

NATURE DISCOVERY BACKPACK
NIGHT SKY & NAVIGATION
ACTIVITY WORKBOOK

CONNECTING WITH NATURE

A PROGRAM OF:

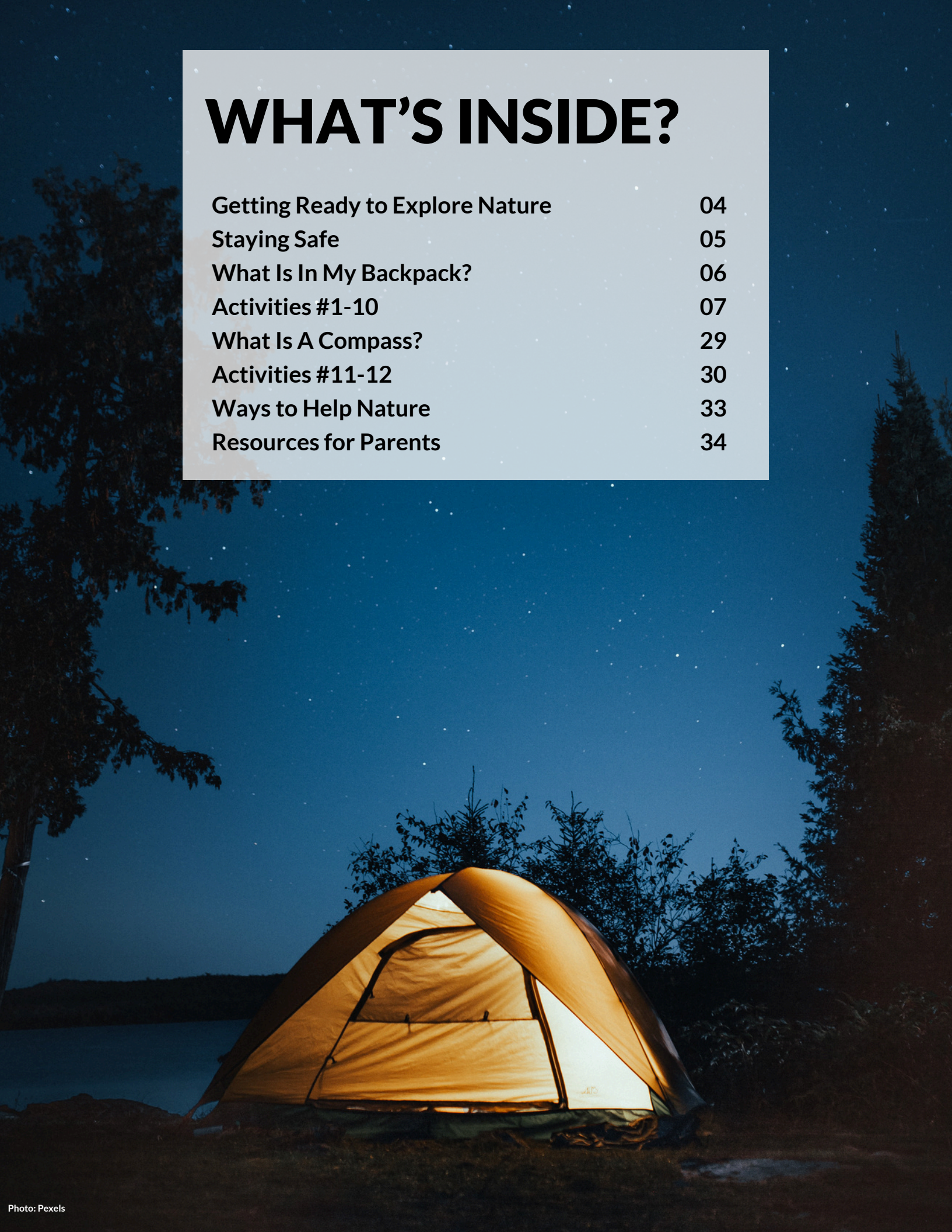


DELIVERED WITH:



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ACKNOWLEDGEMENTS

This workbook was created together by Watersheds Canada and Gravenhurst Public Library with the common goal to educate students and families about the benefits of healthy waterways, lakes, and the surrounding environment for our collective future. This book is linked to the Ontario curriculum for grades K-8. Photography in this book is provided by Watersheds Canada unless otherwise labelled. Cover photo: Getty Images.

Gravenhurst Public Library (GPL) serves a community of 13,000 people and helps to promote a balance between the protection and the enjoyment of Muskoka's beautiful natural landscape. GPL offers a variety of programs, resources, and services for all ages. It is equipped with Wi-Fi and computers and provides tools like park passes, fishing rods, and adventure packs, for people to explore Muskoka and learn about the environment.

GPL acknowledges that the Anishnaabeg, Haudenosaunee and Metis people were and are still the keepers and caretakers of the land and waters upon which the Town of Gravenhurst now sits. This is covered by the Williams Treaty and the One Dish with One Spoon Treaty. GPL is deeply grateful for the enduring presence of Indigenous Peoples who have shaped and strengthened this community for the benefit of future generations. GPL is committed to moving forward in the spirit of reconciliation and respect.

Watersheds Canada is a federally incorporated charity (863555223RR0001) committed to providing education and stewardship programs to communities and individuals across the country to enhance and protect the health of their lakes, rivers, and shorelines.

This Nature Discovery program is made possible because of support from:



**TD Friends of the
Environment
Foundation**

GETTING READY TO EXPLORE NATURE



Photo: Pathum Danthanarayana

We are so excited for you to explore your local nature and the beautiful night sky. You will learn about astronomy and how to protect the health of our local natural spaces and beyond!

You can keep this workbook. This workbook will give you tips to safely explore nature, especially at night or in the woods. You will also learn how you can help protect your local nature!

Please return all field materials in the backpack.

If you are interested in learning more about Watersheds Canada, please visit watersheds.ca or scan this QR code!



STAYING SAFE



Here are some things to keep in mind when exploring outside at night:

- Never go off by yourself. Tell someone where you are going and when you will be back.
- Choose a word, fun sound, or call that everyone in your group knows that you can use when you are looking for each other in the dark.
- Charge all electronics and flashlights/headlamps ahead of time and bring extra batteries/charged power banks for all devices.
- Bring snacks, reusable bottle with water, warm clothes and layers, a waterproof layer, and bug spray.
- Practice good campfire safety. Respect any fire bans. Only use locally purchased wood to prevent the spread of invasive species.
- Watch wildlife from a safe distance. Do not try to handle wild things!
- Please leave nature for everyone to enjoy. Do not pick any plants or bring home any wildlife or insects with you.
- Make sure to properly dispose of any garbage you have.
- **There are ticks in the area. Wear long sleeves and long pants when in a wooded area: <https://www.ontarioparks.com/parksblog/how-to-protect-yourself-from-ticks/>**

WHAT IS IN MY BACKPACK?

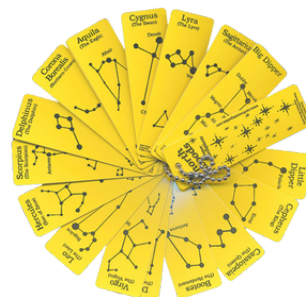
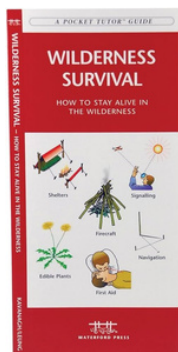
Exploration Tools

- Use the different light settings on the headlamp to see far away while you explore! The red light mode is great for reducing light pollution and preserving your night vision.
- Learn how to use a compass and navigate yourself around in nature using the cardinal directions (north, east, south, west). No GPS or phone needed!



