‘Altering Genes’ Research and Presentations

Lesson Overview
How genes are altered by Humans will include genetic engineering(recombinant DNA technology), GM organisms, medical & agricultural applications, cloning, and gene therapy. The process of how genes are altered will be included as well as any appropriate background knowledge to understand the process or the need for altering the gene. Evaluations of the risks and benefits of the process will be conducted and a position taken. The analysis of the ethics involved. One topic will be studied in depth by a student and will present that insight to their peers. They will hear topics presented and evaluate the content. Finally they will evaluate and select a stockholder’s position of a topic based on a peer’s presentation and justify it.

Curriculum Connections
Altering Genes would fit in the curriculum after basic genetic information has been taught and it is now time to see how that information applies to real world situations. It can be used to ‘test’ students understanding of the concepts as they will have to utilize them in their research and presentations. Some basic information they need to know is:

- DNA replication
- recombinant DNA
- Ethics
- Mitosis
- HGP
- Meiosis
- PRC
- protein synthesis
- Genetic Diseases

Objectives:

1-Students will be able to describe how humans can alter genes.

2-Students will be able to discuss the pros & cons of altering genes in more than one situation.

3- Students will recognize inaccuracies in a position.

4- Students will be familiar with web resources to appraise a genetic topic.

5- Student can construct or design a digital media presentation.

Time

Total: 1 to 2 weeks: 10+ hours
Minimum of 1 hour Introduction to the unit, then 1 week of 5+ hours in the classroom and 3 days of homework time. With an additional 1 hour day to reflect on the unit’s activities & lessons learned. The 5+ hours for the unit includes 3 hours to investigate; 2 hours create presentation and 1 hour to present & evaluate other presentations. Note: The class Internet researching and technology presentation experience may deem more time if not apt.

Altering Genes Research and Presentation
Working in pairs/teams you will select a topic of how Humans are altering genes or would like to alter genes, investigate from a variety of resources, evaluate its application and design a PowerPoint present your findings and evaluation to the class. You will need to document your work, evaluate other presentations and from a presentation formulate your position for altering that gene.

**In the Presentation, Essay and Portfolio: Students should demonstrate their proficiency:**
1- to be able to describe how humans can alter genes.

2- to be able to discuss the pros & cons of altering genes in more than one situation.

3- to recognize inaccuracies in a position.

4- to be familiar with web resources to appraise a genetic topic.

5- to construct or design a digital media presentation.

**The grading for this assignment consists of four components:**

**Component #1 The PowerPoint Presentation** is worth 100 points. Look at the Instructor and Peer Evaluation Rubrics to see the specific evaluation criteria. **= 100 points total**

- The 5 Peer Evaluation Rubrics for technology are worth 5 points. = 25 points
- The 5 Peer Evaluation Rubrics for content are worth 5 points. = 25 points
- The Instructor Evaluation Rubrics are worth 50 points

**Component #2 The Research Documentation** is to include your proof of work for the topic research & presentation development. The following needs to be included in the portfolio: **= 100pt**

- Introduction investigation of assigned brainstormed topic. = 10 points
- A paper copy of your presentation including your "notes". = 5 points
- A copy of the technology and content evaluations of your presentation *(by both co-presenter and self)* = 20 points
- Research Documentation of sources, websites with notes or printouts. = 50 points
- A written self-evaluation of what you learned and/or how you felt about completing this assignment. This evaluation should be completed within one week of your presentation. This evaluation must include your name, date of presentation, & name of presentation. All of this should fit on one page. = 15 points.

**Component #3 Essay Position Of Altering Genes** is an essay of another’s presentation and your personal recommendation showing your understanding of the topic and transfer of knowledge. It must include presenters names, name of presentation, and your name. Include all parts of the rubric and proof of one researched source. All of this should fit on one page. Look at the Essay Handout to see the specific evaluation criteria **= 100 points total**

**Component #4 Evaluations** will be completed of two presentations and your own presentation for both technology and content =6 total. Peer Review of Drafts must be turned in = 2. See Peer Review Handout. 5 points each **= 30 points total**
Specifications of Component #1 The PowerPoint Presentation

An OVERVIEW of the technology specifications: (see the Technology Evaluation Rubrics for further details)

1. Your presentation must include a minimum of 8 slides and not more than 20 slides.
2. Every slide in the presentation must include at least one graphic image.
3. You need to format the slide transitions.
4. You must use at least one slide animation.
5. You must use the "notes" feature to write out what you plan to say when each slide is being shown (NOTE: do not simply read the slides to us, use your words to enhance what the slide is showing). These notes must be printed and given to the instructor prior to your presentation (be sure to staple the pages together).

An OVERVIEW of the content specifications: (see the Content Evaluation Rubrics for further details)

Your presentation will:

1. Describe your altering gene topic.
2. Include background information needed to understand the topic.
3. Identify the sequence of steps in altering the gene(s).
4. Identify misconcepts or misunderstanding of altering the gene.
5. Explain the pros of altering the gene.
6. Explain the cons of altering the gene.
7. Analyze the pros and cons and construct a recommendation of altering the gene.
8. Cite sources used.
Peer review of drafts (before whole class presentation):

Do: Presentation groups pair up and take turn sharing and reviewing.
Submit feedback comments.

Time limits: 3-5 minutes to share
1 min. think/confer time
2 minutes for feedback

Two rotations
1- Share: a) Show power point draft, b) show sources: list or one website and features.
   Share: c) one best feature and d) one draft, need to do, need to fix.
2- Feedback comments: 1) one ‘well done’ = keep, don’t change, creative
   2) one that needs to be worked on with a suggestion.

= Encourage exchange of ideas; community of learners.

Feedback Comments By:

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Component #3 : Essay of personal reaction to another group’s presentation of Altering of Genes

Do: Write an essay of your personal recommendation of another’s presentation Altering of Genes topic. It must include Presenters names, name of presentation, and your name. Include all parts of the rubric and proof of one researched source. All of this should fit on one page. = 100 points total

- State the Altering of Genes Topic. (10)

- Refer to background/fundamental information that is needed to understand topic or 'how-do's they alter genes & sequence to show your own understanding. (10)

- Select a pro or con position to the application of Altering Genes (10)

  include 1) The benefits of your position? (10)

  2) The risks of your position? (10)

  3) How or whom will the technology help? Or hurt? (10)

- Check the presentation. Find a source that validates the information presented & include proof of the researched source. (20)

- Overall: Understandable, organized, readable, length. (20)

Notes during Presentation:
The Ethics of New Genetic Processes:

For each new application of new gene process, we must consider:

1) What are the benefits?

2) What are the risks?

3) Whom will the technology help? Whom will it potentially hurt?

4) What does it mean for me? For my family? For the people in my community?

5) Why might others not share my view?

Ethical, legal and social issues

There are several types of issues to consider as we think about the genetic process:

Ethical issues ask us to consider the potential moral outcomes of ‘The Genetic Process’.

Legal issues require researchers and the public to help policymakers decide whether and how ‘The Genetic Process’ should be regulated by the government.

Social issues involve the impact of ‘The Genetic Process’ on society as a whole.

The questions raised here have no clear right or wrong answer. Your responses will depend on your values, as well as on the opinions of those around you. = Ethics

Adapted from http://learn.genetics.utah.edu/units/gentherapy/qtissues/