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| **Section of Lesson** | **This lesson is designed for an IB Language and Literature course, Year 1, Part II (“Mass Media”). Students will connect knowledge from other courses while analyzing how language and mass media influence public perception of genetic research*.*  All lessons are designed for 90 minute blocks.** |
| **Title (Required)** | Genetic Research in the Media |
| **Introduction (Required)** | The exploration of genetics is laden with more controversy than perhaps any other scientific field being researched today. Public opinion has proven to have a large impact on what geneticists research and to what end. In Europe, for instance, genetically modified food is taboo and research on GMO’s has all but ceased in the European Union. The effects of the layman’s opinion, fueled by the media, are also having an impact on genetic research in the United States. From cloning to GMO’s, the media has besmirched genetic research through language of fear (“frankenfood”) and sacrilege (“playing God”). The purpose of this unit is to teach students to analyze how the language that surrounds the discussion of genetics has shaped public opinion, and how this opinion in turn influences what is researched and why. Students will distinguish between texts of “science fiction” and “science fact” and learn about the research being conducted locally at Strahl labs. Students will have the opportunity to analyze their own views regarding genetic research and complete research on the topics that interest them most.  The assessment for this unit will be an advertisement and written justification as part of cross-discipline project. In their biology class, students will be developing a plan for a start-up business that relates to genetic research in some way and addresses a student-identified problem. In English, students will create an advertisement for their start up that clearly communicates its goal and demonstrates understanding of the key components of visual rhetoric. Students will present their start-ups and advertisements at the school’s annual International Festival. Finally, students will reflect on how the project influenced both their ideas about genetic research and extended their understanding of how language is used to disseminate and shape public opinion. |
| **Real Science Application (If Applicable)** | Though the cloning of animals and the human genome sequencing receive the most press attention, genetic research comprises far more than these large scale projects. In order to broaden their understanding of genetic research, students will be introduced to the protein code hypothesis currently being researched at Strahl labs. Though scientists know that DNA operates on a system of “code,” Dr. Strahl and his team hypothesize that the proteins that bind DNA in chromatin and regulate replication also function through a code of modified and unmodified amino acids. Understanding how DNA is packaged and replicated will help researchers understand how our cells operate and the conditions that could lead to the unregulated cell growth that causes cancer. |
| **Curriculum Alignment (Required)** | Common Core Standards   |  |  |  |  | | --- | --- | --- | --- | | Content Standard | Lesson 1 | Lesson 2 | Lesson 3-6 | | Reading Literature | 11-12.1 | 11-12.6 |  | | Reading Informational Texts | 11-12.1, 11-12.2, 11-12.3, 11-12.4, 11-12.5 | 11-12.1, 11-12.2, 11-12.3, 11-12.4, 11-12.5 | 11-12.1, 11-12.2, 11-12.3, 11-12.4, 11-12.5 | | Writing | 11-12.1A, 11-12.1B, 11-12.1D,  11-12.2B | 11-12.1A, 11-12.1B, 11-12.1D,  11-12.2B |  | | Speaking and Listening | 11-12.1, 11-12.2 | 11-12.1, 11-12.2 | 11-12.4, 11-12.5, 11-12.6 | |
| **Learning Outcomes (Required)** | Students will design their own course of inquiry by asking questions, evaluating their questions, and conducting research to answer their questions.  Students will analyze the rhetoric of several texts and make inferences about how the language of the text communicates the author's purpose.  Students will draw conclusions about how language in mass media can influence people’s thoughts and opinions using authentic texts.  Students will demonstrate mastery of using key rhetorical techniques to communicate their own purpose.  Students will design and execute methods of communicating what they learned and created to the school community. |
| **Time Required and Location (Required)** | 5-7, 90 minute lessons |
| **Materials Needed (Required)** | Teacher List:   * Copies for groups: Paired articles on the same topic that differ in tone (GMO foods, human cloning, animal research) * GATACA clip * Paper, poster, projectors, and other materials as required for student presentations * Internet-connected technology for student research   Student List:   * Small white boards for group response * Stimulus texts * Journal * Creativity, dedication, team work for completing project |
| **Safety (required)** | This lesson does not involve hazardous materials that would require extra safety precautions. |
| **Student Prior Knowledge (Required)** | In order to be successful, students should be well versed in identifying author’s purpose, diction, tone and the effects of these on the audience. They should be familiar with the primary rhetorical techniques used in advertisement and how they contribute to the author’s purpose (supplemental material for teaching rhetoric included in appendix). Students should also have some basic background in genetics (or learn it in science class in conjunction with this unit) such as an understanding that DNA is located in the nucleus of the cell, that it replicates when the cell undergoes mitosis, that physical characteristics of organisms are the coded in DNA, and that genetics is also responsible for predisposition to some diseases. |
| **Teacher Preparations (Required)** | Classroom should be arranged in advance for collaboration with desks grouped together with small whiteboards or paper for jotting down ideas. Strategically group students in advance based on ability and social mixing. Charge ipads/computers and organize how and where students will use technology. It may be helpful to set a timer and to have a system for selecting which students will speak or lead discussion. For example, I shuffle index cards with the students’ names on them and pick one card to determine discussion leader. |
| **Activities (Required)** | Lesson 1: Student-Directed Inquiry  Goals: Students will design their own course of inquiry by asking questions, evaluating their questions, and conducting research to answer their questions.   1. As students come in, the teacher prompts them view the stimuli on the board--a propaganda piece against genetically modified crops (like the one in the appendix or similar). Students should be strategically grouped in learning teams with white boards or a piece of large paper at their table. As the class begins, the teacher tells students that they will decide the course of inquiry for the day by asking questions about the image. Each group should write down questions about the image according to the following criteria: 2. Ask as many questions as you can 3. Do not stop to discuss, judge, or answer any of the questions 4. Write down every question **exactly** as it is stated 5. Change any statement into a question (15 mins) 6. Before sharing out, the teacher should ask students what was challenging about that assignment. Students may discuss challenges such as formulating ideas in the form of a question or writing down exactly what was said. The teacher should suggest that sometimes brainstorming is messy and difficult. Students are picked or volunteer to share out some of the questions their group formulated. (5 minutes) 7. The teacher tells students that they will now focus their inquiry by deciding as a group which question should be their guiding question in examining the text. First, the students must pick at least 3 criteria by which to judge their questions. This can be completed as a class or in groups. For instance, students may decide that the questions need to be complex (not a yes/no question) and specific (refer to a particular aspect of the stimuli). Once students have the criteria by which they will judge their question, they should determine as a group which question best fits the criteria. The students share out their inquiry question by writing them on the board, poster, or sharing out on an electronic forum. Teacher should circulate, prompting groups that are struggling and helping students pick rigorous criteria (10 mins). Examples of questions may include: “Why do the children look like zombies?” “Why is ‘Monsanto’ important?” 8. The teacher presents the instructions for the day either on the board or in handout form. The students will work to answer their research question using both primary sources (the stimuli) and secondary sources gained through research. By the end of class, students should be able to give a short presentation to another group (about 3 mins) about their research question and what they discovered. Students are given a few minutes to structure their plan for finishing their work and recording their plans. An example plan might be “Student X and Y examine rhetoric of stimuli for 10 minutes. Student Z and Q conduct secondary research for 10 minutes. All students work together for presentation script for 10 minutes.” Teacher circulates and helps students start working as needed. (5 mins) 9. Students complete research in their groups and craft their small group presentations. Teacher circulates providing assistance and time management cues as needed (35 mins) 10. Teacher prompts students to combine with another group, give their presentations, and listen to the learning of others. **Students are prompted to write down in their journals the questions that they still have**. These questions will be addressed later in the unit. (15 minutes) 11. The teacher closes class by asking why the students think the class looked at that particular stimulus. The teacher should explain the cross-curricular nature of the unit (if relevant). For the next class, students should find their own stimulus text—article, advertisement, artwork, Twitter feed, poem, etc.—that relates in some way to genetics or genetic research.   Lesson 2: Examining Non-Fiction Texts  Goals: Students will analyze the rhetoric of several texts and make inferences about how the language of the text communicates the author's purpose. Students will draw conclusions about how language in mass media can influence people’s thoughts and opinions using authentic texts.   1. At the start of class, students are directed to sit in their assigned learning teams. There should be paper or whiteboards at each group. As a warm-up, students are asked to think of at least 3 instances as a group in which the media has influenced people’s thoughts or opinions. For example, students may refer to a particularly persuasive ad campaign or a current event. (5 mins) 2. The students share out, led either by the teacher or a student discussion leader. The teacher or student scribe jots down notes on the board, poster paper, or projector, summarizing what is being said. (10 mins) 3. The teacher sums up discussion and gives direction. Each student will get a text which relate to a topic in genetic research (sample texts included in appendix).  While students work, the teacher should circulate, help groups that are struggling, and strategically create groups for the next activity (20 mins) 4. At the end of 20 minutes, the students will “jigsaw”: breaking apart from their original group and working with a partner who read a different article. The teacher instructs students to summarize their article and share their findings with their partner. Then, the students must work as a group to answer the question: *To what extent, does the media influence people’s thoughts and opinions about genetic research? Give specific examples from your article.* Students can share out on paper, white boards, or an online forum. (20 mins) 5. The class discusses their findings, led by either the teacher or a student discussion leader.(10 mins) 6. With students still in their “jigsaw” groups, they should take out the text they found for homework. The teacher instructs students to summarize their text for their partner. The goal is to collaboratively pick 2 texts of the four (2 from the earlier activity and 2 produced by the students) to do a text comparison. Each student receives a Text Comparison Sheet (appendix) which they complete collaboratively with their partner for the remainder of class (30 mins) 7. The teacher closes class and points out some highlights of the lesson, praising students for their good work. Teacher collects Text Comparison Sheet to formatively assess student progress towards learning goals.   Lesson 3: Examining Fictional Texts  Goals: Students will analyze the rhetoric of several texts and make inferences about how the language of the text communicates the author's purpose. Students will draw conclusions about how language in mass media can influence people’s thoughts and opinions using authentic texts.   1. As students arrive, they should complete the following “warm up” question in their journals: *If it were possible and safe, would you genetically engineer your future child to be healthy? Would you engineer them to be attractive or have unusual talents? Explain.*  Students share out with either their small groups or as a whole class (10 mins) 2. The teacher explains that the class will examine fictional texts that relate to genetic research instead of non-fictional ones. The teacher quickly reviews that, just like non-fictional texts, fictional ones also use rhetoric to communicate their purpose to a specific audience. The teacher distributes the Rhetorical Analysis worksheet to each student (in appendix) and explains how the students will use it to unpack the rhetoric of the two texts. (5 mins) 3. The teacher gives a little background on each text (teaching guide in appendix). The class views the *Gattca* clip together. After the students watch (it may need to be played more than once), they work together in their groups to fill out the *Gattaca* portion of the Rhetorical Analysis sheet. The teacher circulates to help students as needed. (15 mins) 4. The teacher calls the class back together and the students share out their findings. The teacher or student scribe takes notes on the discussion for the class (10 mins) 5. The students then read the first chapter of *Brave New World* (which can be used in isolation or continued as a major text for the unit). Students work in their learning teams to fill out the rhetorical analysis for this text. (30 mins) 6. The teacher calls the class back together and students discuss their findings as a class. The teacher asks this question for the students to consider: *Which texts related to genetic research are more effective at communicating their purpose—fictional or non-fictional.* After being given a moment to think, students are directed to move to one side of the room or the other, depending on which side they agree with. Students are prompted to discuss their opinions with their group, then the teacher or a student leader can call on people to discuss as a class. As always, students are encouraged to follow good discussion etiquette, including not interrupting, acknowledging someone they agree/disagree with by name, and supporting their ideas with evidence from the texts. At the end, the teacher may sum up by pointing out that both sides have their advantages and draw-backs (20 mins).   