Is it Still a Brave New World?

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Rationale

The teaching of English cannot be isolated from other subjects. For instance, each work of literature has been written within some historical context. Would it be possible to teach *The Red Badge of Courage* and not discuss the Civil War? How does one teach Shakespeare's *Romeo and Juliet* and not acquaint students with marriage customs of the sixteenth century? Similarly, how does one teach Clarke's *2001: A Space Odyssey* and not talk about space travel? Mustn't one discuss inventions predicted in Wells' *Time Machine*? Teaching all sorts of relevant subject matter is both the joy and challenge of teaching literature. Therefore, despite the fact that science does not seem likely material for the English class, it is completely logical and even necessary when teaching a work of science fiction.

This proposed curriculum unit is intended for an eleventh grade English class to be taught in collaboration with another faculty member who teaches many of the same students. The literature focus will be the dystopian novel, Huxley's *Brave New World* and a more optimistic point of view in Robert Heinlein's *Beyond this Horizon*. Each work was chosen for its literary merit as well as its subject matter. They will provide a wonderful source of topics to be discussed. My colleague teaches Chemistry and will focus on the Chemistry of psychotherapeutic agents and neurochemistry. My lens will be aimed more at the advances related to biology as well as the many ethical issues raised by these scientific innovations.

Objectives

Brave New World by Aldous Huxley introduced the world to the possibilities and the dangers of some interesting new technologies: genetic engineering, medication to control one's mood, birth control pills, test-tube babies, and technological mind-control. Yet Huxley could not have imagined the extent to which these have entered the world of the new millennium. Huxley's view is very pessimistic. Is this the only possible scenario, or

is a bright future equally attainable. The goal of this curriculum unit is to use Huxley's novel as a beginning for an exploration of the promises and the pitfalls of modern advances in biology and neuropsychology. An examination of each area of technology has many arenas for discussion. What are the social implications? How is the health of humans affected? Are we altering the very core of human DNA? How are we affecting the health of our planet? What are the legal and economic ramifications? What are short and long-term psychological consequences to the user and to others? I propose to have students research and debate various medical, biological and psychological cutting-edge technologies followed by full-class discussions of these issues. The overriding question behind each of these debates as well as the main theme of the novel is, "How does science affect the human being?"

Science is outpacing our ability to carefully consider the ethical, biological and psychological consequences of each new advance. What are the issues that we may examine in the course of this curriculum unit? There are so many possibilities. Is it beneficial for our society to do the things on this list even though we may be able to do all of them?

- To bring a baby into the world for the primary purpose of providing bone marrow for a sibling?
- To clone a human being?
- To select abortion for a child who is not the preferred sex?
- To perform genetic engineering on our food?
- To control emotions through antidepressants and other drugs?
- To fertilize embryos and allow parents to select which will be brought to life and which will not?
- To control the thoughts and minds of the public through the media?

My objective is for my students to be actively engaged in reading both the longer works of fiction as well as the shorter pieces; to read with a full understanding and enthusiasm; s to be actively engaged in their research projects; to be full of ideas for their writing prompts; to be anxious and able to share their ideas; to be more fully informed citizens.

Background Information

Genetically Engineered Food

Biologists have been on the cutting edge of science since Watson and Crick's discovery of the structure of DNA. Incredible new possibilities are now available, and much of that is in the realm of biotechnology. Plants and animals have been subject to breeding for optimum characteristics for centuries. A new form of cross-pollination is now taking place. Techniques have been discovered for modifying the basic DNA of living things.

This modern biotechnology is accomplished by directly inserting desired genetic material from one source into another plant or animal's gene. The result is a new hybrid, containing qualities of the original as well as new qualities. For instance, the genes of one plant that has the ability to repel particular fruit-damaging insects could be spliced into the genes of another, thus avoiding the need to spray the new hybrid with pesticides. A tomato would still be a tomato, but with one additional characteristic.

The benefits of genetically engineered fruits and vegetables are so great that this has become a major new agricultural industry. Who wouldn't want food that naturally repels insects, thus avoiding the need for dangerous pesticides? What about food that won't get freezer burn, or ice cream that won't crystallize when refrozen? Wouldn't we all be grateful for food that has increased nutritional value and taste? I certainly have enjoyed corn that seems to get sweeter and sweeter with each passing year. How about preventing starvation and hunger throughout the world because of increased production made possible through genetic engineering? Who but the greatest misanthrope would object to that? What about food that stays fresher on the shelf? Who would object to the economic value of that? What dieter wouldn't want to see potatoes that absorb less fat? What about foods that act as medicines with the ability to deliver vaccines or other medications?

