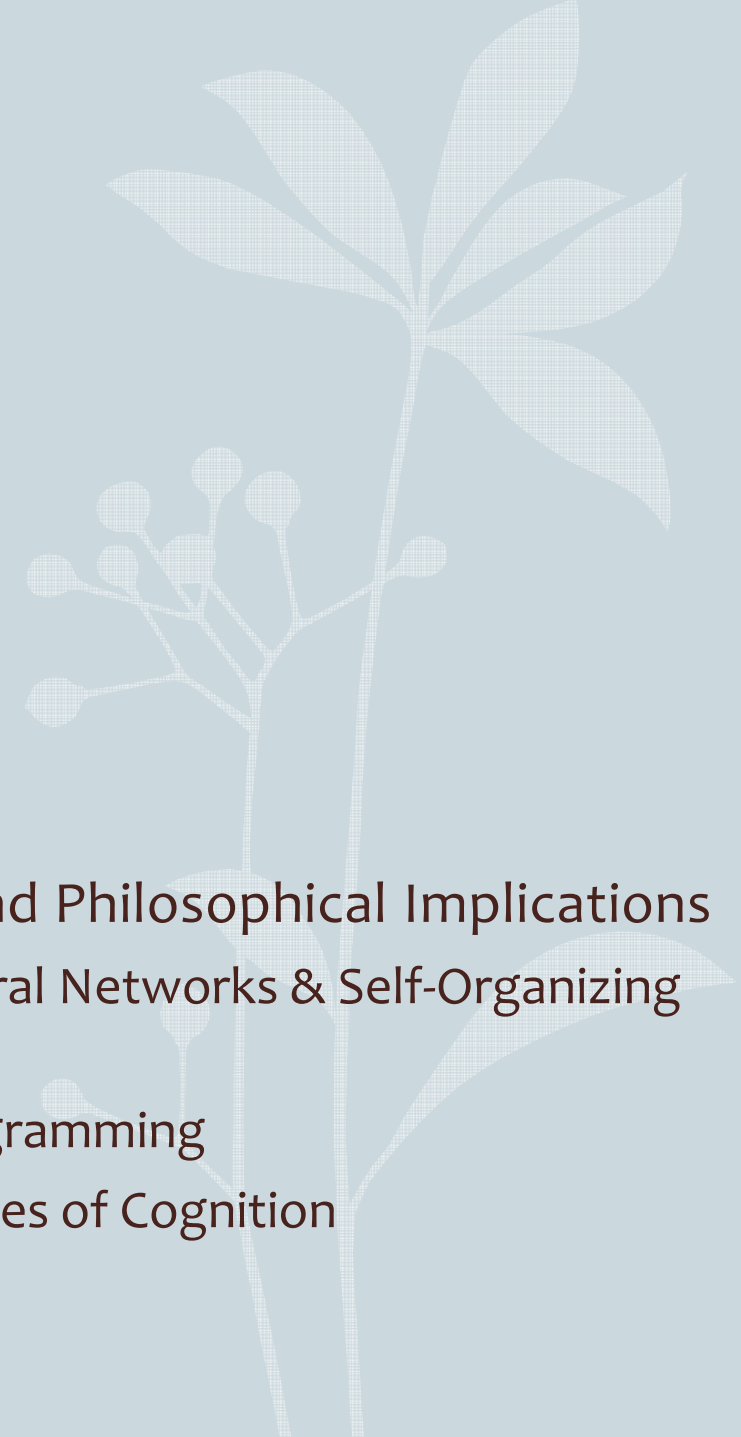


CNS 5037
NEUROPHILOSOPHY
OF CONSCIOUSNESS

Day 2 –

Cognition & The Thinking Brain

Agenda

- Mindfulness Exercise
 - Introduction:
 - Self-Assessment & Review
 - Context for Today's class: Thinking Brain
 - The Thinking Brain: Content, Process, and Philosophical Implications
 - #1. Connectionist Theory of Cognition - Neural Networks & Self-Organizing System
 - #2. Frontal Lobe – Self-Directed Neural Programming
 - #3. Right vs. Left Hemispheres – Types/Modes of Cognition
- 

Self-Assessment of Day #1

1. Our class is about exploring _____.
A. Perspectives, self-awareness, & the brain. B. Perspectives, intelligence, & the brain.
C. Science, human development, & the brain D. Planes, trains, and automobiles
2. The triune theory of the brain asserts that the brain may have developed in how many distinct phases?
A. Two B. Three
C. Thirty D. Thirty-three
3. The brain is made up of 100 billion to trillions brain cells called _____.
A. Synapses B. Neurons
C. Axons D. Lobes
4. Neurons are interconnected in chains of other neurons. This interconnection is referred to as neural _____.
A. Lobes B. Synapses
C. Networks D. Internets

Self-Assessment of Day #1

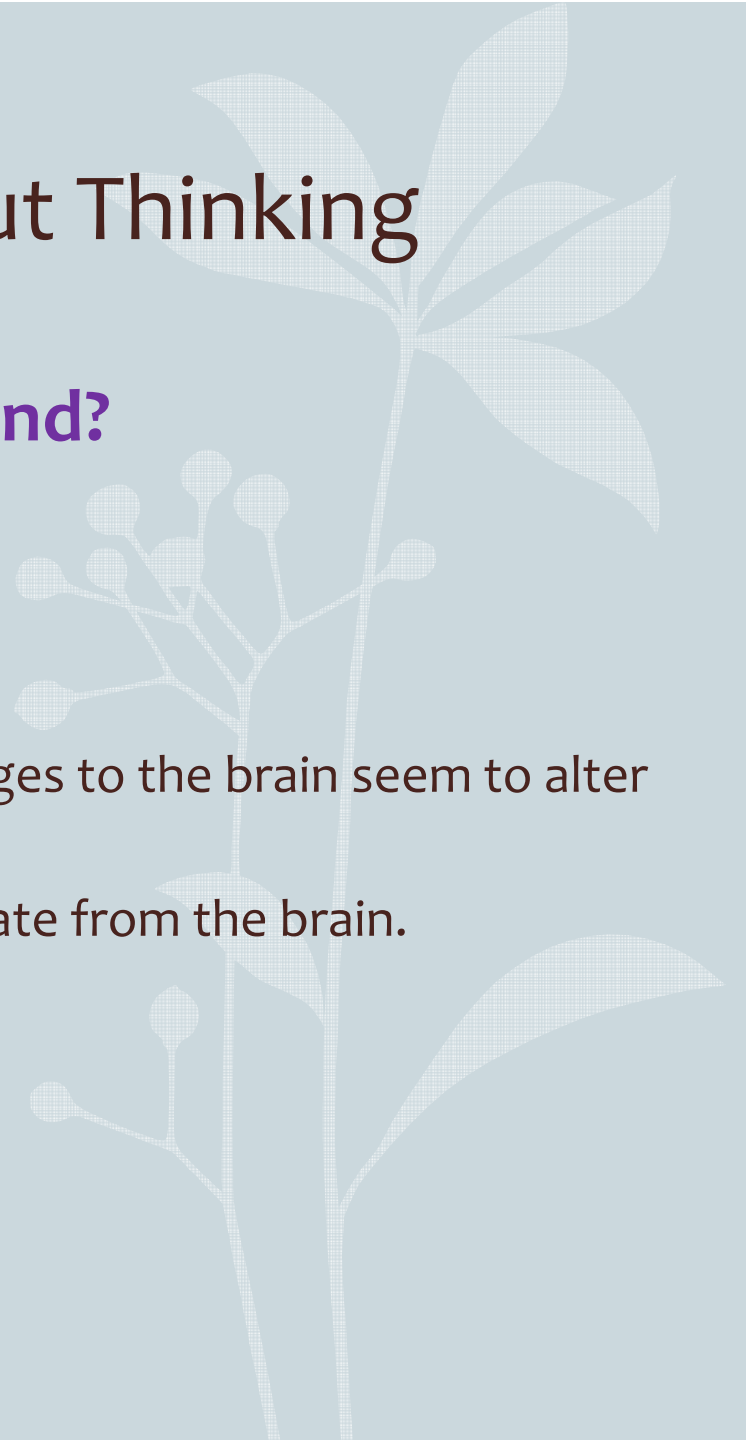
5. Hanson makes the assertion that the mind is _____.
- A. The heart of the brain.
 - B. The spirit that moves the brain.
 - C. What the brain does.
 - D. Separate from the brain.
6. The last part of the brain to have developed, the neocortex, is divided into two halves called _____.
- A. Lobes
 - B. Networks
 - C. Hemispheres
 - D. Partners
7. The study of “neurophilosophy” really took shape after the publication of this philosopher’s book entitled *Neurophilosophy*.
- A. Patricia Thatcher
 - B. Margret Churchland
 - C. Patricia Churchland
 - D. Margret Thatcher
8. This author, along with her husband, believe that many traditional philosophical issues can be approached through the lens of neuroscience. They also believe that all folk psychology should be replaced completely with neuroscience since no non-physical entities (like “beliefs” and “desires”) exists. Their philosophical stance is referred to as:
- A. Postmodernism
 - B. Eliminative Materialism
 - C. Neuralism
 - D. Idealism

HW Review: Thinking about Thinking

What is the mind?

PG 11:

- “The mind is what the brain does.”
- Seems to make sense though because changes to the brain seem to alter the mind.
- However, some might say the mind is separate from the brain.



HW Review: Thinking about Thinking

How can we take more conscious control over our happiness?

PG 6:

- “What flows through your mind sculpts your brain. Thus, you can use your mind to change your brain for the better...”

Pg 13:

- Regulate our thoughts to activate calming systems, activate positive emotions. (be in charge of thought content – access empowering perspectives)
- Learning to be more attentive to both inner and outer worlds (develop self-awareness).
- Making wiser choices when meeting pleasure and pain without grasping and struggling.

HW Review: Thinking about Thinking

How might Hanson's two statements be problematic for free will?

1. The mind is what the brain does.
2. What flows through your mind sculpts the brain.

If what flows through your mind sculpts your brain, and your brain is sculpted by experience every since birth (and even before), aren't all my choices then predetermined by experiences that I had no choice over?

Leads many to question existence of free will.

HW Review: Thinking about Thinking

<http://www.youtube.com/watch?v=-i3AiOS4nCE>



HW Review: Thinking about Thinking

Video seems to indicate that we lack free-will.

What do you think?

- At the very least it illustrates that the process of thinking and the contents of our thoughts are often unconscious choices.
- What are examples of when you were automatically driven to negative judgments about yourself, others, or your circumstances?

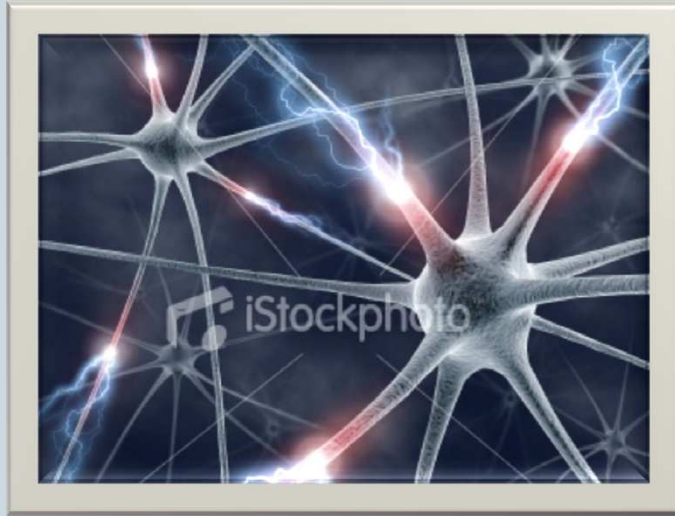
HW Review: Thinking about Thinking

Two Concerns Regarding Cognition (thinking)

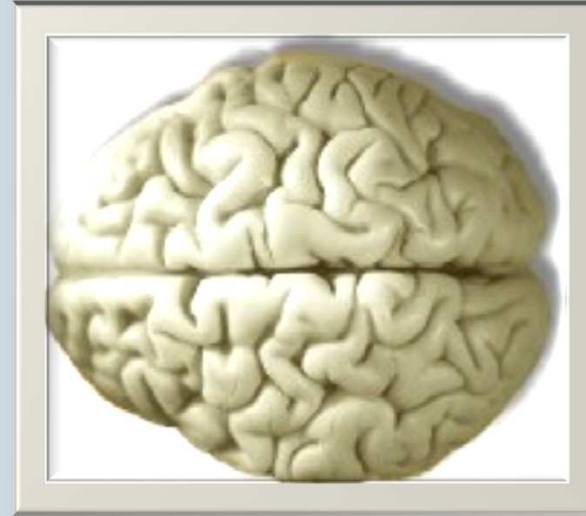
1. **Content:** What we think about.
 - Limited, faulty, or unproductive judgments and perceptions about the world including our own self-image.
2. **Process:** How we think.
 - Can be limited, faulty, and/or unproductive ways of processing information.

Thinking about Thinking: Exploration from Three Perspectives.