Guides & Games

Use the identification guides to learn more about constellations, the night sky, and play a fun game along the way with the 'fundana'! You will also learn about survival skills and how to stay safe in the wild.



ACTIVITY #1: POETRY

List 6 things that describe what you love about the night sky using the first letter of each line. Lines do not have to rhyme in an acrostic poem.

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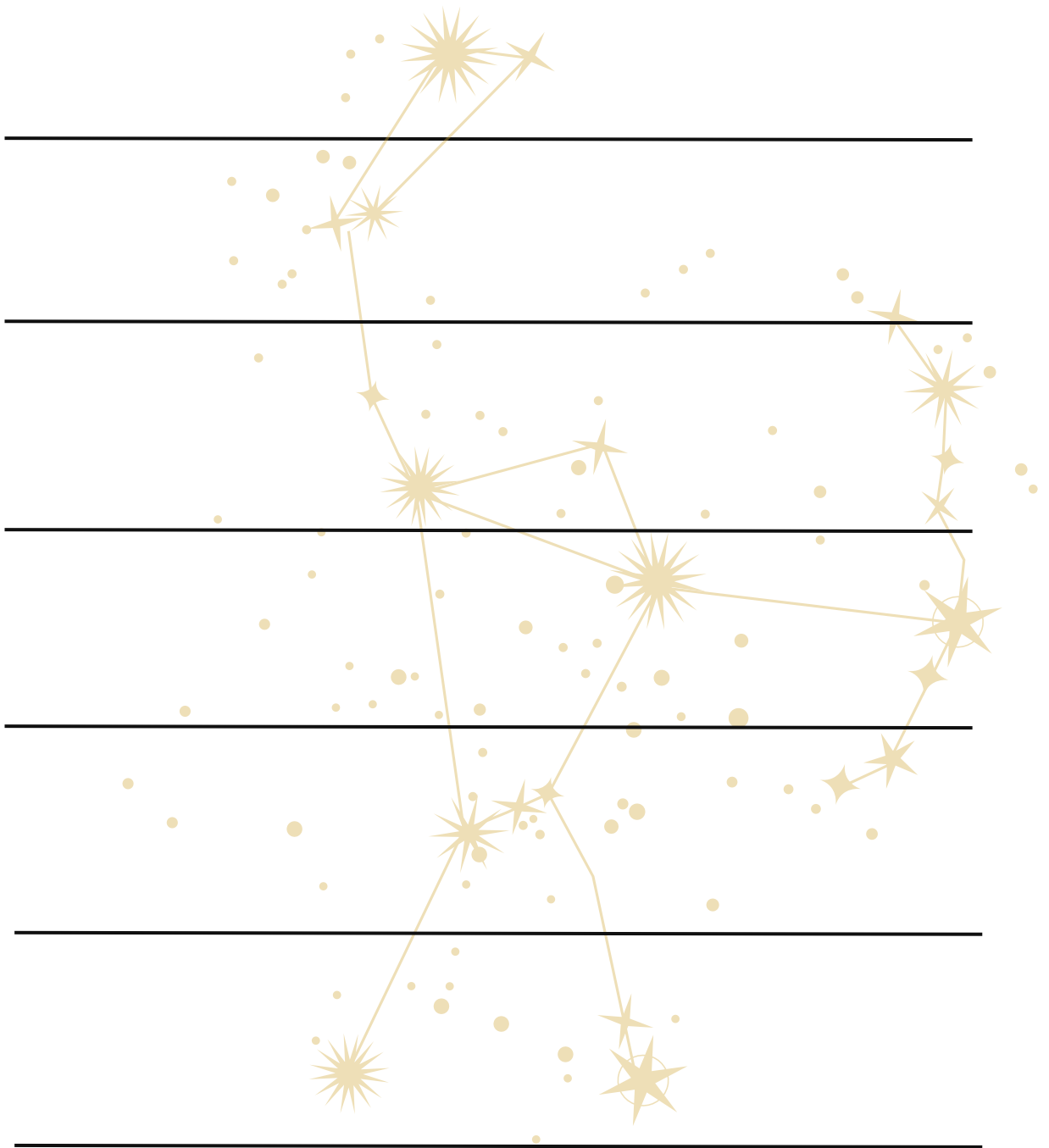
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ACTIVITY #2:

STARGAZING FUN

The night sky is like a giant puzzle. Hidden among the thousands of stars you can find many constellations. A constellation is a group of stars that forms a recognizable pattern and people have given it a specific name.

Materials:

- Headlamp
- Night Sky Guide
- Compass
- Blanket (optional)
- Binoculars or telescope (optional; both available to borrow free from the Gravenhurst Public Library)



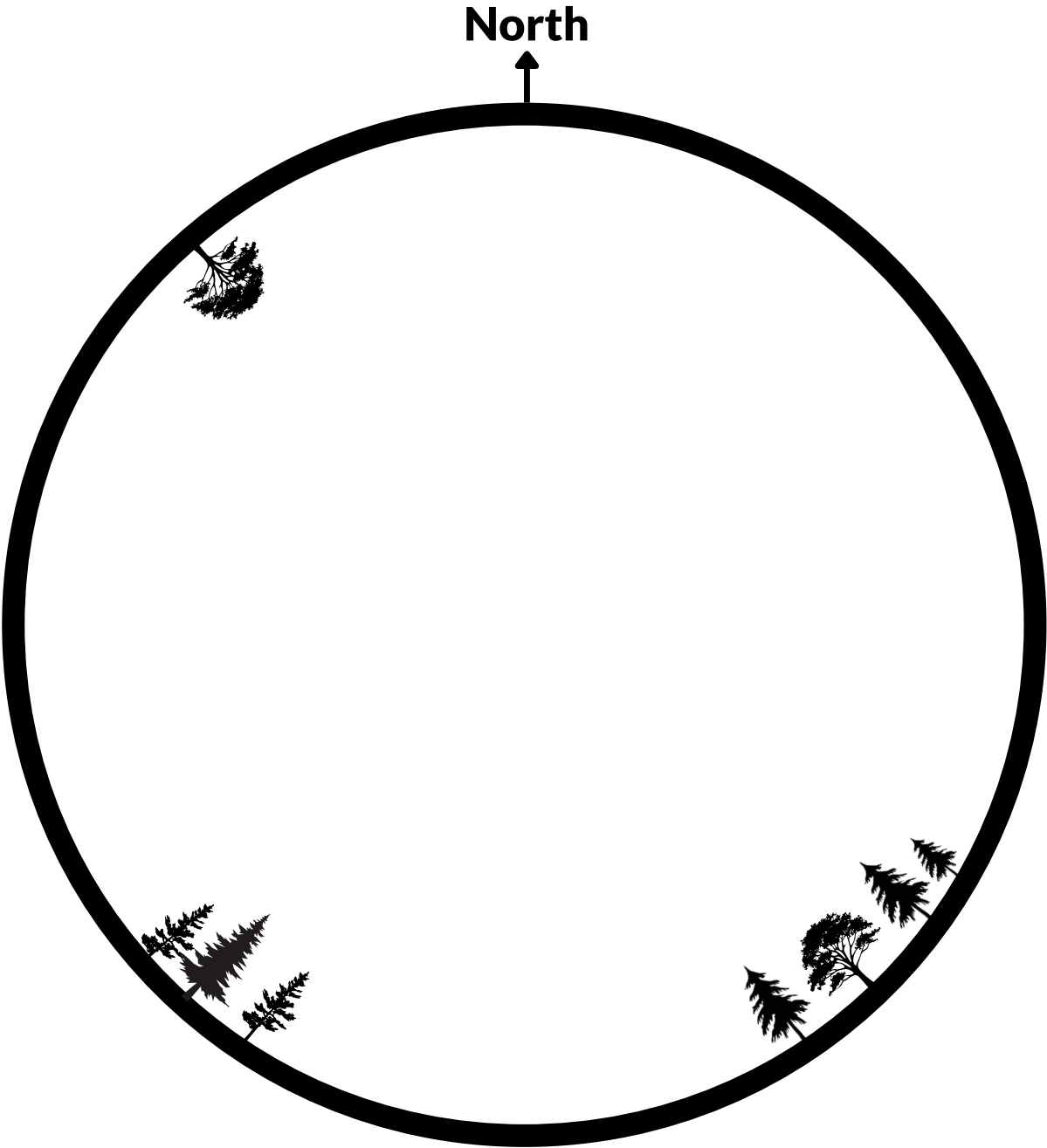
Stargazing Tips:

- Go out in the right conditions. This means little or no moonlight and a cloud-free sky.
- Find an area away from bright lights like street lamps and stores so you can see the stars.

Use the next page to record your constellation sightings! Draw the constellations and name them in the circle using your night sky guide.

DATE: _____

TIME: _____



WEATHER CONDITIONS: _____

WHERE: _____

OTHER NOTES:

ACTIVITY #3:

BUILDING A FIRE

Campfires are regularly enjoyed with marshmallows and storytelling, but they are also essential in survival situations!

Fires provide light, warmth, security, and comfort. In any survival situation, this is the first thing you want to build. A fire makes a great light signal in the dark or a smoke signal during the day.



Building a fire and keeping it going is not always an easy task. You need to battle wind, rain, and other elements to keep it going and contained. That is why having the right skill and knowledge is important.

Using your survival guide, pick your site, find your source of fuel, pick the design of your fire, and how you are going to light it.

LET'S TALK... CAMPFIRE SAFETY!

Use a fire ring

Use an existing fire ring wherever possible to help contain your fire.



Consider surroundings

Do not burn near overhanging logs, steep slopes, rotten stumps, branches, and dry grass or leaves.



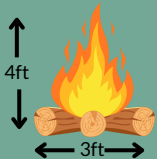
Use proper fuel

Use untreated wood or charcoal as fuel. Do not bring firewood from a different place to burn as this can spread invasive species.



Keep it contained

Campfires should be less than 3 feet in diameter and 4 feet in height.



Get an adult to help

Never light a fire without adult supervision and always make sure an adult is nearby to help you.



Dress appropriately

Avoid loose clothing and instead dress in fitted, tightly woven clothing.



Put it out

Put your campfire out by pouring water on it. Ensure all branches, coals, and sticks are wet. Use dirt if you do not have water.



Pay attention

Never leave a campfire unattended. Even a small breeze can spread a fire.



Stay back!

Stay 5 feet away from an open fire at all times.



5ft



Remove hazards

Take time before starting your fire to clear the area around the fire pit of any leaves and other items that could catch fire easily.





ACTIVITY #4: NATURE GROCERY STORE

What happens when you need to use nature for your needs instead of going to the store? This activity will help you see that nature has many amazing things for us to borrow and use!

Nature provides us with everything we need to survive, like food, shelter, water, and medicine. Many of us have the convenience of going to a store and getting all of these things, not remembering that they originally came from nature!

What if you need something, but a store is too far away? In this activity, your task is to go out into nature and look for things you could use. Everything from pinecones to rocks can have a use.

Find 8-10 items in nature, like a stick, rock, or leaf, and use your imagination to describe how you could use it in a survival situation.



WHAT I FOUND	HOW I COULD USE IT

WHAT I FOUND	HOW I COULD USE IT

ACTIVITY #5: WHAT DO YOU SEE IN THE STARS?

Take out your constellation guide and look at each of the different constellations. What do they remind you of? Maybe you see a horse or a flower! Give one example for as many constellations as you can think of.



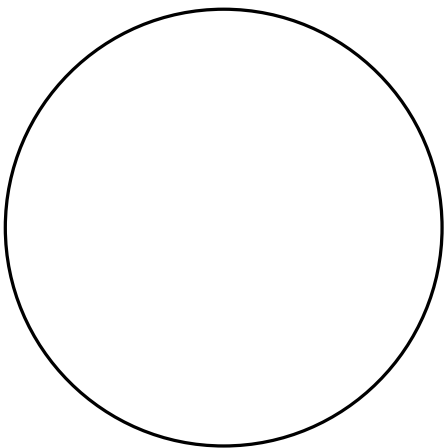
Example: Cepheus looks like a... tent

ACTIVITY #6: MY MOON JOURNAL

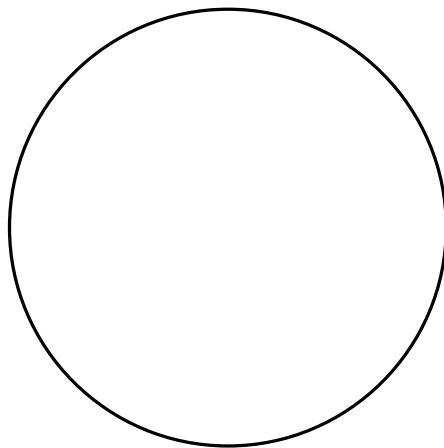


Moon phases represent the different shapes of the Moon that we see at different times of the month. The way the Moon looks will change throughout the month. The moon has 8 lunar phases (shown above).

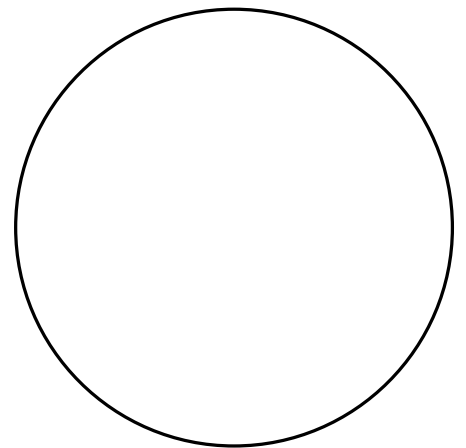
Keeping a Moon Journal for a month is a great way to see those patterns and be able to predict the phase that will appear the next night and next week. Using the next few pages, record the lunar phases over the next 30 days to see the full lunar cycle.



