

# PRIMARY QUALITY

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## PRIMARY QUALITY

**Primary Disciplinary Field(s):** Philosophy (Epistemology, Metaphysics, Perception)

### 1. Core Definition

The term **Primary Quality**, as formalized within modern Western philosophy, refers to those intrinsic, objective, and inherent properties of material substance that exist regardless of whether they are perceived by an observer. These qualities are considered inseparable from the object itself and are characterized by being quantifiable, measurable, and mathematical. Philosophers adopting this distinction, most notably **John Locke**, argued that the ideas derived from primary qualities in the mind of the observer precisely resemble the qualities as they exist externally in the object. Examples traditionally cited include bulk, figure (shape), extension (spatial occupancy), motion or rest, and number. They constitute the true, underlying structure of the physical world.

In contrast to **Secondary Qualities** (such as color, taste, smell, and sound), which are subjective sensory experiences produced by the object's interaction with an observer's sensory apparatus, primary qualities are thought to be constantly present and essential for the object's existence as matter. If one were to divide an object, the resulting parts would still possess primary qualities like extension and solidity. This concept is fundamentally tied to the mechanistic worldview prevalent during the 17th century, asserting that physical reality consists solely of particles in motion, defined only by their spatial and kinematic properties. The objectivity granted to primary qualities makes them the legitimate subject matter of physics and the natural sciences.

The philosophical importance of this distinction lies in its implication for the nature of knowledge (epistemology). If primary qualities are verifiable and objective, they provide a reliable foundation for scientific inquiry and rational certainty about the external world. When we perceive a stone as having a certain volume or weight, the idea of that volume or weight in our mind is assumed to be a faithful representation of the objective property residing in the stone. This provides a clear demarcation between the real, mathematically describable universe and the realm of subjective, changing sensory experience.

### 2. Etymology and Historical Development

The distinction between qualities inherent to objects and qualities dependent upon perception has roots predating Locke, extending back to ancient Greek atomism and resurfacing prominently during the Scientific Revolution. Early modern thinkers, driven by the need to establish an objective framework for physics, began to systematically separate the world of measurable physical properties from the world of qualitative human experience. **Galileo Galilei**, for instance, in his 1623 work *\*The Assayer\**, argued that if sensory experiences like taste, smell, and color were removed,

the material world would still retain its size, shape, and motion. He famously stated that philosophy is written in the "great book of the universe," which is "written in the language of mathematics," emphasizing geometric properties over sensory ones.

**René Descartes** further cemented this idea by arguing that the essential attribute of corporeal substance (matter) is solely **extension** (spatial dimension). All other properties, particularly those relating to sensation, were relegated to the realm of thought (mental substance). Descartes' dualism provided a powerful framework wherein the physical world was purely mechanistic, defined only by primary qualities, while the subjective world of sensory experience was fundamentally different. This paved the way for Locke to structure the concept systematically within a comprehensive theory of knowledge acquisition.

The definitive formulation occurred with **John Locke's** 1689 masterpiece, *\*An Essay Concerning Human Understanding\**. Locke utilized the emerging **Corpuscularian Hypothesis**, which posited that all matter is composed of tiny, imperceptible particles (corpuscles). According to Locke, primary qualities are the properties of these corpuscles themselves--the properties that allow them to affect other objects and our senses. The success of the developing physical sciences, which relied heavily on measurement and mathematical modeling of extension and motion, strongly validated Locke's decision to grant objective reality exclusively to these primary qualities.

### 3. Key Characteristics and Locke's Taxonomy

Locke established a clear taxonomy distinguishing three types of qualities related to material objects. The first, **Primary Qualities**, are those inseparable properties that a body retains through all changes. Locke consistently listed the canonical set: **Solidity** (impenetrability), **Extension** (occupancy of space), **Figure** (shape), **Motion or Rest**, and **Number**. He emphasized that the ideas generated by these qualities in the mind of the observer are direct copies or resemblances of the actual qualities in the object. For example, the idea of a square shape corresponds exactly to the square shape of the physical object.

The second category, **Secondary Qualities**, are powers inherent in the object, residing in its primary qualities (the texture and motion of its insensible parts), to produce various sensations in us (color, taste, heat, smell, sound). The ideas generated by secondary qualities (e.g., the taste of sweetness) do *not* resemble anything in the object itself; the sweetness is purely a subjective mental effect caused by the interaction of the object's corpuscles with the tongue's receptors. If the subject were removed, the secondary quality would cease to exist as a sensation, though the primary qualities causing the power remain.

Locke also defined a third category, sometimes called **Tertiary Qualities** or **Powers**. These are the object's powers to change the primary or secondary qualities of *other* objects. For instance, the power of fire to melt wax (a change in the wax's figure and extension) or the power of the sun to

bleach clothes (a change in the cloth's color). While secondary qualities affect the observer, tertiary qualities affect other external bodies. Both secondary and tertiary qualities are ultimately dependent upon the underlying objective framework provided by primary qualities.

