of her spinal cord. She required surgery on her spine to stabilize her from T7 to T12.

2. Morgan was able to breathe on her own.

3. Morgan could not feel or move anything below her belly button (the location of T9).

4. Morgan could not control her bowels or bladder.

Task 6. Describing the Injury

A. Record the patient's level of injury in the space below.

Spinal Column Section	Vertebra(e)
Thoracic	Vertebra 9

B. Review the description of the injury. Does the description of the injury indicate that the damage to the spinal cord is

Complete or Incomplete (circle one)

C. Based upon the patient's level of injury, is this patient' condition classified as

Paraplegia or Tetraplegia/Quadraplegia (circle one)

D. Record the patient's ASIA Scale Score? **ASIA A** . Explain what this score means:

Morgan has no ability to feel or move below the level of her injury.

E. Write a brief description (in complete sentences) of the patient's spinal cord injury using the correct terminology. Look at the examples in Lesson 3, "Introduction to Spinal Cord Injury" under "Describing a Spinal Cord Injury."

Write as if you are the doctor explaining the patient's condition to the family. Be sure your description includes

- Level of the injury (location on the spinal cord)
- The amount of damage to the spinal cord
- Extent of paralysis
- ASIA Scale Score

Morgan has a spinal cord injury at the thoracic section vertebra 9. The damage to the spinal cord is complete. She has an ASIA score of A. Her injuries have resulted in paraplegia.

Task 7. Case Study Exhibit

Create a case study exhibit that you will use to present your patient to the class later in the unit. Use colored chart paper to cut out a life-sized body outline which will represent your assigned patient. Give the "patient" appropriate physical details such as hair, eyes, etc. Use available materials and creatively present the following information.

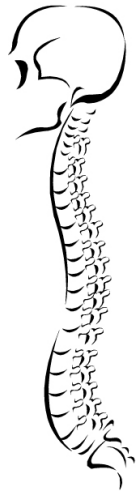
1. Patient's name
2. Brief outline of the injury story
3. Summary of medical condition including level of injury (injuries could be drawn on the "patient")

Note: You will have opportunities to add information to this exhibit later in the unit.

Task 8. "Here's What Happened" – Change The Story

A. Re-read your patient's injury story. Think about what happened to cause the injury and consider if the injury could have been prevented. If so, how could events be changed so that the injury does not occur. In the space below, rewrite the injury part of the story so that the injury is prevented. Be sure to add any prevention ideas to the class Injury Prevention Chart.

Levi's Story - SCI Case Study



Here's What Happened

It was the last weekend of summer vacation and, as was tradition, Levi and his friends were going to the lake to do some boating, rope swinging, and dock diving. Levi and his friends got to the lake around 3:00pm on Friday afternoon so that they would have enough daylight to take the boat out for a spin around the lake before setting up the campsite. Of course stories of the past school year and dreams of the next would be shared between this close knit group of friends. Levi and his friends had known each other since 5th grade, and now it was their senior year of high school. They had to make every moment count.

After the friends arrived at the lake and got the boat out on the water they were off. The boat belonged to one of Levi's best friends, Jeff (actually, Jeff's Dad). And Jeff's Dad had it outfitted for fun. There was a built-in stereo system, a shade cover, a depth finder for when they went fishing in the morning, and best of all, a slide that came off of the back of the boat.

The boys cruised around the lake until they found the small cove where they had often dropped anchor many summers before. It was the perfect scene; a warm sunny day, surrounded by friends and full access to the lake. Once the anchor dropped the friends each took turns using the slide, jumping off the back of the boat, and making wise cracks about each other and about girlfriends. As Levi was getting up on the platform to slide for the tenth time, he had the idea to go down head first instead of feet first. When he did, his life was forever changed. As the friends watched Levi go down the slide head first they laughed and cheered. But when, after what seemed like forever, Levi did not come up, and the friends panicked. Then they saw Levi's limp body under the surface of the water. Jeff jumped in to help Levi out of the water and the other friends quickly followed. It took three of them to pull Levi's lifeless body up out of the water and onto the boat. Levi was not breathing and he was unconscious. Jeff jumped behind the wheel of the boat and sped to the dock where he knew his Dad should be arriving with the rest of the camping gear.

As Jeff haphazardly docked the boat the friends yelled frantically to Jeff's Dad who was unpacking on the shore. He came running down to the boat and immediately began CPR. One of the friends called 911 and soon an ambulance arrived to take Levi to the hospital.

Levi's Condition - What The Doctors Found

1. Levi had fractured his C-2 vertebra and had significant damage to his spinal cord at that location.
2. Levi was unable to breathe on his own so a machine called a ventilator had to help him breathe.
3. Levi was unable to feel any part of body except for the center of his face.
4. Levi could not move any parts of his body.
5. Levi could not control his bowels or bladder.

Task 6. Describing the Injury

A. Record the patient's level of injury in the space below.

Spinal Column Section	Vertebra(e)
Cervical	Vertebra 2

B. Review the description of the injury. Does the description of the injury indicate that the damage to the spinal cord is

Complete or Incomplete (circle one)

C. Based upon the patient's level of injury, is this patient' condition classified as

Paraplegia or **Tetraplegia/Quadraplegia** (circle one)

D. Record the patient's ASIA Scale Score? **ASIA A** . Explain what this score means:

He has no feeling or movement below the level of his injury

E. Write a brief description (in complete sentences) of the patient's spinal cord injury using the correct terminology. Look at the examples in Lesson 3, "Introduction to Spinal Cord Injury" under "Describing a Spinal Cord Injury."

Write as if you are the doctor explaining the patient's condition to the family. Be sure your description includes

- Level of the injury (location on the spinal cord)
- The amount of damage to the spinal cord
- Extent of paralysis
- ASIA Scale Score

Levi has a spinal cord injury at the cervical section vertebra 2 on his spinal column. The damage to the spinal cord in complete. Levi has an ASIA score of A. His injuries resulted in tetraplegia.

Task 7. Case Study Exhibit

Create a case study exhibit that you will use to present your patient to the class later in the unit. Use colored chart paper to cut out a life-sized body outline which will represent your assigned patient. Give the "patient" appropriate physical details such as hair, eyes, etc. Use available materials and creatively present the following information.

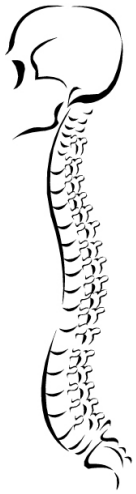
1. Patient's name
2. Brief outline of the injury story
3. Summary of medical condition including level of injury (injuries could be drawn on the "patient")

Note: You will have opportunities to add information to this exhibit later in the unit.

Task 8. "Here's What Happened" – Change The Story

A. Re-read your patient's injury story. Think about what happened to cause the injury and consider if the injury could have been prevented. If so, how could events be changed so that the injury does not occur. In the space below, rewrite the injury part of the story so that the injury is prevented. Be sure to add any prevention ideas to the class Injury Prevention Chart.

Jared's Story - SCI Case Study



Here's What Happened

Jared was a sophomore in high school who played basketball and was on the student council. He had dark brown hair and lots of girls always seemed to want to talk to him. It was the first night of Spring Break and Jared planned to go to the movies with two buddies. They were meeting a group of girls from school and he'd been looking forward to it all week. Just as he finished getting dressed in his room, he heard his friend Ryan's car pull up in the driveway. He grabbed his wallet, said goodbye to his mom and headed down the driveway. Ryan was in the driver's seat and their friend Shawn was in the passenger side. Jared slid into the backseat and Ryan wheeled the car back onto the road.

For a split second Jared thought about putting his seatbelt on, but he liked leaning up in the middle between the two front seats so he felt like part of the conversation. He left his seatbelt off. The boys talked about the girls they were meeting and the movie they were going to see. They were laughing and joking, happy to be together and have a break from school. About a mile from Jared's house, they pulled onto a bigger road and Ryan picked up speed.

He came toward an intersection where the light was green. No reason for him to slow down so he kept moving, driving just at the speed limit. But a driver coming from the left wasn't paying attention and ran the red light. The car smashed into the driver's side sending Ryan's car up on the right median where it flipped over and came to rest upside down. Ryan and Shawn were buckled in and did not seem to be hurt badly. Jared was awake, but he was crying and said he couldn't feel his legs.

Someone must have seen the accident and called 911 because the sirens started almost immediately. An ambulance and several police cars pulled up. Ryan and Shawn were stunned, but with the help of some EMTs they got out of the car and sat on the ground while their vital signs were checked. They were yelling to the rescue workers to please help Jared.

The driver of the other car was a girl in her twenties who they didn't recognize. She sat by herself on the side of the road with her heads in her hands, crying.

Slowly and carefully the EMTs were able to get Jared out of the car and onto a gurney. They were very careful to keep him stable. He was driven to the hospital immediately. When his parents arrived they were told that Jared had been in a car accident and had a spinal cord injury.

Jared's Condition - What The Doctors Found

1. X-rays showed a burst fracture at his L3 vertebra. This fracture forced bone fragments into Jared's spine causing significant damage.
2. The very night he was injured, Jared had an operation called a spinal fusion to repair damage from L2 to L4 and stabilize his spine.
3. Jared could NOT feel or move anything below his level of injury (L3).
4. Jared could not control his bowels or bladder.
5. His upper body and trunk were not injured and still functioned normally.
6. Jared was able to breathe on his own.
7. Jared would need to use a manual wheelchair to get around. Doctors explained that he might not walk again but it was too early to tell. He might at some point be strong enough to try to walk with braces.

Task 6. Describing the Injury

A. Record the patient's level of injury in the space below.

Spinal Column Section	Vertebra(e)
Lumbar	Vertebra 3

B. Review the description of the injury. Does the description of the injury indicate that the damage to the spinal cord is

Complete or Incomplete (circle one)

C. Based upon the patient's level of injury, is this patient' condition classified as

Paraplegia or Tetraplegia/Quadraplegia (circle one)

D. Record the patient's ASIA Scale Score? **ASIA A** . Explain what this score means:

Jared had no feeling or movement below his level of injury (L3)

E. Write a brief description (in complete sentences) of the patient's spinal cord injury using the correct terminology. Look at the examples in Lesson 3, "Introduction to Spinal Cord Injury" under "Describing a Spinal Cord Injury."

Write as if you are the doctor explaining the patient's condition to the family. Be sure your description includes

- Level of the injury (location on the spinal cord)
- The amount of damage to the spinal cord
- Extent of paralysis
- ASIA Scale Score

Jared has a spinal cord injury at L3, lumbar section, 3rd vertebra. His injury is complete. He has an ASIA score of A. Jared's injuries have resulted in paraplegia.

Task 7. Case Study Exhibit

Create a case study exhibit that you will use to present your patient to the class later in the unit. Use colored chart paper to cut out a life-sized body outline which will represent your assigned patient. Give the "patient" appropriate physical details such as hair, eyes, etc. Use available materials and creatively present the following information.

1. Patient's name
2. Brief outline of the injury story
3. Summary of medical condition including level of injury (injuries could be drawn on the "patient")

Note: You will have opportunities to add information to this exhibit later in the unit.

Task 8. "Here's What Happened" – Change The Story

A. Re-read your patient's injury story. Think about what happened to cause the injury and consider if the injury could have been prevented. If so, how could events be changed so that the injury does not occur. In the space below, rewrite the injury part of the story so that the injury is prevented. Be sure to add any prevention ideas to the class Injury Prevention Chart.

Directions: Consider all the decisions that were made along the path from injury to Trauma Center. Select the three important decisions made during the story either by the patient or someone else. Write one decision in each of the three shapes below.

For each decision, choose one question and write a response. You can choose a different question for each decision or respond to the same question for each.

1. Why was this decision important? Explain.
2. What were the immediate and long-term consequences resulting from this decision?
3. Would you have made a different decision? Explain.

Decision 1 =

Responses will vary.

Decision 2 =

Responses will vary.

Decision 3 =

Responses will vary.

Shepherd Center
INJURY PREVENTION

LESSON 5

Treating SCI and TBI - The Rehabilitation Team and Medical Careers

Learning Outcomes

Students will learn about the medical professionals involved in providing SCI and TBI rehabilitation.
Students will realize the career opportunities that exist in SCI and TBI rehabilitation.
Students will practice and develop their note-taking skills while viewing an informative video.

Teacher Planning

Although students' case studies focus on either a SCI or a TBI, during this lesson students will learn about the medical professions that work with both types of injuries.

Students will view a video where actual professionals explain their work and the education it took to enter their profession. Students will also be provided a print resource that supplements the video by outlining by career the daily activities involved in treating SCI and TBI patients.

The lesson can be used to practice students' note-taking skills if students need to develop this skill. There are two note-taking templates that you may copy for student use or students can create their own templates on notebook paper. One template uses the Cornell notes system while the other is a graphic organizer chart. Previewing the video will help you determine the best note-taking activities for your students.

Task 9 provides three activities that students can do with this lesson. You can have students complete all three, select one or two to complete, or assign for homework.

BIG TAKE AWAY:

A significant number of medical professions contribute to the well-being of patients in rehab. This team works hard to provide the best outcome for each patient.

These careers are attainable and make good choices for students that find them interesting.

