SCIENCE CAMPS

Family Science Activity Book

2020, Edition 4

Kids in Grades 4-6

UNIVERSITY OF SASKATCHEWAN
College of Engineering
ENGINEERING.USASK.CA

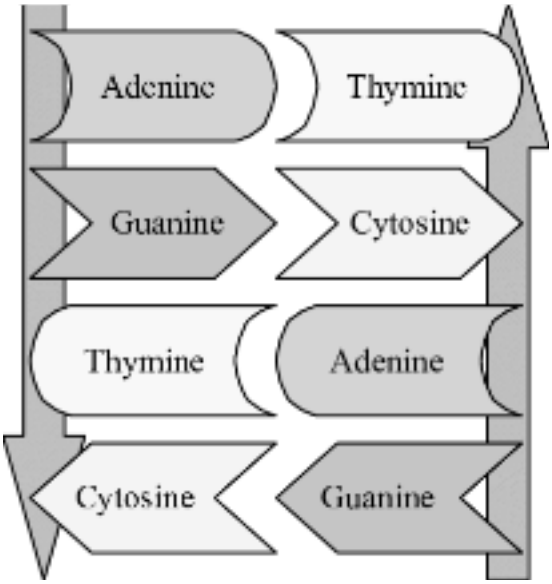
DNA Coding

Our DNA is the genetic code that tells the cells in our body how to grow and reproduce. DNA is made up of four base chemicals: Adenine (A), Thymine (T), Cytosine (C), and Guanine (G). The four base chemicals arrange themselves in pairs to form this shape.

There are rules to how the four base chemicals can arrange themselves in this double helix shape.

Rules For Base Pairing:

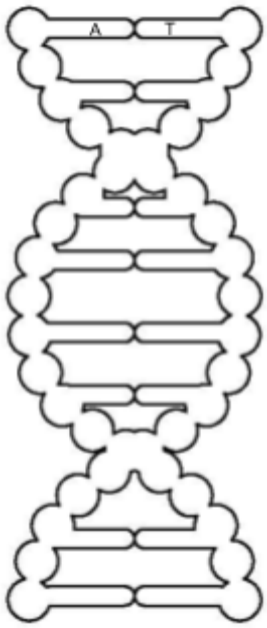
- Adenine (A) can only pair with Thymine (T)
- Cytosine (C) can only pair with Guanine (G)



As you can see, Adenine is only paired to Thymine and Guanine is only paired to Cytosine.

In this DNA sample, all rules are satisfied.

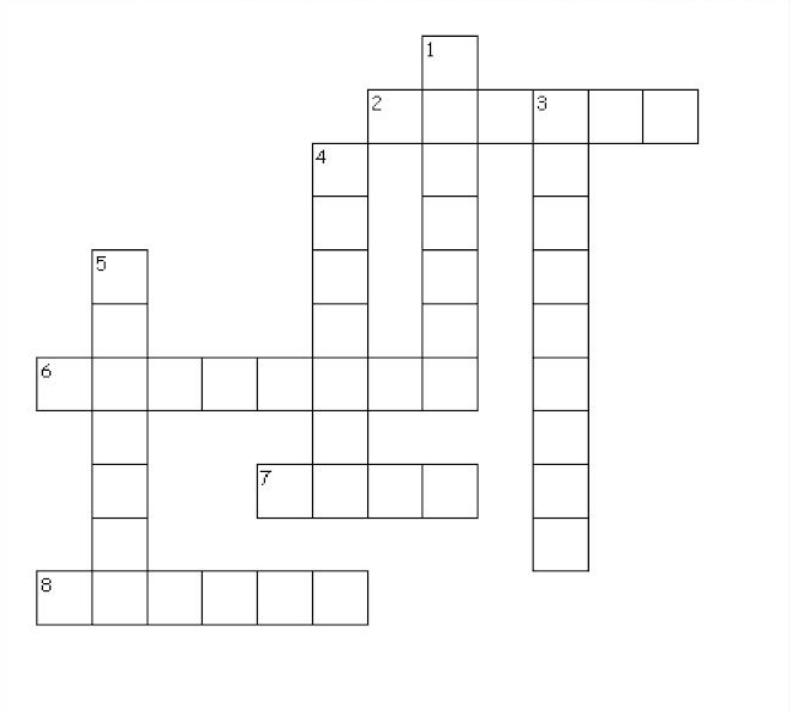
There is no exact way to arrange the base pairs. Fill in this DNA strand with the four base chemicals following the rules above to complete the DNA. The first pair has been filled in with Adenine paired with Thymine.