### Key Characteristics of Primary Qualities

**Inherence:** They are essential properties of matter and cannot be separated from the object.

**Objectivity:** They exist independently of the mind and perception.

**Quantifiability:** They can be measured, counted, and described mathematically (e.g., mass, velocity, volume).

**Resemblance:** The ideas they produce in the mind are exact copies of the qualities existing in the external object.

**Universality:** All material objects necessarily possess these qualities.

## 4. The Corpuscularian Basis and Scientific Significance

The Lockean distinction provided a robust philosophical underpinning for the scientific methodology of the Enlightenment. The central theory utilized was **Corpuscularianism**, a form of atomic theory asserting that all physical phenomena could be explained by the size, shape, and motion of microscopic particles. Within this framework, primary qualities were simply the defining characteristics of these fundamental particles. When we perceive a macroscopic object (like a billiard ball), we are fundamentally perceiving the aggregate primary qualities of its constituent corpuscles.

This framework allowed science to successfully abstract the material world away from human sensory variability. By focusing only on extension, motion, and number, scientists could construct universal laws of nature, such as Newton's laws of motion, which are inherently mathematical and independent of any individual observer's perception of color or texture. The success of Newtonian mechanics provided powerful empirical justification for treating primary qualities as the truly real components of the universe.

The emphasis on primary qualities enabled a shift from teleological (purpose-driven) explanations of nature to mechanistic, causal explanations. For instance, the feeling of heat (a secondary quality) is not explained by the inherent "hotness" of fire, but by the primary qualities of rapidly moving corpuscles that impact the skin (a measurable rate of motion). This explanatory power cemented the primary quality distinction as a cornerstone of empirical realism and the philosophical defense of scientific materialism.

## 5. Debates and Criticisms

Despite its profound influence, Locke's doctrine of primary and secondary qualities faced

immediate and powerful opposition, primarily from the Idealist camp. The most famous and forceful critique came from Irish philosopher **George Berkeley**. Berkeley argued against the existence of material substance independent of perception and, consequently, attacked the distinction between the two types of qualities. His central argument was articulated in his famous maxim, \*Esse est percipi\* (To be is to be perceived).

Berkeley contended that it is impossible, even conceptually, to separate primary qualities from secondary qualities. He asked how one could conceive of an object having shape (figure) or extension (primary qualities) without simultaneously perceiving it as having some color or temperature (secondary qualities). Since our knowledge of both categories comes through sensory experience (ideas), and since all sensory experiences are equally subjective and mind-dependent, there is no logical basis for granting objective reality to one class of qualities while denying it to the other. Berkeley concluded that both primary and secondary qualities exist only as ideas in the mind, thus collapsing the distinction and leading to his theory of Idealism.

Other philosophers, including **David Hume**, expressed skepticism regarding Locke's theory of resemblance. If all we ever experience are our own ideas, Hume questioned how we could possibly compare an idea (a mental construct) to the external, mind-independent object it supposedly resembles. Without the ability to step outside our own minds, the claim that our ideas of primary qualities are accurate copies remains an unprovable metaphysical assumption rather than an empirical truth. Furthermore, the reliance on the unobservable Corpuscularian Hypothesis was criticized as a speculative addition necessary to save the distinction.

## 6. Modern Status and Legacy

While classical Idealism did not overturn the scientific focus on measurable properties, the Lockean distinction continues to be intensely debated in contemporary philosophy of mind and perception. Modern critiques often focus on the precise nature of perception and the limits of physical reductionism. For example, some philosophers argue that qualities like texture, which seem inherent and objective, are difficult to classify purely as primary or secondary, suggesting the categorization is overly rigid.

In the context of modern physics, which deals with entities far removed from common sense perception (e.g., quantum fields), the traditional list of Lockean primary qualities (solidity, figure) often breaks down. However, the fundamental principle--that the physical world is defined by objective, quantifiable properties (like charge, mass, and spacetime curvature) that can be studied mathematically, contrasted with subjective, phenomenal experience (qualia)--remains a foundational issue in the philosophy of science. The problem of how objective physical processes give rise to subjective sensory experiences is often referred to as the **Hard Problem of Consciousness**, a direct intellectual heir to the primary/secondary quality debate initiated by

Locke.

Ultimately, the doctrine of primary qualities served as a crucial historical bridge, enabling the separation of objective scientific knowledge from subjective phenomenal experience, thereby establishing the epistemological foundation necessary for the subsequent expansion of scientific inquiry into the measurable world.

### Further Reading

[An Essay Concerning Human Understanding \(Locke\)](#)

[Galileo Galilei](#)

[René Descartes](#)

[George Berkeley](#)

[Corpuscularianism](#)