Genetics Story Project Sheet

This assignment will be about digging into a genetic trait that is important/interesting to you. It can be a genetic trait that you or your family members possess, but it does not have to be. However, you should put thought into *why* you selected the trait you will end up choosing. The trait you select for this assignment does not have to be a severe medical diagnosis that threatens a person's survival, but it could be. There are many options to select from, including traits that you interpret as being beneficial or harmful, aesthetic, or unique to you. The purpose is to understand the genes that are inside of us that we want to know more about. We will:

1. Research the science behind that genetic trait.
2. Understand the *current* research on that trait
3. Lastly, we will do a reflection on what this trait means to us.

Sections:

1. **Trait**: description of the trait you are researching
2. **Protein**: what protein is responsible for this trait?
3. **DNA**: What is the name of this section of DNA (gene)? How does this gene regulate this trait?
4. **Examples in other species**: Does this trait show up in other species? How?
5. **Variation, Disease, Benefit?**: Is this trait simply genetic variation? Is it considered a disease? Or benefit? Why?
6. **Inheritance Pattern**: How is this trait passed on through generations (sex-linked, Autosomal, recessive, dominant, mutation, chromosomal abnormality, etc.; not just, "It's passed from mom and dad")
7. **Current research on the trait**: what is the current discussion/research about this trait? Why is society concerned/interested or why should they be concerned/interested?
8. **Reflection**: why is this a trait you selected? What does it mean to you? How do you feel about what you found?

Major Deliverables:

A) Outline of information (Due Friday 2/26)
B) Creative, engaging presentation of the information: (Due Thursday 5/2)
    - Website
    - Movie (WeVideo, iMovie, etc.)
    - Stop Motion Animation
    - Poster
    - Other????

For the creative, engaging presentation you will be partnered with a group from Ms. Meghan's class to share the information you've found. Think about what quality craftsmanship and professionalism should look like as you design your product.

Grading:

1. Expert of your topic
2. Craftsmanship and professionalism of presentation
3. Thoughtfulness in your reflection

Outline:
Sections:

1. **Trait**: description of the trait you are researching

(5 sentences)
The genetic trait I'm researching is **Vitiligo**. This is where something happens to the immune system and it rapidly attacks cells (in other words, it attacks itself). Vitiligo is where certain parts of the external hair and/or skin have a loss in pigment of color. Vitiligo is not a harmful medical condition, but it's very rare. This condition can't be cured, and it can last for a lifetime.

2. **Protein**: what protein is responsible for this trait?

(3 sentences and image with caption)
The protein that causes vitiligo is unknown. This disease/genetic trait is a very unusual and mysterious topic, and nobody has discovered why it happens. Scientist can't even differentiate if it's a disease or a genetic mutation.

3. **DNA**: What is the name of this section of DNA (gene)? How does this gene regulate this trait?

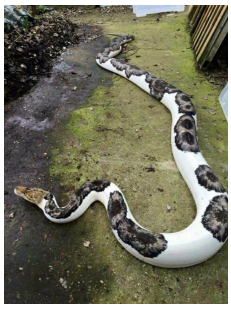
(5 sentences)
(Background info)
According to Genetics Home References, "two of these genes are **NLRP1** and **PTPN22**." The first gene (NLRP1) is the one that has a clear set of rules and instructions for making a protein where its job is to help regulate the process of inflammation. Inflammation just means when your immune system is getting ready to fight a sickness while also protecting itself (sending white blood cells, fixing wounds, making sure it's not attacking its own cells). The other gene (PTPN22) is a guide that tells what the cells to do and where their places should be.

What happens is something goes wrong with these two genes this resulting in the immune system to attack its pigment cells. Scientist haven't figured out how this happens. Vitiligo itself is not a gene, but the byproduct of a genetic mistake.

Source: https://ghr.nlm.nih.gov/condition/vitiligo#genes

4. **Examples in other species**: Does this trait show up in other species? How?

(2 examples and explanations)

This genetic mistake does occur in other species. It's extremely rare, but the animal is not suffering. Vitiligo causes no physical pain. Even in animals, scientist don't know what causes this.

5. **Variation, Disease, Benefit?**: Is this trait simply genetic variation? Is it considered a disease? Or benefit? Why?

(5 sentences)
Vitiligo is an "iffy" subject and it's unknown whether it is either a genetic trait or disease. Most consider it a disease, but I think a more accurate term is a genetic mistake. It's been known to run in families, however it's cause is a factor of whether it's a disease or if it's something genetic. Like I stated earlier, it's very mysterious and still being studied. It could be a benefit if you're confident with splotches or different pigment, but it's considered neutral because there's no health benefits and it doesn't harm you.

6. **Inheritance Pattern**: How is this trait passed on through generations (sex-linked, Autosomal, recessive, dominant, mutation, chromosomal abnormality, etc.; not just, "It's passed from mom and dad")

(5 sentences)
Sometimes vitiligo isn't even passed down, you can just randomly notice pigment colors when you're in your 20's. You also can't get tested for vitiligo; it's completely random. All we know is that Vitiligo is a autoimmune disease. It's strange because sometimes vitiligo can be passed down, but we don't know how because it hasn't been discovered yet. It is most likely a gene abnormality… (I don't know how to explain it if it hasn't been found). A clear hypothesis for Vitiligo is that it's polygenic. This means that some sort of combinations of the two genes resulted in Vitiligo.

7. **Current research on the trait**: what is the current discussion/research about this trait? Why is society concerned/interested or why should they be concerned/interested?

(5 sentences)
The current discussion is how Vitiligo is caused because it's unknown. There is research on how modified protein can "cure' or reduce the effects of vitiligo, but it's still a work in progress.

Society isn't very concerned about this, but the people who have vitiligo must face judgment, harassment, staring, and bullying. Most people who have vitiligo wish to change or get rid of it because of the constant physiological effects society puts on them. Society should be interested because this is an extremely rare disease that needs to be discovered and solved; it can also help the Vitiligo community by figuring out an effective and healthy way to get rid of pigment problems.

8. **Reflection**: why is this a trait you selected? What does it mean to you? How do you feel about what you found?

(7 sentences)
I selected this topic because I learned about vitiligo from a very young age. I also learned about Michael Jackson and how he completely changed skin colors. It's a very interesting disease and it isn't talked about very much. I personally think Vitiligo is beautiful and people should learn to embrace it. I also like that this topic is so out in the open, undiscovered, mysterious, and just strange (but in a good way). What Vitiligo means to me is an unusual skin trait, but it's something I respect people for. I feel like the topic should be researched everyday, because right now it seems like nobody is focusing on it.