3:2

**Unit: 3**
**Lesson: 2**

**Time Length: 45–50 min**

# Physicalism, Modern Science, and Consciousness

## Neuroscience, Artificial Intelligence, and the Soul

### NGSS Instructional Outcomes

Next Generation Science Standards

**HS-LS1–2:** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. Discuss consciousness and its relationship to the soul within humans.

**HS-LS1–2:** Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. Discuss neural correlates of consciousness and brain function.

### CCSS Instructional Outcomes

Common Core State Standards

#### English Language Arts Standards for High School

**ELA-Literacy.RST.11–12.1:** Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. This aligns with discussions and analysis of various philosophical and scientific viewpoints on consciousness.

**ELA-LITERACY.RI.11–12.8:** Delineate and evaluate the reasoning which is relevant to discussions about consciousness and its interpretation.

## Content Learning Outcomes:

- Define consciousness and discuss how this experience cannot be reduced to physical processes.
- Expand conceptual vocabulary for relevant discussions at the junction of theology and bioscience.
- Discuss what neuroscience leaves out about consciousness.
- Explain the basic concepts in neural-correlates-of consciousness.
- Demonstrate how an Islamic view of the world and the soul provides a comprehensive worldview that is lacking in scientism/physicalism.

## Materials:

- Instruction/Teacher Facilitation: Slides 3.10–3.20
- Triple-Entry Vocabulary Journal (Student Responsibility)
- YouTube Video: Neuroimaging and Consciousness by Dr.
- Macksood Aftab
  Activity: Mary's Room: A Philosophical Thought Experiment by
- Eleanor Nelsen
  Lesson 3.2 Assessment

## Instruction/Teacher Facilitation: Slides for Lesson 3.2

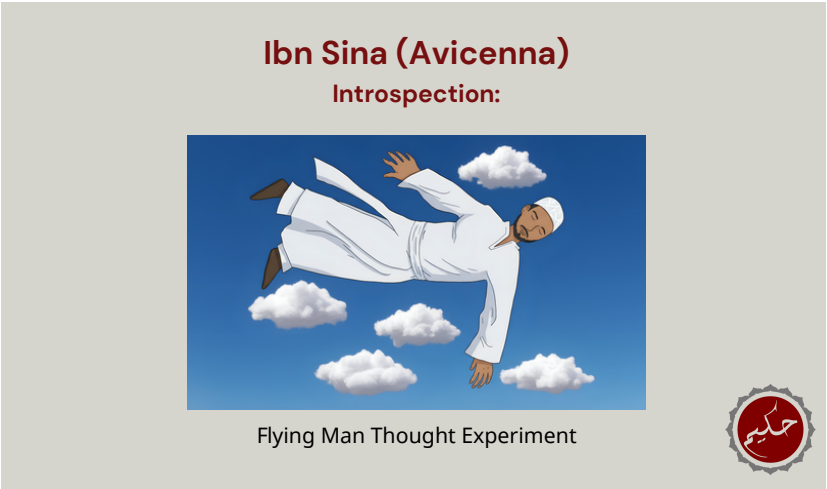
- **Slide 3.10.** Ibn Sina (Avicenna)
- **Slide 3.11.** What is Consciousness?
- **Slide 3.12.** The Nature of Consciousness
- **Slide 3.13.** Neuroscientific Reductionism: I am just my brain
- **Slide 3.14.** Neural Correlates of Consciousness
- **Slide 3.15.** Medicine: Advanced Neuroimaging and Consciousness
- **Slide 3.16.** Semantic Reconstruction of Continuous Language
- **Slide 3.17.** Human Brain Organoids and Consciousness
- **Slide 3.18.** The Hard Problem of Consciousness
- **Slide 3.19.** Mary's Room: A Philosophical Thought Experiment
- **Slide 3.20.** Modern Science: Galileo and Descartes

# Instruction/ Teacher Facilitation

In Lesson 3.1, we discussed an Islamic understanding of the human and compared that to a Neuroscientific Reductionist view of a human. We continued the discussion by asking what the world is made of. We ended the lesson with the topic of consciousness being a key aspect of humanity.

