

WISE Activity Booklets

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

DIY Activities,
Puzzles,
Experiments
... and more!



University
of Manitoba

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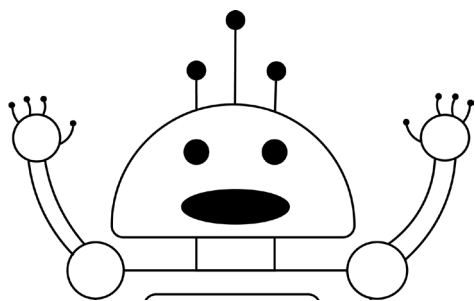
With funding from

Canada

Grade 2

AUGUST 2020

Growth and Changes in Animals
Properties of Solids, Liquids and Gases
Position and Motion
Air and Water in the Environment



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.

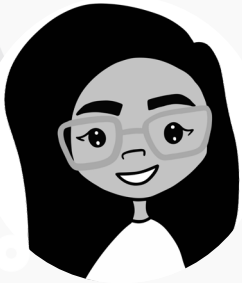
We hope that you enjoy doing the experiments and activities as much as we loved creating them for you.

In this Grade 2 booklet, the science topics you will be exploring are the growth and changes in animals, properties of different phases, position & motion and air & water in the environment!

**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!

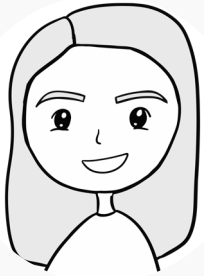
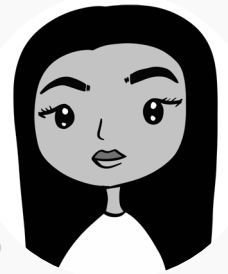


Alora

Alora just finished her fifth year in university, working towards her Bachelor of Science with a major in Neuroscience and a minor in French. She is currently attending the University of Winnipeg. She is aspiring to become a high school science teacher and a guidance counselor. In her spare time, she enjoys reading, writing, and playing the ukulele.

Habiba

Habiba is a second year computer engineering student. In her free time, Habiba loves to learn about everything computer and internet related, but in her free time she likes to draw, go outside as well cook.



Katy

Katy has completed her second 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.

Toni

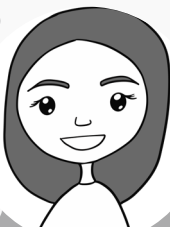
Toni is in her final year of study as a social work student at the University of Manitoba and she hopes to one day work in community development. Toni loves learning and teaching and is happy to be a part of the WISE



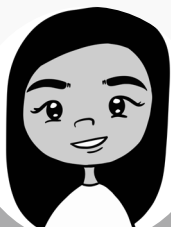
Esiw the Robot

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!



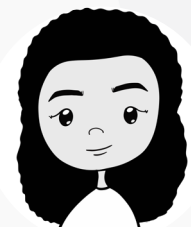
Alex



Bea



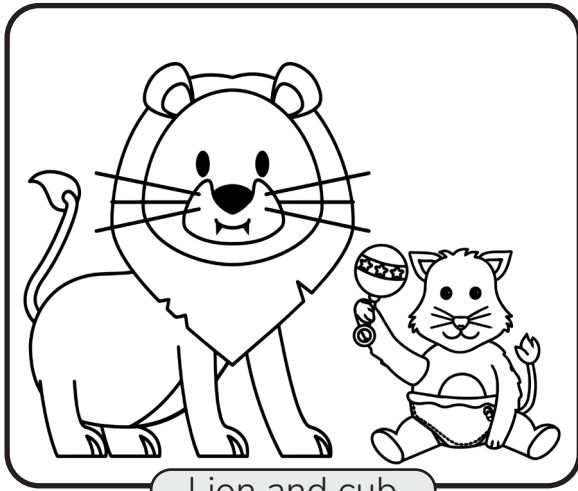
Mahalia



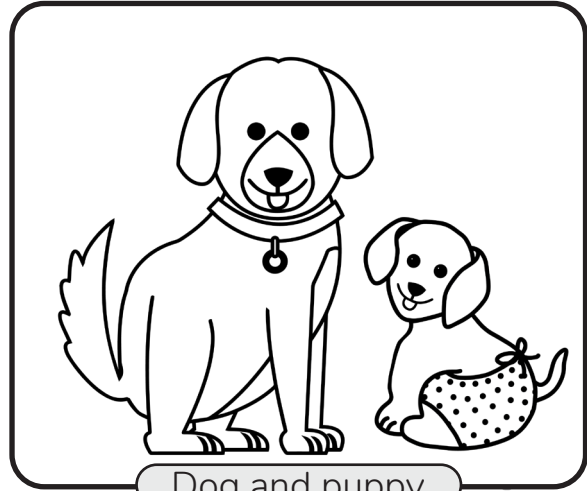
Michelle

Animals and their Babies

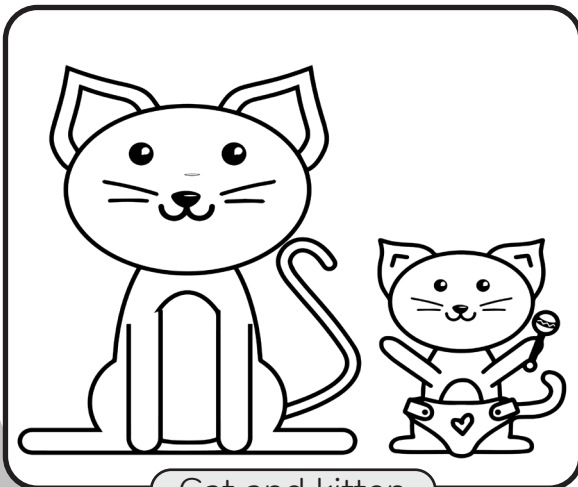
Learn the names of different animals and their babies, then colour them in!



