



# Supporting Teachers

**A Field Guide to Nature Education**

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**Illustrated by Macy Hancock**







# Contents

Acknowledgments- vi  
Introduction - vii

**1**  
The Importance of a Learning  
Language - 1

**2**  
How to Use a Learning Language - 10

**3**  
Plants, the Mighty Producers - 24

**4**  
Adventures with Insects - 27

**5**  
Mammals, Our Furry Friends - 30

**6**  
Beautiful Birds - 34

**7**  
Amphibians, Slimy and Slithery - 39

**8**  
Bushcraft Basics - 43

**9**  
Anytime Activities - 54

Resources - 57  
Appendix - 58

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- Eric Edward

## The PEI Forested Landscape Priority Place For Species at Risk Initiative

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# Introduction

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## Why should you teach outside?

Nature is a wonderful resource. Not only does it provide us with all the necessities of life but as importantly it can be *our* teacher. The sense of well being that comes from a good hike or watching a sunset is not frivolous but essential. The goal of this book is to provide an honest exploration of the challenges associated with nature education and offer solutions that will help you take your students outside.

While doing research for this book, I looked at a variety of different systems of ecological education, all with varying

strategies and goals. There is, engaging imagination, flow learning, place-based education, and two-eyed seeing, are just a few. While they are all different, what they share in common is the conviction that a direct experience of the nature world is vital to our well-being and the well-being of our planet. And each of these systems contributes important insights into what we should consider when teaching children about nature.

However, what I have struggled to find was an account of the inherent challenges associated with nature education, with which I am intimately acquainted.

For the past 25 years I have been an environmental educator here at

the Macphail Woods Ecological Forestry Project. Macphail's is a non-governmental organization and registered charity. Our mandate is the demonstration and teaching of ecological forest practices. The solution is complex and our project is also complex. We manage thousands of acres of forestland, have one of the most extensive native plant nurseries in North America; nearing two hundred *actual* native species of flower, fern, shrub and tree in our five-acre nursery and arboretum. We run free workshops, university field courses, children's camps, a school of woodland ecology and chainsaw safety training. We do research to help fund the project, and offer native plant landscaping, consulting and forestry services.





Over the years, I have taught thousands of individuals about our Island's ecology, forest restoration and chainsaw safety. I have worked with people of all ages, from 6 to 96, and have experienced success and failure. This is why I was deeply unsatisfied with how the systems of ecological education that I was researching, ignored some of the most basic hurdles.

My initial plan for this book was to focus on the work of other educators, but discovered that without offering my own insights there would be a missing link. As a result, this small book is the product of what I have learned from my many years of teaching. I hope you find it useful and encouraging. I am not an expert. My guess is that many of my insights are ones that you have already had and that there are others that you would like to see included.

Taking your class outside has a host of potential positive outcomes. It gives students the opportunity to put their own minds and bodies to good use. It affirms the importance of play and teaches them how to assess risk. Nature as a classroom can also be used to teach any subject. Nature has inspired the greatest artistic and scientific efforts in human history and it can help contextualize what is learned in class.

The second part of the book includes activities and games. They are designed to be simple and intuitive. Hopefully you will develop your own approach to teaching outdoors. I think the most important reason for teaching children in and about nature is that despite it being hard, it is also restorative and genuinely reconnects us with ourselves.

# 1 The Importance of a Learning Language

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## We Are All Nature Educators

I used to start mammal day at camp with an activity called Hands. I would show a series of photos to the children of different animal forelimbs, paws and appendages. The pictures started with images of a duck's foot and then a salamander forelimb, eventually getting to mammals, primates and ending with a human hand. The goal was not to show a hierarchy of evolution but to help children realize a simple fact that we often forget or ignore; that we are animals. As we examined the different "hands", we would discuss what jobs they might be good for, if they looked

funny or familiar and what animal they might belong to. At the last slide, a picture of a human hand would pop up and inevitably there would be a collective gasp, and one child would exclaim, "I'm an animal!" After the laughter subsided, I would have the children carefully look at their own hands and consider what jobs they were good for and how they felt about them. The list was long and included things like holding hands and helping others.

There are so many feelings and expectations surrounding the topic of nature education. When reading environmental or ecological education literature, it is impossible to avoid encountering words and phrases like: unless, must, in order, and if

we neglect. Part of the reason for this is that we are facing a global environmental crisis, caused by our own species. Global warming, species extinction and loss of habitat, combined with patterns of human behaviour that do not seem to be changing, are cause for concern and only natural that proponents of ecological education, feel a certain urgency.

The problem with this urgency is that the burden of responsibility is being placed on teachers, without acknowledging the challenges inherent in outdoor education. Nature is dangerous, unimaginably complex, and it is difficult to find a meaningful way to begin facilitating a direct experience.





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My goal is to address some these challenges and to provide insights gleaned from educators and my own experiences, teaching ecological education. My hope is that you find something of immediate benefit, that is itself natural and compelling. For me, the goal of ecological education is not only to have an experience of nature, or to learn about nature, but is to reconnect with ourselves and discover that we are part of nature.

After all, you are an animal! Which means that just like a mother fox teaching her kits to hunt, you are teaching your wild ones to survive. It is that simple. I don't need to teach you to be a nature educator - you already are one.

## The Challenges

There are two categories of challenges associated with ecological education: institutional and personal.

Institutional challenges include limited access to wild spaces, outdoor class management, and concerns around liability and risk. Luckily these issues are relatively easy to resolve. Personal challenges are more complex and subtle. They include, things like feelings of inadequacy, personal permission and fear.

When we teach, there is an expectation of expertise. This is achieved through training and the delivery of curriculum that has been carefully designed to facilitate the sharing of knowledge. The goal is to provide the context and content needed



for students to have cohesive learning experience - an “ah ha” moment!

For example, our science curriculum is focused on the sharing of scientific knowledge, modes of inquiry and methods for evaluation. The limits or outcomes of learning are clearly defined along with systems of delivery.

The challenge in stepping outside into nature is that teachers are faced with a major problem; to guide a meaningful exploration of nature requires knowledge that they do not have and that curriculum cannot provide. Unless there is prior expertise most of us have limited identification skills and understanding about the our Island's ecology. And this is by no means a criticism.

When I started out I felt this challenge profoundly! And the only avenue for resolving the problem appeared to be getting

as much information into my head as possible. I read and read and read. I was going to resolve the problem by becoming an expert.

I found teaching children about insects to be particularly difficult. There are just so many! Plants, mammals and birds all made sense to me. I possessed behavioural and ecological information, could identify a variety of species and had personal experiences to share. I had enough “expertise” to feel comfortable.

But beyond the basics, I couldn't figure out how to make insects interesting. I was plagued with the fear of not being able to identify specific species of insect, but didn't have a clue about how to start figuring that out!



Insects are an essential part of our ecosystem, so I reached out to an entomologist at Agriculture Canada; Christine Noronha. Christine kindly agreed to visit the camp. She was keen to help and offered to do a presentation then lead an insect hunt. I was thrilled!

On the appointed day, Christine arrived with her team. The children listened attentively during her presentation. Christine described what an insect was, highlighted common families along with their characteristics. She taught us that true bugs and beetles may look similar but if you look closely you will see that bugs have an X on their back while beetles have a line where their elytra (wing coverings) meet. For each family she listed common species and described their role in the ecosystem. It was perfect.

After snacks we went outside and began the bug hunt. Running around like little butterflies

themselves, the children quickly filled their jars with specimens and then dutifully lined up to have Christine and her team identify them.

One by the one the bugs were examined and handed back to the children, with the explanation that they would have to be taken back to the lab to be properly identified. Christine and her team, were able to say what order it belonged to; that it was a plant bug, or leaf hopper or a aphid, but to determine what species was impossible to do without a microscope. And that is when the penny dropped.

I had been waiting for the experts to use their knowledge to identify the insects. I had thought that this was important to explaining how each insect fit into the ecosystem, where it lived and what it ate. Christina and her team did have an incredible wealth of knowledge

to share but no more than what was obvious to the naked eye.

As I stood there, I realized that what I needed to share with children was not expertise but a *simple and common language* for describing what we encountered. I didn't need to know specifically what I was looking at - just how to describe it. Without a language our experience was profoundly truncated and limited. However with a few key words we could unlock the world before us.

I literally dove into the grass with the children. We found beetles and watched them hunt aphids. We compared grasshoppers and crickets. We watched how different caterpillars fed and wondered if they had favourite flowers and grasses to feed on. We started seeing patterns and differences. This leaf hopper used camouflage to avoid predation while this one disguised itself as a thorn. The team of experts got right into it and the whole memory has a kind of halo around it. It was magic. Using the basic descriptive language that Christine had given us in the slideshow, we explored to our hearts content. We, stopped asking what kind of insect we were looking at, but rather what to call this part of an insect or why these legs were extra long.

After that day, I changed my whole approach to teaching. Rather than teaching children to identify a list of specific birds, I focused on developing, what I call a *Learning Language*. So for example, in the case of birds, it meant focusing on body shape, beaks, feet and feathers.

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The Learning Language provided the context, while what was being observed provided the content creating a cohesive learning experience for the student.

Suddenly, I had children who after a short slideshow, could accurately describe a bird and glean a host of information from their observations. "That is a fly catcher - it is perched upright, it has a wide, net beak and is hawking." "That bird is a seed eater, it has a strong "nut-cracker" beak and has distinct black wing-bars and is perched leaning forward."

It also meant that I could focus my attention on the students, rather than needing to be a source of information, I started watching them as they learned to experience the natural world. This proved vital to my understanding of the challenges my students faced when asked to encounter something new.

## The Power of Exploration

When I teach plant Identification, I have a rule in course that when a student asks what a certain plant is, I make them describe it using our Learning Language. As soon as a student realizes the blunder they have made, a few things happen without fail. Their body draws back, they exhale and their pupils dilate. Internally they experience tunnel vision and blackout thinking. In other words, while I am asking them to perform something that is perfectly safe, they go through a complete fight or flight response. The first few times this happens I make sure to work through the process with a student until they begin to see the pattern, understand the language clearly and feel safe. After that, we repeat the exercise until students are comfortable examining a plant and providing a

description before asking a specific question.

Anytime we encounter a limit we experience a pain of one kind or another. When we get to close a flame we experience heat, which if we get even closer, will result in a burn. When we exercise, the next day our body is sore and if we over do it, we get injured. When we learn, we are encountering a limit too. We are getting closer to something that is fundamentally new. We are explorers, and so for example, while learning to read may not be trekking through the jungles of the Congo, that ancient part of our brain that controls our fight and flight response does not distinguish between the two. It is a simple observation but essential to understanding what happens when we are asked to encounter something new.



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Children are a blank slate. They are figuring out what to be afraid of and what is safe. Each new encounter is like filling in a puzzle. This tastes good, that was scary, I can't jump that far and now have two boots full of mud. They swing from recklessness to being profoundly passive, bordering on disinterested. It is their way of coping with the unknown and fear.

The goal is to navigate through these responses toward the moment when a child understands a concept and more importantly knows that they understand. When this happens, they discover their own agency, a pathway of experience opens up before them that they are in control of. What was simply other becomes a part of their world.

I remember working with a young girl during a school visit. We were hiking along the stream and I was teaching the class to distinguish the difference between hemlock and balsam fir. I had shown them how to slide the needles between their fingers. We smelled and tasted the new growth and had compared growth patterns. We had stopped to wrap our arms around a giant hemlock, when I felt a tug at my sleeve. My young friend had further questions. While the rest of the group proceeded to run about, hunting for salamanders, we sat down between to young seedlings. We reviewed the similarities; they are both conifers, they both have flat needles and they both grow in the same habitat. Then we reviewed the differences; balsam fir smell like Christmas, hemlock have only a faint fragrance, balsam fir needles are longer and are very



sappy. Suddenly she could see the difference and *knew* that she could see the difference. I could almost see the light bulb go on above her head. I could see her thinking, "I can identify the difference between these two trees that almost look identical, that means I can identify anything." She hopped up ran off to start sharing her expertise with all her classmates. You know you have had success when a child suddenly becomes a bossy boots.

Once we overcome the fear of a new thing with a child, and give them the tools they need for self-aware knowledge, they can't remain passive, they instantly jump in. They are no longer reckless or disinterested. They are focused and immediately more capable. The power of letting a child encounter a real limit, like identifying a tree or holding a salamander, or lighting a fire is that it expands their ability and potential immediately.

The warmth of heat produces comfort, exercise strengthens our muscles, and learning opens our hearts and minds.

This is well being, what our indigenous community calls "good medicine." It allows us to experience wonder, to explore, to sit quietly together, to discuss our feelings or to remember a past event. These moments belong to a common meeting place, where we are all animals bound together with nature.

## Flow Learning

A Learning Language helps with facilitating direct experience, but it isn't a magic bullet. Class management and knowing how to direct a class's energy towards a meaningful encounter with nature is an art form. And the master, who taught me everything that I know is, Joseph Cornell. Joseph is an environmental educator from California and his book *Sharing Nature with Children* is required reading at Macphail's.

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*Sharing Nature with Children*, introduces Joseph's unique approach to education called *Flow Learning*. The goal of Flow Learning is to help teachers tune into a groups level of enthusiasm (or boredom!) and sensitively lead them into being energized and focused students. As Joseph writes:

*"Through years of trial and error, I developed a set in insights into teaching that now play a central role in my work. You may already be using these principle, yourself. Perhaps you, too, stumbled across them intuitively, as I did, and perhaps you know them by another name. In any case, they can make your nature classes more dynamic, fun and deeply inspiring. Since becoming aware of these principle, I've been able to accomplish my highest goals as a nature educator with amazing consistency. In clarifying the principles for myself and others, I found that they fit together in a wonderfully systematic, flexible way. I call this collection of methods Flow Learning, because it describes a way to use nature-awareness activities in a flowingly purposeful, directional way. The beauty of Flow Learning is that it show you how to begin **where your students are**, then rouse their enthusiastic participation and and guide them, step by step, through increasingly sensitive activities and deep experiences."*

Flow Learning has four stages:

1. Awaken Enthusiasm
2. Focus Attention
3. Direct Experience
4. Share Inspiration

**Stage 1** - Awaken Enthusiasm, begins with games and activities that are fun or silly. They are designed to help the whole group relax and open their hearts to the event.

*"When you lead nature outings, it's extremely important to get off to a good start, because people generally decide within the first few minutes whether they are going to have a good time. By starting with lively games, you're far more likely to get the group's full participation."*

**Stage 2** - Focus Attention, helps develop calm and receptivity. It creates a bridge between the excitement and fun of the activities used in stage 1 and the quiet focused attention needed in stage 3. These activities focus our attention on one of our senses and challenge the participants to attend carefully to what they are encountering. Scavenger hunts, micro hikes or going for a barefoot walk are good examples of activities that work well here.

*"Now you can begin to bring that energy to a fine focus, with games that help people become calmly, enthusiastically attentive."*

**Stage 3** - Direct Experience, expands upon the attentiveness that has been fostered and now immerses the participants in the world around them. This the moment when Learning Language comes into full swing. It is the moment on a hike when you have taught your students to "splush" (which you will learn about later in this book) and have a mixed flock of birds fly in. It is the moment when children are free to put their

skills of observation to full use and begin making discoveries. However, it does not need to be focused on intentional teaching. One of my favourite Direct Experience activities is called Stalker, which involves children moving silently through the forest.

*"Direct Experience activities are designed to intensify one or more sense-elements of the nature experience... They help us discover a deep, inner sense of belonging and understanding."*

**Stage 4** - Sharing Inspiration takes the power of what has been encountered and learned and provides the opportunity for students to share their experiences and thoughts. This could be through, art, writing, creating a play, or making a craft. It can also be as simple as sharing a conversation. It is also the spring board for positive action. Maybe after a hike your class would like to clean up garbage along a trail or organize a planting of native species.

*"Now is a good time, to let people talk about their earlier experiences... Sharing reinforces a sense of wonder and draws a group together."*

So to review, Flow Learning starts with fun games, which lead to activities that challenge the participants to focus their senses with intention, enabling exploration and direct encounters with nature, that inspire reflection and action. Genius!





There are many other wonderful resources available, and I have included a list of books worth reading in the bibliography. Two that I feel need to be mentioned are David Sobel's *Place-Based Education, Connecting Classrooms and Communities*, and Gillian Judson's *Engaging Imagination in Ecological Education*.

*Place-Based Education*, is a brilliant study of why centring education in our communities is critical to helping children learn and understand how everyone and everything is interconnected. It is common sense, which as we know, is not common. Place-Based education is backed by decades of academic research and is becoming popular across the United States. Sobel's work is simply wonderful.

*Engaging Imagination*, is an important work. It is full of tools and methods for helping children develop a deep empathy for the natural world and is well worth the read. It focuses on integrating both the body and mind in the teaching process.

## How to Use this Book

The book is divided into sections: plants, insects, mammals, birds, amphibians and basic bushcraft skills. Each section provides activities, game and crafts that will help you lead your class in learning about the community of life found on our Island. Each activity has a complete list of materials that will be needed. And for many of the activities we have created teaching aids that can be found in the appendix and will be listed in **bold** in the materials list. I have also added a Flow Learning code to each activity, that appear first in *procedure*. **AE = Awaken Enthusiasm, FA = Focus Attention, DE = Direct Experience and SI = Share Inspiration**. I have tried to provide a range of activities that include all four stages of Flow Learning in each section. Some activities can be used for more than one stage and will appear **(xx/xx)**.

Finally, in Chapter 2, I have provided Learning Language templates. Remember that a

Learning Language is intended to grow and hopefully you will develop and expand your own.

## Some Hints, Tips and Tricks

What matters most is that you let yourself get swept up in the adventure. It is not what you know that matters, but committing to describing what you see. Should you find a foot print during a bird hike, by all means change the focus to following the tracks. Guess wildly about what creature might have made them. Try to find the story and infer a pattern. Along the way, a bird may fly in. Quiet the group by lowering your voice and whispering, "a small bird has landed in the tree above us." Silently observe and once it has flown off, ask the class to share their observations. Flip logs to see what is living beneath, but always carefully return them after you have looked. Red-backed salamanders are commonly found under logs, there should be one for every square meter of a healthy forest.

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If you find one, they are easy to catch and children love to hold them. Gently place them *next* to the log when you have finished your observations. *Placing them under a log and then rolling it back, might crush them.*

### Tips for Leading a Hike

When I lead a hike, I always carry a first aid kit, extra water, toilet paper and a small trowel. I also keep a bandanna that can be used as a blindfold or can be fashioned to make a sling. I also make sure that my phone is charged.

It is best to have two adults to lead a group. Having a guide at the front and a helper at the back of the group, to gather stragglers, is a big help. I always discuss my route with my helper and stick to it, should we get separated.

If a group has lots of energy, I will stop and play a few games. Stalker is a fantastic game for focusing the energy of a group, as is Camouflage. The goal is always to work towards direct



experience. Once, they are more attentive, then I begin drawing their attention to the subject at hand. If you are working on plant identification, start with a challenge. "I want everyone to find me find four different kinds of leaf and bring them back in three minutes - bonus points if your leaf is unique." Then use the leaves that were found to start working on your Learning Language. Lay them out on the ground and have the students organize them. They might do it by size, shape or texture. Do any of the leaves have

a fragrance? Look at the margin of the leaf, are they smooth or toothed. Once you are satisfied with your description, you could ask the class to look at the forest. Tell them to head out, individually, and make some observations about the community of trees that surround you. Are there more deciduous trees than coniferous, are there shrubs growing, what is the forest floor covered with - leaves, needles or moss? Can you find trees that match the leaves you first found. If the children are young a simple way to keep them from wandering off is to stand somewhere visible and have them keep you in view as they explore. Give them 10-15mins to do this and it could include a simple drawing or maybe writing a poem. The point being, that you are outside - success! The children are learning, even just by growing more comfortable in nature. We often have high expectations but I have learned that children's experience of nature is so limited that the simplest adventure into the wild is of the greatest excitement and value.



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## The Importance of Play

I can't stress how important play is. It is the natural way that children interact with nature and is not superfluous or "just for fun". Play is the simplest and fastest tool for encouraging children to begin a deeper exploration of their surroundings. It also is an important signifier of safety.

A game can become profound. It can be the moment when a child discovers that they love nature, that they need it. One of my favourite memories of leading camps happened during a round of Predator and Prey. It had been a very difficult week with one camper in particular. It was Sam's first week with us and he was not enjoying it. The bugs, the dirt and the effort were not up his alley and he let us all know. It was the last day, and Sam had decided to be a prey - a hare. I knew, that if he didn't have support, it had the potential to quickly go south. So I played with Sam. Together we hunted for food cards, found a good hiding spot, tucked between two large aspen logs and awaited the arrival of the predators. As we waited, Sam struggled to cope with the discomforts of our situation and eventually crawled up beside me to get more comfortable. I could feel the tension in his body.

We waited. It was quiet. The only sound was the humming of mosquitos until a burst of howling and shrieking filled the woods as the predators entered the game. We instinctually dug ourselves deeper into our hiding spot. Soon

after, we heard foot steps and voices as the foxes ran past us, missing us by a few feet. Before long, shouts rang out as the foxes found their first victims. There was a frantic crashing as the hares attempted to lose the foxes in a thicket and Sam tucked in even closer. Suddenly, the hares and foxes literally jumped over us as they scampered over the logs. I couldn't see Sam's face, and we didn't talk, but I could feel all the tension leave his body and felt it replaced with joy. And I knew in that instant that I had him. Sam spent the rest of game, fleeing predators, sharing food cards and getting absolutely filthy. By the end of the game he was scratched, sweaty and self-possessed.

## Institutional Challenges

### Lack of Wild Space

Ecological education can happen anywhere. If you have a tree, or a blade of grass, or even just a parking lot, there is space for inquiry and exploration. Start by creating a map of all organic life on your school yard and then continuously add to it. Here is an ant hill, dandelions are growing through the cracks by the fence. What will surprise you is the incredible amount of life colonizing what appears to be a dead space.

And then there are a host of very simple solutions. Put a bird feeder outside your classroom window. Let a small area of grass grow wild. A 10m by 20m patch of long grass will have more insects living

in it than you can possibly imagine. Before the grass grows up, plant some native wildflowers for pollinators and then let it go. We have done massive school-yard naturalization projects and they are wonderful. However lots of little changes, lead by staff and students, can have just as big an impact. Every corner of a school yard has potential, and all that is required is letting it go. Let the grass grow, let the "weeds" move in and let nature begin its natural succession.