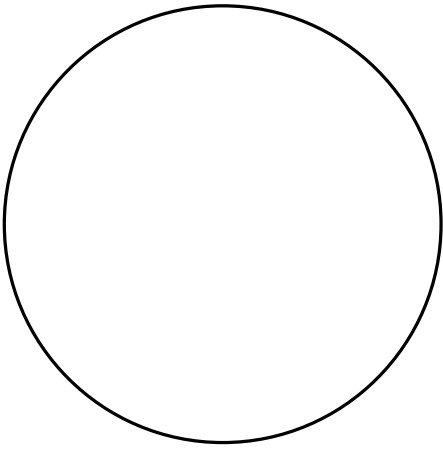
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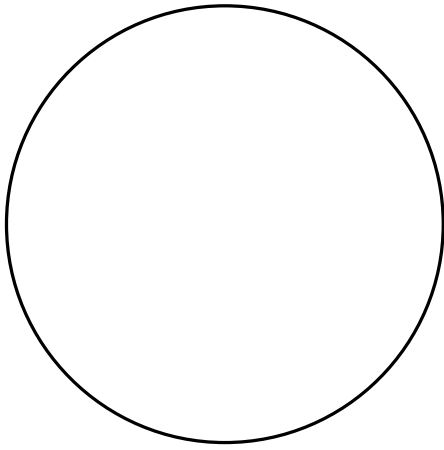
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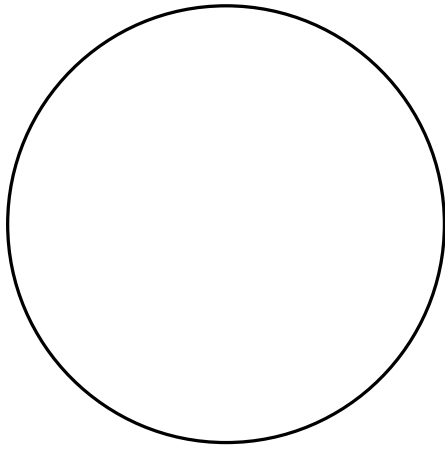
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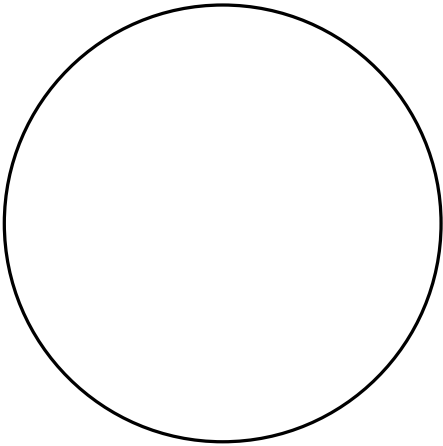
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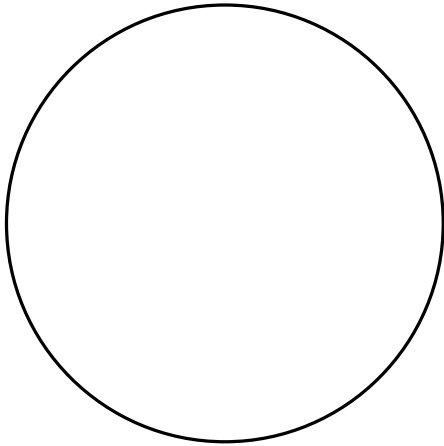
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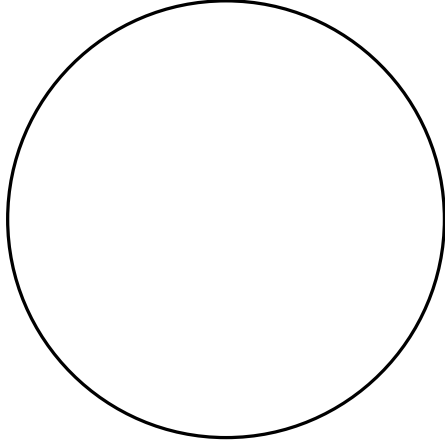
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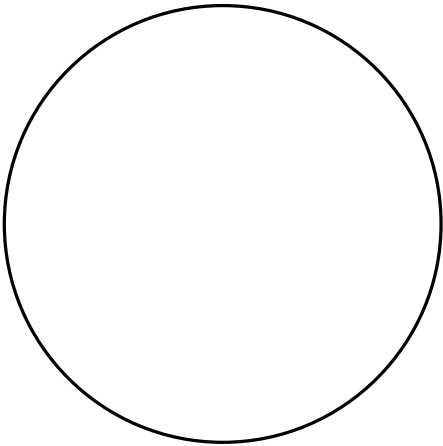
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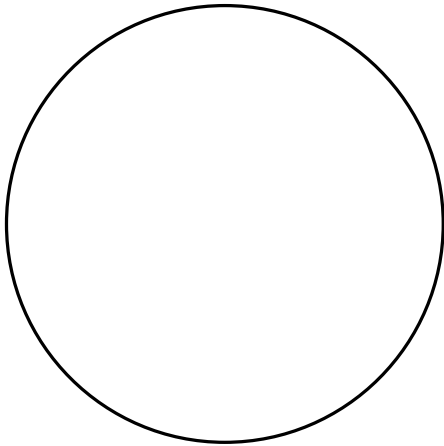
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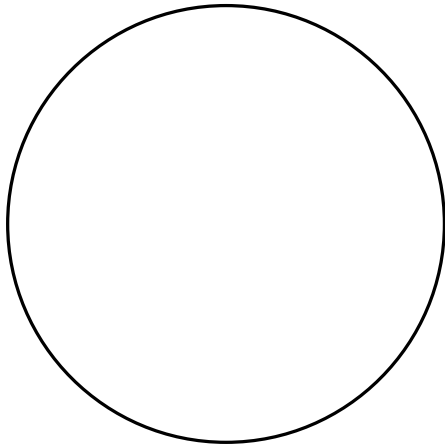
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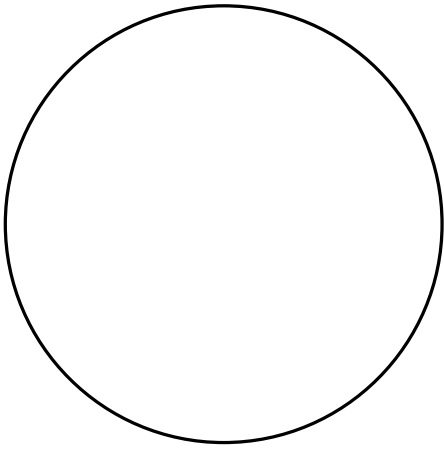
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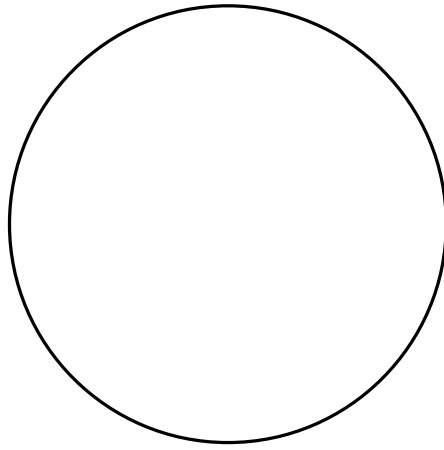
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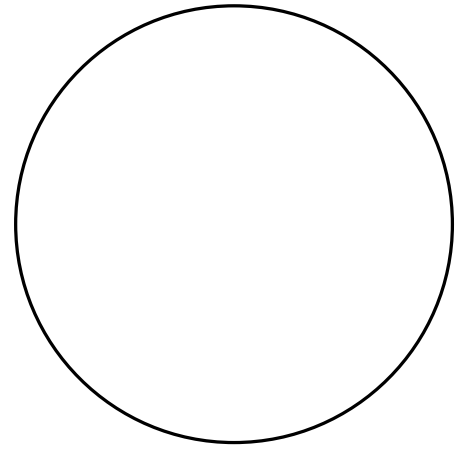
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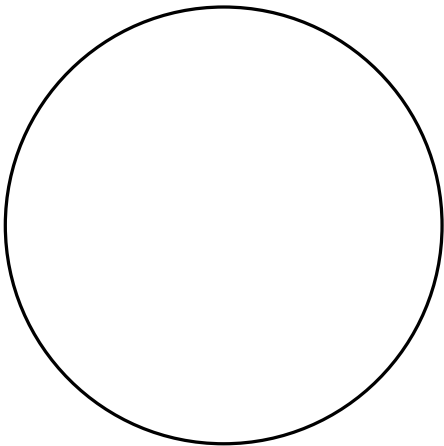
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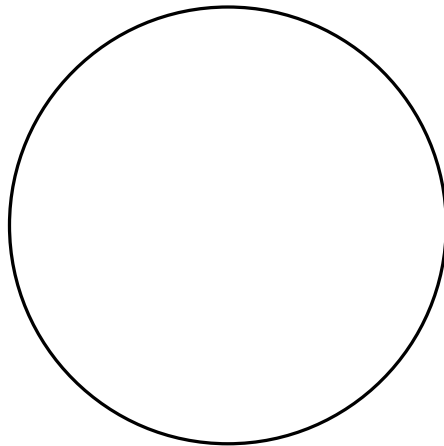
