

A Parent's Guide to INTELLIGENT DESIGN



Resources to help you and your children understand the debate between
Darwinian evolution and intelligent design

by intellect : RATIONAL
in·tel·li·gent de·sign \in-'te-lə -jənt di-'zīn\ *n* 1: The theory
holds that certain features of the universe and of living things are best explained by
an intelligent cause, not an undirected process such as natural selection.
1 a : having or indicating a high or satisfactory

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Introduction

You're a parent, and you think that intelligent design—the scientific idea that many aspects of nature are best explained by an intelligent cause—makes good sense of the world around us. You also feel it's important that kids integrate this scientific theory into their thinking because what they believe about origins will profoundly influence the choices they make.

Therein lies the problem. Kids are constantly bombarded with misinformation on this topic from schools, the media, and sometimes even trusted religious institutions. Pro-Darwin, materialistic thinking appears to be everywhere. Where can you turn?

Discovery Institute offers this Parent's Guide as a resource to help you begin to learn about intelligent design and educate your kids on this issue. In addition to basic scientific information, this guide contains helpful tips and recommended books, videos, and other resources you can turn to for solid, reliable, scientific information on intelligent design. This guide contains eight parts:

Part 1: What Is Intelligent Design?

Part 2: What Is Evolution?

Part 3: What Are Some Scientific Problems with Neo-Darwinian Evolution?

Part 4: How Can Parents Influence Evolution-Education in Local Schools?

Part 5: What Is Theistic Evolution?

Part 6: What can Parents do to Support Intelligent Design?

Part 7: Basic Tips for Parents and Students

Part 8: Recommended Resources

Discovery Institute wants to be a resource for you as you investigate intelligent design and seek to guide the education of your children. This Parent's Guide is just one of many resources—and we invite you to contact us if you have further needs on this issue that we can help you with.

Discovery Institute
208 Columbia Street
Seattle, WA 98104

(206) 292-0401, ext. 108
www.discovery.org/csc
cscinfo@discovery.org

A Parent's Guide to INTELLIGENT DESIGN

Part 1 What is Intelligent Design?

By Casey Luskin

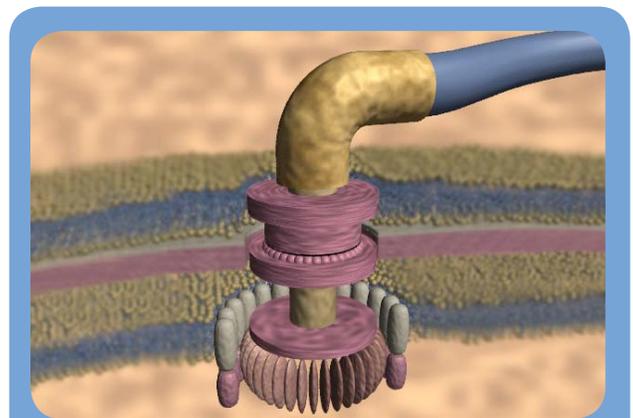
Intelligent design (“ID”) is a scientific theory which holds that some features of the universe and living things are best explained by an intelligent cause rather than an undirected process such as natural selection. ID theorists argue that design can be inferred by studying the informational properties of natural objects to determine if they bear the type of information that, in our experience, arises from an intelligent cause.

Proponents of neo-Darwinian evolution contend that the information in life arose via purposeless, blind, and unguided processes. ID proponents contend that the information in life arose via purposeful, intelligently guided processes. Both claims are scientifically testable using scientific methods employed by standard historical sciences. ID is based upon the claim that there are “telltale features of living systems and the universe which are best explained by an intelligent cause.”¹

Scientists investigating ID compare observations of how intelligent agents design things to observations of phenomena whose origin is unknown. Human intelligent agents provide a large dataset for studying the products of the action of intelligent agents. Mathematician and philosopher William Dembski observes that “[t]he principal characteristic of intelligent agency is *directed contingency*, or what we call *choice*.”² When “an intelligent agent acts, it chooses from a range of competing possibilities” to create some complex and specified event.³ Dembski calls ID “a theory of information” where “information becomes a reliable indicator of design as well as a proper object for scientific investigation.”⁴ ID seeks to find in nature the types of information which are known to be produced by intelligent agents, thus inferring a prior action of intelligence.

The type of information which indicates design is generally called “specified complexity” or “complex and specified information” (CSI). Dembski suggests that design can be detected when one finds a rare or highly unlikely event (making it complex) that conforms to an independently derived pattern (making it specified).

In applying ID to biology, ID theorists often discuss “irreducible complexity,” a concept popularized and elaborated by Lehigh University biochemistry professor Michael Behe. Irreducible complexity is a form of specified complexity, which exists in systems composed of “several interacting parts that contribute to the basic function, and where the removal of any one of the parts causes the system to effectively cease functioning.”⁵



The bacterial flagellum is a good example of an irreducibly complex molecular machine. Using a rotary engine, the flagellum functions like an outboard motor on bacteria which propels them through a liquid medium to find food.

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Because natural selection only preserves structures that confer a functional advantage to an organism, irreducibly complex systems would be unlikely to evolve through a Darwinian process because there is no evolutionary pathway wherein they could remain functional during each small evolutionary step. According to ID theorists, irreducible complexity is an informational pattern which reliably indicates design, because “[i]n all irreducibly complex systems in which the cause of the system is known by experience or observation, intelligent design or engineering played a role [in] the origin of the system.”⁶

ID is a historical science, meaning it uses the principle of uniformitarianism, which holds that the present is the key to the past. ID investigations thus begin with observations about how intelligent agents operate and then proceed to convert those observations into positive predictions of what scientists should find in nature if intelligent design was involved in the origin of a given natural object.

For example, Stephen C. Meyer observes that “[a]gents can arrange matter with distant goals in mind. In their use of language, they routinely ‘find’ highly isolated and improbable functional sequences amid vast spaces of combinatorial possibilities.”⁷ Meyer further observes:

“[W]e have repeated experience of rational and conscious agents-in particular ourselves-generating or causing increases in complex specified information, both in the form of sequence-specific lines of code and in the form of hierarchically arranged systems of parts...Our experience-based knowledge of information-flow confirms that systems with large amounts of specified complexity (especially codes and languages) invariably originate from an intelligent source from a mind or personal agent.”⁸

Using these observations, ID theorists then construct testable predictions about the type of informational properties we expect to find in nature if an intelligent agent were at work in designing a natural object. Specifically, the theory predicts that we will find large amounts of specified complexity in natural objects. The theory then looks at the historical record and performs experimental investigations to test those predictions and determine whether those same informational properties exist in nature, warranting explanation by design.

Design proponents thus use standard uniformitarian reasoning of historical sciences to apply an empirically-derived cause-and-effect relationship between intelligence and certain types of informational patterns to the historical scientific record in order to account for the origin of various natural phenomena. As Meyer explains, “by invoking design to explain the origin of new biological information, contemporary design theorists are not positing an arbitrary explanatory element unmotivated by a consideration of the



Many physicists believe that physical laws of the universe are finely-tuned to allow the existence of advanced forms of life.

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evidence. Instead, they are positing an entity possessing precisely the attributes and causal powers that the phenomenon in question requires as a condition of its production and explanation.”⁹

In this regard, ID uses the scientific method to make its claims. The scientific method is commonly described as a four-step process involving *observations*, *hypothesis*, *experiments*, and *conclusion*. As noted, ID begins with the *observation* that intelligent agents produce complex and specified information (CSI). Design theorists *hypothesize* that if a natural object was designed, it will contain high levels of CSI. Scientists then perform *experimental tests* upon natural objects to determine if they contain complex and specified information.¹⁰

Contrary to what many people suppose, the debate over intelligent design is much broader than the debate over Darwin's theory of evolution. That's because much of the scientific evidence for intelligent design comes from areas that Darwin's theory doesn't even address. In fact, the evidence for intelligent design comes from three main areas: Physics and Cosmology, the Origin of Life, and the Development of Biological Complexity.

