

Chapter Summary

Thinking and Language

ESSENTIAL QUESTIONS How does the brain solve problems?
How does the brain learn new skills?

The human brain does a considerable amount of processing to enable us to think and speak. Our thoughts and language are controlled by the brain and developed over time. This chapter describes the processes humans go through to learn to think, reason, make decisions, and solve problems. It is through the developmental process of language that we are able to communicate our thoughts and feelings about our world.

Thinking and Problem Solving

- People process information by using abstract units of thought such as imaging to visualize a concept, symbols to represent an object or quality, and rules to state relationships between concepts.
- Types of thinking include deductive and inductive reasoning, directed thinking (such as divergent and convergent problem solving), and undirected thinking (such as free flow of ideas, daydreams, or fantasies). Another type of thinking is metacognition, which is an awareness or thinking about your own cognitive processes.
- The decision-making process often happens automatically, or with intuition or gut reactions. Other methods include making lists, setting priorities, or using management skills such as a decision tree to help determine possible outcomes to different decisions.
- Solving a problem involves identifying the problem, evaluating possible solutions, and putting a solution into action. Problems can also be solved by identifying sub-goals, developing algorithms, or using rule-of-thumb strategies called heuristics. Computers also use these strategies to solve problems. Obstacles to solving problems include mental sets, functional fixedness, and rigidity.
- Creative thinking involves flexibility, recombination of elements in a problem, and insight.

Language

- Language is a system of communication that involves combining symbols in a meaningful way.
- Language consists of three parts: phonemes, morphemes, and syntax.
- Noam Chomsky theorized that children inherit a mental program that enables them to learn grammar.
- Infants go through four stages of language development. They babble, learn single words, then phrases, and finally sentences. They infer grammar rules based on what they hear in their language.
- Chimps can communicate with humans if taught sign language and the use of symbols, although they do not have the ability to apply the rules of grammar.
- There are cultural differences in different languages, including gender labels assigned to different words.