### Managing risk

Managing risk is also an important concern. However, I believe that we are all realizing that risk and risky play has mental health benefits and promotes problem solving and risk analysis skills. I know that I am coming from one far end of the spectrum, insofar as I teach children to use knives, hatchets and build fires. My oldest campers make their own shelters to sleep in and cook their own food too, often with disastrous results; but that is part of learning. Making mistakes is the most powerful teacher there is. What we don't want is to create a situation that leads to negative outcomes. And so, I do my utmost to understand the hazards and challenges that my students may encounter and I go to great lengths to prepare them properly. This begins with developing my own competency and researching the absolute best practices available. Think about what you are comfortable with and then consider how to expand your own limits safely.

# 2 How to Use a Learning Language

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## Start With the Basics

A skilled tracker can look at a foot print and infer or induct a host of information. The track is meaningful because of the tracker's experience and knowledge and therefore is seen with greater acuity. Anyone can see the print, but it takes knowledge to decipher meaning. For the uninitiated, this seems mystical or arcane, just as writing and reading once seemed magical, hence *spelling*.

The power of sight is one of the most compelling human experiences. The moment we do "see" it is always an Ah Ha! moment. An instant of change, that marks the movement from ignorance to insight. As educators this is our goal. To reach the "ah ha moment" with our students and the goal of a Learning Language is to provide a pathway for this moment to occur. But first lets consider what the tracker is doing.

While it appears that the tracker is able to yield a host of information from a single print, the truth is that they are working within a framework of knowledge:

1. They know how to read the landscape and identify natural wildlife corridors.

2. They are able to identify a variety but not unlimited number of sign (middens, scat, hair, etc.)
3. The tracker understands the behaviour of their quarry. All animals are creatures of habit.
4. They understand patterns of movement. Is the prey running walking or loping.
5. And finally they can look at a print and determine species and specific information, such as direction of movement.

This framework of knowledge upholds their looking and enables them to see, listen and live open to the natural world. The track is the last piece of the puzzle. It is the final object of observation and connects the tracker to their ultimate goal. The tracker does not go out into nature to find a footprint and then begin tracking. Tracking starts the instant they step outside.

Learning Languages provide this framework of knowledge so that your students can step outside and begin learning.

If I am going to teach children about trees, I do not start by taking them outside to list facts and specifics about each specimen that we encounter. This would only be to prove that I know a lot and they don't. Also it would be like starting with a single foot print. Instead I provide them

with the most basic information, which is the frame work, they need to understand what a tree is and what are the essential differences and similarities or patterns found among trees.

Trees are woody, they evolved this strategy to persist through extreme weather events, and to grow above their competition. Trees are either coniferous or deciduous, which is to say some have needles and cones and others broad leaves and true seeds. Coniferous trees have four common patterns. Some have square needles, some have bundles of needles, some have scaly needles and some have flat needles. That's it! Deciduous trees are a bit more complex but not impossible. Their leaves are either opposite or alternately arranged on a branch, simple or compound, lobed or oval, toothed or smooth. That's also it!

With this small amount of information, you can begin to look at any tree and describe the pattern with insight and begin to hazard a guess about what species it might be. By adding all our senses, "this branch is fuzzy, hey this tree smells like mint, these buds remind me of my thumb nail..." we begin to create a relationship with what we are observing rather than jumping to a name. Because once you do - you stop looking.

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Furthermore, focusing on patterns provides the student with the knowledge they need to begin meaningful self-lead learning. I can say to my students, "Okay, I want everyone to go and find as many different coniferous branch samples as possible." When they return, I have them organize the samples into piles. This will take about 30 secs - because they are brilliant and the human mind is designed to look for patterns. I then get them to explain why they organized the samples the way they did. The children put the pieces together. They experience the power of their observations and begin to see how vital their independence and vision is. It will produce new insights and change the way you see the world.

As a teacher lean into this. Learning with your students turns teaching into a source of joy and excitement. Everyones input becomes valuable, imagination has scope and insights gleaned from direct experience improve the whole group's ability to see.

## Curriculum and Nature Education

Finally how do we integrate curriculum and outdoor education?

First let's remember the benefits of going outside. We know that going outside promotes mental and physical health. We know that it fosters independence and risk analysis. We know that play is an important way for children to learn. And finally, we know that place based education helps fosters a child's sense of

community and responsibility - all valuable outcomes to start with.

Secondly, nature is a fantastic platform for all subjects. Creative writing and journaling are important ways of sharing the positive experience of being outside. Vocabulary flows out of the shapes, colours, textures and forces found in nature. Nature can help contextualize math and give it concrete application. History is written on the land and science is the study of natural phenomena.

The goal of education is to help our children navigate life with insight and confidence. Making sure that each lesson and topic is grounded in the real world and outside the classroom, is an immediate and direct way to empower students.

So if you are working on estimation - look at tree, count the leafs on a limb, count the limbs on a branch and estimate the number of leafs on the tree. If you are teaching geometry, have your students figure out the height of a tree using right angle isosceles triangles. If you are working on colours, give each child an egg carton with colour swatch samples glued to the bottom of each compartment and challenge them to find exact matches from nature.

Nature was the first classroom and it contains all the information we have ever recorded in books. The reason why the books were and are written is so that we can enjoy our life - in nature. Our job is not to devote our life to the sharing and learning of information but to use that

wonderful knowledge to enrich our experience and life. This means that we can either teach our children to memorize facts, or use the facts to help our students read the book of nature.

## A Note of the Learning Languages

Below are the key terms that make up a Learning Language for some of the native flora and fauna found on PEI. It is by no means exhaustive. You will see I didn't include a Learning Language for wildflowers.

I also didn't provide the natural history and ecology for each group. These can be found on our website [www.macphailwoods.org](http://www.macphailwoods.org) under resources. There, we have a section devoted to nature education. However I recommend that you do a bit of research for yourself. Identification books for children are a great place to start and contain the basic patterns you need to create your own language. After all, teaching is the best way to learn and I hope that you become an enthusiastic lover of nature.

Don't focus on the details, always look for the patterns. But as you spend time outside you will learn with your students and gain knowledge and experience that will be wonderful share with future classes.

Good Luck!



## Woody Plants

**Lignin** - Plants that are woody have lignin in their cell walls. Lignin makes the cells stiff and enable woody plants to grow larger than non-woody plants.

**Tree** - The largest living organisms on earth. Typically grows with a single stem. Our largest native tree is the white pine and is recorded to have grown over 2m in diameter and over 36m tall here on the Island.

**Shrub** - Multi-stemmed and low growing woody plants. Usually no taller than 4-6m.

**Conifer** - Trees or shrubs that are often called evergreens, these plants produce cones and have needles that remain on the tree year-round. Conifer needles can be **flat** (hemlock, balsam fir), **square** (spruce), grow in **bundles** (pine, larch), or **scaly** (cedar). There are only 9 species of conifer native to PEI.

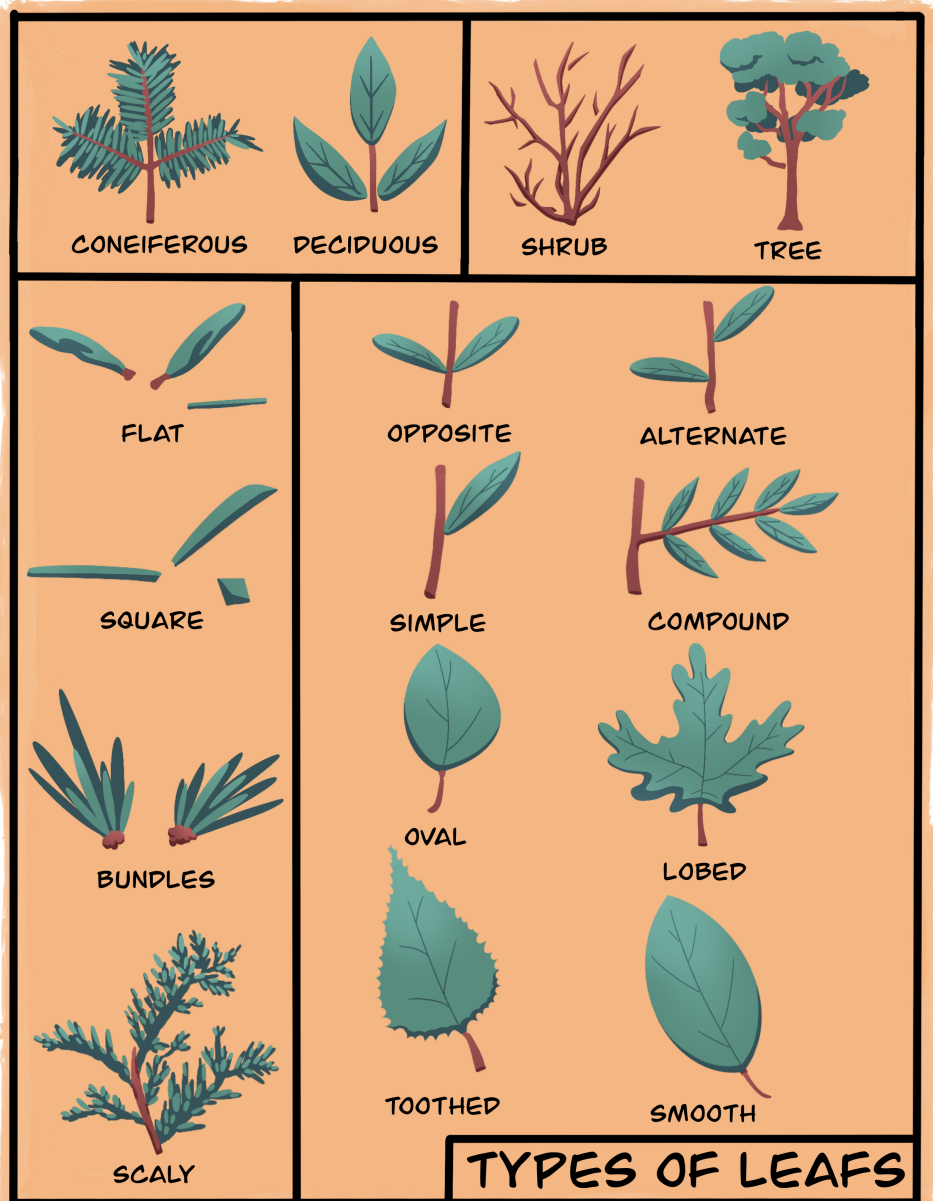
**Deciduous** - Trees or shrubs that loose their leaves. Leaves can be arranged in different patterns and have different shapes.

**Bud** - a small growth or protuberance along the stem or at its terminal end that will produce a flower, leaf or branch.

**Opposite** - leaves that grow opposite one another.

**Alternate** - leaves grow alternately along the stem.

**Simple** - A single leaf produced from a single bud. There is always a bud at the base of the leaf.



**Compound** - A leaf composed of multiple leaflets. The bud will be found at the base of a leaf and not at the base of each leaflet.

**Oval** - there are many different leaf shapes, linear, oblong, obovate, cordate, however oval covers a host of leaf shapes and is easy for children to remember.

**Lobed** - Leaves that have an irregular shape.

**Toothed** - the margin or edge of the leaf has a jagged edge like a saw.

**Smooth** - The margin is smooth.

# Insects

**Exoskeleton** - Insects are invertebrates, which mean that they wear their skeleton on the outside. It is made of chitin and must be shed before an insect can grow. Insects begin their life as an egg and then go through a series of changes or metamorphosis as they approach adulthood.

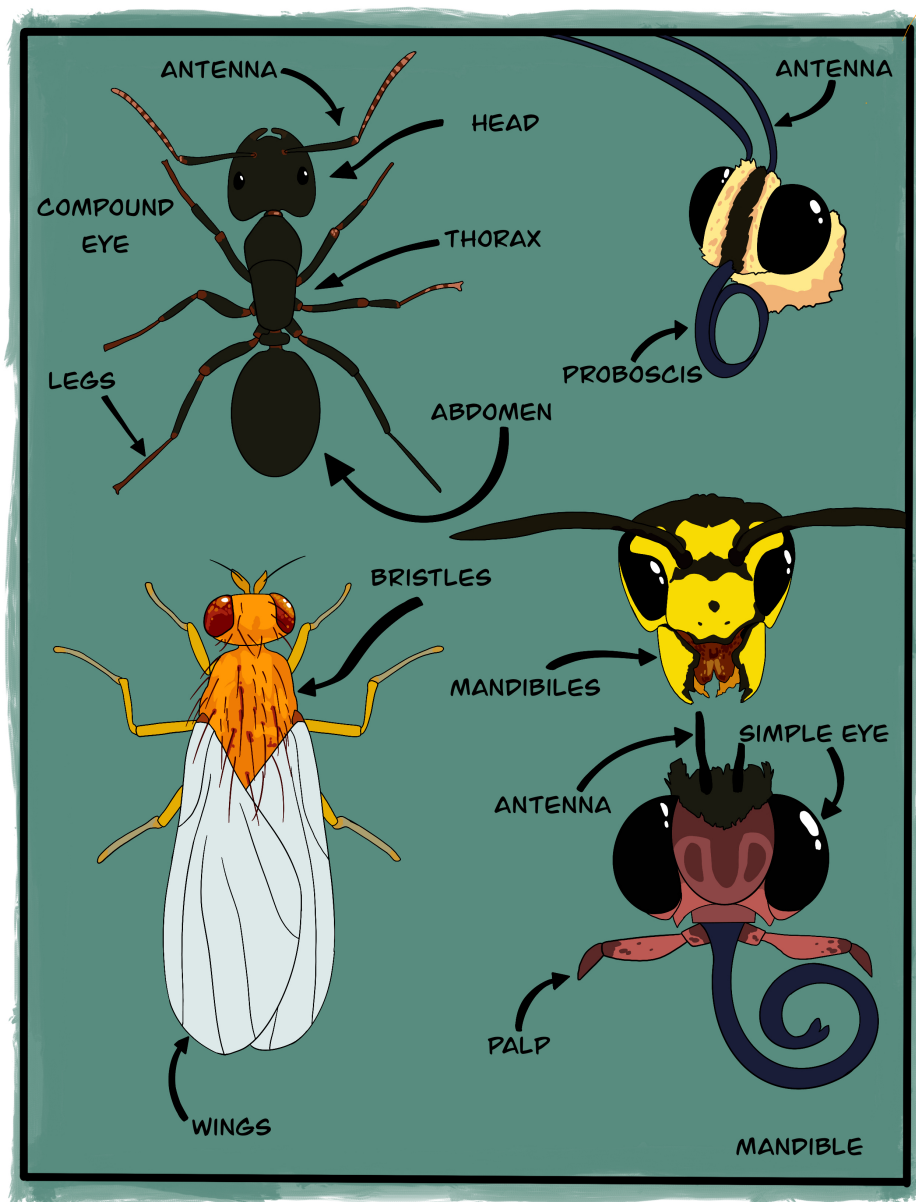
**Body Structure** - Insects have a head, thorax and abdomen, six legs and wings. Not all individual insects have wings but members of their species will. For example, worker ants don't have wings but queens and drones do.

**Head** - the head contains some of of an insects sensory organs, including **antenna** and eyes - both **simple** and **compound**. The mouth parts which can be designed for chewing or sucking. Chewing mouth parts are called **mandibles** and a sucking mouth part is called a **proboscis**. They may also have palps that act like hands.

**Thorax** - The middle section of the insect. It contains the legs and wings.

**Abdomen** - The last section of the insect. It contains most of an insects guts, reproductive organs and **ovipositor** (a tube-like organ for laying eggs), which in some species has evolved into a stinger.

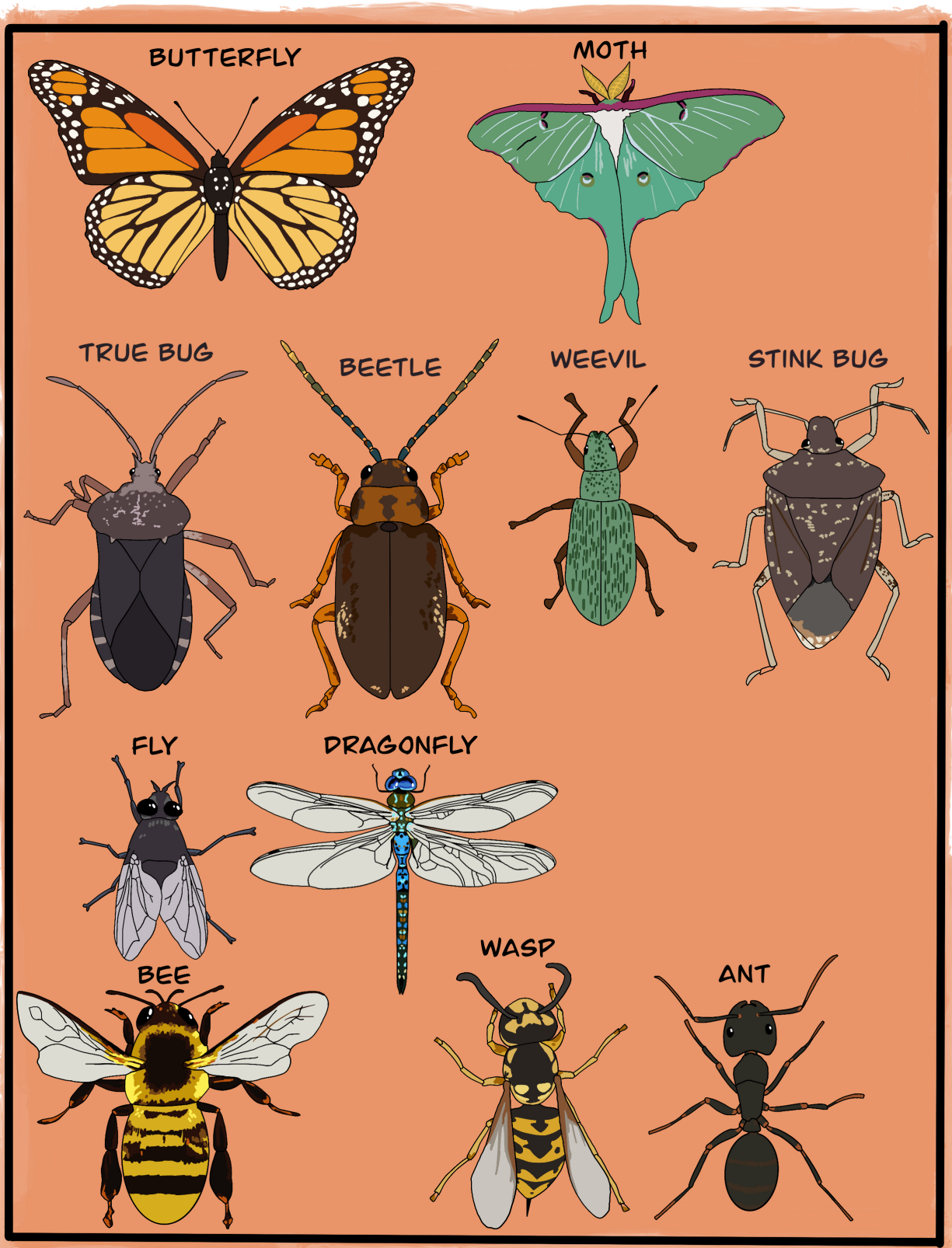
**Wings** - Insects wings come in all shapes and sizes. They grow in single or double pairs. Wings can be large and colourful or small and transparent. Beetles have



hardened forewings called elytra. The elytra completely cover the hind wings. True bugs have elytra that only partially cover their hind wings. Insects are the only flying invertebrates and the only animals to have true wings; bird and bat wings are modified forelimbs.

**Metamorphosis** - Insects reproduce by laying eggs that hatch into insect nymphs or

larvae. Nymphs look like their parents and grow by a series of molts until they reach the adult stage. This process is known as incomplete metamorphosis. With complete metamorphosis, the young insect or larva looks nothing like its parents; it grows again and again by molting, until it reaches the pupal stage, forms a cocoon and rests while metamorphosis takes place.





# Mammals

**Live birth** - Most mammals do not lay eggs but rather give birth to live young.

**Mammary glands** - Specialized glands that produce milk for feeding young. Different species have different milk compositions but all milk is highly nutritious.

**Fur** - Short or fine hair that helps maintain and regulate body temperature. Mammals are the only animals that have hair.

**Warm blooded** - Mammals have a high metabolism; their cells burn energy quickly, which produces heat that is then trapped in the body by fat and fur. Maintaining a high metabolic rate requires a high caloric intake.

**Vertebrates** - Mammals have a back bone and internal skeleton.

**Diet** - most mammals are omnivores, eating a variety of things. For example, squirrels will eat the eggs of birds, and coyotes will eat wild fruit. However, their main diet is as follows.

**Carnivore** - A meat eater: fox, coyote, mink and ermine.

**Insectivore** - An insect eater: bat, skunk and shrew.

**Herbivore** - A plant eater: muskrat, beaver, squirrel, mice, vole and hare.

**Omnivore** - Meat, insect and plant eater: raccoon.



The challenge with mammals is that they are often difficult to spot during the day. Most mammals are crepuscular (active at dawn and dusk) or nocturnal (active at night). Obviously there are some diurnal species, like the red squirrel, but for the most part we have to rely on looking for mammal sign and tracks to figure out who's around. Luckily,

children love looking for tracks and trails. Common mammal signs include:

**Trails** - Trails are used by a variety of animals. They are like highways in the woods. The constant use creates a trough and the width of the trail is typically the shoulder width of the largest animal that uses the trail.

**Run** - A run is used by one species. Runs usually branch off trails and will lead to feeding areas, middens, dens, tunnels or nests.

**Feeding Areas** - A feeding area is where an animal eats. Depending on their diet these will look different. Hares browse on living plants. Their feeding area will have the new growth of young plants snipped off or twigs with the tips chewed off at a 45° angle. Squirrels like to feast on seeds and cones from a high-vantage point, helping them see an approaching predator. Beneath their perch will be an obvious pile of shells, called a midden. Mink catch fish, which they will eat on the bank of a river.

**Escape Route** - A one-time use trail. Characterized by zig zag or circular pattern of direction.

**Lay** - A resting place. Grass, moss or leaves will be gently pressed down.

**Bedding Area** - A sleeping place. Grass, moss and leaves will be very pushed down and show signs of damage and wear.

**Midden** - A small pile of seeds, bones or leaves.

**Track** - The footprint of an animal. Tracks are often the most difficult and subtle sign to follow. There is an entire science and methodology for determining species, direction of travel and more. It is most important when you find a track to look carefully, do your best to think what might have made the track and then look to the immediate



- 1 - TRAIL
- 2 - RUN
- 3 - FEEDING AREA
- 4 - ESCAPE ROUTE
- 5 - LAY
- 6 - BEDDING AREA

- SCAT**
- 1 - MOUSE
  - 2 - HARE
  - 3 - SQUIRREL
  - 4 - SKUNK
  - 5 - COYOTE
  - 6 - ERMINE
  - 7 - RACCOON

surroundings for clues. Winter is a fantastic time to look for tracks.