Lesson 4: Advertising a Genetics Start-up  \*\*Note: Concurrent with this unit, students are working on a project in their biology class in which they are designing a start-up company to address a particular problem or need related to genetic research. If such a collaboration isn’t possible, the teacher may need to design of day of creating or researching current start-ups that the students are interested in advertising for.  Goals: Students will demonstrate mastery of using key rhetorical techniques to communicate their own purpose.   1. As students enter, the same stimulus material from Lesson 1 is up on the board. For a “warm up” students are asked to look back at the list of questions they still had. They should mark out any of these that they have had answered over the last few days and add anymore that they think of. (5 mins) 2. In order to tie together ideas from the last few days, the teacher points out that an effective argument uses both elements of non-fiction (logos, rhetoric) and non-fiction (pathos, language). The teacher points out that the stimulus image combines these elements. Students are given an opportunity to ask their lingering questions about the text while the teacher encourages students to answer their classmates’ questions. (15 mins) 3. The teacher points out that the stimulus advertises and promotes a particular belief related to genetic research. The students, by designing their own start-up in biology class, also have a purpose to communicate. Students are introduced to the idea of creating an advertisement for their start-up (and told it will be their assessment for the unit). While students talk excitedly about how awesome this going to be, the teacher hands out the project sheet and rubric (in appendix). The teacher explains that this sheet will help students formulate their ideas and write the rhetorical analysis that will accompany the final product. (5 mins) 4. Students begin working by brainstorming elements that they will include in their advertisement and making connections to texts they have already worked with in class. Students create a “mock-up” of their design and notes on how they will complete a rhetorical analysis of their text. While students work, the teacher circulates to check the mock-ups and notes to make sure students are on the right track. (65 mins) 5. The teacher wraps up by highlighting the great work that students did. The students should be a complete rough draft of their ad and rhetorical analysis the following day for peer editing and to prepare for presentation.   Lessons 5: Preparation  \*\*Note: As necessary, students can be given additional days in class to work on their advertisement or be assigned to complete it outside of class. Teachers may collaborate to allow students to work both within Biology and English classes.  Goals: Students will demonstrate mastery of using key rhetorical techniques to communicate their own purpose. Students will design and execute methods of communicating what they learned and created to the school community.   1. Students are paired up with a peer editing partner as they enter class. Students share their drafts and complete the peer edit check list (in appendix) for their partner’s work. (15 mins) 2. Students continue working on their ad project while the teacher provides support and encouragement. The use of technology is highly encouraged for this project and teacher may want to arrange to go to the media lab or bring technology into the classroom. (45 mins) 3. The teacher calls the class back together and informs students that as part of the project, they will be sharing their findings at the annual International Festival (or similar venue). In order to be successful, they will be paired with students 2 students will similar topics (or teacher may allow students to pick groups). (5 mins) 4. Students will be prompted to get with their presentation groups, learn about their partners’ projects, and start working on a script for the international festival (International Festival presentation sheet in appendix). (25 mins)   Lesson 6: Presenting and Reflecting  \*\*Note: Depending on skill level of students and time available, teachers may choose to provide extra practice time for students to rehearse their talking points in class. Students also may be assigned to practice on their own for homework. Students may also be required to present their start-up ideas if this is a cross-curricular unit. Collaborating teachers should work together to ensure students have enough time to prepare between their two classes.  Goals: Students will demonstrate mastery of using key rhetorical techniques to communicate their own purpose. Students will design and execute methods of communicating what they learned and created to the school community.   1. Students present their advertisement at the International Festival to members of the school community. The teacher listens to each presentation as well, scoring the students on the presentation section of the project rubric. 2. The following class should begin with a warm up in which students reflect on what they learned and discuss their successes and challenges during the festival. The reflection can be graded according to the “journal check criteria” in appendix (or similar form with which the students are already familiar) or simply shared in class between peers. |
| **Assessment (Required)** | For these lessons, students will be assessed with a text comparison worksheet, their ad and rhetorical analysis, and the presentation.  See the following rubrics in appendix:   1. Text comparison worksheet 2. Ad and rhetorical analysis 3. International Festival presentation rubric |
| **Critical Vocabulary (Required)** | GMO’s: genetically modified organism, commonly used in reference to foods that have been engineered to have genetic differences from the wild type  Genotype: An organism’s genetic code  Phenotype: The physical characteristics that result from that code  Cloning: The process of replicating an organisms DNA in order to create a genetically identical organism  Purpose: The message that the author was intending to communicate in the creation of a text.  Audience: The focused group that an author targets in the creation of a text  Tone: How the author feels about his/her subject; communicated through diction, syntax, and word connotation  Language: Visual or verbal strategies that communicate meaning |
| **Community Engagement (Required)** | Students will engage their school community by sharing out their findings as part of the international festival which is held annually at Millbrook High School. We hope to coordinate a Skype lesson with Strahl labs and hopefully give some interested students the opportunity to intern there during the summers. In addition, there is the possibility of collaboration with UNC’s annual DNA 5K which promotes the teaching of genetics curriculum in K-12 schools. |
| **Extension Activities (Optional)** | As an extension of their classroom activity, students can participate in UNC’s annual DNA 5K for science outreach. Students can participate by raising funds to run, or by volunteering to help UNC promote genetics education in primary and secondary schools. |
| **Modifications (Optional)** | This lesson is intended for an 11th grade IB class but can be modified for any student and many different subject areas. Because a crux of the IB program is student choice and innovation, I’ve left many of the specifics of the project up to the students. The presentation does not (and in many cases should not) be in the form of a traditional oral presentation. Teachers should feel free to allow students to be creative and innovative in how they present their information. More guidelines can be added to the rubric to scaffold the learning of lower-level or younger students. Students with limited English proficiency can participate by using primary sources in their preferred language. Journal responses are designed to be flexible enough that all students can be successful. Though I am placing these lessons within a larger unit on *1984,* many texts and contexts can be used as a foundation. The lessons can also be taught independently as their own unit. |
| **Alternative Assessments (Optional)** | For text comparison: Group students with learning disabilities with conscientious peer. Allow students to make edits to their original work and submit to you for more points. Allow same-language ELL students to work together on texts in their preferred language.  For ad assessment: Keep in mind that every student will create a unique product according to his/her interests and abilities. Guide students towards appropriate scaffolding and resources.  For reflection: Instead of paragraphs, allow students with learning disabilities to make bulleted lists or figures to represent their ideas. Allow ELL’s (English Language Learners) to use dictionaries or write about sources that were published in their preferred language. |
| **Sources** | **Strahl, B., & Allis, D. The Language of Covalent Histone Modification. *Nature*, *403*, 41-45.**  *This article contains a concise review of the focus and purpose of studying modification in histone proteins. It was used in the creation of the Strahl lab presentation.*  **Does Your Body Absorb Genetically Altered DNA? (2014, January 20). Retrieved July 9, 2014, from** [**http://wp.me/p1x1P5-Ch**](http://wp.me/p1x1P5-Ch)  *Text related to GMO foods for nonfiction article activity. Students should hopefully note the pathos of using second person and rhetorical questions. Tone is accusatory and fearful.*  **Marris, C. Public Views on GMOs: Deconstructing the Myth. *EMBO Reports*, *2*, 545-548.**  *Text GMO foods for nonfiction article activity. Students should be able to recognize the logos of the myth-fact structure of the article. This article is important for the overall goal of the unit because it engages with the global perspective. Tone is analytical and erudite.*  **Human Cloning. (n.d.). Retrieved July 9, 2014, from** [**http://www.ama-assn.org/ama/pub/physician-resources/medical-science/genetics-molecular-medicine/related-policy-topics/stem-cell-research/human-cloning.page**](http://www.ama-assn.org/ama/pub/physician-resources/medical-science/genetics-molecular-medicine/related-policy-topics/stem-cell-research/human-cloning.page)  *Text on human cloning for nonfiction article activity. Students may note the inclusive use of language (‘we,’ ‘our findings’) that exclude the general public from the conversation playing out in the text. Tone is clinical and detached.*  **Tierney, J. (2007, November 1). Are Scientists Playing God? It depends on your religion. *New York Times*.**  *Text on human cloning for nonfiction article activity. Students may draw contrast between the objective tone of this article and the use of inclusive language. This article is important for the overall goal of the unit because it engages with the global perspective. Tone is tongue-in-cheek and scholarly.*  **Pacelle, W. (2005, January 21). Is Animal Cloning Ethical? San Francisco Gate. Retrieved July 9, 2014, from** [**http://www.sfgate.com/opinion/openforum/article/Is-animal-cloning-ethical-2737093.php**](http://www.sfgate.com/opinion/openforum/article/Is-animal-cloning-ethical-2737093.php)  *Text on animal cloning. Students should note the pathos used through anecdote. Tone is puckish and critical.*  **McDermott, T. (2008, January 18). FDA: Cloned Meat Safe To Eat. *CBSNews*. Retrieved July 8, 2014, from** [**http://www.cbsnews.com/news/fda-cloned-meat-safe-to-eat/**](http://www.cbsnews.com/news/fda-cloned-meat-safe-to-eat/)  *Another text on animal cloning. Students should recognize the use of ‘expert witness’ to support the argument. Tone is removed and skeptical.*  **Bonham, J. (n.d.). GMOs: Learn the Risks. . Retrieved July 8, 2014, from** [**http://jimbonham.com/blog/wp-content/uploads/2010/07/Monsantos-Genetically-Modified-Foods.jpg**](http://jimbonham.com/blog/wp-content/uploads/2010/07/Monsantos-Genetically-Modified-Foods.jpg)  *An image for students to analyze for visual rhetoric. They should pick up on the pathos of portraying children as victims, the horror link with the imagery of zombies and contamination, and the traditional political cartoon elements such as labeling the corn “Monsanto.” Be sure that students clearly identify the audience, speaker, and purpose of the image.*  **Huxley, A. (1946). Chapter 1. *Brave new world*. New York: Harper & Bros..**  *The opening chapter of Brave New World introduces readers to a future in which all babies are ‘test tube’ babies who are mass-produced in a lab. Should be used to prompt students to consider the “what ifs” of fictional genetic research.*  **Video clip from *Gattaca:*** <http://www.wingclips.com/movie-clips/gattaca/genetically-engineered-birth>  *Like Brave New World, Gattaca is a film about a future in which all humans are genetically modified to be strong, intelligent, healthy, and beautiful. After viewing and discussing, students should respond in their journals about their own beliefs regarding the genetic modification of human beings.* |
| **Supplemental Information (Optional)** | Additional journal articles that are not vital for student learning but may enrich the teacher’s understanding of histone research include:  Duina, A., Miller, M., & Keeney, J. Budding Yeast for Budding Geneticists: A Primer on the Saccharomyces cerevisiae Model System. *Genetics*, *197*, 33-48.  Krogan, N. J. Cotranscriptional Set2 Methylation of Histone H3 Lysine 36 Recruits a Repressive Rpd3 Complex. *Cell*, *123*, 593-605.  Murphy, S. Cracking the RNA polymerase II CTD code. *Trends in Genetics*, 280-288.  Wang, G. An H3K36 Methylation-Engaging Tudor Motif of Polycomb-like Proteins Mediates PRC2 Complex Targeting. *Molecular Cell*, 571-582. |
| **Comments (Optional)** | Though every school does not have an organized international festival, all schools value the experiences of people from around the world. If you do not currently have an event like this at your school, this project could be an opportunity for your class to start one. If a full festival is not an option, consider other creative ways of presenting such as gallery walks, inviting another class to your ‘fair,’ or holding a parent night in which students can present to the parents of their classmates. This project is not intended to yield traditional presentations and your students should not merely get up in front of the class to share out. This unit also presents an opportunity for inter-disciplinary collaboration. In addition to aligning curriculum with a science teacher, students can also learn about the social circumstances that may lead to a country’s policies regarding genetic research in social studies. Students can work on effective visuals and technology tools in art and technology classes. |
| **Author Info (Required)** | Michelle Hicks, M.Ed.:   * Millbrook High School, Wake County, Raleigh * English II, IB Language and Literature Year 1 * 4 years teaching experience * mhicks@wcpss.net   Dr. Brian Strahl   * UNC-Chapel Hill, department of biochemistry and biophysics * Histone modification and gene expression: Yeast genetics, protein purification, peptide synthesis, peptide arrays * Ph.D. NC State University |