Materials Needed

- Student Workbook:
  - "Medical Careers" Task 9 handout
  - "Meet the Rehab Team" print resource
- Cornell Notes template
- Medical Careers note-taking graphic organizer
- Power point slides of rehab pictures
- Medical Professionals Video

Activities

Engage

As students enter classroom, project slide show of 4 pictures of rehab situations. Have students write descriptions of what they think is happening in each picture by responding to the following:

1. Who are these people?
2. What do you think is happening?
3. What does the picture make you wonder?

Briefly share responses.

Explore

Explain that students will watch a video that introduces medical professionals who provide rehabilitation services for SCI and TBI. Instruct students on the note-taking process they should employ during the video viewing. Two note-taking templates are provided at the end of this lesson in the Teacher's Manual.

Explain that each professional's segment will follow the same pattern to help the students organize their notes.

- Name of career
- Description of job
- Explanation of educational requirements
- What they like about their job.

Show the video.

After the video, have students rate their note-taking using the following rubric:

- Score of 1 = Notes are complete with each job title and important details about work; organization and neatness are exemplary
- Score of 2 = Notes are fairly complete with only some missing details; organization and neatness are evident
- Score of 3 = Notes have important gaps (either job titles or work descriptions); organization and neatness should be improved

Students should write their self-rating at the top of their notes and write "First Rating" next to their score.

Now have students review notes with the other members of their group and fill in any information gaps. Then have students re-evaluate their "First Rating Score" and correct their rating based upon comparison to other members of their group. Students should write their "Second Rating Score" at the top of their notes.

Have students circle that part of their notes they believe are most exemplary and place a box around that part of their notes they think should be improved.

Tell students you will collect these at the end of class.

Explain

Direct students to the "Meet the Rehab Team" resource in their workbooks. Instruct students to select two to three careers that interest them most based on what they learned in the video.

Students should read the activities listed for each of those three careers and imagine what that career would be like if they did this work each day.

Instruct students to then choose one of the three for the remaining lesson activities.

Elaborate

Review "Medical Careers" Task 9 with students. Review tasks with students. Students can complete selected tasks during class or for homework. Remind them to use their video notes and "Meet the Rehab Team" resource to complete these activities.

Evaluate

Review the students' video viewing notes. Briefly scan the circled and boxed portions, review the student ratings, and assign a value to the students' work.

Ticket Out

Have student create a tweet about the career they find most interesting. (Write in 140 characters)

Standards Addressed

Georgia Performance Standards – Science Grade 7

S7CS10. Students will enhance reading in all curriculum areas by:

a. Reading in All Curriculum Areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
   - Read both informational and fictional texts in a variety of genres and modes of discourse
   - Read technical texts related to various subject areas

b. Discussing books
   - Discuss messages and themes from books in all subject areas.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

c. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

d. Establishing context
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

Common Core Anchor Standards

R.CCR.7: Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

R.CCR.10: Read and comprehend complex literary and informational texts independently and proficiently.

W.CCR.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Lesson 5 - Images of Powerpoint Slides.

Meet Some of the Rehabilitation Team

Each patient will have a team of professionals helping them through rehabilitation. Some of these professions are outlined here, although these are not all of the professionals who might work with rehab patients. Each team member plays an important role in helping the patient reach their maximum recovery potential.

Doctor:

- Typically a rehab specialist called a physiatrist
- Manages all medical care for the patient
- Prescribes medicines
- Watches out for complications such as blood clots, skin sores, and spasms
- Makes sure the patient is medically stable and able to participate fully in therapy
- Writes prescriptions for equipment, such as wheelchair

Case Manager

- Plans discharge home from the rehab hospital
- Updates patient and family on insurance coverage, insurance approvals and how to best use insurance
- Makes sure the patient's family caregiver is scheduled for training with all necessary team members (PT, OT, TR, SLP)
- Identifies community resources and care providers the patient will need once they are at home
- Coordinates the case with the entire team
- Acts as the point person for the patient and family

Neuropsychologist

- Helps patient understand daily effects of injury
- Helps patient with the physical, emotional, and thinking abilities resulting from the injury
- Performs in-depth cognitive assessments to determine patient's readiness to return to work or school
- Educates families on symptoms of TBI and how to work with their injured family member
- Assists the rehab team with managing TBI symptoms

Counselor

- Talks with patient about emotional responses to injury
- Conducts group therapy sessions to share cognitive and emotional challenges
- Assists family members with emotional adjustment to patient's injury and the life changes that result from it

Nurse

- Manages the physical care of the patients and trains patient and/or family on all personal patient care such as bathing, dressing, bowel & bladder, turns at night, colostomy, and simple wound care
- Manages medications
- Assists with meals/feeding
- Performs head-toe physical exam (check for skin issues, etc.)
- Performs neurological assessment to check for cognitive functional changes (typically mid-day when patient most alert)

Dietician

- Evaluates nutritional status
- Makes recommendations about proper nutrition and diet (Patients are frequently malnourished and underweight after being in the trauma center. Individualized attention to diet and caloric intake assists in recovery.)
- Educates regarding menu selection, proper food consistencies, diet changes, etc., as it fits patient needs
- Teaches the patient and their family members how to make healthy food choices that aid in their recovery
- Works with the Speech Pathologists to help the patient move from depending on tube feeding for their nutrition to eating on their own

Occupational Therapist

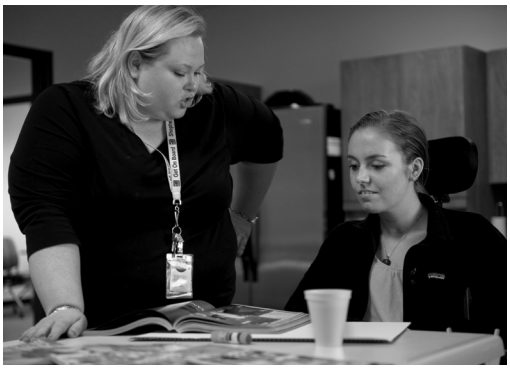
- Works with patient to improve ability to perform activities of daily living and anything else that may now need to be done from a wheelchair, with impaired hand and arm function, or with impaired cognition
- Teaches self-care such as feeding, bathing, dressing, and bowel and bladder care (using the bathroom)
- Teaches daily grooming activities such as tooth-brushing, applying make up, shaving, and fixing hair
- May teach eye exercises for improved vision if needed
- Can work on household tasks such as cooking, cleaning, laundry and vacuuming

Physical Therapist

- Works on upper or lower body strength and coordination needed to propel into/out of a wheelchair
- Teaches bed mobility (rolling, getting up from lying down)
- Transfers to all surfaces
- Teaches how to drive or push a wheelchair
- Identifies what type of equipment the patient will need once they are home, writes prescriptions for it and works with the patient's vendor to get the equipment to the patient
- Teaches patient to walk if they are able to
- Helps someone be able to stand up from various surfaces including getting up from the floor and in and out of a car (transfers)
- Balance activities and endurance/fitness training

Recreational Therapist

- Develops community reintegration skills by taking field trips to restaurants, stores, movies, bowling
- Teaches adaptive sports skills like kayaking, water skiing, rugby, basketball, swimming and any other sports or activities patients request
- Teaches use of adaptive tools for hunting, gardening, and fishing
- Helps patient get comfortable going back out in the community in a wheelchair
- Helps patients with any day to day leisure activities like reading, using cell phones/iPads, Facebook/social media, video games, painting, pottery, etc.
- Teaches how to push/drive a wheelchair over uneven surfaces
- Teaches how to transfer out of a wheelchair chair to sit in a booth at restaurants, an airplane seat, etc.
- Teaches about advocacy/ADA and laws for people with disabilities so they can advocate for themselves and their needs in the community. Ex: doorways being wide enough, raising tables to fit wheelchairs under them



Speech Therapist

- Helps patients during breakfast/lunch: (Patients often need help staying focused due to deficits in attention and may have to re-learn to swallow after a brain injury. Some patients need to start with very soft food, like pudding, because they have weak swallowing) muscles and cannot tolerate a regular diet
- Reviews daily schedule with patients
- Teaches strategies for organizing daily living activities
- Helps people talk when they use a ventilator to breathe
- Works with patient to determine when they are ready to go back to school or work
- Helps patient sequence steps of activities such as taking a shower. Helps patient identify and be able to list the things they need (shampoo, soap, etc) in order in which they use them
- Provides guidance to patients who typically lack initiative complete these basic tasks
- Writes out daily schedule: Reviews the day of the week, date, month, and year as well as where the patient is and why they are here. (Due to deficits in short-term memory, patients often are unaware of where they are, what the year is, or why they are in the hospital)

Task 9: Rehabilitation Medical Careers - This Could Be You!

You have met the medical team that provides care to patients during rehabilitation. Each has a specific role and makes a unique contribution to the patient's well-being.

Directions: Review your notes from the video and the "Meet Some of the Rehabilitation Team" resource. Select the profession that you find most interesting and complete the following activities.

1. **Career Profile:** Write a profile of the career you have selected. This profile should be written in paragraph format. Use the following format as a guide to organize your profile.

    - Create an interesting title
    - Begin the profile with a topic sentence that names the selected career.
    - Summarize the main activities associated with this career in several sentences and describe what you like about each activity.
    - Explain the education required to enter this career (explained in the video)
    - Close by recommending this career to others and tell why you make this recommendation.

2. **Interview Questions:** If you could interview the medical professional you selected, what questions would you ask? Create a list of 5 interview questions that will help you get more information about the career that interests you.

3. **Career Symbol:** Think about the symbols associated with well-known brands. Create a symbol that you think represents your selected career. Try to make the symbol convey some aspect of the career that will appeal to others. Consider the examples below to give you some ideas.

Responses will vary.

Rehabilitation Team

Cornell Notes	Topic/Objective:	Name:
		Class/Period:
		Date:

Profession:	Notes:

Summary – Which professions appeal to you most and why:

Rehabilitation Team

Directions: As you watch the video, write important information about the medical professionals you meet in each of the boxes below.

Job Title	Job Description	Interesting Facts or Statements

Shepherd Center
INJURY PREVENTION

LESSON 6 The Rehabilitation Experience

Learning Outcomes

Students will identify rehabilitation activities depicted in a video of patients engaged in therapy.
Students will understand the value of each activity as patients prepare for their return to daily living.
Students will continue creating their case study exhibit by adding rehabilitation information.

Teacher Planning

Students should remain in case study groups for this lesson.

Help students understand that patients must be in stable condition before they can enter rehab. When patients enter rehab, the rehab team conducts diagnostic tests that establish the patient's condition and help the team identify appropriate rehab activities.

Each group will read a letter that updates them on the current status of their patient. These letters are written by the patients themselves (SCI) or the patient's parent (TBI). These letters describe the patient's condition now that they are in rehab and contain information about each patient's progress and rehabilitation.

The lesson's core is structured around a four- minute video of patients involved in various rehabilitation activities. (This video only depicts SCI patients but some of the activities would be done by some TBI patients as well.) Students who have an SCI case study will bring some background knowledge to this lesson that TBI groups may lack.

Students will view the video once without interruption and then view it again. The purpose for the second viewing is to deconstruct each activity in the video so that students understand the rehabilitative value of what patients are learning and practicing. The video will be paused at each of the scenes listed on "The Rehabilitation Experience" chart. The Teacher Key provides extensive explanation of each scene's importance and each patient's injury. Review this information and determine what you want to share with your students and what you want them to record. One possibility is for you to explain and then have students record the most interesting one or two explanations. Students can use the Task 10 Rehabilitation Experience Chart in their workbooks to record the responses you require. During the video students will see the electric wheelchair "Sip and Puff" technology demonstrated. This lesson includes a separate activity that explains the code for moving a wheelchair using sip and puff technology. The activity allows students to practice this technology using a straw and a balloon.

Big Take Away:

Many medical professionals must work together to provide SCI and TBI rehabilitation for each injured patient.

A patient's time in rehabilitation is filled with learning how to manage daily life. Activities that an uninjured person takes for granted can be challenging for someone with SCI or TBI.

Materials Needed

- Student Workbook:
  - "Life in Rehab - Predictions" Anticipation Guide
  - Rehab letters
  - "The Rehabilitation Experience" Task 10 chart
  - Sip and Puff Wheelchair Activity
- "Fighter" video of SCI patients (4:11 minutes)
- Straws and balloons for each student
- Video projection equipment
- Chart paper and art supplies for case study exhibit

Activities

Engage

Students complete "Life in Rehab - Predictions" Anticipation Guide individually. Briefly have them share and discuss within groups.

Explore

Explain that students will be reading letters describing their patient's current condition. These letters are either written by the patient or by the patient's parent (TBI patients will not be able to write).

Instruct students to carefully read these letters. As they read these letters, students should underline activities and skills their patients are working on during rehab. Allow time for response, discussion and questions.

Explain

Explain that students will be viewing a video of actual rehab patients in a rehab hospital working on daily living skills similar to those their case study patients described. The video shows the therapists working with these patients.

Show the video one time and just let the students watch and experience the video. Explain that they will watch the video again and learn about each of the activities depicted. Allow time for reactions.

Direct the students to the "The Rehabilitation Experience" Task 10 chart in their workbooks (video-viewing graphic organizer). Review the organization of the graphic organizer with students and explain their task.

Play the video again, this time stopping at each of the listed scenes (still photos are not included). Using your Teacher Key, explain each activity in terms of the skill the patient needs to learn and/or practice. Have students record explanations as appropriate in the "What You May Not Realize" column, perhaps the one or two most interesting facts. It is not necessary for them to write down everything you explain.

