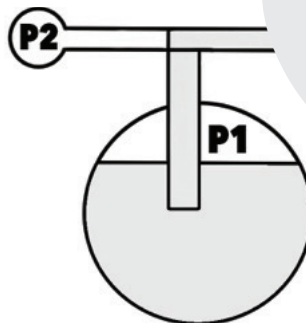


WISE Activity Booklets

A STEM activity booklet for fun on-the-go learning!
Made by WISE Kid-Netic Energy

DIY Activities
Puzzles
Challenges
... and more!



University
of Manitoba

WISE Kid-Netic Energy is a proud member of Actua

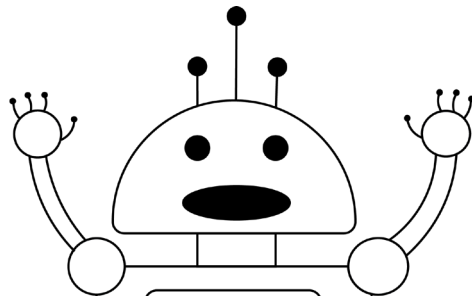
A network
member of
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Youth · STEM · Innovation

With funding from
Canada

Grade 6 Volume 6

Diversity of Living Things - Electricity
Flight - Exploring the Solar System



Hello there!

WISE Kid-Netic Energy is a not for profit STEM (Science, Technology, Engineering, and Math) outreach organization at the University of Manitoba. Our organization offers science and engineering workshops, clubs, camps and events to youth from Kindergarten to Grade 12 throughout the province of Manitoba. We reach on average 25 000 to 50 000 youth depending on funding levels. Our approach is simple – present STEM in messy, memorable and engaging ways so Manitoba youth feel motivated to learn more and more. We reach all Manitoba youth, and we particularly target underrepresented youth like girls, indigenous youth and youth facing socio-economic challenges.

All of us at WISE Kid-Netic Energy have been working hard to create these booklets to continue to bring our fun and educational STEM activities to Manitoba youth during these unprecedented times. We are disappointed that we cannot see you in person, and hope that these monthly booklets bring some STEM excitement to your life.

These booklets have been created by our student instructors who are all studying engineering, science, or in another STEM-related field at university. Peek the next page of this booklet to see who created the activities, experiments and recipes within.

All the activities in this booklet are based on the Manitoba Science curriculum. For any teachers viewing this booklet, all the SLO codes are listed at the bottom of each page.

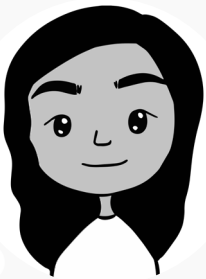
We hope that you enjoy doing the experiments and activities as much as we loved creating them for you.

In this Grade 6 booklet, the science topics you will be exploring are: the diversity of living things, flight, electricity and the solar system!

**Best of luck, and until we see you again,
the WISE Kid-Netic Energy Crew**

P.S. If you have any suggestions for activities or experiments you would like us to try, contact us through our website, or social media accounts that are listed on the last page of this booklet.

Meet our Amazing Authors!

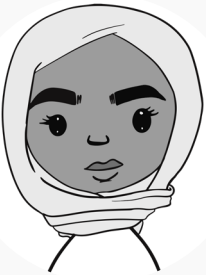
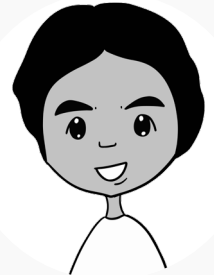


Kajal

Kajal is in her second year of computer science. She likes to read and make new things! Her favourite fruit is mango.

Olivia

Olivia is in her third year of biosystems engineering. She hopes to work in renewable energy or water treatment in the future. In her free time, she plays and refs touch football and enjoys watching cooking shows.

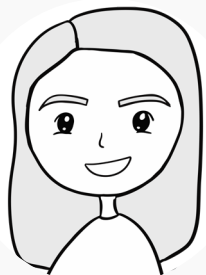
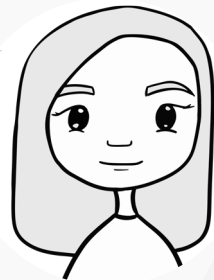


Reem

Reem is in her second year of science at the U of M and U. of M and her favourite classes are psychology and microbiology. In her free time, she loves to watch movies and bake desserts.

Sophia

Sophia is in her third year of science and plans to pursue a career in optometry. She loves math and biology, and in her free time loves reading, watching movies and trying new foods!



Katy

Katy is in her third year of Biosystems Engineering at the University of Manitoba and is passionate about environmental sustainability and working with kids. In her spare time she enjoys running, painting, and spending time outside.

Esiw the Robot

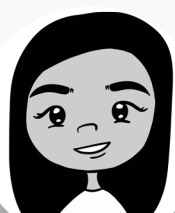
Esiw is a friendly robot that loves to help kids learn about computers & coding! Esiw loves to do math, solve problems and make people laugh!



... and our Incredible Editors!