Appendix

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Does Your Body Absorb Genetically Engineered DNA?

***One of the biggest assurances that pro-GMO manufacturers and scientists continue to make is how “safe” genetically engineered crops are. One of their primary arguments behind this assurance is that “new genes introduced in GM food are harmless, since all genes are broken up and rendered inert during digestion.”***

Here are five studies disproving that theory…

The first study done in the U.K. indicates a potential release of genetically altered DNA in human digestive tracts: “the possibility of functional DNA release from plant GMOs cannot be excluded. The extent of the ability to natural transformation among intestinal bacterial species and strains is not known, although as a phenomenon natural bacterial transformation seems to be more frequent than hitherto recognised, and also intestinal pathogens might be transformable.” (Source: [European Commission on Health and Consumer Protection](http://ec.europa.eu/food/fs/sc/scp/out03_en.html); studying the effects of genetically engineered [Brassica Napus](http://en.wikipedia.org/wiki/Brassica_napus) or “rape” used in the production of rapeseed / canola oil.)

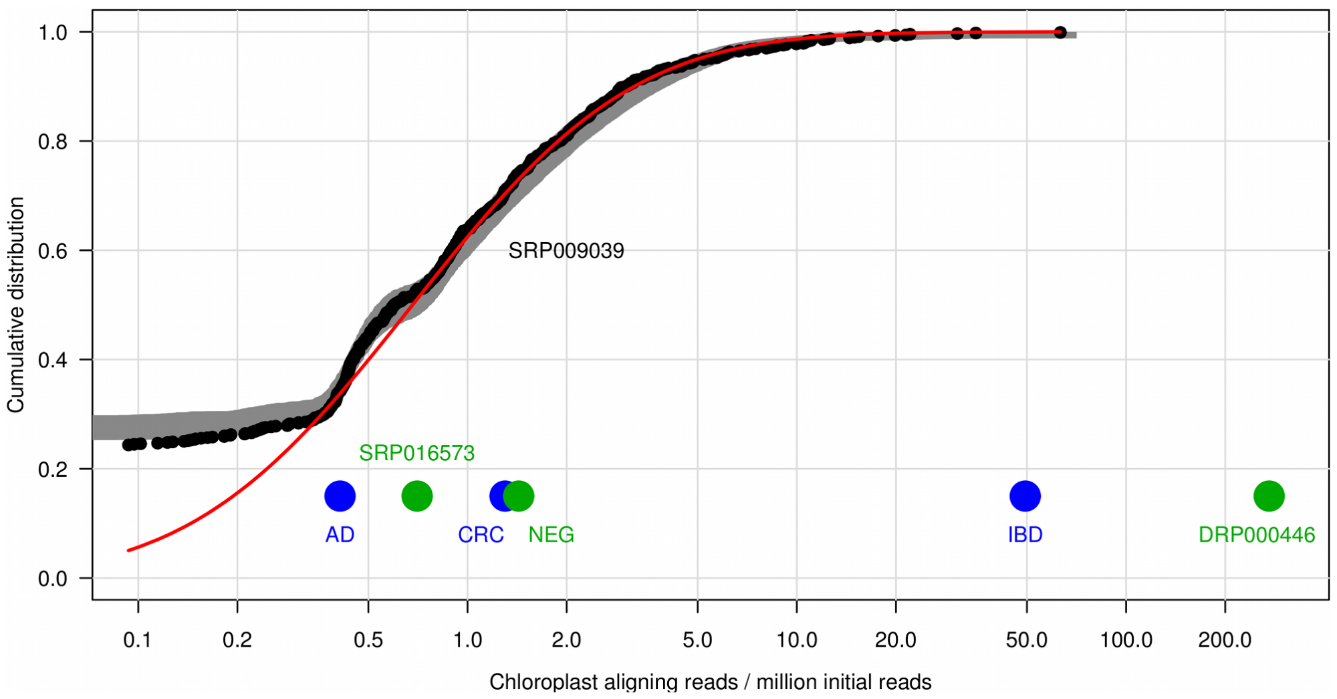
A second study done in China in early 2012 was much more sobering. It showed that ingested plant microRNA — such as the genetically modified bits containing Bt — not only survive digestion, but most definitely influence human cell function. This means that DNA can code for microRNA, which can, in fact, be hazardous… having been linked for ten years to human diseases including cancer, Alzheimer’s, and diabetes. Read the summary article [here](http://www.alternet.org/story/153737/how_genetically_modified_foods_could_affect_our_health_in_unexpected_ways/); view the original study report [here](http://www.nature.com/cr/journal/v22/n1/full/cr2011158a.html).

A third study in Norway, [published in July 2012](http://sciencenordic.com/growing-fatter-gm-diet), proved that GMO genes are indeed transferred through the intestinal wall into the blood. During their study they found “pieces of genetically modified DNA in large enough segments to be identified in blood, muscle tissue and liver.”