Elaborate

Students can practice the wheelchair "Sip and Puff" technology using a straw and balloon. Point them to the sip and puff activity page in their workbooks.

Students can add information about their case study patient's rehab experiences to their exhibit. (Suggestion: have student describe two to three activities their patient is working on in rehab.) Encourage them to display this addition in a creative way.

Evaluate

Assess Task 10 for completeness, correctness, clarity and neatness.

Ticket Out

Have students revisit their True/False responses on the Rehabilitation Experience anticipation guide and adjust responses.

Standards Addressed

Georgia Performance Standards – Science Grade 7

S7CS6. Students will communicate scientific ideas and activities clearly.

a. a. Write clear, step-by-step instructions for conducting particular scientific investigations, operating a piece of equipment, or following a procedure.
b. b. Write for scientific purposes incorporating data from circle, bar and line graphs, two-way data tables, diagrams, and symbols.
c. c. Organize scientific information using appropriate simple tables, charts, and graphs, and identify relationships they reveal.

S7CS10. Students will enhance reading in all curriculum areas by:

a. Reading in All Curriculum Areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
   - Read both informational and fictional texts in a variety of genres and modes of discourse
   - Read technical texts related to various subject areas
b. Discussing books
   - Discuss messages and themes from books in all subject areas.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.
c. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.
d. Establishing context
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

S7L2. Students will describe the structure and function of cells, tissues, organs, and organ systems.

a. Explain that cells take in nutrients in order to grow and divide and to make needed materials.
b. Relate cell structures (cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria) to basic cell functions.
c. Explain that cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.
d. Explain that tissues, organs, and organ systems serve the needs cells have for oxygen, food, and waste removal.
e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

Common Core Anchor Standards

W.CCR.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

SL.CCR.1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Directions: Read the following descriptions of life in rehab. Predict which statements are True and which are False by marking your choices in the column labeled "Before." You will review your answers later in the lesson.

Before			After	
True	**False**	**Descriptions of Life In Rehab after Traumatic Injury**	**True**	**False**
		Rehabilitation from traumatic injury is usually over in a few days.		**X**
		A team of rehab professionals works with every SCI and TBI patient.	**X**	
		Patients in rehab never have opportunities to play games and sports.		**X**
		During rehab, patients follow a daily schedule.	**X**	
		Rehabilitation focuses only on the patient's physical condition.		**X**
		In rehabilitation, the patients spend most time being treated by doctors.		**X**
		The patient's medical condition helps determine rehabilitation activities.	**X**	
		Once patients leave rehab, they no longer need medical care.		**X**
		Patient's families are not involved in the rehabilitation experience.		**X**
		In every age group, there is a higher likelihood of a male suffering from a traumatic injury than a female.	**X**	

A Letter from Trey's Mom

Hi Kids,

I know you're all wondering how Trey is doing. I thought it would be best if you heard the update from me. His brain injury is severe. He was in a coma for 25 days and since he's come out of the coma, he's still not the person you remember at all. He can't talk or breathe on his own. He will open his eyes if someone pricks him with a pin, but otherwise he doesn't open them. And if he does open them he doesn't really see us. I'm spending my days here at the rehab hospital learning how to take care of Trey, which is very hard work. He can't move himself to do anything, so I have to bathe him, dress him and turn him often so he won't develop skin sores. He is not aware when he needs to urinate or have a bowel movement, so he wears diapers. I change him just like I did when he was a baby. He is on a machine called a ventilator that breathes for him. He can't eat food or drink. He's fed and given water and his medications through a tube in his stomach. He's lost a lot of weight. The therapists are teaching me how to keep his limbs stretched out so they won't get stuck – a condition called contractures.

I know you're all wondering if Trey will ever be back to the person you knew. It's hard to say what the future holds, but as of now it's looking like he's going to stay the way he is. After rehab we'll take him home. His room will look more like a hospital room than a teenager's bedroom. Someone will have to be with him all the time. My job provides our insurance benefits so I'll have to hire caregivers for him while I'm at work. My hope is that all of you will learn from what happened to my son. I hope you'll think carefully before you do things that could be dangerous. Trey was a great kid and never in trouble. He didn't mean for this to happen, I'm sure. But if he'd thought it through before he pulled that stunt, he might be back at school with you guys. I wish he could be.

From Carolyn, Trey's mom

A Letter from Caylee's Mom

Hello to all of you from Caylee. I told her I was writing a letter to all her friends and she smiled. Caylee has come a long way since her accident, but she still has very far to go. Her room here at the hospital is decorated with cards from everyone and she has the huge poster made by her classmates. Every night she sleeps with the big pink bear her best friend Brittany sent.

As some of you may know, as a result of being hit by the car, Caylee has a brain injury. It's classified as a moderate injury, which means it's very serious but it could be worse. When she was first injured she was taken to a trauma center where she had surgery. Once she was stable, we moved to a rehab hospital that specializes in brain injuries. The goal here is to help her relearn as much as she can and to make sure we can take care of her and keep her safe.

One of the toughest things is that Caylee sometimes doesn't recognize us. She seems to always know her brother, but it's hit or miss with her dad and me. I have to remind her that I'm her mom and I love her.

She's not able to do things that were once very easy for her. We have to tell her to use the bathroom and show her what to do. Every time. She's physically able to walk, but doesn't know where she's going. If she were to be lost she wouldn't even know how to ask for help. Because of this the unit she's on in the hospital has locked doors. It's not safe for brain injured patients to be able to walk around by themselves. She's also physically able to eat, but has to have help at every meal to remember the steps to feed herself and how to chew and swallow her food. Her team of therapists are teaching her the steps of all these every day activities like brushing her teeth, eating, grooming, getting dressed and going to the bathroom.

Sometimes Caylee's behavior is challenging. She has outbursts and yells things from out of nowhere. She's easily frustrated and agitated. We're told this is all very common for someone with her injury. She has a communication problem called aphasia, which means she has a hard time understanding what people are saying to her and processing information. She has a hard time remembering what words to use to communicate. Her speech therapist helps her with these issues, but recovery is slow and may take years.

We have to childproof our home just as though we were bringing home a toddler. We have to learn ways to keep Caylee safe so she won't hurt herself. At first she will need someone with her all the time. The doctors hope that in a few months, if she continues to improve, she won't need someone 24 hours a day. But all brain injuries are different, so we just have to wait and see. If she's able to come back to school, she will probably not be in the same classes and she'll need a lot of extra help.

Since I have all of your attention, I just want to say that I hope each and every one of you learns from what happened to Caylee. She knew that she was supposed to wear a helmet, but she didn't do it and now our lives are very different and will be forever. Please be safe when you're out there. Wear a helmet. Wear a seatbelt. Be careful. You don't have to be going far from home to get hurt. This happened on a quiet street right by our house and the car that hit her was not going very fast at all. Please be safe.

That's all for now. We're taking it day by day and are thrilled by every single improvement.

Linda, Caylee's Mom

A Letter from Maya's Dad

Hi Everyone,

I think you guys all know what happened to Maya since it was all over the news. She was walking in a crosswalk on a green light and was hit by a driver who was trying to make it through before the light turned red. She has a few fractures and some scrapes, but the real problem is that she has a serious brain injury. It's called a "closed-head" injury meaning that all the damage happened on the inside from her brain hitting against her skull. This kind of injury can be just as bad as an open wound. We're learning a lot of things like this that we never knew before.

Maya's recovery has been slow. She can follow some commands but slowly and with a lot of effort. She can say a few words, but clearly has a very hard time expressing a whole thought and understanding what others say to her. We have to repeat things a lot and have to be very patient with her with every activity. We're expecting to be here for at least another month and then we're hoping she can do a brain injury day program where she'll have therapy all day long for several months.

Maya has been able to stand up, but she has to lean on a walker and it takes a lot of energy just to get up. She might be able to walk on her own again one day, but we know it will be a long time from now and it might always be challenging. We're going to have to be with her all the time once we leave and will have to help her do just about everything – bathe, get dressed, eat meals, and go to the bathroom. Nothing will be quite like it was before.

My hope is that Maya can come back to school with you in the next year. I'm hoping you all will come visit her at home before then so you can get comfortable with the fact that she's not the way you remember her. She's very different in many ways. Sometimes she's not sure who her loved ones are and sometimes she laughs or cries for no apparent reason. She has a very tough time remembering things, but does remember some important things from her life before. When she was finally conscious and able to communicate, she told her doctor that she wanted to be a doctor. We love her as much as we always have and we hope that you will too.

Apparently the driver who hit Maya was speeding and Maya wasn't looking. If either one of them had been paying better attention this might not have happened. All I can say is that I hope you learn something from what happened to my beautiful girl. She may not ever be a doctor like she planned, but maybe she can still save some lives by telling her story. Please share this letter with anyone at school that's wondering about Maya. I know she wants you all to know about the progress she's made since she came to rehab and how you can avoid ending up in a tough situation like this.

Love,
Joseph, Maya's Dad

A Letter from Kendrick

To all my friends,

I miss you all! Thank you for keeping in touch. I don't think I could have made it this far without the encouragement. It means everything. The walls in my hospital room are covered with cards and posters and pictures. It makes it feel like it's my room and not a hospital.

Anyway, I wanted to tell you guys about what happened and how I'm doing. Going through this is like nothing you can imagine. It's the hardest thing I've ever done. When I first got hurt I had no idea what had really happened to me. I didn't understand what it meant. It means the rest of my life will be really different. I'm paralyzed from the shoulders down. I always thought being paralyzed just meant you couldn't walk, but it means a heck of a lot more than that.

When I first got here I couldn't breathe on my own and had to be on a ventilator. The doctors told us that you never know how much better someone will get, but they figured since I was young and healthy and my diaphragm muscle was working that I would be able to come off the ventilator. I finally got off of it a couple weeks ago. It took a really long time though and was like having to work out all the time. I had to practice breathing and I came off the vent for a little bit more time every day. There was a girl down the hall who got hurt in a gymnastics accident and she was on a vent too. We decided to have a contest to see who could get off it first, which helped with motivation when I didn't feel like trying anymore. She won :)

Now I'm learning how to do what I can and my rehab team is teaching my mom how to take care of me. She's been with me every single day since we got here. She sleeps in my room on an air mattress since we're 400 miles from home and can't really spend the money for a hotel. I'm glad though. I'd rather have her here with me anyway. The nurses are really nice, but it's much easier to ask my own mom to scratch my nose or get me some water.

It's been a few months since I got hurt and it seems like I'll be using a power wheelchair for the long haul. Some people get movement and feeling back as time goes on, but I haven't. I have a complete injury and nothing about what I can feel or move has changed. At this point I'm just really happy I can breathe on my own and don't need a feeding tube anymore. After I came off the vent, I was able to eat a lot more easily. I still had to have a trach, which is a hole in my throat, for a few weeks, but that's gone now too and there's just a little scar there.

I'll be home in a few weeks. I'll still need some therapy, but I'm hoping I can still start college next fall like I planned. It won't be the same, but I think it'll mean more to me now than ever.

Keep praying for me,
Kendrick

A Letter from Rico

Hey guys,

Well by now I guess you heard what happened to me. I think the whole school knows about it, if not the whole town. I was hurt in a wrestling match. My opponent used a move that he shouldn't have and it ended with me having a broken vertebrae and a spinal cord injury. Man, I didn't know anything about these injuries before I got hurt. Let me tell you – it changes EVERYTHING!

I had to have surgery to stabilize my spine in the trauma center. About a week after that I was sent to the rehab hospital to start learning how to do things for myself again. The first thing I had to do in rehab was take an exam, but nothing like what we have in school. This one is called an ASIA exam and it's to find out what parts of my body can move and feel normally or are impaired. A therapist stuck pins in my skin and then touched my skin with cotton balls to see exactly where I had feeling. This was done from my face to my toes.

The places above where I got hurt are pretty much the same as before. I can breathe and move my head, neck and shoulders just fine. My biceps (the big arm muscles on top) are strong and I can use my wrists and triceps (the smaller arm muscles on the underside). I can't move all my fingers. I have no use of my abdominal muscles so sitting up in my wheelchair is difficult because I can't hold my back up. There is a strap that helps me to sit up.

Going to the bathroom is the worst part cause I can't really do it anymore. But my body still has to empty out, so I have to use catheters to empty my bladder. I have a bowel program every night to empty my bowels. The nurses do that for me, but I'm going to learn how to do it next week. My occupational therapist said it will be hard for me because I have short arms, so she's going to have to make a tool to help me reach. It's crazy. Like I said, stuff I just never imagined before.

I'm using a manual wheelchair to get around. It's really hard because I'm so weak. And I have to totally rely on my arms and shoulders to push since I have no use of my trunk muscles. My shoulders are sore all the time! I have to take pain meds for it. My physical therapist said it'll get better as I get stronger, but it might take a while and I'll always have to be careful with my shoulders.

Going from one thing to another (bed to wheelchair/wheelchair to bed) is called a transfer. That's a big part of what I'm doing in physical therapy (PT). I'm learning how to transfer with something called a slide board. It's just what it sounds like – a board that I slide on to move from one thing to another. It's a little scary and takes a lot of energy. But my PT is there to help me if I start to fall. And sometimes I just fall. If that happens the PT helps me get up and we do it again till I get it right.