Questions have arisen about the safety of genetically engineered foods. Are we moving too fast to release new products without fully knowing their effects? Do these foods cause unexpected and unpredictable harm to consumers? Many nations have banned the export of foods from the United States because we do not label which foods are GE foods and which are not.). "The European Commission…expressed concern about whether U.S. regulations are adequate to stop bio-engineered grains from getting into exports to nations concerned about gene-spliced foods" (The Campaign 7). "Italy banned the gene-altered maize…citing possible risks to human health" (The Campaign 1). The Chicago Tribune reported that "genetically engineered corn [was] linked to a nationwide recall of taco shells [that] may have spread further than expected into the human food supply…The corn was not approved for human use because of its potential to cause allergic reactions" (The Campaign 3). Furthermore, the results do not end with an individual plant. What are unexpected results on the environment as wind spreads pollen from the newly engineered plants? Some have expressed concern about the monarch butterfly as it feeds on pollen from "pesticidal crops." Would pesticide-resistant properties be unexpectedly transmitted to unwanted plant material, resulting in "super-weeds" (The Campaign 1)?

Making the World a "Happier" Place – the Overdosing of America

"In BNW, happiness derives from consuming mass-produced goods, sports such as Obstacle Golf and Centrifugal Bumble-puppy, promiscuous sex, 'the feelies', and most famously of all, a supposedly perfect pleasure-drug, soma" (Pearce 2). Is this depiction far from our current state of affairs? Americans do not want to feel pain. Even minor

aches and pains are intolerable in today's world. Have a slight headache? Pop a pill. Feel a little down in the dumps? Pop a pill. Of course, pills are not all that we use. Alcohol, prescription drugs, illegal drugs, gambling, smoking, and other behaviors can handily distract one from any unpleasant feeling one might have. When used to excess, they lead to addiction. But even seemingly benign behaviors can be used in this way. Shopping, eating, playing computer games, and even television watching can accomplish similar distractions, and can likewise become damaging addictions. Is anyone willing to just feel unpleasant feelings anymore?

Nor is this particular to our contemporary world. Wasn't Cole Porter singing about how he gets no kick from cocaine? "Homemade remedies, alcohol and drugs were frequently marketed to the average 19th century man or woman to deal with everyday problems, like anxiety. You can still find old copies of ads selling cocaine as a natural remedy. Not to mention we have no idea how frequently people were using drugs in those times as we've only recently started keeping records of legal drug use in America" (Letters 1).

Deborah Kotz, in her article entitled "The Right Rx for Sadness," refers to fiction for an example. "In the 19th century novel *Hyperion*, Henry Wadsworth Longfellow admonished his hero, unlucky in love, to 'take his sorrow to thy heart, and make it a part of thee, and it shall nourish thee till thou art strong again.' Had Paul Flemming been read and alive today, chances are he would have taken Prozac or Paxil instead" (Kotz 1). Authors Horwitz and Wakefield have entitled their new book *The Loss of Sadness: How Psychiatry Transformed Normal Sorrow into Depressive Disorder*. It "argues that selective serotonin reuptake inhibitors – Prozac, Paxil, Zoloft – are commonly overused to treat sadness, a normal and healthy response to divorce, sudden unemployment, the end of a friendship, a house foreclosure" (Kotz 1). The Center for Disease Control in Atlanta reports that antidepressants are the most prescribed drugs in the United States (CNN.com 1).

This rampant use of drugs in our society is not without serious consequences. The Guardian Unlimited from England stated, "Statisticians [reported] an increasingly popular range of antidepressants is associated with growing numbers of suicides and accidental fatal overdoses" (Carvel 1). Teenagers seem to be especially susceptible to this phenomenon. The FDA has been keeping a close watch on this serious public health issue. In 2004, they reported, "Studies with paroxetine (Paxil) appeared to suggest an increased risk of suicidal thoughts and actions in the children given Paxil, compared to those given placebo" (FDA 1).

The doctors who are prescribing these drugs are not entirely responsible. How many times have patients demanded antibiotics to relieve their symptoms from a bad cold? Antibiotics do not address cold symptoms, and yet, under pressure from their patients, doctors "kindly" comply. Demands from patients for drugs have increased tremendously due to new advertising tactics by drug companies. One blogger put it this way: "Have you

noticed a change in television advertisements over the last decade? The change I'm talking about is the type of advertisements television networks run. There are still endless commercials for cars, appliances and alcoholic beverages, but one addition to the gambit which has taken television by storm is drug advertisement" (Ali 1).

