

Darwin, Ethics and the Individual

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INTRODUCTION

As members of the human race we are all naturally curious and driven to ask questions about the world around us. Everyone has pondered the “Big Questions” at some point: Why am I here? What is the meaning of life? How did it all begin? Do I have a purpose in life? Although there are no answers that can truly satisfy everybody, and this topic is possibly a matter of religious faith or philosophical speculation, the theory of natural selection is at the heart of the scientific position and is worthy of careful consideration.

NATURAL SELECTION AND ITS REPERCUSSIONS

The idea that species are malleable and that progression exists between them is an old one; however the theory of Natural Selection expounded by Darwin in *Origin of the Species* (1859) and *Descent of Man and Selection in Relation to Sex* (1871) offered a mechanism by which this could come about and put the idea firmly into the realms of accepted science.

As many more individuals are born of each species than can possibly survive; and as, consequently, there is a frequently recurring struggle for existence, it follows that any being, if it vary however slightly in any manner profitable to itself, under the complex and sometimes varying conditions of life, will have a better chance of surviving, and thus be *naturally selected* (Darwin *Origin*, 13).

This process as a vehicle for evolution has profound and wide ranging ramifications both for individuals, and society as a whole. What exactly does “survival of the fittest” mean for a citizen of the 21st century, and what are the moral or ethical implications? How are we competing and are some members of our communities simply worthless and a drain on our combined resources? Should we care about disadvantaged minorities, the physically or mentally challenged, convicted felons and the elderly, or should we accept that some of us are just “more equal than others” (Orwell 133)? Are the weak in society holding the rest of us back and what exactly constitutes a weak member of society? Are some individuals better than others? If some individuals are “better,” are their opinions more valid than our own? To what extent should we listen to others rather than rely upon our own conclusions or observations?

Although natural selection is the engine of evolution and impinges upon every form of life, surely as sentient beings we are capable of self-determination rather than being governed entirely by mechanisms outside of our control. As a society, we generally care for the less able or, to be blunt, those who would not survive unaided. Is this the correct ethical stance or are we vainly fighting our true, competitive, animal nature? Do nurses care for their patients because they are altruistic or because they are paid? Is society generally altruistic? Are we “nice” so that others will be “nice” to us, and, if so, is this truly selfless?

As students progress through the unit they will be challenged morally as well as scientifically and will be required to adopt and defend an ethical stance on a variety of issues, both real and hypothetical.

Philosophical thinkers, exemplified by the early Greeks, had been challenging purely religious models for millennia and encouraged secular thinking based upon reproducible, empirical evidence. They sought out the “true nature” of reality, the world and existence, independent of the contemporary, accepted ideas and attempted to move away from temporary fads typified by the “opinion-lovers” or *philodoxoi*, as they were known. Facts were deemed to be self-evident and independent of personal opinion. They pioneered the distinction between truth and genuine enquiry which set the scene for the development of modern rationalism. Fifth century Athens and its “cult of reason” is largely reminiscent of, and the progenitor to, modern-day science. In this system, rationality always supersedes speculation based upon subjective personal views.

Socrates was the first to objectively analyze the concept of virtue itself. He believed that the unexamined life was not worth living. His revered student Plato pioneered the quest for knowledge while supporting the relativistic viewpoint that all truth is relative to the individual and so no truth or value system is absolute. Objectivity itself was unavoidably subjective. Aristotle, who was Plato’s pupil, produced the first recorded attempt to classify nature and the material world. These men and their contemporaries created a new way of judging reality and suggested methods for self-discovery and the investigation of physical phenomenon that influenced the development of society from that point onwards. Their far-reaching ideas continue to influence modern society, philosophical or political discussions, and the lives of individuals to this day.

The scientific stance and the religious perspective often disagree on fundamental issues of creation and origins, but in the main they dismiss each other as irrelevant. The religious view is that a system such as science, which is based upon observations of the world, is not the way to achieve spiritual enlightenment or contentment. The scientific view is that religious doctrine is largely flawed, irrational, and subjective, and akin to little more than belief in magic.

The cosmological models proposed by Ptolemy, Copernicus, and later Galileo were in direct opposition to church teachings and as such were perceived as threatening. When Galileo was forced to publicly recant his ideas under threat of torture, this seemed to further emphasize the contradictory church position that was promoting the idea of a mainly altruistic, caretaker deity. The scientific revelations and mathematical proofs inevitably outlasted the non-secular stance and further eroded the credibility of the accepted church.

When organized religion was forced to change its teachings in order to keep up with the unassailable scientific data and undeniable evidence, this further undermined the idea that holy revelations were immutable and constant. The seeds of doubt had been sown and encouraged others to question accepted “truths” in the light of personal experience and testable, repeatable experimentation.