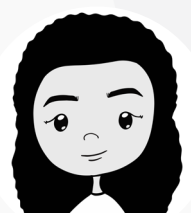
Alex



Bea



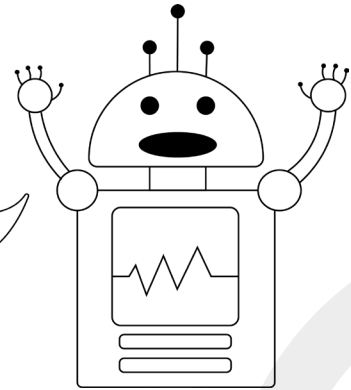
Mahalia



Michelle

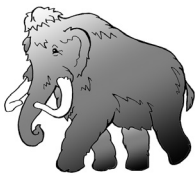
Evolutionary Updates

Phones, apps, and other technology depend on updates to keep them running smoothly and working efficiently! It also lets them adapt to changes in technological preferences around the world. Evolution works similarly! Animals adapt and change so they can survive easier in the changing environments around the globe.

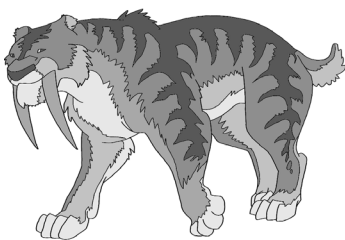


Take a look at these ancient creatures. It's your job to try to figure out what their modern day equivalent is and draw them out! Why did they evolve the way they did? Come up with some reason for changes in each one.

Prehistoric Version



Woolly Mammoth



Sabretooth Tiger



Giant Ground Sloth

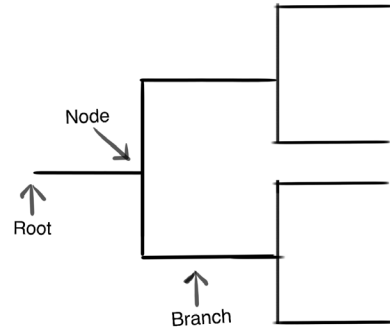
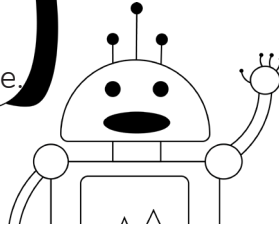


Evolved Version



Phylogenetic Tree and Arthropods

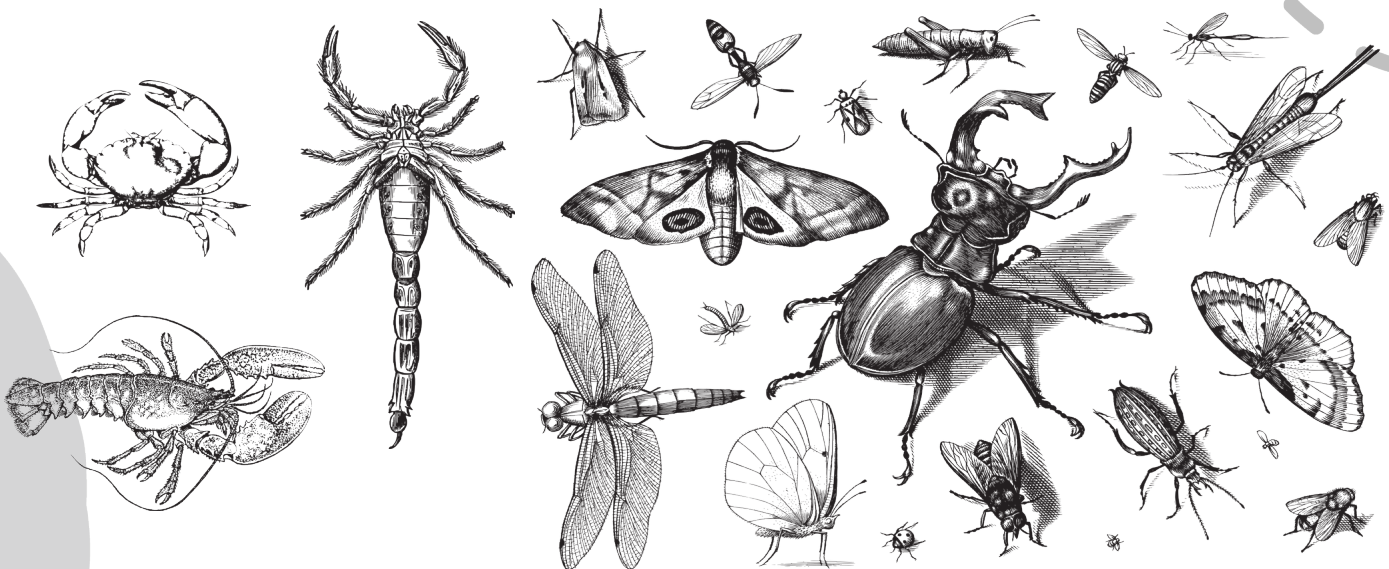
Hi friends! Today I'm going to introduce you to a tool that I use to organize data. It's called a phylogenetic tree. The picture on the right is an example of the tree.



