1. Basics of Memory and Sensory Registers
   a. Define Memory
   b. Apply the information-processing model
   c. Explain the role of Sensory Registers
   d. Explain our primary senses in memory
   e. Define attention
   f. Construct and label:
      i. Neuron
      ii. Dendrites
      iii. Synapse
   f. Describe and apply the 4 types of LTM
   g. Distinguish explicit vs. implicit memory
   h. Apply priming to memory retrieval

4. The Biology of Memory
   a. Explain the process of consolidation
   b. Determine where memories are stored

5. Forgetting
   a. Explain the decay theory
   b. Apply retrograde amnesia
   c. Apply interference (is similar or different interference worse)
   d. Apply situational factors to memory
   e. Apply state dependent memory
   f. Apply the reconstructive process
   g. Explain a variety of ways to reduce forgetting

6. Special Topics in Memory
   a. Explain autobiographical memory
   b. Who experiences childhood amnesia?
      Explain childhood amnesia
   c. Describe a “flashbulb memory”
   d. Explain 3 reasons eyewitness testimony may be wrong
   e. Explain how are recovered memories more likely to be victim to the reconstructive process?

<table>
<thead>
<tr>
<th>Role</th>
<th>Audience</th>
<th>Persuasive Dialogue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A Neuron</td>
<td>The Human whose Brain you Live in</td>
</tr>
<tr>
<td>Format</td>
<td>Growing Dendrites/Getting Smarter</td>
<td></td>
</tr>
<tr>
<td>Directions</td>
<td>As a neuron in your human’s brain, you are lonely. Your human is not filling his/her brain up with neurons and dendrites. You have decided to take matters into your own hands and are going to confront your human with your concerns. In your dialogue, you must include:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. A PLAN for growing more neurons and dendrites that your human can implement into their daily routine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. A simplified explanation of how memories are stored and filed in the brain. (Remember, your human is DUMB, make this easy for a non-psychology person to understand)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. A minimum of 5 vocab words correctly used, with there meaning DEMONSTRATED in your text Vocab/Concepts to consider: neuron, dendrite, synapse, elaborative rehearsal, STM, LTM, the 4 types of LTM, memory improvement strategies, etc...</td>
<td></td>
</tr>
</tbody>
</table>

Grading Criteria:
1. Correct usage of 5 unit vocabulary words demonstrated in your writing: _____ / 5 points
2. Demonstration of correct understanding of memory unit concepts:
   a. Explanation of how memories are stored and filed in the brain _____ / 7 points
   b. Neural growth plan _____ / 3 points
3. Response is written in correct voice and format: _____ 3 points
4. Response shows demonstration of creativity and effort: _____ 2/ points
   Total Points: _____ / 20
Directions: Fill in the blanks below, using the following word choices: Attention, 1, Short-Term, Sensory, 20, External Stimuli/Input, Long-Term, Forever

Directions: The blank space below is your brain. Fill it with neurons and dendrites. Label the path a message may travel. Include at least 3 complete neurons and 2 synapses. Label neuron parts (soma, axon, dendrites... synapses)
STM Crossword

Across:
1. our ability to remember events real or imagined
2. experimented on dogs by pairing an offering of food with the sound of a bell ringing
3. verbal information is encoded
4. the magic number (+/-2) in regard to STM
5. memory that can be held 15-20 seconds
6. repeating information over and over again to extend STM and LTM
7. the most important element of a neuron in keeping our memories
8. learning which involves positive and negative reinforcement
9. the specific name for a brain cell
10. the part of the brain found in primates, which gives us our ability to problem solve, critically think and analyze

Down:
1. memory with a limitless capacity that can hold memory for 1/40th of a second
2. the study of behavior and mental processes
3. memory with an unlimited capacity
4. a career in the field of psychology, in which the practioner is a medical doctor and can prescribe medication and/or therapy
5. location of the echoic store and sense of hearing
6. specialized cells that send messages through sensory nerves to the brain to help us process our sensations
7. connects 1 neuron to another
8. the information processing model compares our memory to a
9. what we visualize when problem solving or remembering
10. determines whether information will be passed on to STM
Memory
Unit 5, Psychology