The theories of Darwin, centuries later, were not presented in a vacuum but instead appeared in an era of increased machination, industrialism, and reason. It was an idea that was both shocking in its ramifications and one that the intelligentsia had been primed to consider. It was an idea that had found its time.



Figure 1

Nevertheless, Victorian society in general was offended by the notion that mankind was descended from more primitive species and outraged by the implied negation of God and Divine

Creation. Darwin was lampooned in a variety of popular newspapers (Fig. 1) and this could explain in part why he waited for decades before publishing. Eventually his hand was forced when Wallace came to the same conclusions independently and prepared to publish his similar findings. Darwin knew he would meet resistance and outrage, but his explanations and deductions were so compelling that gradually the idea gained support. Like Galileo before him, the evidence was convincing and thought provoking, and the basic tenets defied contradiction. Rationalism began to threaten religion at its very core, but doubts still remain to this day. Religious faith is relatively unassailable and scientific ideas are always open to refinement.

The more we can move away from miracles, major improbabilities, fantastic coincidences, large chance events, and the more thoroughly we can break large chance events up into a cumulative series of small chance events, the more satisfying to rational minds our explanations will be (Dawkins 140).

As scientific views of the world gained momentum and questioned everything and anything, not only in terms of what it was but how it worked, the non-secular became less and less influential in intellectual circles. The idea of a cosmos governed by mathematical laws and complex, but measurable and describable mechanisms inexorably gained support as the 20th century proceeded, but left a gap where ethical behavior was concerned. If religious teachings were ineffectual in describing the nature of reality, how significant were the associated social and moral teachings? The rationalists believed that religion did not have a monopoly on morals and that the very idea of ethical behavior was open to question and redefinition.

Nietzsche appears to have been deeply influenced by Darwinism. He considered the ramifications of evolutionary theory to be deeply disturbing. In the absence of a universe designed by God for Man, the alternative seemed bleak. Mankind was alone in a universe without meaning and this left the human race lacking purpose in a cold, endless void. If mankind had not been created as part of a Divine Plan then what was the meaning of life? Did biblical definitions of moral codes still stand or were these also outmoded and irrelevant?

The thought that man was not a divine creation led to Nietzsche's disillusionment with religion in general and eventually his blatant antipathy towards the Christian church in particular:

The priest knows only one great danger, and that is science – the healthy concept of cause and effect. (451)

By 1882 Nietzsche concluded that “God is dead” and his quest for a non-religious answer to the meaning of life and the reason for human existence began in earnest.

He claimed that the post religious world had no absolute values which left exceptional individuals to develop their own. He believed that the masses were ignorant and followed a herd instinct while a few great men could rise above the general populace. These exceptional few could and should develop their own moral code based upon their personal values, as opposed to blindly following the creed of others. These ponderings on the “Superman” or “*Übermenschen*,” in some part led Hitler to his views on racial superiority.

Social Darwinism

Herbert Spencer introduced the idea of Social Darwinism in the late 19th century and although this is now perceived as an anachronism by many, it persisted until the end of World War II as a subject for serious contemplation. Spencer was a follower of scientism and believed that science was the only source of truth and carried more weight than other forms of evidence. He believed that social inequalities were based on a form of meritocracy and that this justified certain racist or imperialist views. In other words, a selection process was applied to ethical matters and these

then underpinned political ideologies. By the 1930s the Nazi movement in Germany had further corrupted the concept of “survival of the fittest” and used it to justify their perceived superiority.

Without God at the helm, so to speak, societies were free to create their own moral guidelines:

Aryan races – often absurdly small numerically – subject foreign peoples, and then, stimulated by the special living conditions of the new territory (fertility, climatic conditions, etc.) and assisted by the multitude of lower-type beings standing at their disposal as helpers, develop the intellectual and organizational capacities dormant within them. (Hitler)

European powers convinced themselves that conquered territories were inferior and somehow benefited from their overseers’ superior ability to rule. Blacks in the southern United States were segregated and discriminated against at almost every level. The Nazis used Social Darwinism as an argument for eugenics or the elimination of “weaker,” “impure,” or “less fit” sections of the population. This was presented as a moral duty to preserve the purity of the Aryan racial profile.

Bias and discrimination were by no means new to the first half of the 20th century, but Darwinism appeared to lend scientific credence to this frightening argument. “Those who want to live, let them fight, and those who do not want to fight in this world of eternal struggle do not deserve to live” (Hitler).