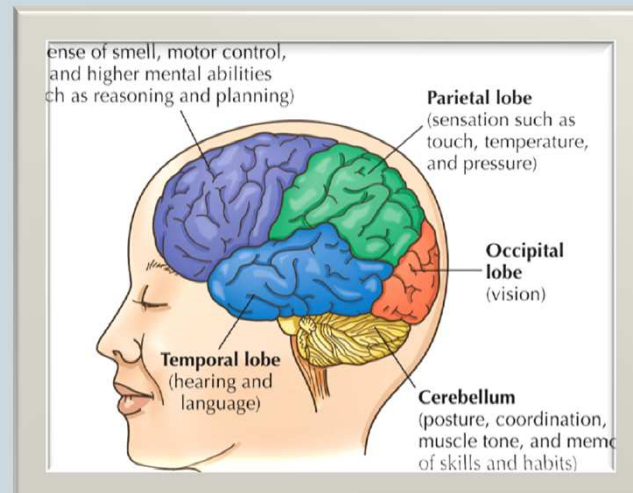
- 1. Connectionism: Neural Networks



- 3. The Two Hemispheres



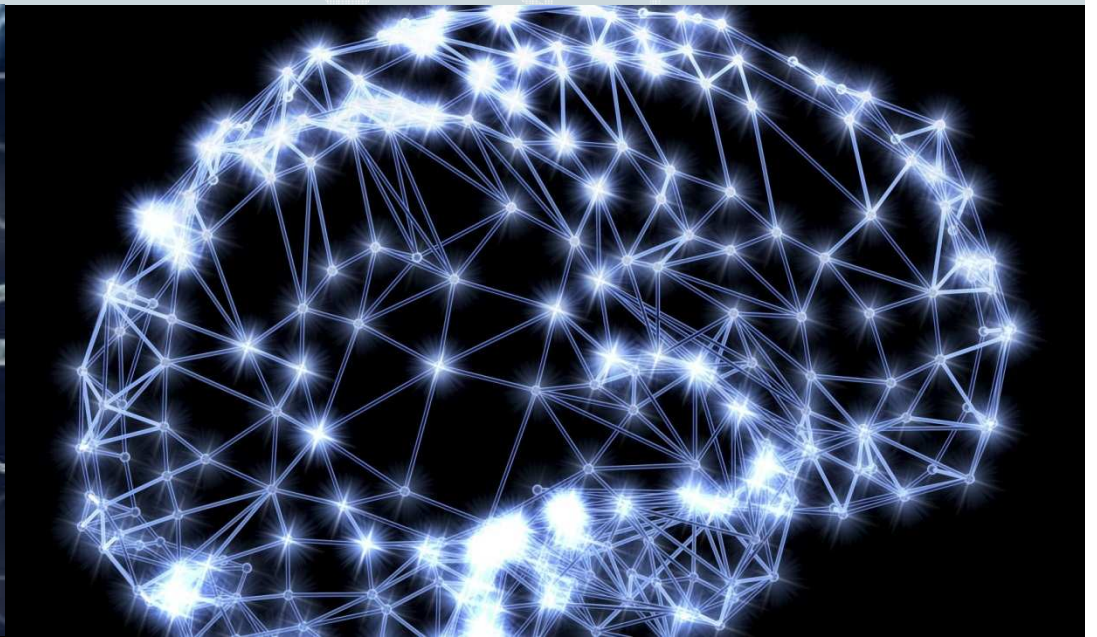
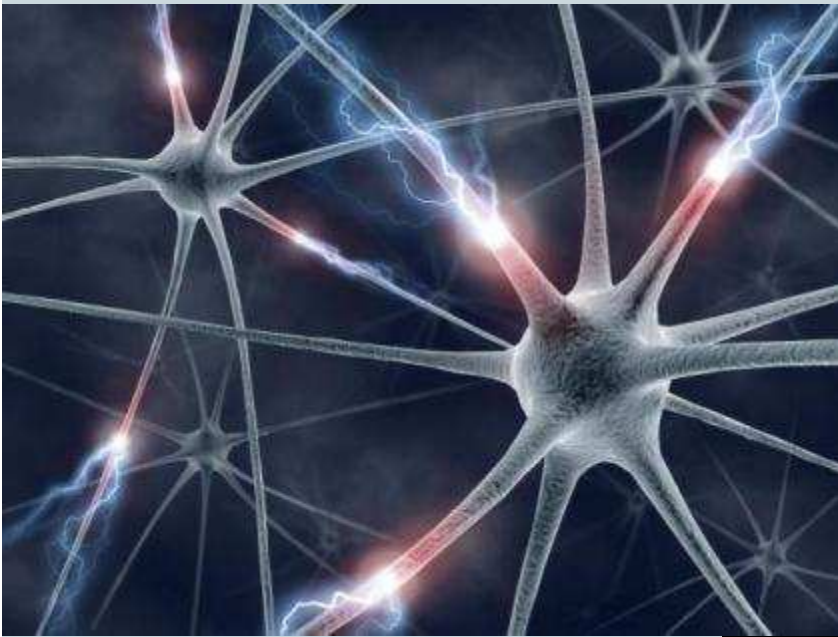
- 2. Frontal Lobe



Thinking about Thinking:

#1. Connectionism: Neural Networks

In dyads or triads, discuss what the significance and implications are of neural networks to well-being and the utility of spiritual practices (traditional psychological techniques).



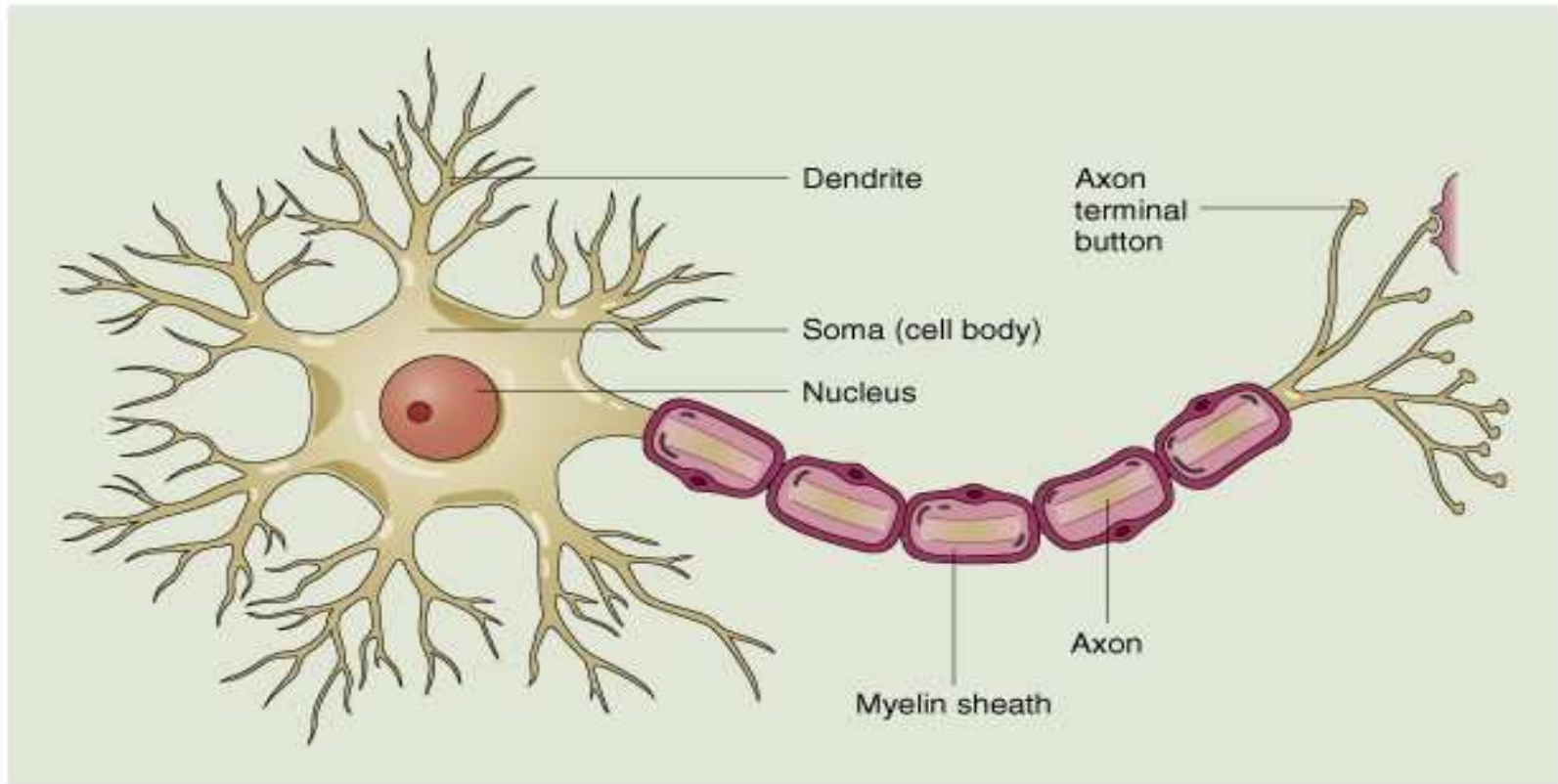
#1. Connectionism: Neural Networks



Cognitive science theory that believes human cognition is the activity of neural networks. Knowledge stored as neural connections.

Thinking about Thinking:

#1. Connectionism: Neural Networks



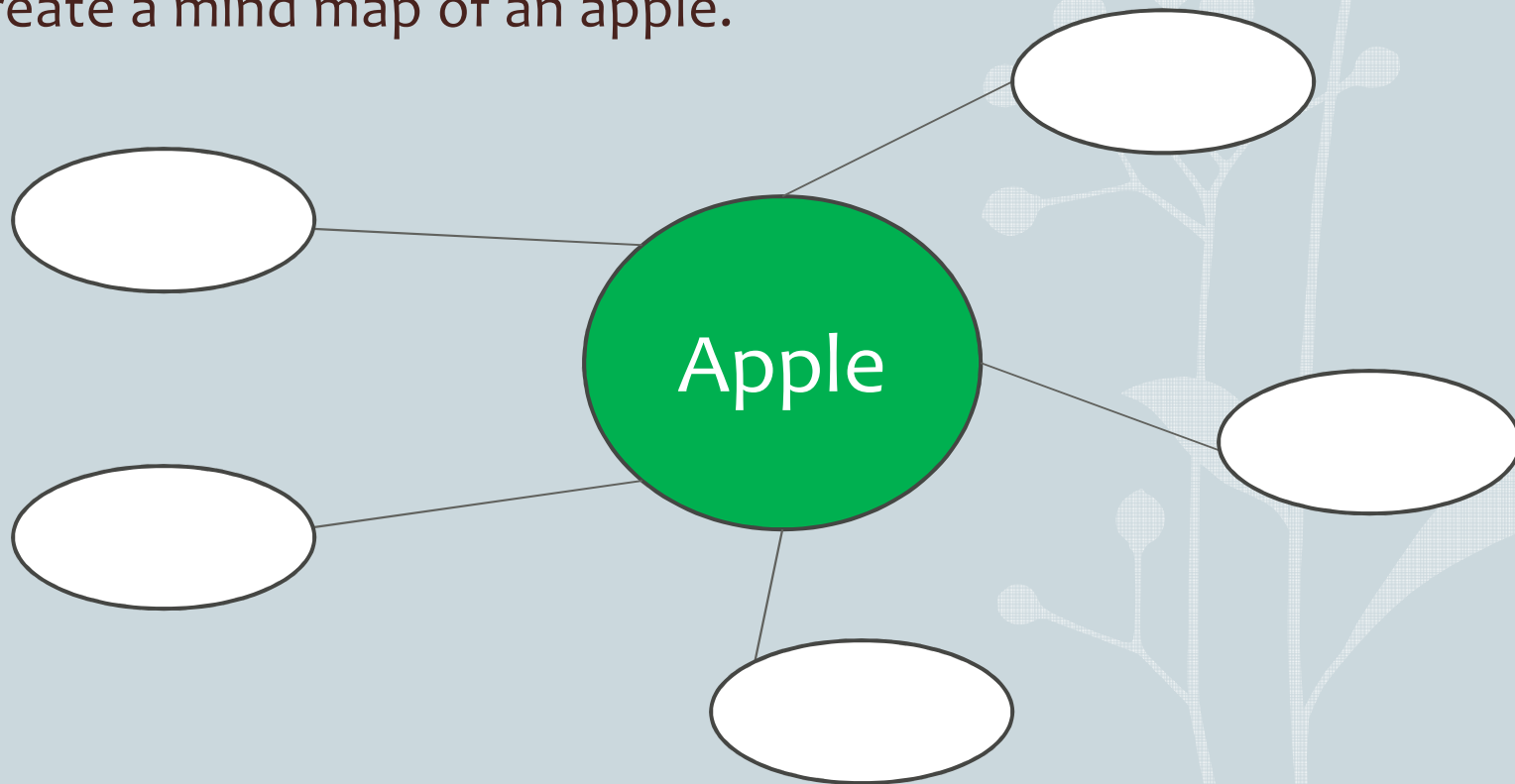
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Thinking about Thinking:

#1. Connectionism: Neural Networks

Understanding Neural Networks

- Create a mind map of an apple.

