**Cognition:** All the mental activities associated with thinking, knowing, remembering, and communicating. Below are some ways that our brains organize information efficiently.

Creating Symbols: using an object or an act to stand for something else

*Examples:*

***+*** *stands for addition*

*Letters of the alphabet stand for the sounds we make*

*An owl stands for wisdom*

Creating Concepts: mentally grouping together ideas and objects based on similar characteristics

*Examples:*

*Creating the idea of mammals by looking at the characteristics dogs, horses, and elephants*

*Teaching the idea of ball to a child by pointing to basketballs, baseballs and kickballs*

Creating Prototypes: using one example to exemplify an entire concept

*Examples:*

*Drawing a golden retriever when you are asked to draw a dog*

*Thinking of a baseball player when you think of a uniform*

**Problem Solving:** Humans have strategies that they naturally use to solve problems.

Algorithms: procedures that a person follows to get a guaranteed result

*Example: using a formula for the area of a circle*

Heuristics: rules of thumb that often (but not always) help us find a solution

*Examples: trial and error, working backwards, means-end analysis, analogies*

Insight and Incubation: waiting for an ‘aha’ moment

*Example: waking up in the middle of the night with an idea for a song*

Intuition: effortless, immediate, automatic feeling or thought, (opposite of conscious reasoning)

*Example:* *knowing instantly someone is perfect for the job at an interview*

Framing: presenting issues differently to affect people’s decisions and judgments

*Example: Making a retirement program an “opt out” instead of an “opt in” increases people’s involvement in retirement program*

**Obstacles to Good Decisions and Judgments:** Humans are sometimes limited by prior experiences and poor heuristics

Mental set: we expect old problems solving methods to work again in a different situation

*Example: using a formula that works well on the wrong math problem*

Functional fixedness: we see an object for only one use

*Example: thinking of matchbook only for making fire, instead of an object to even out a table also*

Confirmation bias: tendency to search for information that supports our preconceptions and to ignore contradictory evidence.

*Example: reading and liking questionable Facebook news stories because you agree with them*

Representative heuristic: judging the likelihood of things in terms of how well they

Seem to match particular prototypes, ignoring other relevant information

*Example: thinking a short, skinny, poetry loving man is probably a professor and not*

*a truck driver*

Availability heuristic: estimating the likelihood of events based on their availability in memory; if instances come to mind easily we presume events are common

*Example: disregarding global warming because of that really cold day last week*

Belief perseverance: clinging to one’s initial conceptions after the basis on which they were formed has been discredited

*Example: believing your child is “gifted” even after evidence contradicts this*

Convergent thinking: thoughts are limited to only available facts

*Example*: *Teacher gives a multiple choice test that features only one correct answer*

**Creativity** is the ability to produce novel and valuable ideas. This is closely related to **divergent thinking**—thinking that expands the number of possible problem solutions.

According to Robert Sternberg, there are 5 components of creativity

1. Expertise
2. Imaginative thinking skills
3. A venturesome personality
4. Intrinsic motivation
5. A creative environment

If you wish to become more creative, some suggestions:

1. Develop your expertise—follow a passion
2. Allow time for incubation
3. Set aside time for the mind to roam freely
4. Experience other cultures and ways of thinking