Let us pick up from there; in Islam, consciousness is an essential part of being human because it is a feature of the soul. Some scientists, on the other hand, view consciousness as inexplainable (and possibly an illusion) since it cannot be directly observed or measured.

## SLIDE 3.10: Ibn Sina (Avicenna)




Is Science/Neuroscientific Reductionism right? What is consciousness exactly and how do we know if it does indeed exist?

**Let us consider Ibn Sina (Avicenna)'s Floating Man Thought Experiment.**

In this philosophical thought experiment, Ibn Sina asks us to imagine a person who has suddenly come into existence, suspended in an empty space, with no sensory experiences and no connection to the external world. This person has no sight, sound, touch, smell, or any other sensory input. This person is also devoid of any memories or knowledge of his/her past experiences. In other words, this person is isolated from the external world and has a completely blank mental slate.

He argues that even in this state of sensory deprivation and mental isolation, the person would still be aware of their own existence. The doubt itself about whether one exists or not is a form of awareness. This awareness of one's existence, according to Ibn Sina, does not depend on sensory experiences or the external world. Therefore, regardless of the existence or non-existence of anything else, individuals know at least they exist due to the fact that they have self-awareness.

He concludes that the thinking self, or the soul, is immaterial and possesses innate knowledge of its own existence. The Floating Man Thought Experiment emphasizes the existence of the thinking self as distinct from the body and the external world.

This conclusion can be reached through individual introspection; no need for any scientific knowledge or training nor any physical/measurable parameters.

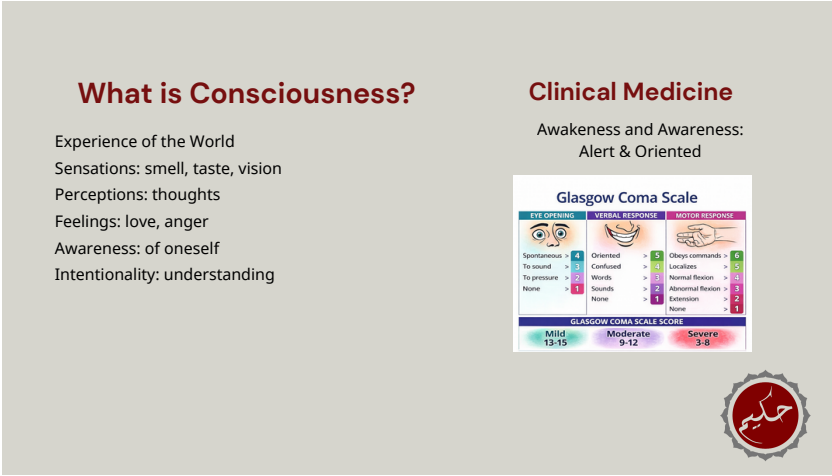
This Floating Man Thought Experiment and Ibn Sina's ideas were a precursor to the ideas of later philosophers, such as René Descartes.

Rene Descartes, known as the founder of modern philosophy, came up with the famous statement *"Cogito, ergo sum"* ("I think, therefore I am").

Basically, it states that regardless of the existence of anything else, at least one thing exists, and that thing is me (the self). These experiments demonstrate the existence of qualitative experience and a subjective self—phenomena that lie outside the parameters of modern science, which primarily interrogates quantitative data.

- **Ask students:** How would we then define consciousness?