The Nazis took the basic idea of natural selection in relation to evolution and extended it to its most extreme and disturbing conclusion. They believed that competition for resources and power would lead to the elimination of the “weak.” Natural disasters, war, famine and disease would favor the strongest and most capable individuals, and so these were perceived as beneficial events which ultimately improved the human race. The concept of eugenics stretches this point to breaking, suggesting that an elite few can assist the natural selection process by culling the weakest members of the gene pool and selectively breeding the most desirable elements. In its most basic form eugenics can be compared to the treatment of domesticated plants and animals and represents a terrifying mutation of artificial selection.

The Holocaust was not only aimed at Jews, although they unarguably suffered most under this monstrous program – blacks, homosexuals, children with incurable diseases or debilitating genetic disorders, gypsies, and the physically or mentally disabled were also murdered in their hundreds of thousands. Those who propounded Social Darwinism failed to consider, or chose to ignore, the fact that compassion and empathy are an intrinsic part of what makes us human and are, at least in part, responsible for our amazing and unparalleled success as a species. If they had studied their biology with a less cynical eye, they would have understood that the key to survival is diversity. Furthermore, the elimination of diversity almost guarantees extinction for any species as a whole. In essence, Darwin’s ideas do not support eugenics. At best it is a perverted form of artificial selection with *Homo sapiens* as the subject. Human beings have free will and will not comply with breeding programs of any description. “Ethnic cleansing” is not natural selection.

A major philosophical objection to the position of Social Darwinism is the Naturalistic Fallacy. The argument states that one cannot argue from an “Is” to an “Ought.” In other words, it is a fallacy to take an observation from nature, such as the role of natural selection, and use it to derive a principle pertaining to ethical values. Nature is neither good nor evil but simply is. Human beings as a species have been remarkably successful at least in part due to their ability to overcome natural processes and minimize or negate their influence. For example, cold weather can be countered by building a fire or wearing clothing. Rather than choosing nature as a teacher to be emulated, we should embrace our negation of natural discomforts and inconveniences by technological or social improvements. We live in highly advanced societies with modern

comforts and it would be ludicrous to argue that improvements, such as spectacles, are against nature and counteract the beneficial effects of natural selection.

Evolution is a directionless process which benefits micro-organisms more than intelligent beings. To a significant degree we have risen above the influence of natural selection more than any other species, and now survival depends more upon our societies and our effectiveness within them. It could be argued that the development of modern social models and fair and balanced cultures have a greater influence on the individual than natural phenomena. In short, our future as a species may owe more to cultural selection than natural selection.

On an individual level, the theory raises many ethical dilemmas and seems to imply that selfish behavior is not only justified but that it is necessary, beneficial, and somehow natural.

Studies into altruism between blood-relatives or peer groups modified this thinking but still left many questions unanswered. More recent developments such as the “selfish gene” suggested by Richard Dawkins added a further twist. When individuals or groups act in an apparently altruistic fashion are they actually increasing the chances of passing on their own genes or at least enhancing the chances of genes similar to their own?

This appears to be the case throughout nature. From ant colonies where millions of individuals give up the right to procreate in order that their sister, the Queen, can breed, to lions that kill the cubs of their vanquished male competitors to ensure that females will come back into estrus. The lions would then mate with the females replacing the dead offspring with their own. The combined resources of the pride would be utilized to ensure the success of these progeny. Would students be more likely to assist a family member, a close friend, an attractive member of the opposite sex, or are they impartial? They will be asked to consider if they have ever committed a truly selfless act and to analyze their responses.

The nature of science itself will also be investigated. Is science merely a form of philosophy, or mode of thinking, that is separate from morals? Does “pure science” stand alone as a defensible view of the world with no ethical responsibilities? Controversial issues such as stem-cell research, cloning, and atomic weapons could provide some fruitful starting points. Who decides what is right? Does the search for knowledge always justify the means?

RELEVANCE AND UNIT OBJECTIVES

The majority of students in my care come from minority groups and are socially disadvantaged; individually they are Gifted and Talented. Through their studies of natural selection and its ramifications, I would like them to reflect upon their own position within society and understand the arena in which they are competing for success. They should also glean a deeper understanding of the nature of that competition. Although they face social disadvantages, they are among a privileged group of individuals who have remarkable intellectual talents. They should utilize this advantage and not squander it. I would like them to understand the responsibilities they carry, for both their families and their particular ethnic or social group within society as a whole.

Academically, I envisage the students becoming more able to weigh evidence carefully when coming to conclusions or formulating hypotheses. They should realize that science does not operate in a vacuum but has significant consequences for society and the human species. Morals and ethics lie outside the scope of science but should be seriously taken into account. Scientism is an outdated mode of thinking, and science has, by its very nature, strict limitations and is but one of many possible viewpoints.

I would hope that students completing the unit would understand that diversity is not only beneficial but also essential to the survival of any species. They should appreciate the value of

“non-productive” members of society and be sharply aware of the ethical considerations involved in judging the worth of others.