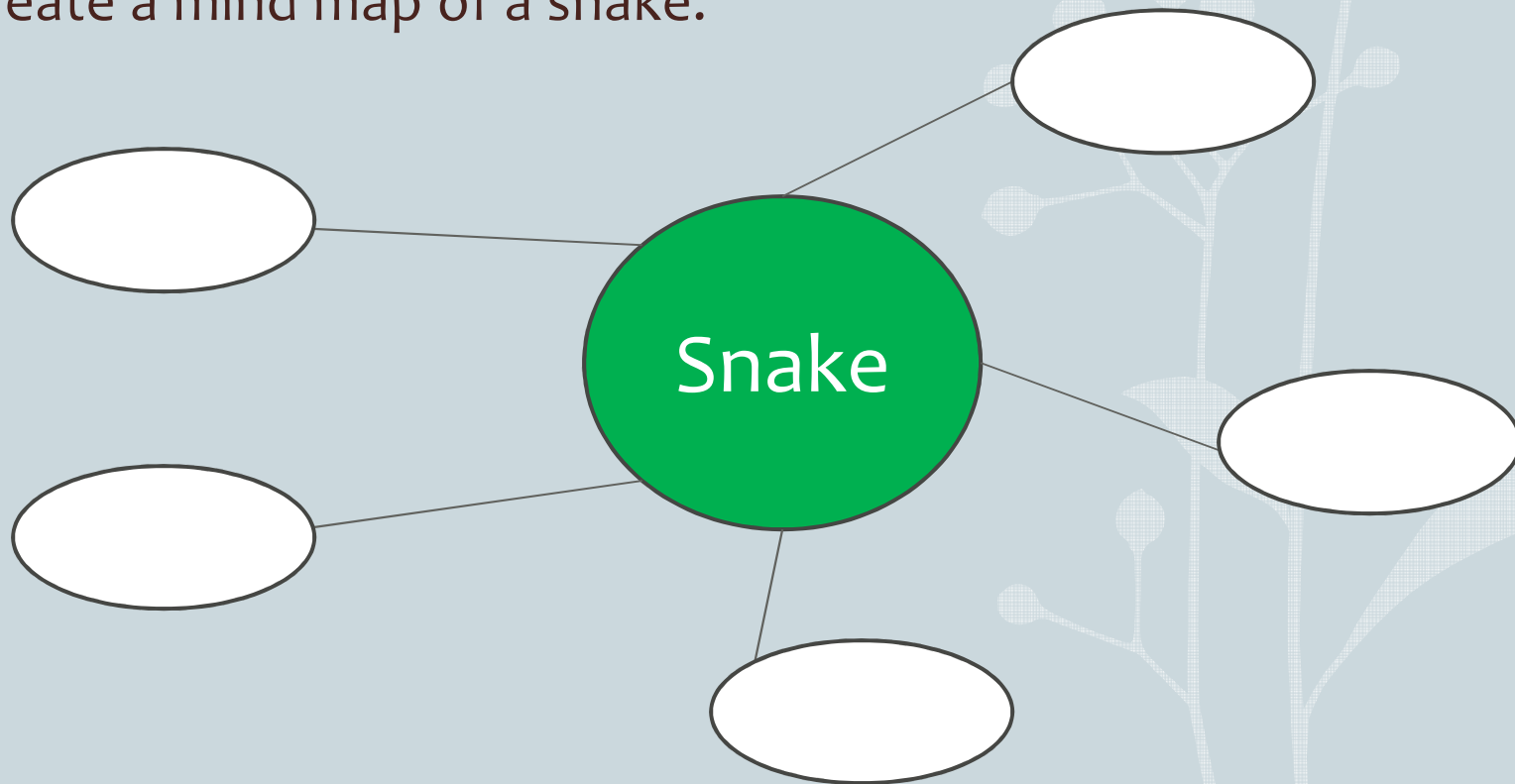


Thinking about Thinking:

#1. Connectionism: Neural Networks

Understanding Neural Networks

- Create a mind map of a snake.

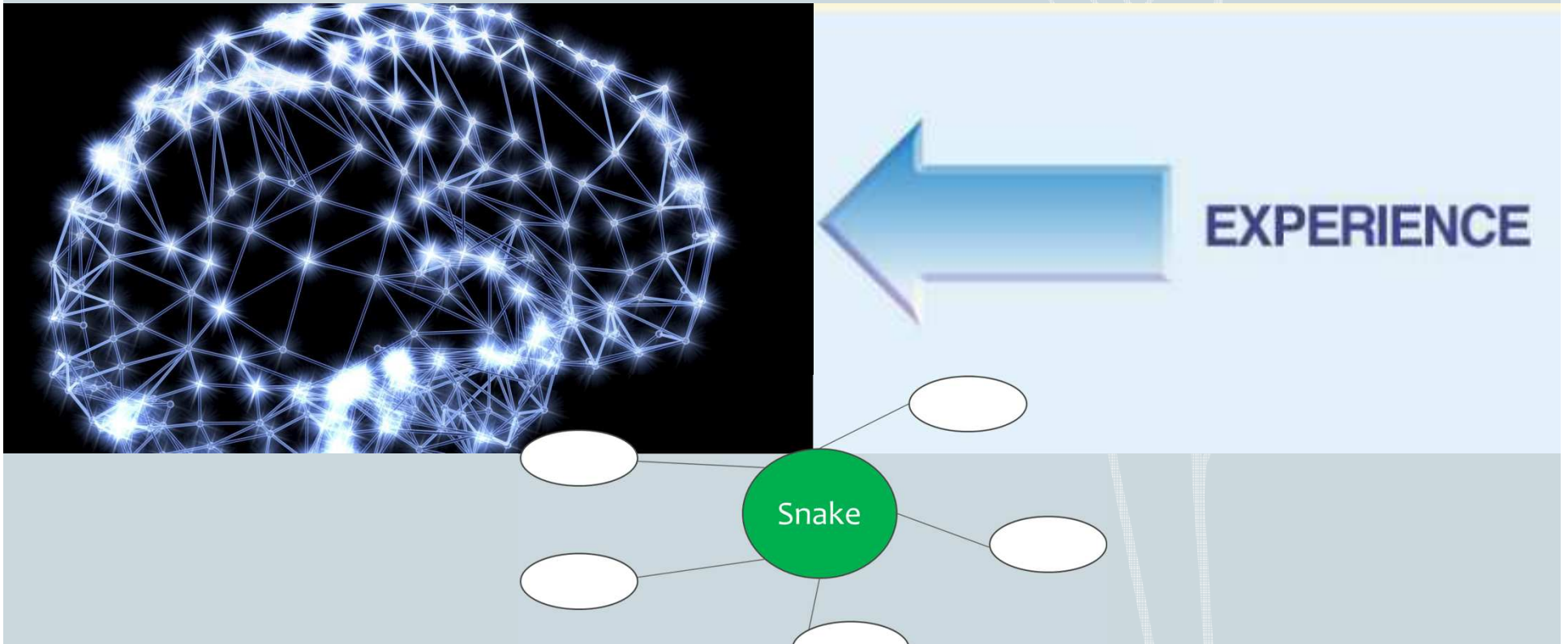


Thinking about Thinking:

#1. Neural Networks

Every experience shapes and restructures our brain.

- As we experience the world we make neural associations between all our sensations and past experience (memory).
- This becomes our meaning of apple & snake.



Thinking about Thinking:

#1. Connectionism: Neural Networks

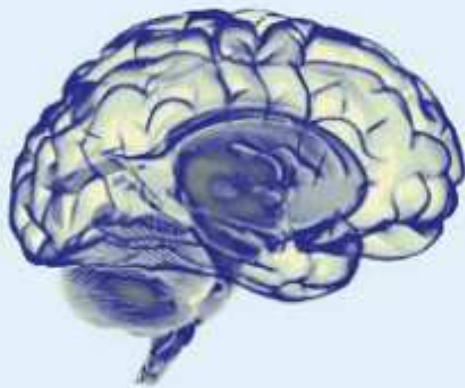
- **Hard-wired based on genetics and evolutionary history**
 - Vision, hearing, touch, motor functions
 - Mimicry, basic reflexes, and more
- **Developed through our experiences within our lifetime.**
 - Physical environment
 - Culture



Thinking about Thinking:

#1. Connectionism: Neural Networks

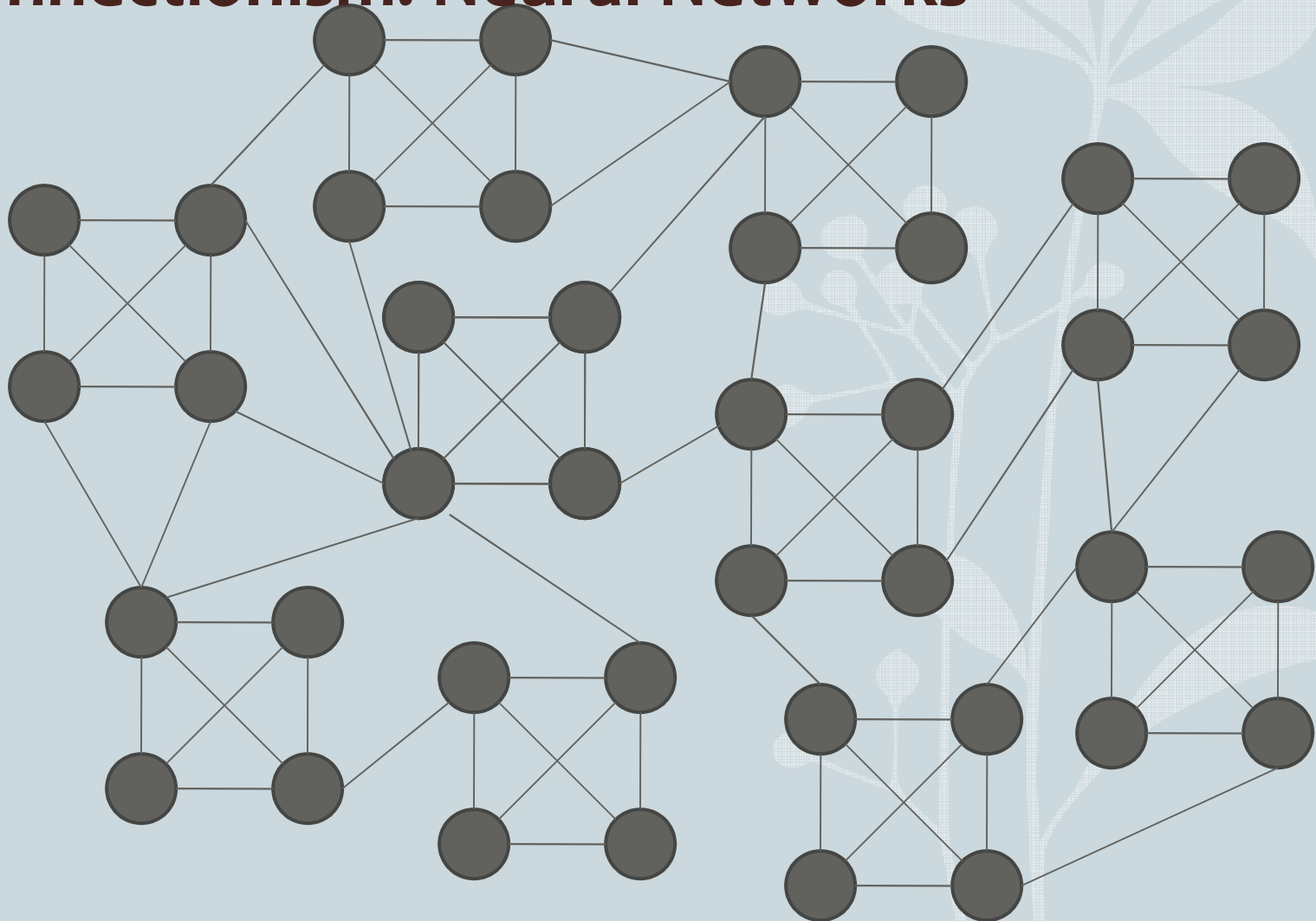
The brain shapes every experience we have, and not necessarily in empowering or optimal ways.



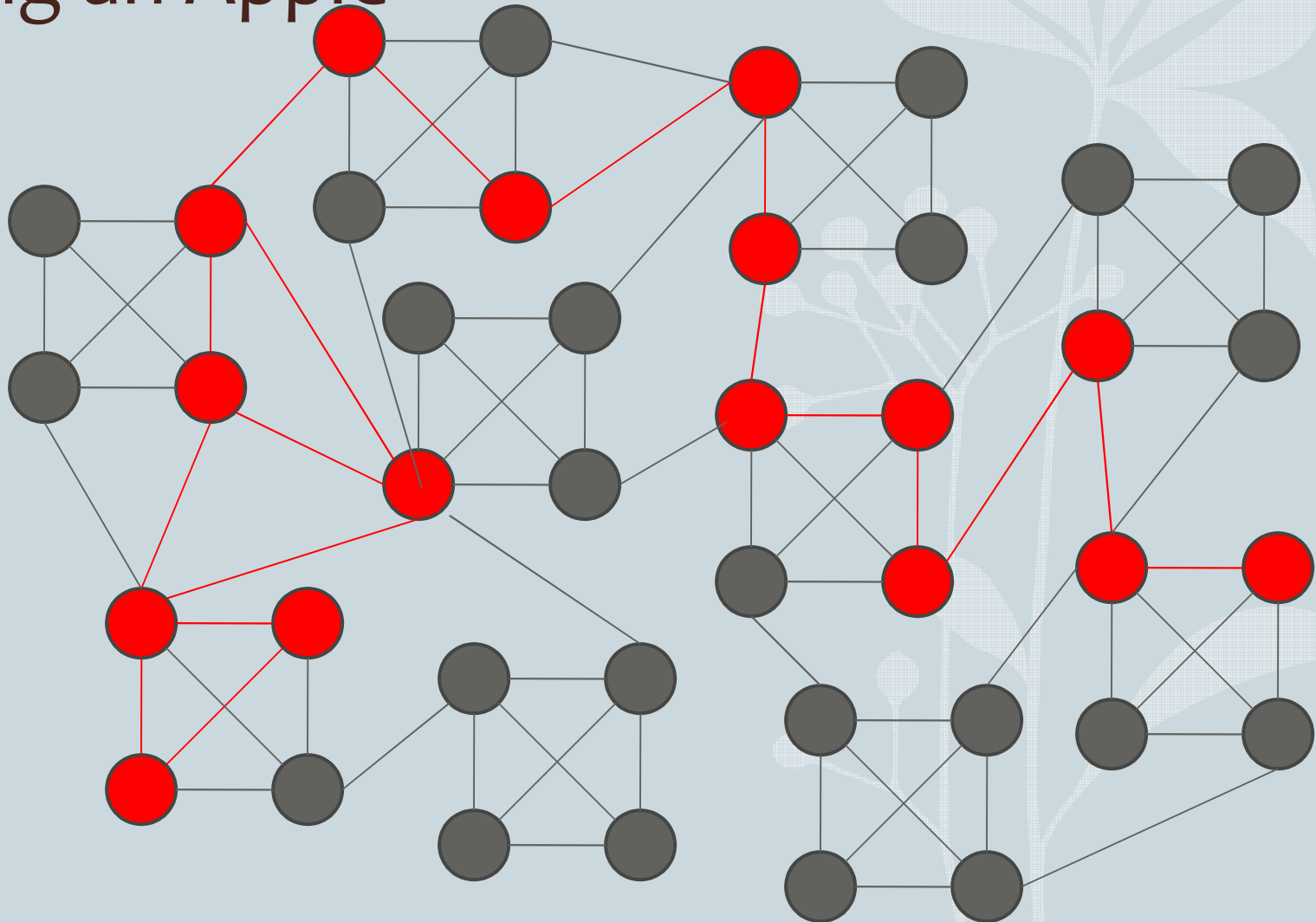
EXPERIENCE

Thinking about Thinking:

