Memory and Forgetting

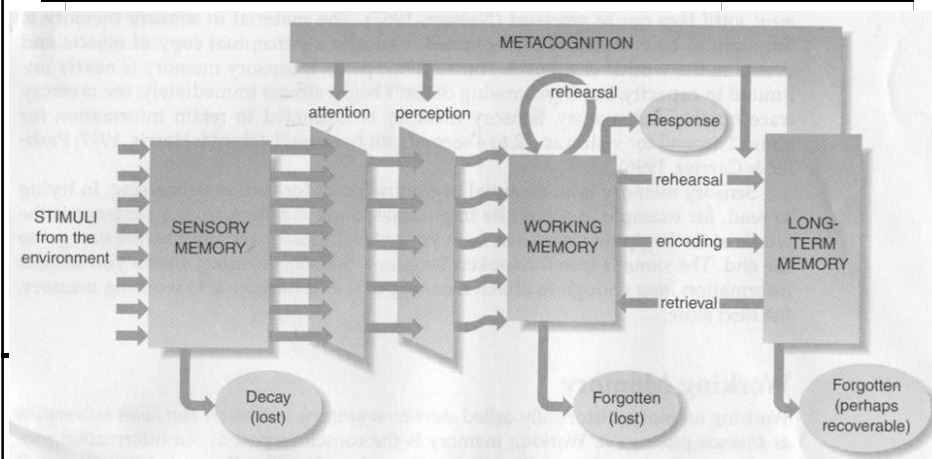## Dr. K. A. Korb
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Learning Goals

- Understand how new information is committed to memory so that you:
  - Can more effectively teach new information in a way so that students will remember it better
  - Will become a more successful student by studying in a fashion that helps you remember new information better

Outline

- Attention
- Perception
- Working Memory
- Long Term Memory
- Metacognition

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Information Processing Model

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Attention

- **Attention:** Consciously focusing on a stimulus
  - Students will **NOT** remember information unless they are paying attention to the lesson
- When planning a lesson, always consider the question: *How can I make this interesting so students will pay attention?*
  - Relate information to students' lives
  - Give demonstrations
  - Include charts or pictures
  - Use humor
  - Ask thought-provoking questions
  - Tell stories

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Perception

- **Perception:** Attaching meaning to a stimulus
- Students understand new information based on their prior knowledge and experiences
  - What the teacher says is not necessarily what the students understand
  - Teachers must plan their lessons to provide the necessary background information and context to ensure that students properly understand

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Perception

- Promoting accurate perception
    - Adequately prepare a lesson so it is organized and meaningful
    - Connect a lesson to students' prior knowledge so they can use their previous experiences to learn new information
    - Minimize unnecessary distractions so students can focus on the lesson
    - Make a lesson interesting so students will pay attention and make an effort to understand

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Working Memory

- **Working Memory**: Store that holds information as a person is thinking about it
- Two Properties
    - **Short Span:** Information only stays for a short time
    - **Limited Space:** Only a limited amount of information can be kept in working memory
        - Keep the main points of a lesson focused to one or two new key points

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Overcoming Limitations of Working Memory

- Overcome limited space by taking notes in class
  - Revise notes immediately after class and add details to make the notes understandable for the future.
- Overcome limited space by studying throughout the term instead of cramming just before exams
- Meaningful information is easier to remember than information that is meaningless to students

Long-Term Memory

- **Long term memory**: Permanent information store
- Long-Term memory has three tasks:
  - **Encoding:** Process information so it is stored in long-term memory
    - How information is encoded influences how well it is remembered and used
  - **Storage:** Keep information stored in long-term memory
  - **Retrieval:** Searching and finding information in long-term memory to be actively thought about

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Encoding in Long-Term Memory

- Two ways to encode information into long-term memory:
  - **Rote Memorization:** Memorize information by frequently repeating it
    - Students are only able to repeat the information in similar contexts
  - **Meaningful Learning:** Link new information with information already in long-term memory
    - Make information relevant to students' lives
    - Students will remember information better
    - Students will be able to apply new information to their life circumstances

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Retrieving from Long-Term Memory

- **Simple Retrieval:** Search for information in long term memory
  - Only way to retrieve information based on Rote Memorization
- **Priming**: Activate a concept in memory by suggesting or provide a hint
- **Activation Spreading**: Retrieve based on relatedness to another concept
  - Suggest a related topic

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Metacognition

- **Metacognition**: Awareness of and control over the learning process
- Metacognitive strategies consist of plans for accomplishing specific learning goals
  - Plan the learning process
    - What is the goal for the study time?
  - Monitor the learning process
    - Consistently ask whether you are achieving your learning goal.
  - Evaluation
    - After the study period, did you achieve your learning goal?

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Metacognition

- Students need to be explicitly taught study strategies
  - Efficient Note-Taking Skills
    - Actively listen in lecture by thinking about how the information relates to what you already know and your own experiences
    - Write ideas or key phrases, not complete sentences
    - Underline information the lecturer stresses
    - If you miss an idea that should be included, draw a blank _____ to fill in later
    - As quickly as possible after a lecture, review or rewrite notes to clarify uncertain points
    - Learn the key points from the notes before the next lecture

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Forgetting

- Forgetting can be caused by:
    - Lack of attention so information never entered memory
    - Mistaken perception (understanding) caused information to be remembered incorrectly
    - Too much information was put at the student and overburdened the working memory

Forgetting

- Forgetting can be caused by:
    - Not studying the information long enough so information was not encoded into long-term memory
    - Not using helpful study skills so information was not encoded into long-term memory
    - Information was encoded into long term memory but student is unable to access the information at the proper time because it was learned by rote memorization instead of meaningful learning

Revision

- Why is getting students' attention important? How can you keep students' attention in your class?
- What is perception? What teaching strategies can you use to promote accurate perception?
- What are the limitations of working memory? What teaching strategies can you use to overcome these limitations?
- What are the two ways that information is encoded into long-term memory? What teaching strategies should you use to engage in meaningful learning?
- What is metacognition? What can you as a teacher do to improve students' metacognitive strategies?

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