Activity Summary: Special Spool
Spinal Cords Students will explore and identify different parts of the spinal cord by building their own spinal columns out of string and empty spools of thread. In addition, students will label the parts of the spinal cord.
Time 35 minutes

Activity Summary: Spinal Column Concentration Students will review spinal cord key terms and work in pairs to play the Spinal Cord Concentration Game.
Time 35 minutes

Full educational standards available at www.sepa.duq.edu/education
Lesson Preparation

Dear Educator,

In this section of the text, you will a number of helpful resources to guide you in teaching the lessons found in this module. The first portion of this page contains keywords that may appear in the following lessons. Definitions have been provided for your convenience. The following portion provides you with an idea for generating discussion in your classroom and preparing your students for the activities provided. These discussion activities will be a great addition to the lessons. Not only do they introduce the concepts to be taught, but they help gauge what your students’ prior knowledge about the content you will be presenting and teaching.

Keywords

Axon- portion of a nerve cell that conducts nerve impulses away from the cell body.
Central Nervous System- portion of the Nervous System consisting of the brain and spinal cord.
Nerve- a bundle of nerve fibers located outside of the Central Nervous System.
Neurons- cells in the Nervous System that are specialized to initiate and conduct electrical signals throughout the body.
Neurotransmitters- chemicals stored at the ends of axons. Responsible for signal transmission across a synapse.
Spinal Cord- the nerve cord housed within the vertebral column. Runs from the base of the brain to the lower spine.
Synapse- the link between neurons which includes the presynaptic membrane, the synaptic cleft, and the post synaptic membrane.
Vertebrae- bones that make up the spinal column.
Glial Cells- non-neural cells in the Central Nervous System that help regulate the extracellular environment.

Discussion time

Discuss the spinal cord with your students. Direct your students to fill out the KWL chart (handout 21). They should fill out the first column of the chart (“K” Column) with information they already know about the spinal cord, and the middle column (“W” Column) with what they want to know about spinal cord. Finally, when the following lessons are completed, you can revisit this chart with your students to complete the final column on the chart (“L” Column), with the information they learned while completing the activities in each lesson. Don’t forget to use the Class KWL Chart (handout 20) to discuss and record a few of the classroom’s responses.

Materials

- Handouts 20, 21
Spinal Cord Activity 1

Special Spool Spinal Cords

How is the Spinal Cord Special? Believe it or not, the spinal cord is made of the same material as the brain. They are both made of cells called neurons! Together they make up the central nervous system.

The most important job of the spinal cord is connecting the brain to the rest of the body. How does it do this? Well, the spinal cord takes signals from the body to and from the brain. Like a note from your mom or dad that tells you what chores to do, these signals are just like messages that tell your body what to do! These messages travel throughout your body, passing from neuron to neuron, through synapses. Synapses are very important because they are the point of contact between two neuron cells.

The spinal cord, its neurons and synapses work together to tell you if a cup of hot chocolate is still hot when you touch it!

The spinal cord is very important. There is a special part of your skeleton called the spinal column whose job is to protect the spinal cord!

What Will Your Students Be Doing?

In groups, your students will work together to build their own spinal columns using string and empty spools of thread. After their spinal columns are made, your students will explore and identify this section of the human body by drawing and identifying the different parts of the spinal cord and spinal column. Remind students to look at a picture of the spinal cord if they need a little help!

Instructions

1. Each student will first take a piece of string and tie the plastic bead to one end of the string to serve as an anchor for the empty spools.

2. Then, using the other end of the string, each student will thread each empty spool onto the string. Remind students to start adding the largest spools and work their way down to the smallest spools.
3. Have students discuss with their group members what the spools and string would present on the real human spinal cord.

4. Students will complete this activity by writing down their observations on handout 23 about making their replicas of the spinal cord.

**Questions on this handout include:**
- How your model of the spinal cord similar and/or different from the human spinal cord?
- Do you have any other observations?

**Reflection**
Students will discuss their group’s findings and ask any questions they may have. Also, they will answer the following questions:
- Why do you think the spinal cord is flexible?
- What are the benefits to having a flexible spinal cord?
- What would happen if the spinal cord was injured?
Students will record their answers on a separate piece of paper.

**Follow-Up**
After reviewing the different parts of the spinal cord, students will draw their own representations of the spinal cord. Remind students to include labels on their drawings showing some of the different parts of the spinal cord they learned about!
Spinal Cord Activity 2

Spinal Column Concentration

What Are the Parts of the Spinal Column, Anyways? The Spinal Column is made of many different parts in the human body. All of these parts work together to bring messages from nerves in the sensory and motor systems to and from the brain as part of the Central Nervous System. These following words are important for understanding the Spinal Column:

- Axon
- Backbone
- Cartilage
- Central Nervous System
- Dendrite
- Glial cell
- Nerve cell
- Skeletal System
- Synapse
- Vertebrae
- Vertebral Column

What Will Your Students Be Doing?

In this activity, your students will be paired with a classmate to play Spinal Column Concentration! Before they begin, have students review key terms related to the spinal cord and cut apart their Spinal Column game cards.

Instructions

Object of the Game: Collecting the most pairs of matching vocabulary cards and definition cards!

1. Students will cut apart their 20 Spinal Column Concentration game cards along the dotted lines.

2. They will then lay both sets of cards face down on the table so that no two cards touch or overlap.

   Player #1: Will start by turning any two cards on the table face up.
   - Matching Cards: Explain to students if the cards create a matching pair (the blue definition card matches the red vocabulary card), they will take both cards and put them face down in a pile in front of them. They will then take another turn, continuing their turns until two cards are chosen that do not create a matching pair.
   - Non-matching Cards: Explain to students if the cards do not create a
matching pair (the blue definition card does not match the red vocabulary card), they will place both cards face down on the table again. Since they did not choose a matching pair, it is now Player #2’s turn.

3. Pairs of students will continue to alternate turns with their partners each time one of them chooses two, non-matching cards. This process will occur until no cards remain on the table.

4. Congratulations! The student who has the most cards wins!

Reflection
Students will quiz their partners on spinal column vocabulary. Have each student hold up their red vocabulary cards, one by one, to see if their partners can state each word’s definition from memory. If their partner is unable to do so, remind students to be a helpful partner by providing a clue! Once one partner has gone through all of their red vocabulary cards, have students switch so the other partner can quizzing with their set of red vocabulary cards. If time permits, students can perform the same activity with their sets of blue definition cards. This time, however, they will try to state the matching vocabulary words from memory.

Follow-Up
Student will take their sets of Spinal Column Concentration Cards home to play with their friends or families. Remind students to explain the rules of the game to the players at home so they know how to play. If a family member or friend does not know the definition of a vocabulary word, have students explain the meaning of the word or give them clues so they can figure it out on their own. Have fun!