

Duplicating Chromosomes

Hands-On Activity

For this activity you need

- Four paper clips per person
- Beads of four different colors
Put the beads in a bowl so they don't escape.

We know that the chromosomes that carry our genetic information are made up of four nucleotides.

These nucleotides connect up with their partners.

Adenine	<- pairs with ->	Thymine
Cytosine	<- pairs with ->	Guanine

Use the colored beads to represent the different nucleotides. Write the colors here:

Nucleotide	Adenine	Cytosine	Thymine	Guanine
Color of Bead				

Create a Chromosome

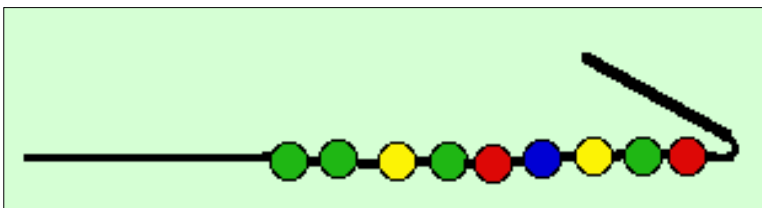


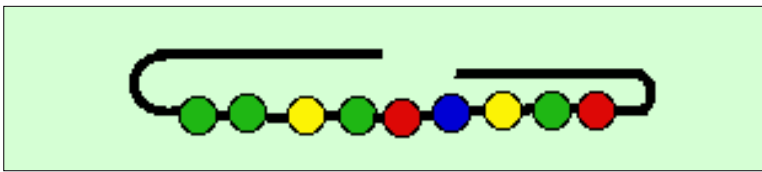
Gather your materials. You are going to make a model of a chromosome. A chromosome has **two** strands.

Straighten out two of the paper clips, leaving a hook at one end of each.

Make the first strand:
The beads represent the nucleotides.

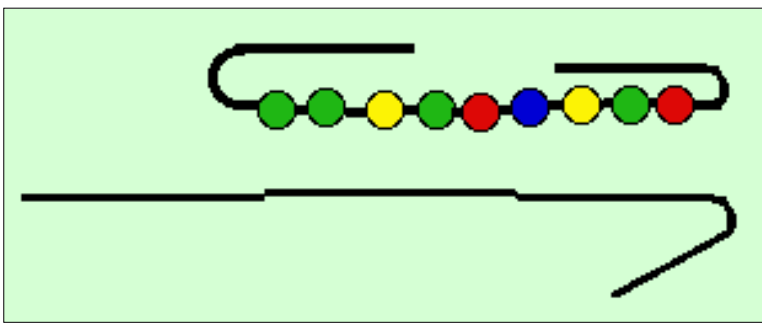
Put beads on one straightened paper clip.





Bend the other end of the paper clip back.

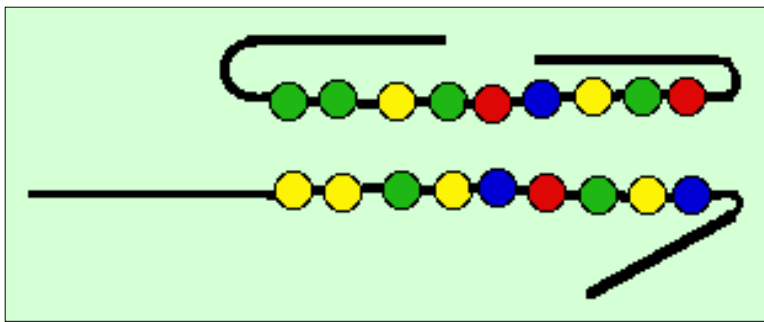
This is one strand of the chromosome.



Now take the other straightened paper clip.

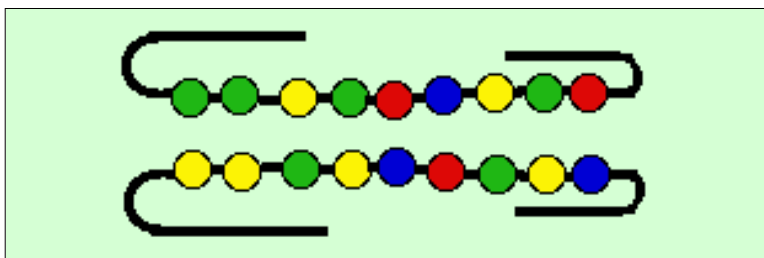
Put it beside the one that you just finished.

This will be the second strand of the chromosome.



This part is tricky!

Find the partner for each colored bead and put it on the open paper clip



Bend the second paper clip to hold the beads.

You have now made the second strand of your chromosome model!
Good for you!

Now exchange chromosomes with a partner and check to be sure that the nucleotides are paired up correctly.