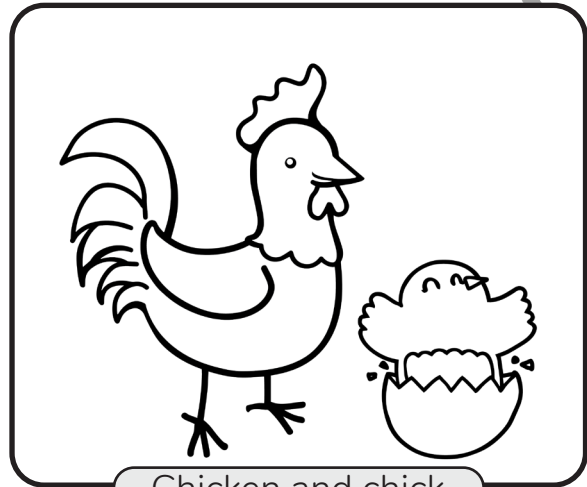
Lion and cub



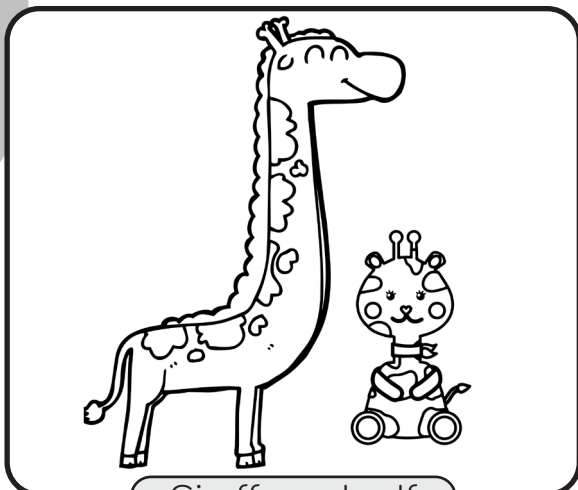
Dog and puppy



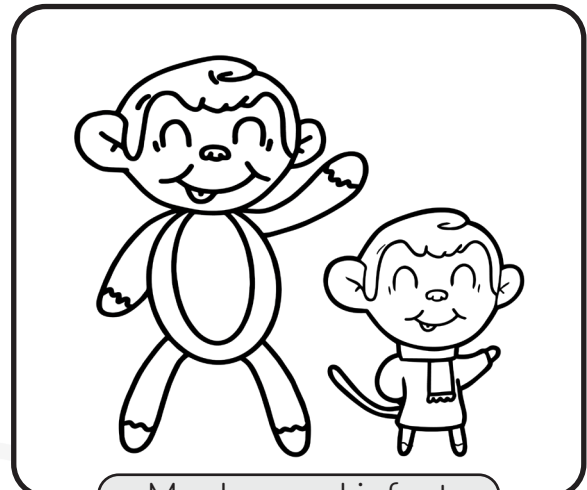
Cat and kitten



Chicken and chick



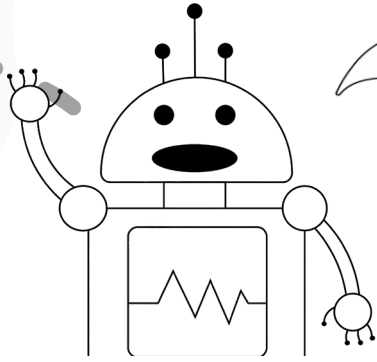
Giraffe and calf



Monkey and infant

What Waste Goes Where

Sometimes we have to throw things out! But where does our waste go? Garbage is a type of waste, but it is not the only type. Garbage is sent to the landfill, or a place to wait for the material to break down. This causes pollution because garbage can take hundreds of years to break down. To reduce this pollution, we have to sort our waste!



Sorting is when we put things into groups depending on their type. In coding this often includes sorting through data and choosing the best way to store it. Today we will be sorting through types of waste and choosing the best way to dispose of it.

RECYCLING

Some waste can be recycled! Recycling is a type of waste that can be made into something else and used again! Different places have different types of recycling. Recyclable materials can include plastic containers, paper, newspaper, cardboard, and drink containers.