In biology, we use a phylogenetic tree to classify types of organisms that have existed. A phylogenetic tree uses evolutionary adaptations to organize all the animals. These adaptations include things like whether an organism is segmented or not and if it has tissue or not.

Organisms that have similar features form a phylum. Arthropods are one example of a phylum.

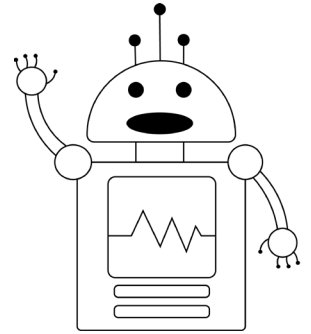
Examples of arthropods:



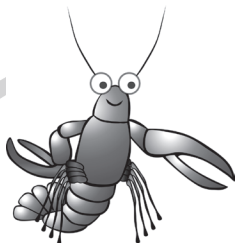
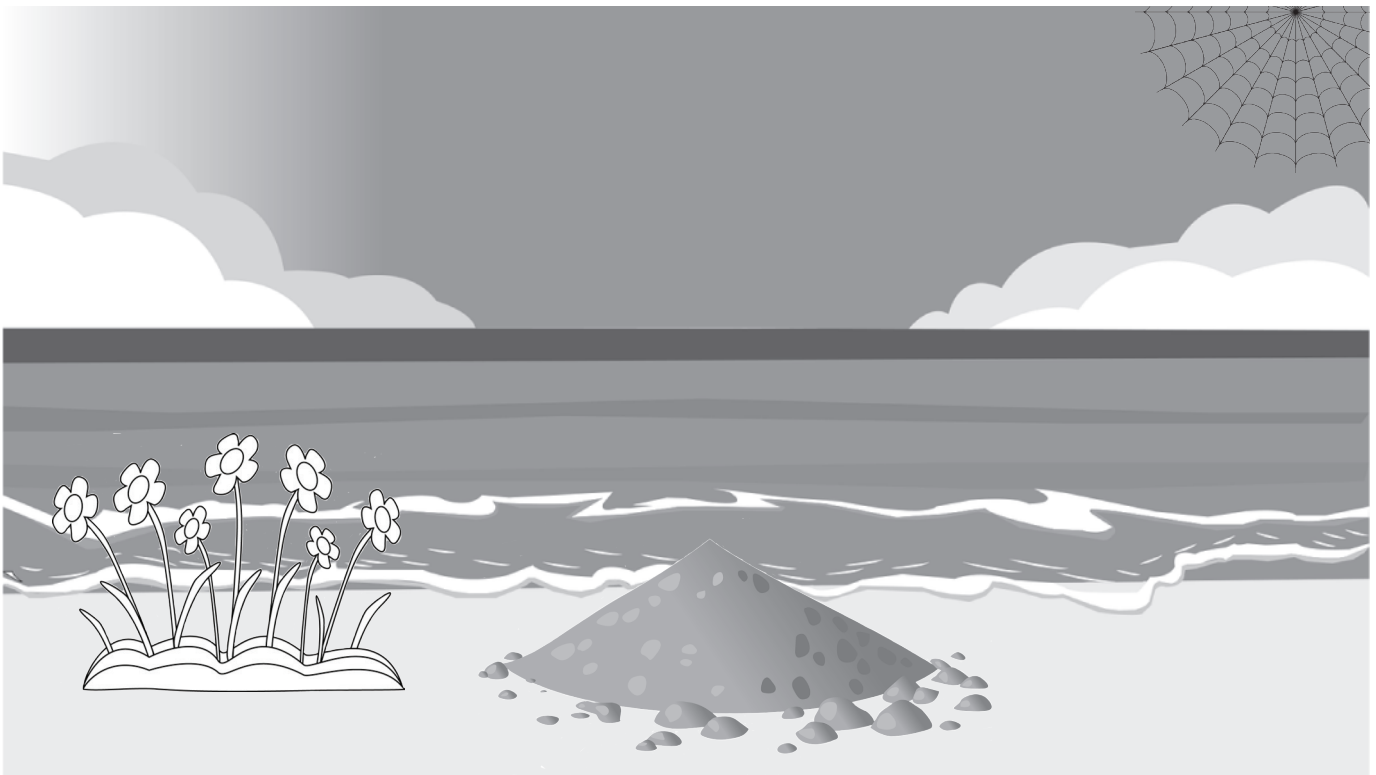
Use the information above to circle the four characteristics of anthropods. Look it up if you are unsure what they mean!

Invertebrates	No tissue	Radial Symmetry
Segmented bodies	Jointed limbs	
Bilateral Symmetry	Ventral Nervous System	Exoskeleton

Did you know that the term debugging means taking out the bugs - or errors - from a program? This term was coined by a Computer Scientist named Grace Hopper in the 1940s!



Can you help me re-bug the following picture? All the arthropods need to go back to their correct habitat. Draw them or draw a line connecting them to where you think they belong!