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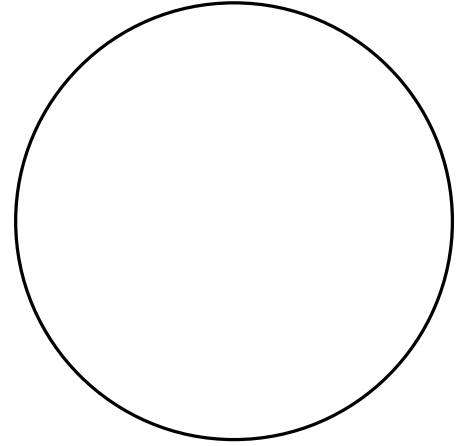
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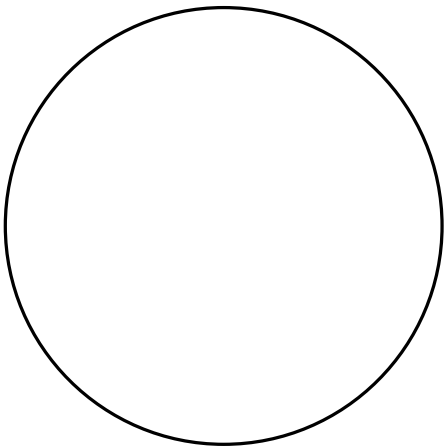
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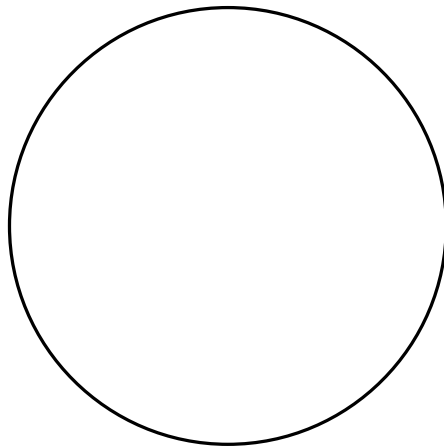
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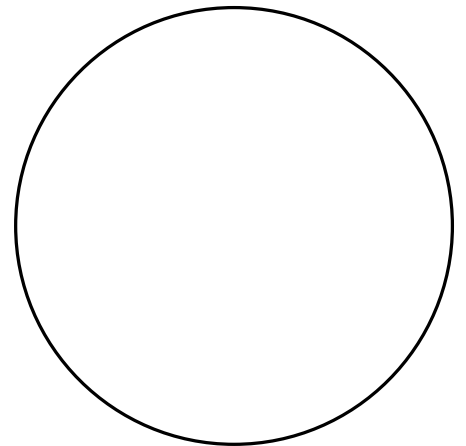
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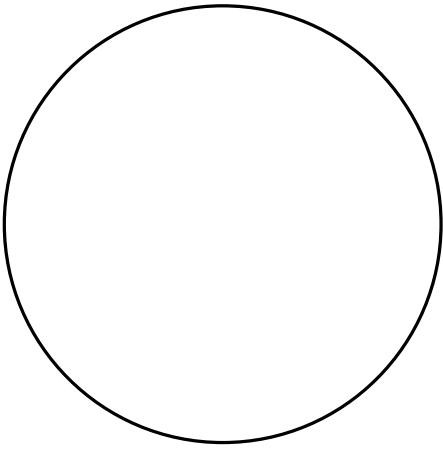
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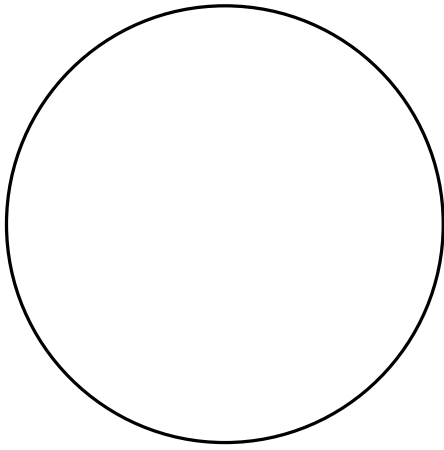
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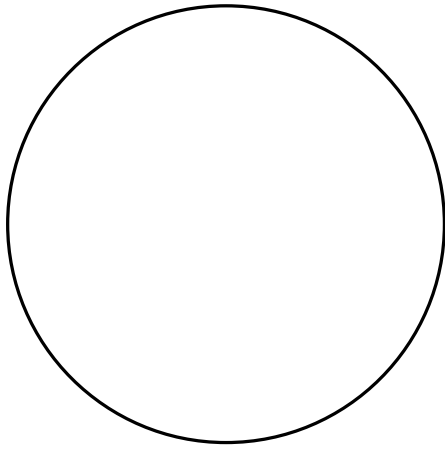
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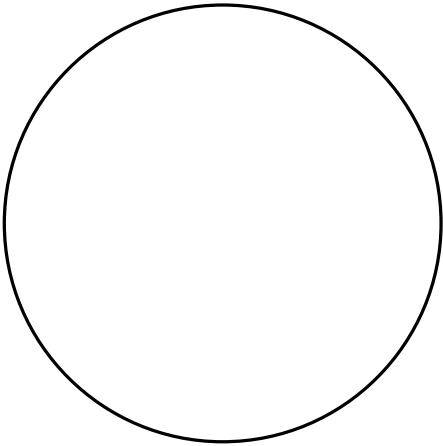
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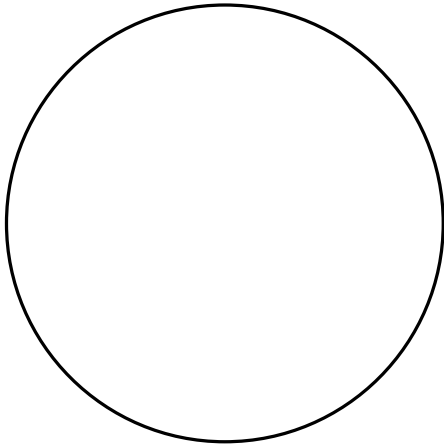
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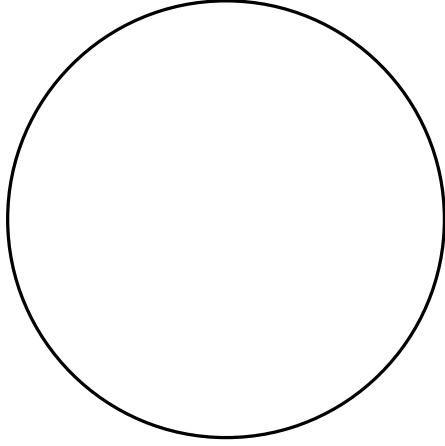
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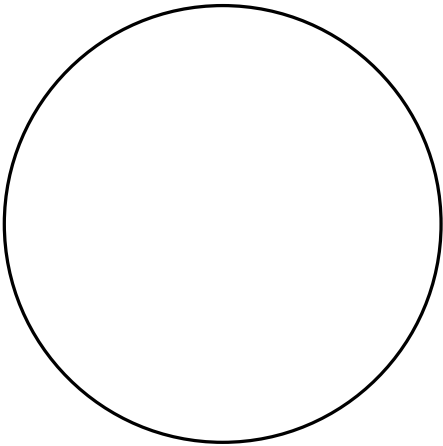
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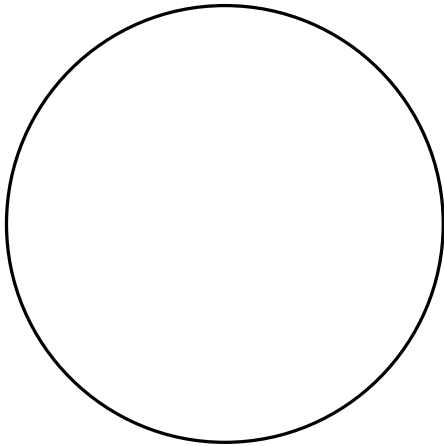
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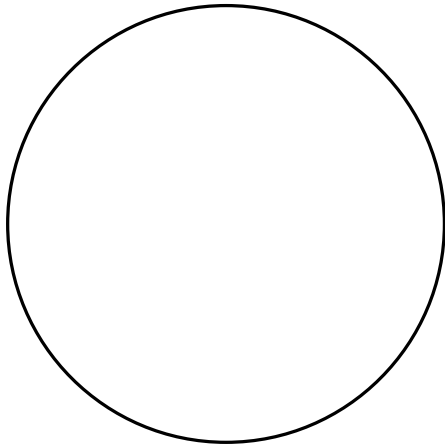
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ACTIVITY #7:

SURVIVAL QUIZ

What should you do in a survival situation? Answers are found at the end of the quiz.

- 1. What is the most important thing you need to survive in the wild?**
 - a. Food
 - b. Water
 - c. Heat

- 2. If you are looking for insects to eat, which ones should you avoid?**
 - a. Big ones
 - b. Bright ones
 - c. Ugly ones

- 3. If you suddenly feel like you are lost, what should you do?**
 - a. Turn around and run as fast as you can back the way you came
 - b. Hike downhill to reach where people are
 - c. Hike to the top of a hill to get a view of the surrounding area
 - d. Stop right where you are and wait for someone to find you

- 4. It is a good idea to build your shelter near what?**
 - a. A cliff
 - b. A dry river bed
 - c. A water source

-
- 5. Which colour of clothing is the easiest for searchers to see in the forest?**
- a. Green
 - b. Yellow
 - c. Blue
 - d. Purple
- 6. Before leaving camp alone or hiking away from your group, what should you do?**
- a. Pack enough food and water for 24 hours
 - b. Talk to an adult about where you are going and when you will return
 - c. Take all your equipment with you
 - d. Leave a note
- 7. Insect larvae contains a lot of protein. Where are the best places to find insect eggs?**
- a. Moist areas, under rocks
 - b. Attached to the insect
 - c. Animal droppings
- 8. Why should you try to avoid sleeping directly on the ground?**
- a. To avoid bugs
 - b. So you do not get sick
 - c. To keep from losing body heat

-
- 9. If your clothes get soaking wet and you are starting to shiver, what should you do?**
- a. Remove your wet clothing and wrap up in an emergency blanket
 - b. Stand in the wind so your clothes will dry quickly
 - c. Keep your clothes on, because the dampness will keep you warm
 - d. Start running down the trail to warm you up and dry your clothes
- 10. Why should you melt snow or ice before drinking it?**
- a. To avoid cutting your mouth on sharp ice
 - b. So you do not get brain freeze
 - c. To avoid dehydration

Answers

- 1. b) The human body needs around 2 liters of water every day for good health. One day without water is a serious concern for someone's safety.**
- 2. b) Although most insects are edible, a good rule of thumb is to steer clear of brightly coloured ones as well as those that are hairy or pungent. Always check a guide or consult an expert before eating anything from nature.**
- 3. d) When traveling in a group, it is a good idea to stop where you are, take a deep breath, and wait for your family to find you. You can also call out for help.**

4. c) Staying near a source of water is a good idea when building a shelter. You should avoid natural hazards like cliffs and dry river beds.

5. b) **When you are lost in the woods, looking cool and fashionable is not as important as being highly visible. You want to wear colours that stand out against the background of dark colours and shadows produced by the trees.**

6. b) Talk to an adult about where you are going and when you will return. It is in fact best to never leave alone and never break away from the rest of the group to go off by yourself.

7. a) **Insect eggs can be found in moist areas under rocks and inside rotten tree logs or stumps. Always check a guide or consult an expert before eating anything from nature.**

8. c) Sleeping on the ground can lead to loss of body heat. You will retain more warmth by making a pile of grass or pine needles on the ground to sleep on.