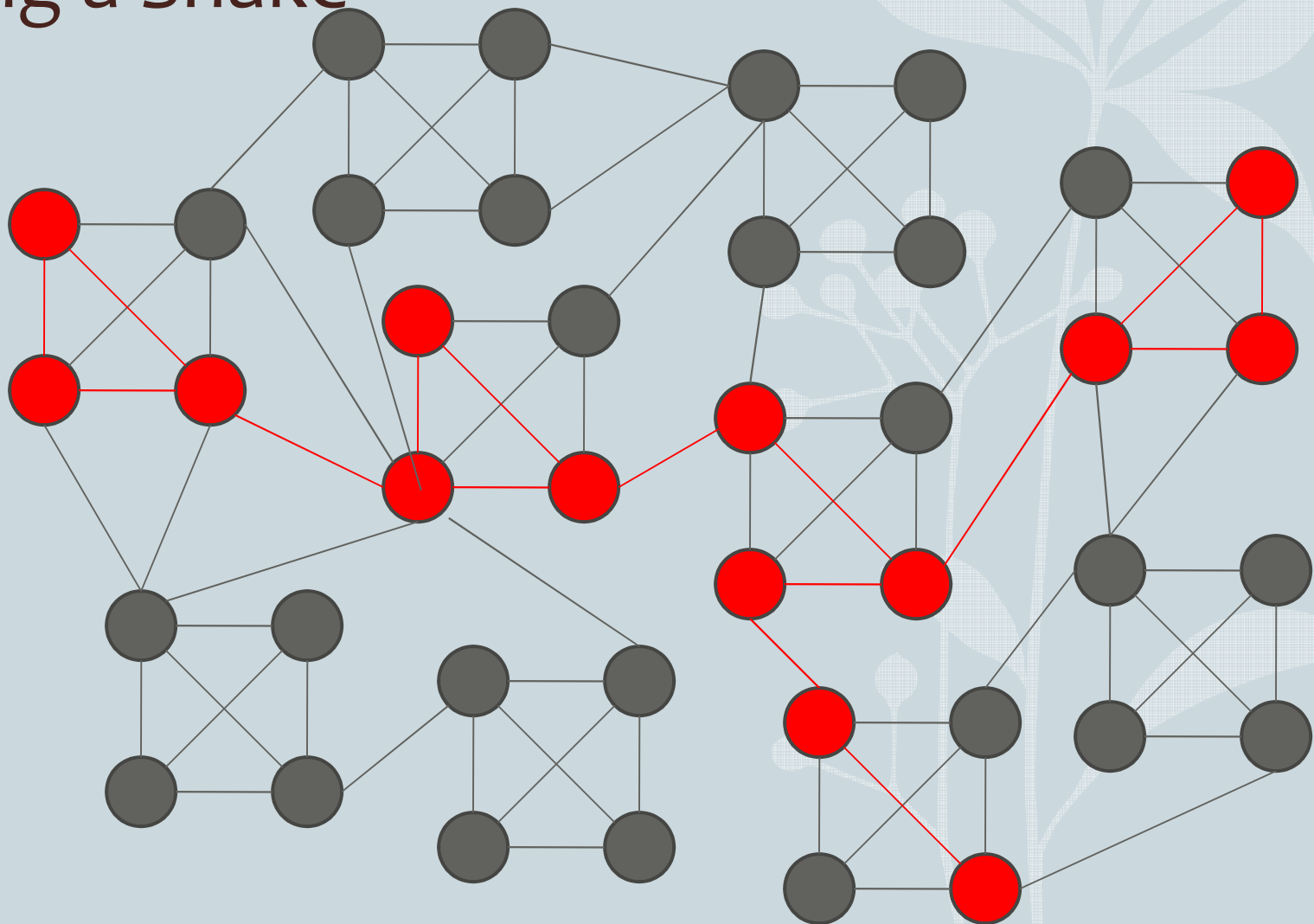
#1. Connectionism: Neural Networks



Seeing an Apple



Seeing a Snake



Thinking about Thinking:

#1. Connectionism: Neural Networks



What does it mean to *experience* an apple?

1. **Sensing** occurs first.
2. Then **Sensory Coding** occurs.
3. Then **Perception** occurs.

What does this mean about our “knowledge” of reality?

Thinking about Thinking: #1. Connectionism: Neural Networks



Thinking about Thinking:

#1. Connectionism: Neural Networks

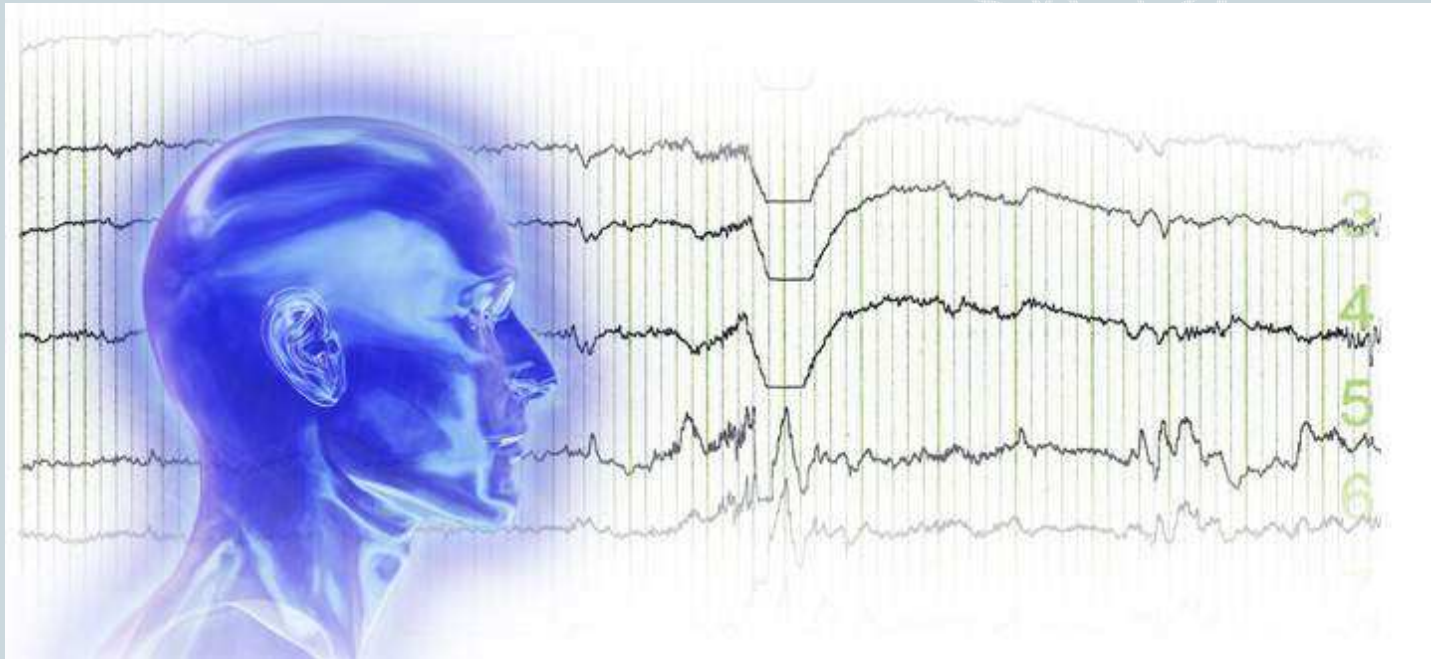
So where do vision and hearing (& the other senses) happen?

The Brain!



Thinking about Thinking: #1. Connectionism: Neural Networks

Brains Operate on the *Nerve-impulse Representation* of the World, Not the World Itself



Thinking about Thinking: #1. Connectionism: Neural Networks

What does this mean
for individual
experience of
reality?

- May be different for each of us.
- Depends on how we are “wired.”

CONTENT:

*How could this be an issue
for well-being?*

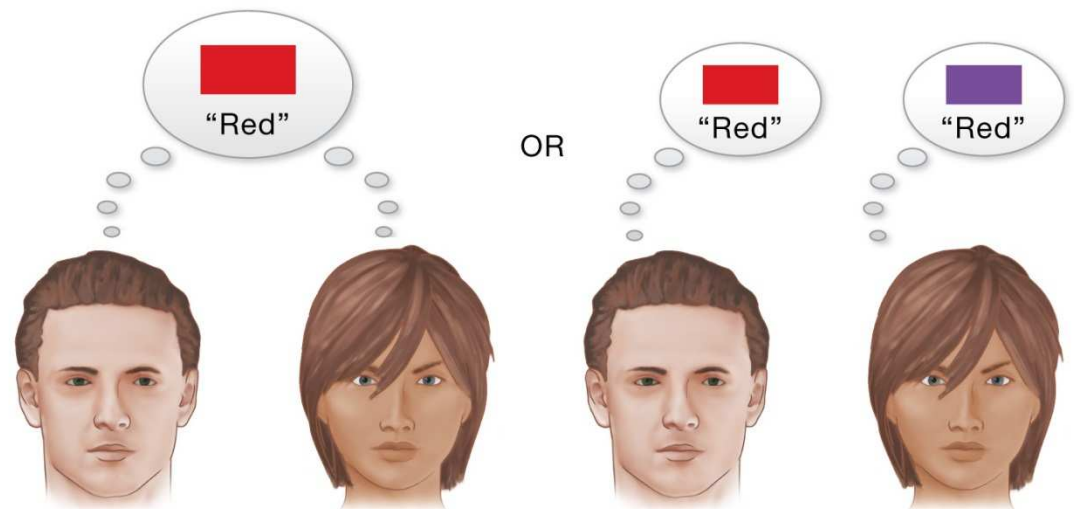
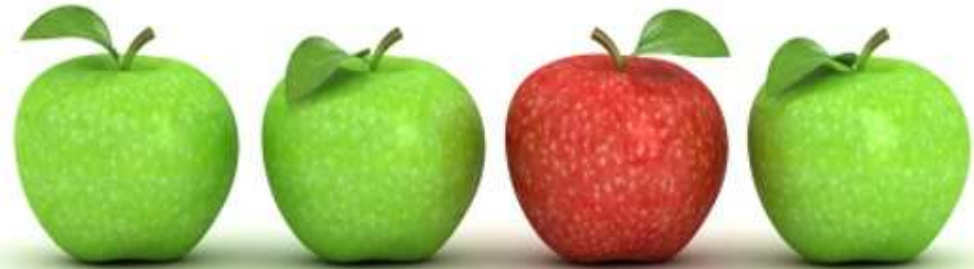


FIGURE 4.2 Qualia: Seeing Red

Thinking about Thinking:

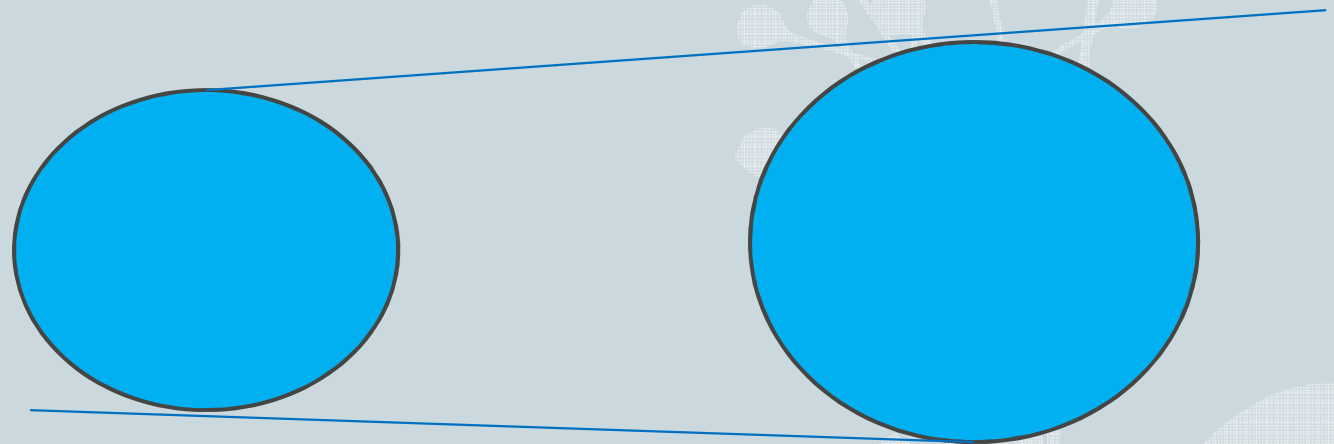
#1. Connectionism: Neural Networks

We've discuss content. What about process?

