**Pass the DNA, Please: A Telephone Relay Race!**

**Background:**

Deoxyribonucleic nucleic acid (**DNA**) is the macromolecule that contains all genetic information and is essential for life. It is composed of two helical strands containing a sugar-phosphate backbone with nitrogenous bases in between. The bases are guanine (G), adenine (A), thymine (T), and cytosine (C). The DNA sequence is converted from DNA into ribonucleic acid (**RNA**) in a process known as **transcription**. During transcription, G is converted to C, C is converted to G, T is converted to A, and A is converted to Uracil (U). The next step after transcription is **translation**, the conversion of RNA into protein. During translation, G is converted to C, C is converted to G, T is converted to A, and A is converted to U to create the appropriate **amino acid**. Amino acids are the building blocks of **protein** and are created based on three letter base codes. A protein is a macromolecule made of many amino acids. A **trait** is a characteristic of an organism such as eye color and is the end result of the original DNA sequence. Any change from the original DNA sequence can result in a different trait than expected and is known as a **mutation**. Today we will see the importance of passing along the DNA message by competing in a relay race with the game Telephone. We split into teams, play telephone, and race to see which team can pass along the right message the fastest.

**Material:**

Paper

Pen or Pencil

Markers of colored pencils

Slip of paper with Fishy Code

**Instructions:**

1. After you have been placed in a team, decide as a group how many letters will be passed along at a time.
2. Line up as a team.
3. The student at the end of the line should have a paper and pencil ready to write down the letters that he/she hears.
4. When the teacher tells you to begin round 1, the first student in your line can begin to whisper the letters from the Fishy Code slip to the teammate next to him or her.
5. You can only whisper letters to the teammate next to you.
6. Once all of the letters have been passed, the student at the front of the line should return the Fishy Code to the teacher and the student at the end of the line should use his or her knowledge of transcription to convert the code from DNA to RNA without help from his or her team and then writes down the corresponding base (G→C, C→G, A→U, T→A).
7. After converting all of the letters, the student at the end of the line should walk to the front of the line and start round 2 immediately by whispering the converted code down the line just as in round 1.
8. The new student at the end of the line should write down the letter he or she hears just as in round 1.
9. Once all of the letters have been passed from round 2, come together with your team and use your knowledge of translation to convert the letters the student at the end of the line heard.
10. Then, convert this message to an amino acid code.
11. Match the amino acid code to the corresponding trait.
12. Lastly, each person must draw or describe your team’s fish in the box in the provided handout.
13. Let your teacher know when you are finished.
14. If other teams are still working, begin working on the assessment entitled Pass the DNA, Please.