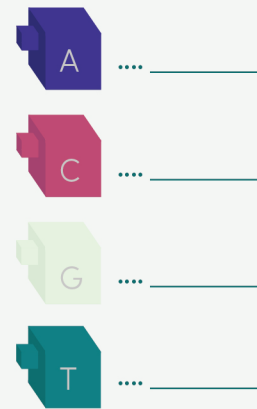
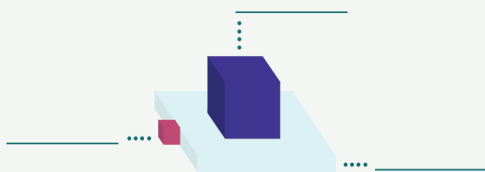
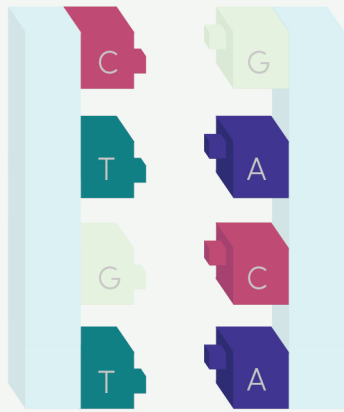
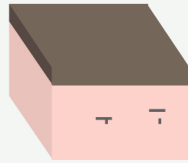


DNA and Genes



What is genetic engineering?



Genetic Engineering (GE) is a process where genetic material is taken from one organism and inserted into the cells of another organism

Examples of GE:

Steps of GE:

1. _____ - DNA is extracted from an organism known to have a desired trait
2. _____ - the gene of interest is located and copied
3. _____ - the gene is modified to perform in the desired way (by replacing and altering regions)
4. _____ - the gene is delivered into the tissue of the cells. We hope for it to insert into the nucleus.
5. _____ - the modified cells are allowed to grow.

Genetic Engineering: what are the advantages and disadvantages?

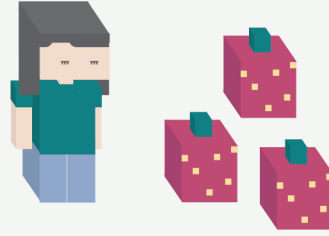
Advantages	Disadvantages

Strawberry DNA Extraction Experiment

Materials:

1. Zip bag
2. Strawberry
3. Water
4. Dish-washing liquid
5. Salt
6. Isopropyl alcohol

Hi, I'm Helen.
I love strawberries
<3



Instructions:

1. Put a bottle of isopropyl alcohol in a freezer.
2. Extraction mixture preparation:
 - a. Measure 90mL of water into a small glass container.
 - b. Measure and add 10mL dish-washing liquid to the water.
 - c. Stir in 1/4-tsp salt and mix until the salt dissolves.
3. Put strawberry into the zip bag and add extraction mixture.
4. Remove as much air from the bag as possible and seal it closed. Smash the strawberry so that no big pieces remain.
5. Pour the resulting strawberry pulp and extraction mixture through a strainer and into a medium glass bowl or similar container. Use a spoon to press the mashed bits of strawberry against the strainer, forcing even more of the mixture into the container.
6. Pour the extracted mixture into a 50-100mL glass container. This will help to isolate the DNA on the surface of the mixture.
7. Add 5mL of the chilled isopropyl alcohol to the solution and hold the mixture at eye level. You're looking for a separation of material that shows up as a white layer on top.
8. Congrats! You have extracted the strawberry DNA!

Why do you think we add dishwashing soap?

Why do you think we add salt?

Why do you think we add isopropyl alcohol?