**Gate** - Different animals have different track patterns, depending on how fast they are moving. Common gates are: **walk, trot, lope and gallop.** These patterns will be different for each species.

Because there is a relatively few number of mammals, they are relatively easy to identify. However, it is always better to describe. Useful things to consider when describing a mammal are:

**Fur** - Fur has many jobs. It insulates, camouflages and sheds water. Consider what colour the



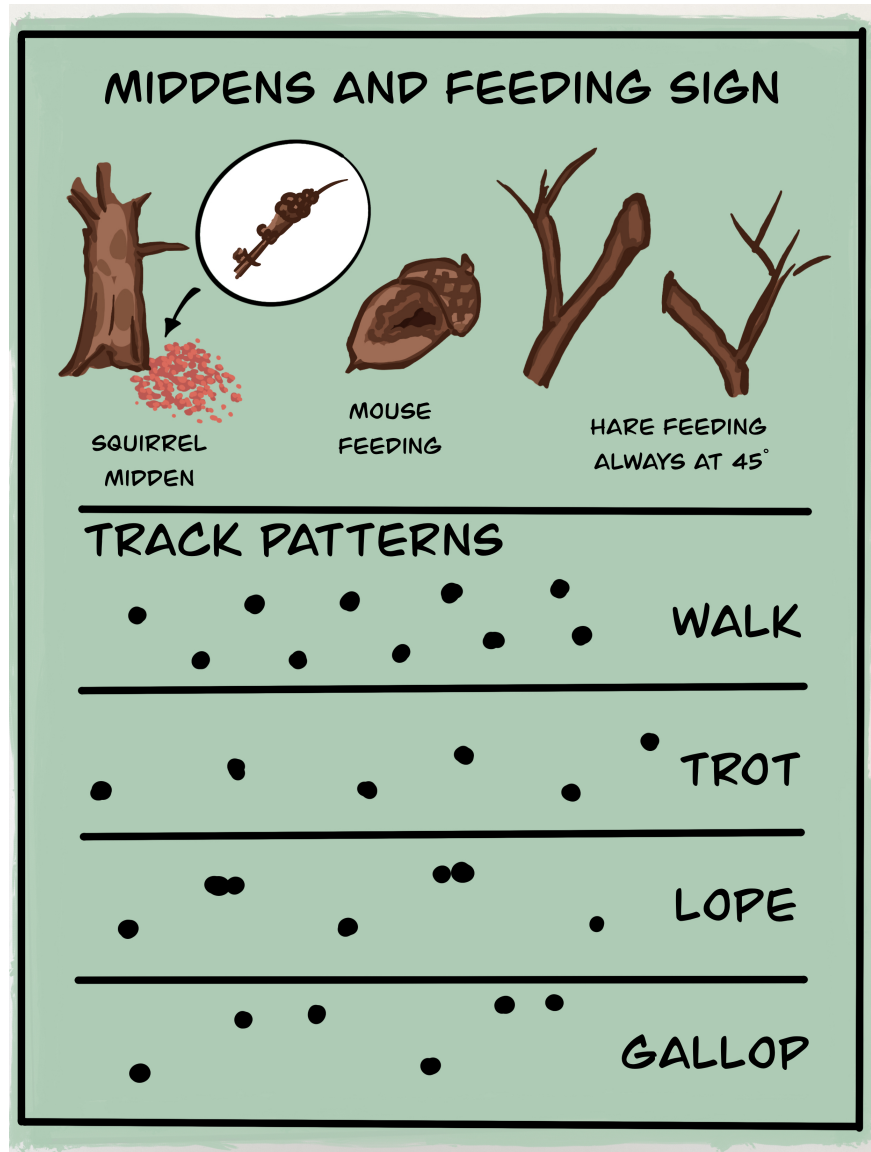
fur is; does it match its surroundings, is it oily and look like it will shed water well, or is it puffy and thick.

**Ears** - When I watch a wild animal like a fox or hare, I am always amazed at how acute their hearing is. Ears are of great importance, both to alert a prey to danger or a predator to the location food. Good questions include; how big are the ears relative to the animal, where are they positioned and can they move?

**Eyes** - Where eyes are positioned on a mammal indicates much about the animal. Forward-facing eyes usually indicates the need for accurate stereoscopic vision, useful in capturing prey. Side-facing eyes indicate that a large field of vision is needed to avoid predators.

**Tails** - Tails help balance, swim, communicate, insulate and warn. A flying squirrel tail is like a rudder, a beaver tale is a huge paddle and a raised skunk tail warns predators of an impending spray. Consider the size, shape and whether or not it is smooth or furry.

**Legs** - Legs are for movement. They are designed for getting from here to there. How animals move, once again tells us much about their life. Ermine legs are short and stubby so that they can fit in tunnels and cavities. Coyote legs are long and lean for speed and easy of travel over long distances. Consider if fore legs and hind legs are the same and if not then why?



**Paws** - Fore limbs with paws that have great dexterity or don't is also a useful observation. A raccoon can pretty much do everything that we can with our hands, while a fox certainly cannot. Consider how an animal interacts with its environment.

**Teeth** - Rodents teeth never stop growing because of their constant need for chewing of tough material. Shrews have a tiny set of sharp predator teeth for capturing

and killing insects. While it is not always easy to observe mammals and their mouths, there are times when you can. Sit and watch a squirrel eat a nut.

# Birds

## Beaks

**Insect Eater (Tweezer)** - A long or short bill for picking insects from leaves or bark.

**Wood Pecker (Chisel)** - A long or short, strong bill for excavating wood fibre.

**Insect Catcher (Bug Net)** - a short bill with a wide base that opens very wide for catching flying insects.

**Meat Eater (Hook)** - A hooked bill for tearing flesh.

**Aquatic Plants (Shovel)** - A wide strong bill for digging up and consuming aquatic plants.

**Generalist (Multitool)** - A long, pointed bill for catching insects, worms and heavy enough for cracking seeds.

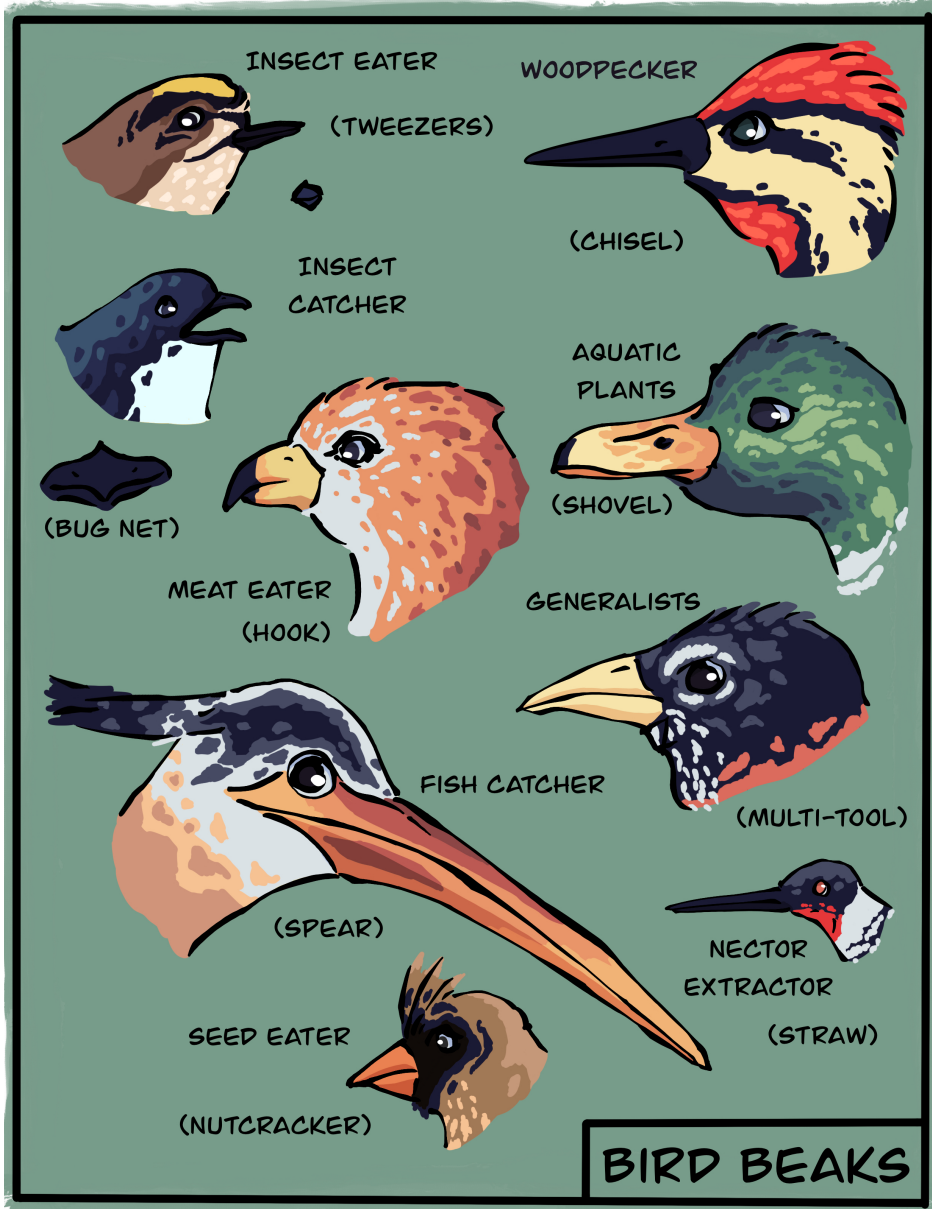
**Fish Catcher (Spear)** - A long sharp bill for spearing fish and amphibians.

**Nectar Eater (Straw)** - A long skinny bill that can fit into flowers.

**Seed Eater (Nutcracker)** - A short, thick bill for cracking seeds.

## Feet

**Perching** - Birds that perch have four toes that extend from the same level on the leg. Three toes point forward and one back. Perching birds often have feet that are specialized for scratching to uncover seeds on the ground.



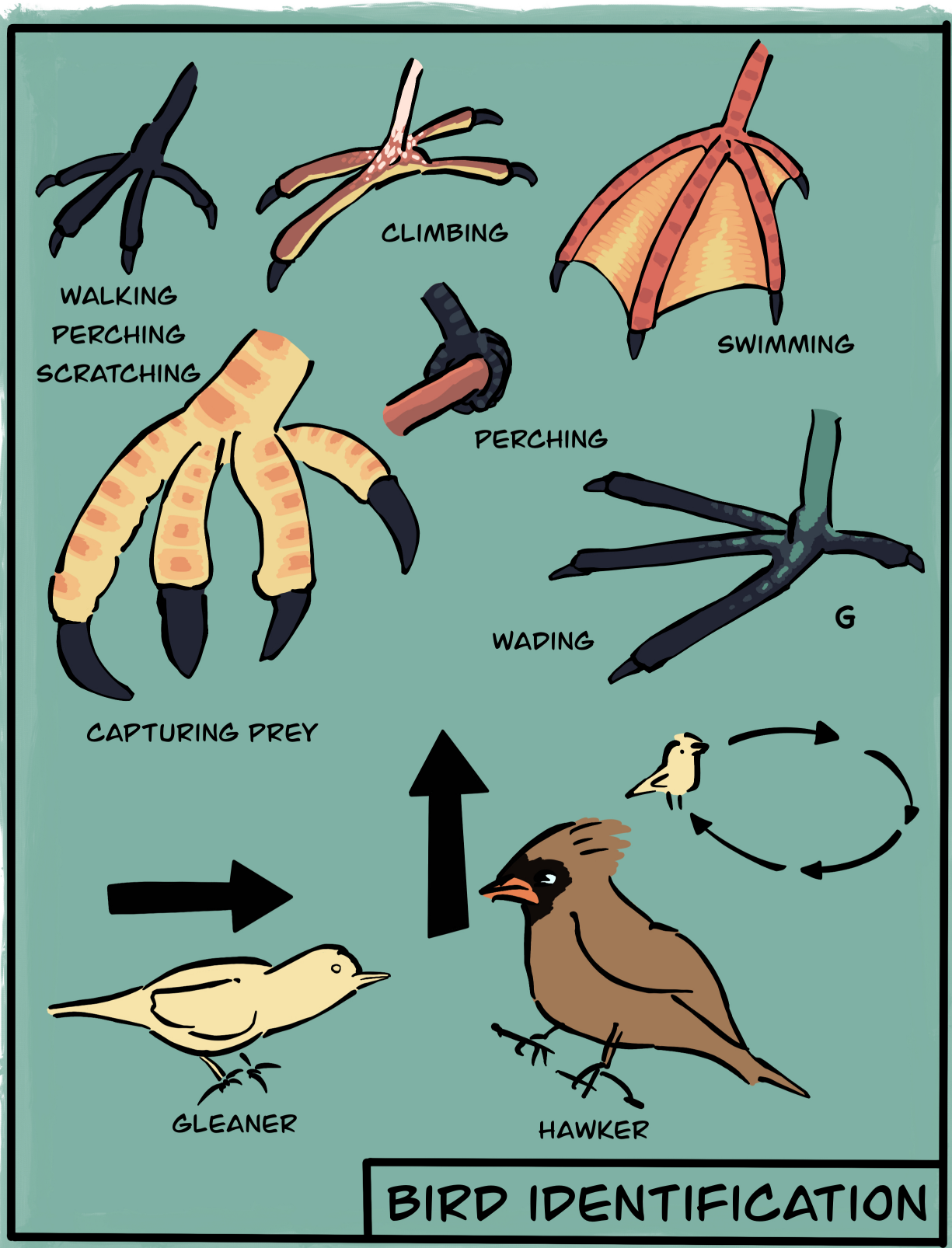
**Climbing** - Climbing birds, such as woodpeckers, have two toes forward and two toes back.

**Webbed Feet** - Ducks have webbed feet for swimming and grebes have lobed feet for diving.

**Wading and Walking** - Shore birds feet are adapted for either

spreading their weight over a larger surface area to avoid sinking or have small hind toes specialized for walking.

**Talons** - Predators like hawks and owls have razor sharp talons for killing and carrying prey.



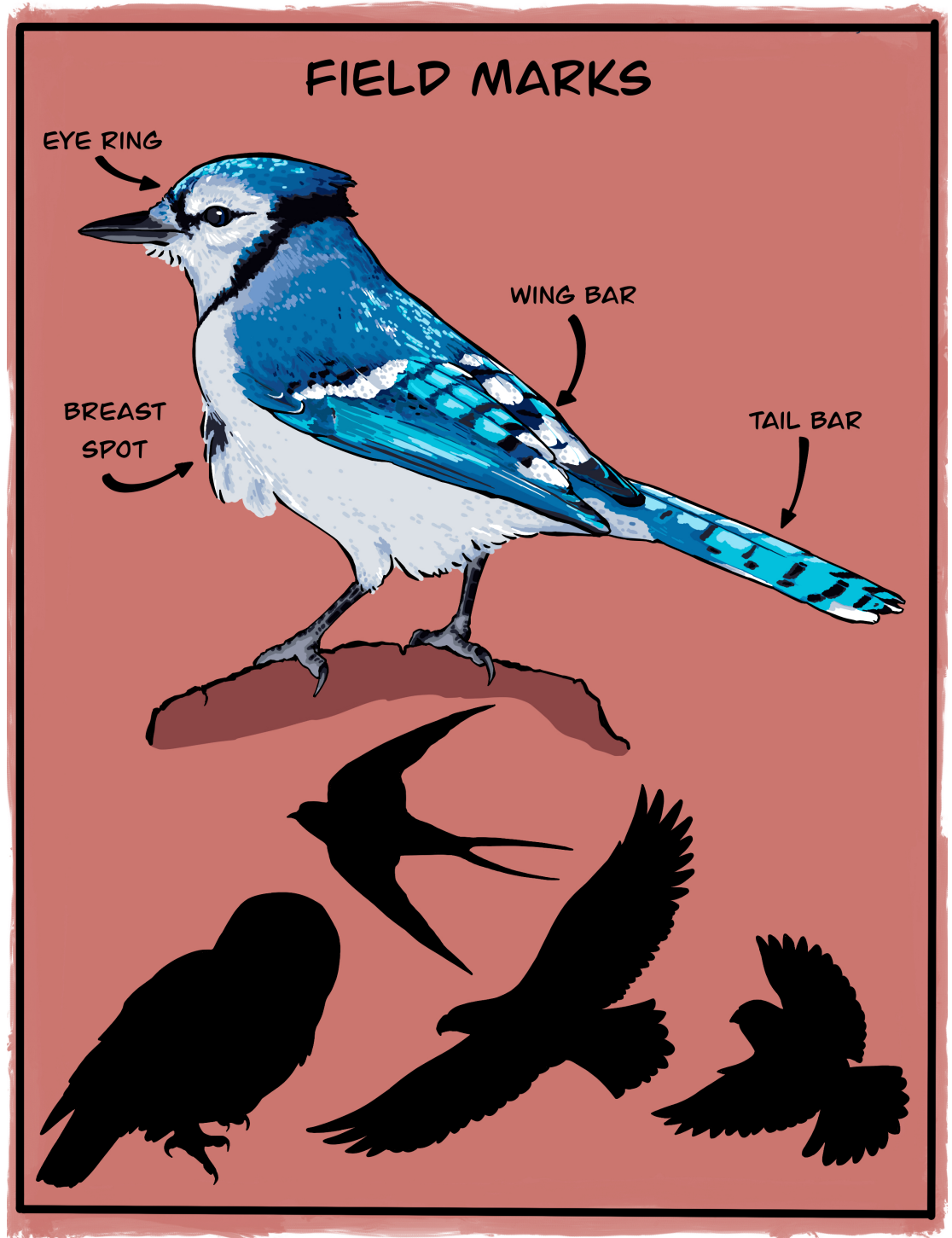
## Body Position

**Upright** - Birds that position their bodies upright are typically hunters. They are looking outward for prey. Birds that hunt flying insects will often perch upright, and attack their prey in a circular flight, called hawking.

**Forward** - Birds that look like they are leaning forward are gleaners, and are looking for food hidden amongst leaves and bark.

**Field Marks** - Physical points that distinguish one species from another that it closely resembles. Look carefully at the head, eyes, breast, wings and tail feathers.

**Body Shape** - It is often difficult to see field marks, or bills when a bird is in flight. However, body shape is a useful tool for distinguishing species on the move or that are silhouetted.





# Amphibians

**Amphibian** - Four-legged, cold blooded invertebrates. Usually carnivorous (insectivores). Undergo a metamorphosis, from larva with gills to an adult breathing with lungs. Amphi - bios, means, two lives.

**Frog** - A short bodied tailless amphibian, with thin, moist, glandular skin.

**Toad** - A short bodied tailless amphibian, with dry, tough, bumpy skin.

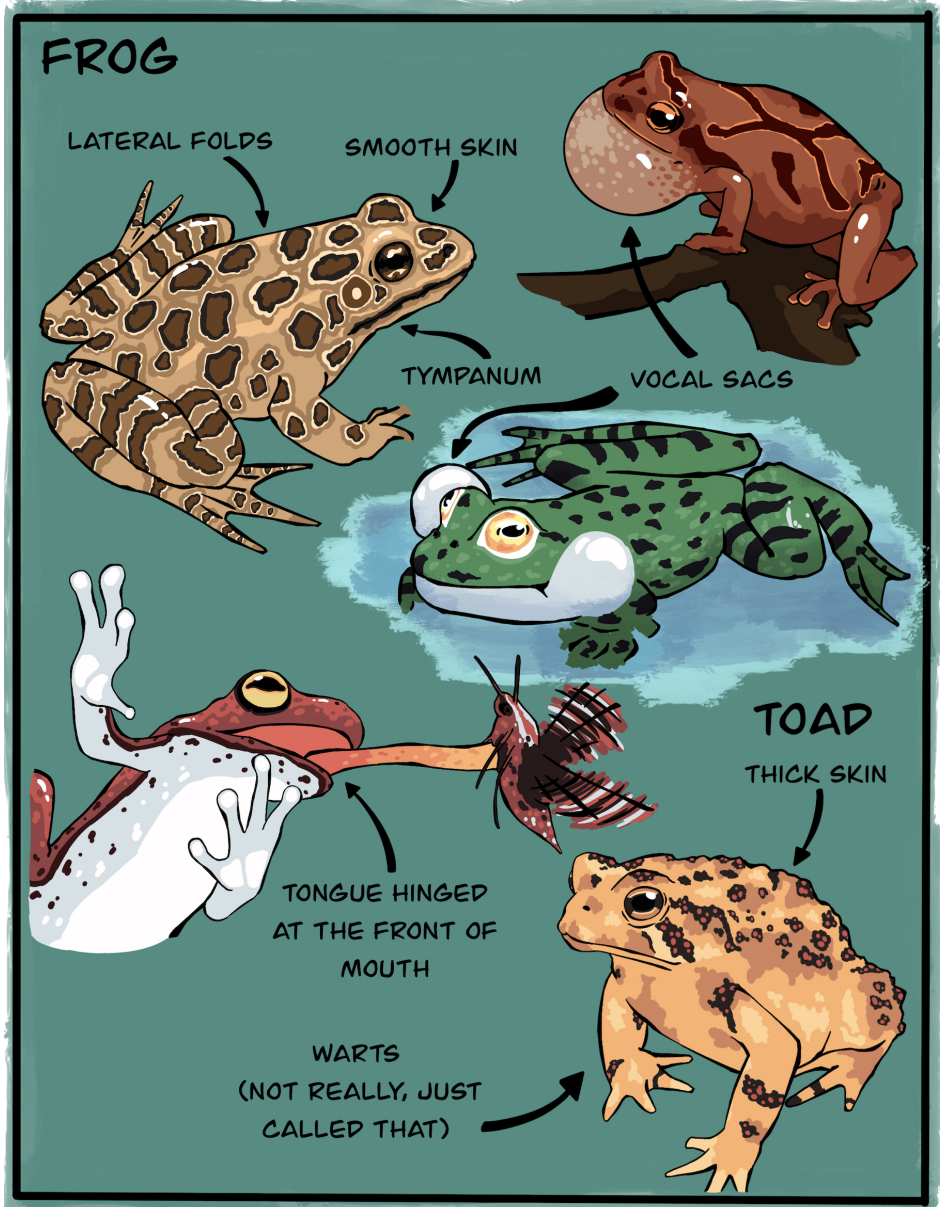
**Salamander** - A long slender bodied amphibian with a tail, characterized by their lizard like appearance.