*How do neural networks affect
the quality of our thinking?*

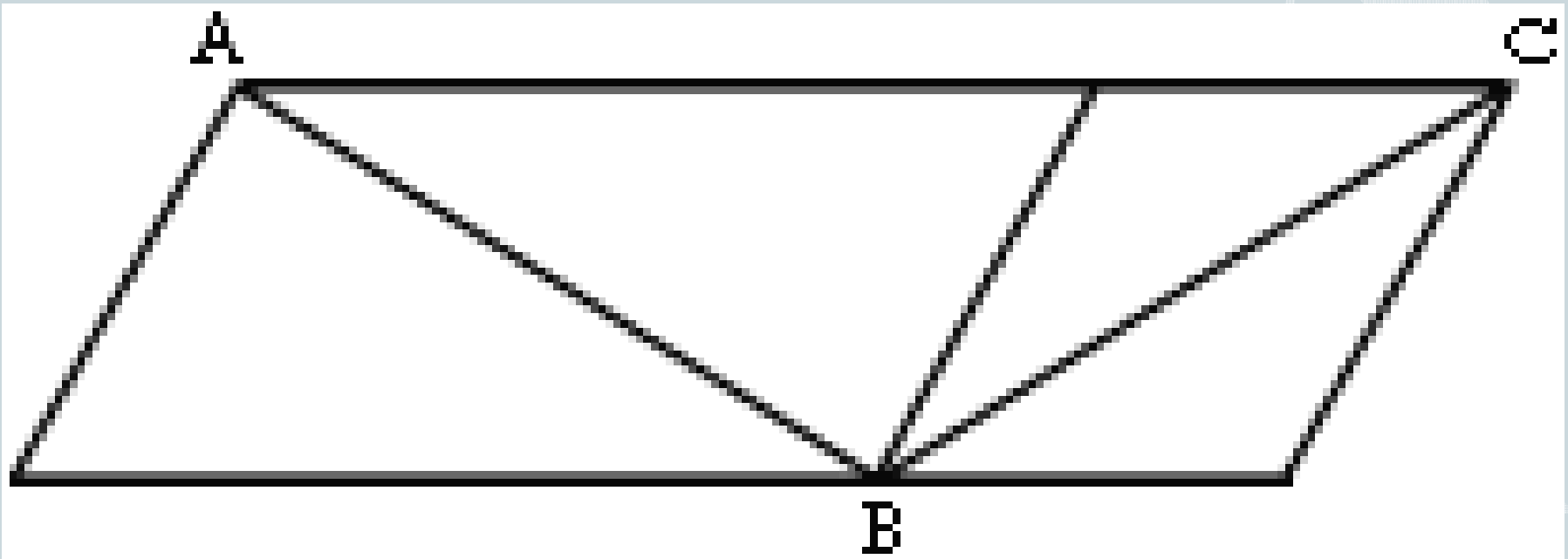
Thinking about Thinking:

#1. Connectionism: Neural Networks



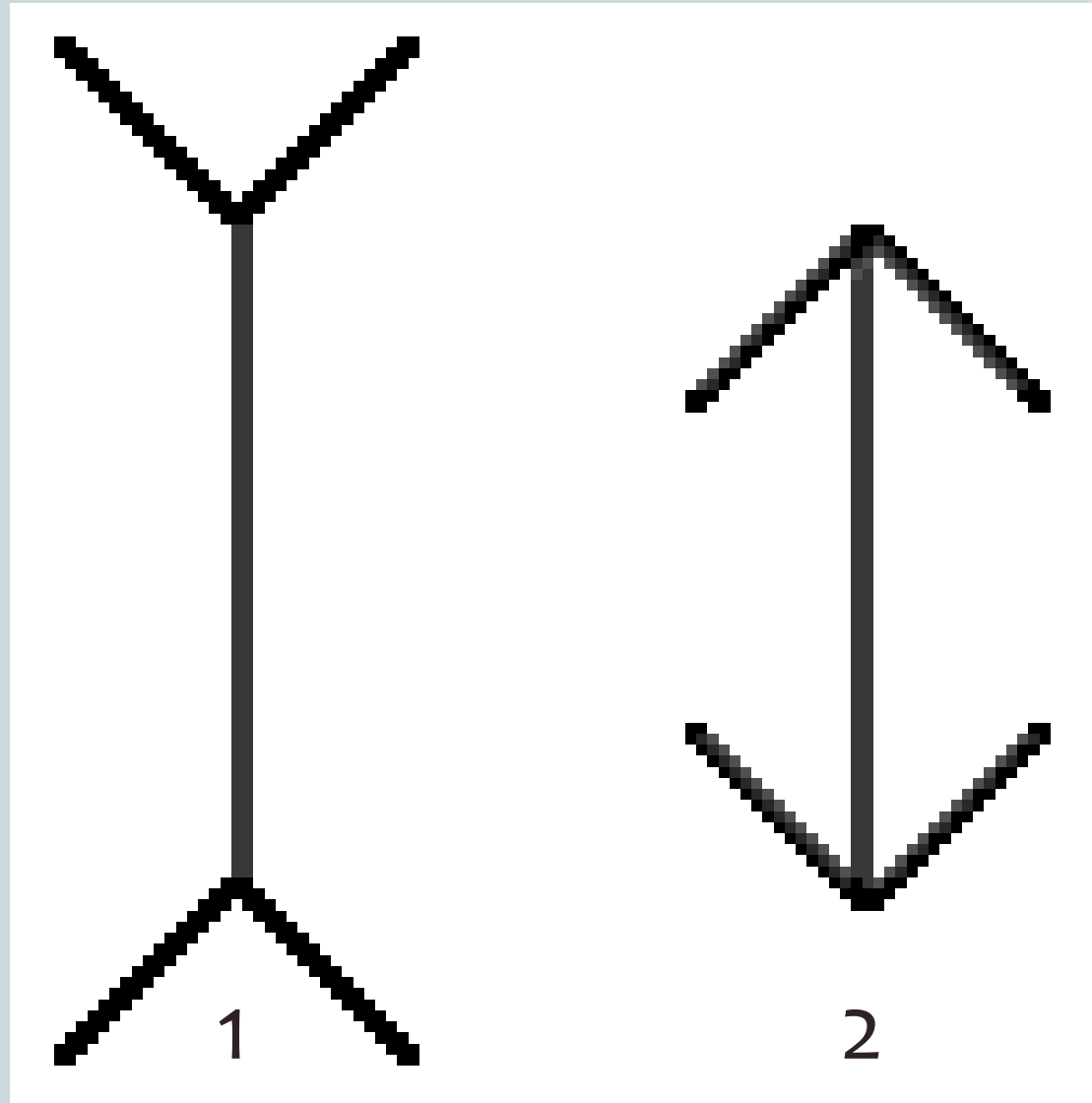
Thinking about Thinking:

#1. Connectionism: Neural Networks



Thinking about Thinking:

#1. Connectionism: Neural Networks

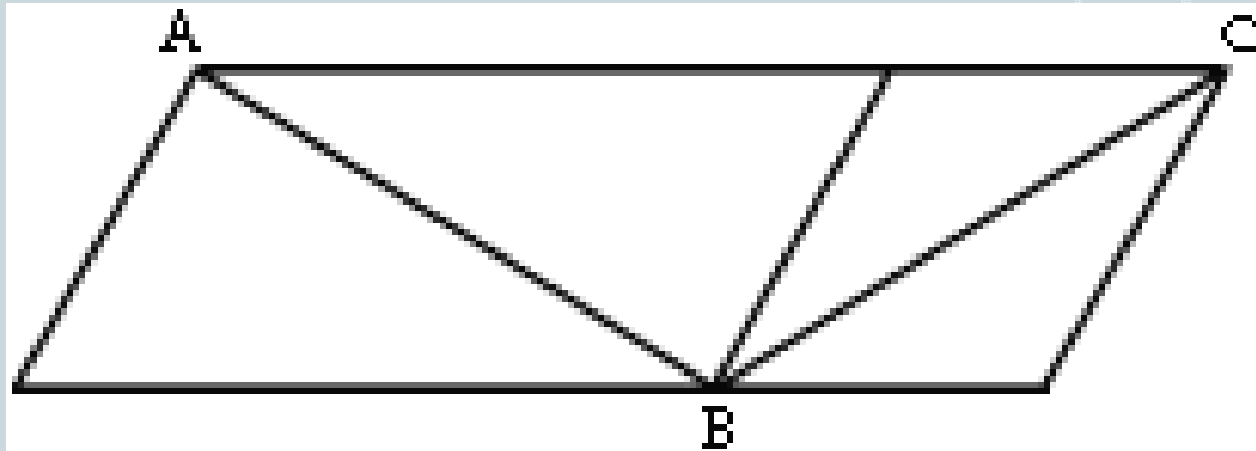


Thinking about Thinking:

#1. Connectionism: Neural Networks

Snap Judgments Based on Context

Clues \rightarrow quick decisions



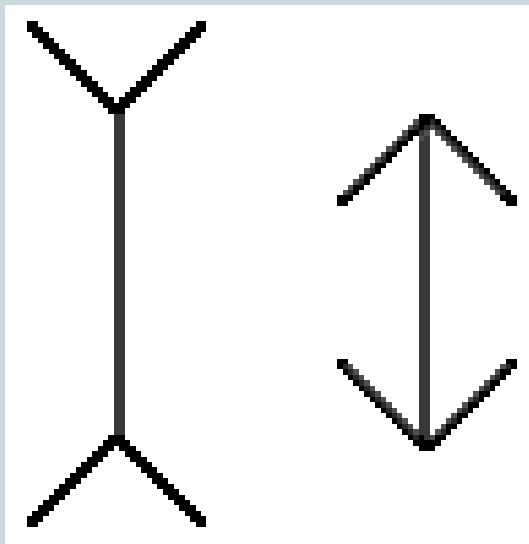
Thinking about Thinking:

#1. Connectionism: Neural Networks

Snap Judgments Based on Context

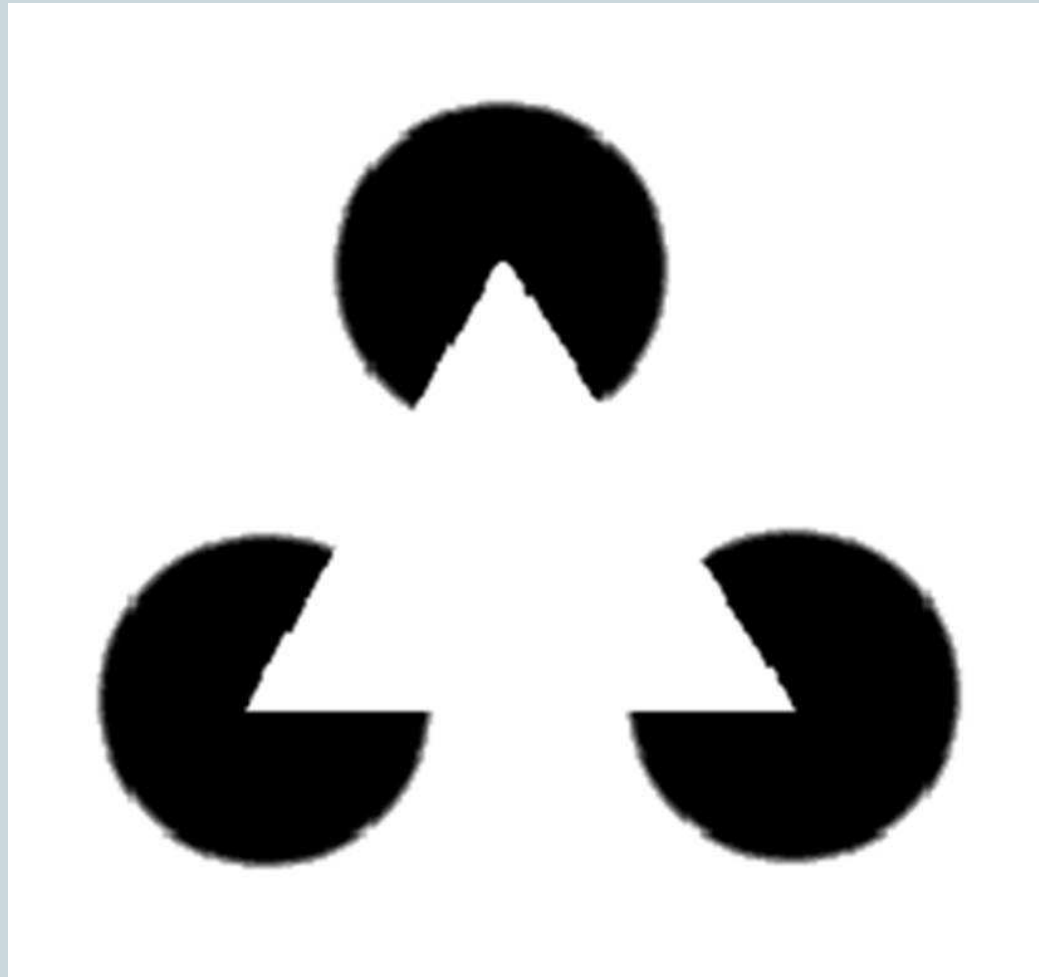
Connectionist: Context “primes” neural network.

Wired to make quick decisions. Networks easily triggered.



Thinking about Thinking:

#1. Connectionism: Neural Networks



Thinking about Thinking:

#1. Connectionism: Neural Networks



Thinking about Thinking:

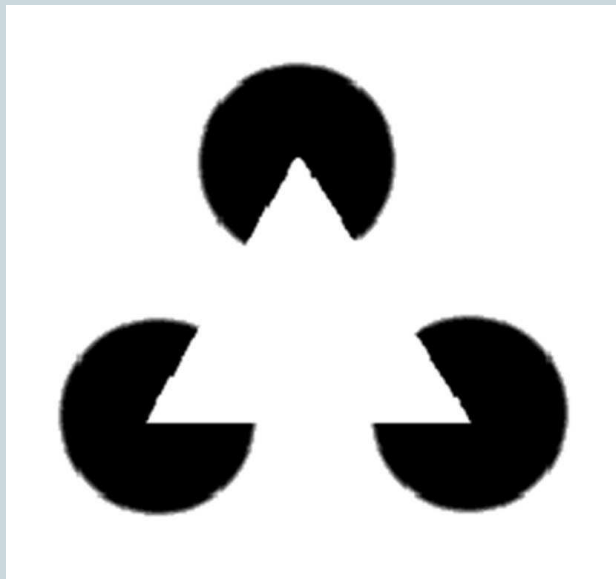
#1. Connectionism: Neural Networks



Thinking about Thinking:

#1. Connectionism: Neural Networks

Understanding/Thinking is Primarily
Habitual Pattern Recognition



Connectionist: *Don't need to activate entire network
– just enough of it.*

Thinking about Thinking:

#1. Connectionism: Neural Networks

$$X * Y/2 = 24;$$

- If $Y=2$, what does X equal?

