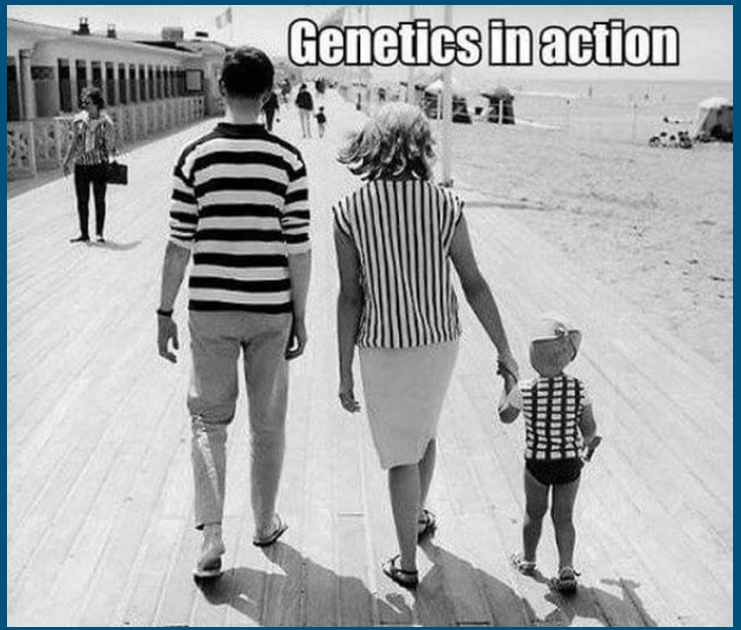
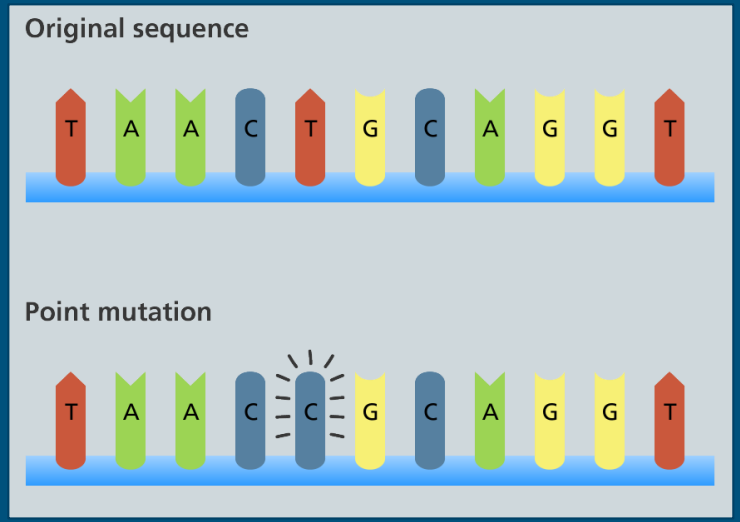
Mutations



What is a mutation?

A **gene mutation** is a when part of the DNA in a gene gets changed.

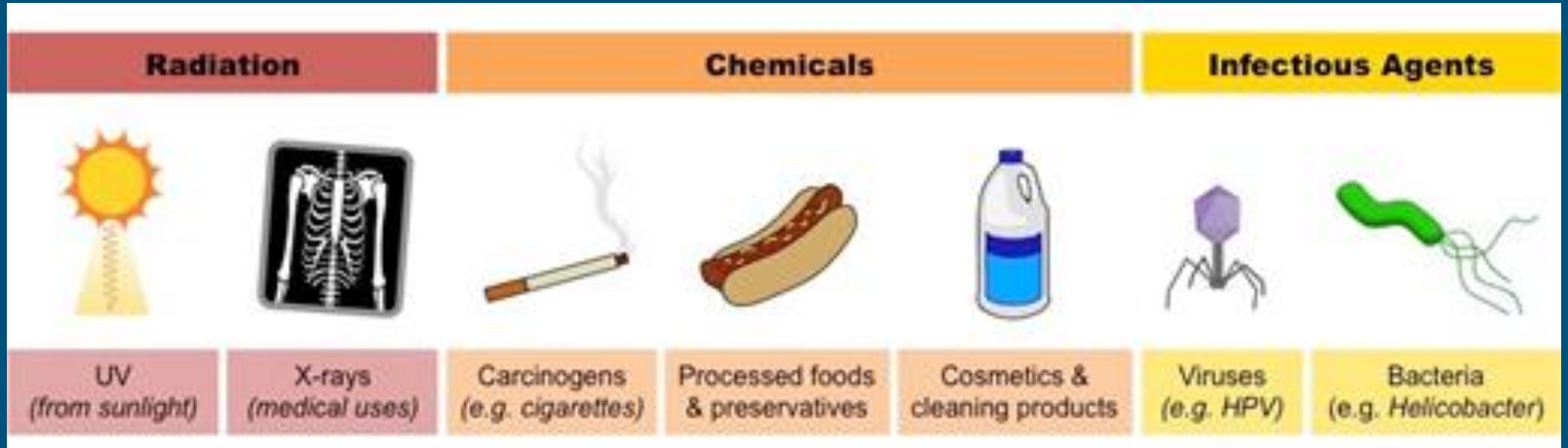


What might some consequences of this be? Discuss with your partner, and write down your brainstorm ideas!