Bioinformatics

Bioinformatics is a field of science related to biology and computer science! They look at DNA. Our DNA assembles into strands called genes, which control how our bodies are made. In humans, 99.9% of genes are the same. The 0.1% that is different is what makes us unique - like our hair or eye colour.

BIOINFORMATICS CROSSWORD TIME!



Across
2. The name of larger gene (check the examples)
6. What the C in DNA stands for
7. Something made up of strands of DNA
8. A map of genes

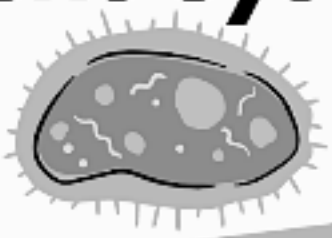
Down
1. What the G in DNA stands for
3. The name of a small gene (check the examples)
4. What the A in DNA stands for
5. What the T in DNA stands for

ANSWERS:

Across: 2) HUMHBB, 6) Cytosine, 7) Genes, 8) Genome

Down: 1) Guanine, 3) HUMLDLR18, 4) Adenine, 5) Thymine

The Immune System



What is the immune system?

The immune system is what keeps us from getting sick! Our bodies act like an army. When there is something in our body that may make us sick, the immune system sends all of its best fighters to fight off the threat and keep us healthy!

Our bodies learn from experience!

When our bodies fight off a disease, our immune system learns what type of cells will be the best fighters for that specific disease. If we are exposed to that again, our bodies will be smarter and better fighters. This means next time we will get less sick, or not get sick at all!

This is why vaccines work. A vaccine has a special form of the disease that is not able to make us sick, but still teaches our immune system how to handle the disease so that we won't get sick if really do get it!

The coronavirus is a brand new virus, which means our bodies don't know how to fight it yet. Scientists are working hard to find a vaccine so that we don't have to get sick. Until then, we should be careful to stay healthy!

Unscramble the words!

imemnu ssmyet
odvic
emrgs
acrveci
helayht
fitgh

Protect yourself from getting sick!

1. Try not to touch your face! Even if your body isn't sick, the germs from your mouth could make other people sick. Wearing a mask also helps with this!
2. Wash your hands for 20 seconds! If you sing the ABC's or Happy Birthday twice while washing, that's perfect!
3. Don't get too close to other people! Sometimes we might feel healthy but still carry some germs. Stand out of arms reach to protect yourself and your friends just in case!

Fun Facts and Foolery!

What should you do it you are attacked by a group of clowns?

Answer: *"Go for the juggler/jugular!"*

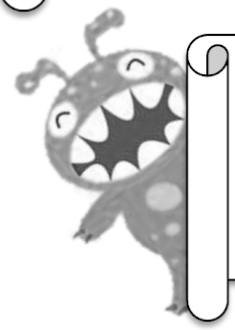
Disappearing Bones?

Did you know that babies are born with 300 bones! Adults have 206… Where did those bones go!?"

Ear-y Facts

The smallest bones in your body are in your ears!

Your sense of hearing come from tiny little hairs, called **stereocilia**, deep in the ear canal.



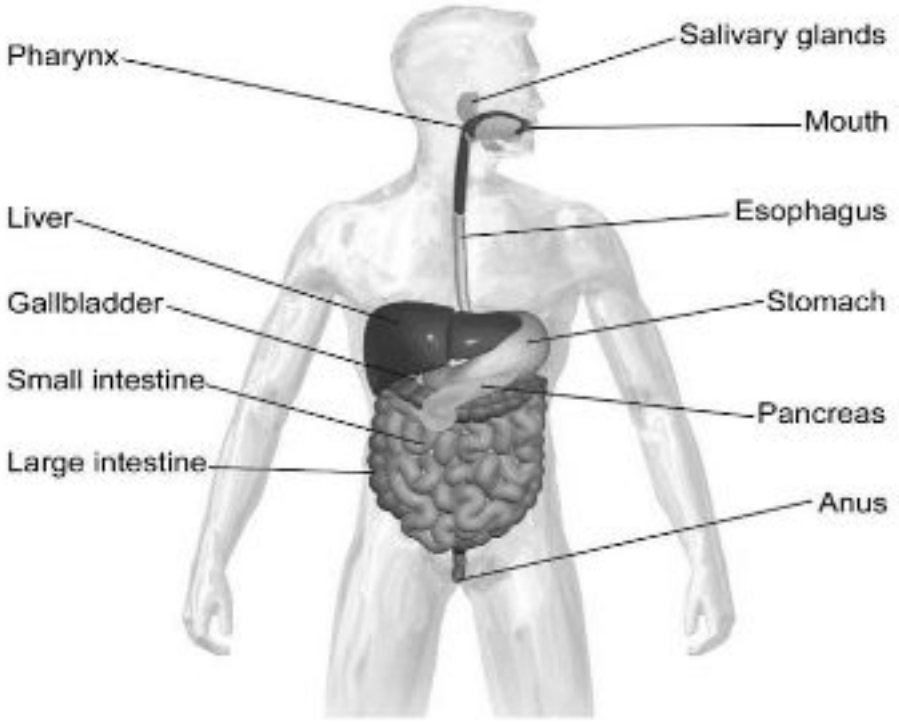
How do scientists freshen their breath?