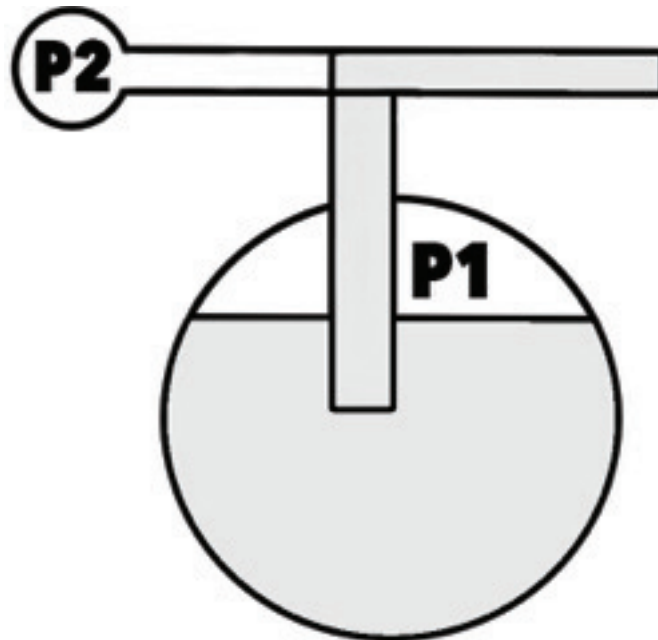


Bernoulli's Principle

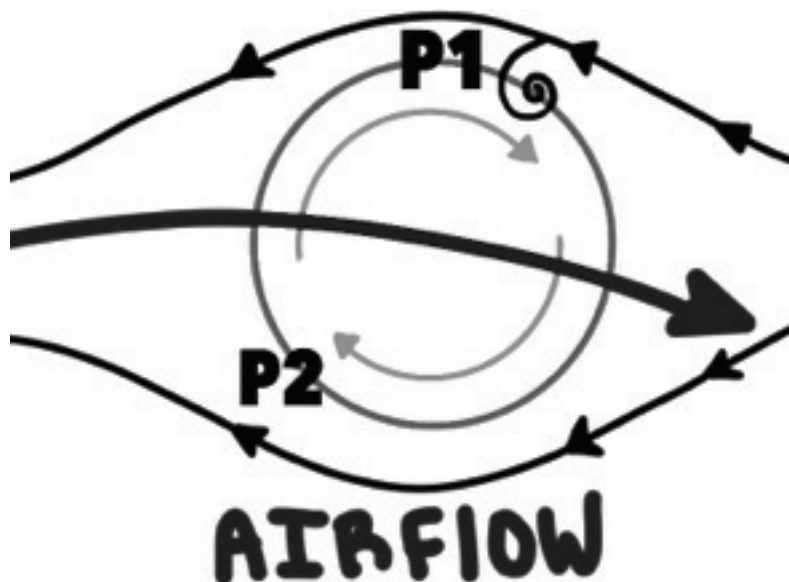
Bernoulli's principle is a physical principle formulated by Daniel Bernoulli that states that as the speed of a moving fluid (liquid or gas) increases, the pressure within the fluid decreases. Pressure is a variable that affects the rest of the system. It can be written as a function as high or low.

Using the examples below, colour the areas of low pressure as blue and the areas of high pressure as red.

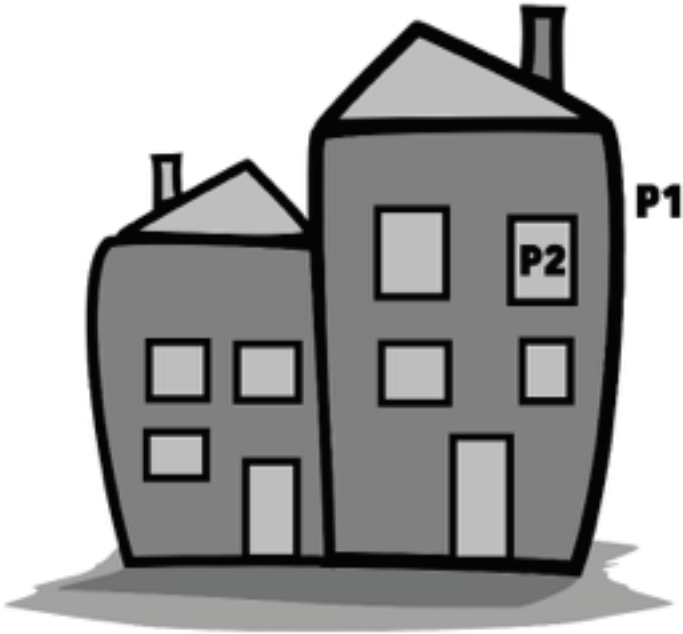
1. A perfume bottle is pressed.



2. This is a curve ball in its path of flight.



3. A window explodes during a hurricane storm due to the change in air pressure.



4. A plane takes off and is flying in the air.



Electricity Challenge

Turn the page for the word list and the hints for the crossword puzzle!

Across

Down

- 1 Converts mechanical energy to electrical energy.
- 4 A stationary electric charge.
- 7 The use of energy.
- 10 A charge that attracts a negative charge.
- 11 A path for electric current to flow.
- 12 The flow of charged particles.
- 13 Transfers electric energy.
- 15 Converts electric energy to mechanical energy.
- 16 A type of field.
- 18 Energy from sustainable resources.
- 19 Required to do work.