I don't know what I could have done to prevent what happened to me. If the other guy had used the correct moves then I don't think I'd have been hurt. What happened to me shows that we have rules in sports for a reason, so no one gets hurt. I know that guy feels awful. I'm not ready to talk to him about it, but I know he'd want to spread the message that you have to be careful in sports. Listen to your coaches!

I think that's enough for now. Time for another therapy session!

Rico

A Letter from Morgan

Hi Everyone,

I really miss everyone and I can't wait to come back to school. I don't know how much you know, but I have a spinal cord injury. It's a complete injury at T9, which means I can't walk and I don't think I will ever be able to. I can't feel or move anything below my belly button. I'm still sad about the accident and I'm working with my counselor few times a week to figure out how to deal with it. It's not easy, but I'll get through it.

Some of the hardest parts are things you would never have thought about! I used to think being paralyzed just meant you couldn't walk, but it means so much more than that. I have to relearn EVERYTHING! Getting dressed, getting out of bed, taking a shower. My arms and hands work just fine so I can push a manual wheelchair, but it's really, really hard. I have to build up a lot of upper body strength and I have to learn from my physical therapist how to move around in the chair. It's not as easy as it looks! So far I've just been pushing around the hospital floor and through the gym. Soon I'll have to learn to go up ramps and hills and do wheelies – that's the advanced stuff. I always thought if you pushed someone in a wheelchair you were doing them a favor, but I'm learning that it's best to push myself as much as possible to build up strength. I try not to let my mom push me when we're going to the cafeteria and things like that. But I do have to be careful to make sure I don't injure my shoulders by working them too hard. It's a lot to think about.

The worst, very worst part is that I can't go to the bathroom the way I used to anymore. I have to use catheters, which are tubes that drain my bladder. I have to put one in every 4 hours. It doesn't stay in or anything. You just drain it and then take the tube out. My occupational therapist is teaching me how to do it by myself. My mom had to learn how to cath me in case I ever can't do it. Talk about embarrassing! But when you go through this you get used to this stuff pretty quickly. To go number two have to do a bowel program. I can't do it myself yet, but I'm hoping to learn so I won't have to have help later.

I keep thinking back about the accident and how one bad decision changed my life forever. For a stupid text message! It could have waited. Or I could have pulled over. I just can't believe such a small thing can cause so much damage for me and my whole family. Now I see how dangerous it is to drive distracted. Please, please, please keep your eyes on the road when you're driving and make sure the people around you do too! You don't have to be the one making the mistake to get hurt. I never want this to happen to any of you.

The good news about my injury is that the doctor says even if I never get any more movement back I can still live alone someday. I can still drive, go to college, have a job, have a baby and lots of things that I wasn't sure I'd still be able to do. I just might have to do them a little differently than someone who doesn't have my injury. I guess that's it for now. Keep me in your thoughts and I hope to see you all soon!

Morgan

A Letter from Levi

Hi Guys,

I know you probably weren't expecting to hear from me since my accident was so bad, but my therapists thought it would be a good thing for me to write you a letter and tell you how I'm doing. I'm using a new computer program called Dragon that types what I'm saying so I'm practicing with it. So here's the deal: I have a spinal cord injury from breaking my neck when I went down the slide head-first into the lake. I hit the bottom really hard and broke my neck at C2, which is a really bad injury. It means that I can't feel or move anything other than my head and I can't breathe on my own. I have to stay on a machine called a ventilator all the time. There's a hole in my throat called a tracheostomy where the ventilator tube attaches.

I can't really do much for myself. The nurses are teaching my parents how to take care of me. They're learning to get me out of bed with a thing called a hoyer lift. They're learning how to dress me, bathe me, empty my bladder with a tube, clean out my bowels with a suppository, feed me and anything else you can think of. There are some things I can do, although I still need some help. I can drive my power wheelchair with a tube that goes to my mouth called a sip-and-puff. If I blow or suck through the tube it tells the wheelchair which direction to go. I can move forward, backward, in a circle or whatever. But I can't be alone for a lot of reasons. I can't open doors or push elevator buttons. I can't cough, so if I get something in my throat (which happens a lot) someone has to push on my chest to make me cough. I can eat regular food, but someone has to feed me. And even though I can't really feel or move most of my body I have a lot of pain that I have to take medicine for. It's called nerve pain. It's kind of like when your foot falls asleep. The medicine helps, but the pain is always there. I also have had some urinary tract infections, which can make me have fevers and headaches. Then I have to take antibiotics, which make me feel a little sick to my stomach. Every day there's some new thing to deal with, but I'm getting more used to it. Not sure if I'll ever really be used to it.

My parents are getting the house ready for me. They hired a contractor to build a ramp and big shower that I can roll into on my giant shower chair. It's like a wheelchair, but it's made for getting wet. They have to widen some doors at home too so my wheelchair will fit. My mom used to have a job, but she quit because someone has to be with me all the time and it's cheaper for her to do it than for us to pay for a nurse. Insurance doesn't pay for someone to help me. Anyway, I know that's a lot and doesn't sound so positive. I'm trying to keep a good attitude and I'm making it my goal to go to college as soon as I can. I may not have control over my body, but I do of my brain and I always did well in school. I met a man with an injury just like mine and he's an engineer for a big corporation. He has to have someone help him at work, but he still has a good career. I know I can do that too if I just put my mind to it.

I wanted to tell you guys to be careful when you're around water this summer. In here I've met 8 other people that were hurt in diving or water accidents. Some in pools, some in lakes, like me, and some in the ocean. I never knew this could happen. Think before you go head first into anything you guys! It's not worth it. My life will be different, in a really hard way, forever.

Anyway, keep the cards and emails coming. It means a lot to know you're out there and still thinking about me. I'll be home in a few months and hopefully we can have a big party then!

Levi

A Letter from Jared

Hi Y'all,

It's your old friend Jared. Where to start? It's been a crazy ride since I saw you last. I was in the back seat of my friend Ryan's car and we got into a wreck. I didn't have my seatbelt on and I got hurt. Bad. I ended up breaking a bone in my lower back (L3) and as a result I have a spinal cord injury. I'm so mad at myself for not wearing my seatbelt. If I had, maybe, just maybe this wouldn't have happened. Best I can do now is move forward and tell you guys about what happened so it never happens to any of you.

When I first got hurt I was really freaked out. You can't imagine what it feels like to not feel your legs. It was so scary and I'm not ashamed to say I was crying my head off. The ambulance came and the paramedics had to get me out of the car. Once I got to the hospital my parents showed up and were both a mess. But they were happy I was alive and that it wasn't worse. I had to have surgery almost right away to stabilize my spine. Then I had to wait till they would let me leave for rehab.

As bad as my injury is, I'm lucky it wasn't higher. I can still breathe and should be able to do pretty much everything for myself. I have full use of my upper body including my hands and all my fingers. My core muscles are still strong, so I can hold myself up and use a lot of that strength for transferring from one thing to another (like my bed to my wheelchair). I can't walk because my leg muscles don't work, but soon I'm going to try to walk using braces and a walker. But the thing is it's really slow and very tiring so I will probably just use a wheelchair most of the time. I can get around a lot faster in the chair. I have to use catheters to empty my bladder every four hours. It's not fun and means I have to wake up to do it once at night. I have to use a bench in the tub to bathe since I can't stand and I have to use a handheld shower head. A lot of things are different. I'll still be able to work and drive and can actually still have kids if I want to, but I'd have to have help from a doctor to make it happen.

I can communicate same as always. My brain isn't injured, just my body. But I'm sad a lot. I'm worried about what the future will be like and I hope that they'll come up with a way to cure SCI in the near future. Please guys, wear your seatbelt. It might not seem cool or whatever, but trust me, there is nothing cool about getting hurt, having to be in a hospital for weeks and not being able to go to the bathroom on my own anymore. It's really tough. I don't ever want anyone else to have to go through this. Miss you guys.

Jared

Task 10: The Rehabilitation Experience

Teacher Key

Directions: View the "Fighters" video and with the help of your teacher complete the chart below.

WHAT YOU SEE PATIENTS DOING	WHAT YOU MAY NOT REALIZE
1. Using an IPAD	Montana, hurt in a dirt bike accident. He uses mouth stick to navigate IPAD. He is a patient with tetraplegia who cannot move his arms and hands
2. Using red boxing gloves	Fletcher was the driver in a car accident with no seatbelt. He is strapped in on a tilt table otherwise he would slide right down to the floor. He only has movement down to his wrists. His injury is at C6. He has no movement in his trunk or below. He's on the tilt table to help regulate his blood pressure (by being vertical) and using the boxing gloves to help strengthen his arms. It also helps him improve his balance.
3. Singing in power wheelchair with iPad	Montana again, dirt bike accident. He has a trach and on cart behind him is his suction equipment for clearing his airway. Airways can get blocked with secretions and patient cannot cough to clear them. Someone has to "suction" him. As you watch him sing, you can see that it's challenging to take in breaths. The singing helps him work on the quality of his voice and be able to take bigger breaths. Singing can be part of his speech & respiratory therapy.
4. "Chorus line" of therapists	These are the people who work with patients every day
5. Using an electrical stimulation arm exerciser	Chris was hurt in a car accident; driver wearing seatbelt, hit a tree. His hands are strapped to machine because he is unable to hold his arms there without support. Although he is able to hold his head and neck up, he has a headrest so that when he does a weight shift in his power chair (and leans all the way back) he does not have to hold his head out in space. He can relax on the headrest. The electrical stimulation (Estim) is doing some of the work for him to help strengthen his arm muscles and make them bigger. His arms are going backwards, which works on different muscles than if they were going forward.

Directions: View the "Fighters" video and with the help of your teacher complete the chart below.

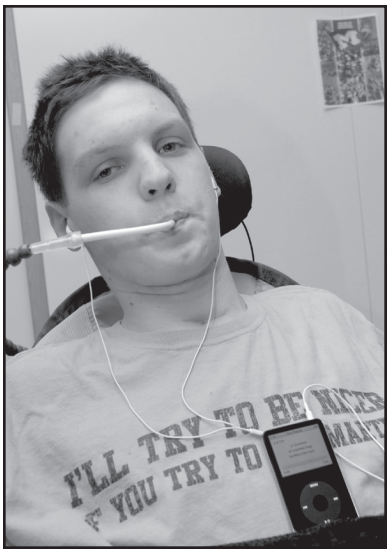
WHAT YOU SEE PATIENTS DOING	WHAT YOU MAY NOT REALIZE
6. Balancing with arms on therapy mat	Zac, hit by a falling tree in his car, his friend was also hit and was a Shepherd patient. Zac appears to have an injury around C7, which means he does not have any use of his trunk or legs. He has some arm muscles, but does not have use of fingers. He's holding his body weight with these few muscles, which means he's VERY strong in the muscles he does have. One therapist said about him "to be able to do this, he's like Superman in the muscles he does have." The physical therapist is leaning on him to wedge him to the mat so he doesn't fall as he's building his strength.
7. "Walking" suspended from ceiling on ZeroG Dynamic walking machine (G stands for "gravity")	Meg, hurt in dancing accident. She did a very complicated aerial move and came down on her neck. Meg is using this to practice walking without the pull of gravity. Without this machine it would take about 5 therapists to accomplish the same task with this patient. The therapist can instead focus on the patient's form and the patient can practice without being scared of falling
8. Putting on contacts	Fletcher, seen earlier, car accident. Fletcher is putting contact lenses using his knuckles instead of fingers. He does not have use of his hands. He may have had someone help him get "set up" by putting the contact on his knuckle for him. His injury is around C6 or C7.
9. Going downstairs in a wheelchair backwards	Nick, car accident, driver wearing a seatbelt, fell asleep at the wheel and hit a tree. He is leaning how to navigate stairs by going down backwards. He has paraplegia, which means he has full upper body strength including use of arms and hands. He needs to learn this so he can use stairs when there is no other option. Going up, someone would help wheelchair bump up each step (going backwards). Patient would need to "Hold on." Some very strong patients can pull themselves up in their chair (strapped to it) without help.
10. Therapist on mat with patient. Both laying on backs	Austin, "belly flopped" into an above ground pool into 4 feet of water. His injury is at C8 (the nerve, although note there is NO C8 vertebrae). He said he never hit anything, just landed funny on the water. Austin is on the therapy mat with his recreational therapist. Happy sharing moment.

Directions: View the "Fighters" video and with the help of your teacher complete the chart below.