**Newt** - A sub-family of salamander. Newts have a juvenile terrestrial phase called an eft. Adult newts have a flattened tail that aids their swimming.

**Tympanum** - A frog or toad's ears.

**Vocal Sacs** - A flexible membrane open to the mouth cavity. Vocal sacs amplify mating songs and calls, used by male frogs to attract a mate.

**Smooth Skin** - Frogs and salamanders have smooth, thin skin that is highly-permeable and helps balance the frogs physiological homeostasis - fluid, electrolyte and acid/base balance. **Before any amphibian activity, we make sure the children wash and rinse their hands to remove any bug spray, sun screen or**



**residue that might harm the frog or salamander.**

**Specialized Tongue** - The job of the tongue is to capture fast moving and elusive prey. It is hinged at the front of the mouth and has natural adhesives.

**Toad Skin** - Dry, bumpy skin. The bumps are called warts. Unlike

frogs that spend their time in or near water, toads are primarily terrestrial. Their thick skin protects them from drying out.

**Species diversity** - There are five native frogs, one species of toad, three salamanders and one species of newt. A great group of animals to wrap your head around!



SPRING PEEPER  
 4 CM - AVG  
 TAN, RUSTY  
 BROWN  
 X ON BACK

WOODFROG  
 6-8 CM - AVG  
 TAN, BROWN, RED  
 DARK EYE MASK

PICKEREL FROG  
 8 CM - AVG  
 RECTANGULAR  
 REGULAR SPOTS

LEOPARD FROG  
 6-10 CM - AVG  
 IRREGULAR  
 ROUND SPOTS

GREEN FROG  
 8-11 CM - AVG  
 MOSTLY GREEN  
 LARGE  
 CONSPICUOUS  
 TYMPANUM





**Spring Peeper** - Our one true tree frog. They have suction cups on their toes and a distinctive X on their back. Despite being the smallest frog, their spring mating song is an incredibly loud chirp that becomes a deafening chorus in groups. Found in shrubs and trees along rivers and streams.

**Wood Frog** - One of the first amphibians to awake in the spring. They have a high tolerance to freezing. They range in colour from red to green to brown but always have a distinctive dark eye-mask. Found in woodlands with vernal pools (spring pools that dry up) or near water.

**Pickereel Frog** - Very rare, can be confused with the leopard frog, however they have a different habitat, living in or near cold, moving water and rocky ravines. Their spots are rectangular and regular.

**Leopard Frog** - Often called a meadow frog, they have round irregular spots.

**Green Frog** - Our largest frog. Green frogs live in and around bodies of water. They are true to their name, very green and have large conspicuous tympanums.

**Spotted Salamander** - Very stout with a wide snouts. They are our largest salamander and have distinctive yellow spots. Found under leaf litter, logs and rocks near bodies of water.

**Blue-spotted Salamander** - Incredibly beautiful, these salamanders are covered in bright blue spots and have long toes. Often found in leaf litter or piles of



composting organics that attract worms and insects.

**Red-backed Salamander** - Our smallest Salamander, they can be easily confused with a worm. However they have legs, eyes and a distinct red stripe on their back. They are completely terrestrial as they lay their eggs on land within

rotting logs and spend their larval stage within the egg.

**Newts** - Between their larval and adult stage newts become efts. Efts are salmon pink or orange with red spots. This bright coloration is a warning to predators. Adult newts have olive green skin dorsally (on top) with a dull yellow belly.



# 3 Plants, the Mighty Producers

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## Meet a Tree

**Materials:** Pencil, eraser, **meet a tree handout**, clipboards

**Procedure: (DE)** This activity is done individually. Students are asked to find a tree that is of interest or especially beautiful to them. Have them use the handout as a template for their inquiries. Students may pick the same tree. Remind the students to use their senses to identify as many of the unique features of the tree as possible. Examples are listed on the handout. **If an adult cannot identify the tree it is best to skip the tasting sense.** Although most trees on P.E.I are safe to consume, some aren't, and it is good practice to never ingest anything that can't be identified. Once students have completed their questionnaire they may want

to come up with their own questions. After they have completed the survey they can do a portrait of their tree on the back of the sheet.

**Hints, tips and tricks:** Meet a Tree is a great warm up activity. It's great for mornings and works well during a hike. It gets students using their senses and focusing on something specific.

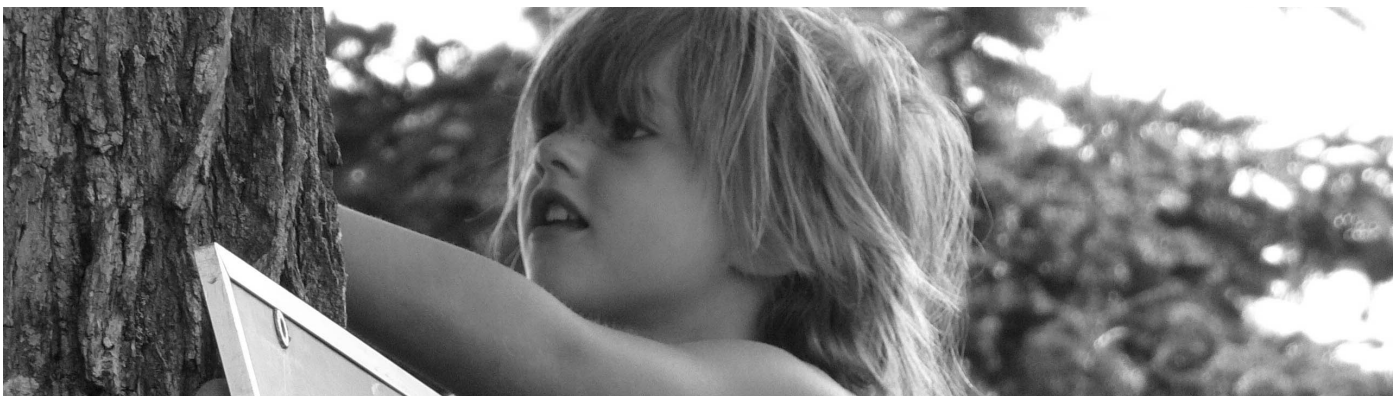
## Plant press

**Materials:**

- Plant press frame
- Corrugated cardboard
- Old newspapers
- Blotter paper - highly absorbent paper used for wicking moisture - optional
- Plant specimens, leaves, petals

- Herbarium paper - acid free card stock works great
- Heavy books
- Pencil and paper
- **Herbarium label** - optional
- Plant books

**Procedure: (DE/SI)** A plant press helps extract moisture from the a plant as fast as possible, while also preserving the structure and colour of the specimen. Plants that are pressed immediately after being collected will have the best results. If you are pressing plants to be mounted you will want to gather some specific information, such as, where it was found, the date it was gathered and the name of the person who collected it. Any other information you may want to gather can be found on the herbarium label that you will use.



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When you are pressing plants you want to do it in a specific order for the very best results. The order is as follows:

1. The bottom frame of the press. The frame adds stability, and allows you to add pressure to the press.
2. Corrugated cardboard provides more stability and allows airflow throughout the drying process.
3. Blotter paper - absorbs the moisture being pressed out of the plants.
4. Newspaper - used to hold the plants.
5. Plants - Plants specimens should be carefully arranged to fit in the press without hanging out the edges. They should not be overlapping or touching one another. Bigger specimens may only need a whole layer. Plants such as grasses or long stems may need to be folded to fit in the press. Smaller specimens can be grouped together without overlapping. When collecting an entire specimen the roots should be taken as well, and washed before being placed in the press. Once the plant is laid out flat on the newspaper it can be covered by another piece of newspaper before moving onto the next layer.
6. Each layer should then be as follows : Cardboard, blotter paper, newspaper, plant, newspaper, blotter paper, cardboard. The layers should be lined up as neatly as possible to fit evenly in the press frame.
7. Top frame of the press - Once all the layers are complete you can place the top half of the

frame on the pile. The frame can be secured with straps or rope. The more pressure put on the plants the less chance there is for wrinkling or shrinking during the drying process.

8. Heavy books - Some people like to set heavy books or other items on their press to help with the process, especially if they struggled to secure the press. This can also prevent having to adjust the straps as plants dry.

Once the press is filled up it should be placed in a dry environment with good airflow. The drying time can vary for different plants. Flowers can take anywhere from a few days to a few weeks to dry. The best way to check if the plants are dried is by simply opening up the press and taking a look. Plants that have been properly pressed should maintain their colour as well as their shape and size. The dried plants can be used for a variety of different crafts but they can also be mounted on herbarium paper. Plants that are mounted should be properly labelled with a herbarium label.

It is important to know that aquatic plants (plants growing in water) may need different materials than what is listed above. They may also require longer in the press.

**Hints tips and tricks:** Children love this activity. They enjoy finding plants or leaves that intrigue them and enjoy the anticipation of opening the press to see if their work has paid off. Younger children can turn their

pressed plants into art while older students can turn the pressings into beautiful scientific collections.

## Identification Game

**Materials:** A selection of leaves from different species of tree, a wooden board 10"x48", push pins

**Procedure: (AE)** This is a great game for helping reinforce identification skills or information learned on a hike or discussed during a presentation. If you are going to play this after a hike, gather leaves from the trees or shrubs that you encountered. I often use this game after a presentation and so gather my samples and set things up before hand. A good number is 6-8. Tack the leaves to the board. Form two equal teams and have them line up opposite one another on opposite sides of the board - like they are going to play red-rover. They should be about 30' apart. Have each group count off separately, so that each player is assigned a number. Each team will have a number one, two, three and so on. The "ones" should be opposite each other and so on. When everyone is ready, the leader will call out a species and a number. As soon as the "twos" hear their number called they race out and try to point to the correct specimen. They only get one guess. The student who guesses correctly first gets a point for their team. To make things harder, rather than limit their guess to one, for every wrong guess they lose two points.



**BEECH**



**ASPEN**



**MAPLE**



**OAK**

**Hints tips and tricks:** I prefer to give clues rather than just the species. For example, I'll say, "this tree gives us sweet, sweet syrup each spring... number two!" That way they reinforce facts and identification. Also this game can be used for identification of all species; plant and animal. For animals, I just laminated pictures that I pin to the board.

## Mystery Plant Scavenger Hunt

**Materials:** 20 clues printed on cue cards, basket, **tally sheet**

**Procedure: (FA)** This is a great activity for older students. It combines solving clues and a scavenger hunt! Place the 20 clue cards in the basket. Each clue has a description of a plant, plus a clue that will help narrow the plant down. We use this game with our oldest students during our

bushcraft camps and so the clues will look like this...

*11. Simple, alternate, oval, toothed - wood smells like peppermint, good for brushing teeth and making tea.*

There are many trees that have simple, alternate, oval toothed leaves. In fact, they are the most common leaf shape. To find the correct tree requires the clue, which only yellow birch correctly matches. The goal is to test identification and plant use in the context of bushcraft but the clues can be tailored anyway you like to be more or less specific. For example a clue for younger children might be...

*2. A leaf that looks like a hand - find me near the school entrance.*

To play, divide the class into groups of three and assign a number to each group. On GO, the teams send one member to fetch a clue from the basket. The

group reads the clue together and then work as a team to find the matching specimen as quickly as possible. Once found, they return to the leader who checks to make sure that the leaf matches the clue. If it does, a check mark is added to the tally sheet. So for example, team 5 started with clue #12, they found the correct leaf and so get a check mark on the tally sheet, under their team number and beside the #12 clue. Once this is done, they drop their clue back in the basket, pick a new one and begin again.

The clues do not need to be solved in order, but the time will come when the only clues that a team hasn't found are being used by another group. They can continue to look in the basket for clues they might have missed, or if they must, wait for the clue to be returned to the basket. Which ever group correctly collects all the clues first - wins!

# 4 Adventures with Insects

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## Insect Hunt

**Materials:** Butterfly nets, buckets, small container or bug jars, magnifying glasses, insect identification guide, pads, pencils

**Procedure: (DE)** During the insect hunt the goal is to gently catch and observe different insects in different environments. Butterfly nets are useful tools for catching flying insects but are not suitable for insects on the ground. Buckets are very efficient aids for catching insects on the ground or in long grass. By simply dragging a bucket through long grass, while running, you can capture hundreds of insects. Another great way to look for insects is by moving things that have been on the ground for a long time such as

rolling over a log. Insects can be found everywhere, so try doing this in different environments.

Once a student has caught an insect that they wish to observe, they can place it into a small container with breathing holes. Students can try to identify their insect using an identification guide or even better, simply recording their observations on the paper provided. If they wish, they can draw their insect while they have it in the container. Once a student has finished observing their insect, have them release it.

**Hints, tips and tricks:** A warm sunny day is best, to give students an opportunity to see different insects up close. Because we take field guides with us that have lots of photos,

students can often identify their insects with little to no help and keep in mind that correct identification is not the goal. Observation is what matters and insects hunts are a great time to be thoroughly confused. Why the heck does this insect have a hard shell, what are those giant back legs for, why is that bug shaped like a thorn? As a teacher, lead by example, and get down in the grass with students. Roll on your back, in the field, and watch the insects move around you. It's a great time to talk about camouflage, adaptation, and specialization. Insects are incredibly designed and it is a wonderful opportunity to let students test their ability to develop a hypothesis.



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## Build a Bug

### Materials:

- Different sized styrofoam balls
- Wooden skewers
- Different coloured paint
- Paintbrushes
- Water cups
- Pie plate or paint tray
- Googly eyes
- Hot glue gun
- Permanent marker
- Newspaper or something else to protect working surface
- Pipe cleaners
- Scissors

**Procedure: (SI)** Build a bug is a craft often done after learning about the different body parts of an insect. All insects have a head, thorax, and abdomen as well as six legs.

First the working surface for the craft may need to be prepared by placing down old newspapers or disposable tablecloths. Glue guns should also be plugged in ahead of time. Students start by picking 3 styrofoam balls for the body of their insect. They then push a skewer through the centre of the three balls to connect them and add stability. The skewer also makes a handle to hold while painting. Once the three balls are arranged on the skewer they can be glued together with hot glue (usually done by an adult). If the person leading the activity wants to, they can prep the bodies of the insects before beginning the craft. Once the body is ready, students can use a permanent marker to mark where they would like the googly eyes to be attached. The person leading the activity can then glue the eyes



exactly where the student wants them. Pipe cleaners can be formed into wings, spikes, mandibles or a proboscis. Next each student should receive a pie plate to put their paint on, a brush, and a water cup for brushes. Encourage students to only put the colours that they need on their pie plate, as well as only using small amounts at once. This helps later with cleanup as well as avoids needless waste of supplies. Students can paint their insects however they'd like. They may want to try to make an existing insect or invent their own. Once students have completed the painting they add the pipe cleaners appendages by poking them into the styrofoam. Once the insects are complete they can be left at the work surface or in a designated area to dry.

Hints, tips and tricks: This is a great craft to wrap up a lesson on insects. It reinforces the parts of an insect and gets students thinking about adaptation and function.

## Spider Web Game

**Materials:** Large playing area, 8 pylons

**Procedure: (AE)** This game is very similar to fruit salad or octopus go. You'll need a large rectangular area to play, that has clearly marked boundaries. The playing area is the spider's web. The leader can pick 1 or 2 students to be "spiders". All the rest of the students will line up along one end of the play area, and they are the insects. The goal of the game is to run from one end of the playing area to the other without being tagged by a spider. Spiders will stand in roughly the middle of the playing area with their backs to the insects. When the spiders are ready they can yell "Go" and the insects run, attempting to get safely through the web. If a student does get tagged by a spider they are now stuck in the web and cannot move from where they were tagged. Students who are stuck in the web can attempt to tag the other students who are

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running by. If they do tag an insect, it is now also stuck in the web. Once all the players have been caught in the web or there is one clear winner the game can be restarted.

**Hints, tips and tricks:** This activity burns energy! It is a great game to be used before a bug hunt to tame the excitement.

## Design an Insect Habitat

**Materials:** Pencil, paper, colouring supplies

**Procedure: (SI)** Students first need to think of an insect to draw and base their habitat around. The insect can be real or it can be fictional (unicorn ant). Students will then need to incorporate all the necessities the insect requires to survive and where they find them within the habitat. For example if the insect needs to drink water it could get it from a river, rain, or dew off plants. Once students have finished drawing all the needs of their insect, they can then start drawing things unique to their creature. For example if a student is drawing a wood boring chew bug, they may want to include something hard for it to gnaw on. Once students have completed their habitat they may want the opportunity to present it to their peers.

**Hints, tips and tricks:** We do this activity to focus on the wants and needs of animals - in this case insects, and how they obtain those through their environment. It is nice to have a computer on

hand during this activity so if students have questions about a real insect you can look it up. While students are presenting, it is a good opportunity to ask questions and check their understanding. It is also important that their peers ask questions and are also learning from one another.

## Micro Hike

**Materials:** magnifying glasses, string cut into 2m lengths

**Procedure: (FA)** Tell the students that you will be going on a hike. Then give each student one length of string. Instruct the students that the string will be

their tour guide. Then have each student find a place that interests them. Any spot will do. Once they have found their location, they will lay their string out in front of them on the ground and begin their hike. To do this, they must use their magnifying glass to shrink down to the size of an ant. Creeping on their bellies, inch by inch, following the string, they will explore the miniature landscape, looking through their magnifying glass, viewing such wonders as a blade of grass bent by dew, or a passing ant scurrying along on its business. Remind them to keep their eyes as close to the ground as possible.



# 5 Mammals, Our Furry Friends

## Animal Moves

**Materials:** Playing space

**Procedure: (AE/DE)** Before this activity make sure you have done some preliminary research on a specific mammal. Animal Moves is a wonderful time for theatrics and we often use it to kick off a lesson on mammals. Gather the students together. I like to sit on the grass with them and discuss different species of mammals they know - any species will do. Prior to the talk - do a little background research into one specific native species. For example, lets think about snowshoe hare. "What does it eat? It's a plant eater. What makes it successful... teeth designed for chewing and great sense of smell. Good! What challenges do hare face... they are also a favoured prey! How do they deal with this challenge? They have huge ears for detecting the approach of predators! Great insight, but did you know that their eyes situated on the sides of their head, provide them an almost 360° view of their surroundings. And did you know that hares rely on camouflage? In the winter their coat turns white and brown during the summer. What would it be like to be hare? Vigilance would be pretty important right!"

At this point, ask, "Who can demonstrate what a hare looks like in the woods... excellent. See how alert the hare is with its head upright listening for predators. Now lets all imagine we are a hare." Let them get into being a hare for a moment. "Its a beautiful sunny morning, just like this, we've emerged from under the balsam fir we were resting under for the night and are eating a nice crisp blue-bead lily leaf. We love mornings, there are lots of shadows to conceal our movements, the sun is warm and predators are resting. Listen to the birds! They are special friends to us, because any change in their song or call will alert us to the presence of danger. Lets hop around and find more food - remember our fore feet stay put while our hind legs swing around them." Let the children hop around and join in, pretend to eat and listen for predators. Finally, "What's that, I think a fox is approaching - remember our first line of defence is to remain perfectly still but be ready because if the fox catches our scent our best chance for survival will be to escape using our fantastic speed. We can leap over 3m in distance and reach speeds of 45km/h." During the hopping around faze, make sure to have moved yourself to the outside of the group and begin to transform yourself into a fox. "The fox is getting closer. RUN!"

**Hints, tips and tricks:** Without explanation or preparation you can get a group of children completely into the moment. You can add as much info as you like. It's a great way to set up a whole discussion about predators and prey. Follow up with Stalker for a one-two punch.





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# Stalker

**Materials:** Blindfold

**Procedure: (FA/DE)** Play this game in any quiet natural setting. Lawns are not great because there are no obstacles and they are very quiet on the feet. Any wooded area, or meadow is perfect. This game is legendary at camp. Games played with older children - 12 and up can last 20 to 45mins. However the success of the game requires the leader to take an active role as moderator and judge.

The rules of the game are simple, however achieving success is complex. A "prey" stands in the middle of the play area blindfolded and will remain stationary in that spot. They are free to turn in any direction but cannot move from that spot. The "predators" take a designated number of steps from the centre - usually 20-40 depending on how long you want the game to last, fanning out in all directions. Once they have settled, the leader may need to adjust the position of various predators to insure that everyone is equidistant from the prey. On GO, the predators start stalking towards the blindfolded prey. If they make a noise and the prey hears the sound, the prey will point in the direction of the sound. The leader confirms that the prey has pointed correctly and then signals or, if need be, asks the predator to sit, who is now "out" and must sit quietly for the remainder of the game. Meanwhile the other predators continue to approach as silently as possible. The prey continues to

listen and point - narrowing the field of predators. However the prey does not get an unlimited number of "points". If there are 20 predators, the prey gets 20+1. Any incorrect point, will use up one of the 21, while a correct point does not.

The game ends one of three ways. If a predator is able to sneak up to the prey - they must stand quietly beside the prey for a silent moment and then gently tag the prey - who is now eaten. Or, if the prey uses up all their points - the leader yells "fair game" and all remaining predators are free to pounce on the prey. Whoever reaches and tags the prey first wins. Or if the prey manages to identify all the predators the game also ends.

**Hints, tips and tricks:** The moderating of this game makes the difference. The moderator, who stands at the centre next to the person playing the prey, must listen just as hard as the prey. If the prey points in the direction of a predator but that player was stationary or silent - I give the benefit of the doubt to the predator, in which case the prey loses one "points". If a predator is obviously making lots of noise and the prey's direction of point is not aimed exactly on target - I will still make the predator sit. Also if a predator is moving too fast, especially at the start of the game or near the end, I caution them and if they continue to move too fast - I make them sit. The only acceptable movement is slow. Players who are out will make noises from time to time that attract the attention of the prey. If the prey points at them, these do

not count as a wrong "point". Just remind the sitters to be silent. If they need to adjust themselves, pause the game and let them get comfortable before continuing. And finally, I let the players know all these nuances prior to the game and ask them to work on an honour system. Sometime players will get bunched up, one will make a noise, the prey will point in the direction of the group and I just ask the individual responsible to sit down.

There are so many incredible outcomes from this game. Just being in nature with a group of children, in total silence is amazing. Predators who are "out" will sit perfectly still, watching the unfolding game with rapt attention, especially if there is an epic stalking battle unfolding between two predators. Build this up. Every now and then, stop and provide an update. "We are down to four predators. Amazing work hunters and incredible listening prey." Doing it in a soft but enthusiastic voice draws the whole group together. We play an extreme version with our bushcraft campers, who are experts, and a single round can last an hour. The most skilled stalkers won't move for the first five to ten minutes. They will plan their line, seeing the moss covered log and avoiding the dry leaves. They know that movement only happens when the prey is turned away and even then only in tiny increments. It is one of the most powerful tools for teaching children about the challenge of hunting and demonstrates the advantage that prey have if they remain vigilant.