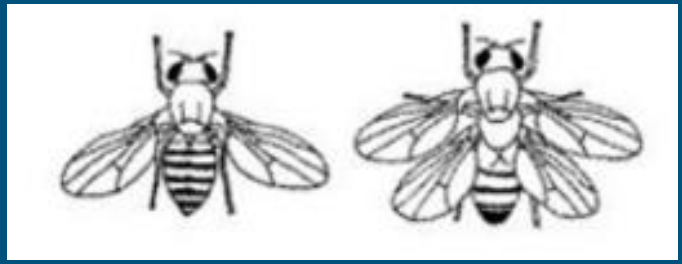
Watch the following video:
http://learn.genetics.utah.edu/content/basics/mutation/

What is a mutagen?

- Physical or chemical agent that changes the DNA
- They can cause mutations that are beneficial, harmful, or have no effect
- However, sometimes spontaneous mutations do occur without a mutagen!



Positive Mutations

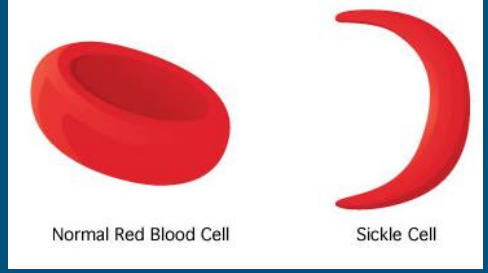


- When a mutation benefits the individual, and increases their chance of reproducing
- Ex. Some people have a mutated gene that increases their bone density
  - It was discovered when a young man walked away from a serious car crash with no broken bones!
- Ex. Some people have a mutated gene that produces a special kind of protein that prevents them from getting HIV
- Ex. Lactose tolerance
  - Only about ⅓ of the world's population can process lactose… otherwise you couldn't eat ice cream!!

Neutral Mutations

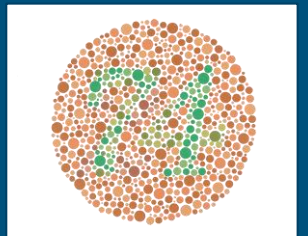
- Mutations that neither help nor harm an individual
- Most mutations are neutral
  - Ex. Blue eyes (all humans used to have brown eyes)
  - Ex. Detached earlobes

Negative Mutations



- Mutations that can be harmful to an organism, and decrease their chances of reproducing.
- Ex. Sickle cell anemia - some people's red blood cells have a sickle, rigid shape which prevents it from carrying oxygen well, and blocks blood vessels
- Ex. Cystic fibrosis - a condition that affects the lungs and digestive system - life expectancy is 35 years.
- Colour blindness - these people might have trouble reading traffic lights, picking fruit, and coordinating their outfits! Males are more likely to be colourblind than females

Sickle Cell - https://www.dnalc.org/resources/3d/17-sickle-cell.html
Cystic Fibrosis - https://www.youtube.com/watch?v=k4U5wyPzxJE

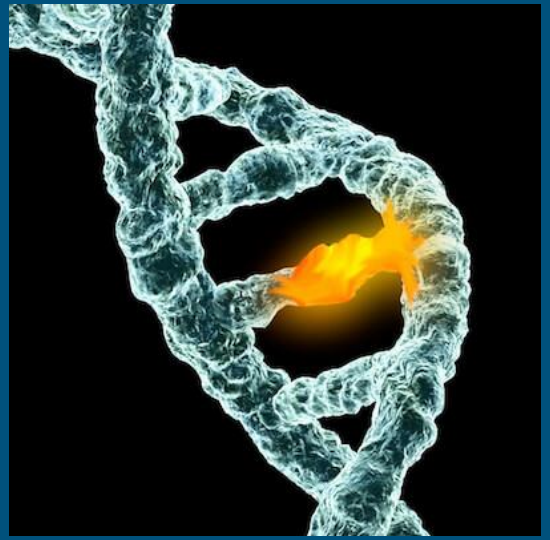


How else can mutations occur?

When your DNA replicates, it can sometimes make mistakes!

This is only relevant in sperm and egg cells. In this case, the child might have a mutation that causes a disorder, but has no family history of the disorder.

Acquired mutations in somatic cells (body cells that are NOT sperm and egg) cannot be passed on to children.



TYPES OF MUTATIONS

A Little Review… How is a protein made?

Transcription

Translation

DNA → RNA → leaves nucleus → ribosome → brings amino acids → complete protein!

A, T, G, C

A, U, C, G