1. Basics of Memory and Sensory Registers
   a. Define Memory

   b. Explain the information-processing model

   c. Explain the role of Sensory Registers

   d. Explain our primary senses in memory

   e. Define attention

2. STM
   a. Define STM

   b. Name and explain the 2 task of STM

   c. Determine the capacity and length of STM
d. Provide 3 examples of Chunking


e. Explain how verbal vs. visual information is encoded


f. Explain how rote rehearsal affects length STM can last


Memory Worksheet
Sections 1-3

1. The information processing model compares the human memory to a

2. We sort out information into “files” in our

3. Much of our information is forgotten through decay, the rest is further processed when we give it our

4. Our working memory, or STM, has 2 primary functions. List them.

5. STM can hold information that can be rehearsed in seconds.

6. The strategy used to help us remember large amounts of information by grouping it together is known as

7. Verbal information is encoded

8. Visual information is encoded using

9. Our STM lasts seconds.

10. If you want to extend and maintain information in your STM longer than 20 seconds you can use

11. How does the capacity of LTM compare to that of STM

12. How does verbatim memory differ from summary memory

13. Create a scenario that accurately reflects the meaning of serial position effect, primacy effect, and recency effect.

14. How does elaborative rehearsal differ from schemata

15. Provide an example of an episodic memory you have had
16. Provide an example of a semantic memory you have had

17. Provide an example of procedural memory you have had

18. Provide an example of an emotional memory you have had

19. Distinguish Explicit from Implicit memory by using a description or example

20. Provide an example of a time you used or needed priming
## Sensory, STM, LTM Chart

<table>
<thead>
<tr>
<th></th>
<th>Sensory Register/Memory</th>
<th>STM</th>
<th>LTM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length of Memory</strong></td>
<td>&lt;1 second</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Amount that can be Remembered</strong></td>
<td>Unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>How to Extend Memory</strong></td>
<td>N/A</td>
<td></td>
<td>1. .</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. .</td>
<td>2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. .</td>
<td>3.</td>
</tr>
<tr>
<td><strong>Ways Memory is Encoded</strong></td>
<td>Based on Senses</td>
<td>1.</td>
<td>1.</td>
</tr>
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<td></td>
<td></td>
<td>2.</td>
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<td>5.</td>
<td>5.</td>
</tr>
</tbody>
</table>

There are 4 Types of Long Term Memory
Fill in the chart below to distinguish these 4 types of LTM.

Answer: 1. What is it? 2. Provide 5 examples of this type of memory.

<table>
<thead>
<tr>
<th>Semantic</th>
<th>Episodic</th>
<th>Procedural</th>
<th>Emotional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
<td>1.</td>
<td>1.</td>
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<tr>
<td>2.</td>
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<td>3.</td>
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<td>4.</td>
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<td>5.</td>
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<td>5.</td>
<td>5.</td>
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<tr>
<td>6.</td>
<td>6.</td>
<td>6.</td>
<td>6.</td>
</tr>
</tbody>
</table>
**Story Method for Remembering**

After seeing the video on Andi Bell’s technique for memorization, use this method to memorize the following list in order. You will walk your class schedule, assigning each of these items a location from your schedule and incorporating a story involving each of these 20 words. You will have 15 minutes. When you return, you will be quizzed to see how your memory compares with your classmates!

1. Caterpillar
2. Garden
3. Hospital
4. Glasses
5. Mask
6. TV
7. Pizza
8. Opossum
9. Sausage
10. Time
11. Monkey
12. Lucky
13. Juice
14. Funky
15. Evidence
16. Domino
17. Memory
18. Breakfast
19. Stinky
20. Neuron

---

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14. Funky
15. Evidence
16. Domino
17. Memory
18. Breakfast
19. Stinky
20. Neuron
THE DENDRITE SONG
(to the tune of Clementine)

Use your dendrites,
Use your dendrites,
To connect throughout your brain.
Take in info, analyze it,
Grow some new ones
Unrestrained.

Axons send out
Neurotransmitters
To the dendrites all around.
Across the synapse
Jumps the impulse;
New ideas can now abound.

