



## BRAVE NEW WORLD: Gene Editing and Designer Babies

Driving Question: What are the possibilities in the modern world of biotechnology?

Learning Goals:	Advanced	Proficient	Partially Proficient	Not Yet Proficient
Asses the impact of genomics on individuals and society.	<i>In addition to meeting the "Proficient" criteria:</i> Blog discusses plausibility of biotechnology in sci-fi in popular culture (GATTACA, Brave New World, etc)	Defines genetic technology that allows colloquialism "designer babies."  Explanation of how a "designer baby" can be produced using genetic engineering techniques (represent recombinant DNA, gene splicing, PCR, gene cloning, gel electrophoresis)	Meets <u>some</u> of the criteria listed in the proficient category.  Blog is messy, disorganized, and difficult to understand.	Does not include criteria in the proficient category  Blog is inaccurate or incomplete.
Discuss the relevance of the human genome project.	Discussion of the current research and approved technologies based on area (mitochondrial disease, CRSPR-CAS9, gene therapy)	Discussion of ethical dilemma of inheritable gene modifications (2pro/con)  Make a claim about whether or not the government should allow designer babies and why	Blog uses 1-4 credible sources.	Blog does not cite credible sources.
Explain applications of biotechnology and gene editing technologies.	Blog includes other applications of genetic technology in industry (agriculture or pharmaceuticals)  Blog page is creative and offers links to resources of interest on Human genetic technologies (short videos, links, cartoons)	Discusses reasons for establishing the human genome project and the impact it has on genetic technologies.  Team makes a claim about whether the government should allow Gene Therapy research and why  Compares genetic technology in Agriculture (GM foods) with genetic technologies for human health  Information is organized and easy to read in Blog format.		
	5 or more sources are cited.	4 sources are cited.		



### **Learning Resources:**

- DNA: The Basics
  - Reading and Article
  - Mitosis and Replication
- Central Dogma (DNA-->RNA--proteins)
  - Video: <https://www.dnalc.org/view/16933-3D-Animation-of-DNA-to-RNA-to-Protein.html>
  - Modeling
  - Gene expression and regulation
- Inheritance of Traits
  - Mendelian Genetics (monohybrid and dihybrid crosses, dominant/recessive traits)
  - Meiosis and Genetic Variation
  - Population genetics (Student survey and infographic)
  - Blood typing Lab
- Genetic Counseling and Diseases
  - Guest Speaker: Renee Rider
  - Genetic Counseling Presentations: [Rubric](#)
- Genetic Technologies Discussions
  - Definition of genetically modified and applications
  - Gene Splicing Paper Lab (E.coli) and Virtual Lab [http://www.mhhe.com/biosci/genbio/virtual\\_labs/BL\\_22/BL\\_22.html](http://www.mhhe.com/biosci/genbio/virtual_labs/BL_22/BL_22.html)
  - PCR/Gel Electrophoresis activity <http://learn.genetics.utah.edu/content/labs/gel/>
  - CRISPR discussion
- Ethics
  - Eugenics discussion
  - Who creates laws? Scientist or politicians?
- Additional Resources:
  - Link to some articles: <http://www.futureforall.org/bioengineering/designer-babies.html>
  - Tutorials: <http://www2.le.ac.uk/projects/vgec/highereducation/topics/recombinanttechniques/resources>
  - Center for Genetics and Society: <https://www.geneticsandsociety.org>