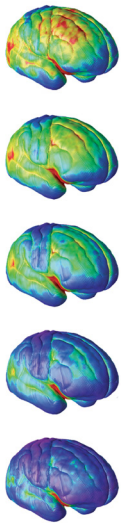


# Abstract Reasoning Facts & Stats

## Thinking by Age



<b>Birth - Age 2</b>	Concrete thinking in terms of what is observed through the five senses.
<b>Age 2 - 7</b>	Primarily concrete. The ability to reason and predict begins to develop.
<b>Age 7 -11</b>	Abstract reasoning starts to grow. The ability to understand why others act the way they do expands.
<b>Age 12 - Adolescence</b>	The capacity to analyze, extrapolate, generalize, and empathize expand.
<b>Adolescence - Adulthood</b>	Critical thinking skills grow allowing higher level thinking such as forming hypotheses to predict and consider alternatives when planning. Empathy expands.

Abstract or conceptual reasoning is the foundational skill of **empathy**. To imagine someone else's thoughts and feelings and see their perspective takes higher level, abstract thinking.



Youth with higher abstract reasoning skills do better on math, language, history, social studies, philosophy, and political studies.



Youth with higher abstract reasoning skills may overgeneralize their failures leading to higher anxiety and depression.

## Thinking Strategies

A thinking strategy or routine is a specific way of processing cognitive information.

**See-Think-Wonder:** 1. Carefully observe 2. Make thoughtful observations 3. Wonder about different meanings or what it can be used for.

**Circle of Viewpoints:** View a problem or issue from as many viewpoints as possible.

**Connect-Extend-Challenge:** 1. Connect an idea to something you already know 2. Extend your thinking and add new information 3. Challenge your assumptions and broaden your way of thinking about a topic, issue, or problem.

## Obstacles to Critical Thinking

**Concrete Thinking:** A literal, black-and-white way of thinking where new information is taken at face value. Although concrete thinking is a necessary step in understanding abstract ideas, people who solely use concrete thinking may have difficulty empathizing, being flexible, and creative.

**Confirmation Bias:** The tendency to interpret new evidence as true if it confirms what we already think or believe. The tendency to discount new information if it contradicts our views.

**Intellectual Arrogance:** The idea that one's knowledge is superior or always right. An inability to see from another's perspective.

**Sea Lioning:** Arguing just to waste someone's time or because you think your arguments are intellectually superior.

**Logical Fallacy:** Any kind of error in reasoning that renders an argument invalid by distorting or manipulating facts, drawing false conclusions, or distracting you from the issue at hand.