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| **Title** | **Evaluating Media Bias in GM Forestry** |
| **Introduction** | All media is biased, especially environmentally themed news articles. Students can look at the same news story via two different outlets and get very different results. It’s almost impossible to find an environmental news story that isn’t at least partially biased in some way. It is important for students to be able to identify the bias, and learn how to interpret an article that contains bias. Students will create biased images from environmental facts related to different aspects of genetic engineering and GM forestry, and will try to decipher each other’s images to get to the facts contained within them. |
| **Curriculum Alignment** | AP Environmental Science-  Competency Goal 7: The learner will build an understanding of environmental decision making.  Objective 7.02 Analyze cultural and ethical considerations regarding the environment; Environmental worldviews; Sustainable development.  NC Essential Standards  Bio.3.3.3- Evaluate some of the ethical issues surrounding the use of DNA technology (including cloning, genetically modified organisms, stem cell research, and Human Genome Project). |
| **Learning Outcomes** | During the activity:  Students will demonstrate thinking by creating “charged” images of different statistics related to genetic modification. They will use prior knowledge on what makes an image seem ‘safe’ or ‘scary’ or ‘dangerous’ and utilize them visually into an image that is meant to evoke a biased reaction.  End of activity:  Students will have completed the visuals and each one will evoke either a positive or negative bias for a specific statistic within genetic modification. The students [or student groups] will be able to explain how their image could be used in a biased way while still presenting a statistic. |
| **Time Required and Location** | There are two ways to complete this activity; if you have access to a large amount of technology and have students that are ‘tech-savvy’ you may elect to do this paperless, and have students create images on the computer and use projectors to show them. As an option for display, you may print the final images for a professional gallery display within the classroom. If you have students that work better by drawing, you may have them draw their images. The time required will be a combination of the different options; see chart below.   |  |  |  | | --- | --- | --- | |  | Tech-savvy [you have it, they can use it] | Low amount of technology available | | Introductory images | 5 minutes-  Display on projector- get student reactions | 5 minutes-  Print and place around classroom; have students  walk around to view; discuss as group | | Research statistics | 10-15 minutes [depending on technology]: Allow students to select a topic and allow them to research a reputable statistic; once chosen, assign a pos. or neg. ‘spin’ | 25 minutes- [may require a different day]  Go to computer lab and find a statistic  [allows for transportation of class to and from computer lab] | | Create visual images | 25 minutes-  students create propaganda images and text using computer programs | 15 minutes-  Students create propaganda images on paper  using art supplies | | Display for bias evaluation | 15 minutes-  Project images onto screen; present biased image for class | 10 minutes-  Display around room; walk around and evaluate for bias;  place into pos/neg categories | |  |  |  | | Total | 55-60 minutes | 55 minutes | |
| **Materials Needed** | See “teacher preparation” section for needs.  **Technology resources**  One of the options requires the extensive use of technology.   * A projector is needed to project images for the class to see * A set of computer with internet access and programs which allow students to create images   + If students have advanced graphic design knowledge with their own programs, such as Photoshop, they may bring in laptops at their own risk [it is not recommended as this presents a possible theft - issue within the school and liability issues for the teacher and school]. * Flash drive or shared network folder for students to save work   Other option [no/ low available technology] only requires printer and copier, and access to a computer lab. |
| **Participant Prior Knowledge** | Students should be familiar with the concept of bias. If students complete current event assignments with regularity, taking one of these and evaluating it for bias would be a great pre-activity. If you have not completed current events, just have students bring in articles or go through a local newspaper to find anything biased.  Extension to this- if you find one biased article, see if you can find the same information presented with a different bias elsewhere. This will show students how easy it can be to have bias, and how subtle it can be at times.  Example of Article Bias [non GMO but environmental]:   * The story: BP settles lawsuit stemming from the Gulf Oil Spill   + Fox News story: “BP Reached Pact to Resolve Claims Stemming from Deepwater Horizon Accident”     - <http://www.foxbusiness.com/news/2012/04/18/bp-reached-pact-to-resolve-claims-stemming-from-deepwater-horizon-accident/>   + CNN: “BP Announces Class Action Settlement in 2010 Gulf Oil Disaster”     - <http://www.cnn.com/2012/04/18/us/bp-spill-settlement/index.html?iref=allsearch>   + Both articles appeared on the same day and cover the same event; even looking at the wording indicates a bias [“Accident” vs. “Disaster”], as do images and tone of the article. * Other situations that can be researched:   + Drilling for oil in ANWR in Alaska   + Responsibility for cleanup at Love Canal in NY   + Responsibility for EQ Fire in Apex, NC   Fracking [Natural Gas Drilling] in local area |