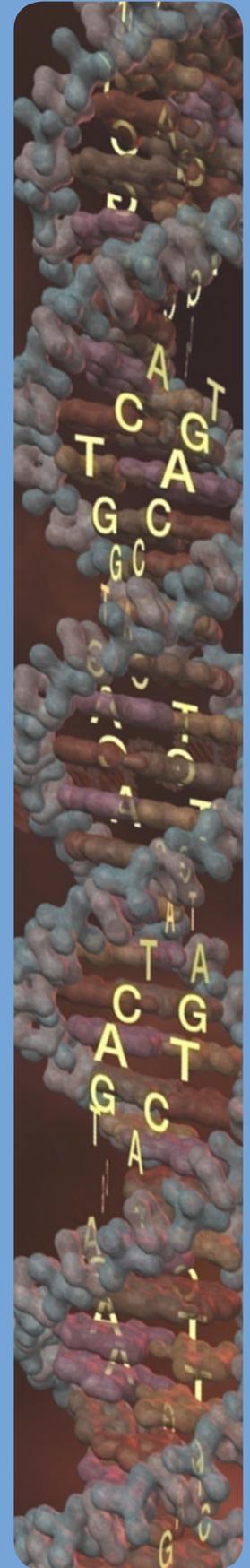
Design in Physics and Cosmology

The fine-tuning of the laws of physics and chemistry to allow for advanced life is an example of extremely high levels of CSI in nature. The laws of the universe are **complex** because they are highly unlikely. Cosmologists have calculated the odds of a life-friendly universe appearing by chance are less than one part in $10^{10^{123}}$. That's ten raised to a power of 10 with 123 zeros after it! The laws of the universe are **specified** in that they match the narrow band of parameters required for the existence of advanced life. As an atheist cosmologist Fred Hoyle observed, “[a] common sense interpretation of the facts suggests that a super intellect has monkeyed with physics, as well as with chemistry and biology.”¹¹ The universe itself shows strong evidence of having been designed.

Design in the Origin of Life

Life is rich in information, but where did this information come from? Bernd-Olaf Küppers has pointed out in his book *Information and the Origin of Life* that “[t]he problem of the origin of life is clearly basically equivalent to the problem of the origin of biological information.”¹²

As noted previously, intelligent design begins with the observation that intelligent agents generate large quantities of complex and specified information (CSI). Studies of the cell reveal vast quantities of biochemical information stored in our DNA in the sequence of nucleotides. No physical or chemical law dictates the order of the nucleotide bases in our DNA, and the sequences are highly improbable and complex. Moreover, the coding regions of DNA exhibit sequential arrangements



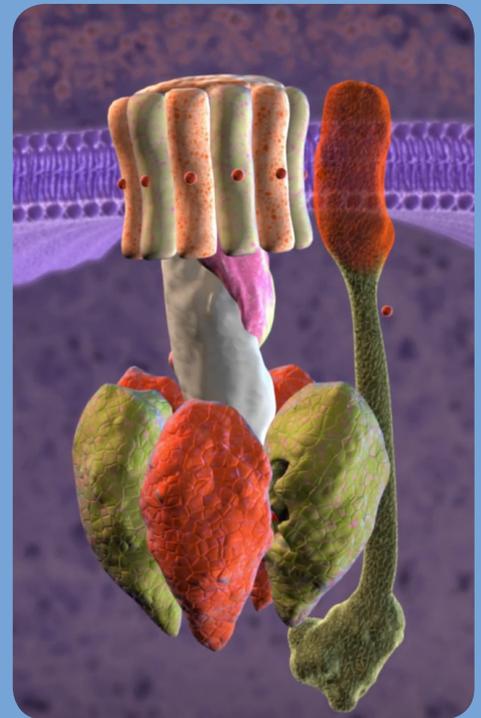
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of bases that are necessary to produce functional proteins. In other words, they are highly specified with respect to the independent requirements of protein function and protein synthesis. Thus, as nearly all molecular biologists now recognize, the coding regions of DNA possess a high “information content”—where “information content” in a biological context means precisely “complexity and specificity.” Even atheist zoologist Richard Dawkins concedes that “[b]iology is the study of complicated things that give the appearance of having been designed for a purpose.”¹³ Atheists like Dawkins believe that unguided natural processes did all the “designing” but intelligent design theorist Stephen C. Meyer notes, “in all cases where we know the causal origin of ‘high information content,’ experience has shown that intelligent design played a causal role.”¹⁴

Design in the Development of Biological Complexity

One easily detectable form of CSI is irreducible complexity, which can be tested and discovered by experimentally reverse-engineering biological structures through genetic knockout experiments to determine if they require all of their parts to function. When experimental work uncovers irreducible complexity in biology, they conclude that such structures were designed.

This method has been used to detect irreducible complexity in a variety of biochemical systems such as the bacterial flagellum. Moreover, the more we discover about the cell, the more we are learning that it functions like a miniature factory, replete with motors, powerhouses, garbage disposals, guarded gates, transportation corridors, and most importantly, CPUs. The central information processing machinery of the cell runs on a language-based code composed of irreducibly complex circuits and machines: the myriad enzymes used in the process that converts the genetic information in DNA into proteins are themselves created by the process that converts DNA into proteins. Many fundamental biochemical systems won't function unless their basic machinery is intact, so how does such complexity evolve via a “blind” and “undirected” Darwinian process of numerous, successive, slight modifications? Since cellular language requires an author, and microbiological machines require an engineer, and genetically encoded programs require a programmer, increasing numbers of scientists feel the best explanation is intelligent design.



Cells are full of molecular machines, such as the ATP synthase— a rotary engine which produces the energy molecule ATP. A single human cell may contain hundreds of thousands, or even millions of these machines.

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Part 2 What is Evolution?

The debate over evolution is largely subject to the definition and use of particular terms. Some people use “evolution” to refer to something as simple as small changes in the sizes of bird beaks, while others use the same word to mean something much more far-reaching. Used one way, the term “evolution” isn’t controversial at all; used another way, it’s hotly debated. Used equivocally, “evolution” is too imprecise to be useful in a scientific discussion. Darwin’s theory is not a single idea. Instead, it is made up of several related ideas, each supported by specific arguments:

Evolution #1: Change over time; the life forms we see today are different than the life forms that existed in the distant past. This can refer to minor changes in features of individual species—changes which take place over a short amount of time. Even skeptics of Darwin’s theory agree that this type of “change over time” takes place.

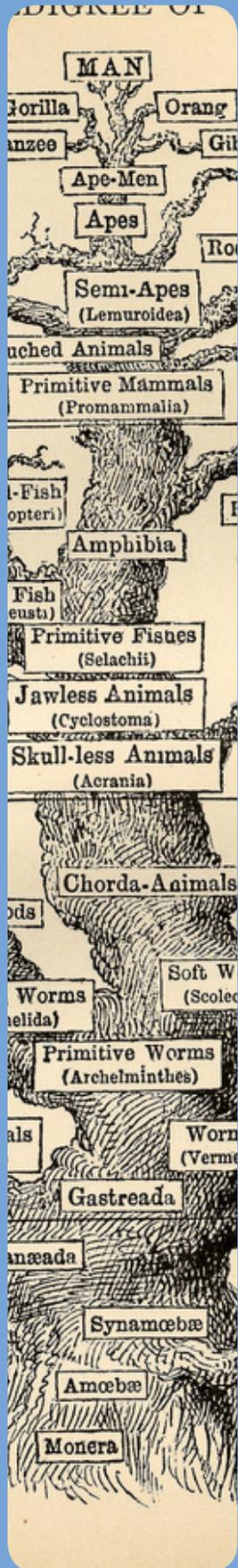
Evolution #2: Common ancestry; all organisms we see today are descended from a single common ancestor in the distant past. This claim became known as the theory of universal common descent, and paints a picture of the history of life on earth as a great branching tree.

Evolution #3: Natural selection and random mutation are an unguided and purposeless mechanism of change which was the primary driving force building the complexity of life. Darwin thought natural selection was responsible for the branching tree pattern of life. He also argued that it had the power to produce fundamentally new forms of life. Together, the ideas of universal common descent and natural selection form the core of Darwinian evolutionary theory. “Neo-Darwinian” evolution combines our knowledge of DNA and genetics to claim that mutations in DNA provide the variation upon which natural selection acts.