Not only did that Norwegian study once again disprove the long-held “pro-GMO” claim that “new genes introduced in GM food are harmless since all genes are broken up in the intestines,” the test animals also showed increased weight gain, increased appetite, decreased immune function, an inability to properly digest proteins, as well as a different intestinal microstructure. (If this sounds like most of the U.S. population, it’s no wonder Monsanto and the Grocery Manufacturers Association don’t want labeling approved in this country.)

In October 2012, [a fourth study](http://www.sott.net/article/252745-GM-wheat-may-permanently-alter-human-genome-spark-early-death) done at the University of Canterbury in New Zealand reinforces the “altered genes survive digestion” theory. In this study, Professor Jack Heinemann found that the double stranded RNA (dsRNAs) present in genetically engineered wheat were able to withstand digestion (even after cooking) and circulate throughout the body, where the RNA amplified into more and different dsRNAs and “alters gene expression in the animal.”

The scientist went on to state: “The molecules created in this wheat, intended to silence wheat genes, can match human genes, and through ingestion, these molecules can enter human beings and potentially silence our genes. The findings are absolutely assured. There is no doubt that these matches exist.” Read a synopsis article [here](http://www.digitaljournal.com/article/332822); view the full study report [here](http://safefoodfoundation.org/wordpress/wp-content/uploads/2012/09/Heinemann-Expert-Scientific-Opinion.pdf)

[](http://gmoawareness.files.wordpress.com/2014/01/journal-pone-0069805-g003.png)

In July 2013, the [most recent study](http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0069805) done by Hungarian scientists proves it once again: “Based on the analysis of over 1,000 human samples from four independent studies, we report evidence that meal-derived DNA fragments which are large enough to carry complete genes ***can*** avoid degradation, and through an unknown mechanism, enter the human circulation system.”

**If these altered genes aren’t digesting, what’s the inherent risk?**

These studies indicate that the food we eat transfers more than just vitamins and proteins to our cells. Our bodies are [absorbing information in the form of microRNA](http://www.theatlantic.com/health/archive/2012/01/the-very-real-danger-of-genetically-modified-foods/251051/).

What’s the purpose of microRNA? They usually function by turning down or shutting down certain genes. What genes would you like to have “turned down or turned off” in your body, without your knowledge or permission?

How about genes from salmon that have been genetically engineered to grow faster and larger than their natural counterpart? (These salmon were [recently approved for sale in Canada](http://www.theguardian.com/environment/2013/nov/25/canada-genetically-modified-salmon-commercial); here in the U.S. the approvals are stalled…)

How about genetically engineered wheat developed by an Australian biotech company (CSIRO), which, had it been approved, would have been able to [silence human genes](http://www.examiner.com/article/genetically-modified-wheat-may-silence-human-genome), resulting in premature death and risk of passing the defect on to future generations?

*And what if the impacts of genetic modification are far more than the scientists ever realized, because scientists are still discovering how DNA actually works?*

[](http://gmoawareness.files.wordpress.com/2014/01/john-stamatoyannopoulos.jpg)**Recent Discovery: DNA contains “hidden” code**

In a December 2013 study, scientists at the University of Washington discovered a [second code “hiding” inside DNA](http://www.washington.edu/news/2013/12/12/scientists-discover-double-meaning-in-genetic-code/), which completely changes how scientists read the instructions contained in DNA, and how they interpret mutations to make sense of health and disease.

According to the lead scientist (Genome scientist Dr. John Stamatoyannopoulos at the University of Washington, pictured above), “The fact that the genetic code can  ***simultaneously write two kinds of information*** means that many DNA changes that appear to alter protein sequences may actually cause disease by disrupting gene control programs or even both mechanisms simultaneously.” – Dec. 13 issue of *Science.*

[](http://gmoawareness.files.wordpress.com/2014/01/david-suzuki-sm.jpg)Geneticist David Suzuki (pictured at left) has been saying the same thing for years: “One small mutation in a human being can determine so much. Even if you move one tiny gene out of an organism into a different one, you are completely changing its context. There is no way to predict how it’s going to behave and what the outcome will be.”

***Are you comfortable being part of the experiment?***

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# Public views on GMOs: deconstructing the myths

Stakeholders in the GMO debate often describe public opinion as irrational. But do they really understand the public?

There is no doubt that genetically modified organisms have a notoriously bad reputation in Europe. The anti-GMO lobby accuses proponents of this technology of pushing the introduction of GMOs into agriculture without adequately considering health and environmental risks. The pro-GMO camp charges its opponents with blowing potential risks out of proportion in order to manipulate public opinion against this new technology. During this mutual finger pointing, both sides have taken to blaming the public for a lack of understanding. Indeed, one often hears claims that: ‘The media is to blame for the “hysterical” coverage of the issue’, or: ‘The problem is that the public does not understand the science behind biotechnology’, or: ‘Public acceptability will improve as soon as consumers see direct benefits’.

A typical demonstration of these arguments was made recently in this journal by Robert Marchant ([Marchant, 2001](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1083956/#kve142c8)). But this is not an isolated example; in the course of my research on the sociology of risk, I am constantly confronted with such perceptions about the public. However, these views—although prevalent among stakeholders in the GMO debate—are not supported by many years of social science research. I choose to call them ‘myths’ to indicate the fact that they appear so ‘evident’ that no further substantiation seems to be needed.

These myths are not restricted to the ‘pro’ or ‘anti’ GMO camps. Both sides, with minor exceptions, tend to share the same misconceived view about public understanding. Both believe that ignorance is a key problem, and develop strategies to ‘educate the public’—even if the content of that ‘education’ is different. Both sides think that direct benefits to the consumer are a central determinant of public acceptance; thus the ‘pros’ seek to communicate the benefits, whilst the ‘antis’ try to demonstrate that these benefits will not be realised or that they will benefit commercial corporations rather than ordinary citizens. Both sides complain—at different times—that they cannot get their views expressed in the media.

Here, I will describe our results from the Public Acceptance of Agricultural Biotechnologies (PABE) project ([CSEC, 2001](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1083956/#kve142c1)) to demonstrate that these ‘myths’ are unsubstantiated. I claim that the very preponderance of these views of the public is a central feature of the GMO controversy, and suggest that the problem of ‘public acceptability’ of GMOs—as it is defined by many decision makers in the public and private sectors—cannot be resolved without deconstructing these myths and the influence they have on institutional behaviour.

We studied the attitudes, discourses and strategies of the major stakeholders in the GMO controversy through interviews, analysis of documents and by observing participants during public debates and other meetings. These stakeholders included biotechnology companies, major food manufacturers, large food distributors, government departments and regulatory agencies, expert committees, scientists and their institutions, farmers’ unions, environmental and consumer protection groups as well as other non-governmental organisations.

Through focus groups, we also investigated how members of the general public perceive the use of GMOs in agriculture. Fourteen two-hour group discussions, with 6–10 participants per group, were held in France, Germany, Italy, Spain and the UK between September 1998 and October 1999. This article focuses on views that were prevalent in all of the groups studied.

During this research we identified a number of ‘typical myths’ about the public’s perception of GMOs, which were promulgated by stakeholders but not supported by our focus group findings. Of course, they are not necessarily prevalent among all stakeholder institutions, or held in such extreme forms by all their members. For the sake of argument, however, extreme versions are presented.

**Myth 1: the public is ‘for’ or ‘against’ GMOs**

According to this myth, the public either accepts or rejects GMOs, with most Europeans being increasingly against them.

**PABE findings:** overall, focus group participants expressed a rather ambivalent attitude. They did not reject or accept GMOs out of hand, and discriminated between different types of GMOs. Participants discussed arguments both for and against GMOs, and were aware of contradictions within these arguments. A key finding was that participants did not react so much to genetic modification as a specific technology, but rather to the institutional context in which GMOs have been developed, evaluated and promoted (see sidebar).

**Myth 2: the public is ‘irrational and unscientific’**

According to this myth, there are facts on one side of the debate and emotions on the other. Rational facts are founded on scientific evidence and demonstrate, to the best of our knowledge, that GMOs are safe. Thus, people who oppose GMOs are irrational; if only they understood the science better, they would accept GMOs. Reference is frequently made to results from Eurobarometer surveys in order to support this view; in particular that ‘70% of the population thinks that ordinary tomatoes do not contain genes, whereas genetically engineered tomatoes do’ ([Hoban, 1998](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1083956/#kve142c7); [Marchant, 2001](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1083956/#kve142c8)).

**PABE findings:** indeed, understanding the nature of genetic modification, although varied between individuals and countries, was often rather limited. In particular, participants tended to be unsure about the technical distinction between conventional breeding methods and recombinant DNA techniques. But this would be better described as a lack of knowledge, rather than firmly held false beliefs about this technology. Participants were conscious of this technical ignorance, and admitted it readily. More importantly, the principal concerns expressed about GMOs were not based on erroneous information and would, therefore, not be addressed by more science education. Thus, even if we could wave a magic wand and create a world tomorrow where all citizens knew that all tomatoes contain genes, the basic questions (in sidebar) would remain unanswered, and the controversy would be unlikely to abate. Indeed, there is evidence that more knowledge about GMOs makes people more sceptical or polarised, not less ([Martin and Tait, 1992](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1083956/#kve142c9); [Gaskell *et al*., 1998](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1083956/#kve142c3)).

**Myth 3: people are obsessed with the idea that GMOs are ‘unnatural’**

According to this myth, members of the public are concerned about GMOs because they think that genetic modification is ‘unnatural’. They do not realise that humans, through breeding, have been manipulating the genetic makeup of crops and farm animals for 10 000 years.