What's the next number in the sequence?

- 1, 2, 4, 8, 16, ?

Mary and Joe are both leaving at the same time to go from San Francisco to go to San Jose. Joe is riding his bicycle and Mary is taking her new sports car. Who is more likely to get to San Jose first?

Expertise!

Why is this good?

Thinking about Thinking:

#1. Connectionism: Neural Networks

Word Patterns

According to research at Cambridge University, it doesn't matter in what order the letters in a word are, the only important thing is that the first and last letter be at the right place. The rest can be a total mess and you can still read it without problem. This is because the human mind does not read every letter by itself, but the word as a whole.

Thinking about Thinking:

#1. Connectionism: Neural Networks

How do neural networks affect the quality of our thinking?

- We use them to come to quick judgments based on context (**most easily triggered network**).
- We impose meaning on our reality based on **dominant networks...**
 - Beliefs, past experience, expectations, values, etc...
- “Understanding/making sense” = I found a way for info to fit within my pre-existing neural network.
- We do all of this habitually. It’s unconscious.
- Good for experts, efficient decision making, etc...

Any problems?



"Say ... what's a mountain goat doing way up here in a cloud bank?"

Pigmy and the Magic Flies



Thinking about Thinking:

#1. Connectionism: Neural Networks

What's the issue with this?

In a survey of clinicians, when they were told that there was a mortality rate of 7 percent within 5 years for a certain operation, they hesitated to recommend it;

if on the other hand, they were told it had a survival rate after 5 years of 93 percent, they were more inclined to recommend it to their patients (Piattelli-Palmarini, 1994, p. 52).

Not really thinking critically. Just recognizing pattern.

“Mortality” = Bad.

“Survival rate” = Good.

Thinking about Thinking:

#1. Connectionism: Neural Networks

The problem with this type of thinking (process)

A man is born in 1990 and dies in 2010.

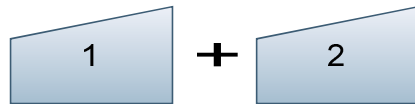
According to his death certificate, the man died when he
was 25 years old.

Is this possible?

Thinking about Thinking:

#1. Connectionism: Neural Networks

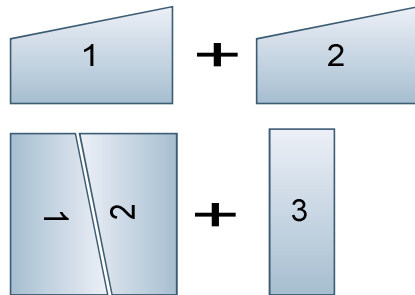
Self-Organizing System → “Linear Thinking” & “Common Sense”



Thinking about Thinking:

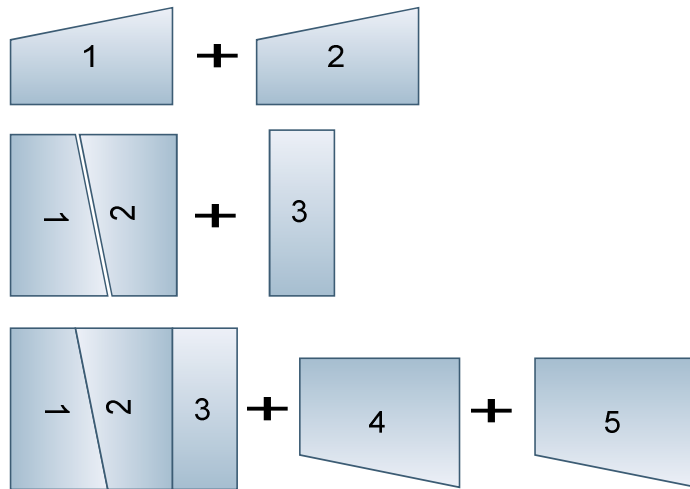
#1. Connectionism: Neural Networks

Self-Organizing System → “Linear Thinking” & “Common Sense”



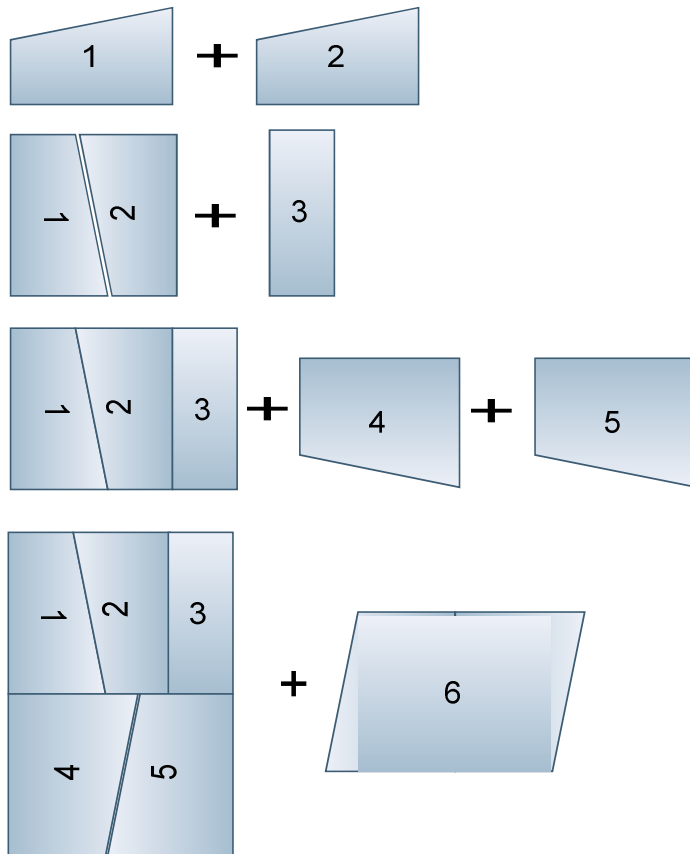
Thinking about Thinking: #1. Connectionism: Neural Networks

Self-Organizing System → “Linear Thinking” & “Common Sense”

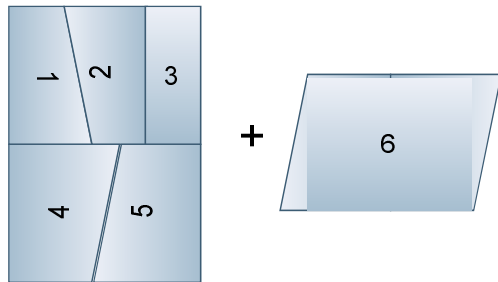
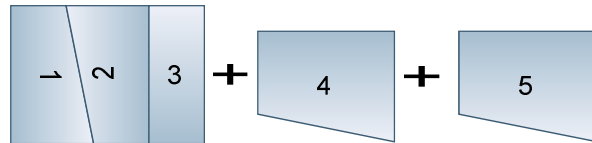
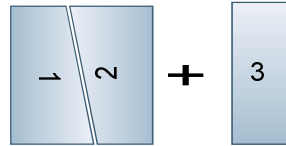
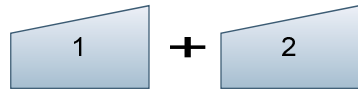


Thinking about Thinking: #1. Connectionism: Neural Networks

Self-Organizing System → “Linear Thinking” & “Common Sense”



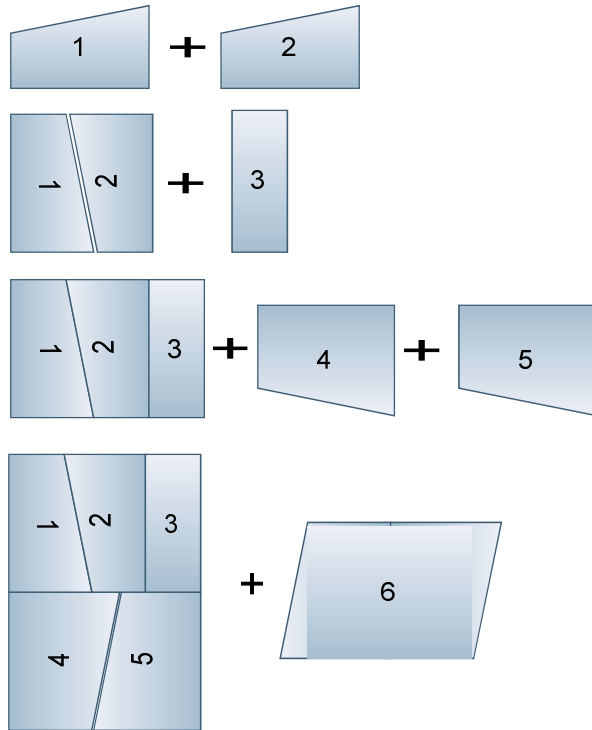
Thinking about Thinking: #1. Connectionism: Neural Networks



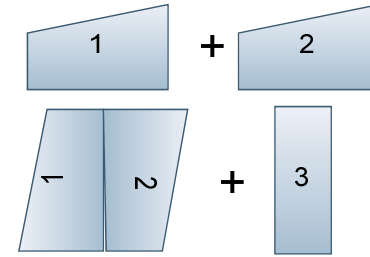
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Thinking about Thinking:

#1. Connectionism: Neural Networks

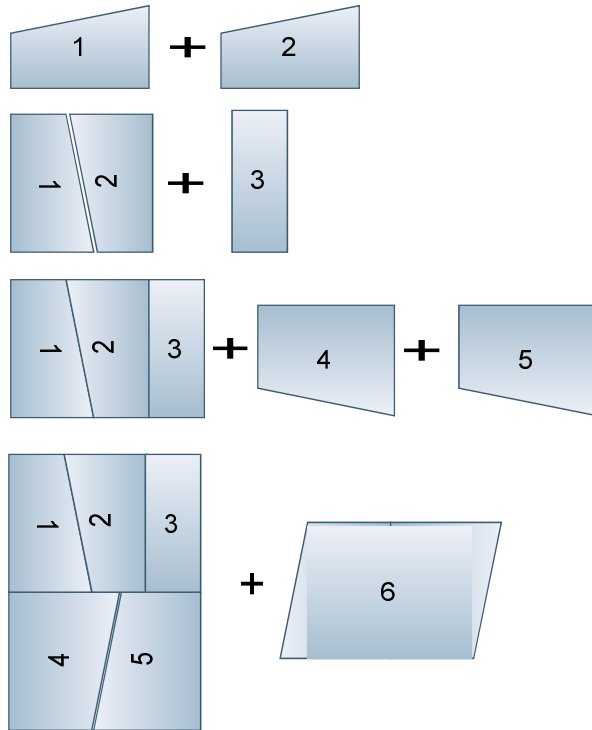


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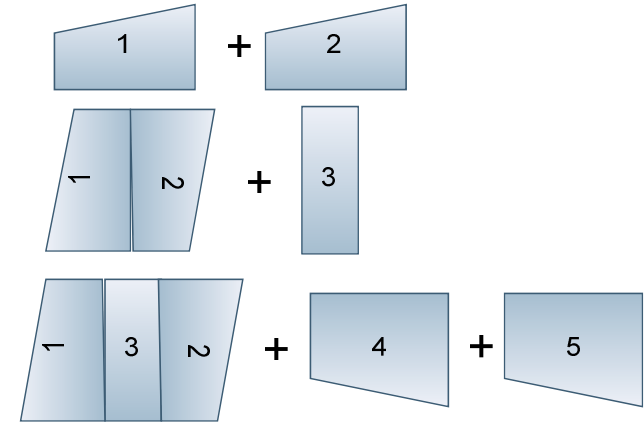


Thinking about Thinking:

#1. Connectionism: Neural Networks

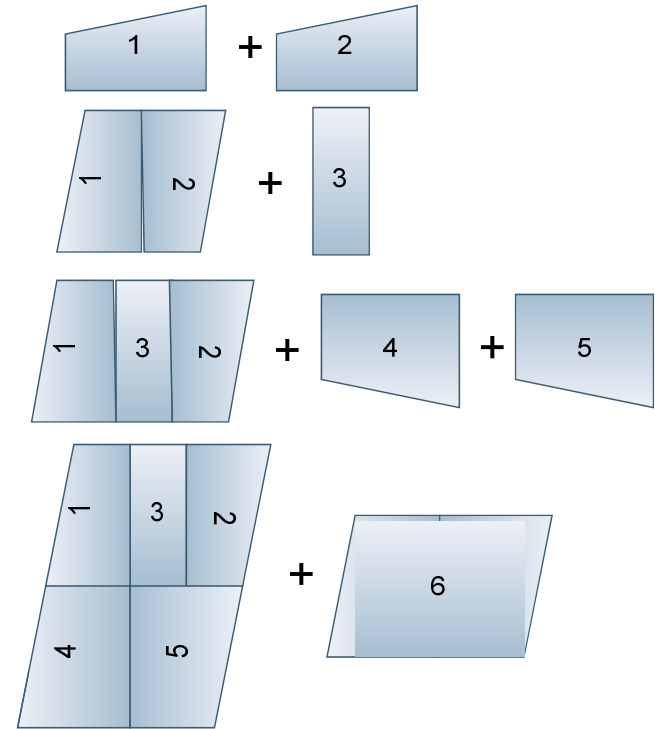
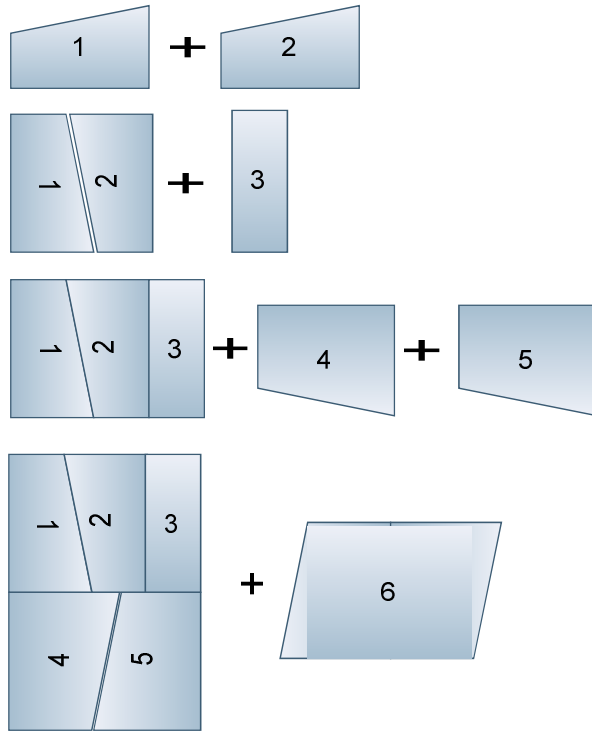


