FLOW SYSTEM

PARTICIPANT WORKBOOK

Complexity Thinking

Workbook: Complexity Thinking

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Complexity Thinking

In the following table, define in your own words the ontological states of order, complexity, and chaos. Provide an example for each of these and explain why this example belongs to the one state and not the other two. Use the order-complexity-chaotic axis figure 2.2.1 to help guide your descriptions..

Ontological States	
Define Order.	
Give an example for Order and why it does not belong to Complexity or Chaos.	
Define Complexity.	
Give an example for Complexity and why it does not belong to Order or Chaos.	
Define Chaos.	
Give an example for Chaos and why it does not belong to Order or Complexity.	
What are the main differences between order, complexity, and chaos?	

Deductive, Inductive & Abductive Reasoning Defined

Deductive Reasoning

In deductive reasoning, **knowledge** drives process. We generate facts, we develop a hypothesis, and then we test. Deductive reasoning, or deduction, is making an inference based on widely accepted facts or premises. So, if I have a fact that all men are mortal, and I have another fact that Socrates was a man, I can easily deduce or conclude that Socrates was mortal. If the premise is true, then the conclusion must be true. We are taking the abstract to the concrete in deductive reasoning.

Inductive Reasoning

In inductive reasoning, **observation** drives process. We form generalizations from specific observations. So inductive reasoning is making an inference based on an observation, often of a sample of a larger population. If I see white swans, and you see white swans, we may make a generalization that all swans are white. Specific observations lead to general conclusion. This takes something that is concrete, a white swan, to an abstract that all swans are white.

Abductive Reasoning

Abductive reasoning can be understood as "A **'best guess'** [type of] hypothetical reasoning–a form of logical inference in which an observation leads to a hypothesis which might explain the observation [the key word here is might]. [Once formed] the hypothesis can then be tested. In abduction, one is seeking the simplest and most likely explanation, without enough facts for a foothold on certainty" (Pendleton-Jullian & Brown, 2018, p. 392). Abductive reasoning has been compared to the type of reasoning displayed by Sherlock-Holmes.

"As we move from deduction to abduction, there is less reliance on facts, and more on speculation, which in turn draws on the imagination" (Pendleton-Jullian & Brown,2018, p. 392).

Abductive reasoning is useful for forming hypotheses when little information is known about the problem or its causes.

Abductive reasoning is often used by doctors as a tool for diagnosing patients, much in the same manner that Sherlock-Holmes did to solve crimes.

Another example can be found in legal trials where jurors decide one's fate. Jurors make their decisions based on the evidence presented to them. If the evidence is strong, great. Unfortunately, if the evidence is weak, then not so great. Jurors are still required to make an inference.

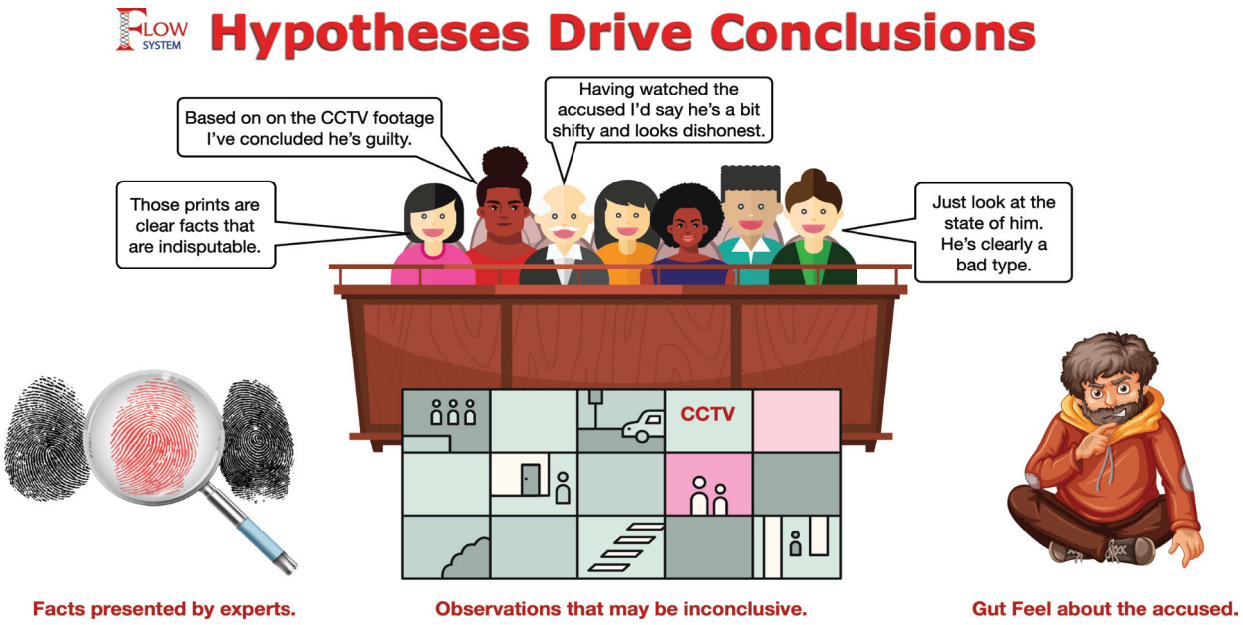

FIGURE 2.2.6: Using Reasoning to Form Hypotheses

Can you see the difference in your work today?

In your own words, provide a definition for each of the three types of reasoning followed by an example for each.

Types of Reasoning	
Deductive reasoning	
Inductive reasoning	
Abductive reasoning	

Apply each of the three types of reasoning in your current situation (e.g., team, group, organization). Identify a problem and provide a brief description of the setting and problem (first row). Next, apply deductive reasoning to the problem (second row). Do the same for inductive reasoning (third row) and abduction (fourth row).

Applying Reasoning	
Problem description	
Deductive reasoning	
Inductive reasoning	
Abductive reasoning	