# SLIDE 3.11: What is Consciousness?




## Experience of the World

- **Sensations:** smell, taste, vision
- **Perceptions:** thoughts
- **Feelings:** love, anger
- **Awareness:** of oneself
- **Intentionality:** understanding

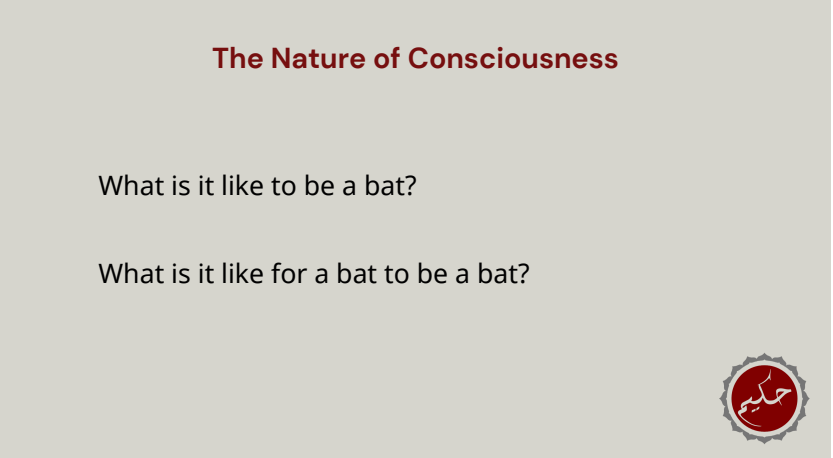
According to clinical medicine, **consciousness** is:
Awakeness and Awareness: *Alert and Oriented*

> Consciousness is assessed in the medical setting to decide if the person is "in there," for example in end-of-life scenarios where we must decide to continue or forgo life support.

> *Glasgow Coma Scale:* (a tool to test patient responsiveness) is used to objectively describe the extent of an impaired consciousness. If someone has been in an accident or lost consciousness at any point, when consciousness is regained, those attending to them will ask, "Do you know where you are?" and "Do you know what day/date is today?" to see if the person is aware of his surrounding, time and place. Note that both questions ask about nonphysical elements.

> In medicine, physicians assume existence of the subjective self to be real. This differs from the view of some neuroscientists and philosophers who would consider it a mere illusion or artifact.

## Slide 3.12: The Nature of Consciousness

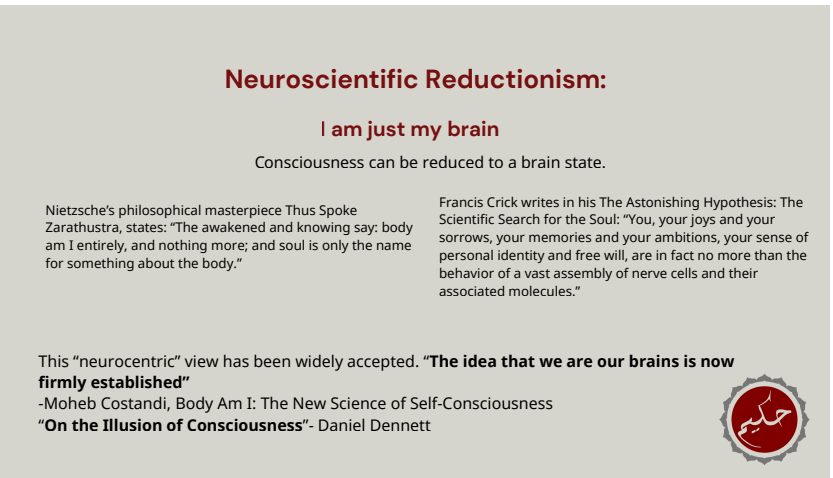



Who has consciousness? Who can we attribute consciousness to?

> "What Is It Like to Be a Bat?" is a paper by American philosopher Thomas Nagel in which he argues that there are facts about a conscious experience that are subjective and can only be known from that subjective perspective. Even if we know all the objective facts about bats, we cannot actually know what it is really like to be a bat.

- Reductionists have trouble addressing this subjective experience argument.

## Slide 3.13: Neuroscientific Reductionism: I am just my brain




**Neuroscientific Reductionist View:**
Consciousness can be reduced to a brain state: *"I am just my brain."*

- Friedrich Nietzsche, in *Thus Spoke Zarathustra* (1883–1892), writes: “The awakened and knowing say: body am I entirely, and nothing more; and soul is only the name for something about the body.”