**PABE findings:** GMOs were indeed frequently characterised as ‘unnatural’ by focus group participants. They expressed the feeling that directly modifying the genome was qualitatively different from any previously used technique. A common viewpoint was that we have previously only been crossing already existing organisms, while we are now also creating novel life-forms that would not have existed otherwise. Thus, genetic engineering techniques were described as ‘pushing Nature beyond its limits’, and were thought to ‘upset the equilibrium of Nature’. This was related to the idea that scientists do not know or understand the full extent of their work, and cannot anticipate the long-term consequences of their actions on ecosystems, human health and social relations. It was in this sense that participants spoke of ‘playing God’, describing those involved in the creation and management of GMOs as ‘sorcerers’ apprentices’.

Furthermore—and contrary to popular belief—many of the concerns expressed about GMOs, including those about ‘unnaturalness’, were also expressed in relation to other agricultural innovations, such as the use of pesticides, animal-derived animal feed and antibiotics in animal feed. Participants felt that such developments were driven by the need or desire for increased productivity, regardless of health and environmental considerations, thus leading to uniform and tasteless food. The concept of organic agriculture was perceived as reversing or opposing this development, whereas GMOs were perceived as the ultimate incarnation of this trend.

**Myth 4: agricultural versus medical use of GMOs**

According to this myth, people are concerned about the use of GMOs in agriculture, but not about their use for the production of pharmaceuticals. The underlying argument is that people only accept new products or technologies when they are perceived to provide direct personal benefits. Thus, people can see direct benefits of medical GMOs, whereas for agricultural GMOs—at least for those produced so far—consumers do not detect any personal advantage. Following this logic, proponents and opponents of GMOs believe that if the ‘next generation’ of agricultural GMOs provide direct benefits for consumers, public acceptance will increase.

**PABE findings:** participants did make a distinction between food and medical applications of GMOs, and were, on the whole, more willing to accept the latter. The perceived benefits associated with medical applications provided a clear argument in their favour. But this was not the only or even the dominant argument.

Rather, those questioned felt that matters of choice, transparency and information are very differently treated in the two sectors. Indeed, drugs were seen as typically being taken upon consultation with a doctor, who explains the pros and cons of the prescription, and patients are supplied with extensive safety notices detailing any potential side-effects. Furthermore, this information is adapted to the particular individual who can decide whether he or she will take the medicine. In addition, participants were aware that medicines are rigorously tested prior to commercialisation and monitored even after approval. In this context, thalidomide was frequently cited as a positive example demonstrating that a product can be withdrawn when harmful effects occur, despite prior testing.

In addition to these arguments, a dominant theme was that medicines are administered to a small, targeted portion of the population who need it at a precise point in time and for a particular defined period. This was contrasted with food, which everybody has to eat, including vulnerable people, such as the very young, old, or those with allergies.

**Myth 5: BSE ‘amalgam’**

According to this myth, virulent reactions against GMOs are due to an unfortunate series of previous and ongoing food scandals in Europe. People have been ‘over-sensitised’ and now react in a disproportionate and irrational way to any new story about food risks, however small. An extreme version of this myth argues that people erroneously amalgamate BSE with GMOs: they do not understand the science well enough to understand that there is no link between the two, since prions contain no DNA.

**PABE findings:** the focus group participants indeed linked GMOs to other ‘affairs’—most notably BSE. Food-related scandals, such as Coca-Cola contamination, dioxins in animal feed and the use of pesticides, were often cited. But the association between such ‘affairs’ was not based on confusion about the biological processes involved but rather on the daily encounters participants had with the institutions involved (see list of lessons). From their own personal experience about human fallibility and previous institutional failures, they felt that corruption, fraud and lack of resources is nothing unusual within control authorities.

**Myth 6: demand for ‘zero risk’**

According to this myth, people demand ‘zero risk’, which is not realistic as we all face risks in our daily activities. If we had applied a zero risk policy in the past, we would not have developed technologies such as the steam engine, electricity or the motorcar.

**PABE findings:** focus group participants never demanded ‘zero risk’. They were perfectly aware that their lives are full of risks that need to be counter-balanced against each other and against the potential benefits. Rather than zero risk, what they demanded was a more realistic assessment of risks by regulatory authorities and GMO producers. The participants found expert statements—asserting that there are no risks—disconcerting and untrustworthy.

**Myth 7: selfish about the Third World**

According to this myth, people do not realise that GMOs can improve food production in developing countries. It is selfish for citizens in First World countries to block technologies that could benefit people in the Third World ([Herrera-Estrella and Alvarez-Morales, 2001](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1083956/#kve142c6)).

**PABE findings:** in general participants were aware of the argument that agricultural GMOs could perhaps improve living conditions in developing countries, but they tended to be sceptical as to whether such research would ever be carried out. They believed that it is a hypocritical argument put forward by companies producing GMOs: people felt that if that was the main benefit associated with agricultural GMOs, why is Europe, with its over-production of food, being ‘flooded’ with GMOs from the USA? They also believed that development of GM crops for Third World countries could be better achieved through public-funded research institutions; yet current research is dominated by private companies.

**Human Cloning**

Animal cloning has produced some remarkable results within the last few years, which has suggested to some that there should be a way to produce a human clone within the next year. Many news articles have appeared recently highlighting the potential to clone a human baby in order to replace a loved one who died as a newborn.

Many social, moral, and ethical arguments have been raised in opposition to copying a person. For more details see [AMA's 1999 CEJA Report: The Ethics of Cloning](http://www.ama-assn.org/resources/doc/ethics/x-pub/report98.pdf) (PDF, 41KB). But perhaps more important is the concern that we do not fully understand the science behind the successes from animal cloning experiments.

**Animal cloning success (and failure)**  
Dolly, the sheep, was the first successfully cloned mammal (I. Wilmut et al., Nature 1997;385:810). Since 1997, gradual improvements in cloning technology have enabled researchers to generate mouse, cattle, goat, pig, deer, rabbit, cat, mule, and horse clones. While there have been no substantiated evidence for the cloning of humans, recent successes by South Korean researchers in generating stem cells from cloned human embryos (WS Hwang et al., Science 2005) have heightened concerns that this scenario is not beyond the realm of possibility.

In spite of recent technological advances, animal cloning remains extremely inefficient. For every 100 experiments only one, two, or if lucky, perhaps three appear to produce a viable offspring in surrogate mothers. While scientific explanations for these failures remain to be defined, many researchers feel they represent nothing more than technical hurdles that will one day be solved. Even then it's survival beyond the perinatal period is unlikely. These is no reason to believe that any different outcomes will occur if and when human cloning begins.

**A quick lesson in cloning technology**Before going into the details of why these abnormalities are thought to occur, it is important to have a basic understanding of what in essence happens in order to clone an animal. First, a donor cell is found, which has its original DNA extracted and discarded. Next is the addition of a nucleus from the desired animal that is to be cloned. The third step involves implanting the combined cell into the animal that the donor cell was appropriated from.

**Understanding the abnormalities**This part of the puzzle is as yet unsolved, but theories do point us in some tangible directions. Scientists believe that the resultant cloning abnormalities are not traceable to the donor nuclei, but more likely explanations involve failures in genomic reprogramming.

Genomic reprogramming in the natural way prior to embryogenesis (i.e., without cloning technology) involves a stage of development of the sperm and the egg known as gametogenesis, which can take months to years to develop a mature gamete. This process is sped up during cloning, and takes only minutes to hours. The process of configuring the exact state of the inner workings of the cell including such complex processes as methylation of the DNA may not be correct for the development of the embryo.

Methylation of DNA and other complex functions are now known to be essential to the correct functioning of each human cell, since they ultimately control gene expression. And thus successful cloning may be dependent upon the donated DNA being correctly altered to the state of an early embryo. It is thought by some cloning experts that failure of the nuclear clones to produce viable offspring is due to inappropriate reprogramming of cells, which leads to unregulated gene expression.

**Screening tools, do they exist?**Because of experience with animal clones, it is reasonable to conclude that future human cloning experiments will have the same high failure rates. The public has heard reassurance that the possibility of performing prenatal genetic screening exists as a way to control quality. If these groups plan on using current routine prenatal diagnosis for the detection of chromosomal and/or other genetic abnormalities, they will not detect the types of epigenetic disturbances that may occur with cloning. There are no extra tools in the developmental pipeline to help improve detection.

**Possible reaction to human cloning failures**  
Besides the public outrage that would accompany human cloning failures would in turn hinder science and genetics, research in areas such as embryonic stem cells for the repair of organs and tissues could be negatively impacted. Research is ongoing to develop reprogramming of certain cells to turn into specific tissues types, which could regenerate nerve, muscle, and other cell types, alleviating Parkinson's, Alzheimer's, and heart disease among other chronic illnesses. The potential benefits of therapeutic cell cloning are enormous, and this research should not be jeopardized with human cloning activities.

**Legislation**Since early 1997 the United States National Bioethics Advisory Commission (NBAC) has been looking at the complex issues that surround this controversial subject. NBAC reached a conclusion in 1997, when it reported back to (Former) President Clinton, that a moratorium on human cloning would be advisable. The moratorium, which is supported by the AMA, suggests that no Federal funds be allocated for human cloning.

Senator Ben Campbell (R-Co) offered a bill (April, 2001) in the Senate to bar human cloning, which will ban any attempts to clone humans, regardless of whether government or private funds are used to finance the research. If this law is violated, the penalty would be up to ten years in jail and a fine of up to $10 million. An accompanying House bill has been introduced (H.R. 1260) by Rep. Brian Kerns (R-In). White House officials have indicated that President Bush would support legislation outlawing human cloning.  
  
