

## Full Lesson: The Errors of System 1

<p><b>Grade Level</b> 6th–12th</p> <p><b>Suggested Timing</b> Under 30 minutes</p> <p><b>Standard</b> CB.1 – Identify cognitive biases and heuristics and the role they play in our decision-making and our views of the world.</p> <p>VAR.5 – Practice and demonstrate self-awareness of thought processes and behaviors.</p>	<p><b>Goal:</b></p> <ul style="list-style-type: none"> <li>Students will experience the difference between System 1 and System 2 thinking and understand that System 1, while incredibly important, is more easily prone to errors called cognitive biases.</li> </ul> <p><b>Impact:</b></p> <p>Cognitive biases impact all of us, adults and young people alike, and they often lead our decisions in unintended directions. Many cognitive biases occur as a result of the heuristics, or mental shortcuts, that our quick automatic system frequently employs. In this lesson, students will experience both the difference between automatic, fast thinking, and effortful, deliberate thinking, and examples of surprising errors our minds can make. They will be introduced to the idea that our fast thinking, while extremely helpful, can lead to errors called cognitive biases.</p> <p><b>Lesson:</b></p> <p><b>Introduction: Stoop Test (~5 min):</b></p> <p>In this activity, students will feel the difference between System 1 thinking, which is fast and automatic, and System 2 thinking, which is slower and more deliberate.</p> <p><b>Project or provide copies of the Stroop Test</b> (available <a href="#">here</a>) so that all students can see it. Call on 1–2 volunteers to move through the entire list of words by naming the physical font color (the color that the word is printed in) <u>out loud</u>.</p> <p>Ask volunteers to <b>observe what they noticed</b> about the question.</p> <p><b>Suggested question prompts:</b></p> <ul style="list-style-type: none"> <li><i>Was there a line where it got a little harder?</i></li> <li><i>Did you stumble (or have a mini-stumble) anywhere?</i></li> <li><i>Did you make any mistakes? Why?</i></li> </ul>
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**Explain** the Stroop Test and Introduce System 1 and System 2 thinking.  
Suggested language:

*You may have noticed that the first few lines were pretty easy to read because the color of the font matched the name of the word you were reading. But in the third line, there was a slight challenge, which was that the color of the font did not match the name of the word and your brain had to work a little bit harder to concentrate just on the font color.*

*What you just experienced here was an example of the difference between our fast, automatic system of thinking, which we call System 1, and our slower, more deliberate and effortful system of thinking, which we call System 2.*

*Both Systems are really important: when you walk to the lunchroom without having to think about where to turn, or when you read words on a billboard as you drive past them, or when you tie your shoe—this is your System 1 thinking in action. It helps you do most of the things you do in a day without having to think hard about them. When you are learning to play an instrument, trying to pronounce a new word you come across in a book, or solving a hard math problem, this is System 2. It is slower and more conscious. In this lesson we are going to be focusing on System 1.*

**Heuristic instruction (~15 min):**

**Introduce** the concept of heuristics: shortcuts to our System 1 thinking makes it so that we can make sense of all the information we are taking in quickly.

**Suggested reflection or discussion question:** *Why might it be helpful that our brains are wired to take shortcuts and make sense of information quickly? What would it be like if we had to think through each and every thought and action consciously and deliberately?*

**Explain** that although these mental shortcuts are really helpful, they sometimes cause errors.

**Show** [optical illusion slide deck](#). As you walk through the slide deck, explain that even when we know our brains are making mistakes, it's still hard to override those errors. These are called optical illusions.

**Introduce** the concept of Cognitive Biases. Suggested language below.

*Our brains follow rules of thumbs, or shortcuts, that are really helpful. For example, we know that when someone is yelling in one kind of way they are probably angry and when they are yelling in another kind of way they may need help urgently. We can usually figure that out at the first sound of their voice. It is amazing that our brains can do this! But just as our brains can be tricked by what we see, as in the optical illusions we saw before, there are also errors that can be caused by the shortcuts in our thinking. These are called Cognitive Biases and they impact all people. They can affect our decision-making and the way we act in ways that are sometimes surprising.*

**Closing reflection:** Have students write independently, or discuss in pairs or small groups. Suggestion questions:

*Why might it be important to know that our thinking is susceptible to errors? How could this impact our decision-making?*

**Differentiation:**

Instead of going through the Stroop test as a whole class demonstration, pair up students and have them administer the test to each other.

**Optional extensions:**

Brainstorm all the things we do in a day that we do well without having to think about what we're doing (e.g. brushing our teeth, chewing, finding the school, etc.).

Conduct 1-2 Cognitive Bias Demonstrations from the Cognitive Bias Menu activities.

Have students keep track through their regular instruction about when they notice System 1 and System 2 in action.