To be fair, not everyone thinks that Huxley's dystopian picture of a world filled with psychotropic drugs is fair or accurate. "Then BNW doesn't…evoke just how wonderful our lives could be if the human genome were intelligently rewritten. In the era of post-genomic medicine, our DNA is likely to be splices and edited so we can all enjoy life-long bliss, awesome peak experiences, and a spectrum of outrageously good designer drugs" (Pearce 2). Some point out the strong need and immense benefit to some very disturbed individuals. Some of the most mentally ill among us do not want to take medication. Wouldn't we prefer to see the paranoid schizophrenic on medication than see him roaming the streets, or perhaps acting out violently against themselves or others? Medication is certainly a better alternative than permanent housing in a mental institution. One blogger put it this way: A "Northern Illinois University shooter was 'revered' by his peers until he stopped taking his medication…Often drugs work effectively up until the day people stop taking them…Maybe if the shooter had a better system of support for his 'illness' other than medication there would be five people still alive right now" (Our Perspective 1). So medication may not be the villain in this case, but the lack of a system to insure that those who truly require it are kept on the medication they need. This same blogger offered an interesting analysis of society's true problem:

> In a world of pills and diagnosis slips, what I think our society needs to fear isn't just overmedication but artificial emotions. I was raised on live journal, aim, cell phones, and facebook. The way that the Internet globalizes our community trivializes the individual. This sense of impotence prevents people from attempting real activism as well as providing them with distractions to ease their consciences…We create personalities online and when we interact through artificial means, it seems to follow that our relationships will be as real and meaningful as our communication (Letters 1).

Human Genetic Engineering

New developments in biotechnology have dramatically altered our universe. Many writers would agree that this is not an exaggeration. "We are fast approaching arguably the most consequential technological threshold in all of human history: the ability to alter the genes we pass to our children" (The Threshold 1), says one writer. Jeremy Rifkin, author of *The Biotech Century*, writes, "Our way of life is likely to be transformed more fundamentally in the next few decades than in the previous thousand years" (Rifkin 1). To some, this evokes images of a new Dr. Frankenstein playing God with the future of

humanity in his laboratory. One opinion is that "Crossing this threshold would irrevocably change the nature of human life and human society. It would destabilize human biology. It would put into play wholly unprecedented social, psychological and political forces that would feed back upon themselves with impacts quite beyond our ability to foresee, much less control" (The Threshold 1). At All About Popular Issues.org, another interesting concern is raised. The author states, "Maybe the greatest concern of all is that man would become simply another man-made thing" or that "No longer will a child be considered a blessing from God, but rather, a product manufactured by a scientist" (Human 1). We all know what a mess government has made of so many other areas in its control. Do we really want government in control of creation itself? Newspaper headlines of the past decade scream this concern. '"Eggs May be Fertilized Without Sperm,' 'Britain's First 'Designer Baby' to Be Born Soon' and 'Fertility Ethics Authority Approves Sex Selection' are just a sampling of recent stories that tell of the accelerating conjunction of genetics and the fertility clinic, the site where the initial battle over the human genomic future will be waged" (Brave 1). What is the appropriate response – panic or gratitude? "Many applications of human genetic technology are benign and hold great potential for preventing disease and alleviating suffering. Other applications open the door to a human future more horrific than our worst nightmares" (The Threshold 1). Perhaps the answer is somewhere in-between.

What are the promises of human genetic engineering? Even before the Human Genome Project was completed, new amazing possibilities became apparent to assist in the reproductive process. It "made the effective modification of the human species seem possible" (Eugenics 11). Nor are these advances limited to reproduction. "Continuing breakthroughs have allowed science to more deeply understand DNA and its role in medicine, pharmacology, reproductive technology, and countless other fields" (Benefits 1). Many devastating diseases are inherited through genes. Advances in identifying the human genetic make-up holds tremendous hope for sufferers of these diseases. With time, not only could genes be located and identified, but manipulated as well. It was in the 1950s "when biologists discovered ways of locating and identifying chromosomes and genes…In their book *Genome*, Jerry Bishop and Michael Waldholz point out [that] 'For the first time, geneticists could correlate abnormalities in human chromosomes with genetic disease'"(Rifkin 3).

> The most promising benefit of human genetic engineering is gene therapy. Gene therapy is the medical treatment of a disease by repairing or replacing defective genes or introducing therapeutic genes to fight the disease. Over the past ten years, certain autoimmune diseases and heart disease with gene therapy. Many diseases, such as Huntington's disease, ALS (Lou Gehrig's disease), and cystic fibrosis, are caused by a defective gene. The hope is that soon, through genetic engineering, a cure can be found for these

> diseases by either inserting a corrected gene, modifying the defective gene (Benefits 1).

Screening programs are now frequently held to check the potential for young couples to carry any genetically harmful diseases. For instance, one condition often checked for among couples of Ashkenazi Jewish descent is Tay-Sachs disease. This awful disease is fatal in infancy to 100% of its victims. If both parents carry the gene for Tay-Sachs, they are currently doomed to live out this tragedy. In some religious communities that still pre-arrange marriages, this is cause to cancel the marriage contract. Screening is a welcome and helpful tool to prevent such an event. In other cases, women can be screened while pregnant to help expectant "parents and their physicians to prepare for the arrival of a child who may have special needs before during, and after delivery" (Benefits 1). It may even be possible one day to perform gene therapy on a fetus, allowing the mother to deliver a healthy baby. "In Israel, at the expense of the state, the general public is advised to carry out genetic testing before the birth of a baby" (Eugenics 11). They test for Tay-Sachs, Cystic Fibrosis, Canavan disease, Fanconi anemia, Familial Dysautomonia, Glycogen storage disease, Bloom's syndrome, Gaucher Disease, Nieman-Pick Disease, and Mucolipidosis IV. Screening programs in African American communities seek to prevent passing on another horrible genetic disease, Sickle Cell Anemia.