| **Facilitator Preparations** | Tech-savvy option- [10 minutes]   * Secure computers with network access * Have either a single network ‘shared’ location to save images or a flash drive available for all students to save their images to when complete * Secure Projector for viewing   Less technology available- [15 minutes]   * List of statistics for students to use [see attachments]   + Make copies of statistics and cut into strips * Paper [posters, 8.5 x 11” computer paper works for this as well] * Art supplies [markers, crayons, tape, glue, construction paper, etc] * EC modification- one hour approximately to find local and current statistics for student groups that are EC |
| **Activities** | Exploration:  Present the students with the following images [links provided in Websites section]   * GM American Gothic * GMO corn * Super beef * Article title [pull current biased article if possible; otherwise use one of the ones listed]   + Drilling in ANWR to cover 2,000 acres of pristine wilderness habitat   + GM corn could be to blame for outbreak of toxin   + Franken-trees are on the rise: how GM technology is coming to a forest near you   + Chestnuts making a return thanks to new GM chestnut population * Corn sugar commercial [if you have access to a projector]   Get students to quickly write their reaction to the image before moving to the next. Allow students to form their own opinions without discussing in groups or as a class.  Go back to the images and discuss each. What about that image makes you think a certain way?  GM American Gothic-  Likely answers- what’s in the test tube, are all farmers really using chemicals, why did they need to do that, is it safe to eat, would I know the difference if I saw the crops  GMO Corn-  Likely answers- think of needles as dangerous; not sure what’s in it or what it will do to the corn; GMO corn is dangerous because you don’t know what’s in it; medicines are in needles so it must be something good that’s being added like a medicine  Super beef-  Likely answers- wow, that’s huge; wonder how it got to be that way; did they inject stuff into it to get it grow, is it more dangerous, would it taste the same, would it be safe to eat  Article title  Likely answers- vary based on article chosen  Corn Sugar commercial-  Likely answers- that doesn’t seem so bad; why have we heard different things, is this just a company that’s doing this kind of commercial, why do they feel the need to tell us this, it makes it to seem like sugar isn’t that bad at all  Content Information for Students:   * Review key vocabulary and check for student misconceptions. * Go over the following differences   + Genetically engineered- has had genetic material inserted into the host genome in a lab; faster process than genetic improvement but brings up some ethical issues related to potential unintended consequences   + Genetically improved- use of crossbreeding and selective breeding to produce offspring with desired traits and characteristics; can take longer to do since you have to wait for generation times, and the results are less ‘guaranteed’ in terms of achieving something specific, but the ‘low tech’ approach is less ethically challenged   + Transgenic organisms- contain genetic material from one species inserted into another species     - Examples-       * Potatoes have Bt toxin introduced to decrease pest damage       * Strawberries have fish genes inserted into them so that they are resistant to frost   + Current uses of GMO technology in forestry include:     - Chinese poplars     - Eucalyptus [cold tolerant]     - American Chestnut   + Student Input:     - What would you consider ‘acceptable’ uses of GMO technology? For medicine? For food? For ecosystem stability?     - Do you think GM technology should be used to help bring back species that have declined or been wiped out in local populations?     - What do you think the major concerns would be with regard to this technology? What arguments could be made on either side of the debate?       * Look through this list and have students justify their selections. Compare with “Topics of Concern” list and look for similarities. If students bring up additional valid concerns other than those listed below, feel free to use them for the activity.     Model System:  Give students a list of topics of issues of concern related to GM forestry- allow up to two groups per topic per class; flip a coin to determine if they will pursue a positive or a negative bias [if two groups, flip to determine which one gets positive and which one gets negative]  Topics of Concern:   * Potential cross pollination with natives * “super” diseases that will harm even more trees * Decreased genetic variability * Effects on wildlife- food sources, place in food chain, etc * Fear of uneducated public with regard to products made from GMOs  1. Students select a topic from those provided. 2. Find a statistic within that topic that you find relevant. 3. Flip a coin [teacher should do this for each group after they find their statistic] to determine if you will create a positive or a negative charged image. 4. Create a propaganda image [may contain pictures, text, etc] to convey your statistic. If you wish to alter the wording, replace it with accurate information.    1. Example- drilling in ANWR would take 2,000 acres, but that only accounts for 1% of the refuge. Replacing a larger number with a small one can convey a different message. 5. Write your statistic as well as your source on the back of your image. If this is being done on the computer, create an index card with your statistic, source, and briefly what your image looks like so that it can be identified.     Content Wrap-Up:  Students, as a group, will write a brief statement about their image and include at least 3 things they did to make their image convey the perspective they wanted it to take. Also, students will prepare a quick presentation to the group that incorporates their content.  **Guided Practice**  Students present their images to the class, if a projector is available for computer images. Otherwise, they can place around room and students can have walk around to each poster and examine closer, placing each image into either a positive or negative category on a piece of paper. As a group, discuss what makes each image convey that perspective. |