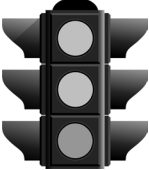


- 2 Energy from charged particles.
- 3 Can connect or disconnect an electric circuit.
- 5 A material that prevents the flow of electricity.
- 6 Has a magnetic field from an electric current.
- 8 A charge that repels a negative charge.
- 9 Energy from non-sustainable resources
- 11 A material that allows the flow of electricity.
- 14 A circuit with multiple paths.
- 17 A circuit with only one path.

Word List

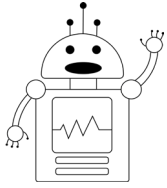
Circuit	Electromagnet	Motor	Renewable
Conductor	Energy	Negative Charge	Series
Consumption	Generator	Non-Renewable	Static
Electric Current	Insulator	Parallel	Switch
Electricity	Magnetic Field	Positive Charge	Transformer

Electric Appliances

Electrical devices are all around us and they fulfill many of our needs. Draw more devices that meet the needs labeled in each box. Use the examples provided to think of more!

<p>Heat</p> 
<p>Light</p> 
<p>Communication</p> 
<p>Movement</p> 

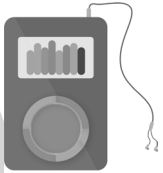
Educational



Information Storage



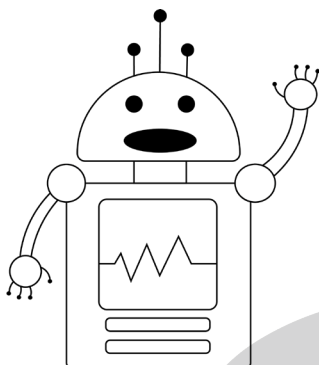
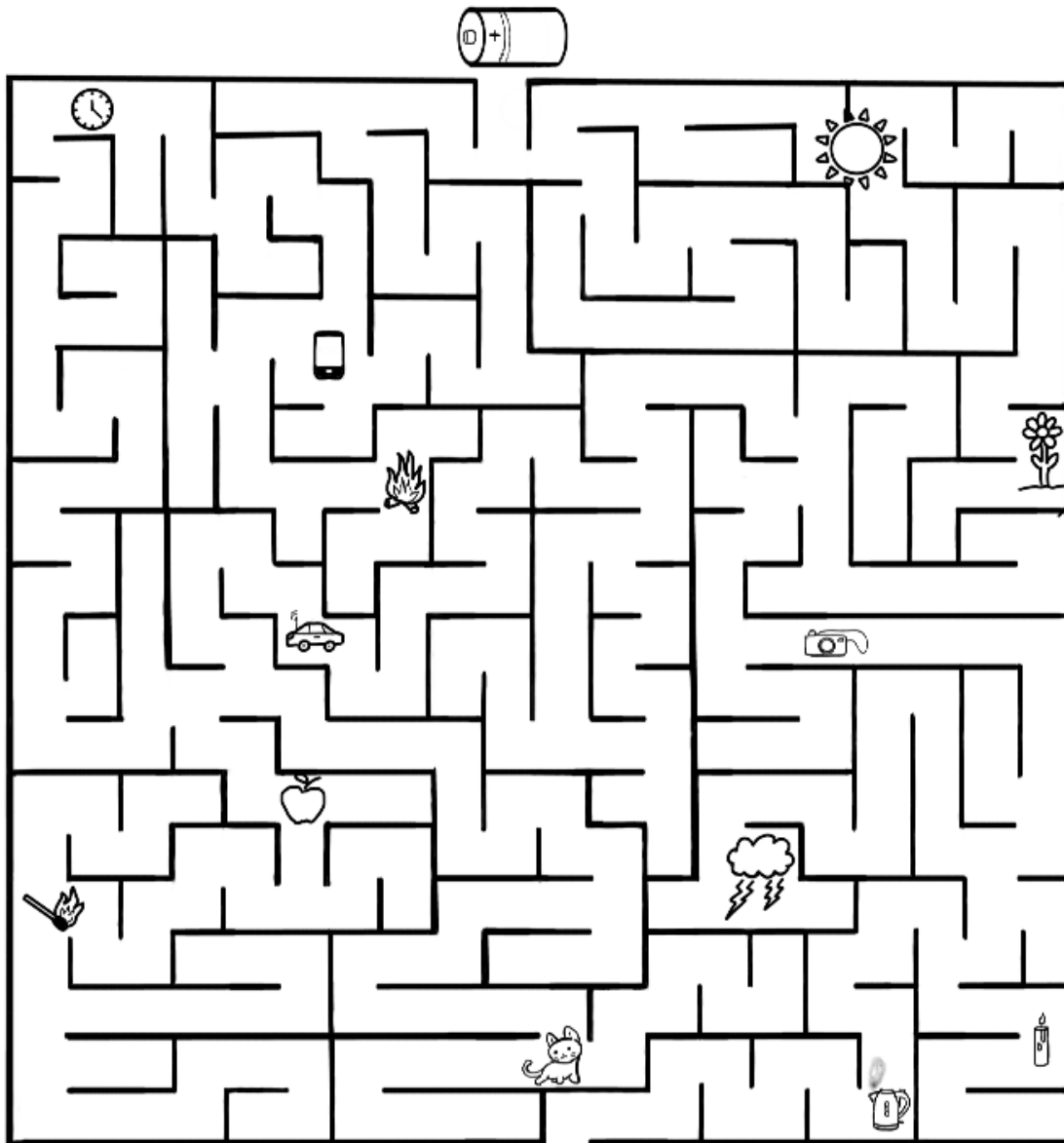
Entertainment