**This article is not intended to be viewed as support by the AMA of these bills.**

Human Cloning. American Medical Association. (n.d.). Retrieved July 9, 2014, from http://www.ama-assn.org/ama/pub/physician-resources/medical-science/genetics-molecular-medicine/related-policy-topics/stem-cell-research/human-cloning.page

Are Scientists Playing God? It Depends on Your Religion

Now that biologists in Oregon have [reported](http://www.nytimes.com/2007/11/15/science/15primate.html) using cloning to produce a monkey embryo and extract [stem cells](http://topics.nytimes.com/top/news/health/diseasesconditionsandhealthtopics/stemcells/index.html?inline=nyt-classifier), it looks more plausible than before that a human embryo will be cloned and that, some day, a cloned human will be born. But not necessarily on this side of the Pacific.

American and European researchers have made most of the progress so far in biotechnology. Yet they still face one very large obstacle — God, as defined by some Western religions.

While critics on the right and the left fret about the morality of stem-cell research and genetic engineering, prominent Western scientists have been going to Asia, like the geneticists Nancy Jenkins and Neal Copeland, who left the [National Cancer Institute](http://topics.nytimes.com/top/reference/timestopics/organizations/n/national_cancer_institute/index.html?inline=nyt-org) and moved last year to Singapore.

Asia offers researchers new labs, fewer restrictions and a different view of divinity and the afterlife. In South Korea, when [Hwang Woo Suk](http://topics.nytimes.com/top/reference/timestopics/people/h/hwang_woo_suk/index.html?inline=nyt-per) reported creating human embryonic stem cells through cloning, he did not apologize for offending religious taboos. He justified cloning by citing his Buddhist belief in recycling life through reincarnation.

When Dr. Hwang’s claim was exposed as a fraud, his research was supported by the head of South Korea’s largest Buddhist order, the Rev. Ji Kwan. The monk said research with embryos was in accord with Buddha’s precepts and urged Korean scientists not to be guided by Western ethics.

“Asian religions worry less than Western religions that biotechnology is about ‘playing God,’” says Cynthia Fox, the author of “[Cell of Cells](http://www.wwnorton.com/catalog/fall06/005877.htm),” a book about the global race among stem-cell researchers. “Therapeutic cloning in particular jibes well with the Buddhist and Hindu ideas of reincarnation.”

You can see this East-West divide in maps drawn up by Lee M. Silver, a molecular biologist at Princeton. Dr. Silver, who analyzes clashes of spirituality and science in his book “[Challenging Nature](http://www.leemsilver.net/challenging/top/biosketch.htm),” has been charting biotechnology policies around the world and trying to make spiritual sense of who’s afraid of what.

Most of southern and eastern Asia displays relatively little opposition to either cloned embryonic stem-cell research or genetically modified crops. China, India, Singapore and other countries have enacted laws supporting embryo cloning for medical research (sometimes called therapeutic cloning, as opposed to reproductive cloning intended to recreate an entire human being). Genetically modified crops are grown in China, India and elsewhere.

In Europe, though, genetically modified crops are taboo. Cloning human embryos for research has been legally supported in England and several other countries, but it is banned in more than a dozen others, including France and Germany.

In North and South America, genetically altered crops are widely used. But embryo cloning for research has been banned in most countries, including Brazil, Canada and Mexico. It has not been banned nationally in the United States, but the research is ineligible for federal financing, and some states have outlawed it.

Dr. Silver explains these patterns by dividing spiritual believers into three broad categories. The first, traditional Christians, predominate in the Western Hemisphere and some European countries. The second, which he calls post-Christians, are concentrated in other European countries and parts of North America, especially along the coasts. The third group are followers of Eastern religions.

“Most people in Hindu and Buddhist countries,” Dr. Silver says, “have a root tradition in which there is no single creator God. Instead, there may be no gods or many gods, and there is no master plan for the universe. Instead, spirits are eternal and individual virtue — karma — determines what happens to your spirit in your next life. With some exceptions, this view generally allows the acceptance of both embryo research to support life and genetically modified crops.”

By contrast, in the Judeo-Christian tradition, God is the master creator who gives out new souls to each individual human being and gives humans “dominion” over soul-less plants and animals. To traditional Christians who consider an embryo to be a human being with a soul, it is wrong for scientists to use cloning to create human embryos or to destroy embryos in the course of research.

But there is no such taboo against humans’ applying cloning and genetic engineering to “lower” animals and plants. As a result, Dr. Silver says, cloned animals and genetically modified crops have not become a source of major controversy for traditional Christians. Post-Christians are more worried about the flora and fauna.

“Many Europeans, as well as leftists in America,” Dr. Silver says, “have rejected the traditional Christian God and replaced it with a post-Christian goddess of Mother Nature and a modified Christian eschatology. It isn’t a coherent belief system. It might or might not incorporate New Age thinking. But deep down, there’s a view that humans shouldn’t be tampering with the natural world.”

Hence the opposition to genetically modified food.

Because post-Christians do not necessarily share the biblical view of an omnipotent deity with the sole power to create souls, Dr. Silver says, they are less worried about scientists “playing God” in the laboratory with embryos. In places like California, residents have voted not only to allow embryo cloning for research, but also to finance it.

But sometimes the reverence for the natural world extends to embryos, leading to unlikely alliances. When conservative intellectuals like Francis Fukuyama campaigned for Congress to ban embryo cloning, some environmental activists like Jeremy Rifkin joined them. A Green Party leader in Germany, Voker Beck, referred to cloned embryonic stem-cell research as “veiled cannibalism.”

Of course, many critics of biotechnology do not explicitly use religious dogma to justify their opposition. Countries like the United States, after all, are supposed to be guided by secular constitutions, not sectarian creeds. So opponents of genetically modified foods focus on the possible dangers to ecosystems and human health, and committees of scientists try to resolve the debate by conducting risk analysis.

The outcome hinges more on beliefs than on scientific data. A study finding that genetically modified foods are safe might reassure traditional Christians in Kansas, but it won’t stop post-Christians in Stockholm from worrying about “Frankenfood.”

Similarly, some leading opponents of embryo research for cloning, like Leon Kass, say they are defending not Judeo-Christian beliefs, but “human dignity.” Dr. Kass, former chairman of the President’s Council on Bioethics, says the special status of humans described in the Book of Genesis should be heeded not because of the Bible’s authority, but because the message reflects a “[cosmological truth](http://www.manhattan-institute.org/html/wl2007.htm).”

It is not so easy, though, to defend supposedly self-evident truths about human nature that are not evident to a large portion of humanity. Conservatives in the House of Representatives managed to pass a bill banning Americans from going overseas for stem-cell treatments derived through embryo cloning. But the bill didn’t pass the Senate.

It is by no means certain that this type of stem-cell research will ever yield treatments for diseases like [Parkinson’s](http://health.nytimes.com/health/guides/disease/parkinsons-disease/overview.html?inline=nyt-classifier), but should that happen, it is hard to see how any Congress — or any law — could stop people from seeking cures.

The prospect of cloning children is much more distant, particularly now that researchers are becoming optimistic about obtaining stem cells without using embryos. For now, scientists throughout the world say they do not even want to contemplate reproductive cloning because of the risks to the child. And public-opinion polls do not show much support for it anywhere.

Even if human cloning becomes safe, there may never be much demand for it, because most people will prefer having children the old-fashioned way.

But some people may desperately want a cloned child — perhaps to replace one who died or to provide lifesaving bone marrow for a sibling — and won’t be dissuaded, no matter how many Christians or post-Christians try to stop them. To reach this frontier, they may just go east.

Correction: November 23, 2007

The Findings column in Science Times on Tuesday, about the different views of biotechnology in Eastern and Western religions, misspelled the surname of a political economist and author who has lobbied Congress to ban embryo cloning. He is Francis Fukuyama, not Fukyama

Tierney, J. (2007, November 1). Are Scientists Playing God? It depends on your religion.. *New York Times*.

Is Animal Cloning Ethical?

With the arrival of Little Nicky, a kitten cloned to duplicate a Dallas woman's deceased pet, [animal cloning](http://www.sfgate.com/?controllerName=search&action=search&channel=opinion%2Fopenforum&search=1&inlineLink=1&query=%22Animal+Cloning%22) has moved from closed-door laboratories to commercial application. The $50,000 feline was delivered by Genetic Savings & Clone, the playfully named company catering to particularly devoted pet owners.

While the intentions of the pet owners are understandable, the practice itself is rife with hazard and requires a decisive response from policy-makers. There are many practical problems with pet cloning, not the least of which is that the genetic duplicate may turn out to act, and even look, different from its forebear. Each creature -- shaped in part by life experience -- is more than an embodiment of his or her DNA. A cloned animal may look much the same and bring back happy memories for pet lovers, but the creature they are looking at is not the same animal.

More to the point, with millions of healthy and adoptable cats and dogs being killed each year for lack of suitable homes, it's a little frivolous to be cloning departed pets. The challenge is not to find new, absurdly expensive ways to create animals, but to curb the growth of pet populations and to foster an ethic in society that prompts people to adopt and shelter creatures in need of loving homes.

Pet cloning is simply not worth repeating. Behind this one little kitten are far grander schemes to clone animals for use in agriculture and research. Before such projects become the norm, we should pause and think carefully about where it is leading -- for animals and for humanity.

It was big news some years ago when scientists in Scotland announced the cloning of Dolly the sheep. This new technology marked a decisive moment in our ability to manipulate the natural world to suit our designs. Dolly has long since passed, afflicted by a lung disease that typically occurs in much older sheep. Since her dramatic birth -- and her pitiful decline -- scientists have turned out clones for mice, rabbits, goats, pigs, cows and now cats. Cloned horses and dogs, we are promised, are on the way. But behind every heralded success are hundreds of monstrous failures.

