Imagine that you and a friend are both looking at an orange. However, when your friend looks at the orange, he has the same experience you have when you see something green. But you have both been conditioned to use the word “orange” to describe this color experience, so you don’t know that your experiences are different.

Philosophers call these kinds of qualitative experiences “qualia” for short, so this scenario is known as the problem of inverted qualia. Its very possibility suggests something important about the relationship between mind and brain: they aren’t the same. Color is the wavelength of the light reflected off the object. Since you and your friend are seeing the same light, the same signal should be sent from your eyes to your brains, and the visual processing centers of your brains should be in the same state. Yet it is conceivable that the two of you could be having different experiences, different qualia. So these conscious, qualitative experiences seem to be something above and beyond the state of the brain.

Likewise, suppose Mary is an expert in neurophysiology and optics. She knows everything there is to know about color vision. She can give a complete physical description of the experience of seeing red. However, Mary has lived her whole life in a strange house where everything is black and white. She has never actually seen red. One day, she leaves her black and white world and sees red for the first time. Does she learn anything new about seeing red? It seems almost undeniable that Mary does learn something new—she learns what it is like to see red. Mary’s case suggests that there is something to be known about consciousness that is left out of a complete physical description.

But if minds are not the same as brains, what are they?

The Mind-Body Problem
Philosophy of mind is an important branch of philosophy focused on understanding the nature of mind—the conscious experiences, thoughts, feelings, and sensations that largely define who we are. This question about the relationship between mind and body is known in philosophy as the mind-body problem. There are three general types of answers one can give to it: there are two distinct types of substances in the world, minds and physical objects; there are only minds; or there are only physical objects.

Contemporary philosophy of mind is usually considered to begin with Descartes in the 17th century. In Meditations on First Philosophy, Descartes formulates the mind-body problem and argues that since ideas have a location in time but not in space, while physical objects have both temporal and spatial locations, minds and bodies must be distinct substances. This view is known as substance dualism. Descartes seems to have thought of the mind as something like a soul. The challenge for dualists is to account for how the mind and body interact. Even dualists must admit there are strong correlations between mind and body. Your arm moves when you will it to. A needle stuck in your arm causes a pain sensation. Psychiatric medications alter moods by changing brain chemistry. Functional magnetic resonance imaging (fMRI) allows scientists to observe changes in brain states as a subject feels pain or listens to music. If the mind is the brain, these correlations are to be expected. But for a dualist, it’s mysterious how changes in our bodies and brains create sensations and affect our thoughts, beliefs, and emotions, and vice
versa. If body and mind are different substances, one physical and one essentially non-physical, through what mechanism do they interact? How does a physical brain cause a pain sensation in a mind that lacks volume, mass, or location?

Despite this problem of interaction, many people are dualists. Like Descartes, dualists can think of the mind as something like a soul, so dualism fits with a religious worldview. Moreover, if the essence of our minds is physical, it’s difficult to see how we can be said to exercise free will or lead genuine, meaningful lives. Doesn’t that make us nothing more than a collection of atoms bouncing around according to probabilistic physical laws?

It’s quite difficult to find people who think there is only mind and therefore no physical world at all. George Berkeley is one of the few in the history of philosophy. He argued that we are simply minds and that all our sensory experiences and other ideas come directly from God. Other philosophers have wondered in a skeptical vein about whether, rather than being embodied people, we might actually be just brains in a vat fed illusory sensory experiences by a genius neuroscientist or a supercomputer, sort of like in the movie The Matrix. But even these philosophers think there could be physical brains or supercomputers. Berkeley’s idealism—the view that there are only ideas and not physical objects—is indeed extreme.

Most philosophers today are physicalists. Physicalists believe that everything that exists is physical; there are no mental substances. Early physicalists identified the mind with the brain. Type identity theorists argued that feeling pain, for example, is the firing of particular neurons in the brain. For ease of reference, philosophers call those neurons C-fibers. “Pain is the firing of C-fibers” expresses the same sort of identity as “lightning is a discharge of electricity” or “water is H₂O.”

One concern about asserting an identity between minds and brains is multiple realizability: that the same mental state can be realized by different physical forms. We can easily imagine that other animals, such as octopi, feel pain, even though their brains are physically and chemically different from humans. Even among humans, neuroplasticity means that our brains can undergo dramatic changes—new nerve cells and new neuronal connections form—yet we can experience the same mental states. In either case, a particular mental state is not necessarily the same as a particular (human) brain state.

More recent physicalists have addressed this problem by associating mental states with the functional role of the physical states, rather than the physical states themselves. A functional role is the connection among sensory inputs, other mental states, and behavioral outputs. So when a person cuts her finger, this sensory input changes her mental state to one in which she feels pain, and she screams. In a human, C-fibers firing cause this pain experience, but it could be realized differently in other physical systems, such as an octopus’s brain. Notice that, even though mental states aren’t identical to physical objects, this is still a physicalist account of mind: only physical substances exist, and mental states are properties or functions of those physical things.

But consider again the cases of inverted qualia and Mary. They suggest that there’s still something missing—what it’s like—from a description of a physical system like a brain and its functional role. Hence philosophers continue to develop more sophisticated physicalist accounts.

Artificial Minds?
Physicalism suggests an exciting possibility: artificial intelligence. If brains are just a collection of specialized cells organized in a special way, then, as technology advances, we should be able to make something functionally equivalent to a brain out of circuits and electronic parts. Like medical scientists were able to create an artificial heart that replicates the functioning of a human heart, brain scientists should be able to create a computer brain of sufficient complexity to replicate the functioning of a human brain.

But is creating a complex computer brain enough to create a mind? Consider John Searle’s Chinese Room argument. Suppose we put an English-speaking man in a room with a set of instructions in English for manipulating strings of Chinese characters. When Chinese writing is sent into the room, he looks up that string of input symbols in the instructions and finds the output string of symbols to write. He sends what he has written out of the room. To an observer, it looks like the man understands Chinese. However, he is just following a series of rules for manipulating symbols and doesn’t have any understanding of the meaning of the symbols in the way that a Chinese speaker does. Since computers work by manipulating symbols in a similar way, Searle’s argument casts doubt, in principle, on the ability of a computer to understand language, and, more broadly, on the possibility of true artificial intelligence.

Philosophers of mind continue to struggle to develop a better understanding of the nature of mind and its relationship to the body. Philosophy of mind is not just armchair pondering. As new technologies spur neuroscience and cognitive science to uncover the secrets of the brain at an amazing rate, philosophy of mind has dramatic implications for the possibilities of brain science and holds the potential for insight into who we are.

Stu Gluck and Carlos Rodriguez are senior program managers for CTY summer programs. They have done curriculum work for several of CTY’s philosophy courses, including developing the Philosophy of Mind course. Stu earned both an MA and a PhD in philosophy from the Johns Hopkins University. Carlos earned his MA in philosophy from the same program. Both are members of the American Philosophical Association. They have both owned neurotic cats. They are both incorrigible. But there the similarities end: Stu is a Gemini whose heroes are Jon von Neumann and Dan Harrington, while Carlos is a Cancer whose hero is Gene Rayburn.