(Make your own category here)

A-Maze-Ing Energy

Make your way through this maze by following the items that use electrical energy and avoiding the other forms of energy. The electrical energy comes from a chemical source, the battery. Other forms of energy includes **Thermal** (heat), **Chemical**, and **Nuclear**. Don't forget to avoid things that don't produce electrical energy.



Every device that runs programs like games or apps needs electrical energy! Some things get plugged into an electrical outlet like computers. Others use batteries, like laptops!

Astronomy Search

I
C
A
S S F
U T G
N R D
I Y O T A
W T N C C
G E A P U
Y F P U T C I
H V V T E E P
L U M P S B R
X V Z L C V O C W
T D S P Y B E Z I
X I J S I Y Z S X

C R B A H S B A D V M N A W L P K J S A B F S P E O G R S B Y G O L O R T S A
Q I H Y S N O I T A T O R L H E L B T T G M A I T U S A D A J V J S S A M
S E T C E J B O L A I T S E L E C L E R X K L P U K J L U F I J M
S M T E N A L P R E T U O M R M D T L Y D D C K W U G H U A Q
N M J F Z E Y M O N O R T S A H O P L D M L E J L Y X V R
P R E V O L U T I O N L P O B J Q I S X F O T V V
M K A C O M N H B O R M L W B Z V T D T B Z Z
D U T V X L J P I N N E R P L A N E T J P
M M G Y Z L N I P W R R B L J E P
G O A U R P H A S E B I Y I M
U Y S O K S F H Y F A H H W X
C A M P I T I A S S M Y F X T
C S U A H H X I T K R J X R V
Y C T K K R E X E I B I L Z M G J
R T H S O L A R S Y S T E M E S A
S U G L X D O X E W O F I L G Z M
B C Q I N Z I S X L T E A V U N M J
G Y Q E A D C W R S A Z Y K D
L F P W V R W T E N I G
P H N X M N K N I W L F
M O F G E U C A G P
O N W X U X
M C F H Y S
R L W D
V P

Word List

- | | | | |
|------------|------------------|--------------|--------------|
| Asteroid | Axis | Mass | Rotation |
| Astrology | Celestial Object | Moon | Satellite |
| Astronaut | Earth | Outer Planet | Solar System |
| Astronomy | Eclipse | Phase | Sun |
| Atmosphere | Inner Planet | Revolution | Weight |

Astrology vs Astronomy

Part one:

Astrology is a pseudoscience that attempts to study how the positions, motions, and properties of celestial objects like planets and moons affect people and events on Earth.

1A Open-minded, Achiever, Loving, Insensitive, Cold.	1B Dynamic, Many talents, Likes games, Two faced, Mischievous.	1C Successful, Creative, Likes to please, Clever, Can lead others on.	1D Alluring, Free, Sensitive, Can't function alone.
2A Creative, Popular, Faithful, Controlling, Too much pride.	2B Hardworking, Straightforward, Loyal, Stubborn, Uncontent until the top	2C Self-reliant, Powerful, Wise, Dominant, Secretive.	2D Good taste, Down to earth, Stubborn.
3A Brave, Independent, Assertive, Impulsive, Hates to be restricted.	3B Irresistible, Adventurous, Lavish, Indecisive.	3C Sets trends, Innovative, Admired, Distant, Eccentric.	3D Sensitive, Friend- oriented, Practical, Hates to argue, Forgives but doesn't forget.

Step one:

Use the chart above to choose the description that is most similar to your personality. Try this out on others!

Personality category: _____

Step two:

Find your zodiac sign based on your birthday:

Capricorn: December 22 - January 20

Aquarius: January 21 - February 18

Pisces: February 19 - March 20

Aries: March 21 - April 20

Taurus: April 21 - May 21

Gemini: May 22 - June 21

Cancer: June 22 - July 22

Leo: July 23 - August 23

Virgo: August 24 - September 22

Libra: September 23 - October 23

Scorpio: October 24 - November 22

Sagittarius: November 23 - December 21

Zodiac: _____

Step three:

Does your personality category (that is based on your zodiac personalities) match your zodiac sign?

Yes or No

Most likely it did not correlate. While astrology may seem scientific because it is based on stars and planets, it is not a science.

Part two:

Astronomy is the study of the universe and its contents outside of Earth's atmosphere. Below, match the descriptions to the right planet in our solar system!