- This “neurocentric” view has been widely accepted. As Moheb Costandi writes in his book *Body Am I: The New Science of Self-Consciousness (2022)*: “The idea that we are our brains is now firmly established.”

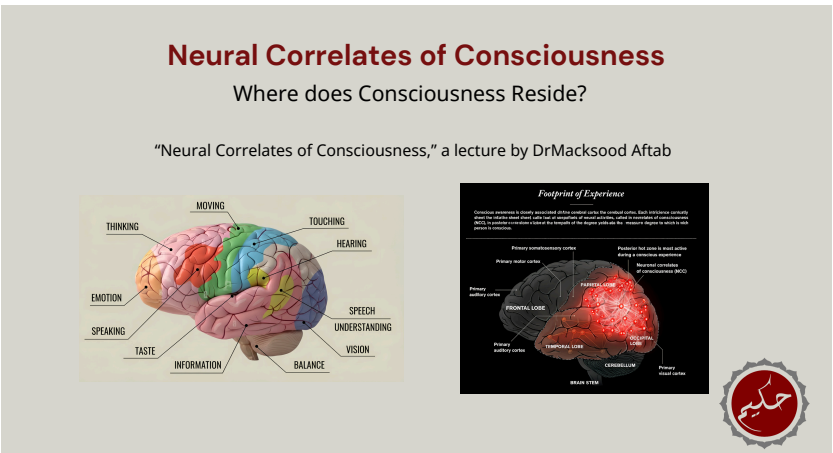
- Daniel C. Dennett, American philosopher and cognitive scientist, also upholds the notion that consciousness is an illusion.

- *The Astonishing Hypothesis: The Scientific Search for the Soul* by the English scientist Francis Crick in 1994. Crick is one of the co-discoverers of the molecular structure of DNA. He later became a theorist for neurobiology and studied the brain. In this book, he wrote: “You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules.”

- *We are Our Brains: A Neurobiography of the Brain, from the Womb to Alzheimer’s (2010)* by D.F. Swaab portrays this concept that we do not just have brains: we are our brains.

Neuroscientists believe that consciousness is just a brain function which occurs due to neurological interactions/neurons firing within your brain. So where in the brain exactly is consciousness occurring?

## Slide 3.14: Neural Correlates of Consciousness



### Neural Correlates of Consciousness (NCC)

Where does Consciousness Reside? Can Neuroscience explain consciousness?

- Conscious awareness is closely associated with the cerebral cortex, an intricately folded and connected sheet of nervous tissue. Each experience corresponds to a specific set of neural activities, called the **neuronal correlates of consciousness (NCC)**. These neural activities form the default mode network and occur in the posterior hot zone of the brain that consists of the parietal, occipital, and temporal lobes.

- The brain structures play a significant role in self-awareness. The complexity of the neural excitations represents the degree to which a person is conscious. Note: Does this explain subjective experience (consciousness)? No. It simply provides a physical correlate for the subjective experience.

## Slide 3.15: Medicine: Advanced Neuroimaging and Consciousness

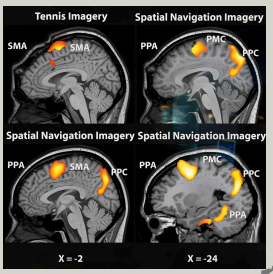
**Medicine:**
**Advanced Neuroimaging & Consciousness**

**Awakeness and Awareness**

**Disorders of Consciousness**
- Locked-In-Syndrome
- Vegetative States
- Minimally Conscious States

Assessment:
Intentional Ability for Willed Action

**Levels of Consciousness**
- Passive
- Active
- Communicating




### Disorders of Consciousness

- *Locked-In-Syndrome:* is a rare disorder of the nervous system where people are paralyzed except for the muscles that control eye movement. They are conscious (aware) and can think and reason, but cannot move or speak; they may be able to communicate with blinking eye movements.