WHAT YOU SEE PATIENTS DOING	WHAT YOU MAY NOT REALIZE
11. Singing in power wheelchair	Gavin dove off his parents' boat into shallow water in a lake. Gavin is using a power wheelchair. His injury is at C2 (like case study Levi). His headrest goes around the front of his head which means he needs total head support. The only body part this patient can move is his face. He is also on a ventilator so there is a hole in his neck called tracheostomy a tube goes. The ventilator breathes for him. Because he cannot turn his head, he has a mirror on the side of his chair so he can "look" behind him. He has a tube at his mouth that is called a "Sip-and-Puff" which allows him to control the motion of his chair by blowing or sucking through the tube. If this tube falls away from his mouth, he has no way to retrieve it and someone has to place it back for him. Also, his arms are strapped to his arm rests because he has no control over them. If they weren't strapped, the movement of the chair may cause them to fall sideways and collide with anything that got in their way.
12. Two patients singing in their wheelchairs	Parker (left), diving accident. Anthony (right), trampoline accident. Parker can move his hands and fingers. Anthony cannot move his hands and fingers. Even though their neck and shoulder muscles work, they both have headrests for weight shifts. Parker seems to have some good trunk strength, whereas Anthony does not and uses a chest strap to help hold him up.
13. Parade of wheelchair patients in blue carpet hallway	Notice who has a power chair vs. who has a manual chair. Notice the different levels of function. It's very hard to tell who has paraplegia and who has quadriplegia by just looking. Some patients with paraplegia may use a power wheelchair if they have a shoulder injury, for example. Some patients with tetraplegia might use a manual chair if they are injured around C6 or C7 because they can still use their arm muscles to push. Every case and every injury is different.
14. Moving from floor to wheelchair	Makiely, car accident. He has paraplegia and is transferring from the floor into a manual chair. Notice the other patient (Chris, car accident when he was 2 years old) is steadying the wheelchair for him, but Makiely can also lock his chair if he has to do this alone. This is a critical skill because people can fall out of their chairs and there might not be anyone to help them.
15. Doing circles in wheelchair	Gavin, seen earlier, diving accident. Gavin is showing how he can control his wheelchair with his Sip-and-Puff technology. He's gotten good at it, so he can go anywhere he wants to. Remember when he gets there, however, that he cannot open doors, press elevator button, he cannot grab a drink at the store, he cannot grab a tissue, etc.

Directions: View the "Fighters" video and with the help of your teacher complete the chart below.

WHAT YOU SEE PATIENTS DOING	WHAT YOU MAY NOT REALIZE
16. Patient and counselor walking down hallway	Drake was making a tackle in football and went head first into the ground with his head flexing toward his chest. He has a cast on his arm in order to increase range and decrease tone in his wrist.
17. Two patients - one throwing food into the mouth of the other	Chris (left), dove into a sandbar at the beach. His injury is at C5. Austin (seen earlier, belly flop accident). Austin has full use of his arms. Chris has less use of his arms. Notice also that he is wearing a cast on his arm. Patients often wear these because their muscles contract and they must be stretched out so he can have better arm function. It appears as though the cast is meant to stretch his biceps, which is a common need for someone with an injury at C5.
18. Putting on makeup	Brooke, dove from a pier into shallow water. She is injured at C6. She has a splint to hold her hands in position to hold her makeup brush. She can only move her wrists not her hands so she has to learn new ways to put on makeup.
19. Doing wheelies	Matt, injured at C7, was locked out and tried to get in his apartment window and fell four stories onto concrete. He's learning how to do wheelies with therapist supporting him. This skill is important because patients must learn to navigate obstacles in places that are not wheelchair accessible...like curbs. Notice that the muscles in his legs appear small. Muscles that do not function quickly become much smaller after a spinal cord injury. This is called atrophy.
20. The Real Deal	**REMEMBER - JUST A FEW WEEKS PRIOR TO THIS VIDEO, THESE YOUNG PEOPLE WERE UP, WALKING AROUND AND HAD NO IDEA THIS WAS GOING TO HAPPEN TO THEM. MAYBE SOME OF THEIR ACCIDENTS COULD HAVE BEEN PREVENTED ... IF THEY HAD KNOWN WHAT YOU NOW KNOW!**

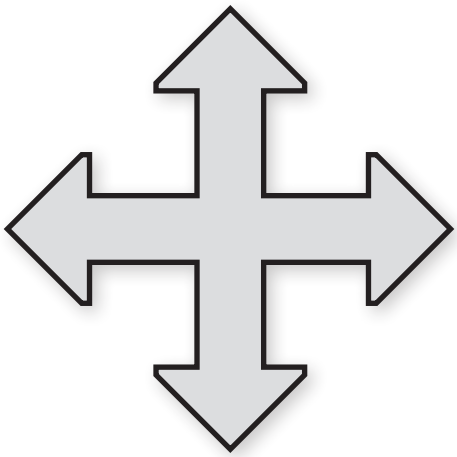


Persons with high level spinal cord injuries who do not have use of their hands can move their wheelchairs by breathing into a tube that controls the chair's movement. Patients move their chairs in any direction by following a code of breathing in (sipping) or blowing out (puffing). The sequence and intensity of the breathing directs the chair.

Activity: Using a straw with a balloon attached, sip and puff on the straw using the code below. Move your body in the direction that corresponds to the sips and puffs you make.

HARD PUFF
Moves The Chair
BACKWARDS

SOFT SIP
Moves The Chair
LEFT



SOFT PUFF
Moves The Chair
RIGHT

HARD SIP
Moves The Chair
FORWARD

Shepherd Center
INJURY PREVENTION

LESSON 7 Return to Daily Living

Learning Outcomes

Students will explore the long-term care needs of SCI and TBI patients.
Students will calculate their patient's long-term care expenses.
Students finalize their case study exhibit.

Teacher Planning

Students should remain in case study groups from Lesson 4 for this lesson.

Spend some time discussing the emotional costs that families experience when a loved-one suffers a TBI or SCI. Use the "What My Mom Did For Me" document in the student workbook as a catalyst for that discussion.

The Gabby Giffords video is excerpted from an ABC news report with Diane Sawyer. It demonstrates that after two years of rehabilitation, Ms. Giffords still struggles with daily living, especially her ability to speak, and she still requires therapy.

Each group will use the chart listing specific costs for their assigned case study patient's long-term care. During the completion of Task 11, students will be calculating the long-term care costs for one year. Some students might need help with the math calculations since unit costs vary on the chart – some expenses are listed as a single cost, weekly/monthly fees, etc. This variety is deliberate so that students are challenged to think about the accurate way to calculate yearly costs. The lesson also calls for all groups to calculate the total cost of all their patients combined and then to estimate and calculate the total life-time costs for their patients.

Review the "Traumatic Injury Exhibition" rating form found in the Lesson 8 section of the student workbook. So they have a clear understanding of expectations as they finalize their exhibit. The exhibition will take place during the next class.

Big Take Away:

Help students understand the enormous costs resulting from TBI and SCI. Also, discuss the emotional costs that cannot be measured in dollars.

Materials Needed

- Student Workbook:
  - "What My Mom Did For Me" Student Activity
  - Costs of Daily Living Task 11 (1 per assigned case study)
  - "Traumatic Injury Exhibition" rating form (Located in Lesson 8)
- Gabby Giffords ABC news interview video (2 minutes)
- Chart paper and art supplies

Activities

Engage

Direct students to read "What My Mom Did For Me."

Ask them to respond:

- What surprised you about the list?
- How would you feel if you were the patient?
- How would you feel if you were the mom?

Discuss the list and explain any care they have questions about.

Explore

Explain to students that throughout rehabilitation the medical team has been preparing the patients for a return to daily living by teaching them and their families the skills they will need to manage daily life. But traumatic injury patients have special needs for daily living as they have seen in the list of things the mom did. The medical team helps patients determine their long-term care needs. Many of these needs come with costs.

Play the Gabby Giffords video and instruct students to focus on the difficulty with which Ms. Giffords struggles to speak. Help students understand that after two years of rehabilitation, her need for further medical attention is evident.

Instruct students to locate the cost handouts for their specific case study in their workbooks and review all the items their patient will need to manage daily life. (Make sure students consult the chart that matches their case study patient – see names at top of the chart). Have students review the costs. Students should understand the extensive amount of care their patient will require.

Explain

Some students may find the cost calculation activity challenging. It might be helpful to carefully guide them through the activity step by step:

Step 1. Direct students to review each item in the "Cost" column. Next mark those items that are single costs with a symbol of their choice, like a star or arrow. Then, enter all the single cost items in the "Total Cost per Item for One Year" column.

Step 2. Direct students to circle the items that require calculations to determine the yearly cost for that item (i.e., $400 [weekly cost] x 52 = $20,800). Have students make those calculations and enter the results in the "Total Cost per Item for One Year" column.

Step 3. Once all yearly costs have been calculated, direct students to add each **section's costs using the amounts in the "Total Cost per Item for One Year"** column and enter their results on the "Section Total" line.

Step 4. Students can then calculate the **Total Cost for One Year** by summing the totals from each section.

Step 5. Finally have students share their calculations with the other students in their group. If individual totals differ, instruct students to backtrack by checking the calculations and totals section by section until they come to agreement.

Once each group has determined an accurate total cost for the patient, students should add this information to their case study exhibits.

Step 6. Conduct two additional cost calculations with the entire class and discuss the importance of each:

A. Direct students to add together all the first year costs for each patient to get a total first year costs for all of the case studies combined.

B. Then have the class consider the age of their patient and estimate how long that patient might be expected to live. Next look at the yearly costs and determine which will be on-going for the life of that patient. Finally calculate the total cost of care for that patient over the patient's lifetime.

   Help students understand the enormity of these costs by comparing them with other costs like the cost of a typical house, new car, and other expenses appropriate for your students. Stress the enormous costs that result from traumatic injury and that can burden families who care for injured patients. Take time to have students consider the emotional costs that cannot be measured in dollars.

   These two calculations could be displayed as part of the case study exhibit.

Elaborate

Students prepare for their case study exhibit and finalize exhibit details. Students should consult the "Traumatic Injury Exhibition" rating form (Lesson 8) that lists exhibit elements and make sure their exhibit is ready to present.

Ticket Out

Each group should report on their exhibit status; are they ready to present or do they need more time. If time is needed, they must explain what is left to do. Also, review costs to check and evaluate calculations.

Standards Addressed

Georgia Performance Standards – Science Grade 7

S7CS3. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

a. Analyze scientific data by using, interpreting, and comparing numbers in several equivalent forms, such as integers, fractions, decimals, and percents.
b. Use the mean, median, and mode to analyze a set of scientific data.
c. Apply the metric system to a scientific investigation that includes metric to metric conversion. (i.e. centimeters to meters)
d. Draw conclusions based on analyzed data.
e. Decide what degree of precision is adequate, and round off appropriately.
f. Address the relationship between accuracy and precision and the importance of each.

S7CS6. Students will communicate scientific ideas and activities clearly.

a. Write clear, step-by-step instructions for conducting particular scientific investigations, operating a piece of equipment, or following a procedure.
b. Write for scientific purposes incorporating data from circle, bar and line graphs, two-way data tables, diagrams, and symbols.
c. Organize scientific information using appropriate simple tables, charts, and graphs, and identify relationships they reveal.

S7CS10. Students will enhance reading in all curriculum areas by:

a. Reading in All Curriculum Areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
   - Read both informational and fictional texts in a variety of genres and modes of discourse
   - Read technical texts related to various subject areas

b. Discussing books
   - Discuss messages and themes from books in all subject areas.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

c. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

d. Establishing context
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

Common Core Anchor Standards

R.CCR.10: Read and comprehend complex literary and informational texts independently and proficiently.

W.CCR.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

SL.CCR.1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

I always knew my mom loved me but never realized how much until she had to care for me when I returned home from rehab. Here is what she did every day.

She had to give me a bath in bed.

She had to spend 30 minutes dressing me.

She had to brush my teeth and comb my hair.

She had to help me cough by pushing on my abdomen.

She had to prepare every meal and snack I ate.

She had to feed me.

She constantly helped me fight despair and depression.

She had to insert a catheter into my bladder and change the urine bag when needed.

She had to help me with my bowels every day by giving me a suppository and then cleaning me.

She had to wipe away my tears.

She had to help me get into a car.

She had to help me change position every 30 minutes during the day to avoid pressure sores on my butt.

She had to **get up every two hours** during the night to turn me from side to side and keep pillows between my knees and under my feet to keep the skin from developing sores.

She rejoiced at every improvement in my condition no matter how slight.

She never stopped showing her love for me.

CAYLEE (TBI Moderate)

Typically patients are ready to go home after about two months in rehabilitation. Family and friends must make careful preparations to help the patient with this transition. One of the most critical concerns for daily living is the costs to the families.

Directions: The rehabilitation team has identified the following expenses will be required for your patient. Read through the list carefully looking at the costs of each item. Notice how each cost is reported. Some are one-time costs while some are recurring. Use this information to calculate your patient's expenses for one year of care on the Task 11 form.

MODERATE TBI LONG-TERM CARE EXPENSES		
ITEM	**COST** All items are one time costs unless otherwise indicated.	**TOTAL COST PER ITEM FOR ONE YEAR**
Home Modifications		
1. Grab Bars in Shower	$100 x 1	$100
2. Hand-Held Shower Spray	$30 x 1	$30
3. Life-Line Alert System (To call for help if she falls)	$95 contract fee; $30 monthly service fee = $95 + ($30 x 12)	$455
		Section total: $585
Equipment		
1. Shower seat	$60 x 1	$60
2. Bedside commode	$45 x 1	$45
3. Walker	$115 x 1	$115
4. Wheelchair rental (only needs for one year)	$140/month x 12	$1,680
5. Diapers/misc.	$60/month x 12	$720
		Section total: $2,620
Daily Living Assistance		
1. Medicine	$180/month x 12	$2,160
2. Pill Organizer	$7 x 1	$7
3. Personal Care Assistant for 3 months - 10 hours per day	$20/hour x 10 hrs = $200/day x 90 days	$18,000
4. Follow-up therapy, 4 weeks	$400/week x 4	$1,600
		Section total: $21,767
		Total cost for one year: $24,972

ASSUMPTIONS:

- There are 52 weeks in a year
- There are 365 days in a year
- There are 12 months in a year
- There are 30 days in a month
- Days are 24 hours long

TREY (Severe TBI)

Typically patients are ready to go home after about two months in rehabilitation. Family and friends must make careful preparations to help the patient with this transition. One of the most critical concerns for daily living is the costs to the families.