Stimulation
Is what the brain needs
To make dendrites stretch and grow.

New connections
Make us smarter
In what we think and what we know.

Use your dendrites,
Use your dendrites,
To connect throughout your brain.

Take in info, analyze it,
Grow some new ones
Unrestrained.
Teen Brains Clear Out Childhood Thoughts

Clara Moskowitz
LiveScience Staff Writer
LiveScience.com Clara Moskowitz
livescience Staff Writer
livescience.com Mon Mar 23, 6:11 pm ET

The mysterious goings-on inside teen brains have befuddled countless parents over the years. Now some insights are being provided by recent neuroscience research. Between ages 11 and 17, children's brain waves reduce significantly while they sleep, a new study found. Scientists think this change reflects a trimming-down process going on inside teenagers' brains during these years, where extraneous mental connections made during childhood are lost.

"When a child is born, their brain is not fully-formed, and over the first few years there's a great proliferation of connections between cells," said physiologist Ian Campbell of the University of California, Davis. "Over adolescence there is a pruning back of these connections. The brain decides which connections are important to keep, and which can be let go."

Scientists call this process synaptic pruning, and speculate that the brain decides which neural links to keep based on how frequently they are used. Connections that are rarely called upon are deemed superfluous and eliminated. Sometimes in adolescence, that pruning process goes awry and important connections are lost, which could lead to psychiatric disorders such as schizophrenia, the researchers think.

Brain pruning
Synaptic pruning is thought to help the brain transition from childhood, when it is able to learn and make new connections easily, to adulthood, when it is a bit more settled in its structure, but can focus on a single problem for longer and carry out more complex thought processes.

For example, if a child receives a brain injury before age 10, another area of the brain can often take over the functions of the damaged region. If the same injury occurs at age 20, however, the person may lose a vital ability, because the brain has lost the flexibility to transfer that function to another area.

"The fact that there are more connections [in a child's brain] allows things to be moved around," Campbell told LiveScience. "After adolescence, that alternate route is no longer available. You lose the ability to recover from a brain injury, or the ability to learn a language without an accent. But you gain adult cognitive powers."

Campbell and UC-Davis psychiatrist Irwin Feinberg recorded the sleep brain waves (called EEG) two times a year over five years in 59 children, beginning at either age 9 or age 12. They found that brain waves in the frequency range 1-4 Hz remained unchanged
between ages 9 and 11 and then fell sharply, by about 66 percent, between ages 11 and 16.5. In the 4-8 Hz frequency range, which corresponds to a different part of the brain, brain waves started to decline earlier and fell by about 60 percent between ages 11 and 16.5 years.

Overall, these changes are consistent with synaptic pruning, because as neural connections are lost in those areas of the brain, brain waves in the corresponding frequencies decrease. Campbell and Feinberg report their findings in the March 23 issue of the journal Proceedings of the National Academy of Sciences.

**Tumultuous years**

Synaptic pruning is just one of many changes thought to be going on inside teenagers' brains. For example, a 2005 study found that teenagers can't multi-task as well as adults because their brains are still learning how to process multiple pieces of information at once they way adults can.

In addition to changes that affect how they think, teenagers' brains also undergo developments that affect how they feel. For example, during adolescence people begin to empathize more with others, and take into account how their actions will affect not just themselves, but people around them.

A 2006 study found that the teenage medial prefrontal cortex, the part of the brain associated with higher-level thinking, empathy, and guilt, is underused compared to adults. But as adolescents mature, they begin to use this region more when making decisions, indicating that they increasingly consider others when making choices.
Questions for Consideration:

1. Using context clues, define synaptic pruning.

2. How might this be connected to mental disease common in teen/early 20s such as schizophrenia?

3. How might the brain adapt to injury/damage that occurs before age 11? After age 20? Why does the brain adapt differently to injury over time?