- *Vegetative States:* occur when the cerebrum (the part of the brain that controls thought and behavior) no longer functions.

- *Minimally Conscious States:* A person who shows clear but minimal or inconsistent awareness.

- *Assessment (to confirm consciousness):* Intentional ability to carry out willed action or self generated action.

## Levels of Consciousness Assessed by fMRI Experiments

- *Passive:* stimulus elicit is activation
- *Active:* response to stimuli detected
- *Communicating:* can choose between options

### Summary

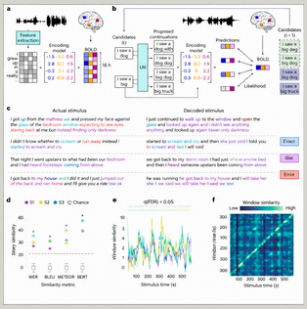
Advanced brain scans can be used to assess if a patient has awareness and agency even if they cannot physically communicate. This suggests that conscious experiences are localized in brain regions and networks. However, consciousness remains qualitatively distinct from any physical process.

# Slide 3.16: Semantic Reconstruction of Continuous Language

**Semantic Reconstruction of Continuous Language from Non-Invasive Brain Recordings**

Jerry Tang, Amanda LeBel, Shailee Jain, and Alexander G. Huth, "Semantic Reconstruction of Continuous Language from Non-Invasive Brain Recordings," Nature Neuroscience 26 (2023): 858–868.

https://pubmed.ncbi.nlm.nih.gov/37127759/



## Semantic Reconstruction of Continuous Language from Non-Invasive Brain Recordings

In new research involving a passage read to a patient and looking at their brain activity in brain scans, the passage is reconstructed without the patient having to say/verbalize anything. A similar study was done using visual stimuli and that image was being reconstructed based on the activity in the brain of the patient. The issue here is that the privacy of conscious experience is deteriorating.

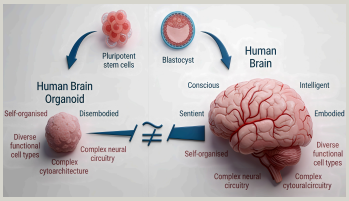
*Question for students:* Does "mind-reading" technology take anything away from the reality of consciousness (or subjective experience)? Answer is No, human subjectivity remains a distinct undeniable reality.

# Slide 3.17: Human Brain Organoids and Consciousness

**Human Brain Organoids and Consciousness: Moral Claims and Epistemic Uncertainty**

Eliza Goddard, Eva Tomaskovic-Crook, Jeremy Micah Crook, and Susan Dodds, "Human Brain Organoids and Consciousness: Moral Claims and Epistemic Uncertainty," Organoids 2(1) (2023): 50–65.

https://www.mdpi.com/2674-1172/2/1/4



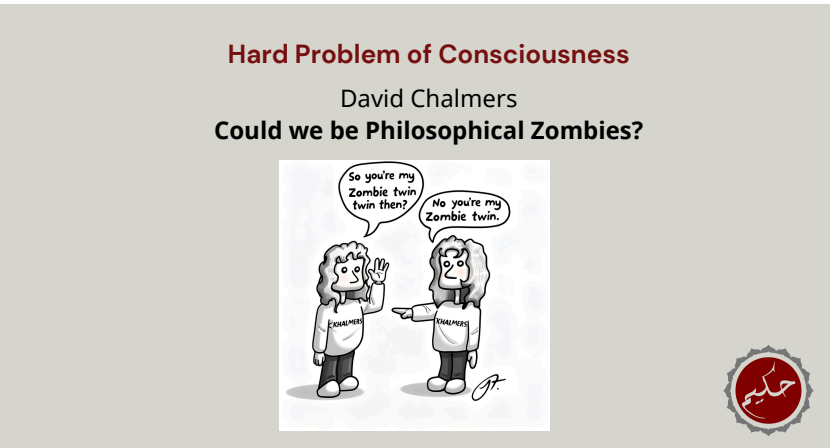

Brain tissue is being developed in the lab to create a human brain organoid that can simulate the brain activity of a human. A pressing ethical question is whether this brain organoid can perceive pain, given that it possesses the neural circuitry responsible for pain perception in the intact human brain; if it can, the question arises whether we have replicated some degree of consciousness. Is consciousness the brain itself, or is it very closely related to the brain and brain function, or is it completely extrinsic to the brain?