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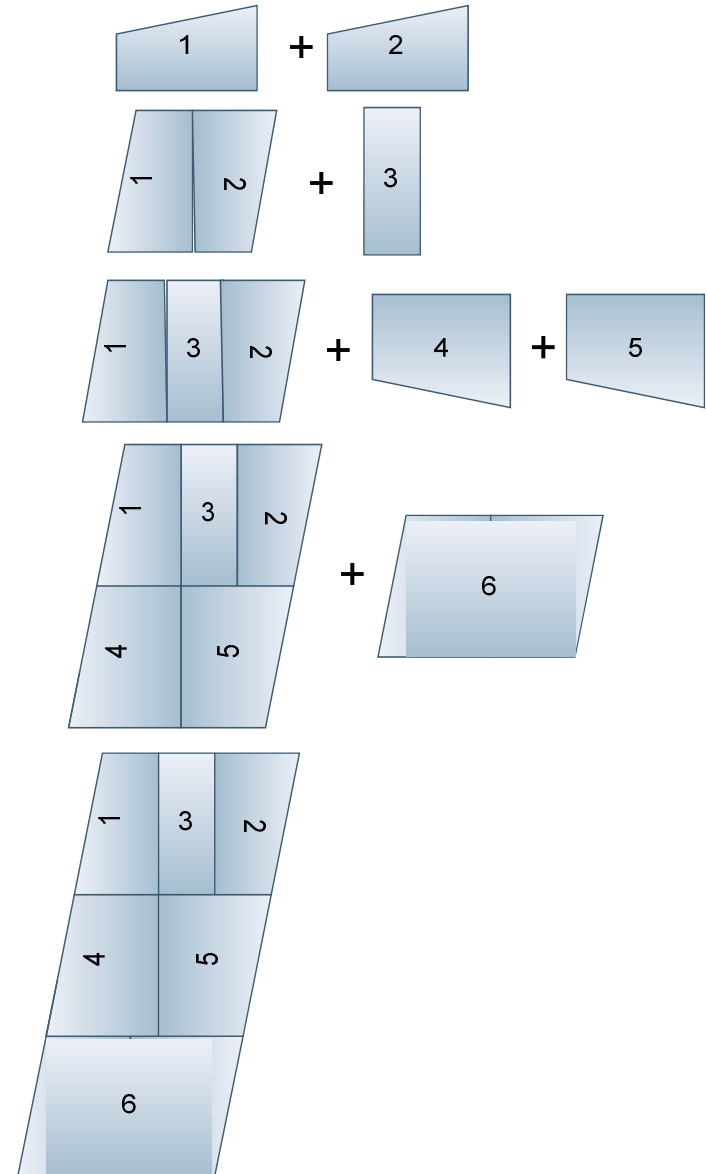
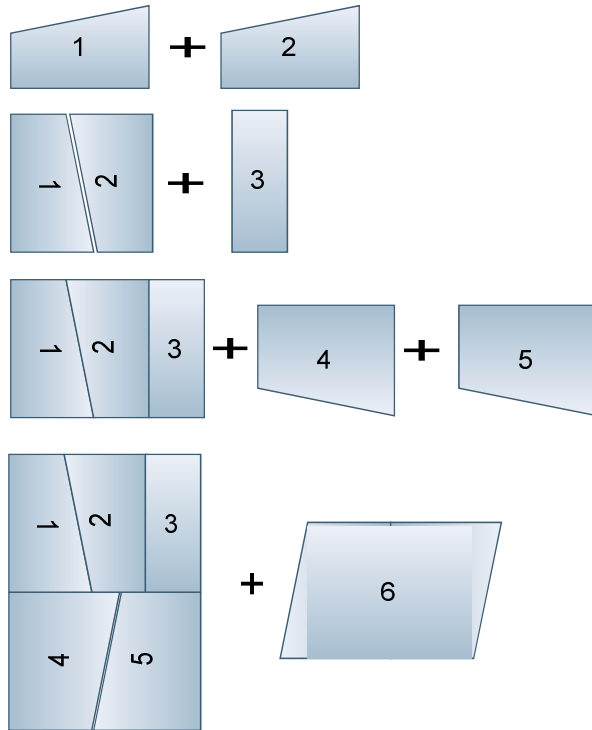
Thinking about Thinking:

#1. Connectionism: Neural Networks



Thinking about Thinking:

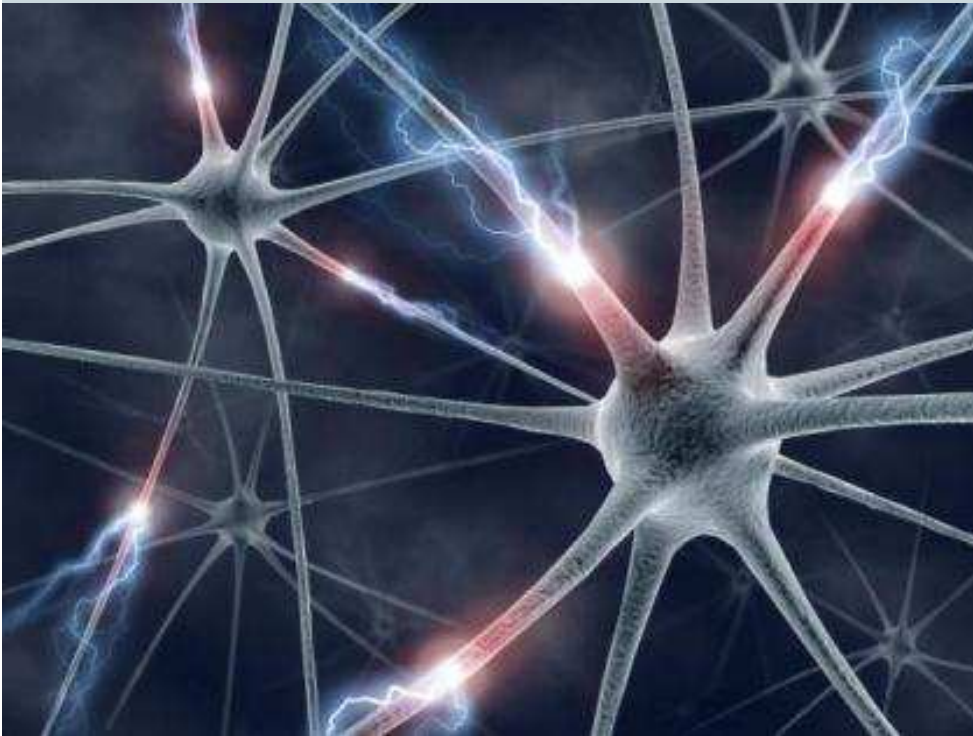
#1. Connectionism: Neural Networks



Thinking about Thinking:

#1. Connectionism: Neural Networks

In dyads or triads, discuss what the significance and implications are of neural networks to well-being and the utility of spiritual practices (traditional psychological techniques).



Thinking about Thinking:

#1. Connectionism: Neural Networks

A man is born in 1990 and dies in 2010.

According to his death certificate, the man died when he was 25 years old.

Is this possible?

Reason or “common sense”: just because it is common doesn’t make it correct.

The wisdom tales are meant to break this form of thinking. Do you see how?

Thinking about Thinking:

#1. Connectionism: Neural Networks

Implications

So what does this imply with regard to how we should approach our experience of the world?

- Realize that our world-view is a “best guess” of reality.
- Be open to changing our underlying assumptions.
- Do not cling to our “story” of the world or our “story” of ourselves.

*Dogma has no political or religious preference.
It's an equal opportunity employer.*

Thinking about Thinking:

#1. Connectionism: Neural Networks

Summary

- Our experience shapes our brain. We are often programmed without knowing it.
- Our brain shapes how we process our experience, so our experience of reality is only approximate and prone to error.
- Our choice of the contents of our thoughts and how we think is often unconscious.
- So, why not be a more active participant in **choosing** the content of our thoughts and the method of processing (be more conscious).