- 1 Seventh planet from the Sun and has a unique tilt.
- 2 Our home planet. The only known planet with living things.
- 3 The hottest planet in our solar system, with a thick atmosphere that traps in the heat.
- 4 The eighth and most distant major planet that orbits the sun. It is dark, cold, and has supersonic winds.
- 5 More than twice as massive than the other planets of our solar system combined. Has a large red spot.
- 6 Has unique and complex system of icy rings.
- 7 The smallest planet in the solar system and the closest to the Sun. It's also the fastest planet.
- 8 A dusty, cold desert world with a very thin atmosphere.



Saturn



Mercury



Jupiter



Venus



Neptune



Mars

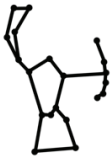


Earth



Uranus

Navigating the Night



The year is 1543, and you and your team of scientists are planning an expedition to find evidence of a new species of _____. To navigate, (Animal)



known as the North Star, or _____. You can find Polaris by finding (Noun) the top corner of the big dipper and following it to the tail of the little dipper.

As you set sail, a(n) _____ storm rolls in, covering your precious (Adjective) stars. You sit shivering in the _____ rain until the storm dies down. (Adjective)

Slowly, the stars begin to speckle the sky again. You begin to see all the constellations in the sky, like Orion, Sagittarius, Taurus, and _____. (Noun)

You find the North Star again, and this time it's closer to the horizon. You know you're close when your latitude is _____ degrees. One of your (Number from 1 - 360)

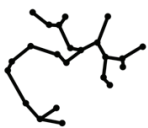
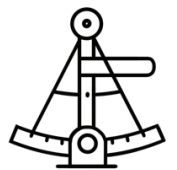
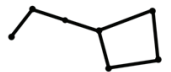
_____ crew members named _____ measures the angle (Adjective) (Name)

between Polaris and the horizon. You are only 3 degrees off! Your team heads off in the same direction. When you feel like you're getting close to land, you

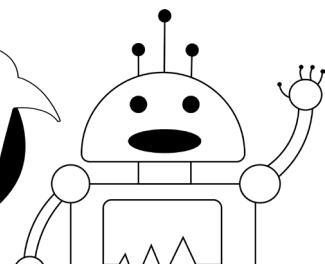
send off a(n) _____. It heads straight, so you follow it, hoping it'll lead (Flying Animal)

you to land. As you get closer, you see palm trees, sand, and _____! (Landform Plural)

Let the research begin!



Filling in the blanks to complete the story is like debugging a code. If you read the story with the blanks it won't make sense, so you add in words to complete the story.

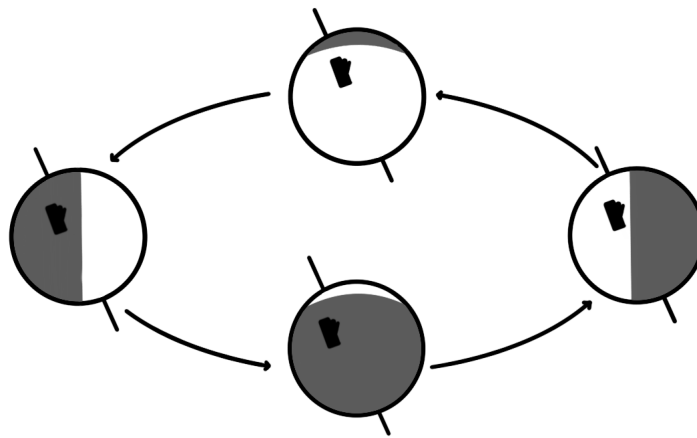
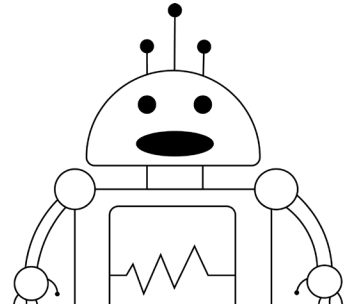


Season Selection

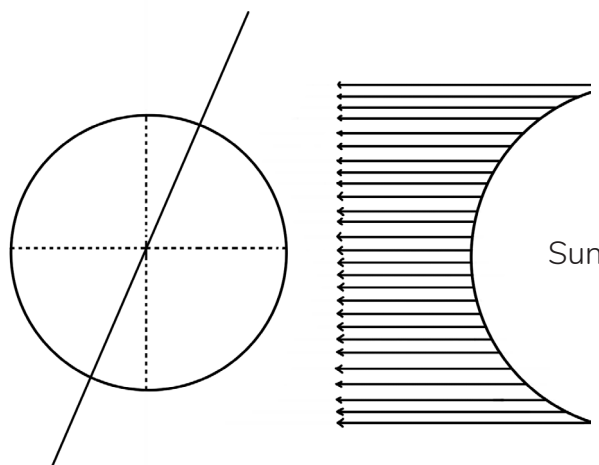
Manitoba is in the Northern Hemisphere of the planet Earth. Summer in the Northern Hemisphere occurs when the North Pole is tilted towards the Sun. Winter for the Northern Hemisphere happens when the south pole is tilted towards the Sun.