| **Assessment** | Students will reflect on their image and explain what makes the image subjective. They can utilize their notes from the ‘content wrap up’ section as well as class feedback to determine if they were successful in creating a charged image that evoked a particular response.  Optional extension- have students create two images for the same statistic so that they result in different responses.  Assessment Scoring:   * From teacher: 30%- look for accurate data, thorough reflection on what actually makes the image subjective; thoughts are organized and clear and coherent and group work is evident * From self-assessment- 30%- ask students to assess their own success on a scale of 1-15 on how well they think they were able to create a ‘charged’ image; this should be a group assessment that is accurately justified [justification for points received, what could have been done differently to get more points]. Give students automatically half of these points and examine their justification for the other half of the points.   Class feedback 40%- ask other students to give each group a 1-10 based on how well they feel that group presented their statistic in a way that made them think a certain thing. Average all of these together for the score for this portion. |
| **Critical Vocabulary** | Forestry Dictionary- Maryland Dept. of Natural Resources- <http://www.dnr.state.md.us/forests/gloss.html>  Bias- subjective viewpoint  Students may need to look up additional terms based on their topics chosen and relevant statistics  [www.dictionary.com](http://www.dictionary.com) is a great site and relatively comprehensive |
| **Modifications** | EC/ ESL students-   * Use initial images to provide explanation of how the images have been altered to make you think a certain way * Teacher can find statistics of local or current issues related to each of the topics instead of having students do research themselves [allow approximately one hour preparation time for this option] * This option does not require a different assessment   Less time option-  Have students find existing propaganda images that connect to their topic of concern. |
| **Alternative Assessments** | Less time modification-   * Students find their own images that are charged within their topic and reflect on what makes that image subjective. Student groups of up to three students each will provide a brief written assignment outlining at least three things that make that image subjective. Look for things such as: colors used, unfamiliar terms or technology, high numbers, low numbers, famous people, .org website names, angle of image; should also include a statement outlining how each of these components could have been used more objectively   Assessment Scoring:  Charged image-10 points  Citation for image- 5 points  Subjectivity components [what makes it subjective]- 75 points; 25 points each- 10 for identifying, 15 for thorough explanation  Statement about objectivity- 10 points |
| **References** | Super beef-  <http://1.bp.blogspot.com/_BawWBZ8XhsY/TVIgAaZUHOI/AAAAAAAAAE4/mvf2DF8drjw/s1600/Belgian+Blue+cow.jpg>  GMO American Gothic-  <http://www.popsci.com/files/imagecache/article_image_large/articles/amgen.jpg>  GMO Corn [link opens bitmap image in Paint]-  <http://www.freewebs.com/thefigtreeonline/GMO%20CORN.bmp>  Corn Sugar commercial-  [www.cornsugar.com](http://www.cornsugar.com) [two great commercials in the video gallery] |
| **Supplemental Information** | This can be made into a longer term project, done completely out of class, if you have really advanced students and not a lot of time [like an AP class]. Require images to be printed. Allow for several days to several weeks [depending on other work] to complete. |
| **Comments** | You can go a lot of different directions with this lesson. The inspiration for it came as I was browsing GM images for some research and came across the GMO Corn image used in the beginning of the lesson. I thought “wow, they’re really trying to send a message there.” Then I came across the GMO American Gothic picture, and decided that a lot of the bias out in the media seems to be negatively biased to GM technology. We always hear about dangers, and problems, and if something’s been modified we connect it to that without thinking about it. The hope behind this is that students can learn to detect bias in what they read so that they can decipher true meanings of articles by looking past the bias. |
| **Author Info** | Heather Earp teaches at West Johnston High School in Benson (Johnston County Schools), where she has been a member of the Science Department since 2003. She has taught numerous science courses including Biology, Honors Biology, Honors Anatomy and Physiology, Earth/ Environmental Science, Environmental Science, Honors Environmental Science, and Advanced Placement Environmental Science. She is a graduate of East Carolina University, where she was a NC Teaching Fellow, and holds a BS degree in Science Education with a concentration in Biology. She holds AP Certification in Environmental Science and K-12 AIG Certification. She has served as a College Board reader for the AP Environmental Science exam. This lesson was developed as part of the Kenan Fellows program through NC State University; Heather is studying Sustainable Forestry and the Use of Biotech Trees for Sustainability and Bioenergy. |