COMPOST

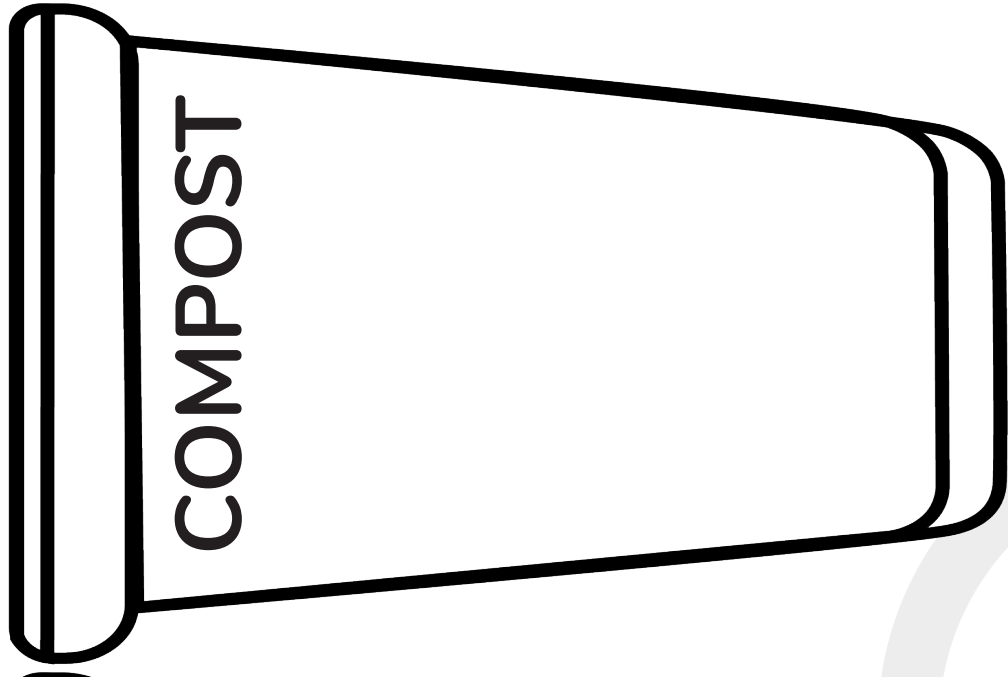
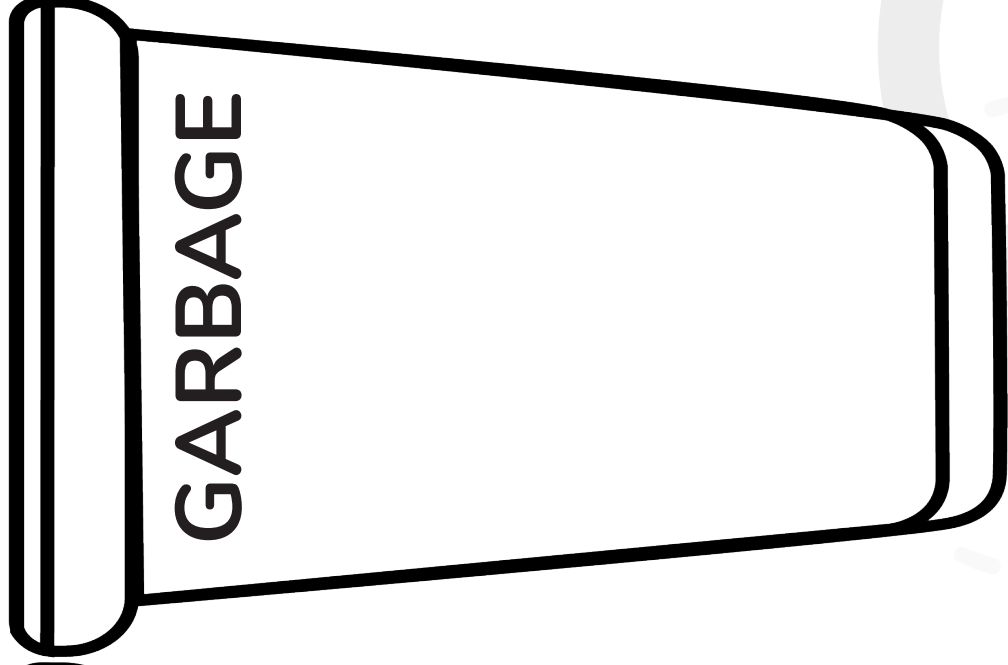
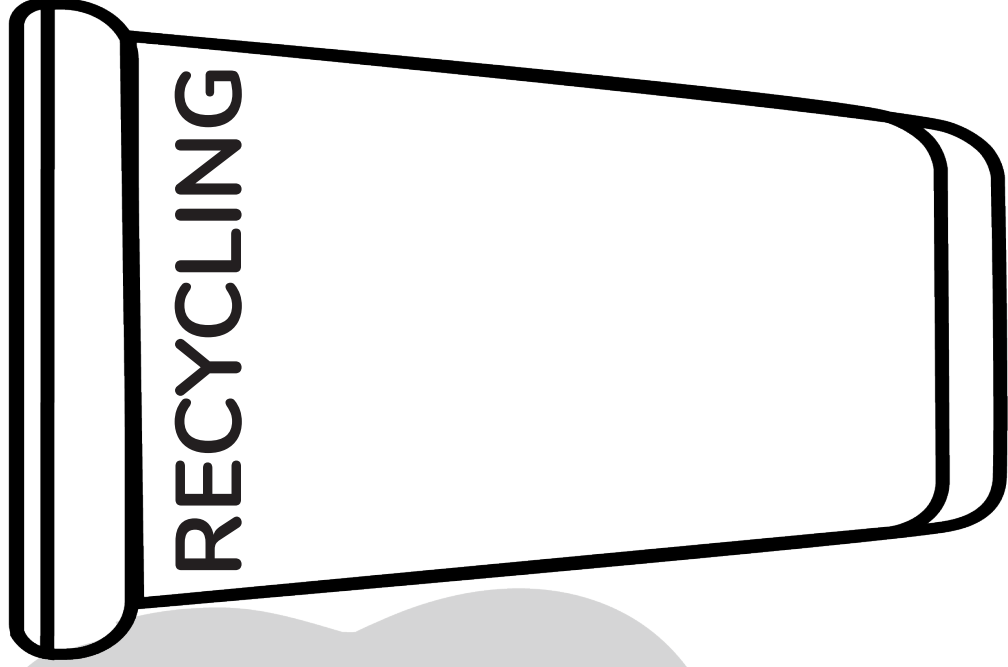
Some waste can be composted! We call this organic waste. Organic waste can be broken into smaller pieces by very small living things called microorganisms. Compost is used to help plants get nutrients and grow big and strong. Compostable materials can include fruit and vegetable scraps, paper products, napkins, paper towels, eggshells and plant trimmings.