I fervently hope that these students will develop a greater sense of self-awareness, a strong idea of the right way to treat others, an understanding of their own position within the wider community, and the ability to place their ideas in an historical context. The “Golden Rule” which suggests that we should treat others as we wish to be treated will be investigated closely. Obviously we cannot contribute to every needy or worthwhile cause. As individuals we have limited resources and most of these are allotted to aid our own survival and success. If we are to treat others in an altruistic fashion, then we cannot do so unselectively. Perhaps we aid those who share our genes and our beliefs or those who may benefit us in return someday. Is this truly altruism, and if it is not, does true altruism exist?

The most fundamental problem with altruism is the fact that cheaters win:

Even in a group of altruists, there will almost certainly be a dissenting minority who refuse to make any sacrifice. If there is just one selfish rebel, prepared to exploit the altruism of the rest, then he, by definition, is more likely than they are to survive and have children. (Dawkins 7)

The answers to why we should behave in a moralistic and unselfish fashion in society are many and varied. Perhaps we fear punishment or retribution. Maybe our families value a particular ethical stance. Some may be concerned about how they might be judged by their peers or perhaps their religious beliefs determine the ‘right way’ to interact with others. Some believe that treating others fairly is required in a civilized society and that without that implicit social contract society, would break down. Perhaps moral behavior is its own reward and satisfies the participants on a spiritual level. Maybe some individuals are simply true altruists who selflessly give to others (Nelson 4).

The Iterated Prisoner’s Dilemma suggests that purely selfish individuals will not succeed in the long run. Furthermore, selfish parents will be less able to raise and care for their progeny and so altruism, at least within the family, is likely to be a beneficial trait that is selected for and that will become more common within populations.

I believe that truly selfless behavior is rare or non-existent in both human society and nature in general. This does not imply that caring for the less fortunate members of an extended community is wrong. On the contrary, for the reasons listed above and many others, we benefit materialistically and emotionally from helping others in a society that requires a level of active contribution but also provides support for the individual. The key appears to include learning lessons from the past where morality or society itself broke down or became a monstrous chimera of its former self. What is right or wrong is a subjective opinion, and history can provide a measuring stick to which our personal positions can be compared.

When extreme views are allowed to thrive under polarized political or ideological groups, then history seems to show that although many citizens suffer or perish, eventually the status quo is reinstated. This is not to say that such a balancing counter-reaction is inevitable. Extremist political, military, religious or ideological regimes appear constantly the world over and will continue to appear. Without careful vigilance and effective counter measures by more accepting and inclusive governments where the views of citizens are actively sought, the Nazi model or something even more horrendous could develop, blossom and wreak devastating havoc. The stark and frightening possibility of a world power dedicated to the selfish interests of a privileged few to the detriment or annihilation of all other citizens, in a society where morals are monstrously redefined, remains a terrifying possibility.

Teaching Strategies

Delivery should encourage hands-on experience, be student-led and teacher-guided. Self discovery is essential and is the only sure way of effecting true learning and retention.

Before the topic is clearly elucidated to students, they should be issued a copy of the *Diary of Anne Frank*. This is required reading and is pertinent to the unit at all levels. It provides a first-hand account of the sheer terror evoked by the Nazis through the eyes of a child of middle school age and serves as a link between personal experience, geopolitical movements and morality.



Figure 3: Anne Frank—age 13

The unit will begin with a description of natural selection and the supporting evidence. The effects of selection should be emphasized. In order to see the process in action, students will perform a series of investigations involving selection. Insects mimicking plants are harder to find in leaf litter and colored discs which closely match a background color will be selected less often in timed experiments. Data will be graphed and analyzed. Students should carry out a version of the “typing monkeys” analogy to demonstrate the effectiveness of selection and to illustrate how order rapidly emerges from random possibilities.

A theory lesson on the peppered moth will be underpinned with students designing and then hiding butterflies around the classroom. Competing groups will then attempt to find their camouflaged prey. The successful strategies of the survivors will be discussed and related to the real world.

A great tool to use at this point would be Richard Dawkins ‘biomorph’ program (61), which shows the order gained from cumulative selection of small variations. A random collection of lines with mathematical properties representing genes can be manipulated and desired offspring selected to breed again. Remarkable variety can be achieved in a very short time. Some examples are shown below:



Figure 2: Biomorph variations

Students will participate in group discussions and debate a variety of issues related to the disadvantaged in society and how they are treated by the more able or privileged. Ideally these discussions will be student-generated and led.

A “balloon debate” would be a key assessment, where individuals are assigned characters and argue for their right to stay in a failing hot air balloon, the least convincing being callously used as ballast. This could be linked to the television series *Survivor*.