Intelligent design does not conflict with evolution if by “evolution” one simply means “change over time,” or even that living things are related by common ancestry (Evolution #1 or Evolution #2). However, the dominant theory of evolution today is neo-Darwinism (Evolution #3), which contends that evolution is driven by natural selection acting on random mutations, an unpredictable, unguided, and purposeless process that “has no discernible direction or goal, including survival of a species.”¹⁵ It is this specific claim made by neo-Darwinism that intelligent design directly challenges.

While ID is compatible with common ancestry, the last couple decades have seen a flood of new gene sequence data which conflicts with the “tree of life” hypothesis (Evolution #2). Additionally, many scientists both inside and outside the ID movement today agree that natural selection (Evolution #3) is inadequate to explain much of what we observe in biology. (See Part 3 for details.) Nonetheless, ID does not reject all of evolutionary biology. Indeed, ID “does not challenge the idea of ‘evolution’ defined as either change over time or common ancestry, but it does dispute Darwin’s idea that the cause of biological change is wholly blind and undirected.”¹⁶

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Part 3 What are the Scientific Problems with Neo-Darwinian Evolution?

Genetics

Mutations Tend to Cause Harm and do not Build Complexity

Darwinian evolution relies on random mutations that are preserved by a blind, undirected process of natural selection that has no long-term “goals.” Such a random and undirected process tends to harm organisms and does not improve them or build complexity. In the words of late leading geneticist Lynn Margulis, a member of the National Academy of Sciences, “new mutations don’t create new species; they create offspring that are impaired.”¹⁷ Similarly, past president of the French Academy of Sciences, Pierre-Paul Grasse, contended that “[m]utations have a very limited ‘constructive capacity’” because “[n]o matter how numerous they may be, mutations do not produce any kind of evolution.”¹⁸ According to the research of University of Wisconsin biologist Ralph Seelke, mutations can break features in bacteria but they cannot put even modestly complex features back together.¹⁹ Likewise, biochemist Michael Behe and physicist David Snoke have published research in the journal *Protein Science* showing that even simple biochemical features like protein-protein interactions cannot be built by random mutation.²⁰

Biochemistry

Random and Undirected Processes do not Seem Capable of Producing Cellular Complexity

Our cells contain incredible complexity, like miniature factories using machine technology but dwarfing the complexity and efficiency of anything produced by humans. Cells use miniature circuits, motors, feedback loops, encoded language, and even error-checking machinery to decode and repair our DNA. Darwinian evolution struggles to build this type of integrated complexity. As biochemist Franklin Harold admits: “there are presently no detailed Darwinian accounts of the evolution of any biochemical or cellular system, only a variety of wishful speculations.”²¹ Biochemist Michael Behe has found that Darwinian evolution tends to break molecular functions rather than build new ones.²² Likewise, biochemical engineer Douglas Axe has published work in the *Journal of Molecular Biology* and elsewhere showing that amino acid sequences which yield functional protein folds are too rare to be produced by Darwinian processes.²³

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Paleontology

The Fossil Record Typically Lacks Intermediate Fossils

The fossil record's overall pattern is one of abrupt explosions of new biological forms, and possible candidates for evolutionary transitions are the exception, not the rule. This has been recognized by many paleontologists such as Ernst Mayr who explained in 2000 that "[n]ew species usually appear in the fossil record suddenly, not connected with their ancestors by a series of intermediates."²⁴ Similarly, a zoology textbook observed that "Many species remain virtually unchanged for millions of years, then suddenly disappear to be replaced by a quite different, but related, form. Moreover, most major groups of animals appear abruptly in the fossil record, fully formed, and with no fossils yet discovered that form a transition from their parent group."²⁵ This pattern is contrary to what would be expected from Darwinian evolution.

Taxonomy

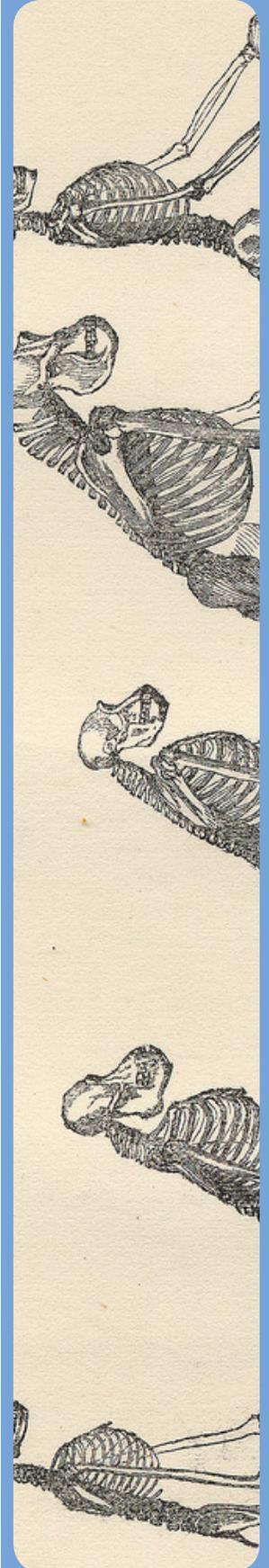
Biologists Have Failed to Construct a "Tree of Life"

Biologists hope that DNA evidence will reveal a grand tree of life where all organisms are clearly related, but it hasn't. Trees describing the alleged ancestral relationships between organisms based upon one gene or biological characteristic very commonly conflict with trees based upon a different gene or characteristic. As the journal *New Scientist* put it, "different genes told contradictory evolutionary stories" leaving the tree of life project "in tatters, torn to pieces by an onslaught of negative evidence."²⁶ The eminent microbiologist Carl Woese explained that such "[p]hylogenetic" conflicts "can be seen everywhere in the universal tree, from its root to the major branchings within and among the various taxa to the makeup of the primary groupings themselves."²⁷ This implies a breakdown in common descent, the hypothesis that all organisms share a common ancestor.

Chemistry

The Chemical Origin of Life Remains an Unsolved Mystery

The mystery of the origin of life is unsolved and all existing theories of chemical evolution face major problems. Basic deficiencies in chemical evolution include a lack of explanation for how a primordial soup could arise on the early earth's hostile environment, or how the information required for life could be generated by blind chemical reactions. As Greg Easterbrook recently commented in *Wired* magazine, "What creates life out of the inanimate compounds that make up living things? No one knows. How were the first organisms assembled? Nature hasn't given us the slightest hint. If anything, the mystery has deepened over time."²⁸ Or, as evolutionary biologist Massimo Pigliucci says, "we really don't have a clue how life originated on Earth."²⁹



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Education

Textbooks Often Overstate or Misstate Key Lines of Evidence for Modern Evolutionary Theory

Modern biology textbooks have a chronic habit of papering over scientific evidence that dissents from the standard lines of evidence—or “icons”—used to support Darwinian evolution. For example, when attempting to demonstrate common ancestry, textbooks frequently portray drawings of vertebrate embryos which *inaccurately overstate* the similarities between different organisms in their earliest stages of development.³⁰ Textbooks also often present examples of small-scale “microevolution” and over-extrapolate the evidence to make unwarranted claims about “macroevolution.” They discuss minute changes in the sizes of beaks on the Galápagos finches or small changes in the colors of peppered moths³¹ to claim that fundamentally new types of organisms can evolve via Darwinian processes. As evolutionary biologist Robert L. Carroll asks: “Can changes in individual characters, such as the relative frequency of genes for light and dark wing color in moths adapting to industrial pollution, simply be multiplied over time to account for the origin of moths and butterflies within insects, the origin of insects from primitive arthropods, or the origin of arthropods from among primitive multicellular organisms?”³² Many scientists feel the answer is “no”—but biology textbooks never inform students of this fact. This is all the more reason why teachers need academic freedom to inform students about the facts when textbooks don’t tell the full story.



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Part 4 How Can Parents Influence Evolution-Education in Local Schools?

