



Science, Evolution, and Intelligent Design

The Union of Concerned Scientists is an independent, nonprofit alliance of more than 200,000 citizens and scientists. We base our research and outreach on rigorous scientific analysis and the maintenance of scientific integrity in decision making among the public and policy makers.

We are gravely concerned about current attempts to mandate the teaching of “intelligent design” and other non-scientific accounts of the origins of species and biological diversity in our nation’s science classrooms. We are also troubled by the misleading interpretations of scientific principles being used to discredit and misrepresent the science of evolution. This misuse of science and education could have significant negative long-term consequences for American competitiveness and world leadership on scientific matters.

Science is a powerful way of understanding the natural world through a process of observation, experimentation, and analysis. It provides society with a reliable foundation for individual and collective decision making. Evolution by natural selection is one of the most studied and tested theories in science and is the central organizing principle of biology. It has played a fundamental role in the advancement of medical research—especially in areas involving genetics, disease resistance, and immunology—and is supported by key concepts in other scientific disciplines such as physics, geology, chemistry, and astronomy. Modern evolutionary theory provides a robust explanation for how life on Earth developed over the last four billion years through the passing on of genetic information from one generation to the next.¹

The recent national focus on improving the level of math and science skills in the United States make attacks on evolution and science education particularly counterproductive. Science education enables students to develop the intellectual tools needed to make empirical judgments and play a productive and participatory role in human society. Evolution is a fundamental part of science education. UCS recommends and endorses the National Science Teachers Association statement on evolution as well as the white paper *Evolution Science and Society: Evolutionary Biology and the National Research Agenda*, authored by eight major professional scientific societies.

For more than a century, overtly creationist views have driven most opposition to the teaching of evolution. The recently emerged intelligent design movement, on the other hand, takes on the guise of science to promote itself as a scientifically valid alternative to evolution. Intelligent design promoters suggest that some structures found in nature are too complex to have developed through natural selection and are best explained as having been purposefully designed by an “intelligent” agent. The main tenet of this movement is what its supporters call “irreducible complexity”: the idea that these structures are dependent on all of their individual parts to function, and therefore could not have evolved piecemeal over time. These and other claims are based on a misinterpretation of natural selection. Not all structures have the same function, or need to be simultaneously functional, throughout the evolution of an organism.²

Those advocating the teaching of intelligent design in the science classroom will only be successful if the public lacks understanding of basic concepts in science, including evolution. Despite the claims of the movement, intelligent design is not a scientific theory because the influence of an “intelligent” agent in the origin and evolution of life can neither be tested nor falsified.

Scientists, teachers, and members of the public are growing increasingly alarmed by attempts to convince the public and policy makers that intelligent design has a legitimate place in the science classroom. Numerous leading science and education groups have formally endorsed the teaching of evolutionary theory and opposed the teaching of non-science alternatives in the science classroom. They are also developing more effective public communications strategies to address these and other challenges to science. UCS supports these efforts.

This anti-evolution movement claims that it is only “fair” to teach alternatives to evolution. But a science classroom is not a place where all ideas are given equal weight. Science is a process in which ideas are ultimately accepted or discarded based on rigorous observation and testing. While discussions of intelligent design and creationism may have a role in other parts of the curriculum, they do not have a place in the science classroom.

For many scientists and people of faith, there is no conflict between science and religion. Numerous religious organizations have made statements in support of evolution and the separation of science and religion in the classroom.

If non-scientific beliefs are accepted as science, we are concerned that the public’s understanding of science will be further eroded, the integrity of science will be diminished, and the potential implications for society will be profound. The ability to distinguish between claims based on evidence and analysis of the natural world and those based on belief may be lost, leading our future decision makers to make choices based on unsubstantiated information.

Over the past several years, political interference with science that does not support certain political or ideological beliefs has become widespread and pervasive. The recent resurgence of anti-evolution movements is an example of this broader trend. We encourage the mobilization of scientists, teachers, policy makers, and concerned citizens to combat efforts to undermine science education and the integrity of science.

Notes

¹ The theory of evolution is based on the principle of natural selection (descent with modification) proposed by Charles Darwin and others in the mid-nineteenth century. Modern evolutionary theory, referred to as “neo-Darwinism” or “evolutionary theory,” has progressed beyond Darwin’s ideas to include genetics and molecular biology and the investigation of additional natural mechanisms of evolution such as genetic drift. Although there is lively discussion about the role of different evolutionary mechanisms, there is no alternative theory with any credibility accepted by evolutionary biologists, or indeed the scientific community as a whole, about the validity of the theory of evolution.

² Under the theory of natural selection, structures may have one function at one time and be adapted for another use later on. In some instances what might now be seen as complex may have begun as a byproduct of another structure with little or no function in its initial stages. Natural selection is not the only mechanism for evolution and some phenomena that may not be adequately explained by natural selection may be explained by other evolutionary mechanisms.