Answer: *With Expert-mints!*

Why didn't the skeleton cross the road?

Answer: *Because he didn't have the guts!*

The Great GastroIntestinal Escape



Salivary Glands: The salivary glands are the glands in our mouth that make Saliva. Saliva is a fancy word for spit!

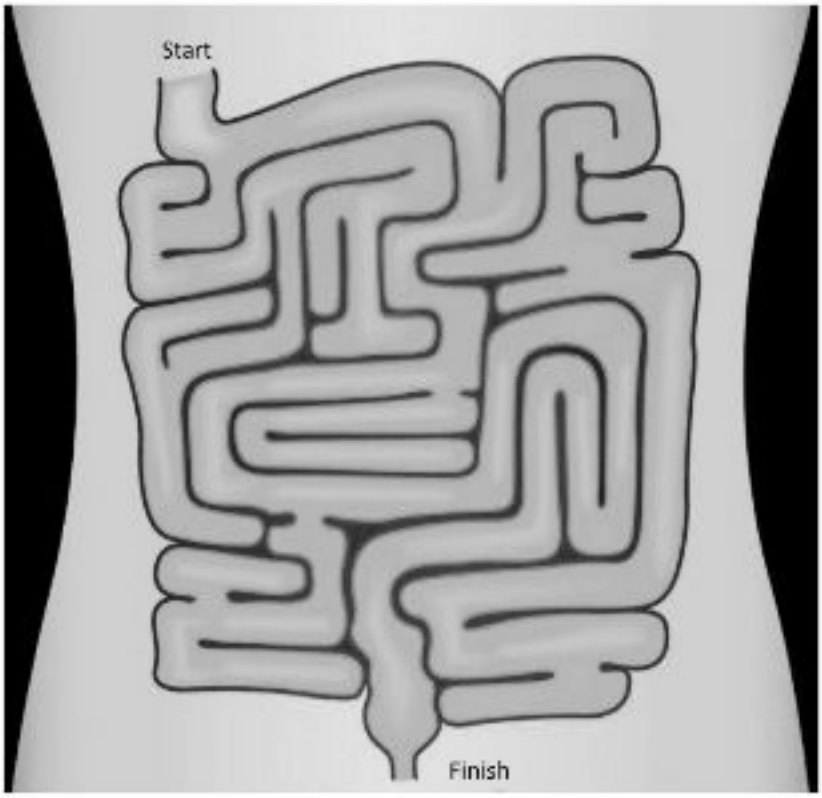
Pharynx: The Pharynx is the beginning part of our throat.

Esophagus: The esophagus connects the pharynx to the stomach.

Stomach: The stomach's main job is the break down all the food we eat to make it easier for our body to process.

Pancreas: The pancreas produces important digestive enzymes that help break down our food further than just stomach acid.

Small and Large Intestines: The place where the nutrients from the food is absorbed into the body, also any water that was used to process the food is absorbed back too!



Subject's Name

Oh no! _____'s intestines don't just look like a maze anymore, but they are one! Can you find your way out?
Did you find your way out? GOOD JOB!

Now that you beat the maze once, we want you to do it again but this time, we want you to pretend that you are telling a robot how to get through the maze. We can just tell it to find the exit, instead we have to be specific.

For example, if we wanted to tell a robot how to follow the arrow from "start" to the end of the arrow we would need to tell it.

1. Enter Maze
2. Turn
3. Walk straight until you hit a dead-end
4. Turn

Try and use the list below to keep giving the imaginary robot directions for how to escape the maze! Remember, directions for computers must be very specific!

Thank you to our local Sponsors!

UNIVERSITY OF SASKATCHEWAN
College of Engineering
ENGINEERING.USASK.CA

UNIVERSITY OF SASKATCHEWAN
Western College of Veterinary Medicine

A network member of actua.ca

actua™

Youth · STEM · Innovation

2020 Actua National Funders

Canada Google.org NSERC CRSNG Foundation Fondation RBC SUNCOR TD READY COMMITMENT

TOYOTA LOCKHEED MARTIN Imperial

2020 Actua Western Canada Major Funder

FINNING CAT