Empathy will be discussed as the basis of morality. The idea of “Do unto others as they would do unto you” will be compared to rules within society as a whole or in small group settings, including the family. A brief study of chimpanzee society based on the work of Dr. Jane Goodall will be a spring-board for this discussion. Chimpanzees live a relatively sedentary life

with few predators, and it has been argued that the development of a large brain is linked to social bonding and “group politics.”

There is an obvious correlation between these observations and the development of the human brain. These findings also have implications for the development of human social structures. The ability to empathize with another individual will be selected for. Since these individuals will be more influential in the development of moral codes, they will be held at an elevated level within their particular social grouping and have a correspondingly greater impact.

Students will be introduced to Game Theory and investigate the nature of altruism versus mutual cooperation by playing The Iterated Prisoner’s Dilemma (Axelrod and Hamilton) and carefully analyzing the relevant merits and demerits of each strategy. The most successful strategy should be a “generous” version of “tit for tat,” which will be the basis of a discussion on the role of cooperation in real-life situations.

Students will then watch *The Diary of Anne Frank* and discuss their impressions. They will be shown graphic images of the Holocaust and asked to link this terrifying outcome with the ideas they have studied in the unit. The ultimate fate of Anne Frank and her family will starkly emphasize the horrific consequences for the individual when such extremist political views are allowed to gain momentum.

One of the overall aims of the unit is to encourage and nurture moral objectivity. Students should be able to weigh the relative pros and cons of any moral argument and take a stand that is balanced, objective and fair. They should not base their position purely on faith, religious or scientific dogma, family or cultural tradition, bias, prejudice, or instinct. As much as possible they should judge based upon evidence, personal experience, and common sense observations:

What believers in moral objectivity really care about is whatever is supported by the best evidence. They are prepared to accept the possibility that even what *they* think is correct *might* not be. (Nelson 5)

Suggested Extension Activities

1. Students will be required to research and report upon an ethical issue, where they represent both sides fairly and justify their personal stance. They will be encouraged to brain storm and come up with an ethical dilemma that is pertinent on a personal level. This could be linked to a news event such as hurricane Katrina or another natural disaster. They will investigate, and report upon, how this is related to Darwinism versus the moral obligation to aid the weak or needy.
2. They should work closely with a disadvantaged group within the school or local community and report their findings. Possible placements will include the Life Skills classes at school, a nursing home for the elderly, or a hospital ward for children.
3. Guest speakers will play a pivotal role. I feel it is vital that students have the opportunity to meet disadvantaged members of the local community who can provide inspiration. I would like to invite a sightless educator and a wheelchair bound mountaineer to talk with my students. When the mountaineer’s chair could go no further, he literally dragged himself the rest of the way and reached the peak of the tallest mountain in Texas after three days of heroic effort.
4. Fieldtrips to educational establishments, such as the Holocaust Museum, should be a part of the students’ overall experience. Students will also be introduced to a Holocaust Chest containing photographs, personal items and first hand accounts of Holocaust survivors.

LESSON PLANS

Lesson One

Objectives

Students will be introduced to the concept of natural selection and see it operating in the classroom. They should have prior knowledge of genetics and inheritance.

Materials

Stop watch, colored discs of paper (black, yellow and red), a large sheet of black construction paper, plastic insects, large tray or box of leaf litter, drawing paper, colored pens/pencils, tape and scissors

Activities

Distribution of *The Diary of Anne Frank* to each student.

Four student volunteers will be asked to briefly step outside. A large sheet of black paper is placed on a table and colored discs scattered over its surface. Red, black and yellow work well. The discs represent dinosaur eggs and the students outside are egg-stealing mammals. Another student volunteer is handed the stopwatch and is the proud T-Rex parent. Out of sight of the table, the egg-stealers are informed that they have five seconds to pick up as many eggs as they can using the first finger and thumb of one hand. If they take too long, the T-Rex will eat them. The egg-stealers then attack the “nest” one at a time, and the collected eggs are put to one side and counted.

When graphed, the black eggs against the black background are selected least often. Usually red eggs are next, with yellow eggs, representing the greatest contrast in color to the background, selected in the greatest numbers.

Alternatively a box of leaf-litter containing plastic insects can be used to create similar results. Brightly colored organisms will be collected in greater numbers than those that are muted or those which resemble leaves and sticks.

This should lead to a discussion of the results and what they might mean in nature and is a great opportunity to discuss the peppered moth. In the mid 1800s England, the peppered moth population was mainly pale with dark speckles and hid on the bark of silver birch trees. Occasionally a dark version would appear and be eaten by birds as it stood out against the lighter background. When the soot produced by the Industrial Revolution darkened the trees’ surface the situation was reversed. Speckled moths were spotted more easily by predators and the darker variety became the most common form.

