

Joshua Eskew
Best Lesson
Project FOCUS
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Interactive DNA and RNA

~To Enhance and Discover the Importance of DNA and RNA in Everyday Life~

Georgia Performance Standards

S7L3 – Students will recognize how biological traits are passed on to successive generations

- a. Explain the role of genes and chromosomes in the inheriting a specific trait

Target Grade Level: 7th Grade

- Grade Level Science: Biological Science
- Unit Title: Heredity and Genetics
- Specific Topic of Unit: DNA and RNA

Materials

- 3 20 oz. Bags of Sour Patch Kids (nitrogenous bases)
- Box of Long Toothpicks (hydrogen bonds)
- 2 Bags of Twizzler's Strawberry Licorice (sugar-phosphate backbone)
- 1 Box of Dixie Cups

** Each student will get one Dixie cup that contains 4 green, 4 red, 4 orange, and 4 yellow sour patch kids

** Each student will be given 2 Twizzler Licorices

**Each student will be given 2 large paper towels

Safety Concerns

Appropriate safety measures should be taken; the teacher and Project Focus leader should constantly be monitoring the students. The toothpicks are sharp on the ends; therefore the students should be careful while handling the toothpicks. Also, the students are free to eat the DNA/RNA product at the end of the lesson, however caution should be taken if the candy has been dropped on the floor. Students and teachers should make sure to wash hands before and after lesson, while paper towels should be used throughout entire lesson to keep clean environment.

How to Facilitate the Lesson

The teacher should split the students up into groups of two at each table. Each group, consisting of 2 students, will receive two Dixie Cups, four paper towels, and 4 licorice Twizzlers. The Dixie cups will contain 4 sour patch kids of each color, so 16 total. Before the activity begins, the teacher should review key concepts and terms regarding DNA and RNA, along with determining two differences between DNA and RNA

1. Once the materials have successfully been passed out, the teacher will write a DNA sequence (5'-ACGTA~~CTG~~-3') that the students will be instructed to create in their DNA twizzler
2. The Sour patch kids will be resembled by different colors
 - a. C – Red
 - b. G – yellow
 - c. A – green
 - d. T – orange
3. The students will use the toothpicks to create the hydrogen bonds that exist between the nucleotides to connect the two stands of DNA.
 - a. Two sour patch kids will go on each side of the toothpick and then each point of the toothpick will be inserted into both twizzlers
4. DNA is read in the 5' to 3' direction so the students will regard the top of twizzler as the 5' and the bottom of the twizzler as the 3'
5. The goal is to synthesize the complementary strand of the provided DNA sequence to create a new DNA Double Helix Twizzler!
6. Once all of the toothpicks are in place, the twizzlers should be stabilized and connected, so the students should twist the twizzlers into the DNA double helix shape
7. The teacher should sign off on the student's works and then ask the students to describe the components of the DNA based off what each piece of candy represented, along with two differences between DNA and RNA!
8. You're done! The students are free to eat their DNA!

Modifications

The students seemed to struggle with getting the sour patch kids on the toothpicks, so I would encourage the students to halve the Sour Patch Kids so that they can easily fit and slide onto the toothpick. The teachers should constantly be monitoring the students, so they do not eat the candy until after the teacher has cleared them to do so! Also, make sure that the students are constantly observing and asking questions about what each piece of candy represents on an actual DNA model

References

<http://teach.genetics.utah.edu/content/begin/dna/Have%20Your%20DNA%20student.pdf>