



# GENE EDITING WITH DR NATALIA RIVERA-TORRES

## TALKING POINTS

### KNOWLEDGE:

1. In simple terms, what are genes?
2. How many genes are contained within each cell in the human body?

### COMPREHENSION:

3. What is sickle disease? What parts of the body does it affect? What specific impacts can this have on a patient?
4. Why is sickle cell disease particularly suited to CRISPR and the research that Natalia is conducting?

### APPLICATION:

5. Can you think of some of the ways in which editing genes might be beneficial to humans?
6. How might gene editing help researchers overcome challenges associated with other diseases and health conditions?

### ANALYSIS:

7. The Gene Editing Institute does extremely important work, but it is also focused on encouraging high school and college students to get involved in the field. Can you write down some of the reasons why this is important? What would you personally like to experience in a lab that would encourage you to become involved?

### EVALUATION:

8. There are those that say gene editing and changing the genome of children is unethical. Can you think of some reasons why people might have this objection? What are the pros and cons of tampering with an individual's genes? What about changing the genes of foodstuffs?
9. Conversely, some say that not using gene editing to treat certain conditions is unethical. What argument would you make to support this viewpoint?

## ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

- How would you explain Natalia's research to a younger audience? Create a poster or PowerPoint aimed at a Year 7 student in your school. Think carefully about how you would use images and simpler language to explain complex ideas.
- Fast forward 50 years from now and imagine that gene editing is a common occurrence throughout the world. What would this world look like? Would everything be a positive change or could there be some negative impacts? Really try and consider the reasons for thinking what you do.

## MORE RESOURCES

### THE GENE REVOLUTION: CHANGING HUMAN NATURE

The BBC has a fascinating documentary about CRISPR and what it might mean for human evolution. It is almost 90 minutes long, but it is well worth watching to get a broad understanding of CRISPR and what it might enable in the future:

<https://www.bbc.co.uk/iplayer/episode/m000dt7d/storyville-the-gene-revolution-changing-human-nature>

### GENETIC ENGINEERING WILL CHANGE EVERYTHING FOREVER

There is a much shorter video on YouTube that describes some of the potential ramifications of CRISPR:

<https://youtu.be/fjAhjPd4uNFY>

### ARE YOU BASED IN THE US?

This site serves as a great starting point for you to learn more:

<https://www.genome.gov/About-Genomics/Introduction-to-Genomics>