

Time: 50 minutes

Learning Outcomes:

- To relate the genetic code to the assembly of proteins
- To summarize factors that lead to different types of mutations
- To distinguish among positive, neutral, and negative effects of mutations

Background:

This activity introduces students to the concept that DNA is a code, and that different mutations or changes can happen within the code that can have a positive, neutral, or negative effect. The students decipher instructions to make a pipe cleaner person.

Materials:

- Pipe cleaners in two different colours
- Googly eyes (can be purchased from any craft store)
- Glue stick or glue gun
- Photocopies of coded pages 2-6

Procedure:

1. Assess background knowledge about DNA by asking class questions such as “What is DNA?”, “What does DNA stand for?”, “Where is it found?” etc.
2. Distribute one copy of a coded sheet to each person (or pairs). Distribute three pipe cleaners of one colour, one short piece of pipe cleaner of another colour, and two googly eyes to each person.
3. Emphasize to the class that their classmates have different codes and that they should only look at their own set of instructions.
4. Read scenario on top of coded sheets aloud.
5. Do the first step as a class, as everyone has the same first step. Tell students that the pipecleaners are not labeled, but that the instructions refers to each cleaner as “A-C” to make the instructions easier to follow.
6. Discussion after activity: Page 2 includes the full set of instructions, while page 3 omits part of step #8 (no eyes), page 4 is missing the first letter on step #7 so that the remainder of the instructions do not make sense (point deletion), and page 5 is missing steps 6-8.
 - Ask students to compare and contrast the pipe cleaner people they have made, and relate them to the codes they were given.
 - These mutations were deleterious. Ask students to brainstorm some neutral or positive mutations.
 - Discuss the relationship between DNA, genes, proteins, etc.
 - Extrapolate this activity to human DNA, and how mutations may or may not cause disease.