But advances allow for possibilities far beyond mere screening techniques. Genes may some day be modified within a living cell. One author proposes, "If a lung disease is caused by defective lung cell genes, it might be possible to treat the disease by modifying the genes in those lung cells" (Threshold 1). Parents who find themselves carriers of a genetic disorder may one day be able to modify their own genetic make-up so that their children will be healthy.

Cloning

One extreme version of genetic manipulation is cloning. Cloning is "taking body (i.e., non-sex) cells from an adult and introducing them into an unfertilized egg that has had its genetic material removed, and then encouraging embryo development" (18 Ways 2). Even this very controversial technique is seen by some scientists as having

> …enormous benefits…These include helping infertile couples who have had no luck with other infertility treatments to have children or allowing a parent bearing a gene for a debilitating disease such as Huntington's chorea to avoid passing the gene onto his or her child. In theory, specialists could also use cloning to grow embryonic stem cells into vital organs, blood, or tissue, which doctors could then use for

> transplants, transfusions, and other replacement interventions (On Human 1).

One well-known proponent of human cloning is molecular biologist Lee Silver of Princeton University. In his book, *Remaking Eden: Cloning and Beyond in a Brave New World*, "Silver looks forward to a future in which the health, appearance, personality, cognitive ability, sensory capacity and life span of our children all become artifacts of genetic modification" (Threshold 2).

But even a cloning-booster such as Lee Silver acknowledges the possible dangers. He states, "For human beings…it's not just a question of whether cloning could work, it's a question of whether it could work safely. A basic principle of medical ethics is that doctors should not perform any procedure on human subjects if the risk of harm is greater than the benefit that might be achieved" (Silver 103).

Those scientists who excoriate the idea of human cloning differentiate between reproductive human cloning and therapeutic cloning. Rudolf Jaenisch, a professor of biology at MIT and a founding member of the Whitehead Institute for Biomedical Research stated, "Human cloning is totally flawed. It's bad science" (Jaenisch 1). He explained that in the area of cloning other mammals for scientific research, "most die before birth…[while] only a few percent make it to adulthood, and most of those that do are abnormal in some way" (Jaenisch 1). Since humans are also mammals, we are likely to face the same fate. Don Wolf, a senior scientist at the Oregon Regional Primate Research Center in Beaverton concurs. He explains that at this stage, there is a "huge risk for fetal demise… [as well as] the likelihood that you're going to produce an abnormal child" (Wolf 1). Glenn McGee from ActionBioscience.org put it this way:

> Early human experiments [in cloning] are likely to result in a number of clinical failures and lead to miscarriage, the necessity of dozens or even hundreds of abortions, or births of massively deformed offspring. Recent study of mammalian cloning also suggest that a number of defects often created in the reprogramming of the egg do not manifest themselves until later in the life of the resulting clone, so that mature clones have often undergone spectacular, unforeseen deaths (McGee 1-2).

Do we want to allow a process that is so likely to produce dead babies, or even worse, do we really want to produce beings that suffer from untold illnesses and abnormalities?

On the other hand, "therapeutic cloning is a very different kettle" (Jaenisch 1). In therapeutic cloning, the scientist transfers the nucleus of one organism into another, but the resulting embryo is not placed in a womb for reproduction. Instead, it is transferred to a Petri dish and an embryonic stem cell is formed, the same one that President Bush is so

against. Most scientists agree that stem cell research can offer many helpful results for the treatment of Parkinson's disease, cardiac disease, and diabetes. In addition, the donor of the cells would not have to be concerned with rejection since these cells would be identical to the donor.

Teaching Strategies

Debating

Debating in the classroom is a useful technique to engage students and to involve them in a multitude of standards in one activity. Debates in the classroom have many advantages. Debates force students to more fully engage with the information they have found in their research. It can be one way to avoid plagiarism because they will need to truly know their material. It will also allow students viewing the debate an opportunity to be involved and express their own opinions. One department of education described it this way:

> Debating is a structured contest of argumentation in which two opposing individuals or teams defend and attack a given proposition. The procedure is bound by rules that vary based on location and participants. The process is adjudicated and a winner is declared…The intent of the strategy is to engage learners in a combination of activities that cause them to interact with the curriculum. Debate forces the participants to consider not only the facts of a situation but the implications as well. Participants think critically and strategically about both their own and their opponent's position. The competitive aspects encourage engagement and a commitment to a position.
>
> Debates require students to engage in research, encourage the development of listening and oratory skills, create an environment where students must think critically, and provide a method for teachers to assess the quality of learning of the students. Debates also provide an opportunity for peer involvement in evaluation (Instructional 1).