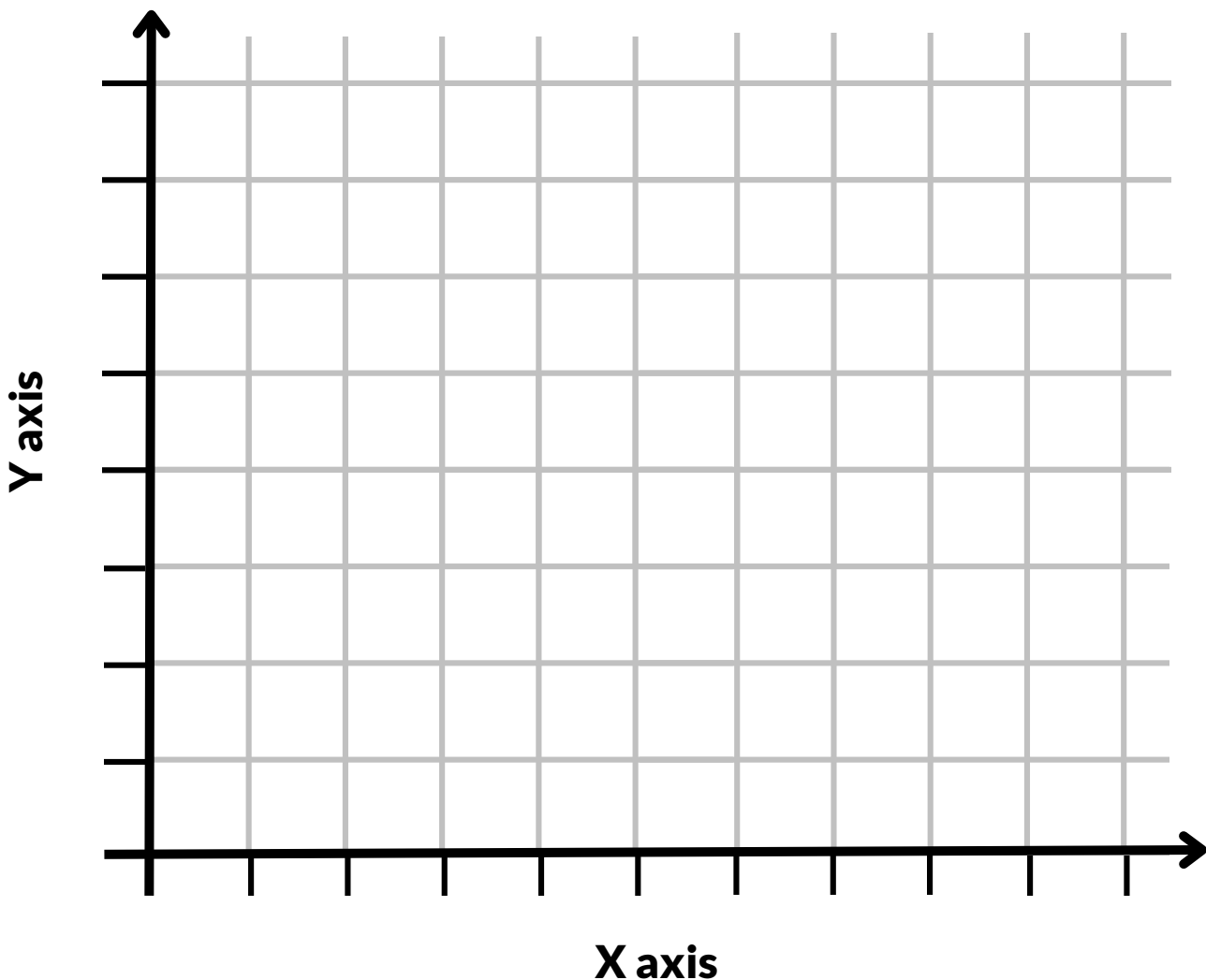
9. a) **Wet clothing drains away your body heat many times faster than dry clothing. Hunker down and cover your head with the emergency blanket, because you lose a lot of body warmth through your head.**

10. c) Eating frozen snow and ice will reduce your core body temperature and lead to dehydration.

ACTIVITY #8: CREATE A CONSTELLATION

A constellation is a group of stars that form a shape and has a name (Orion, Ursa Major/Big Dipper, etc.). Many cultures use constellations to tell the stories of their ancestors and their beliefs. Constellations can be used to navigate the globe and they connect us to the place where we live.

Create your own constellation on the grid below, making sure to put your dots where two lines come together!



What is the story, teaching, or meaning behind your constellation?

Next, take your field guide out at night and along with a trusted adult, see how many constellations you can find. Make a list of the ones you find:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

ACTIVITY #9: BUILDING A SHELTER

For this activity, you will be building a shelter to protect yourself from the elements!

Getting Started:

1. Pull out your survival guide.
2. Decide what type of shelter you are going to build.
3. Decide what you are going to protect yourself from (ex: the cold in the winter, the heat and bugs in the summer).
4. Before you start building, look at the requirements in the guide and make sure your shelter meets those requirements. Be sure to use your imagination!
5. Start building!
6. Draw your final shelter on the next page and label any key survival elements or design choices you made.



My Shelter Looks Like:

ACTIVITY #10: MOON MODELS

Materials:

- Small white foam ball
- Pencil
- Tinfoil
- Headlamp
- Black construction paper



What To Do:

1. Stick the pencil into the white foam ball.
2. Wrap up the ball in tinfoil. Try to make sure that the wrapping is as smooth as possible.
3. Turn on the headlamp and turn off all other lights to make the room dark. You can also close curtains and doors.
4. Place a piece of black paper on the table and place the moon on the black paper.
5. Next, shine the headlight onto the moon.
6. Slowly move around the table, keeping your eyes on the moon, which is lit up one side by the headlamp. You will see the different shapes it takes - these shapes are the moon's phases!

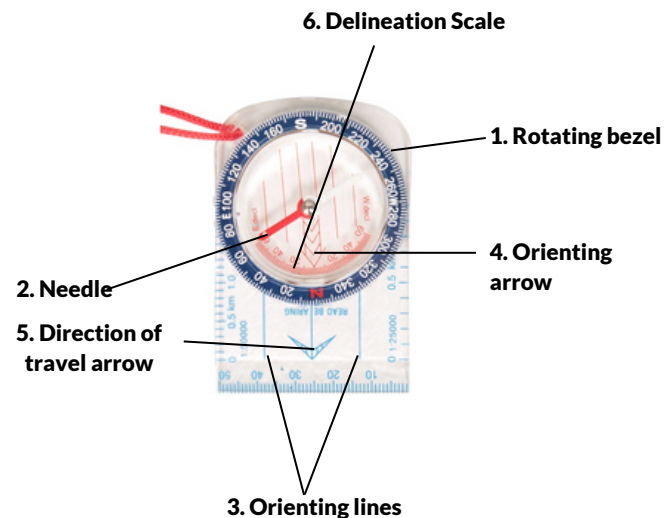
WHAT IS A COMPASS?

The magnetic compass has been used for navigation for hundreds of years. At one time, it was the only reliable means of direction-finding on days when the sun and stars were not visible. Using a compass will help you:

- Know which direction you are travelling in. This is called your **heading**.
- Align your map with your surroundings. This is called **setting the map**.
- Work out which direction an object or destination is from you. This is known as its **bearing**.
- Walk in a straight line. This is called **following a bearing**.

Understanding Your Compass

1. **Rotating bezel/compass wheel:** shows four main compass points N-S-E-W. It also has a mark every two degrees up to 360°.
2. **Magnetic needle:** the red end indicates north and the white end for south.
3. **Compass lines:** on the bottom of the baseplate; also known as orienting lines.
4. **Orienting arrow:** fixed and aligned to north within the dial.
5. **Travel arrow:** the direction is the big arrow at the end of the baseplate.
6. **Delineation scale:** used to adjust the difference between magnetic north and true north, known as "magnetic declination".