As all of this has unfolded, policy-makers have stood idly by, failing to place any restraints of law and ethics on corporations and scientists who are tinkering here with the most fundamental elements of biology. We hear indignation and expressions of well-founded concern about human cloning. But we hear hardly a word of doubt or moral concern about the idea of animal cloning, much less about the particular animals subjected to these experiments. It won't be long before biotech companies in the hire of agribusiness announce plans to sell commercial clones as food. Cloned ham, steak, and even drumsticks may be served at retail operations in the future, and there's no law to forbid the sale of meat or milk from clones produced in a laboratory.

Like pet cloning, the cloning of farm animals is monumentally unnecessary. Farmers are already producing so much meat that they must find export markets to turn a profit. As for milk, it's cheaper than bottled water. The dairy industry recently "culled" tens of thousands of healthy dairy cows in order to depress production.

Small farmers, already put at a disadvantage by mounting debt and mechanized competitors, will be further marginalized as cloning practices become commonplace. More than ever, they'll be at the mercy of corporate factory farms to purchase their supply of clones.

Consumers face threats of a different sort. Who knows if consuming meat and milk from clones is safe? A recent [Food and Drug Administration](http://www.sfgate.com/?controllerName=search&action=search&channel=opinion%2Fopenforum&search=1&inlineLink=1&query=%22Food+and+Drug+Administration%22) symposium addressed this issue, but the confident declarations that the animal products are safe didn't seem all that reassuring: Just one misstep could be catastrophic. With mad cow, foot-and-mouth, avian flu and other diseases now posing a greater threat in our globalized agricultural markets, the production of genetically identical animals would pose serious threats to food security. Genetic variation, already low from conventional breeding, would also be almost eliminated by cloning.

As for the animals in our factory farms, cloning is the final assault on their well-being and dignity. When the FDA held a public consultation on animal cloning in November 2003, researchers reported a graphic list of problems for clones and their surrogate mothers in cattle, pigs, sheep and goats -- a string of developmental abnormalities and a host of deaths before, during and after birth. The animals being cloned exhibit grievous problems, such as cows with grossly enlarged udders, major leg problems and other forms of lameness. And these are the very animals trumpeted as success stories.

Of the largest group of clones yet -- produced by Cyagra, which clones cattle -- few embryos survived to term, and of those that did, a third then died by the age of 1 year. The FDA's report, "Animal Cloning: A Risk Assessment" put a nice spin on this when it said that "the proportion of live, normal births appears to be increasing." In other words, the situation has improved from atrocious to very bad.

It is time for Congress and the FDA and other regulatory bodies to engage in the animal-cloning debate. Many of the ethical concerns raised by human cloning apply to this reckless disregard for the integrity of animal life. Should such questions be left entirely to scientists and corporations, since they have an intellectual and commercial stake in these projects? Our government alone can stand up for the public interest in preventing this cruelty.

Cloning is a startling procedure, to be sure, and many scientists would have us view it as some inevitable stage in our technological development. But humanity's progress is not always defined by scientific innovation alone. Cloning -- both human and animal -- is one of those cases in which progress is defined by the exercise of wisdom and of self-restraint

FDA: Cloned Meat Safe to Eat

Meat and milk from cloned animals is as safe as that from their counterparts bred the old-fashioned way, the U.S. Food and Drug Administration said Tuesday.  
  
The decision removes the last U.S. regulatory hurdle to marketing products from cloned cows, pigs and goats, and puts the FDA in concert with recent safety assessments from European food regulators and several other nations.  
  
"The data show that healthy adult clones are virtually indistinguishable" from their counterparts, concludes FDA's 900-plus page safety report.  
  
But for economic reasons, it will be years before many foods from cloned animals reach store shelves. At $10,000 to $20,000 per animal, they are a lot more expensive than ordinary cows. That means producers likely will us clones' offspring for meat, not the clones themselves.  
  
In addition, several large food companies - including dairy giant Dean Foods Co. and Hormel Foods Corp. - have said they have no plans to sell milk or meat from cloned animals, because of consumer anxiety about the technology.  
  
With FDA's ruling, "If you ask what's for dinner, it means just about anything you can cook up in a laboratory," said Carol Tucker-Foreman of the Consumer Federation of America, who pledged to push for more food producers to shun cloned animals.  
  
The two main U.S. cloning companies, Viagen Inc. and Trans Ova Genetics, already have produced more than 600 cloned animals for U.S. breeders, including copies of prize-winning cows and rodeo bulls.  
  
"We certainly are pleased," said Trans Ova President David Faber, who noted that previous reports by the National Academy of Sciences and others have reached the same conclusion.  
  
"Our farmer and rancher clients are pleased because it provided them with another reproductive tool," he added.  
  
Food producers have voluntarily withheld cloned animals from the market pending FDA's decision, and it was not immediately clear Tuesday if that moratorium was ending immediately - or if other government agencies must weigh in first.  
  
The ruling was long-expected - and mirrors FDA's initial safety assessment back in 2003 - but highly controversial nonetheless. Debate has been fierce within the Bush administration as to whether the FDA should move forward, largely because of trade concerns. Consumer advocates petitioned against the move, and Congress had passed legislation urging the FDA to study the economic ramifications before moving ahead.  
  
It was a day forecast since 1997, when Scottish scientists announced they had successfully cloned Dolly the sheep. Ironically, sheep are not on the list of FDA's approved cloned animals; the agency said there was not as much data about their safety as about cows, pigs and goats.  
  
By its very definition, a successfully cloned animal should be no different from the original animal whose DNA was used to create it.  
  
But the technology hasn't been perfected - and many attempts at livestock cloning still end in fatal birth defects or with deformed fetuses dying in the womb. Moreover, Dolly was euthanized in 2003, well short of her normal lifespan, because of a lung disease that raised questions about how cloned animals will age.  
  
The FDA's report acknowledges that, "Currently, it is not possible to draw any conclusions regarding the longevity of livestock clones or possible long-term health consequences" for the animal.  
  
But the agency concluded that cloned animals that are born healthy are no different from their non-cloned counterparts, and go on to reproduce normally as well.  
  
"The FDA says, 'We assume all the unhealthy animals will be taken out of the food supply,"' said Joseph Mendelson of the Center for Food Safety, a consumer advocacy group that opposes FDA's ruling. "They're only looking at the small slice of cloned animals that appear to be healthy. ... It needs a lot further study."

Text Comparison Worksheet

Thoroughly read the two texts. As a group, determine which will be Text A and which will be text B. Remember: You should work together but split the task of writing equally. I’ll be looking for everyone’s handwriting!

1. Describe the tone of Text A. How do specific words or devices create this tone?
2. Describe the tone of Text B. How do specific words or devices create this tone?
3. In 2-3 sentences, describe how the purpose of the articles is similar or different.
4. Is one text more convincing than the other? Explain with specific textual examples.
5. Does one text display more bias than the other? Explain with specific textual examples.
6. Fill in the following chart to describe particular pieces of language in each text and their effects.

|  |  |  |  |
| --- | --- | --- | --- |
| Text A | | Text B | |
| Language | Effect | Language | Effect |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. Imagine you and your group are the editing team of a journal and these two texts are up for publication. It’s your job to publish the best writing regardless of your personal feelings towards the subject. Will you publish one, both, or neither texts? Decide as a team!

Notes on Teaching *Brave New World* and *GATTACA*

Chapter 1 of Brave New World introduces readers to a dystopian future in which all humans are genetically engineered, classically conditioned, and then drugged into a life of complacency and vapid happiness. The following are some questions you may consider to prompt students.

1. What do we know about the character of Lena? In what ways does she seem similar and different to the other characters?
2. How does Huxley expect readers to react to “The Center”? How do you know? How is this different from how characters in the novel react?
3. Assuming the technology could be possible, what would be some potential benefits to handling human reproduction in this way? What are some drawbacks? What are the ethical issues?
4. Why are children retained at the center after their birth? Consider the effects of this practice for the individual and society.
5. As a society we believe that children need love to thrive. What do you think someone who works at The Center would say about this idea?

GATTACA is a film that also takes place in a dystopian future in which genetic engineering has created a de-facto caste system: the children of the wealthy are genetically manipulated to be beautiful, intelligent, strong, and incredibly healthy. People who are born the “unnatural” way are segregated into an underclass and presumed incapable and inferior to the genetically engineered population. A clip of the film can be found at the following link: <http://www.wingclips.com/movie-clips/gattaca/genetically-engineered-birth>

Here are some questions that can prompt students in their discussion groups:

1. Why does Vincent’s father change his son’s name shortly after his birth?
2. Why do you think Vincent’s parents decide to have a genetically engineered “perfect” child?
3. What kind of language does the geneticist use when discussing Marie and Anton’s engineered children? What does this tell you about the value he places on them?
4. How do Marie and Anton differ in their expectations about genetic engineering? Who do you agree with more?
5. Do you agree with the geneticist when he says: “This child is still you, simply the best of you”? Why or why not?

Rhetorical Analysis: Fictional Texts

*Gattaca*

What, at first glance, do you think the purpose of this text is?

Pick 2 of the following elements, quote where it appears in the text, and explain how it is being used to further the purpose: figurative language, mood, tone, symbolism, loaded language, diction, pacing, cadence, imagery, framing, irony.

|  |  |  |
| --- | --- | --- |
| Element | Example | Purpose |
|  |  |  |
|  |  |  |

Do you think that this text is effective at communicating its purpose? Explain.

*Brave New World*

1. What, at first glance, do you think the purpose of this text is?

Pick 2 of the following elements, quote where it appears in the text, and explain how it is being used to further the purpose: figurative language, mood, tone, symbolism, loaded language, diction, pacing, cadence, imagery, framing, irony.

|  |  |  |
| --- | --- | --- |
| Element | Example | Purpose |
|  |  |  |
|  |  |  |

Do you think that this text is effective at communicating its purpose? Explain.