The Reading Response Journal

There are many ways of doing Reading Response Journals. Here is one version from the Talbot County Public Schools Web Site:

> Keep a READING JOURNAL, in a double entry reading log format, as shown below
> 1. Write…a concise summary of the plot, main characters and themes.

2. **Fold** several loose-leaf pages in half vertically to make two equal long columns. **Label** the left hang column “Quotes” and the right hand column “Significance”.
3. As you read, **choose 8-10 quotes that you feel are significant** (in terms of a key character’s development, a recurring or important theme, or which simply made you think about an idea in a new or different way)…
4. On the right column, **reflect** on the significance of what is being said. Ponder your selected quotes and try to answer you own questions in this space. Make connections to the world outside the reading, explain how the selected quote is important to a character or event, and/or use the quote as a springboard for personal reflection.

Evaluation:

Selection and tracking of a substantial number of quotes
Thinking on significance of quotes
Response to literature
Following directions carefully

Anticipation Guides

“Anticipation Guides are often structured as a series of statements with which the students can choose to agree or disagree. They can focus on the prior knowledge that the reader brings to the text, or the "big ideas" or essential questions posed (implicitly or explicitly) by the writer as a way for the reader to clarify his/her opinions before reading the text and then compare them to the writer's message as they read” (Ladewig 1).

Literature Circles

Literature Circles are useful when the teacher would like to have their class reading more than one novel at the same time. Small temporary groups of students formed on the basis of what book they are reading, and students in the same group read the same novel. Ideally, students get to select their own books, and manage their own discussions. Each group member would be assigned a role to help facilitate discussions. For instance, one student might be assigned the job of keeping the discussion on the topic of the novel. Other roles are described here:

* Discussion director - develops questions for the group to discuss
* Passage picker or literary luminary - chooses a selection that the group rereads and discusses because it is interesting, informative, the climax, well written....
* Vocabulary enricher - chooses words that are difficult or used in an unfamiliar way

* Connector - finds a connection between the story and another book, event in their personal life or the outside world
* Illustrator - draws a picture related to the reading
* Summarizer - prepares a brief summary of the passage read that day
* Travel tracer - tracks the movement when the characters move a lot
* Investigator - looks up background information related to the book (Instructional 1).

Classroom Activities

Before Reading:

Lesson Plan One (one class period)

To prepare students for what is to come, and to begin discussions about the issues raised in the novel Brave New World, I will give my students an Anticipation Guide with questions such as those below. Students will be asked to agree or disagree.

1. Cloning people is a good thing.
2. If we could alter the genes of a child before it is born to make it smarter or more attractive, we should.
3. Taking legal drugs is okay if it makes me feel happier.
4. It is a good thing to alter foods to make them taste better.
5. It is better to alter foods genetically to resist damaging bugs than to spray foods with pesticides.
6. Using a human embryo for research is acceptable as long as that embryo would never be born anyway.
7. Advertising does not influence me when I am deciding what to buy.
8. Emotions only cause problems.
9. It would be good to have the ability to choose whether my child would be a girl or a boy.
10. It is possible to change the way someone thinks by playing them tapes while they sleep.

Before they share answers orally, students will be asked to explain their answers in their journals. Then they can share with one partner before sharing with the entire class.

Lesson Plan Two (five or six class periods)

The primary activity that will be conducted by students outside of class, besides reading the novel, will be to conduct debates. The topics will require research and will be

expected to turn in a written paper that forms the basis for their arguments. Since many will be using the Internet to find much of their information, guidelines for evaluating the validity of Internet sites will be presented in advance of beginning the research project. Two web sites with useful activities and questions for evaluating web sites are "A WebQuest About Evaluating Web Sites" at http://www.sdst.org/shs/library/evalwebstu.html from the Springfield Township High School Virtual Library and "Evaluating Web Sites" from the Lesley University Library at http://www.lesley.edu/library/guides/research/evaluating_web.html. Students will then receive instruction on the proper use of parenthetical citations and the format of a works cite page following the MLA format for their research papers. Cautions about the dangers and consequences of plagiarism will be given as well.

Each student will be assigned a debate topic at random using the jigsaw method. These are the topics: human genetic engineering, cloning, genetically engineered foods, and the use of mood and behavior altering medications. They will be asked to take one of the following roles: Affirmative One, Affirmative Two, Negative One, and Negative Two. The affirmatives and negatives can combine resources and research their topic together. For each position, the roles will differ slightly. Affirmative One will prepare a debate that defends a position, outlining all possible benefits. For instance, why is cloning a good thing. Affirmative Two will anticipate arguments that may be given by the other side and respond to those. Negative One will defend the opposing position, outlining the dangers, while the partner, Negative Two, will also anticipate arguments and respond.

Following each debate by the four main participants, the entire class will be allowed to ask questions and also to express their own perspectives. Students observing the debate will be asked to express their opinions and vote for the team that they believe won the debate.