What season is Manitoba in? Label each globe in the cycle.

Seasons are like loops in coding! The planet is constantly rotating around the Sun, and we see the same seasons the same time of the year every year!



Which part of the planet is experiencing day, and which part is experiencing night? Shade in the day with yellow and the night with blue.



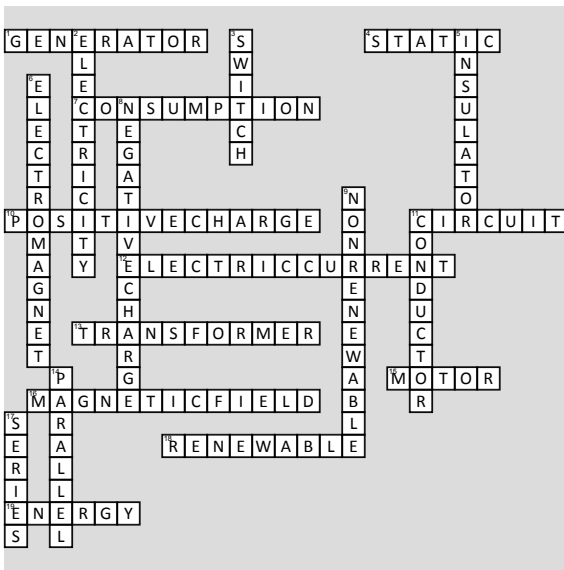
Answer Keys

Phylogenetic Tree and Arthropods (pages 5-6)

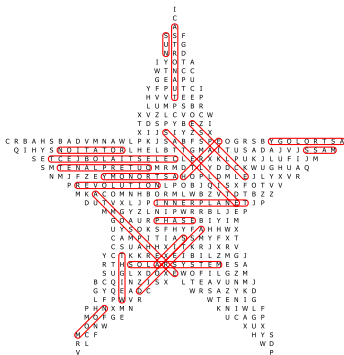
Characteristics of arthropods: Invertebrates, Exoskeleton, Jointed limbs, Ventral Nervous System, Segmented bodies, Bilateral Symmetry.

Beach scene: Butterfly with flowers, ant in the sand hill, spider in the web, lobster in the water.

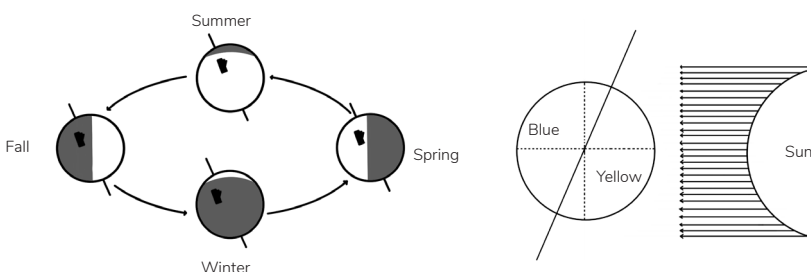
Electricity Challenge (pages 9-10)



Astronomy Search (page 14)



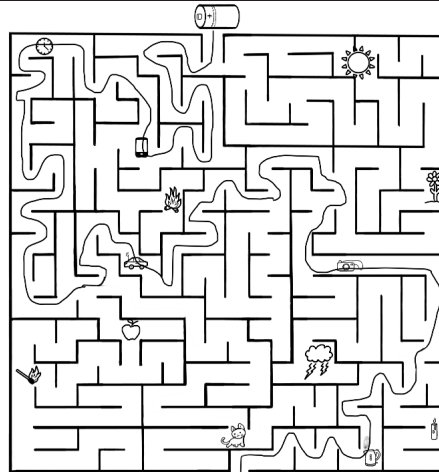
Season Selection (page 18)



Bernoulli's Principle (pages 7-8)

1. Perfume bottle: P1: high pressure, P2: low pressure.
2. Curve ball: P1: high pressure, P2: low pressure.
3. Windows: P1 (outside): low pressure, P2 (inside): high pressure.
4. Plane wing: P1: high pressure, P2: low pressure.

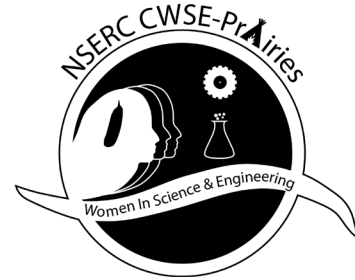
A-Maze-Ing Energy (page 13)



Astrology vs Astronomy (pages 15-16)

- | | | |
|-----------------|--------------|-------------|
| Part one: | 3A: Aries | Part two: |
| 1A: Sagittarius | 3B: Libra | 1 - Uranus |
| 1B: Gemini | 3C: Aquarius | 2 - Earth |
| 1C: Virgo | 3D: Cancer | 3 - Venus |
| 1D: Pisces | | 4 - Neptune |
| 2A: Leo | | 5 - Jupiter |
| 2B: Capricorn | | 6 - Saturn |
| 2C: Scorpio | | 7 - Mercury |
| 2D: Taurus | | 8 - Mars |

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