Advertising Your Start Up!

Now that we’ve learned how authors use rhetoric to communicate their purpose regarding genetic research, you are going to do the same with the start-up that you’ve been designing in Biology class! For your project, you must produce

* An eye-catching effective advertisement (print or digital) that communicates the purpose of your start up
* A 1 paragraph rhetorical analysis in which you discuss 3 devices that you used to make your ad effective. You should look back at our conversation on fictional texts to see what elements to include

Use the following worksheet to help you brainstorm and draft your project. **A mock-up of your ad and notes on your rhetorical analysis are due by the end of class today!**

What is the purpose of your start up? How can you communicate that purpose in an eye-catching advertisement?

What elements will your advertisement include? On a separate sheet of paper, sketch out your ideas (“mock-up”) of what your ad might look like. Remember to include the devices that you listed above as you draft.

In addition, you be present your start-up and ad at this year’s International Festival! You will be evaluated on the IB Language and Literature HL/SL Further Oral Activities Assessment Chart (next page). All students in a group will receive the same grade on this assignment. For the purposes of this assignment…

Criterion A measures your depth of knowledge on the topic of your choice and how you communicated that knowledge in your advertisement

Criterion B measures your understanding of how language is used to communicate your purpose in your advertisement (your rhetorical analysis)

Criterion C measures how well you worked with others to organize your presentations

Criterion D measures how well you were able to communicate your ideas in your presentation

**Criterion A: Knowledge and understanding of the text(s) and subject matter or extract**

0 The work does not reach a standard described by the descriptors below.

1–2 The activity shows limited knowledge and little or no understanding of the text(s) and the subject chosen.

3–4 The activity shows some knowledge and understanding of the text(s) and some awareness of the significance of the text(s) in relation to the subject chosen.

5–6 The activity shows adequate knowledge and understanding of the text(s) and awareness of the significance of the text(s) in relation to the subject chosen.

7–8 The activity shows good knowledge and understanding of the text(s) and good awareness of the significance of the text(s) in relation to the subject chosen.

9–10 The activity shows excellent knowledge and understanding of the text(s) and excellent awareness of the significance of the text(s) in relation to the subject chosen.

**Criterion B: Understanding of how language is used**

0 The work does not reach a standard described by the descriptors below.

1–2 The work shows a superficial understanding of the way language is used to create meaning; there is little appreciation of the use of language and style.

3–4 The work shows some understanding of the way language is used to create meaning; there is some appreciation of the use of language and style.

5–6 The work shows an adequate understanding of the way language is used to create meaning and adequate appreciation of the use of language and style.

7–8 The work shows a good understanding of the way language is used to create meaning and good appreciation of the use of language and style.

9–10 The work shows an excellent understanding of the way language is used to create meaning. The appreciation of the use of language and style is thorough and detailed.

**Criterion C: Organization**

0 The work does not reach a standard described by the descriptors below.

1 Little organization is apparent; the oral activity has little structure.

2 Some organization is apparent; the oral activity has some structure.

3 The oral activity is organized; the structure is generally coherent.

4 The oral activity is well organized; the structure is mostly coherent.

5 The oral activity is effectively organized; the structure is coherent and effective.

**Criterion D: Language**

0 The work does not reach a standard described by the descriptors below.

1 The language is rarely clear and appropriate, with many errors in grammar and sentence construction and little sense of register and style.

2 The language is sometimes clear and appropriate; grammar and sentence construction are generally accurate, although errors and inconsistencies are apparent; register and style are to some extent appropriate to the oral activity.

3 The language is mostly clear and appropriate, with an adequate degree of accuracy in grammar and sentence construction; the register and style are mostly appropriate to the oral activity.

4 The language is clear and appropriate, with a good degree of accuracy in grammar and sentence construction; register and style are effective and appropriate to the oral activity.

5 The language is very clear and entirely appropriate, with a high degree of accuracy in grammar and sentence construction; the register and style are consistently effective and appropriate to the oral activity.

Journal Check Rubric

Before journals are due, you should staple this form to the entry in your journal that you would like graded. You should pick the entry that best fits the following criteria:

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Evidence | Analysis | Language |
| 5 Response clearly and specifically addresses to the question(s) asked. Response is focused and completely relevant. | 5 Response draws on at least 2 specific, relevant pieces of evidence from the text to support the answer. Evidence is quoted (or specifically identified for visual evidence) and effectively integrated fully into your own sentences. | 5 Response to question is clearly and completely explained. Entry includes specific justification of how and why you arrived at your answer. Analysis portion shows great thoughtfulness and a learning stretch. | 5 Response uses language that is completely appropriate, scholarly, and specific. Entry is free of fragments and run-ons. There are very few grammatical and spelling errors |
| 3 Response clearly answers the question(s) asked. Response is mostly focused and relevant. Entry could be improved with more specifics. | 3 Response draws on at least 2 specific pieces of evidence from the text to support the answer. Evidence is quoted (or specifically identified for visual evidence) and integrated into your own sentences. | 3 Response to question is mostly explained. Entry includes justification of how and/or why you arrived at your answer. Analysis portion shows thoughtfulness. Learning stretch may be lacking. | 3 Response uses language that is mostly appropriate, scholarly, and specific. Entry is free of fragments and run-ons. There are some grammatical and spelling errors. |
| 1 Response attempts to address the question(s) asked. Response has some focus and specifics. Entry is irrelevant at times. | 1 Response draws on fewer than 2 pieces of evidence from the text. Evidence is “plopped down” in response and/or improperly integrated. | 1 Response to question is somewhat explained. Entry is missing justification of how and/or why you arrived at your answer. Analysis portion lacks thoughtfulness. No learning stretch. | 1 Response uses language at is sometimes appropriate, scholarly, and specific. Entry contains fragments and/or run-ons. There are many grammatical and spelling errors. |

Your score: \_\_\_\_\_\_\_\_\_\_\_\_\_/20 Comments:

**Think about using a……Rhetorical Précis**

*A rhetorical précis differs from a summary in that it is a less neutral, more analytical condensation of both the content and method of the original text. If you think of a summary as primarily a brief representation of what a text says, then you might think of the rhetorical précis as a brief representation of what a text both says and does. Although less common than a summary, a rhetorical précis is a particularly useful way to sum up your understanding of how a text works rhetorically*

|  |
| --- |
| **The Rhetorical Précis Format**  **a)** In a single coherent sentence give the following:            -name of the author, title of the work, date in parenthesis;            -a rhetorically accurate verb (such as "assert," "argue," "deny," "refute," "prove," disprove," "explain," etc.);            -a ***that*** clause containing the major claim (thesis statement) of the work.  **b)** In a single coherent sentence give an explanation of how the author develops and supports the major claim (thesis statement).  **c)** In a single coherent sentence give a statement of the author's purpose, followed by an "in order" phrase.  **d)** In a single coherent sentence give a description of the intended audience and/or the relationship the author establishes with the audience. |

**Rhetorical Précis Sentence Starters:**

***\*PART One (What?)***

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

**(Author)**  **(A)**  **(Title)**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(B)**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***\*PART Two (How?)***

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ supports his/her \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(Author’s Last Name)** **(B)** **(C)**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***\*PART Three (Why?)***

The author’s purpose is to\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(D)**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in order to / so that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The author writes in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_tone for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(E)**  **(audience)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A** | **B** | **C** | **D** | **E** |
| article,  book review,  essay,  column,  editorial | argues, argument,  asserts, assertion,  suggests, suggestion,  claims, questions,  explains, explanation | comparing, contrasting  telling, explaining,  illustrating, demonstrating,  defining, describing,  listing | show  point out  suggest  inform  persuade  convince | formal  informal  sarcastic  humorous  contemptuous |

**1)** In the article “End Homework Now” (2001), Etta Kralovec and John Buell claim that the practice of assigning homework is not an effective teaching method because its negative effects outweigh its benefits. **2)**Kralovec and Buell support their claims by providing examples of how homework disrupts families, overburdens children and limits learning and by dispelling myths about the benefits of homework and providing alternative practices that would lead to improvement in student achievement. **3)**The authors’ purpose is to make the reader question a practice that is a trademark of the U.S. education system and decide whether it is conducive to creating a “smarter” student. They seem to be speaking to the entire educational community: administrators, teachers, students and parents.

**FIIDDS & SPARSE for Rhetorical Analysis**

**S**peaker: Who is the author? When and where did the author write and how might this influence the argument? What are the author’s beliefs or values? What is the author’s **exigence**?

**P**urpose: What critical information does the writer want to communicate? What is the intended result or call to action?

**A**ppeals to a specific **A**udience: What groups or individuals is the author addressing? How are the specific appeals (ethos, logos, pathos) used to persuade the audience?

**R**hetoric: How are reasons and evidence presented in a deliberate structure? How does the author use any of the following to structure the argument?

* Claim, data, **concession, assertion, antithesis, fallacies, analogy, over/understatement, rhetorical question,** examples, **anecdote,** cause/effect, **direct address**

**S**tyle (FIIDDS): How does the author use any of the following to support the purpose or effect the audience?

* **F**igurative language (simile, metaphor, paradox, etc.), **I**magery, **I**rony, **D**etail, **D**iction, **S**yntax

**E**nd result: How do the audience’s beliefs and values shape the meaning or message of the text? What tone is created? Does the tone contribute to the purpose or detract from it? Is the text persuasive?

*When using this outline, you DO NOT have to address every question or item for every text. This is a tool for helping you think more deeply and critically about the texts we study.*