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It takes generally at least two rounds for the children to understand the game and start developing strategy, so commit some time. It took me quite a while to get comfortable letting the game unfold at such length but has been so much fun. My only regret, is that I don't get to play.

## Animal Masks

### Materials:

- Brown, black, grey and white craft foam sheets
- Clothing elastic
- Scissors
- Stapler
- **Mask template**
- Paper
- Glue
- Markers
- Natural materials (optional, leaves, bark, grass, etc)

### Procedure: (SI)

1. Trace the template onto the foam sheets
2. Students can use the scissors to cut out their masks. To make easy eye holes just fold the mask in half and make a small cut along the pre-marked line. This will allow space for the scissors to complete cutting out the eye holes out.
3. Use the clothing elastic and measure it around the head of whoever the mask is for and cut it to length. You'll want the elastic to be slightly shorter than the actual measured length.
4. Staple to elastic onto the mask so the can be worn.

5. Have the children decorate their mask using coloured paper, markers, and natural found materials. Masks that are going to be specific animals may want to add ears or whiskers.

**Hints, tips and tricks:** Animal masks is a simple craft that allows children to imagine that they are a different animal. They are also fun to use in different games afterwards. We do this activity with children aged 6-8 and it works especially well after a hike, during which the children have collected materials. Good materials include, dried leaves, birch bark, lichens - especially old-man's beard and small dry twigs.

## Predator & Prey

**Materials:** Large playing area with clear borders, **food-cards** (paper cards that are labelled) sponge, face paint (optional), whistle

**Procedure: (DE)** Predator and prey is a food chain game that can last upwards of an hour and requires a minimum of 15 students. Before the game is played the leader must hide food-cards in the playing area. Each food-card is marked with a number and has the word FOOD written on it. All the food-cards marked with number 1 are placed in one pile, all the food-cards marked with number 2 are placed in one pile etc. The piles are not hidden but spread evenly throughout the play area in plain view. The players can have their faces painted to represent the animal or role that they are playing in the game.





On GO the prey enter the game. They are herbivores and are given 15-20 minutes to look for the food cards, which represent plant food and look for hiding spots that they will later use to avoid the predators. When a prey finds a food-card pile, they can take one card from that pile. For example, If there are 8 food-card piles, a prey could have a maximum of 8 food-cards, numbered 1 through 8.

After the allotted time, the predators will enter the game. Predators cannot pick up a food-card from the piles, instead they must collect food by successfully hunting their prey, which they do by chasing and tagging them. When a prey is captured, they give one food card to his or her capturer. The prey is then given a grace period of one minute to find a new hiding spot. Which means that if a group of predators are working together, only the predator that tags the prey gets a food-card. It does not matter which food-card is given to a predator, which means that they could end up with any combination of food-cards. Predators are given 15 minutes to hunt before the next stage of the game.

Disease comes next. Disease is played by one student and is

neither a predator nor a prey but negatively effects both populations. Disease will attempt to captures food-cards from both groups, by hitting them with a wet sponge. A successful hit earns disease one food-card. Disease has 10 minutes before the next stage.

Finally the hunter enters the game, played by one student. The hunter cannot be predated, is not effected by disease and kills his or her prey by sight. If the hunter sees a predator or prey, they will simply shout “bang” and have “shot” their quarry. The predator or prey that has been shot must then give one card to the hunter. The hunter is only in the game for 10 minutes. At this time the game is finished. Blow the whistle to alert the players that the game is finished.

If at any point a predator or prey is tagged, hit by the disease sponge, or “shot” by the hunter and don’t have a food-card left, they are dead and must return to the starting location.

**Hints, tips and tricks:** A good play area is one that is clearly and naturally defined. A copes of trees surrounded by field is a good example but could be as straightforward as using the entire

schoolyard. Just make sure there are lots of good hiding spots and that the players know the boundaries.

It is important to have more prey than predators. A good ratio is 2 to 1. Its also important to have the correct number of food-cards. A simple rule of thumb is to have one pile of food-cards per prey and one card in each pile per prey. For example if you have 8 prey, you should have 8 food-card piles, each with 8 cards.

Remind the students that it is a game. The play can get intense, especially near the end, so it is important that they take care of one another and err on the side of caution, rather than competition. And remind them to be creative and find their own ways of surviving. Team work and sharing of resources, even between natural enemies, can happen when the threat of disease or over hunting is present.

Finally, discuss the results with class. What was it like to be a prey? What were the challenges? What strategies worked? The children will have real life experience that changes the way they think about nature.

# 6 Beautiful Birds

## Owls and Crows

**Materials:** Pylons, rope

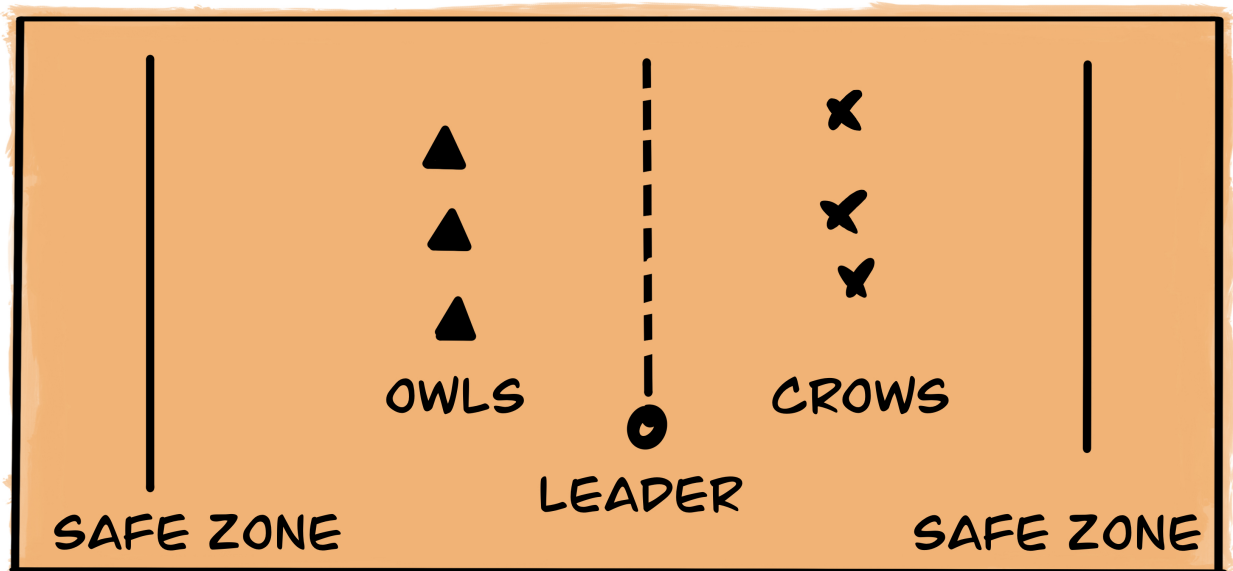
**Procedure: (AE)** This game combines trivia with tag. Divide the class in two groups and have them line up facing each other like in Red-rover. The groups should be no more than 6 paces apart. Stand in the middle of the two groups but not between them, just off to the side. Once they are ready, start by reviewing some basic bird ecology. "What can you tell me about owls and crows? What do they eat? Did you know that owls and crows are enemies. Because owls are such efficient predators, crows will mob or chase owls out of their territory, any chance they get!" Then explain that one team will be the

owls and the other team will be the crows. Next pick a safe zone for each team - roughly 10-15m behind each group. If there are no natural boundaries, pylons or rope can be used.

Then explain that you are going to test their knowledge by asking them true or false questions. If the answer is true, the crows will chase the owls, as the owls attempt to escape to their safe zone. If it is false the owls will chase the crows to their safe zone. If an owl or crow is tagged or runs in the wrong direction and is tagged they join the other team. Start with a few practice rounds that don't involve running - just pointing.

**Hints tips and tricks:** Owls and Crows is a great opportunity to be

both serious and silly. I generally come up with questions off the top of my head, relating to whatever subject we are teaching. Birds lay eggs. Mammals are warm blooded. Amphibians are invertebrates. All birds are meat eaters. The largest known bird is Big Bird etc. Mix up the true and false questions and have fun. The game gets a group moving and thinking. If one team starts getting lopsided, I will ask more questions that will help the losing side.



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## Design a bird

**Materials:** Colour pencils, markers, scissors, 1/2 a sheet of construction paper or poster paper, **bird body part sheets** (bodies, beaks, feet, tails), glue sticks

**Procedure: (SI)** There are three base bird body types and each one has an associated parts sheet. First, students will need to pick the body they wish to use. Once they have done that, they are given the beaks, feet and feather sheet that matches their body. There is a raptor body, song bird and water fowl/game bird body. The students then cut out the body, beak, feet and tail feathers that they wish to use to create their bird. Next, glue the body to the construction paper and then add the parts to complete their bird design. After gluing, they colour their bird. Finally students create a habitat

for their bird, by filling in the background, with coloured pencils or markers.

**Hints, tips and tricks:** Use the time, explaining the craft, to review different avian adaptations. Make sure the students think about what the bird eats, where it lives and whether or not it has colour plumage to attract a mate, etc. Bird identification starts with the beaks, feet, feathers, and body shape which is why we focus on those body parts during this craft.

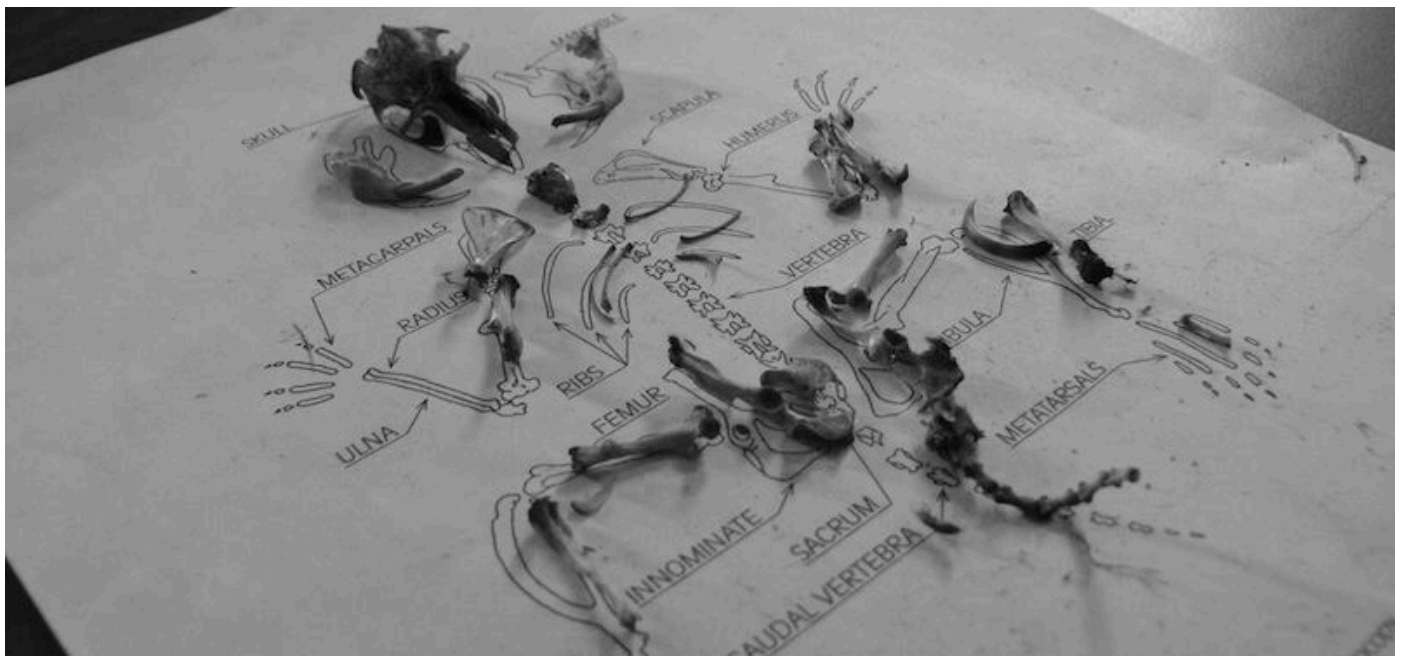
## Owl Pellets

**Materials:** Owl pellets (purchased online, tweezers, wooden stick, **skeleton diagram**, sandwich bag

**Procedure: (DE)** This activity is a wonderful way for children to better understand the digestive system of birds. All raptors and predatory birds, produce pellets

including owls. Birds have two stomachs; one muscular and one glandular. In the case of raptors, the muscular crop separates the juicy parts from the indigestible bits which are then regurgitated after a good meal. Because owls tend to eat their prey whole, their pellets will contain the complete skeletons of their prey, providing a wonderful insight into what the owl has been eating. Owl pellets can be purchased online and are sterile and safe to handle. Pellets found in nature should be handled with gloves.

Because the pellets contain hair and bones this activity can be quite messy. The small pieces of bone are easy to lose and the hair can blow around. Students may want to wear PPE such as safety glasses, gloves, and a mask but it is safe to do this activity without them.



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When dissecting owl pellets the easiest way to start is by gently teasing the pellet apart into more manageable sections, using hands. Once the pellet has been broken apart students can start to pick through the hair to look for bones using tweezers and wooden sticks. They can try to match up the bones that they've found with the ones on the skeleton diagram. Students may find other things in their owl pellets such as feathers, or parts of insects.

**Hints, tips and tricks:** This activity is delightfully "sciency". It teaches students about food chains, mammalian bone structure, and the habits of predatory birds. After dissecting, the class can discuss the different kinds of prey they found, how many rodents an owl would need to eat everyday and how much land might be needed to support their needs.

## How to Draw a Bird

**Materials:** Pencil, paper or drawing pad, picture of a bird

**Procedure: (FA)** Drawing is an wonderful way of seeing. I know that if I draw something from nature that I will remember it for life, like the scalloped edge of a twin-flower leaf or the beak of tree swallow.

I know that many teachers feel that their artistic skills are inadequate and avoid leading drawing lessons. However, anyone can learn to draw. It just

takes time and helps to know a few techniques. The point is not to be skilled but to use drawing as focus for the practice of observation. Working on drawings with a class is also hilarious and inspiring. You never know what student will surprise you with brilliance or who will produce a work of complete silliness. Make sure that after each step, the class shares their work and discusses the process. This activity is taken from [The Nature Connection](#) by Clare Walker Leslie, an amazing book!

### Step 1 - Blind Contour

Place you pencil or pen on the paper and look at the bird you want to draw. Without taking your eyes off the subject, start drawing, making one continuous line as you go. Don't look at the paper and don't lift your pencil or pen! Take only one minute.



### Step 2 - Modified Contour

This time, you can look back and forth from the picture of the bird you are drawing to your paper, but still don't lift your pencil. Just keep on drawing the shape without taking your pencil off the

paper until you're completely finished. This is called a modified contour drawing.



### Step 3 - Quick Sketch

Now make some quick drawings, using only a few lines to show the basic shape or feeling of what you're seeing. You can improve your sketch into a finished drawing later if you like.





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#### Step 4 - Field sketch

What I like to do is have a 3 or 4 bird pictures prepped in a slideshow and using a timer, give the students only 30 seconds to do a quick sketch of each bird. Between pictures, have a blank slide. After the 30 seconds flip to the blank and give the students 1 minute to add some quick notes and observations.



## Bird Watching Hike

**Materials:** Binoculars, bird book, notepads and pencils

**Procedure: (DE)** You do not need to be an expert bird watcher to lead a bird watching hike. In fact there is a benefit to being as confused and excited as your students. The best time to lead a hike is first thing in the morning.

Before heading out, look at some pictures of common Island birds. These could include, black-

capped chickadee, blue jay, song sparrow, hairy woodpecker, merlin, barred owl, red-breasted nuthatch, crow, gold finch and American robin. Each of these birds have different adaptations that will develop the classes Learning Language. They have different beaks, feet and feathers.

Also take some time with the class to personalize your field guide. Go through it, with your students, and check mark any species you know or recognize.

On the hike, remind the class not to just look with their eyes but to listen closely with their ears. Birds are vocal and much can be learned by listening to their calls and songs. To reinforce this, I like to stop early in the hike and have the students close their eyes and hold up their hands in two fists. Each time they hear a new bird call or song - have them put one finger up. Let them listen for a minute and then have the class compare the different sounds they heard and guess where they came from.

**Splushing** - If there are lots of birds close by, a fun activity to do with students is to teach them to splush. Splushing is simply making a sppsssh sppsssh sppsssh sound with your mouth. It doesn't have to be particularly loud - or specific. Every birder develops their own version. I like to add kissing sounds at the end. Birds are both curious and territorial, when they hear this sound, they want to investigate and will fly right in to see if a strange bird has invaded their home. It is a great way to see birds up close. It works best if you

can quietly sneak into an area of dense foliage and sit quietly for a moment.

When you do spot a bird, encourage the children to do their best to describe it. Where did you find it? What kind of beak does it have? What is its body shape? Is it feeding on the ground or hunting for flying insects? Does it have noticeable field markings? These observations will help with identification, which is a process of elimination.

**Hints, tips and tricks:** The entire exercise is not about being able to identify the birds you find, but to develop the ability of your students to observe, and describe what they are seeing. Let them make field drawings, take notes and begin developing a list of familiar species. Keep a set of binoculars in the window of your classroom and encourage the children to continue observing birds over the course of the year and watch your list grow.





## Build a Bird Nests

### Materials:

- Long grass/bed straw/weeds
- Sticks
- Mud
- Any other materials birds may use - spider webs, animal fur, feathers, moss
- Scissors

**Procedure: (FA/DE/SI)** This craft will produce a grass and mud nest, resembling a Robin's nest. First have the students gather long grass, enough to fill both their hands and any other materials that interest them. These materials might include, old-man's beard lichen, soft dry grass and small flexible twigs. While the students are collecting, dump some water in a mud puddle, if it hasn't rained recently. Once the children are ready, have them take their long grass and gently pull it from end to end, like a Christmas cracker, so that the strands remain parallel but create a longer bundle of

fibres that looks like a messy piece of rope, about a foot or so long. Next twist the bundle of grass in opposite directions, moving one hand towards yourself, and the other away. The grass should start to look more like a thick piece of rope at this point. Keep twisting until the grass twists over itself creating a wreath-like circle. Wrap the ends around one another, completing the circle. A small circle is easier to work with - no more than 10-15cm in diameter. Any loose strands should be looped through the circle, to tidy it up and help to secure the frame. Next, push soft short grass into the circle to create the bottom of the nest. To this add flexible twigs, mud and more grass. Continue until the student is happy with their nest. Finally line the nest with soft materials to create a cozy spot for eggs. Scissors can be used to trim long strands of grass. Place the nest in a sunny spot to dry.

**Hints, tips and tricks:** That birds build their nests without hands is

amazing. With their beaks, feet and yes - butts, they create incredibly complex nests. Before, it is a good idea to start by looking at pictures of different bird nests with your students. Have them come up with a list of nesting materials and nest designs. Let them develop their own categories. There are lots of great videos and YouTube that capture the whole process.

# 7 Slimy and Slithery - Amphibians

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## Raising Tadpoles

**Materials:** 20 litre fish tank, gravel, larger rocks, aquatic plants, dip net, bucket

**Procedure: (DE)** Before collecting tadpoles, it is important to set up the tank. Children love building homes and creating healthy habitats, doing this will encourage their interest and compassion. We have 5 species of frog, here on the Island, and all except the green frog, which are much larger and spend their first year as a tadpole, will thrive in a well prepared fish tank.

It is important not to over crowd your tank, so make sure that you only keep 10-30 tadpoles per 4L of water. I recommend raising a small number of tadpoles to begin with and taking good care of them. Over crowded tadpoles may become carnivorous and begin predated one another. I learned this lesson the hard way.

Begin by cleaning the tank and rinsing it thoroughly. Cover the bottom of the tank with gravel and then place larger rocks on top. Gravel and rocks collected from a local stream are best as they are already covered in delicious food

for the tadpoles. After you have the tank set up, collect water from the same water source that you'll be gathering the tadpoles from to fill your tank. Tap water contains chemicals that can harm tadpoles. Additionally, water from a natural water source contain mosquito larva which can serve as another food source for the tadpoles. Add just enough water to begin covering the largest rocks. The rocks will provide a place for young frogs to rest on, eventually allowing them to climb out of the water. Without rocks, young frogs will drown.



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The best time to collect tadpoles is late spring. Wood frogs begin mating on the first warm days in early April and by mid May the tadpoles are growing rapidly. Pretty much every vernal pool, ditch and pond will have tadpoles. If there is persistent water and some plant life, there will be tadpoles and the smaller the pool the easier it is to catch the tadpoles. The best tool for catching tadpoles is a dip net but a bucket is just as useful. Gently push the bucket into the pool and as it fills, the tadpoles will be sucked in with the water. Alternatively, letting the children muck about and capture tadpoles by hand is also very fun.

Place the tadpoles in zip lock bags with some of the pond water. And, finally, collect some aquatic plants. Most aquatic plants can be dug up easily using your hands, as they are generally very shallowly rooted in mud. Rinse the mud off the plants roots before placing them in a bucket.

Before putting the tadpoles in the tank, add the plants you gathered. Simply tuck their roots in the gravel. Let the sediment settle and then add the tadpoles.

During the first couple of weeks, the tadpoles will eat the algae on the gravel and rocks and on the plants, you placed in the tank during set up. After that, you'll have to boil lettuce to feed them, or order algae wafers or aquatic frog and tadpole food to feed them. They should be fed every three to four days. If they're not eating all of the food between feedings reduce the amount



you're feeding them to keep the water from getting cloudy.

It will take between 6 and 12 weeks for the tadpoles to reach full maturity. About midway through their cycle, you'll notice their back legs forming. At this stage, tadpoles become carnivorous and will need to be fed fish food and make sure that they are able to climb onto the rocks in the tank. When the frogs are ready to be released, let them go in tall, damp grass near the nursery pond where they were collected. If school ends before the tadpoles have completed their complete lifecycle, simply release the tadpoles with the students.

## Ponding

**This activity is taken from:**  
**Nature with Children of All Ages**  
**Edith A. Sisson**

**Materials:** Dip nets, white or light coloured pans, dishes or other low-sided containers for observing post creatures, small plastic containers for "back flushing," white plastic spoons, eye droppers, small jars with tops, identification book (optional)

**Procedure: (DE)** Divide the students into groups of two or three. Give each group one of each of the items listed under materials. Dip nets can be made from dollar store sieves, duct taped to a broom stick or branch.