4. How do brain waves respond to synaptic pruning?

5. According to the article, which part of the brain is responsible for higher-level thinking, empathy, and guilt?

6. Based on your assessment of your own consciousness, how much synaptic pruning do you have left (are you done- an adult thinker, in the middle of the process, or just getting started)? EXPLAIN your answer with personal examples!
The New York Times
January 23, 2007
Amnesiacs May Be Cut Off From Past and Future Alike

By BENEDICT CAREY

In the movies amnesia is bizarre, and thrilling. The star is usually a former assassin or government agent whose future depends on retrieving the bloody, jigsaw fragments that restore identity and explain the past.

Yet in the real world, people with amnesia live in a mental universe at least as strange as fiction: new research suggests that they are marooned in the present, as helpless at imagining future experiences as they are at retrieving old ones.

The new study, reported last week in The Proceedings of the National Academy of Sciences, is the first rigorous test of how brain-injured people with amnesia mentally inhabit imaginary scenes. The results suggest that to the brain, remembered experience and imagined experience are reflections from the same mirror, rich inner worlds animated by almost identical neural networks.

The findings provide a glimpse into what it might mean to truly live in the moment. And they feed a continuing debate about memory. Some researchers say that the brain region central to forming new memories — the hippocampus, a sliver of tissue deep in the brain where the day’s memories are registered — is not necessary for retrieving those experiences, once they have been consolidated elsewhere in the brain.

Others, including the authors of the new study, contend that the hippocampus in fact provides the stage on which inner mental dramas are set. Without its help only the props remain — loose facts, people’s names, snippets from favorite songs: the players without the play.

“The study suggests that these patients have fragments, the brick and mortar to create new scenarios, but their descriptions lack coherence because they don’t have the scaffolding the hippocampus provides,” said Morris Moscovitch, a neuroscientist at the University of Toronto, who was not involved in the study. “The other interpretation is they don’t have enough brick and mortar to put it all together.”

The researchers, led by Eleanor Maguire and Demis Hassabis of University College London, instructed five men with severe hippocampus injuries to imagine themselves in familiar scenes, like a museum, a pub and a beach. People with this type of injury, often from oxygen deprivation due to a heart attack, can seem in conversation to be as mentally adept as the next person — until it becomes clear they have forgotten comments made only moments before.

The men, urged to fill out the scenes with imagined detail, described what they could. The researchers analyzed transcripts of their answers, carefully scoring each one for personal touches: projected emotions, sensations and actions. They found that compared with similar descriptions produced by adults without brain injuries, the five men’s imagined scenes were flat, barren of personal dimension.
"We think that what the hippocampus provides is a scaffold for experience and imagination, and that scaffold is spatial," Dr. Maguire said. The brain’s record of physical space, she said, appears to be necessary to infuse a scene with rich personal dimension.

Other researchers said the dulling of imagination could reflect a more fundamental dynamic. The brain may naturally draw on previous experiences to inform imaginary scenes, said Peter J. Bayley, a neuroscientist at the University of California, San Diego. If so, the only such memories accessible to the men might have been childhood scenes, consolidated over the years outside the hippocampus, which would not likely provide rich detail to outfit, say, an imaginary pub.

"The differences between the two groups may reflect the difficulty the patients are having retrieving information from the recent past," Dr. Bayley said. He and other researchers have previously reported on patients with hippocampus damage who can recall childhood memories in the same kind of detail almost everyone else does.

The distinctions the brain makes between loose facts and the richer, wraparound ambience of an experience are important to understanding memory, because people with healthy brain function tend to recall the gist of experience, whereas those with hippocampus damage can often recollect discrete facts with more accuracy. The difference is partly reflected in the study participants’ words.

When asked to envision an open-air market, one brain-injured man said: "I see people, very many people. Most of all ... um ... not many men, all I see are young ladies. And basically they are all in a hurry."

A participant without brain injury responded: "Right, so on either side of me I’ve got stalls and it’s noisy. We have a person on my right who is selling fruit and veg, and they’re telling us that bananas are on special offer this week, and they’re shouting about that."

In an essay published this month in the journal Nature, two Harvard researchers, Daniel L. Schacter and Donna Rose Addis, contend that this ability to richly imagine scenes, whether entirely dependent on the hippocampus or not, is perhaps the most promising frontier for memory research.