In *Origin of Species*, Charles Darwin cautioned that “a fair result can be obtained only by fully stating and balancing the facts and arguments on both sides of each question.”³³ Unfortunately, the vast majority of public schools today reject Darwin’s advice, and only teach students about the pro-evolution view. Controlled, pressured, and intimidated by the Darwin Lobby (a powerful coalition of politically-oriented scientific organizations, educators associations, and activist groups), most public schools effectively censor from students any scientific evidence which challenges neo-Darwinism. Even many private schools which use mainstream biology textbooks wittingly or unwittingly teach only the Darwinian view. The result is not education, but indoctrination.

As a parent, you might feel justifiably concerned, or even outraged about this situation; you want objectivity in classroom instruction regarding origins, and don’t want students being misinformed. You may wish to contact local public school educators to advocate for positive changes in how evolution is taught. But it’s important to channel your desire for change in a productive and helpful direction. What follows are some crucial Do’s and Dont’s to follow whenever trying to positively influence education:

Do contact Discovery Institute before commencing your efforts. *This is a must.* We have extensive experience working with public schools, and can provide you with many resources. There are many unforeseen obstacles you’ll encounter when dealing with public education, and we can offer important and unique advice to your specific situation to help you navigate these tricky areas.

Don’t push intelligent design into the public school curriculum. While we do feel ID is considered constitutional to teach in public schools, pushing ID into public schools politicizes this scientific debate, and does long-term damage to ability of pro-ID scientists to gain a fair hearing. As Discovery Institute’s Science Education Policy Page states:

As a matter of public policy, Discovery Institute opposes any effort to require the teaching of intelligent design by school districts or state boards of education. Attempts to mandate teaching about intelligent design only politicize the theory and will hinder fair and open discussion of the merits of the theory among scholars and within the scientific community. Furthermore, most teachers at

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the present time do not know enough about intelligent design to teach about it accurately and objectively.³⁴

Do advocate for the teaching of the scientific evidence both for and against neo-Darwinian evolution in an objective fashion. As our Science Education Policy Page continues:

“Instead of mandating intelligent design, Discovery Institute seeks to increase the coverage of evolution in textbooks. It believes that evolution should be fully and completely presented to students, and they should learn more about evolutionary theory, including its unresolved issues. In other words, evolution should be taught as a scientific theory that is open to critical scrutiny, not as a sacred dogma that can't be questioned.”³⁵

Do protect teacher academic freedom to teach good science on this topic. Discovery Institute can offer you examples of successful state and local academic freedom policies that permit teachers to teach both the scientific evidence for and against Darwinian evolution.

Don't ask that that evolution be removed or diminished from the curriculum. Even if you personally disagree with it, the scientific case for Darwinian evolution should still be presented to students. Students need to learn about evolution in order to be informed citizens—especially if they plan to attend college. However students shouldn't only learn the pro-Darwin view. **(Rather than taking this subject out of the classroom, students should study Darwinian evolution objectively, learning about both the scientific evidence for and against the theory)**

Do explain that the case for objectivity in evolution-education comes from science—and isn't an argument based upon religion. There is credible scientific dissent from Darwinian evolution: over 800 Ph.D. scientists have signed a statement that they “are skeptical of claims for the ability of random mutation and natural selection to account for the complexity of life,” and therefore “[c]areful examination of the evidence for Darwinian theory should be encouraged.”³⁶ Moreover, many peer-reviewed scientific papers dispute core tenets of biological and chemical evolution.³⁷

Do point out that leading science education theorists agree that the best way to teach science is to let students engage in critical thinking where they can weigh alternative evidence and debate

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controversial issues. As a 2010 paper in the journal *Science* explained, students learn science best when taught “to discriminate between evidence that supports ... or does not support”³⁸ a scientific concept. When science is taught in this manner, students learn the critical thinking skills they need to think like good scientists.

Don't try to do this alone. In addition to getting help from Discovery Institute, try to identify like-minded parents, students, scientists, educators, college faculty, and other members of your community who support objective evolution-education. Your chances of success are much higher if you can build a coalition of people who want to make positive changes.

Do be prepared for negativity from the media (and perhaps angry bloggers) who want to maintain the *status quo* through threats of ridicule and personal attacks. Their goal is to intimidate you into silence. Stay true to your convictions—and remember you're doing this for students, so they won't be misinformed and indoctrinated on the topic of origins.

Conclusion

Science education authorities warn of two primary deficiencies facing American science education today. First, insufficient numbers of students are being inspired to pursue careers in science. Second, students aren't being taught the critical thinking skills they need to succeed in science.³⁹

If there are problems with science education, it stands to reason they are linked to the *status quo*. But in American public education today, the *status quo* teaches evolution in a dogmatic pro-Darwin-only fashion which fails to help students use critical thinking on this topic. Teaching students about the scientific debate over evolution will not only improve their critical thinking skills, but it will get them interested in science. In essence, teaching the controversy over neo-Darwinian theory might be part of the solution to some of the biggest problems facing American science education.

Note for Private and Home School Education: Many of these tips can also apply to private school or home school education. However, since private / home schools have fewer legal restrictions than public ones, teaching ID in the private school or home school setting causes far less controversy. Discovery Institute supports educators who wish to teach ID in the private or home school context. See Part 8 of this Parent's Guide for a list of resources which can be used in these settings to learn about ID.

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Part 5

What is Theistic Evolution?

By John G. West

Theistic evolution is the effort to reconcile Darwin's theory of undirected evolution with belief in God in general and Christian theology in particular. Analogous terms to theistic evolution include "evolutionary creation," "fully gifted creation," and "biologos."

Theistic evolution encompasses a wide array of different approaches and views, which has generated considerable confusion about the actual meaning of the term. To a large extent, differences in opinion among theistic evolutionists are driven by how theistic evolutionists define both "theism" and "evolution." Does theism require a God who actively and intimately guides the development of life? Or does it allow a passive God who may not even know how the development of life will ultimately turn out? Alternatively, does evolutionary theory require an undirected process (as Darwin insisted)? Or can evolution include a process guided to specific ends by an intelligent cause? One's conception of theistic evolution will be markedly different depending on how one answers these questions.

In the initial decades after Darwin proposed his theory, theistic evolution typically was presented as a form of guided evolution. Although Darwin himself firmly rejected the idea that evolution was guided by God to accomplish particular ends, many of Darwin's contemporaries (including those in the scientific community) rejected undirected natural selection as sufficient to explain all the major advances in the history of life. Instead, there was widespread acceptance of the idea "that evolution was an essentially purposeful process... The human mind and moral values were seen as the intended outcome of a process that was built into the very fabric of nature and that could thus be interpreted as the Creator's plan."⁴⁰

This view of evolution as a purposeful process began to disintegrate early in the twentieth century after Darwinian natural selection underwent a resurgence due to work in experimental genetics. Once Darwin's theory of undirected evolution became the consensus of the scientific community, the task for mainstream theistic evolution became considerably harder: Now one had to reconcile theism not just with the idea of universal common ancestry, but with the idea that the development of life was driven by an undirected process based on random genetic mistakes. But how can God "direct" an "undirected" process? Modern theistic evolutionists do not offer clear or consistent answers to this question.



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Prominent current proponents of theistic evolution include Brown University biologist Kenneth Miller, author of *Finding Darwin's God*; Eastern Nazarene University physicist Karl Giberson, author of *Saving Darwin*; former head of the Human Genome Project Francis Collins, author of *The Language of God*; and biologist/theologian Denis Lamoureux. Former Calvin College professor Howard Van Till was a prominent defender of theistic evolution in the early to mid 1990s, but his prominence waned after he abandoned Christianity and embraced "freethought."

While some contemporary proponents of theistic evolution maintain that their views are consistent with traditional Christian theology, many others have made clear that embracing theistic evolution requires radical revisions in how one views God.