Directions: The rehabilitation team has identified the following expenses will be required for your patient. Read through the list carefully looking at the costs of each item. Notice how each cost is reported. Some are one-time costs while some are recurring. Use this information to calculate your patient's expenses for one year of care on the Task 11 form.

SEVERE TBI LONG-TERM CARE EXPENSES		
ITEM	**COST** All items are one time costs unless otherwise indicated.	**TOTAL COST PER ITEM FOR ONE YEAR**
Home Modifications		
1. Ramps	$700 x 1	$700
2. Shower modifications	$1,900 x 1	$1,900
3. Hand-held Shower Sprayer	$30 x 1	$30
4. Doorways	$2,000 x 1	$2,000
5. Electrical power supply additions	$1,200 x 1	$1,200
6. Back-up generator (for the ventilator in case the power goes out)	$2,000 x 1	$2,000
		Section total: $7,830
Equipment		
1. Roll-in Shower Chair	$2,500 x 1	$2,500
2. Wheelchair, manual	$2,500 x 1	$2,500
3. Wheelchair, power - may need for longer distances in the community (for emergency evacuation)	$25,000 x 1	$25,000
4. Hoyer, manual - a metal lift used to help transfer the person from one surface to another.	$750 x 1	$750
5. Hospital Bed	$1,500 x 1	$1,500
6. Hand Splints	$400 x 1	$400
7. Leg Splints	$1,500 x 1	$1,500
8. Ventilator	$300/month x 12	$3,600
9. Wheelchair accessible van	$42,000 x 1	$42,000
		Section total: $79,750
Daily Living Assistance		
1. Medicine	$200/month x 12	$2,400
2. Feeding Pump	$1,000 x 1	$1,000
3. Tubing bags	$100/month x 12	$1,200
4. Tube Feeding	$270/month x 12	$3,240
5. Blood Pressure Cuff	$50 x 1	$50
6. Suction machine/supplies	$650/year x 1	$650
7. Diapers/ Supplies	$150/month x 12	$1,800
8. Personal Care Assistant - 24 hours every day	$20/hour x 24hrs x 365 days	$175,200
		Section total: $185,540
		Total cost for one year: $273,120

ASSUMPTIONS:

- There are 52 weeks in a year
- There are 365 days in a year
- There are 12 months in a year
- There are 30 days in a month
- Days are 24 hours long

MAYA (TBI Moderate)

Typically patients are ready to go home after about two months in rehabilitation. Family and friends must make careful preparations to help the patient with this transition. One of the most critical concerns for daily living is the costs to the families.

Directions: The rehabilitation team has identified the following expenses will be required for your patient. Read through the list carefully looking at the costs of each item. Notice how each cost is reported. Some are one-time costs while some are recurring. Use this information to calculate your patient's expenses for one year of care on the Task 11 form.

MODERATE TBI LONG-TERM CARE EXPENSES		
ITEM	**COST** All items are one time costs unless otherwise indicated.	**TOTAL COST PER ITEM FOR ONE YEAR**
Home Modifications		
1. Grab Bars in Shower	$100 x 1	$100
2. Hand-Held Shower Spray	$30 x 1	$30
3. Life-Line Alert System (To call for help if she falls)	$95 contract fee $30 monthly service fee = $95 + ($30 x 12)	$455
		Section total: $585
Equipment		
1. Shower seat	$60 x 1	$60
2. Bedside commode	$45 x 1	$45
3. Walker	$115 x 1	$115
4. Wheelchair rental (only needs for one year)	$140/month x 12	$1,680
5. Diapers/misc.	$60/month x 12	$720
		Section total: $2,620
Daily Living Assistance		
1. Medicine	$180/month x 12	$2,160
2. Pill Organizer	$7 x 1	$7
3. Personal Care Assistant for 3 months - 10 hours per day	$20/hour x 10 hrs = $200/day x 90 days	$18,000
4. Follow-up therapy for 4 weeks	$400/week x 4	$1,600
		Section total: $21,767
		Total cost for one year: $24,972

ASSUMPTIONS:

- There are 52 weeks in a year
- There are 365 days in a year
- There are 12 months in a year
- There are 30 days in a month
- Days are 24 hours long

KENDRICK (C4 Tetraplegia)

Typically patients are ready to go home after about two months in rehabilitation. Family and friends must make careful preparations to help the patient with this transition. One of the most critical concerns for daily living is the costs to the families.

Directions: The rehabilitation team has identified the following expenses will be required for your patient. Read through the list carefully looking at the costs of each item. Notice how each cost is reported. Some are one-time costs while some are recurring. Use this information to calculate your patient's expenses for one year of care on the Task 11 form.

SCI LONG-TERM CARE EXPENSES – C4 Tetraplegia		
ITEM	**COST** All items are one time costs unless otherwise indicated.	**TOTAL COST PER ITEM FOR ONE YEAR**
Home Modifications		
1. Ramps	$700 x 1	$700
2. Roll-in shower	$1,800 x 1	$1,800
3. Lower kitchen sink/counters	$1,000 x 1	$1,000
4. Widen doorways	$2,000 x 1	$2,000
		Section total: $5,500
Equipment		
1. Hospital Bed	$1,000 x 1	$1,000
2. Wheelchair, back-up manual, in case power chair breaks or person must travel in a car.	$2,500 x 1	$2,500
3. Wheelchair, power	$25,000 x 1	$25,000
4. Hoyer, a metal lift used to help transfer the person from one surface to another.	$750 x 1	$750
5. Bathroom equipment - roll-in shower chair: a special wheelchair that can get wet.	$2,500 x 1	$2,500
6. Hands free telephone system	$300 x 1	$300
7. Wheelchair accessible van	$42,000 x 1	$42,000
		Section total: $74,050
Daily Living Assistance		
1. Medicine	$200/month x 12	$2,400
2. Bowel and bladder supplies	$500/month x 12	$6,000
3. Personal Care Assistant - 24 hours day, every day	$20/hour x 24hrs day= $480/day x 365 days/year	$175,200
4. Therapy (physical, occupational) - Weekly for one year	$400/week x 52	$20,800
5. Blood pressure cuff	$50 x 1	$50
6. Medication organizer box	$7 x 1	$7
		Section total: $204,457
		Total cost for one year: $284,007

ASSUMPTIONS:

- There are 52 weeks in a year
- There are 365 days in a year
- There are 12 months in a year
- There are 30 days in a month
- Days are 24 hours long

RICO (C7 Low Tetraplegia)

Typically patients are ready to go home after about two months in rehabilitation. Family and friends must make careful preparations to help the patient with this transition. One of the most critical concerns for daily living is the costs to the families.

Directions: The rehabilitation team has identified the following expenses will be required for your patient. Read through the list carefully looking at the costs of each item. Notice how each cost is reported. Some are one-time costs while some are recurring. Use this information to calculate your patient's expenses for one year of care on the Task 11 form.

SCI LONG-TERM CARE EXPENSES – C7 Low Tetraplegia		
ITEM	**COST** All items are one time costs unless otherwise indicated.	**TOTAL COST PER ITEM FOR ONE YEAR**
Home Modifications		
1. Ramps	$700 x 1	$700
2. Roll-in shower	$1,800 x 1	$1,800
3. Lower kitchen sink/counters	$1,000 x 1	$1,000
4. Widen doorways	$2,000 x 1	$2,000
		Section total: $5,500
Equipment		
1. Wheelchair, manual	$2,500 x 1	$2,500
2. Wheelchair, power - may need for longer distances in the community	$25,000 x 1	$25,000
3. Hoyer, a metal lift used to help transfer the person from one surface to another.	$750 x 1	$750
4. Slide board - wooden board for transferring out of the wheelchair.	$50 x 1	$50
5. Bathroom equipment - tub bench	$100 x 1	$100
6. Bathroom equipment - padded, raised toilet seat	$300 x 1	$300
7. Car, already owned, modified with hand controls	$16,500 x 1	$16,500
		Section total: $45,200
Daily Living Assistance		
1. Medicine	$200/month x 12	$2,400
2. Bowel and bladder supplies	$500/month x 12	$6,000
3. Therapy (physical, occupational) - 10 weeks	$400/week for 10 weeks	$4,000
4. Blood pressure cuff	$50 x 1	$50
5. Medication organizer box	$7 x 1	$7
		Section total: $12,457
		Total cost for one year: $63,157

ASSUMPTIONS:

- There are 52 weeks in a year
- There are 365 days in a year
- There are 12 months in a year
- There are 30 days in a month
- Days are 24 hours long

MORGAN (T9 Paraplegia)

Typically patients are ready to go home after about two months in rehabilitation. Family and friends must make careful preparations to help the patient with this transition. One of the most critical concerns for daily living is the costs to the families.

Directions: The rehabilitation team has identified the following expenses will be required for your patient. Read through the list carefully looking at the costs of each item. Notice how each cost is reported. Some are one-time costs while some are recurring. Use this information to calculate your patient's expenses for one year of care on the Task 11 form.

SCI LONG-TERM CARE EXPENSES – T9 Paraplegia		
ITEM	**COST** All items are one time costs unless otherwise indicated.	**TOTAL COST PER ITEM FOR ONE YEAR**
Home Modifications		
1. Ramps	$700 x 1	$700
2. Lower kitchen sink/counters	$1,000 x 1	$1,000
3. Widen doorways	$2,000 x 1	$2,000
		Section total: $3,700
Equipment		
1. Wheelchair, manual	$2,500 x 1	$2,500
2. Bathroom equipment - tub bench	$100 x 1	$100
3. Bathroom equipment - padded, raised toilet seat	$300 x 1	$300
4. Car, new modified with hand controls	$42,000 x 1	$42,000
		Section total: $44,900
Daily Living Assistance		
1. Medicine	$180/month x 12	$2,160
2. Bowel and bladder supplies	$500/month x 12	$6,000
3. Therapy (physical, occupational) - 4 weeks	$400/week, 4 weeks	$1,600
4. Blood pressure cuff	$50 x 1	$50
5. Medication organizer box	$7 x 1	$7
		Section total: $9,817
		Total cost for one year: $58,417

ASSUMPTIONS:

- There are 52 weeks in a year
- There are 365 days in a year
- There are 12 months in a year
- There are 30 days in a month
- Days are 24 hours long

LEVI (C2 Tetraplegia)

Typically patients are ready to go home after about two months in rehabilitation. Family and friends must make careful preparations to help the patient with this transition. One of the most critical concerns for daily living is the costs to the families.

Directions: The rehabilitation team has identified the following expenses will be required for your patient. Read through the list carefully looking at the costs of each item. Notice how each cost is reported. Some are one-time costs while some are recurring. Use this information to calculate your patient's expenses for one year of care on the Task 11 form.

SCI LONG-TERM CARE EXPENSES - C2 TETRAPLEGIA		
ITEM	**COST** All items are one time costs unless otherwise indicated.	**TOTAL COST PER ITEM FOR ONE YEAR**
Home Modifications		
1. Ramps	$700 x 1	$700
2. Roll in shower	$1,800 x 1	$1,800
3. Lower kitchen sink/counters	$1,000 x 1	$1,000
4. Widen doorways	$2,000 x 1	$2,000
5. Electrical power supply additions	$1,200 x 1	$1,200
6. Back-up generator (for the ventilator in case the power goes out)	$2,000 x 1	$2,000
		Section total: $8,700
Equipment		
1. Hospital Bed	$1,000 x 1	$1,000
2. Wheelchair, back-up manual, in case power chair breaks or person must travel in a car.	$2,500 x 1	$2,500
3. Wheelchair, power	$25,000 x 1	$25,000
4. Hoyer, manual - a metal lift used to help transfer the person from one surface to another.	$750 x 1	$750
5. Bathroom equipment - roll-in shower chair: a special wheelchair that can get wet.	$2,500 x 1	$2,500
6. Ventilator	$300/month x 12	$3,600
7. Inexsufflator: cough machine	$9,000 x 1	$9,000
8. Hands free telephone system	$300 x 1	$300
9. Wheelchair accessible van	$42,000 x 1	$42,000
		Section total: $86,650
Daily Living Assistance		
1. Medicine	$200/month x 12	$2,400
2. Bowel and bladder supplies	$500/month x 12	$6,000
3. Personal Care Assistant - 24 hrs/day every day	$20/hour x 24hrs day= $480/day x 365 days/year	$175,200
4. Therapy (physical, occupational) weekly for one year	$400/week x 52	$20,800
5. Blood pressure cuff	$50 x 1	$50
6. Medication organizer box	$7 x 1	$7
		Section total: $204,457
		Total cost for one year: $299,807

ASSUMPTIONS:

- There are 52 weeks in a year
- There are 365 days in a year
- There are 12 months in a year
- There are 30 days in a month
- Days are 24 hours long

JARED (L3 Paraplegia)

Typically patients are ready to go home after about two months in rehabilitation. Family and friends must make careful preparations to help the patient with this transition. One of the most critical concerns for daily living is the costs to the families.

