

CANDY DNA AND REPLICATION LAB

Objective: Students will show how the basic structure of DNA is important in the process of DNA replication

Materials: Twizzlers chunks (red and black) - 24 piece each color
Juju-b's (4 different colors) - 6 of each color
wooden toothpick halves – about 70

Note: Be sure that working surfaces and hands have been cleaned before starting this activity, if you intend to consume your models after finishing (and I know that's your intention).

Procedure:

1. Assign one nitrogen base to each of the four colors of juju-b.
Adenine = _____
Thymine = _____
Cytosine = _____
Guanine = _____
2. What do the black Twizzlers represent? _____
3. What do the red Twizzlers represent? _____
4. What structure is formed from a red Twizzler, a black Twizzler and a juju-b?

5. Prepare six individual nucleotides: use toothpicks to connect one black to one red Twizzler piece. Then add one juju-b perpendicularly to the black candy.
6. Assemble nucleotides into a *polynucleotide* strand by connecting the red piece of one nucleotide to the black of another. Continue until a strand of six nucleotides has been constructed. You may want to use the diagram we went over last class as a guide.
7. Which combinations of two bases form the complimentary base pair "rungs" of DNA? _____
8. Assemble a strand that is complementary to the strand that you have already built. Place the second strand next to the first so that the complimentary "bases" touch.
9. Show Mr. Ulrich your DNA model. Politely ask him to initial your lab paper here.

You are now ready to REPLICATE!!!!

(turn the sheet over)

10. To demonstrate replication, first make 12 more nucleotides with the same nitrogen bases as the first two strands.
11. "Unzip" the DNA double strand one "rung" at a time. Assemble the proper nucleotides, one by one.
12. Once you have finished replicating, Politely ask Mr. Ulrich to initial here _____.
13. After you demonstrate this to Mr. Ulrich, you may dispose of your models. This is one case where you may eat your science project, if you have kept everything clean **and Mr. Ulrich gives permission.** *Be sure to remove toothpicks before you eat!!!* Clean up, being sure that no toothpicks or sticky residue is left behind. Wash your hands!

Conclusion Questions:

1. What is the function of DNA?
2. Why is it so important that the order of base pairs stays the same?
3. What would happen if there was a change in the base pair sequence?
4. What special proteins make replication of DNA possible?

You may have to hunt for these next two. Check your text

5. What is the difference between replication and duplication?
6. At which stage of cell division (mitosis) does replication take place?