Contemporary theories of theistic evolution raise at least three significant challenges to traditional Christian theology:

First, many theistic evolution proponents assert that, because Darwinian evolution is by definition "undirected," God could not have actively guided the evolutionary process, contrary to traditional Christian teachings about God's sovereignty. According to theistic evolution, God cannot even know with certainty or specificity how the evolutionary process will turn out. Applied to human beings, this means that God did not know beforehand whether the evolutionary process would produce human beings or some other rational creature, such as a big-brained dinosaur.

In the initial years after Darwin's theory was proposed, most theistic evolutionists believed that God guided the evolutionary process to specific ends. However, as the Darwinian view of the undirected nature of evolution gradually solidified in the scientific community, defenders of theistic evolution increasingly disowned the idea of guided evolution. Consequently, many leading proponents of theistic evolution today insist that Darwinian evolution by definition is an undirected process and that not even God knows what the process will produce with certainty or specificity.

For example, Anglican John Polkinghorne writes that "an evolutionary universe is theologically understood as a creation allowed to make itself."⁴¹ Former Vatican astronomer George Coyne claims that "not even God could know... with certainty" that "human life would come to be."⁴² And biologist Kenneth Miller of Brown University, author of the popular book *Finding Darwin's God* (which is used in many Christian colleges), insists that evolution is an undirected process, flatly denying that God guided the evolutionary process to achieve any particular result—including the development of human beings. Indeed, Miller insists that "mankind's appearance on this planet was not preordained, that we are here... as an afterthought, a minor detail, a happenstance in a history that might just as well have left us out."⁴³

Miller does say that God knew that the undirected process of evolution was so wonderful it would create some sort of rational creature capable of praising Him eventually. But what that something would be was radically undetermined. How undetermined? At a 2007 conference, Miller admitted that evolution could have produced "a big-brained dinosaur" or a "mollusk with exceptional mental capabilities" rather than human beings.⁴⁴

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Second, many theistic evolution proponents repudiate traditional Christian teaching about the original goodness of creation and its subsequent "Fall." Karl Giberson in *Saving Darwin* directly rejects the idea that "sin originates in a free act of the first humans" and that "God gave humans free will and they used it to contaminate the entire creation."⁴⁵ Giberson argues that since human beings were created through Darwinian evolution, sin was present in human beings to begin with: "Selfishness... drives the evolutionary process. Unselfish creatures died, and their unselfish genes perished with them. Selfish creatures, who attended to their own needs for food, power, and sex, flourished and passed on these genes to their offspring. After many generations selfishness was so fully programmed in our genomes that it was a significant part of what we now call human nature." Although Giberson does employ the term "fall" in his book, it is clear that he merely means that humans continue to be sinful, just like they were from the beginning. There was no actual "fall" in his view, as he confirmed at an appearance at Biola University in 2009. Notably, the foreword to Giberson's *Saving Darwin* was written by prominent fellow theistic evolutionist, Francis Collins.

Third, theistic evolutionists who seek to retain the idea that God guided the evolutionary process typically insist that God's guidance in biology is hidden from us. Such theistic evolutionists claim that God created evolution to look like "a random and undirected process," even though it isn't. These theistic evolutionists repudiate the consensus view of Jewish and Christian thinkers who for more than two thousand years maintained God's design could be clearly observed throughout nature.

Theistic evolution proponents who do not openly deny that God guided the development of life typically insist that His guidance is unobservable in biology. Francis Collins proposes this view in *The Language of God*, suggesting that from God's perspective the outcome of evolution could "be entirely specified... while from our perspective" evolution "would appear a random and undirected process."⁴⁶

Thus, in Collins' view, design in biology is undetectable. Yet for thousands of years, Jewish and Christian thinkers maintained that God's design could be clearly seen throughout nature. From the psalmist who claimed that the "heavens declare the glory of God" (Psalm 19) to the Apostle Paul who argued in Romans 1:20 that "since the creation of the world His invisible attributes are clearly seen, being understood by the things that are made," the idea that we can see design in the regularities and functionality of nature was clearly accepted. In fact, Jesus himself pointed to the feeding of birds and the exquisite design of the lilies of the field as observable evidence of God's active care towards the world and its inhabitants. (Matthew 6:26-30).

The observability of design was a key theme in the writings of the early church fathers as well. Responding to the Epicureans' denial of any sort of creator, early Christians repeatedly affirmed that nature provided evidence that it was the product of purposeful design. In the words of Theophilus (115-188 AD), Bishop of Antioch in the 2nd century: "God cannot indeed be seen by human eyes, but is beheld and perceived through His providence and works... as any person, when he sees a ship on the sea rigged and in sail, and making for the harbor, will no doubt infer that there is a pilot in her who is steering her; so we must perceive that God is the governor [pilot] of the whole universe." What were these "works"

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through which we could see the intelligent activity of God? Theophilus went on to list the regularities of nature from astronomy, the plant world, the diverse species of animals, and the ecosystem. Similar arguments about how nature displays clear evidence of design were made by Dionysius (200-265 AD), Bishop of Alexandria and John Chrysostom (347-407 AD), Archbishop of Constantinople.

Conclusion

Although theistic evolution receives much attention from the newsmedia, it represents a fringe position among leading evolutionary biologists. Nearly 95% of the biologists in the National Academy of Sciences describe themselves as atheists or agnostics, a far higher percentage than in any other scientific discipline.⁴⁷

Similarly, according to a 2003 Cornell survey of leading scientists in the field of evolution, 87% deny existence of God, 88% disbelieve in life after death, and 90% reject the idea that evolution is directed toward an "ultimate purpose."⁴⁸

Thus, Darwinian biologist Richard Dawkins, author of *The God Delusion*, is far more representative of the beliefs of evolutionary biologists than Christian geneticist Francis Collins, author of *The Language of God*.

For more information, read *God and Evolution: Protestant, Catholics, and Jews Explore Darwin's Challenge to Faith*. The website FaithandEvolution.org also has more resources on theistic evolution.



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Part 6

What Can Parents do to Support Intelligent Design?

The most obvious way that parents and families can support intelligent design is to join, or financially support, ID organizations like Discovery Institute. Despite stereotypes put out by the media, the ID movement is vastly underfunded compared to the Darwin Lobby:

- Evolutionary biologists receive millions of dollars in federal tax money from the National Science Foundation (NSF) or National Institutes of Health to fund their research every year.
- Major scientific organizations like the American Association for the Advancement of Science or the National Academy of Sciences pour vast amounts of resources and funding into political battles over evolution-education.
- Numerous public and private universities spend millions of dollars each year putting on conferences, courses, and public outreach events promoting Darwinian evolution.

In one case, the leading anti-ID activist group, the National Center for Science Education, received a \$500,000 government grant to create a single website to help teachers promote evolution. In another, the NSF gave nearly \$2 million to “teach young children” about “Darwin’s model of natural selection.” This money is of course unavailable for projects that would dissent from Darwinian evolution.

As a single 501(c)(3) non-profit organization, Discovery Institute’s Center for Science and Culture functions as the hub of the ID movement. It funds scientific research and scholarship, curriculum development, student-education programs, public-education initiatives, conferences, and many other initiatives to increase public awareness of the issue. Discovery Institute relies entirely upon the donations of private individuals and foundations. Financially supporting Discovery Institute helps maintain many programs and initiatives which are promoting intelligent design to many different kinds of people.

All that said, we certainly understand that not everyone has money to give, *and there many non-financial-related ways you can support intelligent design activities.* You can start by educating yourself about intelligent design, and then seek to



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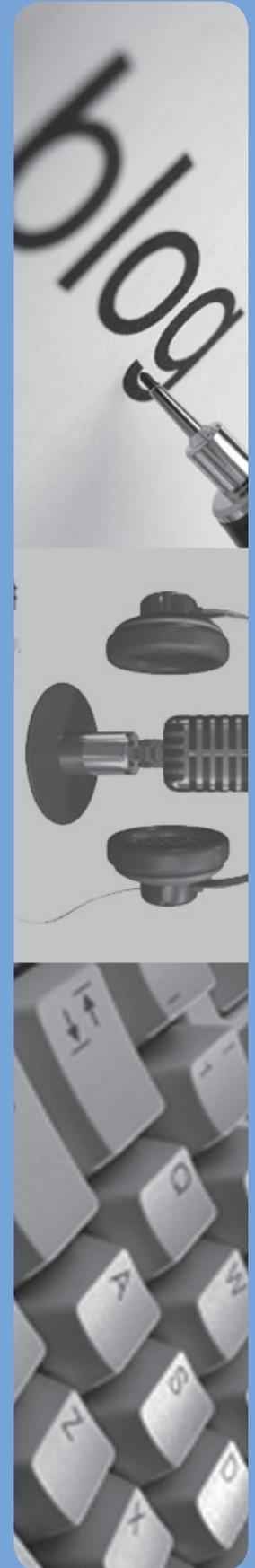
educate your friends, family, and others in your sphere of influence.