Directions: The rehabilitation team has identified the following expenses will be required for your patient. Read through the list carefully looking at the costs of each item. Notice how each cost is reported. Some are one-time costs while some are recurring. Use this information to calculate your patient's expenses for one year of care on the Task 11 form.

SCI LONG-TERM CARE EXPENSES – L3 Paraplegia		
ITEM	**COST** All items are one time costs unless otherwise indicated.	**TOTAL COST PER ITEM FOR ONE YEAR**
Home Modifications		
1. Ramps	$700 x 1	$700
2. Lower kitchen sink/counters	$1,000 x 1	$1,000
3. Widen doorways	$2,000 x 1	$2,000
		Section total: $3,700
Equipment		
1. Wheelchair, manual	$2,500 x 1	$2,500
2. Bathroom equipment - tub bench to sit on	$100 x 1	$100
3. Leg braces for brace walking	$1,000 x 1	$1,000
		Section total: $3,600
Daily Living Assistance		
1. Medicine	$200/month x 12	$2,400
2. Bowel and bladder supplies	$500/month x 12	$6,000
3. Therapy (physical, occupational) - 4 weeks	$400/week x 4	$1600
4. Blood pressure cuff	$50 x 1	$50
5. Medication organizer box	$7 x 1	$7
		Section total: $10,057
		Total cost for one year: $17,357

ASSUMPTIONS:

- There are 52 weeks in a year
- There are 365 days in a year
- There are 12 months in a year
- There are 30 days in a month
- Days are 24 hours long

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INJURY PREVENTION

LESSON 8 Traumatic Injury Exhibition

Learning Outcomes

Students will understand the serious injuries, significant impacts, and enormous costs (medical, financial, emotional) that result from risky behavior leading to traumatic injury.
Students organize and present an exhibit following prescribed criteria.
Students practice evaluating peer presentations and providing appropriate peer feedback.
Students will understand the essentials of disability etiquette.
Students will understand and practice disability etiquette though a variety of activities.

Teacher Planning

Select the presentation option that works best for your students: Group Presentations or Gallery Walk.

If groups are making presentations, be sure they understand the expectation for the information to be presented. This format allows presenters control over the information presented.

If students will engage in a gallery walk, organize their movement around the room and make sure they understand the rating form. This format means students must locate info on exhibits as they visit them. If the students are peer rating, be sure to provide enough copies of the rating form.

The "Traumatic Injury Exhibition" rating form provides suggested criteria for evaluation; this document can be adjusted to meet the needs of your students. The exhibit ratings can serve as a formative assessment for the case study portions of the unit. If the students are peer rating, be sure to provide enough copies of the rating form.

The "Getting It Right: Disability Etiquette" Task 12 provides an important extension or a separate lesson that can have a positive impact on students' understanding of students with disabilities in the school community and help students interact with those students in appropriate ways. This might be an opportunity to invite students with disabilities into your classroom. You can select appropriate activities from the Task for your students and consider using some of the activities as homework. If the role-playing activity is assigned (#3), try to guide group selection of behaviors so that a variety of different etiquette behaviors are demonstrated for the class. This could be managed by assigning behaviors for each group to portray.

Materials Needed

- Student Worbook:
  - "Traumatic Injury Exhibition" rating forms
  - "Etiquette Guidelines"
  - "Getting It Right: Disability Etiquette" Task 12
- Case study exhibits displayed around the room

Activities

Traumatic Injury Exhibition: Explain the exhibition format.

Group Presentations: Each group presents their case study explaining the exhibit they have prepared about their case study. The presentation should include all elements on the "Traumatic Injury Exhibition" rating form. Students can conduct peer evaluations as each group presents.

Gallery Walk Alternative: Allow students to conduct a gallery walk around the Traumatic Injury Exhibition and complete peer evaluations.

Elaborate

Disabilities Etiquette Activity
Direct the students to the "Etiquette Guidelines" page in their workbooks.
Instruct students to carefully read each guideline. Have students discuss briefly. Take time to help students understand each guideline. Review the Task 12 activities and assign all or selected activities. Some of these can be completed for homework.

Reflection – Ticket out the Door

Have students divide a piece of paper into 4 sections and complete each as follows:

1. In the upper left corner, draw a heart and write one thing they loved most about the exhibition.
2. In the upper right corner, draw a square and write the four things they want to remember about the case studies presented.
3. In the lower left corner, draw a triangle and write the three things that surprised them about the cases presented.
4. In the lower right corner, draw a circle and write one statement that would be important for others to know about traumatic injury.

Evaluate

Review the "Traumatic Injury Exhibition" ratings

Standards Addressed

Common Core Anchor Standards

SL.CCR.1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Traumatic Injury Exhibition Rating

Names of Presenters:

_____ _____ _____ _____ _____

Each presentation must include all the elements described on the evaluation form below.

1 = Could Be Better; missing or incorrect information
2 = Good Job: minor gaps or mistakes in information
3 = Way to Go; all elements included

Presentation Elements

1. Description of case study patient: Score _____

- Age
- Gender
- Interests
- Personality

2. Narration of injury story: Score _____

- What happened
- What risky behavior caused the injury

3. Explanation of the patient's injuries Score _____

- Description of the anatomy involved
- Explanation of the level of injury

4. Explanation of the injury impacts (select those that apply) Score _____

- Physical
- Cognitive/Communication
- Daily Living

5. Summary of Rehab activities Score _____

6. Cost for Care Score _____

7. Presentation Skills: Score _____

- Organized
- Clear
- Participant demeanor

Total Score _____

Name of Rater:

_____

Get it Right: Disability Etiquette Guidelines

What's The Best Way To Think About Someone With A Disability?

- Remember the Golden Rule. Treat others the way you wish to be treated.
- There is much more to a person than their disability. Each person has strengths you can appreciate if you take the time to recognize them. A person with a disability can also be a son, writer, mother, singer, basketball player, engineer and many other things.
- See people with disabilities as ordinary people actively going about the business of living as other people do, not as passive victims, tragic figures, or super-heroes.

How Should I Talk To Someone With A Disability?

- Talk normally, don't talk down to the person and don't raise your voice unless the person asks you to.
- Speak directly to a person with a disability, rather than through a companion who may be along.
- Pay attention and be patient if the person speaks slowly. Wait for the person to finish speaking. Do not finish their sentences or speak for them.
- Don't pretend to understand what someone is saying if you don't. Politely ask them to repeat it.
- Use language that puts the person before the disability and describes what a person has, not who a person is, i.e. "has paraplegia", not "is paraplegic" This is called "People First Language."
- Relax. Don't be embarrassed or apologize if you happen to use common expressions that seem to relate to the person's disability, such as "See you later" (to person who is blind) or "I've got to run" (to a person with paraplegia)
- Avoid negative, disempowering words such as "confined, suffers from, a victim of, or afflicted with."

How Should I Act Around Someone With A Disability?

- In greetings, offer to shake hands and be prepared to "shake" whatever is offered to you.
- Always ask if and how you may assist the person; don't be surprised or offended if the person is not interested in your assistance. When you offer to assist someone with walking, allow the person to take your arm. This will help you to guide, rather than propel or lead, the person.
- Ask permission before touching the person or any assistive device, such as a wheelchair or cane. Never move a person's wheelchair or other device out of reach or without permission.
- Make eye contact without staring.
- Don't touch, talk to or try to engage with a service animal.
- Never slap a disabled person on the back or thigh as a goodwill gesture, they could be thrown off balance or have a muscle spasm or seizure.
- Don't make choices for the person who is disabled such as where they should sit at the dinner table. Allow them to make their own decisions.

Task 12: Getting It Right: Disability Etiquette

Student Task

Complete the following activities as directed by your teacher.

1. Draw a picture of yourself. Cover that picture with all the important people, activities, and interests that you think make you who you are. For example, if you love to swim, add a pool, if you love to read, add a book. Then write 5 adjectives that your best friend might use to describe you.

   Next drawn a second picture of yourself. On that picture, write only ONE item from the first picture. Compare the two pictures and reflect on how each one makes your feel. Write a paragraph explaining which one you prefer and why.

   Explain how someone might feel when they are defined only by their disability.

2. Reflect on any incidents you may have seen at school, the mall, church or somewhere else where a person with a disability was being treated in ways that might make them feel uncomfortable? With a partner, describe what happened. Explain how you could "redo" this event using what you've learned about disability etiquette. What would you do differently (even if the event didn't involve you).

3. Select one person in your group to role-play a person with a disability; this person could be the teen in your case study. Create two situations where the group members interact with the person with the disability. The situations can display either appropriate or inappropriate etiquette. Act out your situations for the rest of the class. The class will have to determine what kind of behavior is being portrayed – appropriate or inappropriate etiquette.

4. Write a letter to a sibling or a friend who has not been in this class. Explain to them the most important things you have learned about how to think about, talk to and act around someone with a disability.

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LESSON 9

"You've Got a Friend in Me" Being an Injury Prevention Advocate

Learning Outcomes

Students will investigate the concept of advocacy and brainstorm examples of successful advocates.
Students will translate advocacy messages into language comfortable for them to use as advocates for SCI and TBI safety.
Students will create safety skits depicting appropriate use of advocacy language.

Teacher Planning

Students will be working in groups during this lesson, but these groups could consist of a new combination of students. It might be good to mix up students who worked on TBI with those who worked on SCI for this lesson.

Familiarize yourself with the *Toy Story* movie song "You've Got a Friend in Me." Prepare to lead a discussion making the following points:

Friends do many things with and for each other:

- Being a friend means keeping friends safe and speaking up when friends are in danger, in other words being a safety advocate for friends.
- They are embarking upon their teenage years when they will most likely be confronted with many opportunities to engage in risky behavior or witness others doing risky things.
- They need to consider what they will do to prevent themselves and their friends from experiencing the kinds of traumatic injury they have just studied.

Select four students to act out a skit for the rest of the class and give them a copy of the texting while driving model script to follow.

Post the skit requirements so students know the guidelines for the skits they will create.

A. The plot will be drawn at random from the list provided in the lesson materials. Suggestion: students may have the option of using their case study patient's story as the plot for their skit.

B. Each skit must have the three essential characters:
   - Risk taker
   - Safety advocate
   - Encouragers of risk (more than one depending on group size)

C. Student must use at least two of the "messages" from the list of "Safety Messages" provided in their workbooks but that message must be delivered in language comfortable for the students.

D. The skit must model real-life safety advocacy that other students could use.

Also, review the skit rating form with them so students are aware of the criteria for evaluation. If students will be rating skits, make sufficient copies for them to do so.

At the end of class, project the Ticket Out question for students.

BIG TAKE AWAY:

Being a safety advocate will not be easy, but these students have been given an advantage of special knowledge about TBI and SCI injury that their friends may not have. Sharing this knowledge with friends who might be at risk is a true act of friendship.

Materials Needed

- Student Workbook:
  - Advocacy Skit rating forms
  - Being an Injury Prevention Advocate Task 13
- "You've Got a Friend in Me" song (2:00) available on YouTube
- "Texting While Driving" model skit (4 copies for selected student performance)
- Copies of Advocacy skit rating forms for each student
- Computer to project Ticket Out question

Activities

Engage

Play the song "You've Got a Friend in Me" as students enter class. Instruct students to brainstorm a list of things friends do for each other while listening to the song.

Explore

Lead a discussion about friendship emphasizing what friends do for each other. Have students share from the list they just created. See if any students say that being a friend means keeping others from harm. Lead the discussion to that concept of friendship. Some suggested talking points follow:

- Friends do many things with and for each other.
- Being a friend means keeping friends safe and speaking up when friends are in danger, in other words being a safety advocate for friends.
- They are embarking upon their teenage years when they will most likely be confronted with many opportunities to engage in risky behavior or witness others doing risky things.
- They need to consider what they will do to prevent themselves and their friends from experiencing the kinds of traumatic injury they have just studied.

Point out that students have spent the considerable time learning what happened to a "friend" who was seriously injured. Challenge students to reflect on this question.

If you could prevent one of your friends from experiencing the kind of injury you have just explored with your case study "friend," would you want to do so?

Write the word "advocate" on the board and discuss its meaning. Connect the words "friendship" and "advocate" by discussing that being a friend means keeping friends safe and speaking up when friends are in danger, in other words being a safety advocate.

Point out that they will probably have many opportunities to become "Advocates for TBI and SCI Injury Prevention" since teens often engage in risky behavior. They have gained a great deal of knowledge from this study that other teens may not have. They can put that knowledge to good use.

Explain

Explain that during today's lesson they will have an opportunity to practice being an injury prevention advocate by creating skits that demonstrate appropriate ways to be an advocate and keep friends safe. Have the selected students perform the model skit for the class. Discuss the actions of each of the different characters in the skit:

1. Risk taker
2. Safety advocate
3. Encouragers of risk

Dissect the ways the advocate tried to encourage safety by looking at the language used and the number of interventions attempted. This story turned out ok but what could have happened? How easy was it for the advocate to speak up? Take time to discuss the difficulty of speaking up and the importance of doing so.

Elaborate

Explain that students will write their own skit. Provide the ground rules:

A. The plot will be selected at random from the "Advocacy Skit Scenarios" provided in Task 13 in the student workbook. Suggestion: students may have the option of using their case study patient's story as the plot for their skit.

B. Each skit must have the three essential characters:

- Risk taker
- Safety advocate
- Encouragers of risk (more than one depending on group size)

C. Student must use at least two of the "messages" from the list of "Advocacy Safety Messages" provided in the student workbook but that message must be delivered in language comfortable for the students.

