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# Mysteries of Memory Worksheet: Teacher's Guide

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*Possible student answers follow each question*

## Session 1: Memory and the Brain

Go to the website Exploratorium: The Memory Exhibition (<http://www.exploratorium.edu/memory/index.html>). Under Features, click on Sheep Brain Dissection: The Anatomy of Memory and answer the questions below as you read through all the slides.

a. What is the cortex of the brain?

The cortex is the outer layer of the brain.

b. Explain something you learned about the cortex.

- Cortex means *bark*.
- The cortex of the brain is only a few millimeters thick.
- It contains 70% of a person's one hundred billion brain cells.
- It is responsible for the highest level of cognition, which includes all thought and memory.
- With respect to body size, humans have a larger cortex than any other animal.
- The dark-colored top of the cortex is called *gray matter*. The inner, lighter layer is called *white matter*.
- The prefrontal cortex is responsible for the working memory.

c. What is *working memory*?

Working memory coordinates long-term memories with sights, sounds, and feelings so you can respond to events as they happen. It happens at the front of the brain, in the prefrontal cortex.

d. What is *long-term memory*?

It accesses an amazing range of information, from knowledge of yourself to your understanding of the world. Long-term memories for events and experiences are processed deep in the brain, in a spiraled area called the hippocampus. It is here that the brain transfers newly gained information into permanent memory.

e. What part of the brain processes *skill memory*?

The cerebellum

f. In the space below, draw a picture of a brain showing where the three different types of memory are located and what they are called.

[Refer to the Sheep Brain Dissection slides at the above website.]

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## Session 2: How Memory Works

1. Go to the website Exploratorium: The Memory Exhibition (<http://www.exploratorium.edu/memory/index.html>). Under Online Exhibits, click on Don't Forget!...Playing Games With Memory.
  - a. Play the first game, Memory Solitaire. How did you do? Did you expect to do better or worse?  
[Encourage students to use complete sentences. Rather than writing "good" or "bad," they should note how many they got correct and what they had expected.]
  - b. Now click the Continue button and read about how you can improve your memory in the section Ways to Remember. What does elaborative encoding mean?  
*Elaborative encoding* is a way to connect new information to memories that you already have, which helps you remember the new information. It can help you move information out of your working memory and into your long-term memory.
  - c. Now do the second activity, Tell Yourself a Story. What happened? Why does making up a story help you to remember things better and for longer? (List the two reasons given.)  
[Students should note how many they got correct.]  
Making up a story helps because:
    - (1) you are connecting the different pictures in your mind so that when you remember one you remember the others, too.
    - (2) you are making a mental picture of the things, which helps you to remember.
  - d. Now do the third activity, Wander Around Your House. Instead of walking around your house, you could look around the classroom or computer lab. How well did you do on this test compared with the last test?  
[A short answer is fine here, giving the results of this test and comparing it with the last test.]
  - e. Read the information under What's Going On. Besides connecting the things and picturing them in your mind, what other memorization trick did you use in this game?  
I gave myself hints to remember the things.
  - f. Write one suggestion that is given on the site for memorizing a list of 10 things to buy at the store  
Make up a silly story using all of the items, or imagine the items in different parts of the house.

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2. Go back to the main page by clicking on the Memory link at the bottom of the page, and click on Doodles. Go through the activity and write here what you learned about memory from this.  
It was easier to remember the second set of doodles because they make more sense, they aren't meaningless, and they connect with things I already know. It's easier to remember something that has meaning and that is connected to something you already know.
  
3. Go back to the main page and click on Common Cents. What does this activity teach us about memory?  
We usually don't remember all the details about an object, just enough to be able to recognize it.
  
4. Click on If You're Going to Rob a Bank and do the activities. What does this part of the website teach us about remembering faces?  
We remember hair the most, and the upper part of the face. Hair is the most important factor for recognizing someone, followed by the eyes, then the nose, and then the mouth and chin.
  
5. Using the memory techniques you have learned, think of a good way to remember what you need to take home from school tonight to do your homework: your math book, language arts book, history book, and an art project from the art room. Draw and/or describe your memory strategy here (the sillier the better):  
[Students might
  - draw a graphic image of each item sitting somewhere in their house
  - make up a silly story that involves all of the items
  - make up a sentence using the first letter of each word, and draw a graphic representation of the sentenceMake sure the image or story connects to things they are already familiar with in a way that makes some sense. Offer suggestions during the discussion of these responses and have students brainstorm even more ideas for remembering things.]

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## Session 3: Memory Strategies

1. Here's an example of a memory strategy I have used since this lesson:  
[perhaps information was visualized, turned into a story, etc.]
  
2. One way to remember what I read better is to ...  
[*Visualize* is the key word here, and/or to make a mental image of what I read]
  
3. One way I might apply this knowledge on memory:
  - a. in my life in general:  
[remembering phone numbers, remembering people's names, pretty much anything that needs to be remembered]
  
  - b. in my reading:  
Visualizing what I read
  
  - c. in my classwork:  
Remembering facts, concepts, assignments