Internet Related Ways to Support ID

- **Websites:** Stay up-to-date on the debate by becoming a regular reader of our news-site, Evolution News & Views (www.evolutionnews.org)
- **Newsletter:** Subscribe to Discovery Institute's free Nota Bene e-mail newsletter (www.discovery.org/csc/notabene).
- **Facebook:** Visit and "like" Discovery Institute's Center for Science & Culture on Facebook (www.facebook.com/discoverycsc).
- **Twitter:** Become a follower our main Intelligent Design Twitter feed (@DiscoveryCSC).
- **Podcast:** Listen to Discovery Institute's ID the Future Podcast. There are multiple ways you can do this: Download the podcast directly from www.idthefuture.com, follow our ID the Future Twitter feed (@idthefuture), or subscribe to ID the Future on iTunes.
- **Blog:** Start your own ID blog, or participate in other ID blogs like Uncommon Descent (www.uncommondescent.com).

Become a Voice for ID and Academic Freedom

- Sign our Academic Freedom Petition (see www.academicfreedompetition.com).
- Plan an ID-related event for your local community. Bringing an ID-speaker or showing an ID-video at an event that is open to the public are great ways to promote ID. This could be as simple as renting out a room at a local public library to show an ID-video, or renting a university lecture hall for a full ID-conference to reach an entire campus. You can also work with local churches or other community organizations to put on ID-events that powerfully reach local communities. If you're planning an event, consider hosting it on Academic Freedom Day. Academic Freedom Day is celebrated on February 12th, to be a contrast to "Darwin Day" events which celebrate Darwin's birthday on the same day. Because of "Darwin Day," people are often talking about this debate around February 12th, so Academic Freedom Day events can be a great time



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to host an event. For details see www.academicfreedomday.com.

- Write *letters to the editor* to local newspapers, calling on them to stand up for good science education and provide corrections to misinformation or biased reporting on this issue. This can also include making helpful comments on news websites about ID-related issues.
- Ensure that local public libraries, secondary school libraries, and university libraries have up-to-date copies of intelligent design books. (See Part 8 for some suggested books.) Even if you don't have the money to donate the books, you can recommend books to local libraries and ask if they would consider adding them to their collections.
- Become an advocate for objective evolution-education in local schools, whether public or private. Encourage educators to use solid scientific resources which expose students to scientific views that dissent from Darwinian evolution. Be sure to contact Discovery Institute before doing this. See Part 4 for a list of tips on influencing local education, and Part 8 for a list of recommended educational resources.

Support Student-Focused ID Initiatives

- **Start an IDEA Club:** A great way to increase awareness about ID is to start an Intelligent Design and Evolution Awareness (IDEA) Club. These extracurricular clubs are affiliated with the IDEA Center (a distinct organization from Discovery Institute), and can organize events on local college or high school campuses, and also in communities to educate the public about intelligent design. You could start an IDEA Club yourself, or help a student do so. See www.ideacenter.org for details.
- **Discovery Institute's Summer Seminar on Intelligent Design:** Encourage students to attend Discovery Institute's Summer Seminar on Intelligent Design. This 8-day program is available to college-level juniors and above in both the natural sciences and the humanities. All expenses are paid for students who attend the program, but we need people to tell students about the program. You can help by letting students know about it. For details, visit www.discovery.org/sem
- **College Shopping:** If you know students who are college-shopping, help them consider how the schools they're examining deal with topics like the origins of life and human beings. Part 7 of this Parent's Guide gives tips and advice for college shopping.
- **Encourage Students in their ID-focused Academic Pursuits**

Of course there are many other things you can do to support ID. Do your own brainstorming to find opportunities within your personal sphere of influence to educate people about the issue. Keeping your eyes out for local ID conferences and inviting friends, or giving appropriate ID books to friends or family as gifts are easy ways to make a difference. See Part 8 for a list of recommended resources.

Part 7
Basic Tips for Parents
and Students

As a parent, you have an important opportunity to guide your children, and other students, as they learn about ID. What follows are some useful tips for students and parents when approaching this topic:

#1 *Study origins at home, and don't opt out of learning evolution in school.*

Don't be afraid to raise the topic of evolution with your kids, and don't prevent them from learning about the subject in school. Rather, encourage them to learn about evolution, *but be sure to couple it with discussions and education at home to help supplement information they may not be learning in the classroom.* If you're going to encourage your kids or other students to learn about Darwinian evolution, it's vital to follow the other tips.

#2 **Help your kids develop critical thinking skills—and use them when studying and debating evolution. For example:**

Challenge assumptions: The more you study Darwinian evolution, the more you'll discover that many of its claims are based upon assumptions, not hard facts. For example, universal common descent is often assumed rather than demonstrated by phylogenetic trees. The assumption of common ancestry also often influences the interpretation of fossils or genetic data. Likewise, biological structures are often said to have evolved by random mutation and natural selection. Ask questions such as, "Is this an assumption, or has it been demonstrated by the evidence?"

Spot circular reasoning: Evolutionists often use circular reasoning. Sometimes, an argument may boil down to "This organ must have evolved because we know it evolved." Keep your eyes out for circular reasoning which assumes the truth of the argument.

Watch for contradictory claims and logic: Evolutionary thinking often employs contradictory logic and inconsistent methodologies. The logic employed to infer Darwinian evolution in situation *A* may be precisely the exact opposite of the logic used to infer it in situation *B*. Here are a few examples:

- Biological similarity between two species implies inheritance from a common ancestor (i.e. common descent) except for when it doesn't (and then they appeal to processes like "convergent evolution" or "horizontal gene transfer").

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- Neo-Darwinism predicts transitional forms may be found, but when they're not found, that just shows that the transitions took place too rapidly and in populations too small to become fossilized.
- Evolutionary genetics predicts the genome will be full of useless junk DNA, except for when we discover function for such "junk" DNA. Then evolution predicts that cells would never retain useless junk DNA in the first place.

When both A and (not) A imply Darwinian evolution, then a theory is based upon an inconsistent scientific methodology. Keep an eye out for assumptions and contradictory methodologies, for they abound in evolutionary reasoning.

#3 *Proactively educate your kids about credible scientific viewpoints that dissent from Darwinism at home—especially when classes censor non-evolutionary viewpoints.*

The Darwinian educational establishment doesn't make it easy for students to become objectively informed on the topic of evolution and intelligent design. But with assistance from parents and some self-study at home, it can be done. You may need to encourage your kids or other students to pro-actively study and understand ID arguments which may be misrepresented or censored in the classroom.

So yes, parents should encourage kids to study the pro-evolution viewpoint. But also help them learn material from credible Darwin skeptics to learn about other viewpoints. This might be as easy as purchasing some ID-videos and having students watch them at home. Part 8 of this Parent's Guide suggests various helpful resources.

#4 *Model Civility at all times.*

The debate over Darwinism and intelligent design can often become heated and emotional. Reasonable people often disagree—and in fact you might sometimes disagree with your own kids. Be sure to model respect and civility when discussing this issue with your children or others.

Dealing With Controversy

Richard Dawkins once said that any person who doubts evolution is "ignorant, stupid or insane" and might even be "wicked." Though Dawkins is extreme in his views, he's not an extreme example. How should you respond to reactions like this?

- Be mentally prepared that you might face this kind of response.
- Maintain a civil and respectful tone regardless of how others treat you. Don't use namecalling or personal attacks—stay calm and use logical arguments.
- After educating yourself and learning scientifically-backed arguments against Darwinism, you'll have the intellectual confidence to respond to any critic with grace and style. When an angry critic sees you remaining calm and rational, they just might start listening.