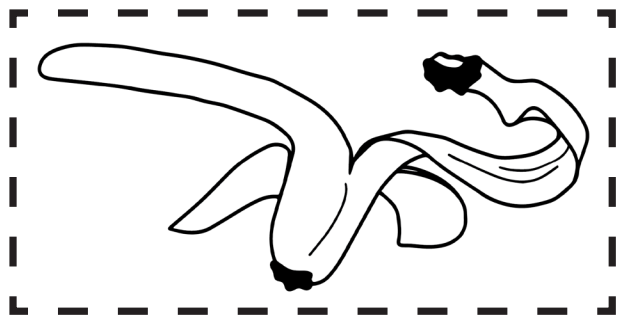
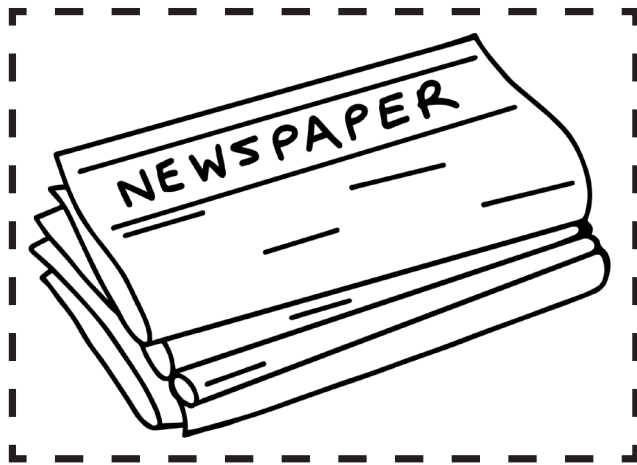
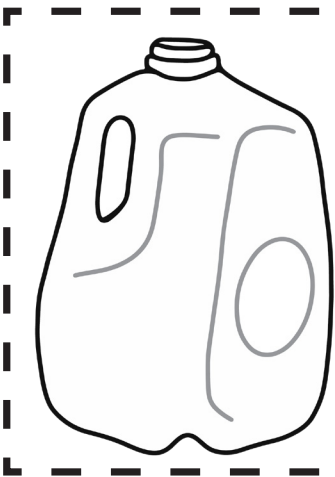
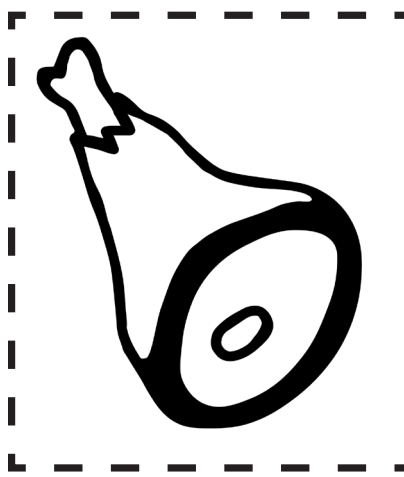
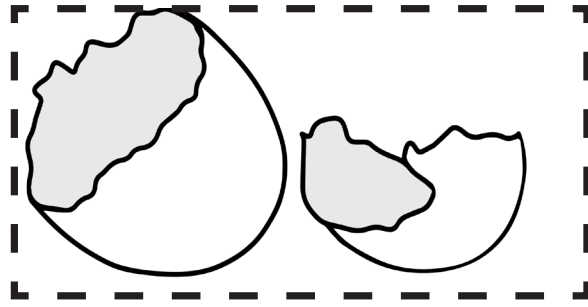
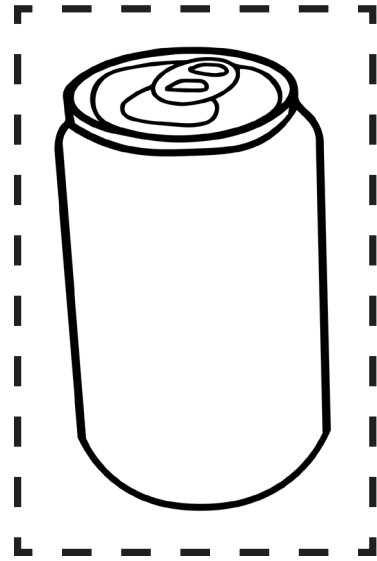
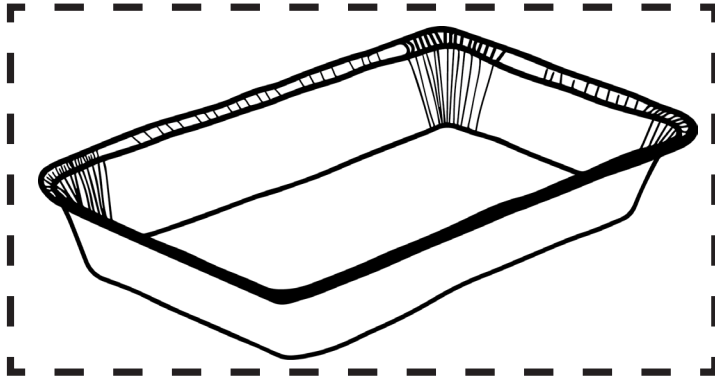
GARBAGE

Some waste cannot be recycled or composted. This waste can be put in a landfill. This is our last choice when sorting our waste, but sometimes we do not have other good options. If the waste cannot be reused, recycled, or composted, then it can go in the garbage.

Cut out and colour the images of waste on page 7. Then glue it to the bin on page 6 that it should be disposed in. Remember something only goes in the garbage if it can't be reused, recycled or composted.

Place the waste in the correct bin!





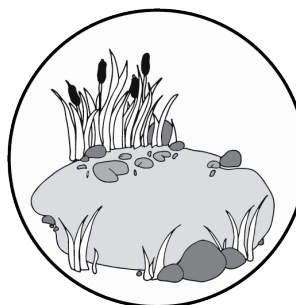
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Help Save the Beaver!

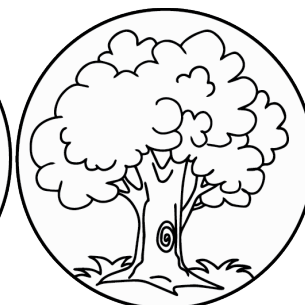
Some animals need specific things to survive! For example, fish need water to survive; they can not live without it. A really cool animal found in Manitoba is a beaver! Check out the things that are good and bad for beavers below and use that to complete the maze on the next page!

Good Things For Beavers

Home: beavers tend to live in marshes or ponds and in areas with a lot of trees.



Pond

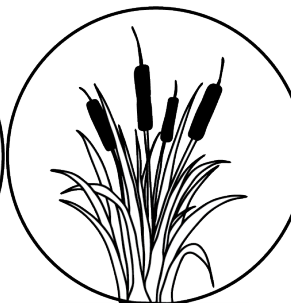


Tree

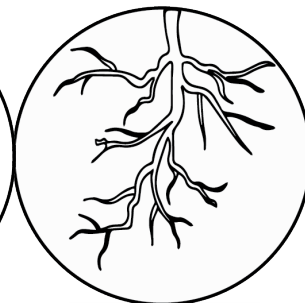
Food: beavers are herbivores so they only eat plants like apples, cattails and tree roots.



Apple



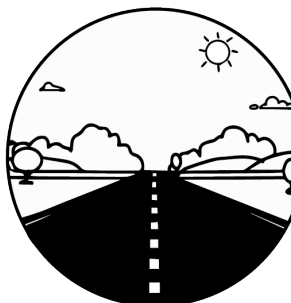
Cattail



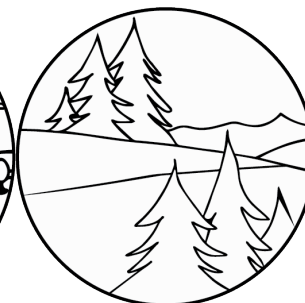
Tree Roots

Bad Things For Beavers

Places: Tundra is a bad place for beavers to live because there's not enough trees. Roads and highways are dangerous for beavers; they don't know to look both ways before crossing.

