

# Physical body

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Physical body (From Wikipedia, the free encyclopedia)

In physics, a physical body or physical object (sometimes simply called a body or object) is a collection of masses, taken to be one. For example, a cricket ball can be considered an object but the ball also consists of many particles (pieces of matter).

In philosophy; particularly the branch of metaphysics called ontology which is the study of existence; a physical object is an object which exists throughout a particular trajectory in space over a particular duration of time, as contrasted with abstract objects such as mathematical objects which do not exist at any particular time or place.

The common conception of physical objects includes that they have extension in the physical world, although there do exist theories of quantum physics and cosmology which may challenge this.

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## **In classical physics, mechanics, quantum physics, and cosmology**

Further information: Physics, Classical mechanics, and String theory

A physical body is an object which can be described by the theories of classical mechanics, or quantum mechanics, and experimented upon with physical instruments. This includes the determination of trajectory of position through space, and in some cases of orientation [disambiguation needed] inspace, over a duration of time, as well as means to change these, by exerting forces.

In classical physics, a physical body is a body with mass, not only energy, is three dimensional (extended in 3-dimensions of space), has a trajectory of position and orientation in space, and is lasting for some duration of time. It is the subject of study in an experiment and is the object referred to in a law of physics, or physical theory. It can be considered as a whole, but may be composed of a collection of smaller physical bodies, e.g. a weight, ball, proton, or planet.

For instance, the force of gravity will accelerate a body if it is not supported, thus causing a change of its position (that is, it falls freely). However, it is not necessary for there to be forces present for an object position to change - only the rate of change of the object's position, that is, its velocity, will change under the influence of forces.

But in Quantum physics and Cosmology, there is a debate as to whether some elementary

particles are not bodies, but are mere points without extension in physical space within space-time, or are always extended in at least one dimension of space as in String theory or M theory.

## **In psychology**

In some branches of psychology, depending on school of thought, a physical body is a physical object with physical properties, as compared to mental objects. In (reductionistic) behaviorism, a physical body and its properties are the (only) meaningful objects of study. While in the modern day behavioral psychotherapy it is still only the means for goal oriented behavior modifications, in Body Psychotherapy it is not a means only anymore, but its felt sense is a goal of its own. In cognitive psychology, physical bodies as they occur in biology are studied in order to understand the mind, which may not be a physical body, as in functionalist schools of thought.

## **In philosophy**

Further information: Ontology and Metaphysics

A physical body is an enduring object that exists throughout a particular trajectory of space and orientation over a particular duration of time, and which is extended in the world of physical space, e.g. as studied by physics. Examples are a cloud, a human body, a weight, a billiard ball, a table, or a proton. This is contrasted with abstract objects such as mental objects, which exist in the mental world, and mathematical objects. Other

examples that are not physical bodies are emotions, the concept of "justice", a feeling of hatred, or the number "3". In some philosophies, like the Idealism of George Berkeley, a physical body is a mental object, but still has extension in the space of a visual field.

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