Watch the video: "**Neuroimaging and Consciousness**," (1 Feb. 2024) where Dr. Macksood Aftab explains the above aspects and gives an overview of Neuroimaging and Consciousness.

**Neuroimaging & Consciousness**

Here we must also explore: Is basic consciousness (such as the feeling of pain) all there is to have human experience? The full picture encompasses much more including: intentionality, higher order thinking, and deliberation.

## Slide 3.18: The Hard Problem of Consciousness




Q&A

**Ask students:**
**Q:** What is the problem with the neuroscientific reductionist view of consciousness being just neurological activity?

> **A:** If everything is reduced to just a physical state or firing neurons, there is no room for the soul in this theory/ philosophy. No soul means no purpose in life; the purpose of human existence is being ignored.
>
> Consciousness would then be just alertness and brain activity, not a moral consciousness.

**Q:** Why is there an experience associated with a physical state?

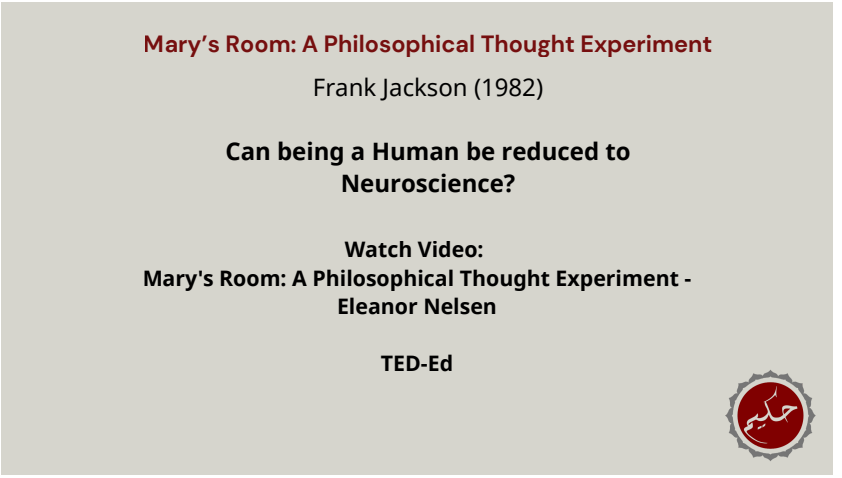
> A: Physical states often produce the experience of emotions. For example, a person whose heartbeat speeds up because of excitement or nervousness. Also, the experience of emotions can affect physical states.

***The Hard Problem of Consciousness*** is the problem of accounting in physical terms for subjective, intrinsic, first-person experiences. Physicalism can explain the mechanism of how the brain works but it does not explain why it works the way it does. Connect back to the discussion of consciousness and the questions of "who has consciousness," and "what it is like being that person/animal." The physicalism of neuroscientific reductionism does not account for a unique, personal, subjective existence.

**Are we Philosophical Zombies?** Proponents of the philosophical zombie argument, such as David Chalmers, argue that since a philosophical zombie is by definition physically identical to a conscious person, we could philosophical zombies. He argues that if a being physically identical to a conscious person but lacking subjective experience were possible, it would disprove physicalism. This is because physicalism claims that everything about consciousness can be explained by physical processes. However, the argument is self-refuting. If a philosophical zombie is truly identical in every physical way to a conscious person, there is no reason to assume it lacks consciousness. Simply put, being physically identical should also mean being consciously identical. Basically, it is a self-refuting argument because it is clear, that just being physically identical does not make them consciously identical.