"For almost 100 years, memory has been the object of experimental studies that have focused almost exclusively on its role in preserving and recovering the past," they wrote. "We think it’s time to try to understand some of memory’s errors by looking to the future."
Article Questions:
Directions: Answer all questions in complete sentences, unless otherwise indicated.
1. Explain why a person with amnesia would be unable to imagine the future.

2. Evaluate the importance of imagining the future for you personally. Cite a personal example (it can be made-up).

3. Determine the role of the hippocampus in imagination.

4. How does memory detail differ from a normal person to one who suffers from a damaged hippocampus?

5. Write a story in which the main character suffers from a hippocampus injury. The story can be about anything as long as the main character displays clear evidence of this disorder in his actions and dialogue. The story must be at least one full page in length and will count as a TEST GRADE!!!!
When Our Eyes Deceive Us

Being part of a system that identified and ultimately convicted the wrong man became another form of victimization.

Dahlia Lithwick
NEWSWEEK
From the magazine issue dated Mar 23, 2009

Describe the last person who served you coffee. What if I helped refresh your memory? Showed you some photos of local baristas? Pulled together a helpful lineup? Cheered exuberantly when you picked the "right" one? Now imagine that instead of identifying the person who made your venti latte last week, we had just worked together to nail a robber or a rapist. Imagine how good we would feel. Now imagine what would happen if we were wrong.

Last month, a Texas judge cleared Timothy Cole of the aggravated-sexual-assault conviction that sent him to prison in 1986. Although his victim positively identified him three times—twice in police lineups and again at trial—Cole was ultimately exonerated by DNA testing. The real rapist, Jerry Wayne Johnson, had been confessing to the crime since 1995. Unfortunately for Cole, he died in prison in 1999, long before his name was cleared.

Our eyes deceive us. Social scientists have insisted for decades that our eyewitness-identification process is unreliable at best and can be the cause of grievous injustice. A study published last month by Gary Wells and Deah Quinlivan in Law and Human Behavior, the journal of the American Psychology-Law Society, reveals just how often those injustices occur: of the more than 230 people in the United States who were wrongfully convicted and later exonerated by DNA evidence, approximately 77 percent involved cases of mistaken eyewitness identification, more than any other single factor.

Wells has been studying mistaken identifications for decades, and his objection to the eyewitness-identification system is not that people make mistakes. In an interview, he explains that eyewitness evidence is important, but should be treated—like blood, fingerprints and fiber evidence—as trace evidence, subject to contamination, deterioration and corruption. Our current criminal-justice system allows juries to hear eyewitness-identification evidence shaped by suggestive police procedures. In a 1977 case, Manson v. Braithwaite, the Supreme Court held that such evidence could be used if deemed "reliable." Today we know you can have a good long look, be certain you have the right guy and also be wrong. But Manson is still considered good law.

Jennifer Thompson was 22 the night she was raped in 1984. Throughout the ordeal, she scrupulously studied her attacker, determined to memorize every detail of his face and voice so that, if she survived, she could help the police catch him. Thompson soon identified Ronald Cotton in a photo lineup. When she—after some hesitation—again picked Cotton out of a physical lineup a few days later, a detective told her she'd picked the same person in the photo lineup.

But in this case Thompson got it wrong, although Cotton served 10 years before DNA evidence exonerated him and decisively implicated another man, Bobby Poole. The curious part of the story is that despite Thompson's determination to memorize every detail, when she first saw Poole in court she was certain she had never seen him before. Indeed, according to Wells and Quinlivan, "even after DNA had exonerated Cotton and Thompson herself had accepted the fact
that Poole was her attacker, she had no memory of Poole's face and, when thinking back to the attack, she says, 'I still see Ronald Cotton'."

In their paper, Wells and Quinlivan suggest a host of tricks the mind can play, ranging from incorporating innocent "feedback" from police investigators to increasing certainty in one's shaky memories that become reinforced over time. Add to that Thompson's determination to regain control over her life, and her need to believe that the justice system was just, and it would have been doubly hard for her to look at a police lineup that, as it happened, did not include an image of the real rapist, and walk away. To hear Thompson and other victims tell it, being part of a system that identified and ultimately convicted the wrong man became another form of victimization, and for that reason alone the system needs to be reformed.