During Reading:

Lesson Plan Three (on-going during the reading of the novel)

Students will be randomly assigned either *Brave New World* by Aldous Huxley or *Beyond This Horizon* by Robert Heinlein. They will be asked to keep a Reader Response Journal is which they summarize each chapter and select quotes that seem meaningful to them. While journaling, students will be asked to focus on lines in the novel that seem to give a positive view of genetic engineering for *Beyond This Horizon*, and a negative view for *Brave New World*.

As each chapter is assigned, students will discuss their reading in literature circles. Each student will be given a role to play as described in teacher strategies earlier in this unit.

Teacher Resources

Genetically engineered foods

"Genetically Engineered Foods: Fears and Facts." An interview with FDA's Jim Maryanski. *U.S. Food and Drug Administration*.
http://www.fda.gov/bbs/topics/consumer/con00191.html
A representative from the Food and Drug Administration answers many questions of concern related to genetically engineered foods.

"Medical Encyclopedia: Genetically engineered foods." *MedlinePlus*. June 6, 2006.
http://www.nlm.nih.gov/medlineplus/ency/article/002432.htm
This article from Medline Plus defines genetically engineered foods and explains their risks and benefits in a brief, clear fashion.

Shah, Anup. "Genetically Engineered Food." *Global Issues: Social, Political, Economic and Environmental Issues That Affect Us All.* September 26, 2002.
http://www.globalissues.org/Envissues/GEGood.asp
This writer provides a clear list of economic concerns raised by the existence of GMOs.

The Campaign to Label Genetically Engineered Foods. October 2000.
http://www.thecampaign.org/newupdates/oct00u.htm
Here is the text of many AP news releases on related topics.

Overdosing America

Ali, Sharief. "Keeping America Hooked on Drugs." *The Rebel Yell*. February 14, 2008.
http://www.unlvrebelyell.com/article/2008/02/14/keeping-america-hooked-on-drugs/
One blogger explains his view about how the drug industry keeps us hooked.

"Letters: Our Perspective: America's dependency on pills." *The Signal*. February 19, 2008.
http://media.www.gsusignal.com/media/storage/paper924/news/2008/02/19/Letters/Americas.Dependency.On.Pills-3217421.shtml Many individuals provide their personal perspective on this web site. Some are quite well written.

"America's Health in Transition: Protecting and Improving the Quality of Health and Health Care." *The National Academy of Sciences.* September 1, 1995.
http://www.nas.edu/qual/ahit.html This article answers a series of questions on the issue of quality of care, including preventable injuries and unnecessary surgeries in cases of inappropriate care.

Carvel, John. “Anti-depressant’s link to suicide.” *Guardian Unlimited*. August 20, 2004. http://www.antidepressantsfacts.com/2004-08-20-Anti-depressant's-link-to-suicide.htm.
This is a short but informative article from an English newspaper.

Cohen, Elizabeth. “CDC: Antidepressants most prescribed drugs in U.S.” CNN.com/health. July 9, 2007. http://www.cnn.com/2007/HEALTH/07/09/antidepressants/index.html.
This is a CNN news report on the rampant use of antidepressants.

“FDA Talk Paper: FDA Updates Its Review of Antidepressant Drugs in Children.” *U.S. Food and Drug Administration*. August 20, 2004. http://www.antidepressantsfacts.com/2004-08-20-FDA-updates-review-antideps.htm
This informational release from the FDA provides background information and details of a recent study.

Kotz, Deborah. “The Right Rx for Sadness.” *U.S. News & World Report.* Vol. 143, Issue 4. August 6, 2007. This magazine article presents reasons for over-prescription, suggests ways to beat depression without drugs, and the dangers of not treating depression.

Pearce, David. “Brave New World? A Defence of Paradise-Engineering.” BLTC Research. 2007. http://www.huxley.net/ This author sets out a lengthy and convincing treatise in defense of the position that a utopia is indeed possible, and unlike Huxley, he is not being satirical. He believes that advances in biotechnology, Pharmacology, and consumerism will be positive forces, not negative.

Human Genetic Engineering and Cloning

“Benefits of Human Genetic Engineering.” *All About Popular Issues.org*. 2002 – 2008. http://www.allaboutpopularissues.org/benefits-of-human-genetic-engineering-faq.htm
This provides a very brief but clear discussion of the benefits.

Brave, Ralph. “Governing the Genome.” *2001 The Nation Company, L.P.* December 10, 2001. http://online.sfsu.edu/~rone/GEessays/GoverningGenome.html
Here is an outline of various opinions regarding the possibilities of human genetic Engineering.

“Eugenics.” *Wikipedia, the free encyclopedia*. http://en.wikipedia.org/wiki/Eugenics
This is useful for a brief history of eugenics.

