


### Warm up

Give the compliment strand for the following primary strand of DNA

A-T-G-T-C-G-T-T-T-A-G-T-C-G-A-A-C-C-G-G-T-C-G-A-T-A-G

|||||  
T A C A G C A A A T C A G C T T G G C C A G C T A T C

## DNA Replication

- DNA molecules being composed of complementary strands allow DNA to copy itself or replicate.
- Replication creates two identical molecules of DNA.
-  DNA replication ensures that each cell will have all of the genetic information it needs to carry out its activities.

# DNA Replication

- DNA replication begins when the two sides of the DNA molecule unwind and separate, like a zipper unzipping.

↳ Helicase

- The molecules separate between the paired nitrogen bases on each rung.
- Next, nitrogen bases floating in the nucleus pair up with the bases on each half of the DNA molecule: A with T and C with G.

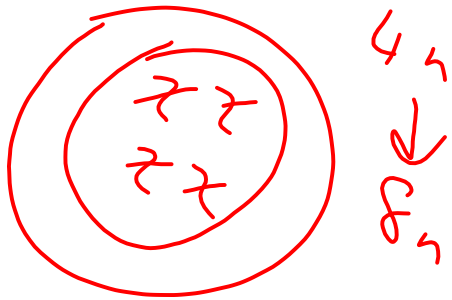


Helicase

The enzyme that is responsible for breaking the bond between the nitrogen bases  
 → "Unzipping enzyme"

A - T	A - T
T - A	T - A
G - C	G - C
G - C	G - C
A - T	A - T
C - G	C - G
T - A	T - A
C - G	C - G
G - C	G - C
A - T	A - T
C - G	C - G

(H) - - -  
- - -  
- - -  
- - -  
- - -  
- - -  
- - -  
- - -  
- - -  
- - -  
- - -



↓  
P  
M  
A  
T



A - T	A - T	(H)
T - A	T - A	
C - G	C - G	
C - G	C - G	
C - G	C - G	
G - C	G - C	
A - T	A - T	
T - A	T - A	
T - A	A - A	

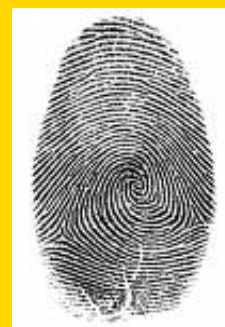


## **DNA fingerprints**

**Every person has unique DNA. Identical twins are the only people who would have the same DNA.**

**Allan Legere case was the first case in Canada that used DNA fingerprinting.**

<http://fig.cox.miami.edu/~cmallery/150/gene/DNA.forensics.jpg>



**DNA fingerprinting can be used to identify a child's parents. Each child inherits one set of chromosomes from each parent. This is why children resemble both of their parents.**

**A child who has a mom with brown hair and blue eyes and a dad with blond hair and brown eyes might end up with brown hair from his mom and brown eyes from his dad. RFLPs are inherited in the same way, some from the mother and some from the father.**