D. The skit must model real-life safety advocacy that other students could use.

Provide a brief but appropriate time limit to develop the skit and for the length of the skit so that students have time to perform.

Have students perform skits for the class. The rest of class can be rating skits as they are performed. Debrief after skits by emphasizing the language and actions of the advocate.

Finally have student write any new prevention ideas on the Prevention poster displayed in the classroom since Lesson 1.

Evaluate

Collect student rating forms for each skit.

Ticket Out the Door

Ask students to rate their willingness to be a safety advocate by responding to the following question:

How likely will you be to speak up with conviction and be a safety advocate when you see friends engage in risky behavior?

Rating scale: **1 – not likely** **2 - perhaps** **3 - willing to try** **4 - definitely doing it**

Standards Addressed

Georgia Performance Standards – Science Grade 7

S7CS10. Students will enhance reading in all curriculum areas by:

a. Reading in All Curriculum Areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
   - Read both informational and fictional texts in a variety of genres and modes of discourse
   - Read technical texts related to various subject areas

b. Discussing books
   - Discuss messages and themes from books in all subject areas.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

c. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

d. Establishing context
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

Common Core Anchor Standards

W.CCR.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

SL.CCR.6: Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

"Texting While Driving" Model Skit

Characters: Mother; Kelsie, 7th grader, advocate; Carley (sister), 9th grader; Robert (brother), 11th grader

ACTION: (A mother and three of her children run towards their shiny black SUV parked in the driveway.)

Mother: "We're going to be late to the movie. Hurry up!"

(Robert opens the back door and Carley and he climb in.)

Robert: "Relax, Mom. We've got plenty of time." (Robert pulls out his smart phone and begins to text his best friend.)

Carley: "I can't wait to see this movie! I heard it's really good."(Carley begins to look in her purse for her ipod. She can't seem to find it.)

Kelsie: (slides into the front passenger seat) "I heard the movie is good, too. Everyone at school is talking about it."

Mother: (places her smart phone on console and then cranks engine) "Okay, everybody, remember the rule: Buckle up before we take off."

(Mother and all three children fasten their seatbelts. Mother backs out of driveway, looks right and then left before entering the street, and starts to drive.)

Kelsie: "Did you get the car washed today, Mom? The dashboard really looks clean."

Mother: "Sure did, honey. Went over to ---"

(Suddenly, Mother's phone alerts her that she has received a text. She looks down at the phone and starts to read the message.)

Kelsie: "Mom, remember the rule: no talking on phone while driving! That includes looking down."

Robert: (mockingly). "Yeah, Mom, remember the rule."

Mother: "It's a text from your father; it's important. I've got to answer him."

Kelsie: "Mom, NO! You've told us never to ---."

(Kelsie suddenly yells.) "YOU JUST WENT THROUGH A RED LIGHT!"

Carley: "It was yellow..."

Robert: (Now leaning into the front seat) "It was yellow. Calm down, Kelsie."

(Mother ignores requests and continues to text)

Kelsie: "Mom, stop it. If you don't put the phone down, I'm going to take off my seat belt. The law says you have to wear a seat belt and the law also says you can't drive and text. If you're breaking the law, then so am I! (Kelsie starts to unbuckle her seatbelt, turns to her sister and brother in the back seat.)

Kelsie: "Carley and Robert take off your seat belts!"

Mother: “Put that seatbelt back on right now.” (Mother continues to text.)

Robert: “Kelsie, you need to wear your seatbelt. With Mom still texting and driving, we’re going to have an accident. Buckle up!”

Kelsie: “MOTHER, stop texting! You don’t want us be paralyzed for the rest of our lives; do you? Put the phone down!”

(Kelsie secures her seatbelt)

Mother: “Just give me one more second; I’m almost through.”

(Suddenly, the car swerves and the right tire hits the sidewalk. Mother stops texting, pulls into a side street and parks car at the curb. Everyone gets out to assess the damage.)

Mother: “I’m afraid we have a flat tire.”

Kelsie: “At least you didn’t run over and kill someone.”

Carley: “Yeah, then we’d have a flat person.”

Kelsie: “Mom, I will never ride with you again if you text and drive. Do you hear me? You could have killed somebody or killed us.”

Mother: “Yes, Kelsie, you’re right. I’ve learned my lesson. This could have been ended up a tragedy. I could have hurt someone else, or one of my precious children.”

Kelsie: “Mom, you have to promise never to do that again and to always keep your eyes on the road when you’re driving.”

Mother: “I promise.”

Task 13: Being an Injury Prevention Advocate

Student Task

Directions: Create a skit that portrays an effective safety message and shows others how to be a good injury prevention advocate. Use one of the scenarios below as directed by your teacher. Be sure the skit includes these three essential characters:

- Risk taker
- Safety advocate
- Encouragers of risk (may be several characters)

Also use at least two of the safety messages listed below.

Advocacy Skit Scenarios

1. You and your friends are all at the pool. One of them suggests having a contest to see who can dive from the shallow end all the way to the deep end.

2. You're at your friend's house with a group of friends. She has a trampoline with no safety nets. She and the others are jumping enthusiastically and doing flips. They all want you to join in.

3. You're with some high school kids and one of them has a pickup truck. A bunch of you want to go to the movies but there's not room for everyone in the truck. The driver tells you and some other kids to hop in the truck bed.

4. You're about to go for a bike ride with a group of friend. Your friends are not wearing helmets. They all urge you not to wear yours. They think helmets are stupid and they don't want to be seen riding with you wearing one.

5. You're in the car with your dad and siblings. He's not wearing a seatbelt and never cares if others do.

6. You're going out to the mall with friends. Your cousin is driving on the highway and going 15 miles over the speed limit.

7. You're heading to a state park with your family. Your mom is driving and does not know the way. She keeps looking at Google Maps on her phone as she drives.

8. You and your friends have just left school and are walking to get ice cream a few blocks away. As you come to a busy intersection, several of your friends run across the street. One of your friends in lagging behind, walking with you but not paying attention because she is texting a boy. Everyone across the street is yelling for you guys to hurry up and cross. The light in changing and your texting friend is not paying attention. She responds to the urging of others by stepping into the intersection as cars are coming.

Advocacy Safety Messages

Directions: Translate each of the following messages into words you feel comfortable with. Use at least two of these messages in your skit.

9. I don't feel safe when you... It is not safe for you to _____

10. I'm scared _____ you're scaring me _____ this is scary...

11. I don't want to get hurt _____ I don't want you to get hurt...

12. I don't want to get in trouble _____ grounded _____ pulled over _____ a ticket...

13. I'm not allowed...

14. I knew someone who got hurt this way _____ I took a class and met some people who did these things and got hurt...

15. Even if you text/talk/eat/put on makeup really quickly you can still cause an accident. Taking your eyes off the road is very dangerous...

16. It's not worth the risk to me _____ You should not take that risk...

17. You're putting me in danger and I need to have a say in that...

18. You could get seriously hurt doing that...

Advocacy Skit Rating

Names of Performers:

_____

_____

_____

_____

1. The skit included the three assigned characters. Points Earned _____

- Risk taker (5 points)
- Safety advocate (5 points)
- Encourages of risk (5 points)

2. The skit included at least two safety messages Points Earned _____

(5 points each)

3. Group members displayed appropriate behavior when presenting the skit. Points Earned _____

- All members did so = 5 points
- Some members did so = 3
- No members did so = 0

4. The skit provided a model for TBI and SCI advocacy that I could use. Points Earned _____

- Yes = 20 points
- Perhaps = 10 points
- No = 0

Total Points Earned _____

(Total possible = 50)

Name of Rater:

_____

Shepherd Center
INJURY PREVENTION

LESSON 10

Promoting Injury Prevention in the Community

Learning Outcomes

Students will compare and contrast the elements of published injury prevention posters.
Students will analyze the causes of the traumatic injuries they have studied throughout the unit to determine which can most likely be prevented by community awareness.
Students will compose an injury prevention message aimed at the selected cause of injury.
Students will create a poster to convey their message using appropriate design elements.
Students will rate the effectiveness of posters designed by their classmates.

Teacher Planning

Note: Be sure to schedule time SOON after this lesson to administer the post-assessment. It might be the day following the completion of the unit.

Students will be continuing their injury prevention advocacy by designing an injury prevention poster. Students can work in small groups or with partners.

Ideally this lesson will occur over two class periods. The first day students will create their posters. The second day students will present their posters.

This lesson provides an excellent opportunity for collaboration with the art department in your school. Teachers with design expertise can assist students with their projects.

If computers are available, students can create their posters using available computer design programs and tools.

If computers are not available, students will need chart paper and any other classroom art supplies.

The "Creating an Injury Prevention Poster" Task 13 in the student workbook provides a step-by-step process for students to follow in order to create their posters. A poster presentation evaluation form is provided in this lesson. If you want students to evaluate peer poster, supply sufficient copies of this form.

Activities

- Student Workbook:
  - "Creating an Injury Prevention Poster" Task 14 (in student workbook) (1 per student)
- Computers for each small group of students or student pairs (if available)
- Chart paper and other art supplies for creating poster (if computers are not used)
- Sample poster power point slides
- Projection equipment for displaying sample posters and student-created posters (if computer generated)
- Post-Assessment (1 per student)

Activities

Engage

Project the power point slides displaying examples of injury prevention posters. Ask students to select two posters to analyze by comparing and contrasting the elements of each. Have students chart their comparisons using a Venn diagram (or graphic organizer of choice).

Explore

Guide students through an exploration of the example injury prevention posters. Point out the salient features that make these posters effective:

- Clear message
- Use of humor (perhaps)
- Eye-catching visuals
- Size of type
- Use of color
- Design elements: proportion, placement, etc.

Explain

Explain that their challenge is to create an injury prevention poster for display in their neighborhood or community that will appeal to teens or young adults. This poster should target preventing an injury that students have learned about in this unit. Explain they will present their posters to the class.

The following steps are provided for students on the Task 14 page in their workbooks. Review them with students to make sure they understand the process to follow.

A. Selecting a Cause:
   1. List the causes of TBI or SCI they have learned during this unit.
   2. Review the list to identify potential ideas for a prevention campaign.
   3. Select one cause for the focus of the groups' injury prevention poster.

B. Creating a Poster:
   1. Brainstorm ideas for messages addressing injury prevention.
   2. Select the most appealing for the poster.
   3. Brainstorm ideas for visual elements that will enhance the message:
      a. Do you want people depicted on the poster or words only?
      b. Where will you place the selected elements and how large should each be?
      c. What colors will be most appealing?
      d. Will there be a border around the poster?

C. Finalize the design and determine assignments.

Briefly review the evaluation form so students understand how they will be evaluated.
Monitor students as they create their posters providing assistance as needed.

Evaluate

Have students present their posters to the class.

Provide students a "Poster Rating Form" so they can provide feedback as each poster is presented.

Ticket Out - Completed evaluation forms for poster presentations.

Standards Addressed

Georgia Performance Standards – Science Grade 7

S7CS10. Students will enhance reading in all curriculum areas by:

a. Reading in All Curriculum Areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
   - Read both informational and fictional texts in a variety of genres and modes of discourse
   - Read technical texts related to various subject areas

b. Discussing books
   - Discuss messages and themes from books in all subject areas.
   - Respond to a variety of texts in multiple modes of discourse.
   - Relate messages and themes from one subject area to messages and themes in another area.
   - Evaluate the merit of texts in every subject discipline.
   - Examine author's purpose in writing.
   - Recognize the features of disciplinary texts.

c. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

d. Establishing context
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.

Common Core Anchor Standards

W.CCR.6: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

W.CCR.7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

W.CCR.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

SL.CCR.5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

L.CCR.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.CCR.2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.CCR.6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Image of Public Service Announcement Posters Powerpoiont Slide

Task 14: Creating An Injury Prevention Poster

Student Task

Continue your injury prevention advocacy by creating an injury prevention poster for your neighborhood or community that will appeal to teens and young adults. This poster should target prevention of an injury you have learned about during this unit.

Follow these steps to complete this task:

Select the type of injury you want to prevent and identify the cause of that injury:

1. List the causes of TBI or SCI you have learned during this unit.
2. Review the list to identify potential ideas for a prevention campaign.
3. Select one cause for the focus of the injury prevention poster you will to create.

Design the Poster:

1. Brainstorm ideas for effective messages that will get the attention of teens and young adults.
2. Select the best idea for the poster.
3. Brainstorm ideas for visual elements that will help deliver this message. Consider the following:
   a. Do you want people, objects, or symbols depicted on the poster or words only?
   b. Where will you place the elements you want and how large should each be?
   c. What colors will be most appealing?
   d. Will there be a border around the poster?
4. Finalize the design.

Create the poster using available technology or art supplies.

TEAR ALONG LINE TO DETACH RATING FORM

Poster Creator(s): _____

_____

Injury Prevention Poster Rating

Rate each poster presentation using this scale:

1 = unsatisfactory, 2 = satisfactory, 3 = good, 4 = very good, 5 = excellent.

1. The message targets the causes of injuries we have studied. _____
2. The message is clear and effective. _____
3. The message makes me think about injury prevention. _____
4. The design is attractive and eye-catching. _____
5. The message could convince a young person to avoid risky behavior _____

Evaluators: _____

_____

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