The problems with the eyewitness-identification system cannot be laid at the feet of crime victims any more than they can be blamed on police investigators. Wells' argument for reforming our eyewitness-identification system is that the incentive for the police to subtly nudge our memories is not only uncorrected by the justice system, but also sometimes rewarded by it. Wells wants the Supreme Court to revisit the scientific basis for its 1977 decision. Whether or not the John Roberts court wishes to take up the issue of innocent prisoners—there is one test case percolating through the New Jersey courts—a few states and cities have used innocent-exoneration scandals to rethink their eyewitness-identification practices. Proposed changes include showing victims photos sequentially and explaining that the perpetrator may not be included in the lineup, and ensuring that whoever conducts the lineup has no knowledge of which person is the actual suspect.

This is not an issue that tracks the usual left-right divide. Some of the most zealous reformers of the eyewitness-identification process are lifelong conservatives who recognize that the credibility of the whole justice system is on the line each time an innocent man goes to jail and a guilty one walks free.

1. Identify the % of people whose wrongful convictions were due to mistaken identity.

2. Explain how DNA testing has assisted those who have been wrongfully convicted.

3. Describe why our memory is NOT a mistake, according to Gary Wells.

4. Create a script showing how police interviews may play a role in "corrupting" eyewitness accounts.

Cop

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________
Victim

Cop

Victim

5. Summarize the story of Jennifer Thompson.

6. According to the article Thompson was victimized again by the criminal justice system. Explain why this is so. Do you agree or disagree? Explain.

7. Wells suggests that someone with no knowledge of the suspect should conduct photo or physical line ups. Evaluate how this might be helpful in preventing wrongful arrests and imprisonment.

8.

<table>
<thead>
<tr>
<th>Role</th>
<th>Ronald Cotton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audience</td>
<td>Member of the United States Congress</td>
</tr>
<tr>
<td>Format</td>
<td>Letter</td>
</tr>
<tr>
<td>Topic</td>
<td>Faulty Eyewitness Testimony</td>
</tr>
<tr>
<td>Directions</td>
<td>Write a letter to Congress as Ronald Cotton. Tell Congress of your story of false imprisonment and encourage legislators to make necessary changes in police policy to prevent false imprisonments, such as your own. Be Sure to:</td>
</tr>
</tbody>
</table>
1. Tell the story of your own conviction
2. Provide detailed descriptions of at least 3 changes you would make to ensure correct identification of criminals
3. Include 5 vocabulary words used correctly with their meanings explained in your letter.

Grading Criteria:

- Correct usage of 5 unit vocabulary words: ________/5 points
- Demonstration of correct understanding of eyewitness testimony problems and possible solutions: ________/10 points
- Response is written in correct voice and format: ________/3 points
- Response shows demonstration of creativity and effort: ________/2 points

Total Points: ________/20
Go to http://www.exploratorium.edu/memory/dont_forget/index.html. Follow the directions for each section, thinking and writing what is required of you. Summarize the results for each of the memory enhancing activities listed below.

**Memory Solitaire**
Write everything you remember here:

After checking, what did you forget:

Explain why memory solitaire helps and cite the study results discussed that prove this:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

**Tell yourself a story**
Write everything you remember here:

After checking, what did you forget:

Explain why telling yourself a story helps you memorize:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Answer the following questions using information from:

1. What is the average amount of information you can remember in the short term. Based on this, why do you think credit cards usually consist of 16 numbers?

2. Identify the type of long term memory that doesn’t require conscious recall.

3. In your own words, summarize the role each of the following has in memory
   a. Hippocampus
   b. Amygdala
   c. Cerebral Cortex
   d. Neurons
   e. Neurotransmitters

4. Identify the 3 basic stages of memory:

5. Click on the “keep your brain alive exercise” link. Based on what you read, define neurobics.

6. List the 8 general guidelines to improve memory
   a. Underline the guideline from above that refers to elaborative rehearsal.
   b. Circle the guideline from above that refers to rote rehearsal.

7. Read the section on mnemonic devices. Provide at least 2 examples of mnemonic devices you have used and link them to the types described in this section.