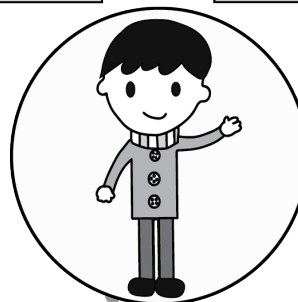


Roads



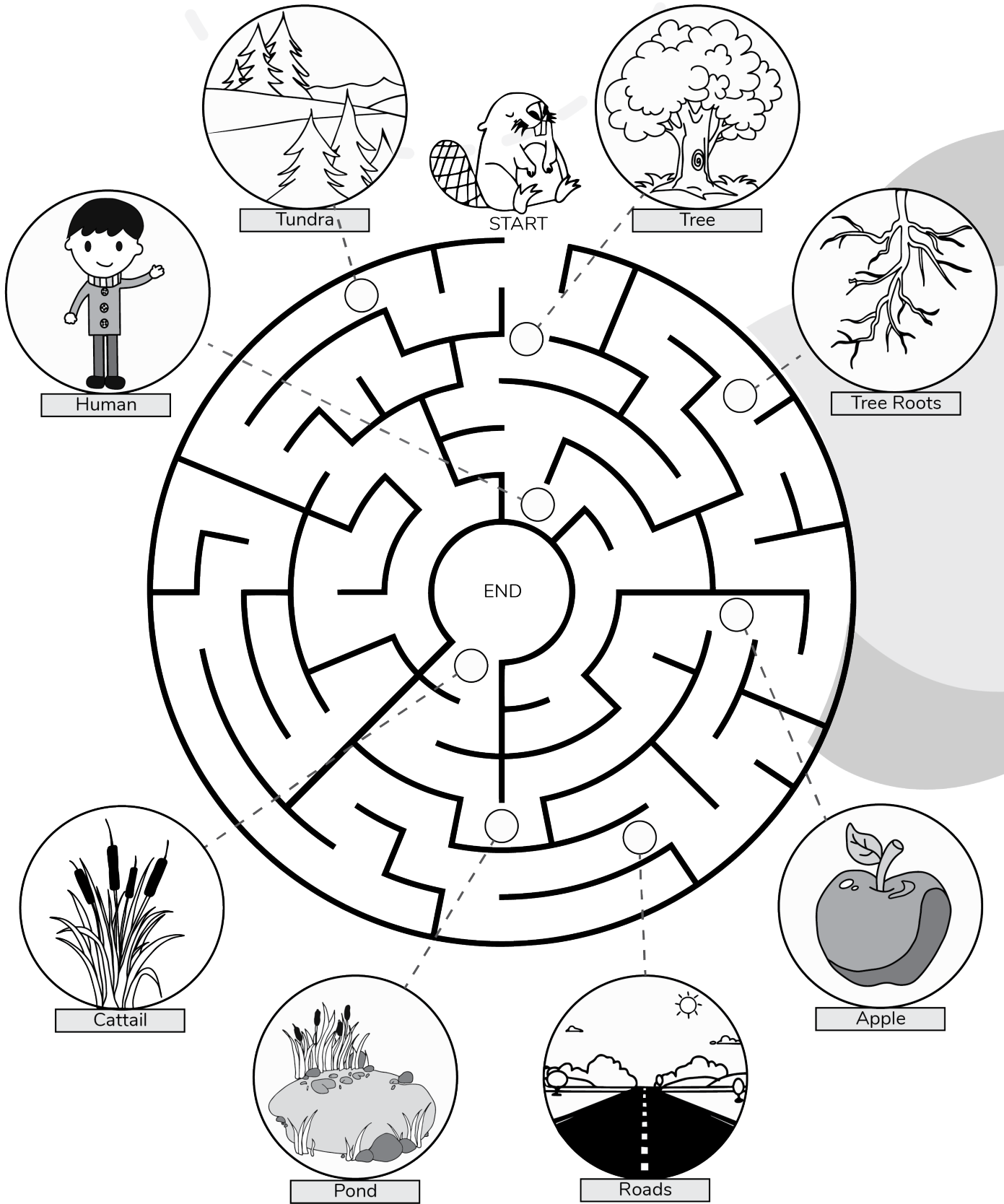
Tundra

Predators: Humans are bad for beavers because they hunt them for sport. They also cut down the trees they need to build their homes. Other animals that are bad for beavers are wolves and bears because they eat beavers.



Human

Help the beaver find his way through the maze. Make sure to collect all of the good things for beavers and avoid all of the bad things.

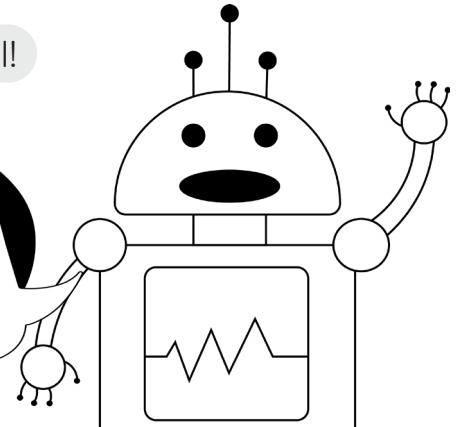


Build A Windmill

Wind is the moving air that pushes the blades of a windmill to make it spin. This a good thing because this is a way we can generate energy!

Follow the instructions below to make your own windmill!

Instructions are important, you need to make sure you follow the instructions closely to make sure you make what you want! I'm controlled by a set of instructions called a program, and when I follow them I create an output!

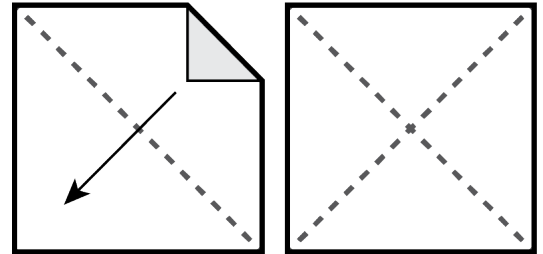


Materials

- A square piece of paper
- Glue
- Plastic straw or pencil (with an eraser)
- Thumb tack
- Scissors

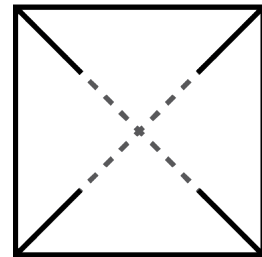
STEP 1

Start with a square piece of paper. Fold it in half diagonally, unfold it and fold it the other way diagonally to create a crease that looks like an 'X'.