“Human Genetic Engineering – A Very Hot Issue!” *AllAboutPopularIssues.org*. 2002 –

2008. http://www.allaboutpopularissues.org/benefits-of-human-genetic-engineering.htm
This web site offers links to many related articles.

Holt, Sarah. "On Human Cloning: Three Views." *NOVA Online*. October 2001. http://www.pbs.org/wgbh/nova/baby/cloning.html
This interview presents over eighteen means of reproduction, a glossary of terms, explanations of some of the science involved with illustrations.

_____. "The 18 Ways (And Then Some)." *NOVA Online*. October 2001. http://www.pbs.org/wgbh/nova/baby/18ways.html
This provides links to three opposing views on human cloning.

Jaenisch, Rudolf. "On Human Cloning." *NOVA Online*. October 2001. http://www.pbs.org/wgbh/nova/baby/clon_jaen.html
An expert in Biomedical Research speaks out against human cloning in a NOVA Interview. He states the facts clearly and simply.

McGee, Glenn. "Primer on Ethics and Human Cloning." *ActionBioscience.org*. February 2001. http://www.actionbioscience.org/biotech/mcgee.html
A professor of bioethics offers a brief outline of cloning with definitions and many connected issues.

Rifkin, Jeremy. "Chapter One." *The Biotech Century – A Second Opinion: The Marriage of the Genetic Sciences and the Technologies Reshaping Our World*. 1997. http://www.human-nature.com/reason/books/rifkin.html
This is the first chapter of a book by the President's advisor on biotechnology. It Explains much of the science, the pros, the cons, and the economic issues related to human genetic engineering.

"The Threshold Challenge of the New Human Genetic Technologies." *Center for Genetics and Society*. March 1, 2003. http://geneticsandsociety.org/article.php?id=272
This article offers definitions, opinions form many prominent scientists, as well as policy suggestions.

Silver, Lee. "On Human Cloning." *NOVA Online*. October, 2001. http://www.pbs.org/wgbh/nova/baby/clon_silver.html

_____ *Remaking Eden: Cloning and Beyond in a Brave New World*. (New York: Avon Books). 1997.

Wolf, Don. "On Human Cloning." *NOVA Online*. October 2001. http://www.pbs.org/wgbh/nova/baby/clon_wolf.html

A scientist who works in the field of Embryology clearly explains why we are not yet ready to conduct human cloning.

Teaching Strategies

"Instructional Strategies Online." Saskatoon Public Schools, Inc. 2004 - 2008. http://olc.spsd.sk.ca/DE/PD/instr/strats/debates/index.html This School District web site provides many useful handouts and instructions for the teacher as well as the student, and links to other helpful sites for holding a classroom debate.

_____. Saskatoon Public Schools, Inc. 2004-2008. http://olc.spsd.sk.ca/DE/PD/instr/strats/literaturecircles/index.html This School District web site provides a clear explanation of how to run literature circles in the classroom, roles that students could play, and other helpful suggestions.

Ladewig, Brian. "Reading Strategies: Scaffolding Students' Interactions with Texts." Greece Central School District. http://www.greece.k12.ny.us/instruction/ela/6-12/Reading/Reading%20Strategies/anticipation%20guide.htm This site presents excellent examples of strategies to use before, during, and after reading.

Lindenberg, Gail. "Literary Debate Guidelines." *Exxon Mobil Masterpiece Theater's American Collection Educator's Site*. http://www.ncteamericancollection.org/literary_debate_guidelines.htm This site, written by a high school teacher, provides lists of useful terms, strategies, and debate protocol.

"Reading Journals: AP 11: Language and Composition." Talbot County Public Schools. http://www.tcps.k12.md.us/uploads/EHSMC/2006-12PAP.pdf

The Talbot County Public Schools offer a useful technique, clearly explained, for doing a reading journal. There are details for all high school grades on various sites.

Student Resources

Huxley, Aldous. *Brave New World*. Harper Perennial: New York. 1992**.**

Heinlein, Robert. *Beyond This Horizon*. Signet. 1948.

Appendix: Pennsylvania Academic Standards for Reading, Writing, Speaking and Listening for Grade 11

1.1. Learning to Read Independently

A. Locate various texts, media and traditional resources for assigned and independent projects before reading.

D. Identify, describe, evaluate and synthesize the essential ideas in text. Assess those reading strategies that were most effective in learning from a variety of texts

G. Demonstrate after reading understanding and interpretation of both fiction and nonfiction text, including public documents.

- Compare and contrast texts, using themes, settings, characters and ideas.
- Make extensions to related ideas, topics or information.
- Assess the validity of the document based on context.
- Analyze the positions, arguments and evidence in public documents.
- Evaluate the author's strategies.