To reinforce this idea and emphasize its implications students will then individually create a “moth” from paper and colored pens and hide it somewhere in the classroom using tape. The next class will have two minutes to find the hidden moths and destroy them. Survivors will be identified and discussed at the beginning of lesson two.

Evaluation/Homework

1. Why is it better to blend in if you are a moth?
2. When is it beneficial for you personally to blend in?
3. Are there times when you should stand out?
4. What are you competing for?
5. When do you undergo a selection process?
6. What is your survival strategy?

Lesson Two

Objectives

Students will begin to understand that all organisms, including themselves, are undergoing a selection process. The process of natural selection can lead to evolution or extinction.

Materials

Demonstration PC, LCD projector, Internet access, student computers

Activities

The lesson will begin by reviewing the homework answers and drawing a concept map on the board. It is important that this section is student-driven and relevant to their lives and genuine concerns. Significant time should be allocated to ensure that as many viewpoints as possible are considered.

The surviving “moths” will be revealed and their survival strategies discussed.

Students can be introduced to Conway’s Game of Life at this point. This is a simple computer applet that applies three simple rules to “cells” which then become extinct, remain stable, or grow and move. This could be demonstrated using a PC and an LCD projector. Students could suggest different variations and see how they develop. Most individuals will either die or become stable, but some will grow exponentially, and others will even become motile and go crawling off the screen. They are all undergoing a selection process implied by the rules and some are successful while others “fail.”

Utilizing the projector and Internet set-up, Richard Dawkins’ Biomorph program can now be demonstrated. This software presents a more sophisticated series of line drawn “organisms” which can be selected for breeding. Amazing variations can be achieved in a short period, demonstrating the remarkable power of small cumulative changes over time.

Once they are familiar with the concepts, small groups of students should be assigned to computers to investigate this software at their leisure. Prizes could be offered for the most long-lived Conway creature or the biomorph with the greatest number of “legs.”

Evaluation/Homework

1. How did the computer models you used compare to real-life organisms?
2. How were they different?
3. What effect did small changes have over a long time?

Lesson Three

Objectives

Students should understand that society and individuals make selections that affect others and have moral implications. Interactions with others are often animalistic in nature and may be derived from more primitive primate behavior.

Materials

Postcards, VCR/DVD player, Video of Dr. Goodall working with chimpanzees

Activities

Students will be asked to think about the worth or unworthiness of individuals in society. They should consider whether or not society should care for its “non-productive” members. Examples to consider could include convicted felons, the physically or mentally ill, the elderly, and the unemployed. This activity should segue neatly into the Balloon Debate.

Each table is asked to nominate a spokesperson to represent their group. Groups are then given a postcard with details about a character they have been assigned. All of the players are in the basket of a hypothetical, hot-air balloon which is rapidly falling from the sky. The class as a whole, need to throw some ballast overboard, so every group has to argue for its right to remain aloft. Tables will plead their case in turn, and then a vote is taken to decide which group is thrown overboard to their deaths. The process will be repeated until only one group remains as the ultimate winner.

Characters should not be anyone in the classroom or the school environment in general to avoid hurt feelings, but could include: Stephen Hawkings; Oppenheimer; the President; a famous musician or TV personality; a baby with AIDS; a supermodel with a degree in philosophy; a well-known sports personality; the school principal; a cancer researcher who has committed murder; and a gifted and talented adolescent.

After callously throwing individuals from a balloon in a somewhat glib and impersonal fashion, the students will be shown a video of Jane Goodall’s work with the chimpanzees in the Gombe Nature reserve. The chimpanzee behavior is remarkably complex and disturbingly human.

Alliances are made and broken, groups, and sub-groups form and reform as the apes reveal their primitive society and early social politics. The behavior is sometimes brutal and includes hunting prey as well as “murder” and infanticide within the group. Skirmishes between competing groups are reminiscent of primitive warfare. The contrast to the previous activity should provoke some intense debate and speculation.

Homework/Evaluation

1. How does chimpanzee “society” resemble that of humans?
2. How do their social groups differ from ours?
3. What was the most surprising thing you learned from our closest relatives?
4. Why do you think chimpanzees have such large brains considering they are relatively sedentary and have few predators?
5. How do you think the two activities we did today may be linked?

Lesson Four

Objective

Students will investigate strategies that may help them out in competitive situations using game theory.

Activities

Students will pair up and play The Iterated Prisoner’s Dilemma which investigates conflict versus cooperation to determine which is the better strategy. The students will play a simple version of “rock, paper, scissors” with only two options. Option one is a pointing finger which represents cooperation (C), option two is to keep the fist closed representing defection (D).