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ID critics are infamous for their incivility, but it's important that you maintain civility at all times, even when opponents aren't returning the favor. This will help them form their own opinions, and also enable them to better help others understand the facts on this issue.

Bonus Tip *Consider ID when College-Shopping.*

As a final tip, it's important that you guide your kids while they are thinking about college. Every young learner must chart the educational path that suits him or her best. For some students, it's perfectly appropriate for them to attend public or private colleges or universities which are hostile towards ID; others will thrive better in an environment which is friendly towards it. Either way, it's important to know where a prospective university stands. In particular, be sure to inquire, along with your kid, about academic freedom at a particular college for proponents of intelligent design. You might consider asking questions like the following:



- Are faculty allowed to help students follow the evidence in the natural and social sciences, regardless of where it leads? Does this include the freedom to discuss the scientific arguments both for and against a prominent theory such as evolution?
- Are science faculty open to the possibility of concluding (if driven by sufficient evidence) that certain features of the universe and of living things are best explained by an intelligent cause, rather than an apparently unguided process such as natural selection?
- Have any faculty actually reached such an “intelligent design” conclusion based on scientific evidence, while remaining full participants within your academic community? Would you fire or silence any proponents of intelligent design theory, as some universities have done?
- Detect signs of intellectual honesty and academic freedom by asking professors questions such as those above, looking for agitated body language or condescending facial expressions.
- Ask whether there are any faculty who dissent from Darwinism, and if not, why?
- Notice repressive policies such as rigid speech codes that might limit freedom of speech.⁴⁹

The answers to these kinds of questions will not just tell you about a school's attitude towards intelligent design, but will also indicate many other important characteristics of that university. Feel free to contact Discovery Institute for a list of ID-friendly colleges and universities as well.

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Part 8 Recommended Resources

There are many books, videos, and other educational resources available for both parents and students to learn about intelligent design. Most of these resources are appropriate for those who have reached middle or high school age (most schools don't cover topics like evolution until that age anyway). Recommended resources are broken up into four categories: Websites, Videos, Textbooks, and General Introductory Books. These resources are marked according to the legend below.

Websites:

- ID Portal: www.intelligentdesign.org
- News Site: www.evolutionnews.org
- ID Podcast: www.idthefuture.com
- IDEA Student Clubs: www.ideacenter.org
- Discovery Institute's Center for Science and Culture: www.discovery.org/csc
- Uncommon Descent Blog: www.uncommondescent.com
- Resources Responding to Theistic Evolution: www.faithandevolution.org

Icon	Appropriate Use of Resource
	Good for Personal Study at Home
	Appropriate for Public, Private, or Home School
	Great for Private or Home School Use; <i>Not Recommended for Public Schools</i>

Textbooks:



Explore Evolution: The Arguments For and Against Neo-Darwinism by Stephen C. Meyer, Scott Minnich, Jonathan Moneymaker, Paul Nelson, and Ralph Seelke (Hill House, 2007): Designed for public school use, but also used in many private schools, *Explore Evolution* is a supplementary biology textbook that teaches critical thinking by giving students a thorough understanding of both the strengths and weaknesses of Darwinian evolution. Ideal for high school or early college. See www.exploreevolution.com



The Design of Life: Discovering Signs of Intelligence in Biological Systems by William A. Dembski and Jonathan Wells (FTE, 2007): This high-level textbook by two leading ID theorists presents the scientific case for ID in biology. Ideal for advanced high school or college use. See: www.thedesignoflife.net

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Discovering Intelligent Design by Hallie Kemper, Gary Kemper, and Casey Luskin (Discovery Institute Press, 2012): This high school curriculum presents the scientific case for ID design in cosmology and biology in an easy-to-understand format. Leading ID-videos are integrated into the textbook. Scheduled for release in late-2012. Contact Casey Luskin for more information: cluskin@discovery.org



Icons of Evolution Study Guide: This study guide serves as an excellent companion to the *Icons of Evolution* documentary and provides students with activities to critically analyze common lines of evidence used to support evolution. *See:* www.discovery.org/a/2130

Videos:



Unlocking the Mystery of Life (Illustra Media): This powerful documentary uses stunning graphics to explain the evidence for design from DNA, molecular machines, and cell biology. *See:* www.unlockingthemysteryoflife.com



The Privileged Planet Documentary (Illustra Media): This documentary also features an extremely high-quality graphical presentation of the evidence for design of the cosmos from fine-tuning arguments. *See:* www.theprivilegedplanet.com



Darwin's Dilemma: The Mystery of the Cambrian Fossil Record (Illustra Media): This documentary uses powerful graphics to present fossil evidence which supports ID and challenges Darwinism. *See:* www.darwinsdilemma.org



Metamorphosis (Illustra Media): This DVD explores the case for design from insect metamorphosis, and explains how this “all or nothing, do or die” process poses a great challenge to Darwinian evolution. It also explores aesthetic arguments for intelligent design.



Icons of Evolution Documentary (Coldwater Media): This documentary features biologist Jonathan Wells and discusses problems with many common lines of evidence used to support Darwinian evolution. *See:* www.discovery.org/a/2125



Where Does the Evidence Lead? (Illustra Media): This video features science clips from the documentary *Unlocking the Mystery of Life*. It is an excellent tool for teachers. *See:* wheredoestheevidencelead.com

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Expelled: No Intelligence Allowed (Premise Media): This documentary, featuring comedian and academic Ben Stein, tells the stories of many scientists who faced persecution because they support ID. *See:* www.ncseexposed.com

General Introductory Books:



Darwin on Trial by Phillip Johnson (InterVarsity Press, 1991): This seminal book takes on the task of challenging the Darwinistic paradigm through demonstrating how Darwinism is based upon naturalistic philosophy rather than evidence.



Darwin's Black Box: The Biochemical Challenge to Evolution by Michael Behe (Free Press, 1996): This book explains how "irreducible complexity" in biochemical systems poses a great obstacle to Darwinian evolution, while pointing to design.



Defeating Darwinism by Opening Minds by Phillip Johnson (InterVarsity Press, 1997): This short book provides good advice for students on how to think critically about the scientific evidence and respond to common tactics used by evolutionists.



Intelligent Design Uncensored by William Dembski and Jonathan Witt (InterVarsity Press, 2010): This short book provides an easy-to-read introduction to ID, answering many common objections in plain language.



Icons of Evolution: Why Much of What We Teach about Evolution is Wrong by Jonathan Wells (Regnery, 2000): This book shows that many common lines of scientific evidence (the "icons") used to support evolution in mainstream biology textbooks are false.



Intelligent Design 101: Leading Experts Explain the Key Issues edited by H. Wayne House (Kregel, 2008): This collection of essays provides a broad introduction to ID, along with addressing scientific, legal, cultural, philosophical, and theological dimensions of the debate.



The Politically Incorrect Guide to Darwinism and Intelligent Design by Jonathan Wells (Regnery, 2006): This easy-to-read book, filled with amusing anecdotes, introduces readers to the scientific and cultural dimensions of the debate.