#2. Frontal Lobes

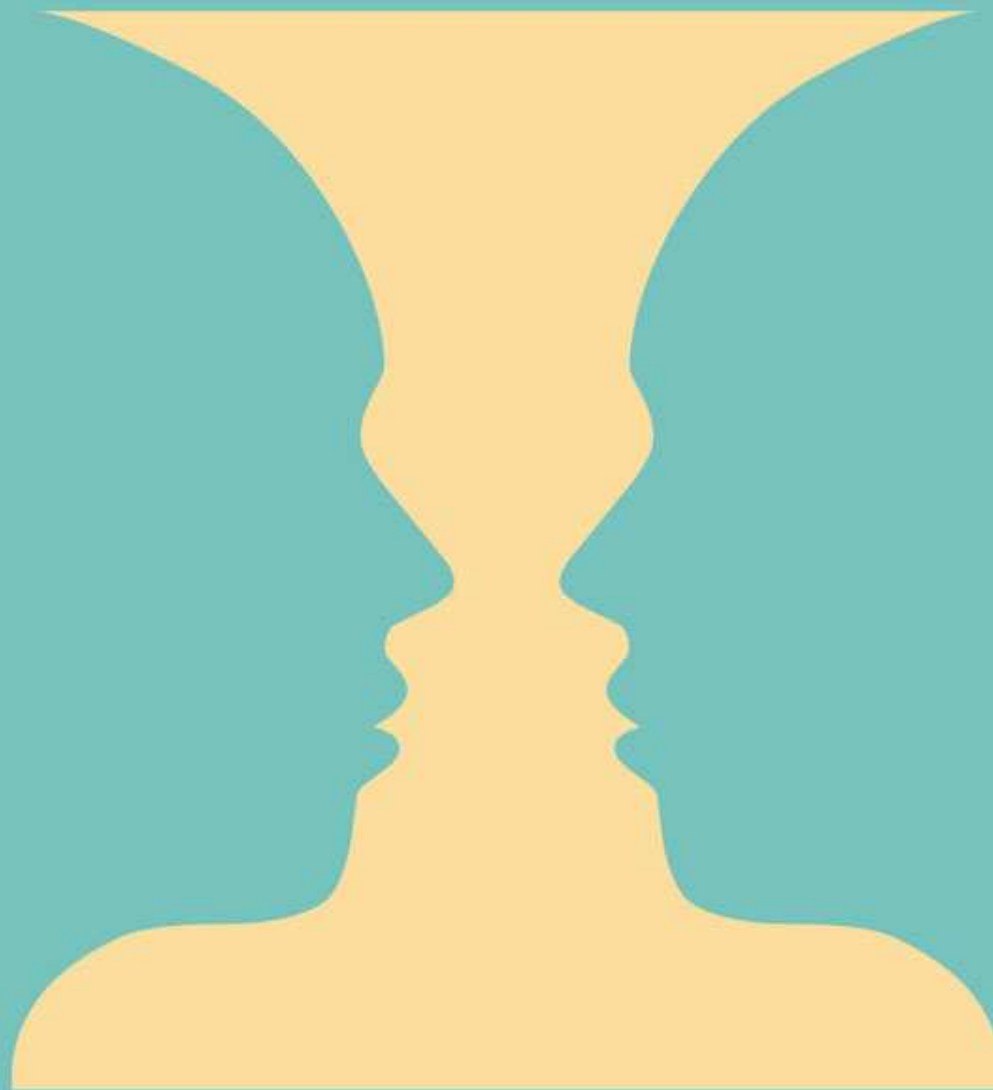


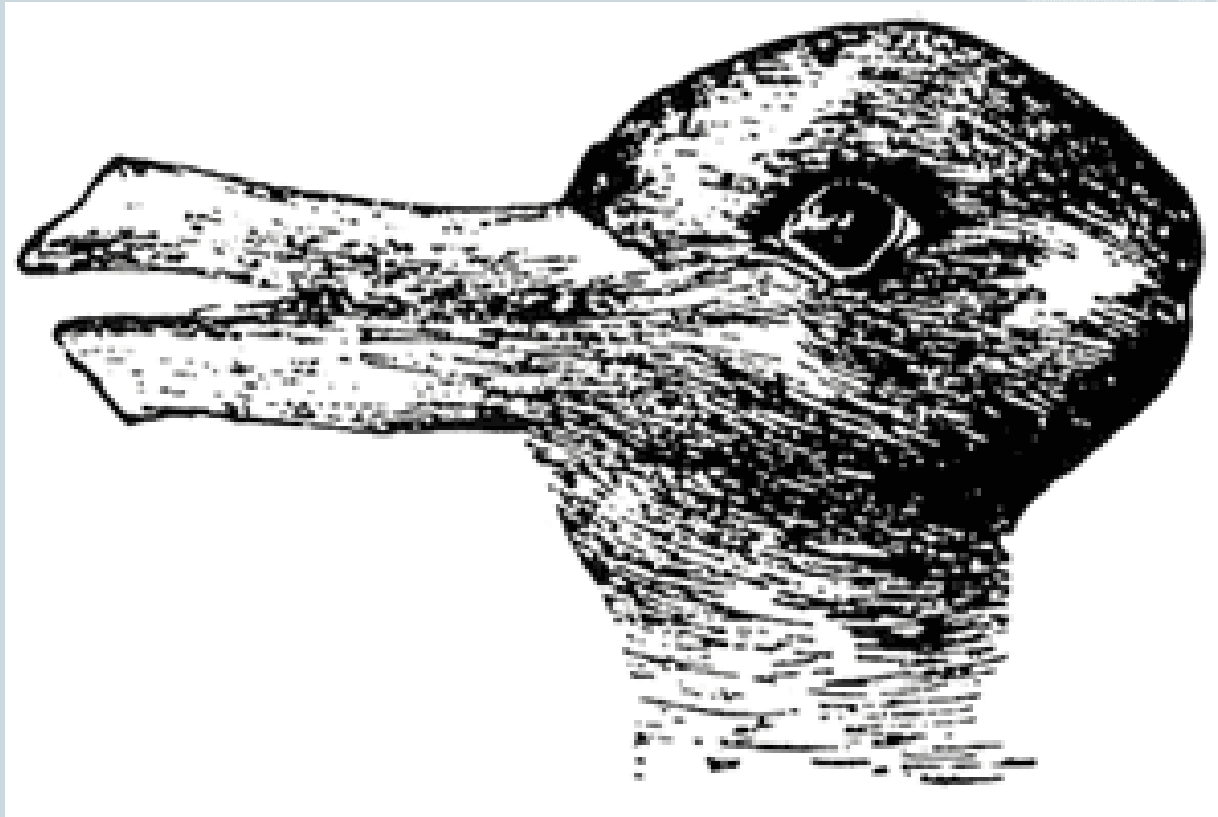
Thinking about Thinking:

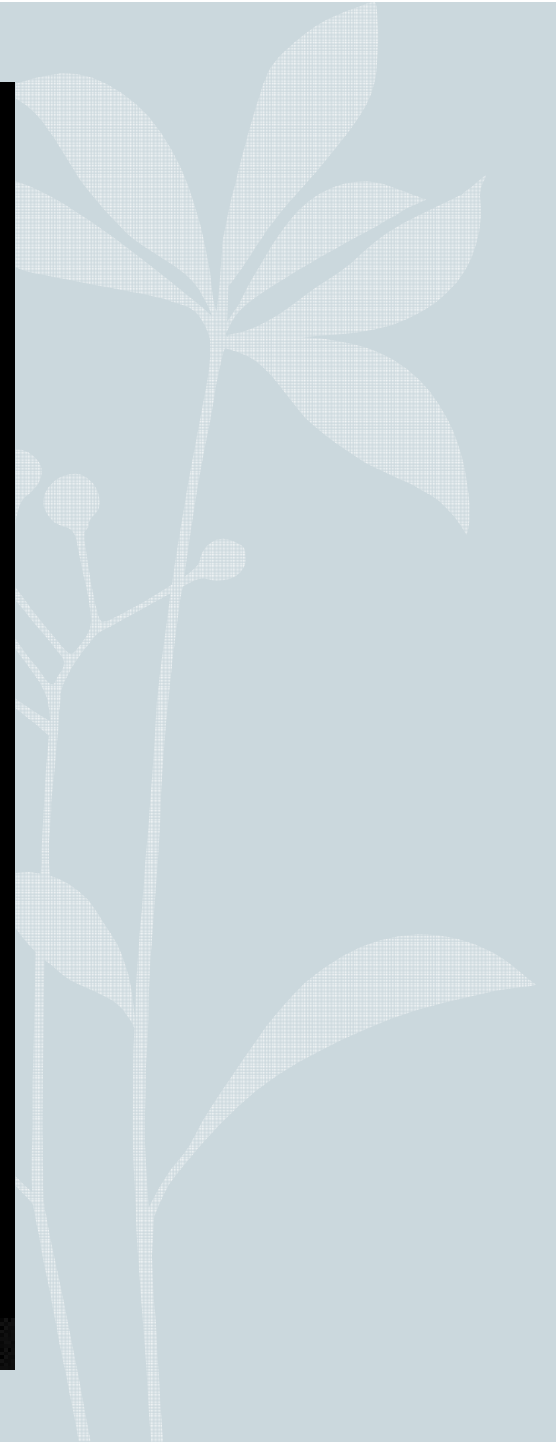
#2. Frontal Lobes

- Control Center & Executive Functions
- Reasoning & Planning
- Impulse & Attention Control
- Consciously Directed Thought

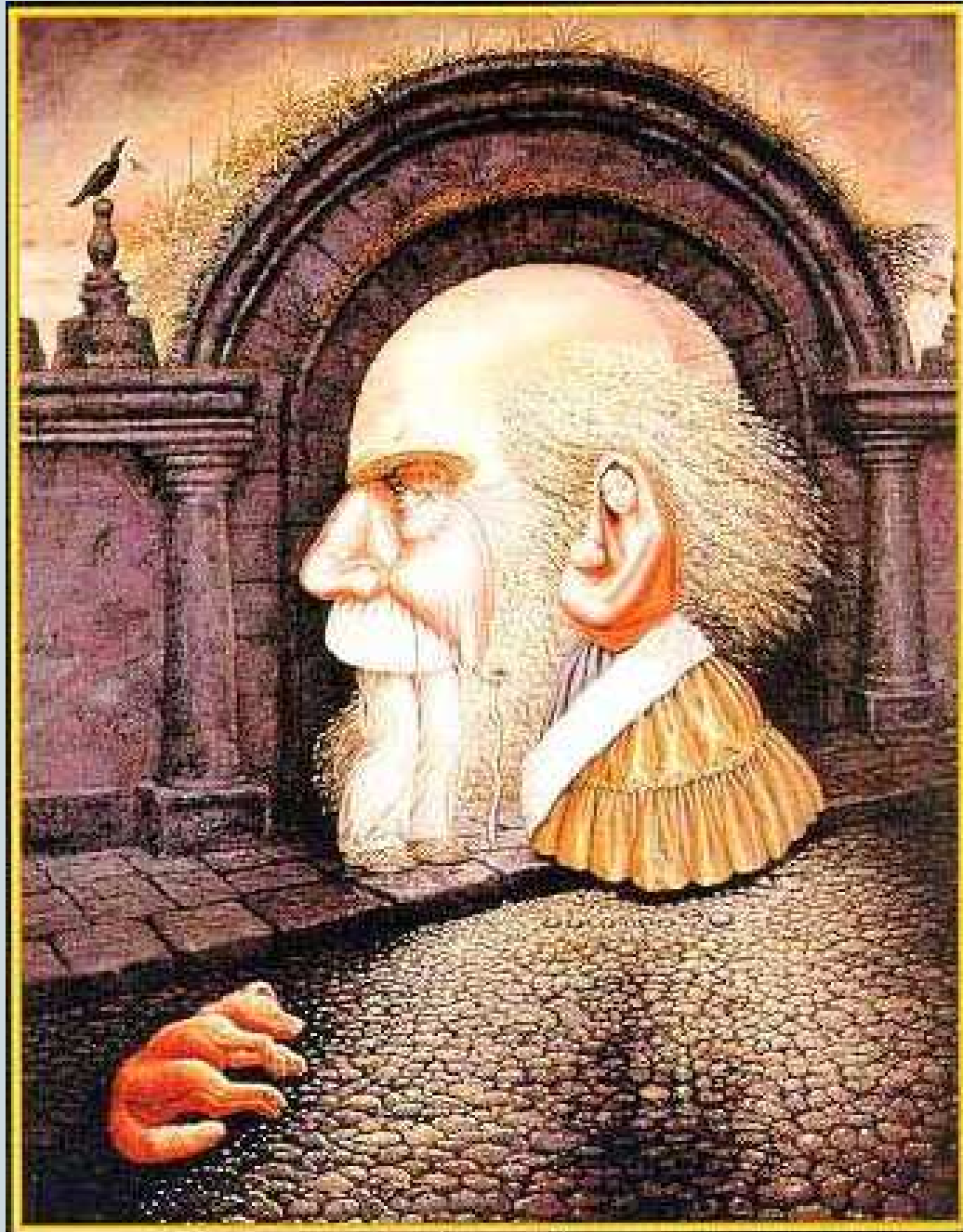












Thinking about Thinking:

#2. Frontal Lobes

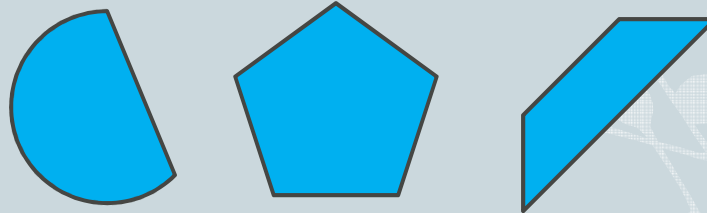
Why is it difficult for us to change?

1. Hebbian Learning:
 - The more we reinforce associations the stronger the network
2. Tendency to reinforce existing networks
3. Drive Toward Homeostasis – Familiarity

Thinking about Thinking:

#2. Frontal Lobes

The more often we see something, the more likely it becomes a “preferred” stimulus.



We are often “programmed” unconsciously.
Philosophical implications? Affects on well-being?

Thinking about Thinking:

#2. Frontal Lobes

- Control Center & Executive Functions
- Reasoning & Planning
- Impulse & Attention Control
- Consciously Directed Thought

*Might as well
program ourselves.*



Thinking about Thinking:

#2. Frontal Lobes – Self-Directed Neuroplasticity

Neuroplasticity: *The brain's ability to change, adapt, and rewire itself based on new experiences.*

- **Stroke Victims**



- **Juggling Study**

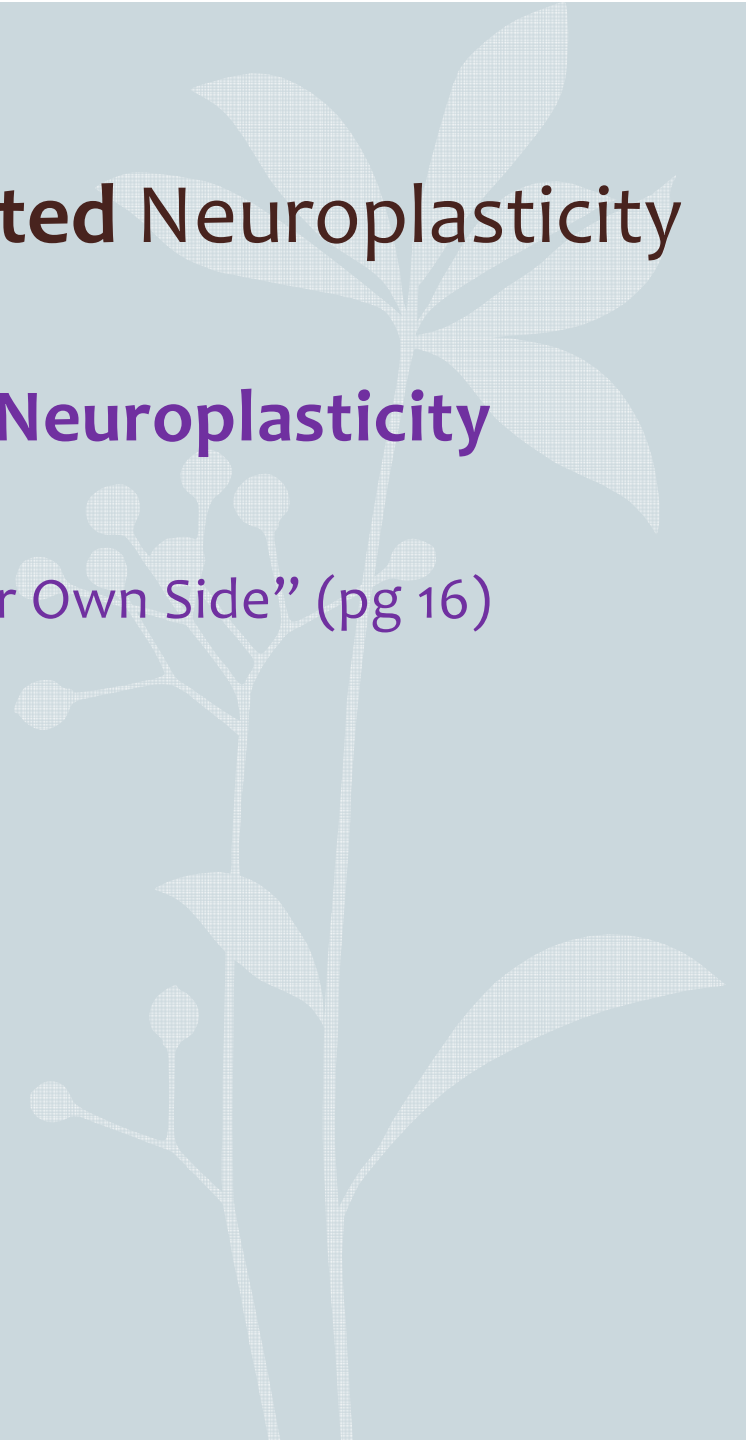


Thinking about Thinking:

#2. Frontal Lobes – Self-Directed Neuroplasticity

Accidental vs. Purposeful Neuroplasticity

The importance of “Being on Your Own Side” (pg 16)



Thinking about Thinking:

#1 & 2. Neural Networks & Neuroplasticity

In dyads or triads, discuss what the significance and implications are of neural networks to well-being and the utility of spiritual practices.

