

# Learning, Memory, and their Relationships

Learning is a relatively permanent change in knowledge and/or behavior as a result of experience.

Learning is the procedure/process by which memories are laid down (formed) as a result of experience, and hence for the establishment of relatively permanent changes in knowledge and behavior.

Memory is therefore an outcome of learning: storage and retrieval.

Conscious attempts to learn are not required.

Latent learning is learning without any conscious attempt.

Learning is based on alterations in synaptic connectivity among neurons, involving changes in biochemistry and possibly anatomy.

Memory is the subsequent stabilization, maintenance, and persistence of these changes over time, thereby permitting the future recall and application of what was learned.

Learning and memory involve the following stages:

1. Encoding (with two steps)
  - Acquisition—registering inputs in sensory buffers
  - Consolidation—creating stronger representations over time
2. Storage
3. Retrieval

Memory includes the following forms:

1. Sensory Memory—lasting milliseconds to seconds
2. Short-term/Working Memory—lasting seconds to minutes
3. Long-term/Reference Memory—lasting hours, days, or years

Note: The term *working memory* is more commonly used today than *short-term memory* since it is involved in *processing information* not only when first experienced, but later when retrieved and used.