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Assign each group an area of shore for collecting. Have the students of each group collect and observe aquatic creatures in the following manner:

1. Sweep the dip net through the water or along the bottom of the pond.
2. Bring the net out and hold it upside down over the observing pan.
3. Fill the smaller “backflushing” container with pond water and pour the water through the net in order to wash all the contents of the net into the observing pan.
4. Let the contents of the pan settle down so that the small aquatic creature may be seen against the light-coloured background.
5. Use the spoon or eyedropper for catching sample specimens and put them into the jar for observation.
6. Return the remaining creature and the water in the observing pan to the pond.
7. Repeat the process and see what new creature can be found.

Often the discoveries in the observing pan are exciting. For instance, a cry of “I’ve caught a monster!” May indicate that a large predacious diving beetle larva has been found, and these are indeed impressive. You can use an identification book to help guide the observations of your students. And it can be fun to make a communal zoo with captured creatures. Fill a pail or large container with water and have the children add one creature. By limiting the zoo to one creature per students, they will carefully look at their own, to

differentiate between the various kinds.

**Hints, tips and tricks:** If possible, visit the same freshwater area in different seasons. Note any differences in the make up of the animal population.

Eventually letting the children get in the pond is a blast. Make sure that they are prepared with old clothes and have a second set ready to change into. Let them know that they will feel the decaying leaf litter of the past 60 years on their feet, and to move carefully. One of my all time favourite memories of camp was working my way into a clump of willows with a young camper. We were lying on our bellies in the muck, watching salamander larva swim around us. It was gross, mucky and smelly, but my little companion turned to me and gasped, “this is awesome!”

## Tails

**Materials:** tails made of Duct tape, cloth or bandanas

**Procedure: (AE)** Salamanders are carnivorous and will eat anything that fits in their mouth. They also have the unique ability to lose their tail if attacked by a predator. While losing their tail is not ideal and does hurt the salamander, it allows them to live another day and in time their tail will regrow. Tails is a running and tagging game that lets children pretend to be salamanders, hunting and being hunted.

Before the game, establish a boundary. We often use the shade

created by trees as our boundary, but anything will do. Each student is given a tail. We use a strip of duct tape that has been folded on itself to create a tail that is about 50cm long. Instruct the students that the tail should be tucked into the back of their pants and should be left long enough to reach the back of their knees. And let them know that they shouldn’t tie it to their clothing.

On Go the students, turned salamanders, will attempt to capture other tails without losing their own. When a student succeeds in capturing another salamander’s tail, they hand it back and continue on their way. The salamander who has lost their tail will stand on the border of the game and wait until the individual who took their’s gets out. Giving them time for their tail to regrow. For example, John pulls out the tails of Peter, Sam, and Julie, so they stand on the border. David pulls out John’s tail and now Peter, Sam, and Julie are all back in the game. Students can also get back in the game if the leader calls out “Tail Break”, in which case, everyone re-enters the game. If a student’s tail falls out while they are running they can pick it up, tuck it back in and resume playing.

In this game everyone is on their own and so there should be no teaming up or forming of alliances. Remind the students at the start, that this is a non-contact game. Students can only run and dodge to protect their tails, they can not lay down or sit down or physically prevent someone from taking their tail.

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**Hints, tips and tricks:** We do this activity as a fun running game at any point in the day. The duration of the game is easy to control so you can play for 5 or 15mins. It burns energy and teaches students about salamander defence strategies.

## Infinity Frog Lifecycle

**Materials:** White cardstock or sturdy **paper printed with template**, scissors, double sided tape, colouring supplies

**Procedure: (SI)** Begin by having each student carefully cut out the rectangles on the cardstock printed with the template provided. Each student will need 8 rectangles in total. Once each student has cut out the required pieces, the class can then follow the steps in this video <https://www.youtube.com/watch?v=AtqbhZLrzFY&list=LL&index=1&t=49s> . We make our flip books using white paper so we can draw on them afterwards.

Once the students have finished assembling their flip books, they will decorate each one of the four panels with one stage of a frogs life cycle. The life cycle order is as follows:

1. Eggs - Frogs lay eggs in vernal pools, ditches, and permanent bodies of freshwater. The eggs are layed in clusters or clumps (but not always). They are clear and gelatinous on the outside with a small black centre that is the undeveloped tadpole.

2. Tadpole - Once they have emerged from their eggs, the next step in their lifecycle is tadpoles. Tadpoles have round bodies, a tail, a small mouth and eyes, and internal gills allow them to breathe underwater.
3. Froglet - Froglets start to look quite similar to frogs but still have some features of a tadpole. In this stage their bodies start to take on a more frog-like shape, their arms and legs start to develop, and their tail starts to be reabsorbed into their bodies and they start to lose the function of their internal gills. In this stage they can start to be found closer to the surface or the edge of the water as they're almost ready to move onto land.
4. Frog - Fully mature frog. A mature frog is no longer able to breathe underwater, and can be found on land. Despite being a land creature in this stage they are still often found in or around water because they need to keep their skin wet.

Once students have completed drawing in the panels they will have a book that flips four times with the four different stages of a frog's life cycle.

**Hints, tips and tricks:** This activity, while being complex, produces a super cool craft that really drives home the life cycle of a frog. In our experience children love the outcome and are excited to take it home.

# 8 Bushcraft Basics

## Shelter Building

**Materials:** Forested area for building, rope (optional)

**Procedure:** Divide the students into groups of two or three. Their challenge will be to construct a shelter that is weather proof and

warm and must be built using only materials that are dead. I like to use the phrase, "If its brown, and its down - go to town!" Remind the students that in a real survival situation the use of any material is acceptable but because these shelters that are being made for fun it is best to protect the plants and mosses growing in the forest.

The simplest shelter to build is the "A-frame" style (triangle shape). It requires no rope and can be made to be nearly bullet proof. At our bushcraft camps, we let our oldest campers construct their own shelter to sleep in, and their only complaint is that they are too warm.

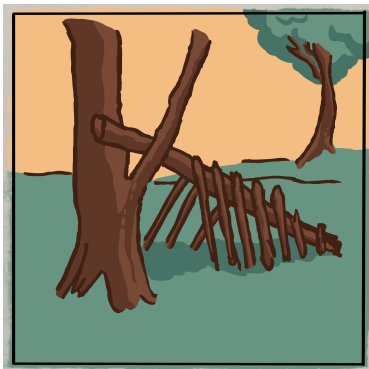




1. When building an “A frame” the simplest way to start is by finding a ridge pole and placing it in a tree that has a natural fork. The fork should be as low to the ground as possible and the pole long enough to accommodate the students lying down beneath it.



2. Once that's done, place branches and sticks along the supporting ridge pole to create the walls. It is best if the sticks don't poke above the ridge pole as they will direct rain water down into the shelter.



3. When the walls are complete use dead branches, and other debris to thatch the walls.



4. Finally Insulate the walls with dead leaves. These can be gathered by arm load or swept up with an improvised rake.



5. Once the teams are satisfied with their shelter, they can add homey touches, like a mock fire pit, stone path or wreath.

**Hints, tips and tricks:** Children love building forts and shelters. A fantastic book is David Sobel's *Children's Special Places*. It delves into the importance of these place for children and the role they play in their emotional well being. Sadly, many of the children we have at camp have never built a fort or shelter and given the chance, they fall in love with their little home. Shelter building is just fun and your role as a leader should be to guide the

process. Some groups may struggle with getting started and need help finding a place to begin. Others will lose focus and need some encouragement. I usually cycle from group to group, offering whatever assistance is needed. At some point, magic usual sets in, and the groups are off and running. They will establish a division of labour, work process and vision that often exceeds my wildest expectation. Once the shelters are built, we stay to eat and play in them.

## How to Use a Fixed Blade

**Materials:** Fixed blades, first aid kit, stocked with pressure bandages, branches for whittling, wooden boards, pre-made mallets

**Procedure:** This activity is for children 12 years and up. Knife use is a basic skill that, while risky, is incredibly empowering. Most adults have a none existent knowledge about how to use a knife safely or efficiently and my goal with students is to make them competent and informed initiates who can correct their parents. This may seem like a reversal of responsibility but that is the point. Children and adults all exist under the same system of physics and yet we tend to treat children like they have no place in that order. Allowing them to take part in the world of responsibility is an important step to their discovery of self.

Before we pass out knives we discuss knife safety carefully.

## Understanding Your Knife

A sharp knife is a safe knife. A safe knife should also have a short (10cm), fixed blade, with a strong spine and a simple Scandinavian bevel. Ideally it should also have a full tang.

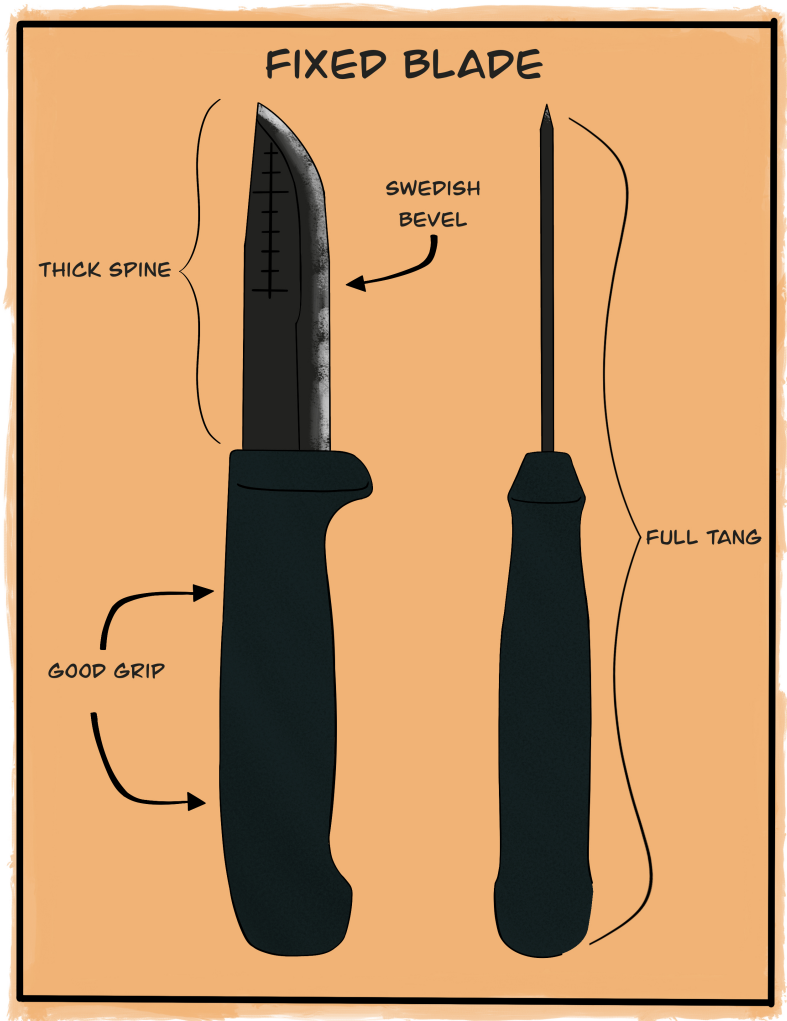
### Basic Rules

Knives are tools and are kept in their sheath, on the belt at all times, unless being used to accomplish a task. As soon as the task is completed it is replaced into its sheath. Don't walk with an unsheathed blade and remember not to swat flies with a knife still in your hand.

### Grip - Forehand

There are only three approved ways to hold a knife: the forehand grip, chest lever, and backhand.

The forehand grip is the most commonly used grip. The knife is held with the blade facing forward and with the thumb wrapped around the fingers.



With this grip, the material being worked is always held to the side and cutting happens away from the user. The best position for working with a knife is on your knees.

It is good practice to use a board, stump or block of wood to brace the material being cut. If you are standing, your feet should be firmly placed, hip-width apart and the material should be, once again, held to side.

### Grip - Chest Lever

The chest lever is an incredibly strong grip, used for small controlled cuts. The knife is rotated 90°, so that it is facing through your knuckles. The knife is then brought to the chest, while the material being worked on is braced under the opposite arm. The cut is made by using your chest as a fulcrum and drawing the knife and material away from one another in a short controlled cut. This method is essential for most fine work, or cuts that require a lot of strength. Using this method prevents sudden, violent



movements of the knife. Should you attempt a cut that requires a great deal of force, you, your knife and the material are all braced and locked in a safe position.

### Grip - Backhand

This grip is only used for cutting cordage and is the only time that the blade is held in a position facing the user.

From the forehand grip, the knife is rotated 180°, so that the blade is



facing the user. Cordage is then cut in a short controlled motion, cutting towards the user, who should maintain a long arm position. As soon as the cut is completed, the user rotates the blade to a forehand grip and then replaces the knife in its sheath.

**NO MATTER WHAT GRIP IS USED, NEVER, EVER, EVER, EVER - CUT TOWARDS YOUR OWN FLESH.**



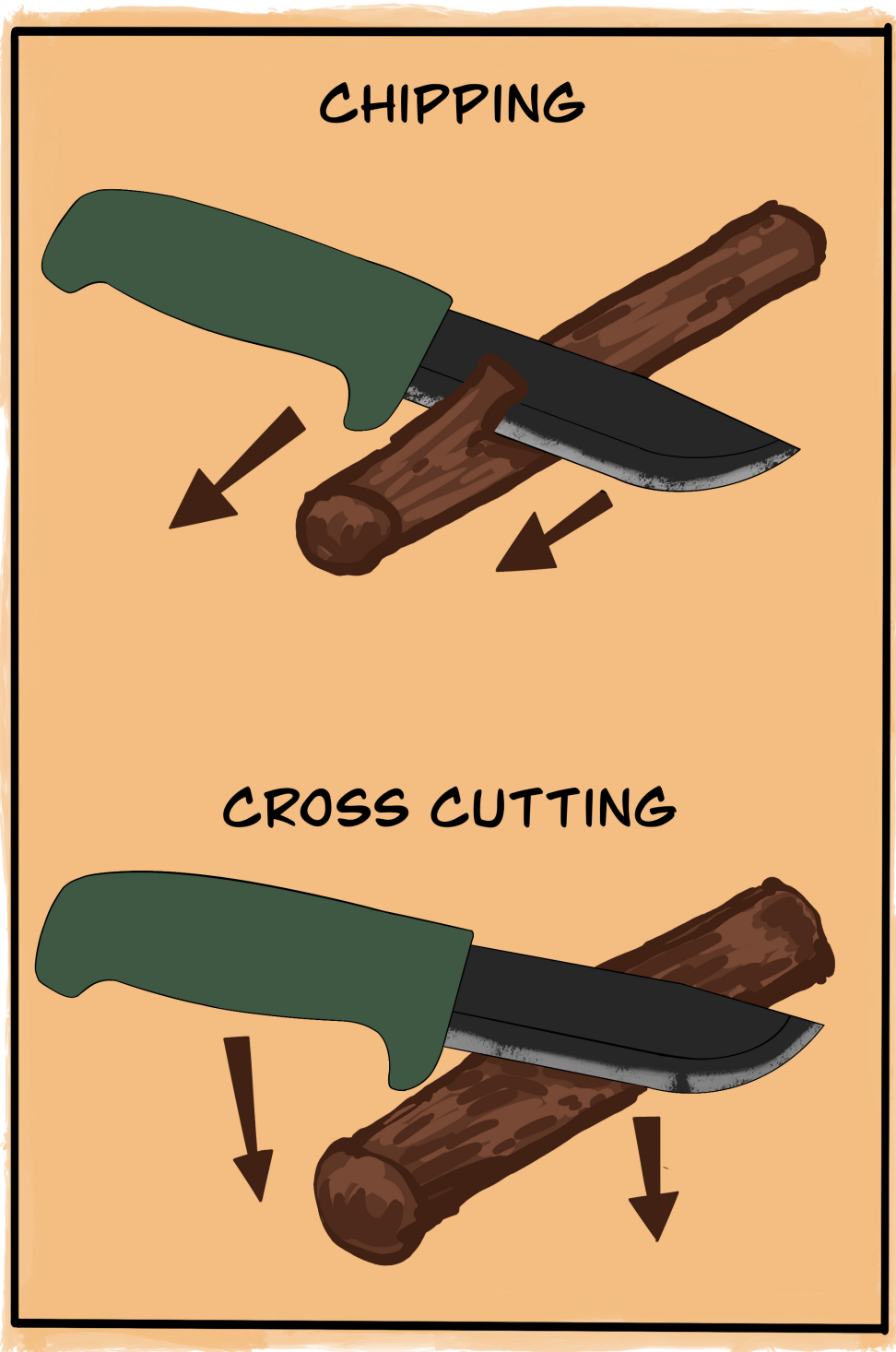
## Useful Techniques

There are many useful techniques for making knife work safe and functional. We always provide beginners with a board to work on, or to support the material they are cutting. We also recommend the use of a short heavy branch that can be used as a hammer. Most cuts happen as a result of a dull knife being forced through wood with an excess of force. A sharp knife that is used in a controlled, patient manner is remarkably safe.

### Chipping and Cross Cutting

Chipping is the most common cut used in whittling. Chipping severs or slices through wood in the direction of the wood grain and only requires the force necessary to brake the chemical bond holding the wood fibres together.

Cross cutting, involves cutting perpendicular to the direction of the wood grain. It is very difficult to do, as each fibre must be severed individually. However, short shallow cross cuts, in combination with chipping cuts allow the safe removal of wood fibre. This combination of chipping and cross cutting is a technique called "Stopper Cuts."





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## Stopper Cuts

Stopper cuts are made by placing the material on a work surface and holding the knife perpendicular to the wood grain. The spine of the knife is then gently tapped with an improvised mallet. This stopper cut should only be 1cm deep.

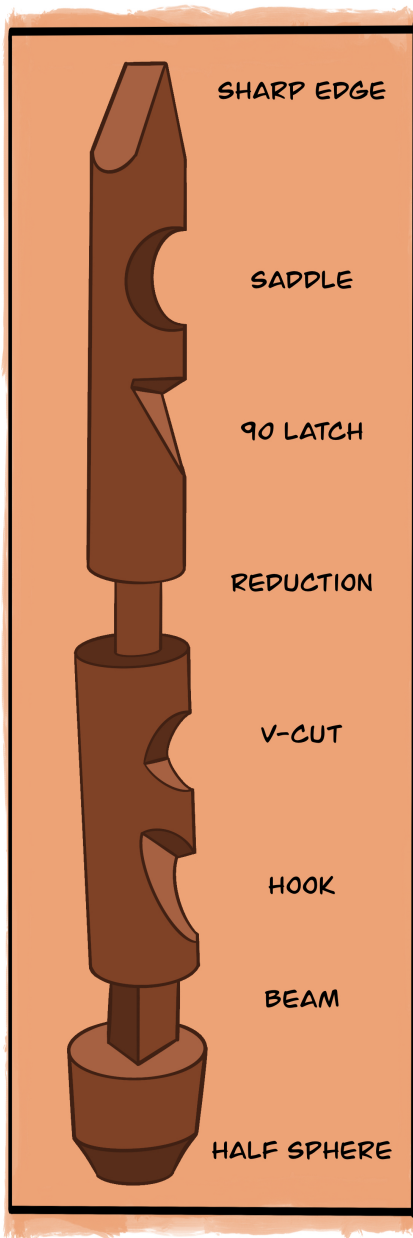


The material is then picked up and braced under an arm. Using a forehand grip in combination with a thumb, push the knife slices or chips toward the stopper cut. This results in a precise removal of wood fibre.



This specific cut is called a 90° Latch. However, this technique can be used to create many different results. For example, it can be used to make beams, v-cuts, hooks and saddles. A stopper cut that is made around the circumference of the wood is the first step of a reduction.





### Final Safety Considerations

When we are teaching a group of children to use knives, we always prepare for the worst and have a fully stocked med kit, ready and at hand. We have never had serious cuts but certainly have had lots of knicks and small cuts. That being said it is best to be prepared.

We also make sure that children are working at a safe distance from one another. A good rule of thumb is 2m. If a student wishes to enter another's work space they first must ask permission, "May I enter your work space?" The individual asked, then puts their knife away, and responds, "all clear!" After that they are both safe. It's a good habit with all things dangerous to respect each others space and autonomy.

Children also like to sit to use their knives. However it is much safer to work on their knees. That being said, anyone who is whittling in a sitting position must place their elbows on their knees. This guarantees that the knife is kept away from the arteries in their inner thighs.

Teaching children to use knives is challenging but the rewards are great. I love having my campers come back and show me the projects they have worked on at home, or with stories of helping their parents to use their knives correctly. The sooner we give agency to children the sooner they learn to respect themselves and others.





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## Practice Camp Fires

**Materials:** Matches, ferro rods, tinder, fireboard

**Procedure:** When I first started teaching fire safety, I jumped through a *lot* of hoops. During that process, I spoke with the Department of Forestry to get any important information I might need. The gentlemen I spoke to asked, “Why would I teach children to light fires.” The question caught me off guard. I didn’t know what to say - there are so many reasons. Fire lighting is a skill that could save their life, help them make informed decisions about fire and understand the risks involved. It is also just a wonderful skill to have.

I grew up lighting fires and I think that fire lighting is part of what makes us uniquely human. Having the ability and knowledge to do it safely is incredibly empowering.

This activity is an introduction to fire lighting. It does not involve maintaining or sustaining a fire. Before getting to the actual fire lighting, it is essential to review fire safety. Remind the children that after the lessons they will be fire-safety officers - with the knowledge to identify hazards and the skills to develop a safety plan.

### **Fire safety starts with understanding when and where fires can be started.**

1. A fire must never be started without adult supervision.
2. The department of forestry maintains a forest fire index

that shows the risk of a forest fires. If the risk exceeds the level - moderate, camp fires are prohibited.

3. You must have permission to start a fire on private property and you are never permitted to light a fire on public land.

To review - **You must have adult supervision, safe forest fire index, permission, not on public land.**

### **Next are the HARD NO’S.**

1. Do not light a fire on dry grass, or in a field.
2. Do not light a fire on pine needles or dry leaves.
3. Do not light fires near the roots of trees.
4. Do not light fire near a building or man-made structure.



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To review - **Dry grass is highly flammable and grass fires can spread quickly. Conifer needles contain resins that are also highly flammable even when wet. Dry leaves, like dry grass will burn quickly and lead to forest fires. Roots, even below the surface of the soil can become heated and smolder for months until conditions dry, leading to forest fires. Buildings and structures are highly flammable.**

### **Be Prepared!**

1. Before you light a fire you must be prepared to put it out. This includes a shovel and access to water.
2. Have a med kit with burn dressings.
3. Have practiced - STOP, DROP AND ROLL.