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Endnotes

1. Stephen C. Meyer, "Not by Chance: From Bacterial Propulsion Systems to Human DNA, Evidence of Intelligent Design Is Everywhere," *Natl. Post A22* (Dec. 1, 2005).
2. William A. Dembski, *The Design Inference: Eliminating Chance through Small Probabilities* (Cambridge: Cambridge University Press 1998), 62.
3. Ibid.
4. William A. Dembski, "Intelligent Design as a Theory of Information," *Intelligent Design Creationism and Its Critics: Philosophical, Theological, and Scientific Perspectives*, edited by Robert T. Pennock (Cambridge: MIT Press, 2001), 553.
5. Michael J. Behe, "Molecular Machines: Experimental Support for the Design Inference," *Intelligent Design Creationism, in Intelligent Design Creationism and Its Critics: Philosophical, Theological, and Scientific Perspectives*, edited by Robert T. Pennock (Cambridge: MIT Press 2001), 247. See also Michael J. Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution* (New York: Free Press 1996), 39.
6. Scott A. Minnich & Stephen C. Meyer, "Genetic Analysis of Coordinate Flagellar and Type III Regulatory Circuits in Pathogenic Bacteria," *Proceedings of the Second International Conference on Design & Nature*, Rhodes Greece, edited by M.W. Collins and C.A. Brebbia (Ashurst, Southampton, United Kingdom: WIT Press, 2004), 8.
7. Stephen C. Meyer, "The Cambrian Information Explosion," *Debating Design: From Darwin to DNA*, edited by William A. Dembski and Michael W. Ruse (Cambridge: Cambridge University Press, 2004), 388.
8. Stephen C. Meyer, "The Origin of Biological Information and the Higher Taxonomic Categories," *Proceedings of the Biological Society of Washington*, 117(2):213-239 (2004).
9. Ibid.
10. These kinds of tests were reported by pro-ID molecular biologist Douglas D. Axe, "Extreme Functional Sensitivity to Conservative Amino Acid Changes on Enzyme Exteriors," *Journal of Molecular Biology*, (2000), 301:585-595; Douglas D. Axe, "Estimating the Prevalence of Protein Sequences Adopting Functional Enzyme Folds," *Journal of Molecular Biology*, (2004), 1-21.
11. Fred Hoyle, "The Universe: Past and Present Reflections," *Engineering and Science* (November, 1981) 8-12.
12. Bernd-Olaf Küppers, *Information and the Origin of Life* (Cambridge: MIT Press, 1990), pp. 170-172.
13. Richard Dawkins, *The Blind Watchmaker* (New York: W.W. Norton, 1996), 1.
14. Stephen C. Meyer, "Word Games: DNA, Design, and Intelligence," *Signs of Intelligence: Understanding Intelligent Design*, edited by William A. Dembski and James M. Kushiner (Grand Rapids: Brazos, 2001), 116.
15. National Association of Biology Teachers Statement on Teaching Evolution.
16. Stephen C. Meyer, "A Scientific History and Philosophical Defense of the Theory of Intelligent Design," *Staat - Gesellschaft*, Vol. 7 (2008), at www.discovery.org/a/7471
17. Lynn Margulis, quoted in Darryl Madden, "UMass Scientist to Lead Debate on Evolutionary Theory," *Brattleboro (Vt.) Reformer* (Feb 3, 2006).
18. Pierre-Paul Grassé, *Evolution of Living Organisms: Evidence for a New Theory of Transformation* (New York: Academic Press: New York NY, 1977).
19. Ann K Gauger, Stephanie Ebnet, Pamela F Fahey, Ralph Seelke, "Reductive Evolution Can Prevent Populations from Taking Simple Adaptive Paths to High Fitness," *BIO-Complexity*, Vol. 2010 (2010).
20. Michael J. Behe & David W. Snoke, "Simulating Evolution by Gene Duplication of Protein Features That Require Multiple Amino Acid Residues," *Protein Science*, Vol 13:2651-2664 (2004).
21. Franklin M. Harold, *The Way of the Cell: Molecules, Organisms and the Order of Life* (New York: Oxford University Press, 2001), 205.
22. Michael J. Behe, "Experimental Evolution, Loss-of-Function Mutations and 'The First Rule of Adaptive Evolution,'" *Quarterly Review of Biology*, Vol. 85(4) (December, 2010).

A Parent's Guide to INTELLIGENT DESIGN

23. Douglas D. Axe, "Estimating the Prevalence of Protein Sequences Adopting Functional Enzyme Folds," *Journal of Molecular Biology*, Vol. 341: 1295-1315 (2004); Douglas D. Axe, "Extreme Functional Sensitivity to Conservative Amino Acid Changes on Enzyme Exteriors," *Journal of Molecular Biology*, Vol. 301: 585-595 (2000). See also: Douglas D. Axe, "The Limits of Complex Adaptation: An Analysis Based on a Simple Model of Structured Bacterial Populations," *BIO-Complexity*, Vol. 2010 (2010).
24. Ernst Mayr, *What Evolution Is* (Basic Books, 2001), 189.
25. C.P. Hickman, L.S. Roberts, and F.M. Hickman, *Integrated Principles of Zoology* (1988, 8th ed), 866.
26. Graham Lawton, "Why Darwin was wrong about the tree of life," *New Scientist* (January 21, 2009).
27. Carl Woese "The Universal Ancestor," *Proceedings of the National Academy of Sciences USA*, Vol. 95:6854-9859 (June, 1998).
28. Gregg Easterbrook, "Where did life come from?," *Wired Magazine* (February, 2007), 108.
29. Massimo Pigliucci, "Where Do We Come From?," *Darwin Design and Public Education*, edited by Stephen C. Meyer and John Angus Campbell (East Lansing: Michigan State University Press, 2003), 196.
30. Jonathan Wells, "Haeckel's Embryos & Evolution: Setting the Record Straight," *American Biology Teacher*, Vol. 61(5):345-349 (May, 1999).
31. Jonathan Wells, "Second Thoughts about Peppered Moths," *The Scientist*, Vol. 13(11):13 (1999).
32. Robert Carroll, *Patterns and Processes of Vertebrate Evolution* (Cambridge: Cambridge University Press, 1997), 8-10.
33. Charles Darwin, *The Origin of Species*, edited by J. W. Burrow (London: Penguin Group, 1985), (1859), 66.
34. "Discovery Institute's Science Education Policy," at <http://www.discovery.org/a/3164>
35. "Discovery Institute's Science Education Policy," at <http://www.discovery.org/a/3164>
36. See <http://www.dissentfromdarwin.org/>
37. See notes 17-32 in this Parent's Guide and accompanying text in Part 3.
38. See Jonathan Osborne, "Arguing to Learn in Science: The Role of Collaborative, Critical Discourse," *Science*, Vol. 328 (April 23, 2010) 463-466.
39. Many authorities recognize this problem. See *America's Lab Report: Investigations in High School Science*, p. 1 (National Research Council, 2006); National Science Board, "The Science and Engineering Workforce: Realizing America's Potential," (August 14, 2003), 7, at [nsf.gov/nsb/documents/2003/nsb0369/nsb0369.pdf](http://www.nsf.gov/nsb/documents/2003/nsb0369/nsb0369.pdf); and National Science Foundation, "An Emerging and Critical Problem of the Science and Engineering Workforce: A Companion to Science and Engineering Indicators 2004" (2004) at [nsf.gov/statistics/nsb0407/nsb0407.pdf](http://www.nsf.gov/statistics/nsb0407/nsb0407.pdf)
40. Peter J. Bowler, *Darwinism* (1993), 6.
41. John Polkinghorne, *Quarks, Chaos, and Christianity* (New York: Crossroad Classic, 1995), 113.
42. George Coyne, "The Dance of the Fertile Universe," 7.
43. Ken Miller, *Finding Darwin's God* (New York: Harper Perennial, 1999), 272.
44. Ken Miler, quoted in John G. West, *Darwin Day in America* (Delaware: ISI Books, 2007), 226.
45. Karl W. Giberson, *Saving Darwin*, (New York: HarperOne, 2008), 12.
46. Francis Collins, *The Language of God* (New York: Free Press, 2006), 205
47. Larry A. Witham, *Where Darwin Meets the Bible* (New York: Oxford University Press, 2002), pp. 271-273
48. Cornell Evolution Project Survey
49. Dr. Michael Keas helped contribute these questions.

by intellect : RATION...
in·tel·li·gent de·sign \in-'te-lə -jənt di-'zɪn\ n 1: THE THEORY
holds that certain features of the universe and of living things are best explained by
an intelligent cause, not an undirected process such as natural selection.
... 1 a : having or indicating a high or satisfactory

**For more information, or if you have questions about
issues relating to intelligent design or evolution,
please contact:**

Educational Outreach Coordinator

Center for Science and Culture
Discovery Institute
208 Columbia Street
Seattle, WA 98104
(206) 292-0401 x108
cscinfo@discovery.org