The brain is absolutely necessary, but it is NOT a sufficient condition for conciousness on this view.

## Slide 3.19: Mary's Room: A Philosophical Thought Experiment




### Group Discussion: Mary's Room

**Ask students:** Can being a human be reduced to Neuroscience?

- Watch the video: "**Mary's Room: (A) Philosophical Thought Experiment-Eleanor Nelson**," TED-Ed, January 24, 2017.

Mary's Room

**Ask students** to think of how to answer these questions:

1. From a neuroscientific reductionist view, did Mary learn anything new from experiencing the red apple?
2. From an Islamic perspective of consciousness, did Mary learn anything new?

**Outline with students points brought up in the video:**

*The Knowledge Argument* states that there are non-physical properties and knowledge that can only be discovered through conscious experience.

*Contrasting Physicalism* states that everything, including mental states, has a physical explanation.

Students might discuss how seeing color is totally different from just learning about it. Some quality of this experience transcends the physical description.

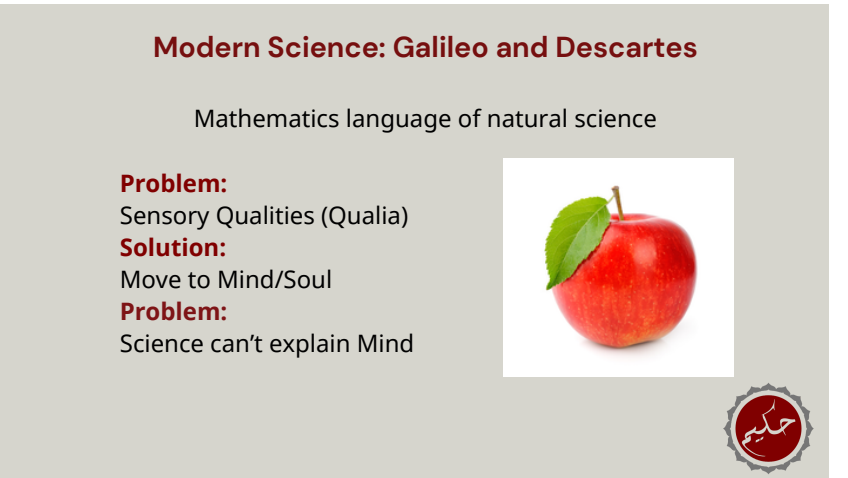
After the discussion, clearly state that experiential knowledge is not the same as physical knowledge. These experiences have properties called **qualia** - subjective qualities that you cannot accurately describe or measure.

Qualia is unique to the person experiencing it. Physical facts cannot fully explain mental states, especially feelings.

*[Note: at 3:00 of the video, the topic goes into AI, so this serves as a good prelude to the next lesson.]*

There are limits to knowledge; knowing facts about something is different from experiencing something.

## Slide 3.20: Modern Science: Galileo and Descartes



The brain is absolutely necessary but it is NOT a sufficient condition.

a. Mental states cannot be described by physical facts.
   - Contradicts physicalism

b. How does a neuroscientist analyze consciousness?
   - S/He needs to deny our experience and knowledge.

c. How does a Muslim analyze consciousness?
   - Consciousness is the experience of the unobservable soul that we know through introspection and revelation.

The unobservable soul is known to us through introspection and revelation. Neuroscience studies the correlations between physically observable phenomena. Neuroscientific reductionism fails to explain fully what it means to be a human as it denies the soul. An Islamic perspective accounts for our physical *and* metaphysical properties and interactions.

**Extra Activity:** How would each side defend their position? Model a debate.

**Biology Connections**

- See the chapter on the Nervous System in Biology Textbook.
- Study of neurons and nervous system, neurons communicating at the synapses, neurotransmitters.
- Study of the human brain, cerebral cortex, fMRI scans, and limbic system.