

DNA Base Pairing Activity

The purpose of this activity is to reinforce the idea that base pairs only pair with certain other base pairs.

1. Pass out the Base Pair Cards to students. It will work best if there are equal numbers of each letter.
2. Inform the students that they should put out their right or left hand based on what letter they have.
 - a. A and T = right hand
 - b. G and C = left hand
3. Inform the students that they can only pair with someone that has the same hand out and a different color. They will need to hold their card with the opposite hand so everyone else can see what color card they have.
 - a. For example, a student with an A card can only pair with someone that also has their right hand out and a card that is not Yellow.
4. Depending on the size of the group, give them app. 5 minutes to pair up with another student.
 - a. If this is a group of students that are somewhat unfamiliar with each other, you could also use this as an ice-breaking activity. Have them introduce themselves to their pair partner and tell them something interesting about themselves.
 - b. If there is an uneven number of students, at the end you can reinforce that even though there are multiple bases that have not paired, they cannot pair because there is not another appropriate base to pair with.
5. After the pairing exercise is complete, inform them that their hands that are shaking each other have formed a hydrogen bond that is holding the two bases together.
6. Next have the "base pairs" line up next to each other. They have now formed a strand of DNA.

To demonstrate Genetic Engineering

7. Depending on the size of the group, select 3-5 bases on one side of the strand to "cut" out of the strand and have that many other students ready to "insert" into the strand.
 - a. You make it so that each student in the strand that you "cut" out has something in common (ie. red shirt, female, etc.) and then each student in the strand that you insert also have something in common but different than what is "cut" (ie. brown shirt, male, etc.). This will visually show that the final product is different than the original DNA strand.
8. Go ahead and "cut" them out of the strand.
9. You can talk about how you have just cut a strand of DNA out of one species and will now insert a strand of DNA from another species into that "hole" that is left. Explain that even though it is a new species, the base pairs rules still apply. So, the strand that is "inserted" must have the same order of bases.
10. Once the new strand is inserted, you have just performed genetic engineering. The new strand of DNA will now be able to do whatever the new strand of DNA was coded for.