RFLP-restriction fragment length polymorphism



Broken Projector day

Read Page 208 -209 Answer # 1,2,3,4,5

Read Page 212 -213 Answer # 1,2,3,4,5

Read Page 214 -215 Answer # 1,2,3,4,5,6

Read Page 216 -218 Answer # 1,2,3,4,5,6

A — T  
 T — A  
 T — A  
 C — G  
 G — C  
 G — C  
 G — C  
 T — A  
 T — A  
 A — T  
 A — T

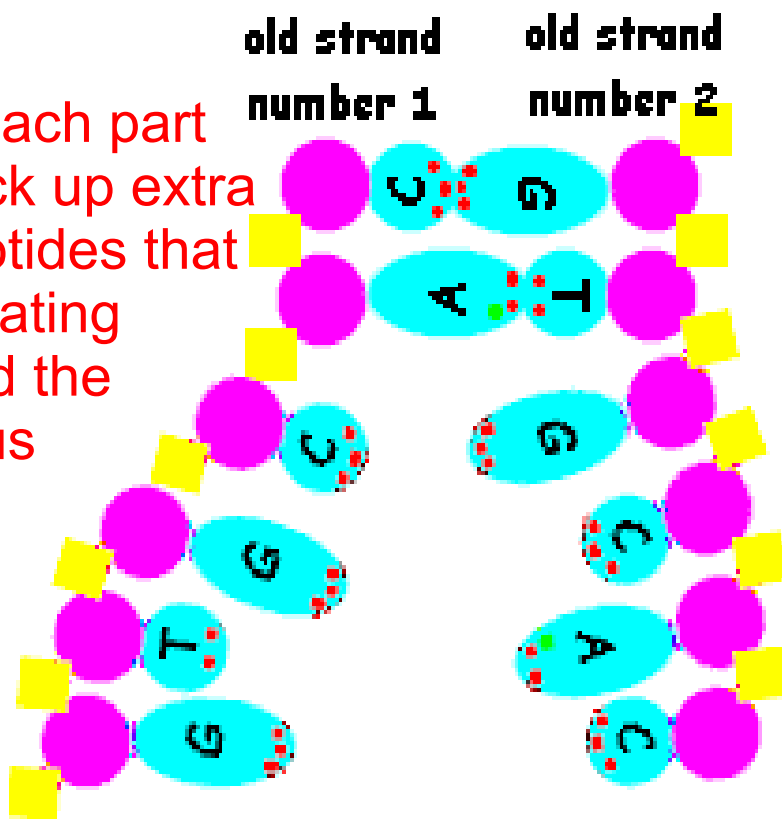
Each strand  
 split apart by an enzyme

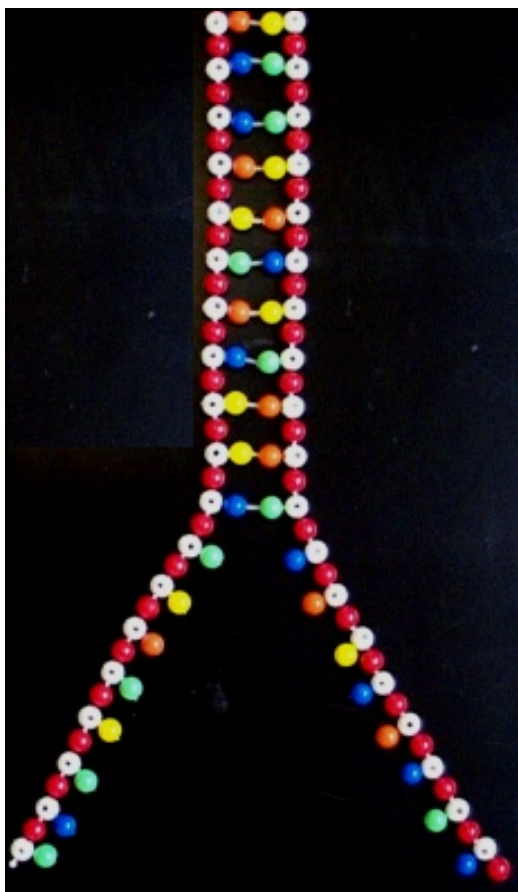
helicase

A — T  
 T — A  
 T — A  
 C — G  
 G — C  
 G — C  
 G — C  
 T — A  
 T — A  
 A — T  
 A — T

A — T  
 T — A  
 T — A  
 C — G  
 G — C  
 G — C  
 G — C  
 T — A  
 T — A  
 A — T  
 A — T

Now each part  
will pick up extra  
nucleotides that  
are floating  
around the  
nucleus





<http://www.youtube.com/watch?v=hfZ8o9D1tus>



<http://www.youtube.com/watch?v=cDIKrLJjRIY>





<https://www.youtube.com/watch?v=DyVnwKcp0YY>



Bill Nye - Genes

## What is DNA Fingerprinting?

The chemical structure of everyone's DNA is the same. The only difference between people (or any animal) is the order of the base pairs. There are so many millions of base pairs in each person's DNA that every person has a different sequence.

Using these sequences, every person could be identified solely by the sequence of their base pairs. However, because there are so many millions of base pairs, the task would be very time-consuming. Instead, scientists are able to use a shorter method, because of repeating patterns in DNA.

- These patterns do not, however, give an individual "fingerprint," but they are able to determine whether two DNA samples are from the same person, related people, or non-related people. Scientists use a small number of sequences of DNA that are known to vary among individuals a great deal, and analyze those to get a certain probability of a match.