When reviewing fire safety, I am very clear and blunt about the potential dangers. These include death, destruction of property and life altering injuries. Life is dangerous but we seem to be obsessed with diminishing this reality. Children, when given the facts are able to decide how they feel about the activity and may decide to sit out. If they do, they become my safety officers.

### **How to Light a Fire**

This activity does not actually create a camp fire. It is simply practicing the process of creating a spark and lighting tinder on fire. However to understand the goal, here is a complete description of the fire lighting process.

Successful and safe campfire building is the result of good preparation. First ensure that all safety requirements have been met and that you have means for putting fires out.

The complete process includes clearing the site within a 2m radius of the fire, of all combustible organic materials, and exposing mineral soil directly where the fire will be made. If the ground is wet, a raft of dry branches can be placed on the soil to protect your fuel from water.

Every fire needs; fuel, oxygen and a heat source to burn. The proper collection of fuel is what guarantees success. Fuel should be gathered in three sizes: tinder, kindling and fuel. Tinder is a highly flammable material that will ignite under a shower of sparks. Good tinder includes, birch bark, dried lichens or fine dry grasses. Kindling is fine pieces of wood that will catch on fire from the tinder. It is gathered in a series of sizes, from match stick size up to thumb width. Fuel wood will actually produce a long lasting fire. Once again it is gathered in series of sizes from thumb width to wrist size.

Step one is lighting the tinder on fire. Step two is to quickly use the tinder to ignite the kindling. Kindling is then added in expanding sizes until the fire is hot enough to burn fuelwood. Fuelwood is added as needed.

### **Practice Fire Lighting**

When doing this activity we have water, a shovel, a blanket and a

properly stocked med-kit on hand.

The goal of this activity is to practice using a match and then a ferro rod to light a fire. A ferro rod is a small metal alloy rod. When struck with a harder metal, it produces hot sparks. Ferro rods are incredibly useful and an essential tool in bushcraft.

For this activity we use pieces of hardwood boards to practice on. 2"x10"x24" are perfect. The fire boards protect the lawn from scaring and create a safe platform to work on. The fires will be allowed to go out as soon as the tinder is ignited or shortly after so the boards will blacken but not burn.

Begin by having the children spread out on the lawn. A good distance between children is 2m. Each child is given a box of matches, ferro rod and tinder. We collect birch bark before this activity. Make sure that when you are collecting the bark you only remove the loose hanging bits.



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## Matches

The children will first practice lighting a match. To light a match, the match is held between the thumb and middle fingers and supported by the index finger.



The match is pulled towards the person lighting the match, along the friction strip and as it ignites, held at a slight downward angle to allow the matchstick to begin burning.



Have the children practice a few times to get over their jitters and develop a sense of the process. Once they are comfortable they can light a small bundle of tinder on fire, no larger than a golf ball. The fire will burn for a few moments and then go out.



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## Ferro Rod

Ferro rods typically come with a striker. A striker is a small steel plate for “striking” against the ferro rod. It creates friction and will produce sparks. At camp we use our bushcraft knives instead of strikers but this is not necessary. The accompanying pictures show a knife being used, but the process is the same. Also the amount of tinder that is shown is not required for this activity.

To light a fire with a ferro rod is challenging the first time you try.

Step 1 - Prepare the tinder. Using the finest pieces of birch bark, crumple and shred them until they form a soft fluffy ball of tinder.

Step 2 - Position the striker in the middle of the tinder, held in your strong hand.

Step 3 - Hold the ferro rod beneath the striker at a slight angle downward.

Step 4 - Quickly pull the ferro rod away, while applying force upward into the striker. This motion will produce sparks aimed into the centre of the tinder.

Students can repeat the process until they are confident and capable.



# 9 Anytime Activities

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## Egg Carton Colour Game

**Materials:** Egg cartons, a range of colour swatches, hot glue gun

**Procedure: (FA)** This game is a winner. It is wonderful for children of all ages and while at first it may seem incredibly simple, it is one of those activities that becomes addictive and enthralling.

First you will need to go to a paint store to pick up a range of colour swatches, then cut them into small squares that will fit into the bottom of the egg cartons. Prepare the egg cartons by cutting off their tops and gluing one colour into each each egg cup. Try to give as much variety to each carton. However, it is fun to include different shades of the same colour, especially green.

Give each child a carton and explain that the goal of the activity is to find items from nature that match the colours in their egg carton. Impress upon them that the goal is match the colours as closely as possible. Discuss what colours they think may be tricky and remind them to take only small samples. Then let them explore.

Once the activity is underway, I like to move from child to child.

See how they are doing and offer suggestions or help. I usually take a carton for myself and show the children how I am progressing to help them understand the goal.

## Scavenger Hunt

**Materials:** Scavenger hunt sheets, pencil.

**Procedure: (FA)** Children love a good scavenger hunt! This activity works best with children working together in teams of two or three. Pass out the scavenger hunt list and set a time limit for the hunt. Explain that not all the items will need to be collected but simply found and recorded. The animal that lives under a log, for example.

They may not be able to find everything on the list, in the allotted time, so they should be strategic with what they look for. If you need to, set some boundaries for the hunt. This is especially important in wooded areas.

When everyone is ready say, GO and sit back and watch the fun.

**Hints, tips and tricks:** This is a great warmup activity. The hunt should last no more than 10-15 minutes and can be used in a variety of ways. For example, on

the final day of our bushcraft camp, after breakfast, we do a huge scavenger hunt that has the campers run over the entire property and to sweeten the pot, the winning team gets a ride home in the truck with all their gear. It wears them out, challenges their knowledge and gives us a few moments of peace and quiet.

## Camouflage

**Materials:** none

**Procedure: (AE)** This game is a quick activity, wonderful for hikes and just fun. It requires a bit of explanation - but worth it. Play in a dense young forest, with lots of ferns and ground cover and fallen logs.

Explain to the children that this is a predator and prey game. There will be one squirrel (I usually pick a squirrel as they are diurnal and common) who will be the prey, and the rest of the students will be ermine hunting the squirrel. Ask for a volunteer to be the prey. Everyone else is a predator. Tell the predators, that good hunters must be able to conceal themselves while stalking prey.

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In this game, the predators will attempt to hide closer and closer to prey without being seen. The game is divided into three rounds. To play, the prey must stand in one spot and cannot take a step or crouch down, but is free to turn 360°, while the predators remain hidden close by.

Play begins when the prey counts to 40, during which time the predators hide. While counting, the prey must close its eyes *and* plug its ears. When finished, the prey will open its eyes and carefully begin looking for the predators. They can turn but not take a step or crouch. The predators remain as silent and still as possible. If the prey locates a predator, it simply points and describes the predator that they have found. “I see a blue pants and a red shirt behind that log.” The leader can help the prey at this point, “Peter, that’s you.” Once a predator, has been spotted, they are out of the game and can stand off to the side.

Once the prey feels that they have identified all the predators that can be seen, the leader will announce that round two is ready to begin. The prey will close its eyes and plug its ears and, this time, count to 30. During which, the predators will attempt to find a new hiding spot closer to the prey. Once the prey has completed the count it will again look for predators.

For the final round, the prey only counts to 20, looks for the predators and then once they feel that they have found all that they can. The prey calls out, “STAND UP PREDATORS!” The predator closest to the prey, wins the game

and replaces the prey in the next round.

**Hints, tips and tricks:** Let the predators know that if they find a good hiding spot close to the prey in the first round, they don’t have to move between rounds. And if a lot of predators are found in the first round, I generally let them join in the following rounds. I also moderate how long the prey has to look for predators, it is best to keep the rounds moving along quickly. I let them look thoroughly and then start the next round. Some prey will try to look, then look again and then again.

I have two favourite moments in this game. The first is at the start of the game. The prey begins the first round, generally surrounded by children and after counting opens its eyes to a completely empty, silent forest. My second favourite moment, happens at the end, when the Prey calls out, “stand up”. Suddenly, out of no where, a whole gang of children will appear.

## Speed Camouflage

**Material:** None

**Procedure: (AE)** This is similar to camouflage but faster and works best in a thicket or dense young forest. In this game the prey stands in a spot and can turn 360° and crouch. The predators all begin at a single starting point determined before the game begins. I usually use a big tree, small clearing, or old stump. The prey should be about 40m from the predators starting point. On GO, the prey quickly shuts its eyes and plugs its ears and

counts to 4 - slowly, or one one-thousand, two one-thousand, three one-thousand. While the prey is counting, the predators must move towards the prey and find a hiding spot. After the count is finished, the prey opens its eyes and looks for predators just like in Camouflage. If they see a predator, the predator must return to the starting point and touch it before starting over. After a few moments looking, the prey repeats the process by saying “Ready... one, two, three, four!” An so on and so forth. Predators are not aloud to move between rounds, while the prey is looking. Once a predator gets close enough, while the prey counts, the predator can attempt to jump up and tag the prey before the prey opens its eyes - ending the round. Let the winner take the roll of prey

**Hints, tips and tricks:** Keep this game moving quickly. I let the prey take a good quick look and then encourage them to count again. Once predators get closer, I let the prey have more time. A complete round of counting and looking should take less than 20 seconds. This game works best at the end of a day, when children need something that is just pure fun.

## Amazing Meetings

**Materials: Amazing meetings handout,** pencils, clipboards

**Procedure: (AE)** This is good activity when starting with a new class or beginning a series of nature explorations. It gives the students time to talk about how they feel about nature and provides a baseline for the group.



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Simply give each student a handout, clipboard and pencil.

Let them mingle and take turns asking each other the questions found on the sheet. For example, James may ask Peter, "Have you ever held a bird in you hand?" To which Peter might respond, "No." James could then continue to ask Peter, "Have you ever caught a fish?" And this time, Peter responds, "Yes!" James will then write Peter's name in the appropriate box and then answer a question for Peter.

Each student can only provide one positive answer for another interviewer. This insures that lots of mixing and questioning happens.

## **In Conclusion**

Good luck. I hope that you find these games and activities as fun and exciting as I have. There are endless resources out there, but I have listed a few bellow.

We are part of nature and it contains all that we need to learn and live joyfully.

# Resources

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## Books

**Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants**, by Robin Wall Kimmerer (Milkweed Editions, 2013).

**Bird Watch, A Young Person's Introduction to Birding**, by Mary Macpherson (Summerhill Press, 1988).

**Bring School to Life**, by Sarah K. Anderson (Rowan & Littlefield, 2017).

**Engaging Imagination in Ecological Education**, by Gillian Judson (Pacific Education Press, 2015).

**Last Child in the Woods**, by Richard Louv (Algonquin Books of Chapel Hill, 2005).

**Mapmaking With Children, Sense of Place Education for the Elementary Years**, by David Sobel (Heinemann, 1998).

**National Audubon Society Field Guide to North American Insects and Spiders**, by Lorus and Margery Milne (Knopf, 1980).

**The Nature Connection**, by Clare Walker Leslie (Storey Publishing, 2010).

**Place-based Education, Connecting Classrooms and Communities**, by David Sobel (An Orion Reader, 2004).

**Rediscovery, Ancient Pathways - New Directions**, by Thom Henley (Western Canada Wilderness Committee, 1989).

**Sharing Nature with Children - Second Edition**, by Joseph Cornell (Dawn Publications, 1998).

**Sharing Nature with Children II**, by Joseph Cornell (Dawn Publications, 1989).

**The Sibley Guide to Birds, Second Edition**, by David Allen Sibley (Knopf, 2014).

**The Sibley Guide to Trees**, by David Allen Sibley (Knopf, 2009).

**Tracking and the Art of Seeing** by Paul Rezendes (Camden House Publishing, Inc., 1992).

## Websites

[takemeoutside.ca](http://takemeoutside.ca)

[johnmuirlaws.com](http://johnmuirlaws.com)

[macphailwoods.org](http://macphailwoods.org)

[coeo.org](http://coeo.org)

[schools.wwf.ca](http://schools.wwf.ca)

# Appendices

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- 1. Meet a Tree - Questionnaire**
- 2. Herbarium Label - Template**
- 3. Mystery Plant Scavenger Hunt - Tally Sheet**
- 4. Animal Mask - Template**
- 5. Food Card - Template**
- 6. Bird Body Sheets**
- 7. Owl Pellet Bone Sorting Chart**
- 8. Infinity Frog Life-Cycle - Template**
- 9. Scavenger Hunt**
- 10. Amazing Meetings**

# Meet a Tree

*Tree description: (bark texture and colour, shape of leaf, smell, tree shape and size...)*

- 1. How old are you?*
- 2. Where are your parents?*
- 3. What's your favourite season?*
- 4. How big will you grow?*
- 5. Do you have any children?*
- 6. How deep are your roots?*
- 7. Do you have any brothers or sisters?*
- 8. Where are they?*

Date of Collection .....

Name of Plant .....

Location .....

Habitat .....

Collected By .....

Remarks .....

Date of Collection .....

Name of Plant .....

Location .....

Habitat .....

Collected By .....

Remarks .....

Date of Collection .....

Name of Plant .....

Location .....

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Location .....

Habitat .....

Collected By .....

Remarks .....





Food

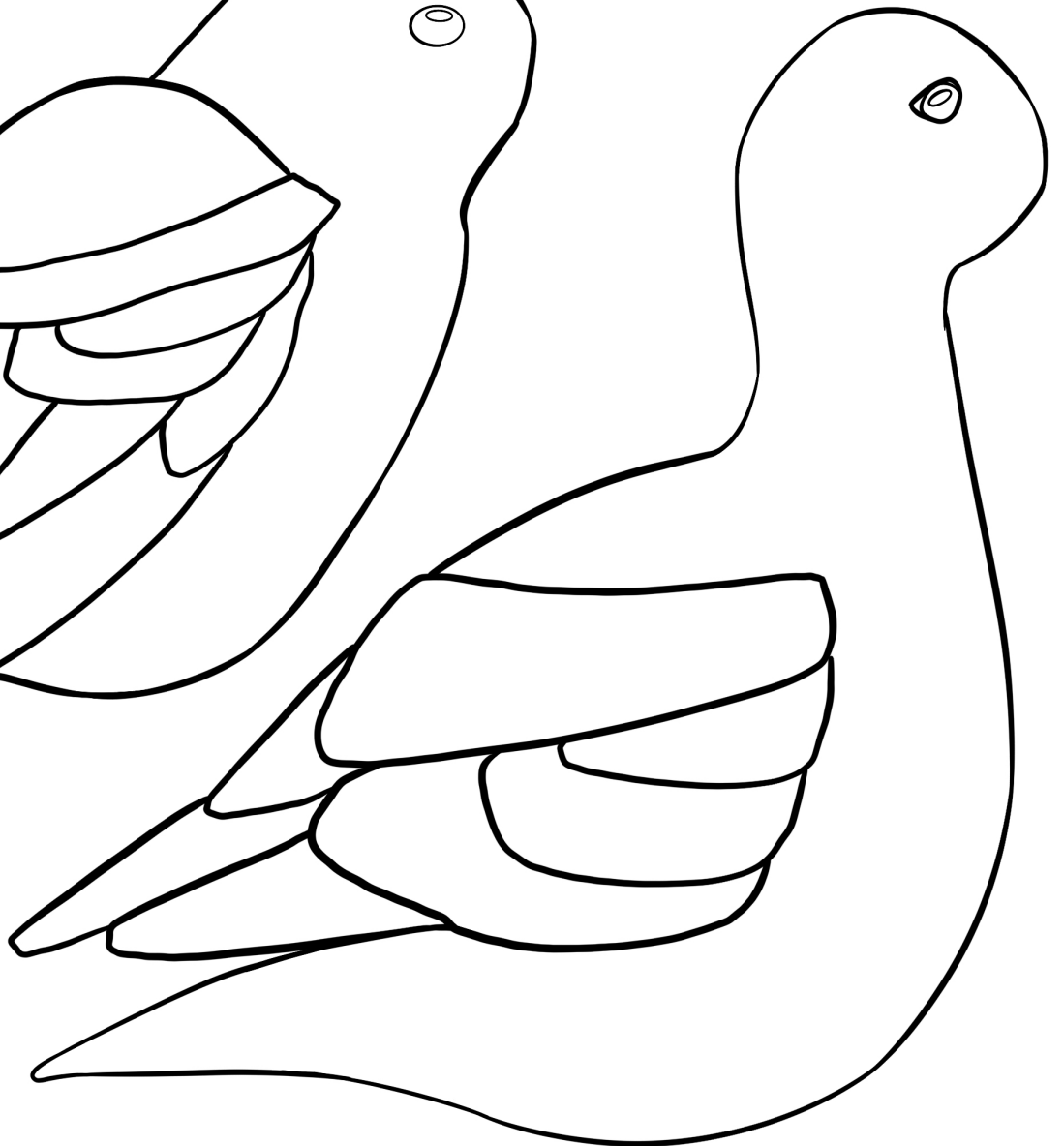
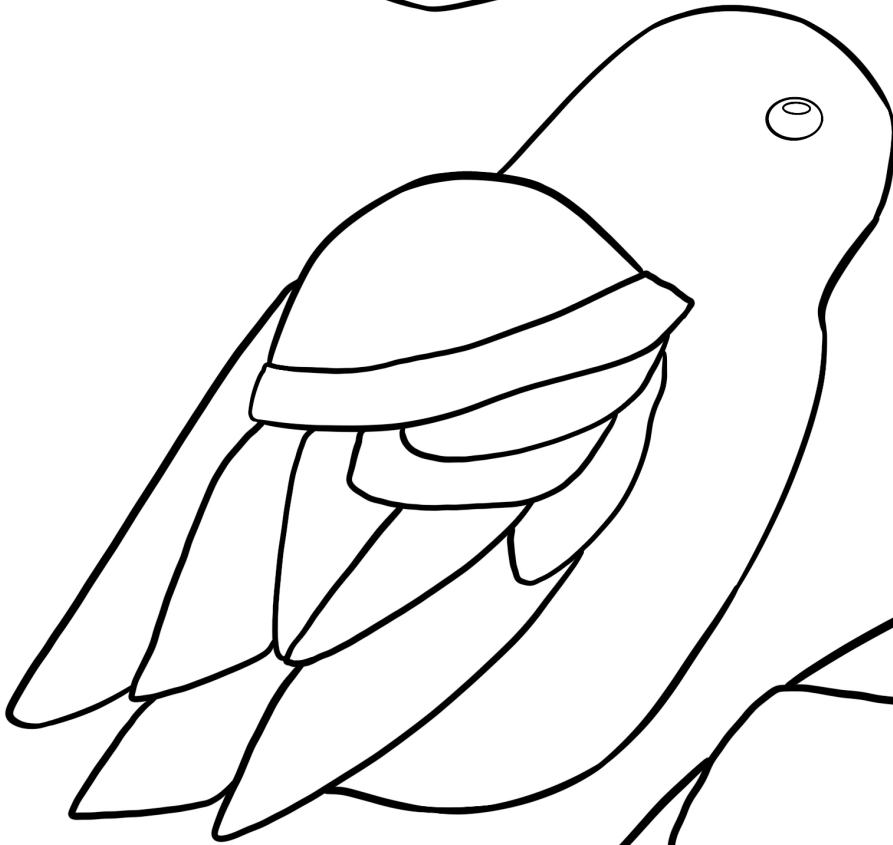
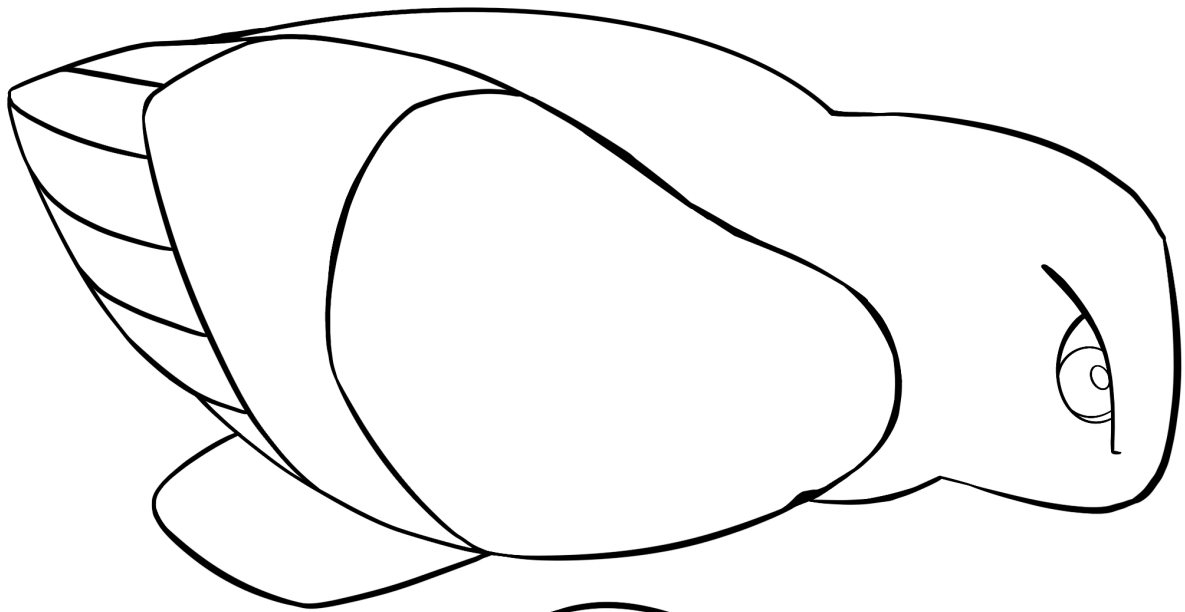
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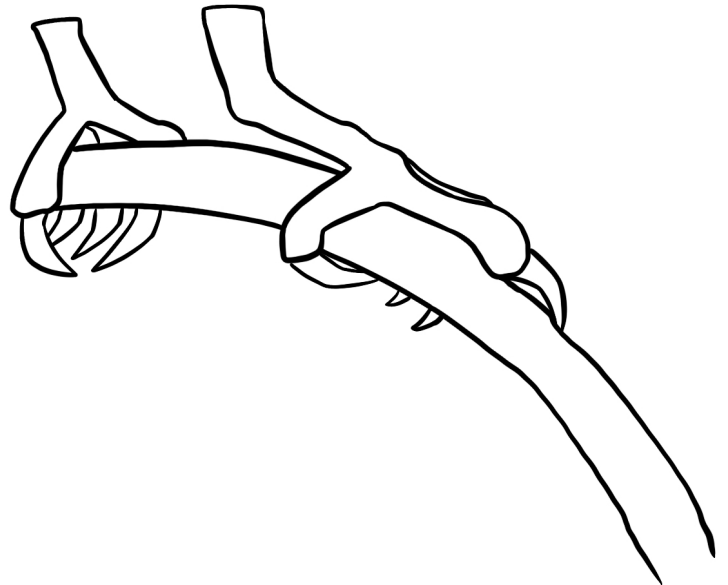
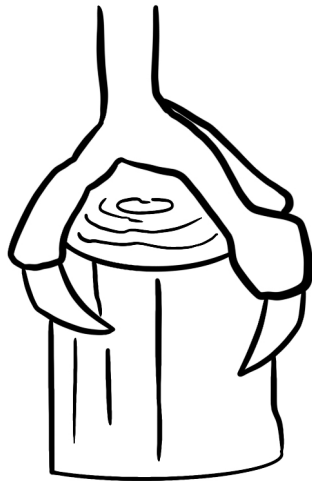
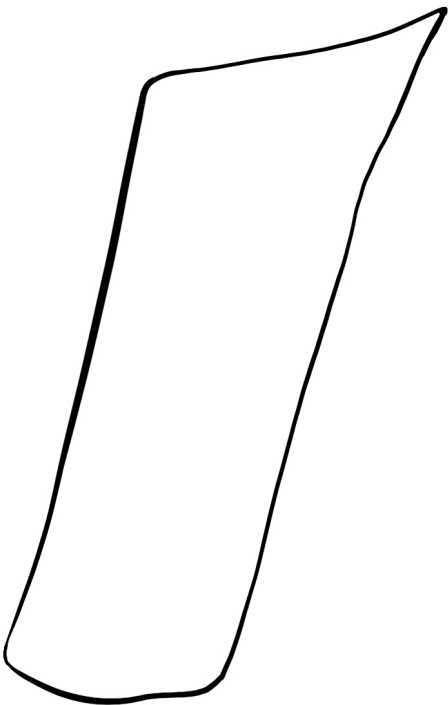
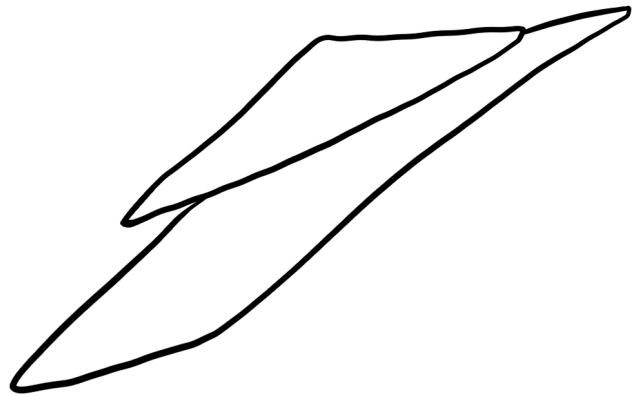
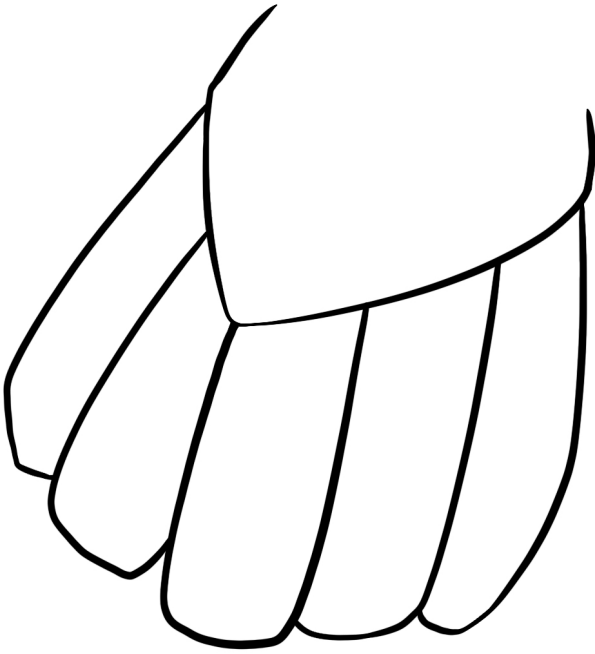
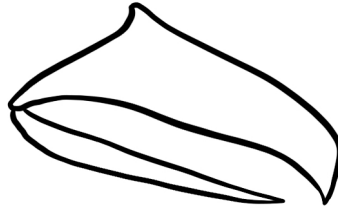
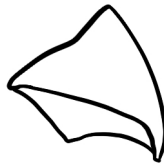
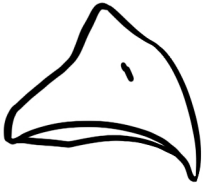
Food