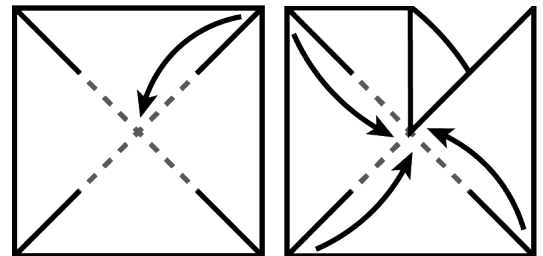
STEP 2

Cut along the crease, from the corner, halfway to the middle for each crease.



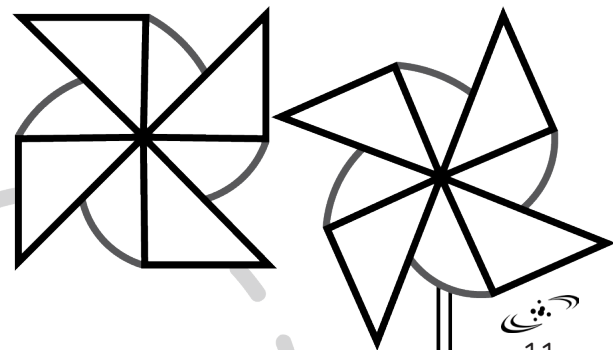
STEP 3

Grab the corner of one flap and fold it towards the center of the square. Glue the corner to the center. Repeat for each flap.



STEP 4

Stick the thumb tack in the middle of the square then use it to attach it to your straw or pencil (into the eraser). Blow on the blades of your windmill to watch it spin!



Water Cycle Word Search

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

AIR

EVAPORATE

MOISTURE

SALTWATER

CLOUD

FREEZE

OCEAN

STATE

CONDENSE

FRESHWATER

POLLUTION

TEMPERATURE

CURRENT

LAKE

PRECIPITATION

WATERCYCLE

EMISSIONS

MELT

RIVER

WIND

What's in Our Atmosphere

The atmosphere is made of all kinds of different things. These things are sometimes called substances. Each substance is special and does something different.

Read about each substance, then colour it in. Next, practice writing out the name of the substance on the line below it!

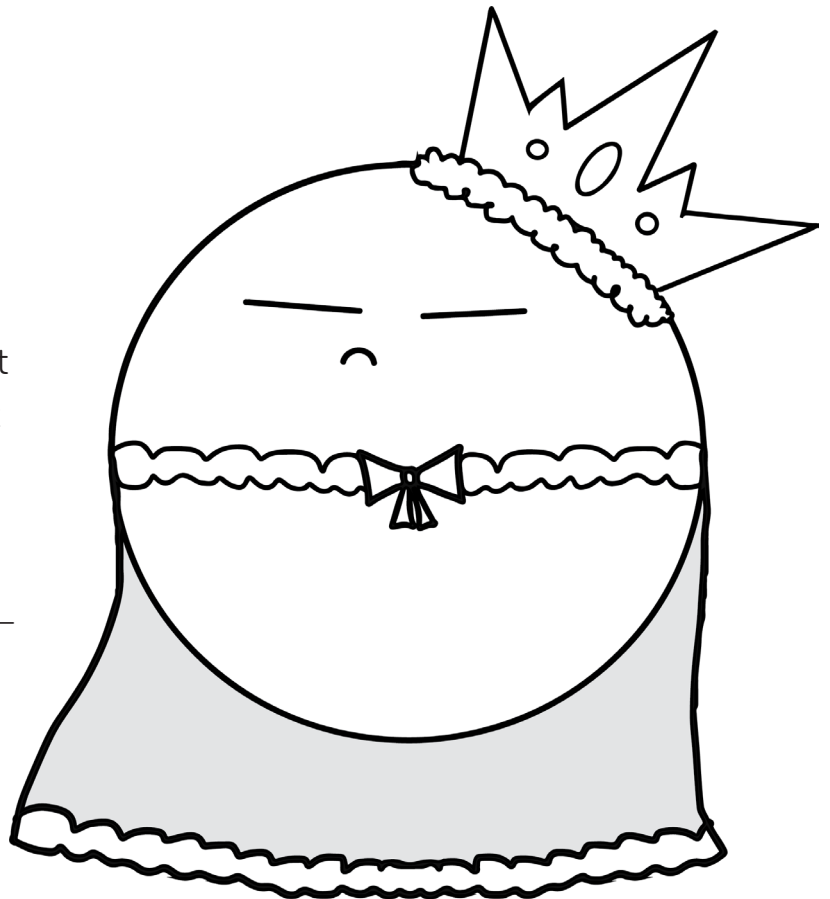


This substance is called nitrogen. Nitrogen is an element that is found in DNA. It is in plants and animals and it helps plants get their food from the sun.

Write the name of the substance:

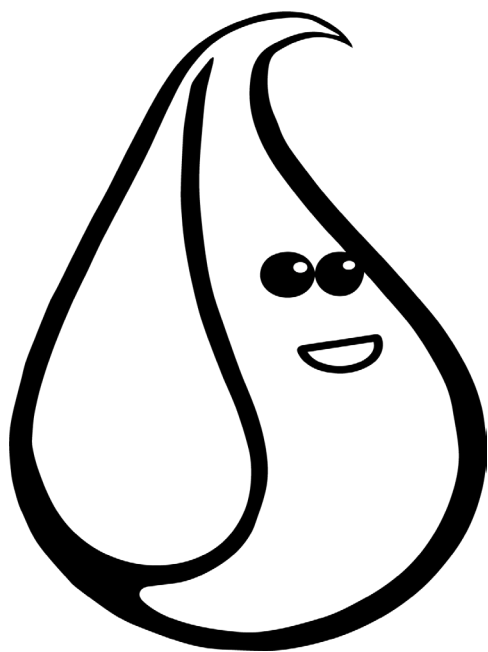
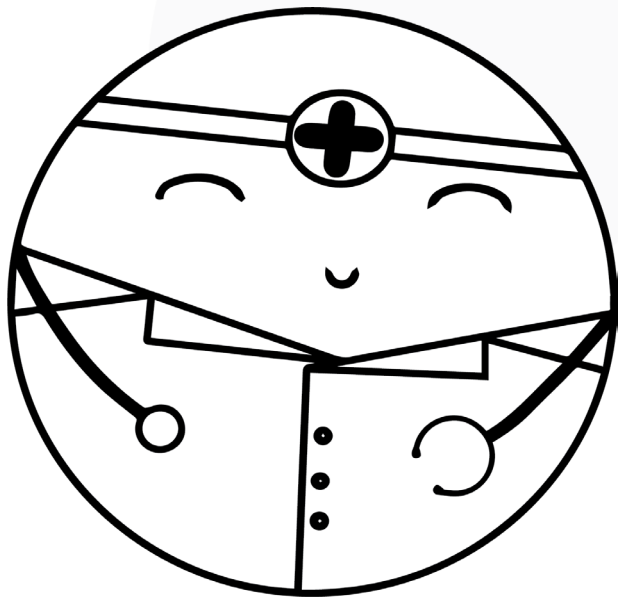
This substance is called argon. Argon is a noble gas. This means it is very strong and it does not react with other elements.