The scoring is as follows:

Action		Score	
Player 1	Player 2	Player 1	Player 2
C	C	3	3
C	D	0	5
D	C	5	0
D	D	1	1

Students should decide beforehand which strategy will best suit them as an individual. The games should be played, scores tallied, and then the winning strategies discussed. Generally the best strategy is to play tit-for-tat where the player copies the last move of his/her opponent. Surprisingly, the most effective of all is “generous tit-for-tat,” where the player performs a random act of kindness one third of the time.

Homework/Evaluation

1. Which strategy worked best?
2. Why do you think this was successful?
3. Do you think this would benefit you in real-life situations?

Lesson Five

Objective

Students will be introduced to selection taken in its most monstrous transformation – Social Darwinism in the form of the Nazi Third Reich.

Materials

VCR/DVD player, “The Diary of Anne Frank” video/DVD, a PC with Internet access, LCD projector

Activities

Students will watch the *The Diary of Anne Frank* (1959). The movie will be compared to the book and discussed.

The students should then be shown some Holocaust images from the Internet sources listed, using an LCD projector.

Homework/Evaluation

1. Do you understand Anne Frank’s situation more clearly? Why did her family shield her, why did her friends hide her family, and why were the Nazis so determined to commit genocide?
2. Do you think that Darwinism was to blame for the Holocaust?
3. Can scientific theories stand-alone or are they subject to moral scrutiny?
4. Give some other examples of where science clashes with society’s moral position.

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Darwin’s groundbreaking work, which introduces the idea of a terrestrial origin for Homo sapiens and details Natural Selection as the mechanism whereby this, could come about.

Dawkins, Richard. *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe Without Design*. London: W.W. Norton and Company, 1996.

A scientific analysis of contemporary critics of the theory of evolution written from the viewpoint of a renowned biologist.

Hitler, Adolf. "Chapter XI: Nation and Race." *Mein Kampf. Volume I: A Reckoning*. Sonofecthelion. 25 June 2006. <http://www.hitler.org/writings/Mein_Kampf/mkv1ch11.html>.

Adolf Hitler's most infamous work. Amongst other things he stresses the need for racial purity and the superiority of the Aryan race. Most alarmingly he calls for the elimination of the weak or 'impure' in order to preserve "untainted bloodlines."

My Life with the Chimpanzees. Film. Jane Goodall. National Geographic Society, 1998.

An in-depth documentary detailing Dr. Goodall's work with wild chimpanzees in the Gombe Nature Reserve in Africa. Dr. Goodall's work brings to light the remarkable resemblance between *Homo sapiens* and our closest cousins and offers intriguing insights into how human societies may have developed.

Nelson, W. *Morality: What's In It for Me?* Nashville, TN: Westview Publishing, 1991.

A user-friendly explanation of many philosophical viewpoints on ethics and altruism. Self deprecating and humorous in places, it is an informative, comprehensive and accessible source.

Nietzsche, Friedrich. *Selections From: Human, All Too Human, Miscellaneous Maxims and Opinions, Thus Spake Zarathustra, Beyond Good and Evil, Twilight of the Idols and the Antichrist*. New York: Collector's Library. Barnes and Noble, CWR, 2005.

Selected excerpts from the collected writings of Friedrich Nietzsche. He investigates the fate of morality in a secular world.

Orwell, George. *Animal Farm*. New York: First Signet Classic Printing, 1996.

The classic novel that uses animal characters to shockingly illustrate the brutalities and inconsistencies of the Russian Revolution. Personal gain is contrasted with altruistic behavior.

Supplemental Resources

Books and Magazines

Dawkins, Richard. "The Selfish Gene." *Popular Science*, 1990.

Dawkins introduces the intriguing notion that genes and not individuals select and are selected during the process of evolution.

Frank, Anne. *Anne Frank: The Diary of a Young Girl*. The Anne Frank Center, 2003.

The harrowing story of a teenage Jewish girl and her family who are forced into hiding during World War II. Ultimately she dies of typhus in a Concentration Camp but her words still resonate.

Huxley, Aldous. *Brave New World*. New York: HarperCollins, 1998.

A monstrous vision of a future dystopia where humans are bred in vitro and governed by a totalitarian state.

Morris, Desmond. *Naked Ape: a Zoologist's Study of the Human Animal*. New York: Dell Publishing, 1999.

A scientific analysis of human beings as a newly discovered species of ape.

---. *The Human Zoo: A Zoologists Study of the Urban Animal*. Kodansha Globe, 1996.

A fascinating look at the conflict between humans' biology and their very recent urban environments.

Pinker, S. *How the Mind Works*. New York: W. W. Norton and Co., 1997

An in-depth, philosophical discussion of altruism between blood relatives as it applies to the human species and other organisms.