Food

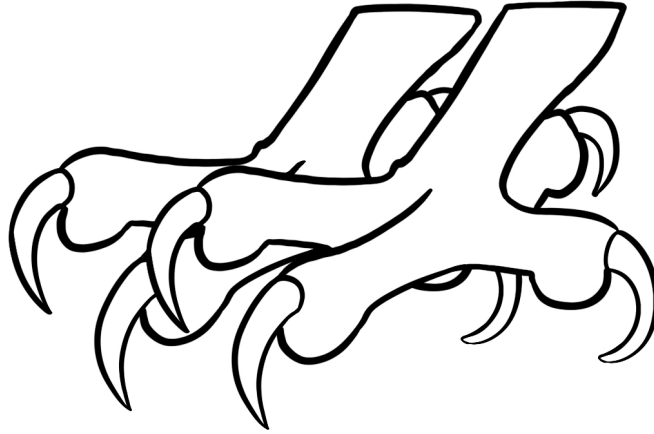
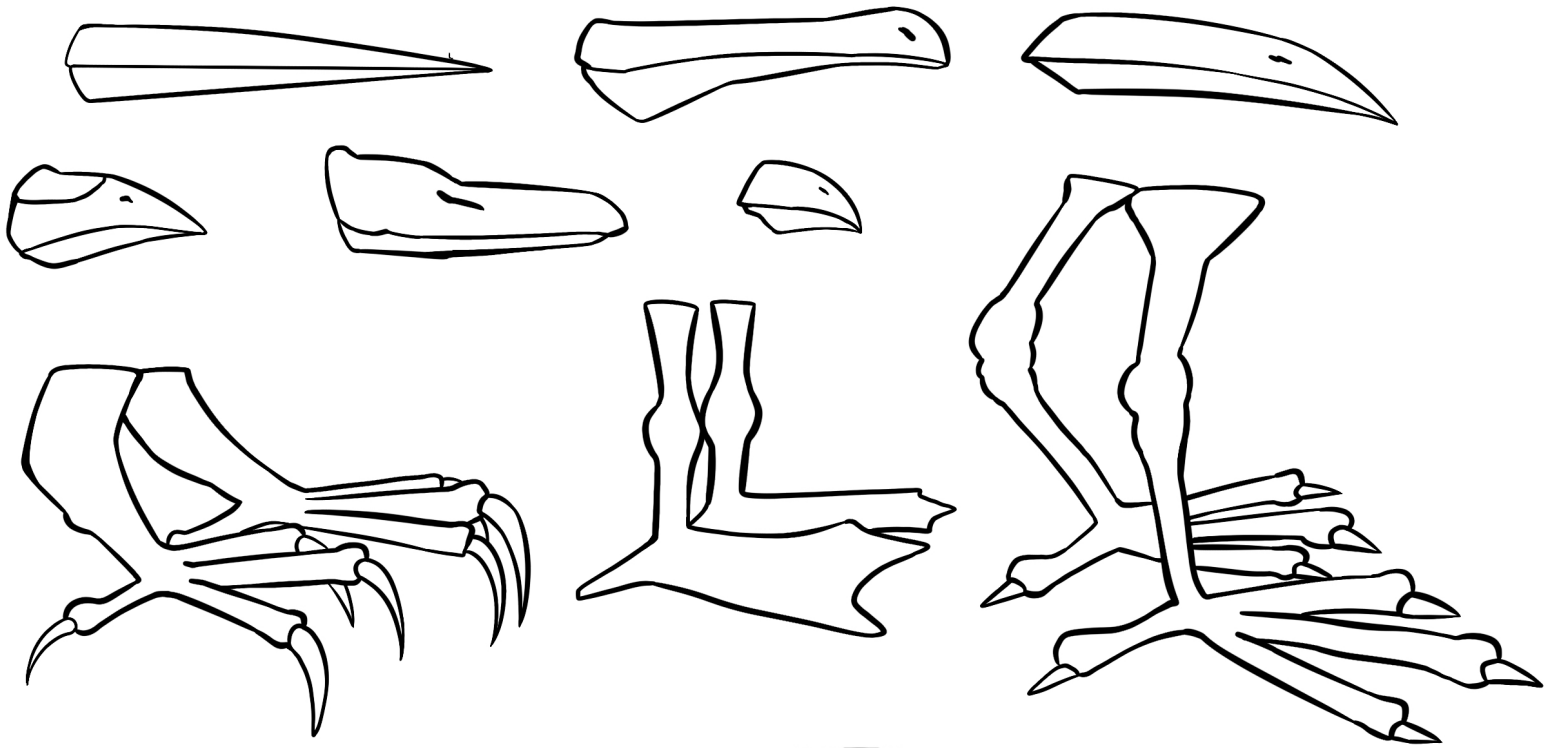
Food

Food





























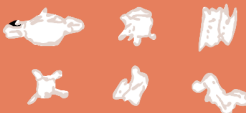
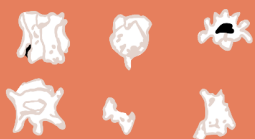








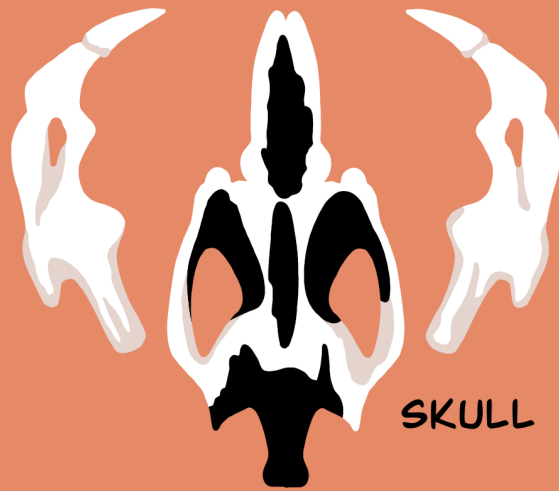




# OWL PELLET BONE SORTING CHART

	RODENT	MOLE	SHREW	BIRD
SKULL				
JAW				
SHOULDER BLADE				
FRONT LEG				
HIP				
BACK LEG				
RIB				
VERTEBRAE				
MISC. ITEMS	<p>CATERPILLAR LARVAE AND CATERPILLAR COCOONS</p> 		<p>CATERPILLAR DROPPINGS</p> 	



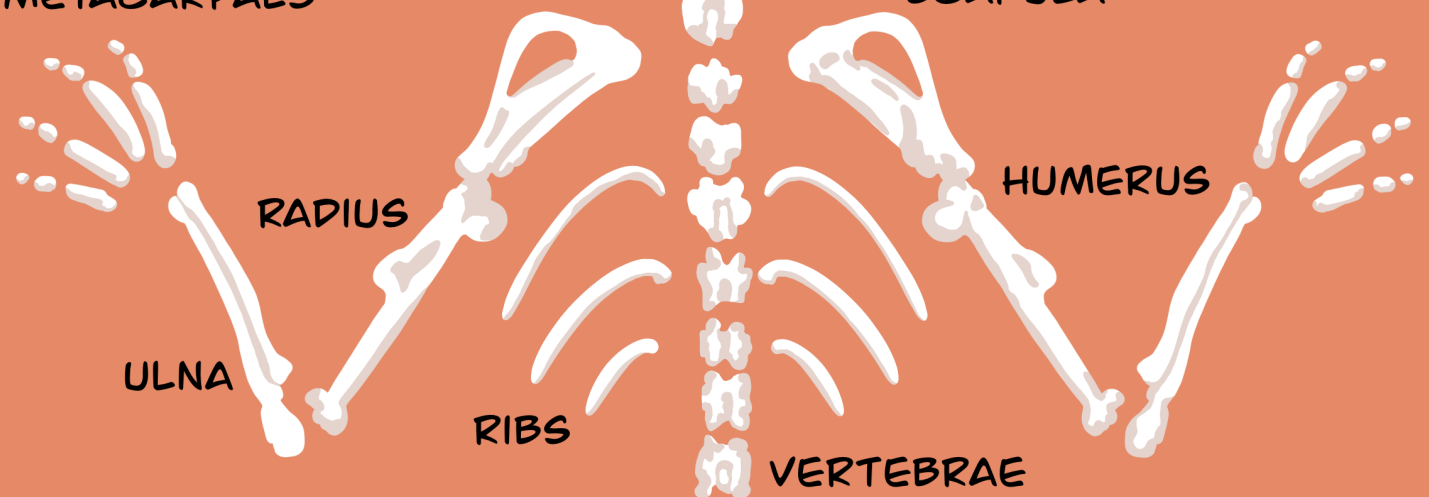


MANDIBLE

SKULL

METACARPALS

SCAPULA



RADIUS

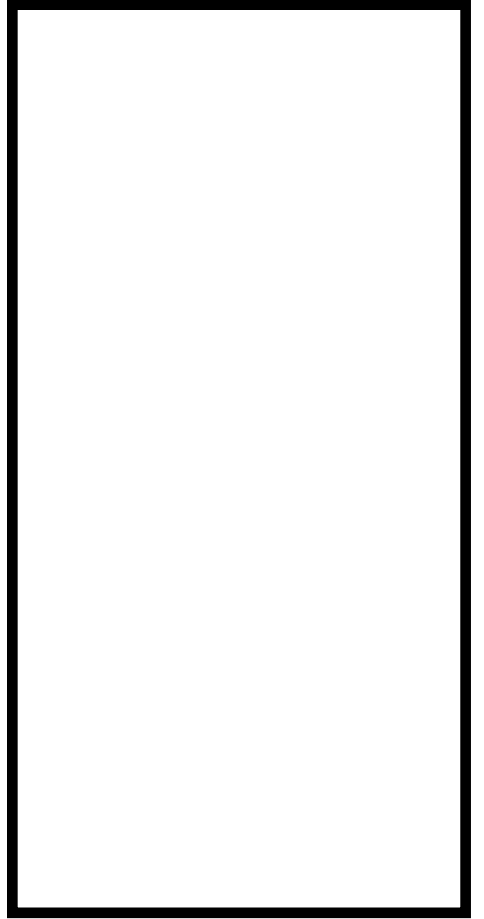
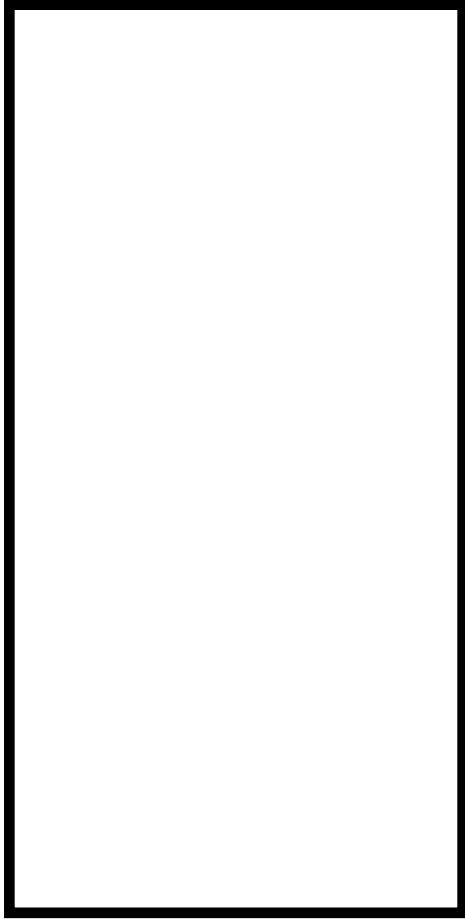
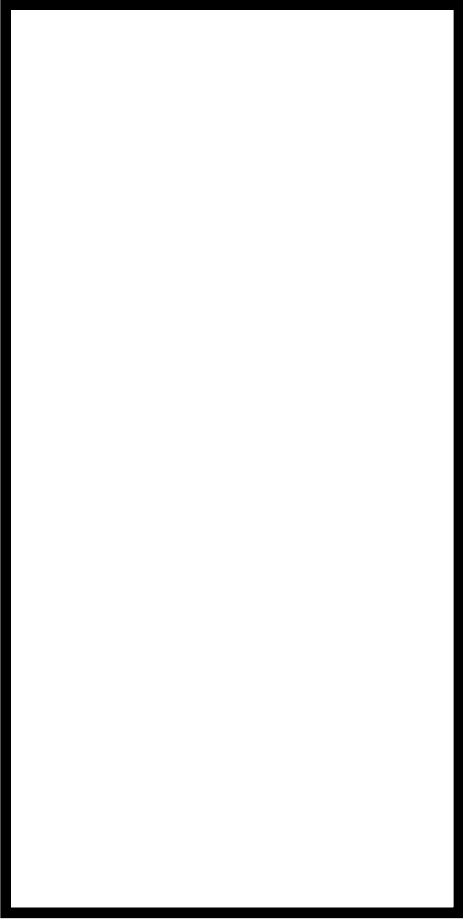
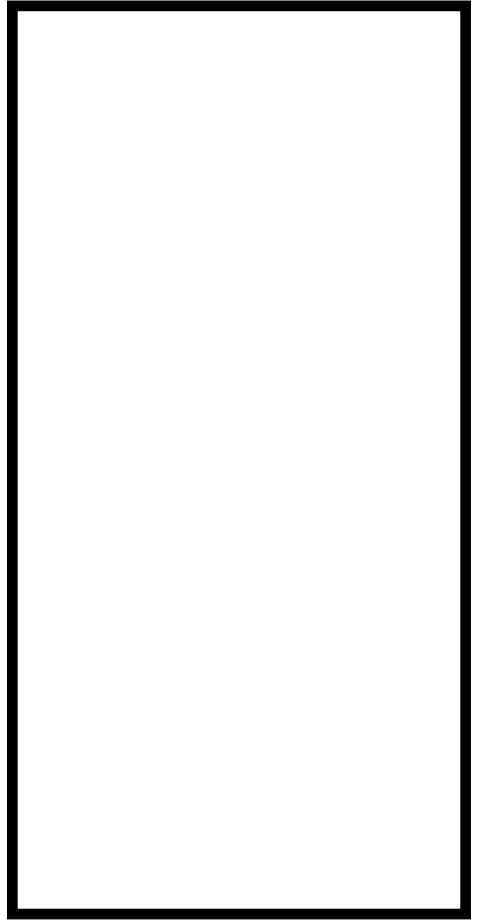
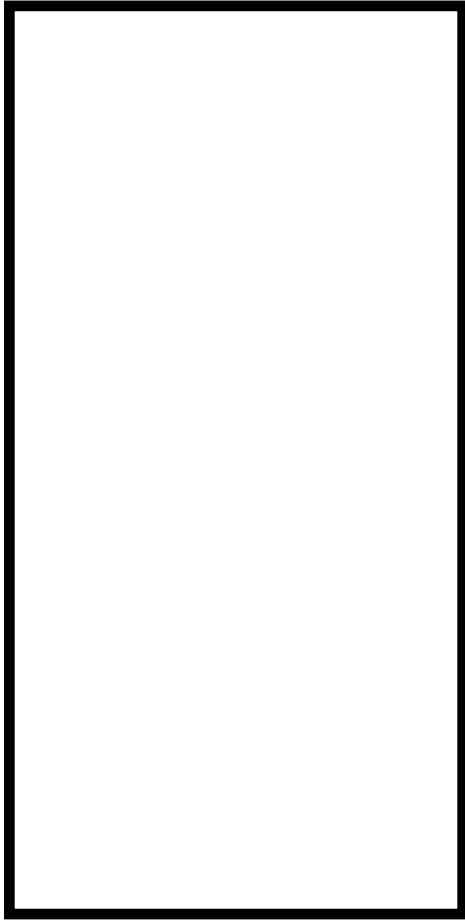
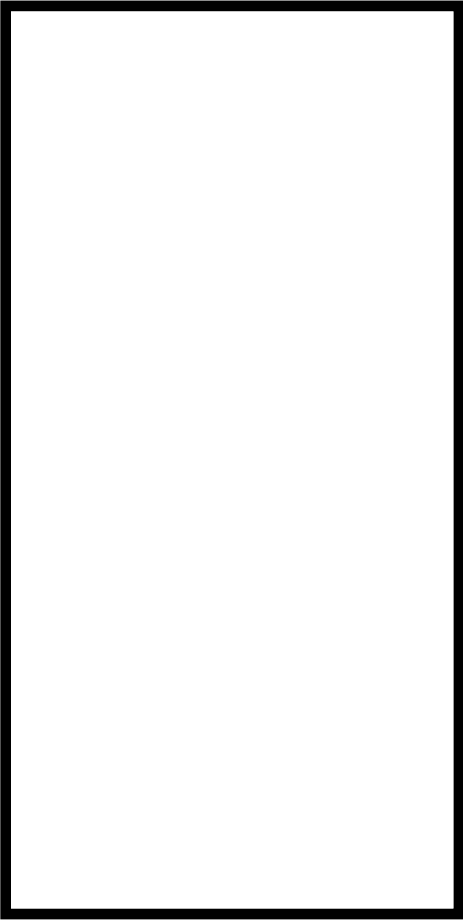
HUMERUS

ULNA

RIBS

VERTEBRAE





# SCAVENGER HUNT

A needle that is flat

Something that is smaller than tip of your pinky finger

Something that lives under a log and has many legs

Five different leaves

Something that is orange

A piece of an eggshell

Signs of animal activity (paths, teeth marks...)

Something that smells good

Ten different plants growing on a tree (not branches or leaves)

Something that holds water

Something sticky

A needle that grows in a bundle

One seed

Twenty rocks – starting small and getting bigger .....

Something that you would like the other groups to find

# AMAZING MEETINGS!

Find someone who...

has eaten a bug!	has gone camping for more than a week.	has held a bird in their bare hands.	has caught a fish.
wants to be a biologist or naturalist.	has gotten lost in the woods.	has lite a fire using a flint skick.	rescued a wild animal.
has shot a bow and arrow.	has gone swimming in the pacific ocean.	was not born on PEI.	has a favorite animal. What is it?
has slept outside without a tent.	has gotten lost.	has a bird feeder at their home?	has dreamt of being a wild animal.