Write the name of the substance:



This substance is called oxygen.
Oxygen is what people, animals and plants breathe in. It is like a doctor because it helps everyone!

Write the name of the substance:

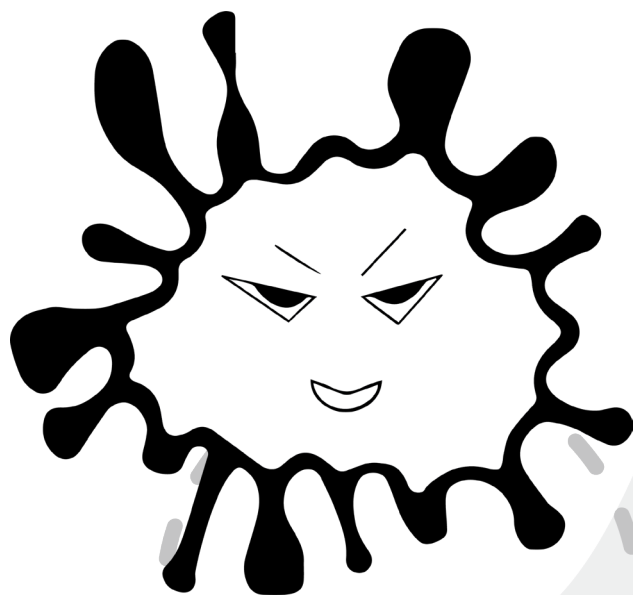


This substance is called water vapour. Water vapour absorbs heat from the earth's surface and helps keep our planet warm!

Write the name of the substance:

This substance is called carbon dioxide. Carbon dioxide is what plants use to breathe. It also traps heat in our atmosphere. When there is too much carbon dioxide in the atmosphere, it traps too much heat and makes the planet warmer. This is called global warming.

Write the name of the substance:

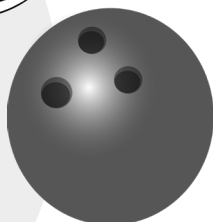


Sink or Float?

Have you ever gone bobbing for apples on Halloween? In order for the game to work, apples need to float on the water! Hmmm, do all fruit float? What about vegetables? Let's do an experiment to find out, but first we should learn more about why things float or sink!

First let's think about a big boat and a tiny rock. A boat can float, but rocks sink. That's because floating has nothing to do with size.

Whether something floats or sinks depends on how **buoyant** it is.



Buoyancy depends on an object's density. **Density** is an object's weight compared to its size. Think of a soccer ball compared to a bowling ball. They are similar in size, but the bowling ball is a lot heavier. That is because the bowling ball is a lot more dense.

Because the soccer ball is light and not very dense it floats on water, compared to a bowling ball that is very dense and sinks in water.

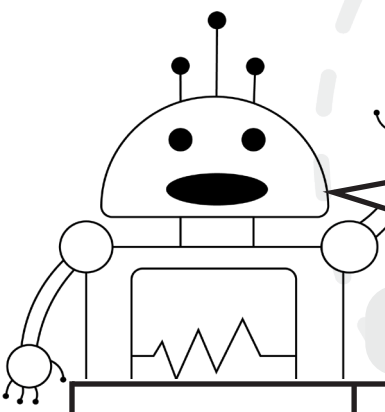
Experiment Time!

Materials

- 7 different fruits or veggies
- A large container or bowl
- Water
- Pen or pencil

Procedure

1. Fill your container or bowl with water a little bit more than halfway full.
2. Write the name of all the fruit and veggies you are testing in the column labeled "Name of Fruit or Vegetable".
3. Make predictions as to whether you think each fruit/veggie will sink or float.
4. Gently place the fruit/veggie in the water.
5. Record if it sank or floated.
6. Take that fruit/veggie out of the container and put another one in.
7. Repeat for each fruit/veggie.

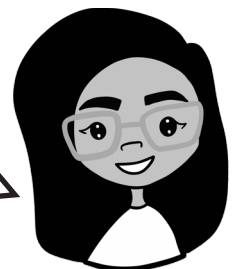


Binary is a language that computers and robots understand that is made up entirely of 0s and 1s. 0 means off and 1 means on in binary.

Fill out the chart below, but for the prediction and observation ones, use binary instead. Put a "1" instead of float and "0" instead of sink.

Name of Fruit/ Vegetable	Peeled or Unpeeled?	Prediction (What you think is going to happen)	Observation (What actually happens)	Did anything else interesting happen?
E.g. orange	<i>Peeled</i>	1 (float)	0 (sink)	<i>It looked like it was going to float, but slowly sunk to the bottom</i>
E.g. pineapple	<i>Unpeeled</i>	0	1	<i>I thought the heavy fruit would sink, but it floats!</i>

Here's a hint: citrus peels (like lemons, oranges and mandarins) have thick peels that hold a lot of air! So, if your fruit floats with its peel on, try peeling it and testing it again!



How to Build a Race Car

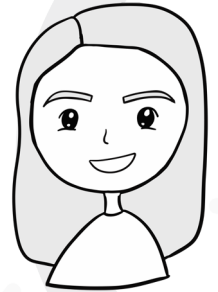
Race cars are designed to be fast! Follow these instructions to build your own race car and learn some more about race cars!