ACTIVITY #11: MAKING A MAP

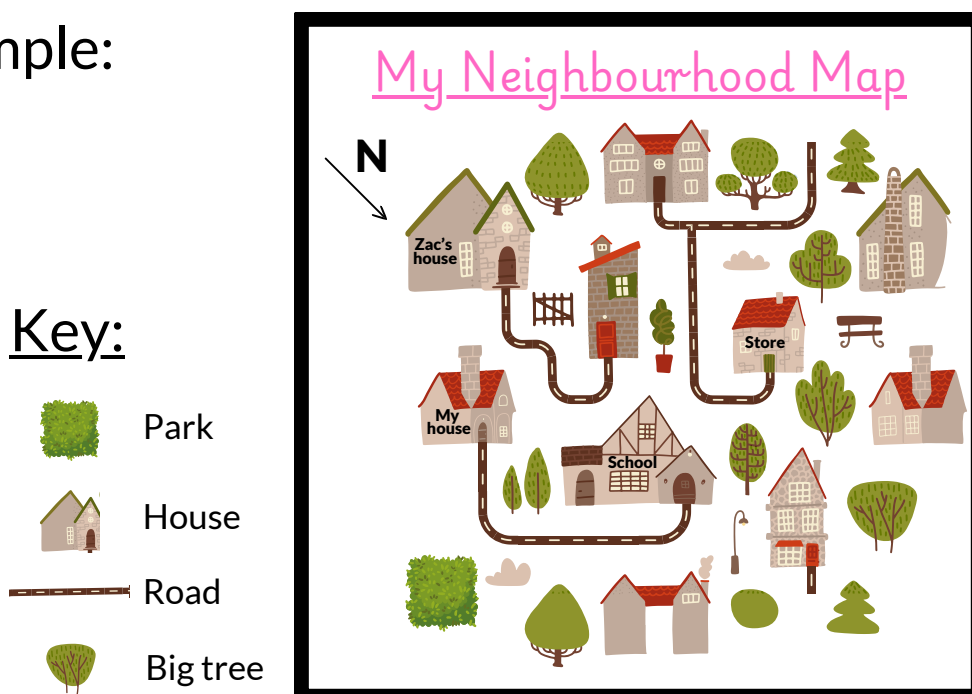
*Until very recently, maps were the main tool for navigation.
It is still an important skill today to be able to read a map!*

In this activity, you will make a map of your surroundings. Your map may be of any place you like, such as your classroom, school, schoolyard, house, or backyard. You want to pick a place where you can draw lots of details so someone using your map would be able to find their way around.

Draw your map on the next page. Your map should have:

- Title
- Compass (make sure everything on your map is facing the right way)
- Key that lists all of the different elements on your map

Example:



ACTIVITY #12: NAVIGATE USING A MAP

In this activity, you will be using the map you made in Activity #11 to explain how to get to different places by using compass directions (ex. to get from the couch to the kitchen, take 7 steps north-east).

Give 5 examples of routes you can take using your map. These directions should be detailed enough that someone else who is unfamiliar with the area could follow them.

1. _____
2. _____
3. _____
4. _____
5. _____

WAYS TO HELP NATURE

- ☐ **Gather data.** Take photos and observations of different animals and plants you see in nature and submit them to an online database like [iNaturalist](#), [eBird](#), [MonarchWatch](#), or [Water Rangers](#).
- ☐ **Help local bees.** The City of Gravenhurst is a certified Bee City! Join in and plant pollinator friendly gardens: beecitycanada.org/bee-cities/gravenhurst/
- ☐ **Be natural.** Consider adding native plants to provide stabilization, habitat, and food to your property. Learn what native species to plant on your property: naturaledge.watersheds.ca/plant-database/
- ☐ **Keep it clean.** Prevent the spread of invasive species by staying on trails while hiking and by cleaning equipment after boating. Learn more: <https://ontario.ca/page/invasive-species-fact-sheets>
- ☐ **Be respectful.** Take only photos and leave only footprints when exploring in the forest. This lets other people, animals, and plants use the space too.
- ☐ **Get connected locally.** Join the [Muskoka Little Sprouts Eco-Club](#), visit the [Tree Museum](#), follow the [Muskoka Envirohub Climate Corner](#), visit a [local trail or park](#) like Chamberlain Trail or Peninsula Trail, or join [Muskoka Conservancy](#).
- ☐ **Follow Gravenhurst Public Library online!** Hear about collection and program updates by visiting the library website (gravenhurst.ca/library), or by following on Facebook (@gravenhurstpubliclibrary) and Instagram (@gravenhurstlibrary).
- ☐ **Check out more from the Library!** Sign-out [TackleShare Equipment](#), snowshoes, park passes, toddler ice skates, hiking poles, telescope, and other themed Nature Discovery Backpacks like this one with your Gravenhurst Public Library card.

RESOURCES FOR PARENTS

Fireworks

Although fireworks create a spectacular show enjoyed by many, there are risks to this activity.

Noise and light from fireworks can have a negative impact on wildlife, including nest desertion. The particulate left in the sky after a firework explodes contains heavy metals which can land directly on the lake or be washed into the lake following a rain storm. This has harmful effects on the aquatic food chain. Fires and injuries to people and pets are also possible.



Be 'Wake-Aware'

Lakes and rivers are fragile environments. Fish, wildlife habitat, shorelines, and docks are vulnerable to damage from boat wakes.

- Be aware of the size of your wake while operating a boat. Adjust your speed and directions to minimize your impact on shorelines.
- Distribute passengers throughout the boat to reduce time spent in transition speed.
- Wakeboard and water ski away from shorelines.
- If boat shopping and a motor-free boat is not an option, opt for an outboard motor which gives the driver more control over the amount of water being forced downwards.

SHORELINE LIGHTING

Many of us have likely sat out at night and noticed the lights at properties across the way. Take a moment to reflect on how this makes you feel and consider if light from your property is also trespassing. This doesn't mean we have to get rid of all our outdoor lights, though! Perhaps we do not need as many or they can be retrofitted to reduce the glare.

Ask yourself:

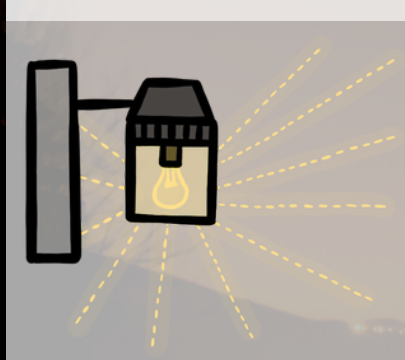
- Does the area on my property really need to be lit (is it useful)?
- Does it need to be this bright (low level and warm-coloured)?
- Is the light transmitted further than it needs to be (is it targeted and controlled)?

Not Recommended: Glare Lights

Typical 'Wall Pack'



Typical 'Yard Light'

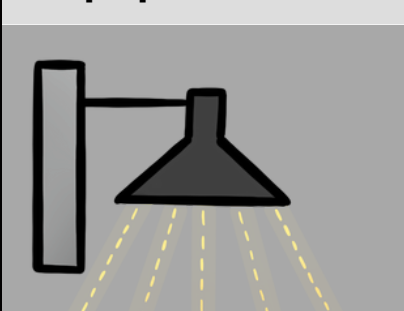


Flood Light



Recommended: Shielded Lights

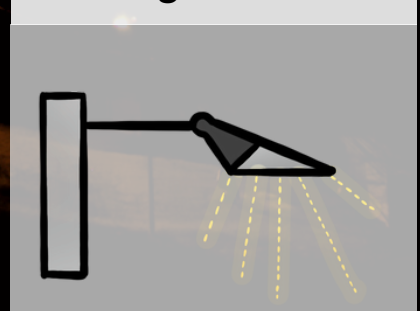
Opaque Reflector



Typical 'Shoebox'



Flood Light with Hood





115-40 Sunset Blvd, Perth, ON, K7H 2Y4
watersheds.ca