Short, Philip. *Pol Pot: Anatomy of a Nightmare*. John MacRae Books, 1987.

A candid reporting of Pol Pot's demonic purging of Cambodia. The horrors of Year Zero and the Killing Fields are spelled out in graphic detail.

Vonnegut, Kurt. *Galapagos*. 1986.

A satirical look at natural selection based around a group of apocalypse survivors who are trapped on the Galapagos Islands and who evolve into an entirely new human race.

Walch, J. Weston. *Understanding the Holocaust*. 1995.

A frank look at the atrocities of the Holocaust and the flawed thinking of those who perpetrated it.

Wells, H.G. *The Island of Dr. Moreau*. New York: Bantam Classics, 1967.

Written in 1896 when *Origin of the Species* was peaking in its controversy, Wells experiments with the idea that people are merely sophisticated animals. The main protagonist surgically alters animals to give them human characteristics but ultimately the savage behavior is exhibited by the humans in the tale.

Wilkins, Steve and Douglas Wilson. *Southern Slavery, As It Was*. Moscow, Idaho: Canon Press, 1996.

An historical and biblical perspective on slavery in the Southern states which ultimately argues that slavery was a good thing.

William, Golding. *Lord of the Flies*. 1959.

A group of English school boys are trapped on a tropical island after a plane crash. Their struggle to survive and establish some sort of civilized society rapidly degenerates into violence, murder and chaos.

Websites

“Cloning Fact Sheet.” *doegenomes.com*. <http://www.ornl.gov/sci/techresources/Human_Genome/elsi/cloning.shtml>. A thorough, wide-ranging treatment of cloning and related topics.

“Do No Harm.” *Do No Harm: The Coalition of Americans for Research Ethics*. June 2006. <<http://www.stemcellresearch.org/>>.

An expansive list of arguments and counter arguments pertaining to stem cell research.

“Wars and Conflict: The Troubles.” *BBC – History*. July 2006. <<http://www.bbc.co.uk/history/war/troubles/>>.

A detailed and balanced source of information on The Troubles in Northern Ireland, the longest conflict in European history. A society where rigid, traditional, political positions create little room for compromise between opposing groups. A shared morality is ignored when paramilitary factions employ terrorism for political reasons.

Hensel, Allen. “Conway’s Game of Life.” *Conway’s Game of Life*. 2005. <<http://www.ibiblio.org/lifepatterns/>>.

A remarkable mathematical ‘game’ or life simulator, where cells follow three simple rules and then die out, become stable or grow, propagate and move.

“The Holocaust.” Feb 2005. <<http://www.teacheroz.com/holocaust.htm>>.

A comprehensive list of holocaust images, articles and teaching resources.

Jones, Mark. “Blind Watchmaker Applet.” *Blind Watchmaker Applet*. 2001. Department of Physics at Syracuse University. <<http://physics.syr.edu/courses/mirror/biomorph/>>.

A version of Richard Dawkins Biomorph program where simple “organisms” mutate and can be selected to produce fascinating variations.

“Stem Cell Information.” *The Official National Institutes of Health Resource for Stem Cell Research*. June 20th 2006. <<http://stemcells.nih.gov/>>.

All you need to know about the official position on stem cell research.

Films

Forest Gump, Dir. Robert Zemeckis, 1994.

Tom Hanks plays the comedic and inspirational part of a slow-witted but determined individual who not only overcomes his disability but has a major influence on world history.

Freaks! Dir. Tod Browning, 1932.

A hard hitting movie that was banned for over 30 years. A beautiful trapeze artist agrees to marry a circus midget but this is a cold-hearted plot to steal his money. The side-show ‘freaks’ come to his aid and disfigure his bride-to-be in a terrifying act of revenge. Altruism is linked to group allegiances and contrasted with pure selfishness, in a pre-Nazi treatment of the physically disabled.

The Great Dictator, Dir. Charles Chaplin, 1940.

Chaplin’s classic where he plays Adenoid Hynkel in a satirical treatment of Adolf Hitler and Nazi Germany.

My Left Foot, Dir. Jim Sheridan, 1989.

The moving story of Christy Brown – an Irishman almost completely paralyzed by cerebral palsy, who overcomes great adversity to become a playwright and artist.

Rain Man, Dir. Barry Levinson, 1988.

Dustin Hoffman plays Raymond Babbitt, an autistic savant with remarkable mathematical abilities.

Schindler’s List, Dir. Steven Spielberg, 1993.

The true life story of Oskar Schindler, a Polish factory owner who saves his Jewish workforce from the Nazis at great personal risk to himself.

The Tagebuch Der Anne Frank, The Diary of Anne Frank, Dir. George Stevens, 1959.

The harrowing tale of a young girl’s life as a fugitive under Nazi rule.