H. Demonstrate fluency and comprehension in reading.

1.2 Demonstrate fluency and comprehension in reading

A. Read and understand essential content of informational texts and documents in all academic areas.

- Differentiate fact from opinion across a variety of texts by using complete and accurate information, coherent arguments and points of view.
- Distinguish between essential and nonessential information across a variety of sources, identifying the use of proper references or authorities and propaganda techniques where present.
- Use teacher and student established criteria for making decisions and drawing conclusions.
- Evaluate text organization and content to determine the author's purpose and effectiveness according to the author's theses, accuracy, thoroughness, logic and reasoning.

1.3. Reading, Analyzing and Interpreting Literature

A. Read and understand works of literature

F. Analyze the relationships, uses and effectiveness of literary elements used by one or more authors in similar genres including characterization, setting, plot, theme, point of view, tone and style.

J. Read and respond to nonfiction and fiction including poetry and drama

1.4. Types of Writing

F. Write complex informational pieces (e.g., research papers, analyses, evaluations, essays).
- Include a variety of methods to develop the main idea.
- Use precise language and specific detail.
- Include cause and effect.
- Use relevant graphics (e.g., maps, charts, graphs, tables, illustrations, photographs).
- Use primary and secondary sources

G. Write persuasive pieces.
- Include a clearly stated position or opinion.
- Include convincing, elaborated and properly cited evidence.
- Develop reader interest.
- Anticipate and counter reader concerns and arguments.
- Include a variety of methods to advance the argument or position.

1.5. Quality of Writing

A. Write with a sharp, distinct focus.
- Identify topic, task and audience.
- Establish and maintain a single point of view.

B. Write using well developed content appropriate for the topic.
- Gather, determine validity and reliability of, analyze and organize information.
- Employ the most effective format for purpose and audience.
- Write fully developed paragraphs that have details and information specific to the topic and relevant to the focus.

C. Write with controlled and/or subtle organization.
- Sustain a logical order throughout the piece.
- Include an effective introduction and conclusion.

D. Write with a command of the stylistic aspects of composition.
- Use different types and lengths of sentences.
- Use precise language.

E. Revise writing to improve style, word choice, sentence variety and subtlety of meaning after rethinking how questions of purpose, audience and genre have been addressed.

F. Edit writing using the conventions of language.

- Spell all words correctly.
- Use capital letters correctly.
- Punctuate correctly (periods, exclamation points, question marks, commas, quotation marks, apostrophes, colons, semicolons, parentheses, hyphens, brackets, ellipses).
- Use nouns, pronouns, verbs, adjectives, adverbs, conjunctions, prepositions and interjections properly.
- Use complete sentences (simple, compound, complex, declarative, interrogative, exclamatory and imperative).

1.6. Speaking and Listening

A. Listen to others.

- Ask clarifying questions.
- Synthesize information, ideas and opinions to determine relevancy.
- Take notes.

B. Listen to selections of literature (fiction and/or nonfiction).

- Relate them to previous knowledge.
- Predict solutions to identified problems.
- Summarize and reflect on what has been heard.
- Identify and define new words and concepts.
- Analyze and synthesize the selections relating them to other selections heard or read.

C. Speak using skills appropriate to formal speech situations.

- Use a variety of sentence structures to add interest to a presentation.
- Pace the presentation according to audience and purpose.
- Adjust stress, volume and inflection to provide emphasis to ideas or to influence the audience.

D. Contribute to discussions.

- Ask relevant, clarifying questions.
- Respond with relevant information or opinions to questions asked.
- Listen to and acknowledge the contributions of others.
- Adjust tone and involvement to encourage equitable participation.
- Facilitate total group participation.
- Introduce relevant, facilitating information, ideas and opinions to enrich the discussion.

- Paraphrase and summarize as needed.

E. Participate in small and large group discussions and presentations.

- Select and present an oral reading on an assigned topic. (I)
- Organize and participate in informal debate around a specific topic. (A)
- Use evaluation guides (e.g., National Issues Forum, Toastmasters) to evaluate group discussion (e.g., of peers, on television).

F. Use media for learning purposes.

- Use various forms of media to elicit information, to make a student presentation and to complete class assignments and projects.
- Evaluate the role of media in focusing attention and forming opinions.
- Create a multimedia (e.g., film, music, computer-graphic) presentation for display or transmission that demonstrates an understanding of a specific topic or issue or teaches others about it.

1.8. Research

A. Select and refine a topic for research.

B. Locate information using appropriate sources and strategies.

- Determine valid resources for researching the topic, including primary and secondary sources.
- Evaluate the importance and quality of the sources.
- Select sources appropriate to the breadth and depth of the research (e.g., dictionaries, thesauruses, other reference materials, interviews, observations, computer databases).
- Use tables of contents, indices, key words, cross-references and appendices.
- Use traditional and electronic search tools.

C. Organize, summarize and present the main ideas from research.

- Take notes relevant to the research topic.
- Develop a thesis statement based on research.
- Anticipate readers' problems or misunderstandings.
- Give precise, formal credit for others' ideas, images or information using a standard method of documentation.
- Use formatting techniques (e.g., headings, graphics) to aid reader understanding.