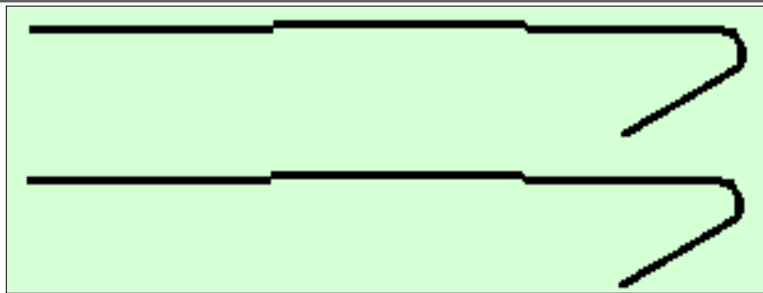
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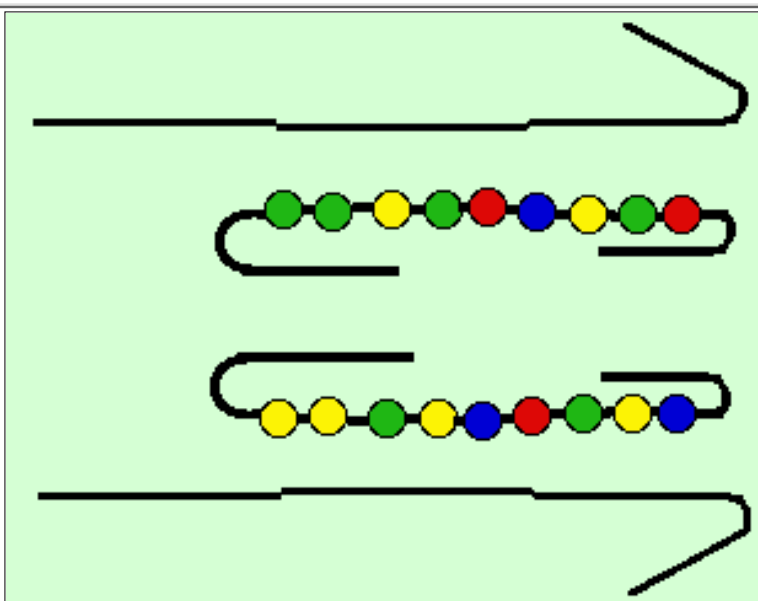
Duplicating Your Chromosome

When a cell divides, it has to make copies of the chromosomes in it. Every cell in the body has copies of the same chromosomes.

Let's duplicate your chromosome the way your body would.



Straighten out the remaining two paper clips.



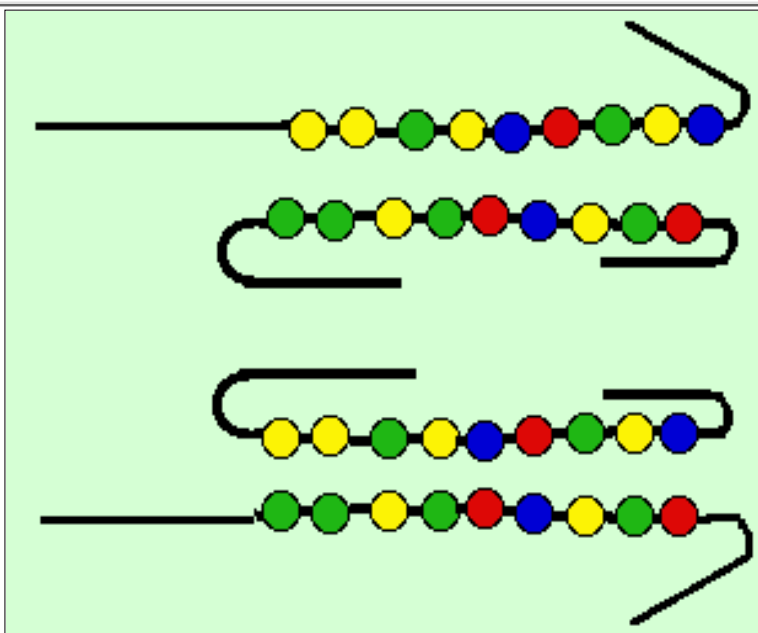
Separate the two strands of your chromosome.

Now, think!

Each of these pieces is half of a chromosome, rather like one side of a zipper.

Place each half of the completed chromosome next to a straightened paper clip.

Now, carefully put the partner beads on the empty paper clips.

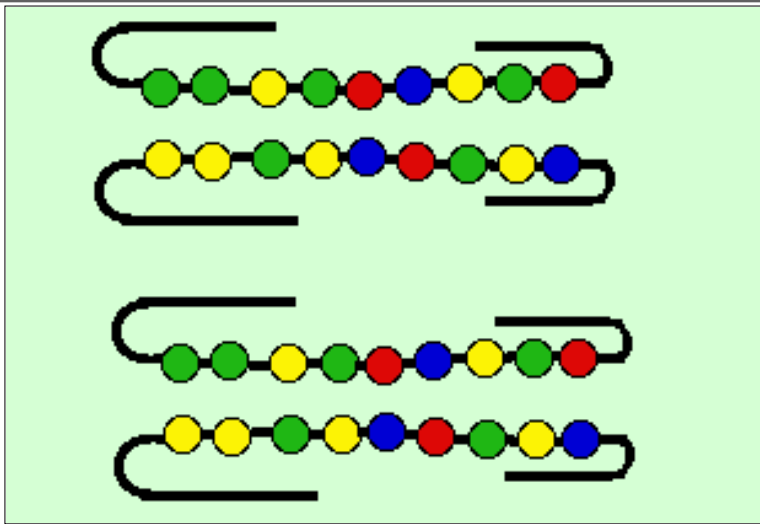


When all the partner beads are in place, fold up the other end of the paper clips

What do you have now?

How does this process work?

Did you get an exact copy of your chromosome?



You should have two complete, double stranded chromosomes now.

Share your chromosomes with the people sitting near you.

Mix all your chromosomes together and then pick out one. Can you find the other piece of it? Match up your amino acids!

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