Plan for today

• Quiz
• Research
• Application
What do you think leads to the best learning?

A. Amount of time spent studying.
B. Paying close attention to the materials as you study.
C. The intention or desire to learn.
D. Learning in a way that matches your personal learning style.
E. What you think about while studying.

• Read the instructions on your sheet to yourself.
• Raise your hand if you have any questions.
• Then listen for the list of words.
What do you think leads to the best learning?

A. Amount of time spent studying.
B. Paying close attention to the materials as you study.
C. The intention or desire to learn.
D. Learning in a way that matches your personal learning style.
E. What you think about while studying.
Penny Test

- Do you know what a penny looks like?
- Draw one for me. Include as many details as possible.
Why is this task so hard?

Encoding failure
Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
Levels of Processing
(Craik & Tulving, 1975)

CAR

- Is the word written in capital letters?
- Does the word rhyme with train?
- Does the word fit in the sentence “He saw a _____ on the street.”

Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
3. Form visual images
   boat - tree
Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
3. Form visual images
4. Generate cues
Retrieval Cues
Mäntylä (1986)

Stimuli - 504 nouns

- Group 1: generated three retrieval cues for each word at encoding (e.g., TREE: tall, green, bark)
- Group 2: provided with three retrieval cues at encoding
- Group 3: no encoding phase; provided with three retrieval cues at test

Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
3. Form visual images
4. Generate cues
5. Create context and organize information
Listen to the following passage

• Before I read it to you, if you are sitting on the left side of the room, close your eyes for a moment.
Test

• Write down as much as you can recall from the passage.
### Organize Information

#### Critical Thinking Table—Behavioral Neuroscience—Chapter 2

**How Does My Brain Work?**

<table>
<thead>
<tr>
<th>Essential Questions</th>
<th>Fundamental and Powerful Concepts</th>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Introduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Neuron</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.1 What does my brain consist of?</td>
<td>neurons structure</td>
<td>cell body, dendrites, axon, axon terminal, myelin sheath, glial cells</td>
</tr>
<tr>
<td>2.2.2 What do neurons do and how do they do it?</td>
<td>function, information transfer, conduction, synaptic transmission</td>
<td>resting potential, ion channels, action potential, refractory period, all-or-none principle, synapse, vesicles, receptors, postsynaptic potential, reuptake</td>
</tr>
<tr>
<td>2.2.3 What are the chemicals in my brain?</td>
<td>neurotransmitters</td>
<td>acetylcholine, dopamine, serotonin, norepinephrine, GABA, glutamate, endorphins</td>
</tr>
</tbody>
</table>
Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
3. Form visual images
4. Generate cues
5. Create context and organize information
6. Test frequently
Testing Effect
(Roediger & Karpicke, 2006)

1. Read passage
2. Math problem
3. Reread
4. Recall
5. Take Recall Test

Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
3. Form visual images
4. Generate cues
5. Create context and organize information
6. Test frequently
SEE-I

- S is a STATEMENT: A clear, concise, correct definition of the term. 
  _______ means...

- E is an ELABORATION: Another way of saying it, using your own words.
  In other words...

- E is an EXAMPLE: A good one, one that is correct and actually works, one 
  that is from your own experience.
  An example of ________ would be....

- I is an ILLUSTRATION: A metaphor, image, or comparison.
  ________ is like...
SEE-I: Language

- S is a STATEMENT: Language is a system for combining a finite number of arbitrary symbols into an infinite number of meaningful statements.

- E is an ELABORATION: In other words, language allows you to communicate by taking just a few things and putting them together to communicate about a limitless number of things.

- E is an EXAMPLE: Written English is a good example of a language because we have only 26 letters, but we can put them together to make a nearly infinite number of words which are then put together to make a limitless number of meaningful statements.

- I is an ILLUSTRATION: Language is like a ball of clay. At first, it is just a meaningless lump of material. While you may only have a small amount of it, a skilled artist can shape it into just about anything.
Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
3. Form visual images
4. Generate cues
5. Create context and organize information
6. Test frequently
Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
3. Form visual images
4. Generate cues
5. Create context and organize information
6. Test frequently
7. Engage in spaced practice
Spaced Practice
(Müller & Pilzecker, 1900)

- Learn List A
- Learn List B
- 6 min delay
- Learn List B
- Test List A

28% recalled
48% recalled
Teach them to

1. Attend to information
2. Engage in deep processing and self-reference
3. Form visual images
4. Generate cues
5. Create context and organize information
6. Test frequently
7. Engage in spaced practice
References


• Chew, S.L. (2013). *Perceptual judgment task demonstration*. Presented at the National Institute of Teaching in Psychology, St. Petersburg, FL.


References, cont.