Materials

- 4 Plastic bottle lids
- 2 Wooden skewers or dowels
- 2 Plastic straws
- 1 Plastic bottle
- Scissors
- Glue
- Decorations (optional)

Real race cars have many different parts. We are going to do our best to have all of those parts in the cars we are building. Here is what some of these parts in our cars would be in real race cars:

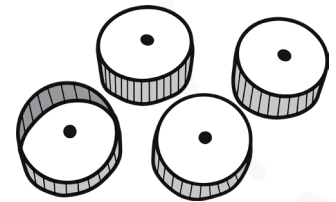
- plastic bottle lids = wheels
- wooden skewers = axles
- plastic straws = axle support
- plastic bottle = car body



Instructions

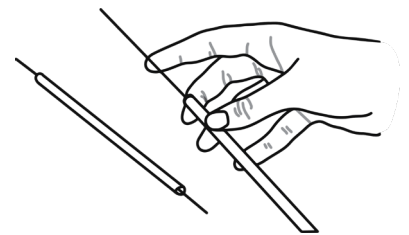
STEP 1

Carefully make a hole in each “wheel” (bottle lid) using your scissors. Ask an adult if you need help.



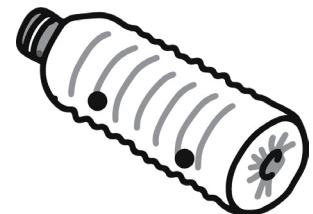
STEP 2

Take one of your “axles” (skewers) and put it inside the “axle support” (straws). Do this with both sets of axles and axle supports.



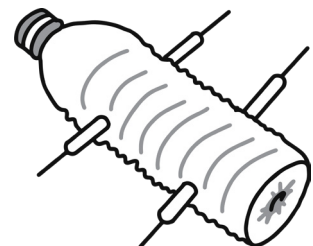
STEP 3

Carefully make 4 small holes on the lower half of the “body” (water bottle), two on either side, around 5cm apart. Make sure the holes are big enough for the axle supports to fit through.



STEP 4

Insert the axle supports and axles (straws and skewers) through the holes in the body (water bottle). Make sure they stick out on either side of the body.



**STEP
5**

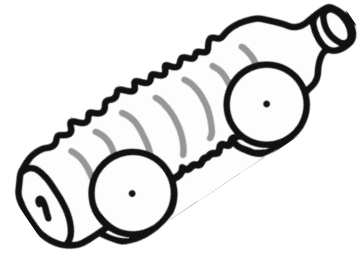
Glue a “wheel” (bottle lid) to the end of each axle (skewer).

**STEP
6**

Decorate your race car however you would like.

**STEP
7**

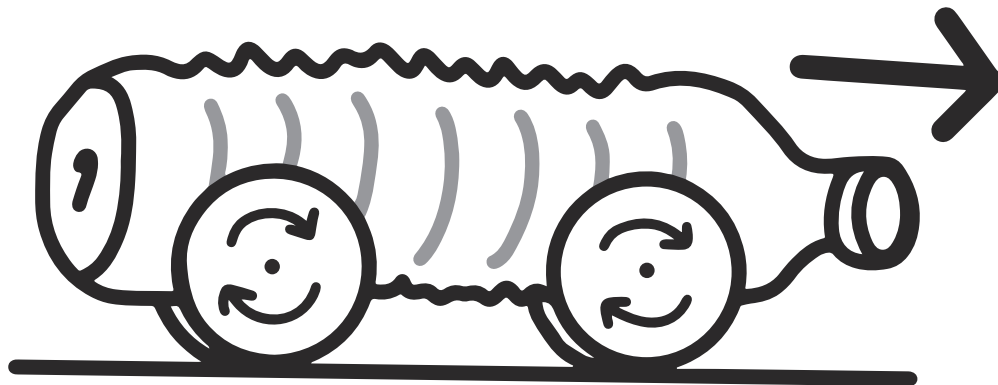
You are done! Time to push it and pull it around and watch it move!



Clockwise or Counterclockwise?

Clockwise is the direction the hands of a clock move.

When wheels are spinning clockwise your car is going forwards!



Counterclockwise is the opposite direction that the hands on a clock move.

When wheels are moving counterclockwise your car is moving backwards!



Answer Keys

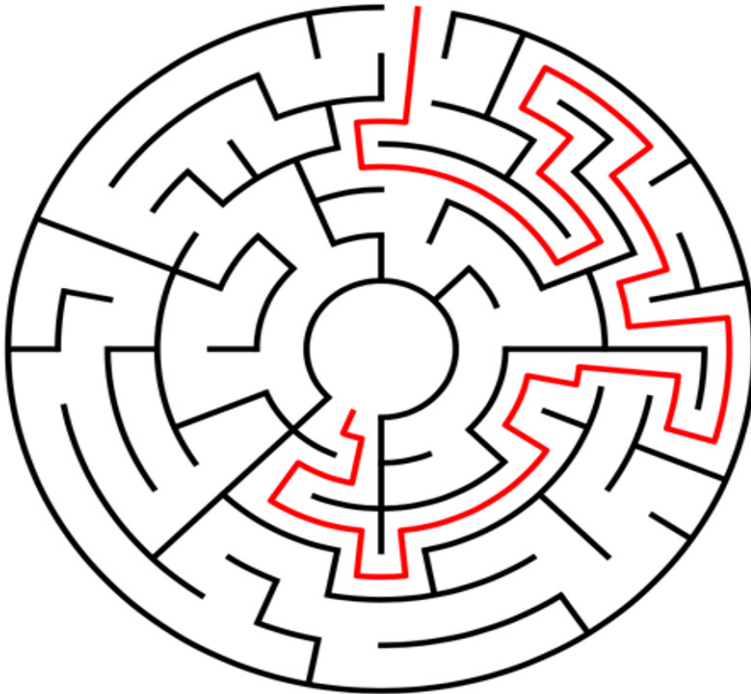
What Waste Goes Where (pages 5-7)

Compost: banana peel, egg shells

Recycling: foil tray, soda can, milk jug, newspaper

Garbage: meat, candy wrapper

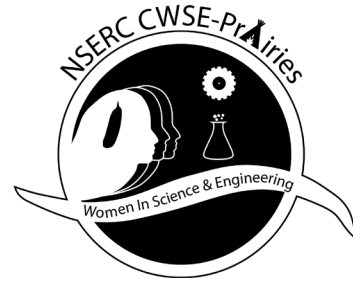
Help Save the Beaver (pages 9-10)



Water Cycle Word Search (page 12)

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

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