

# Common Topics

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## Common Topics

### Matter

- What the world is made of is a question that has engaged philosophers too, from the pre-Socratics to the early modern.
- The philosopher Thales was one of the first to try describing the world without resorting to supernatural arguments.
- Atomic theory has its roots in Greek philosophy, indeed the word atom comes from the Greek for ‘indivisible?’.
- Philosophers talk of what ‘substances?’ the world is made of.
- Einstein’s theories of relativity show us that time and space are not independent quantities, and quantum mechanics (QM) tells us that words like wave, particle, position and velocity are meaningless at a certain scale.

### Objective Reality

- The idea of an objective reality, as is what is knowable, is an important topic for both physics and philosophy.
- Descartes set a foundation for knowledge with his ‘I think therefore I am?’ and worked from there.
- The Many Worlds interpretation of QM states that we are in just one world of many, corresponding to all possible outcomes. Is this just a mathematical formalism, or does it have deep philosophical implications?
- While different schools have different opinions on what we can know, QM states qualitatively and quantitatively what we cannot know and by how much.

### Determinism and Free Will

- As physical entities, people are systems of particles, so how much of our actions are governed by the laws of physics?
- The concept of free will is central to much of philosophy. Are we free to make our own decisions, or are we simply automata?

- Many philosophers ascribe special importance to our supposed determinism behaviour, while others believe in free will. Others claim the two are compatible.
- The problem is muddied with the Copenhagen interpretation of QM, that states some processes are inherently random.
- Some physicists, such as Wigner and Penrose ascribe special importance to the role of consciousness in QM, and vice versa.