COMMON POLLINATORS OF BRITISH COLUMBIA

A Visual Identification Guide

Created by Border Free Bees and the Environmental Youth Alliance

2nd EDITION

Table of Contents

Introduction

Pollinators play a critical role in supporting both terrestrial ecosystems and agricultural landscapes. Female bees are the most efficient pollinators, as they spend their lifetimes actively collecting both pollen and nectar to feed to their kin, visiting hundreds to thousands of flowers in the process. Other types of pollinators, such as male bees, flies, butterflies and most pollinating wasps, visit flowers to feed on nectar, a vital energy source. During this process, pollen passively brushes onto their bodies and is transported between flowers for pollination.

About This Guide

This visual guide was created to help educate the public on how to identify common pollinators in British Columbia. It is estimated that there are around 500 species of bees in British Columbia. To tell different species apart, you often need to compare very minute characteristics, such as the shapes of veins on their wings, which can be challenging without a microscope and an expert eye. This guide breaks down pollinators into 7 simplified and easily recognizable categories: ***Honey Bees***, ***Bumble Bees***, ***Hairy Belly Bees***, ***Mining Bees***, ***Wasps***, ***Hover Flies*** and ***Butterflies***.

insight
CITIZEN SCIENCE

INSIGHT is a mobile app created by Border Free Bees that allows citizens to record pollinator observations using their smart phones. This guidebook was designed to help citizens identify the seven categories of pollinators used in the app. By recording your observations with the app, you will be contributing valuable information to citizen science. Growing our understanding of the status of pollinators in British Columbia will allow for more informed decisions in the effort to support pollinator populations. To participate as a citizen scientist, visit **insightcitizenscience.com**.

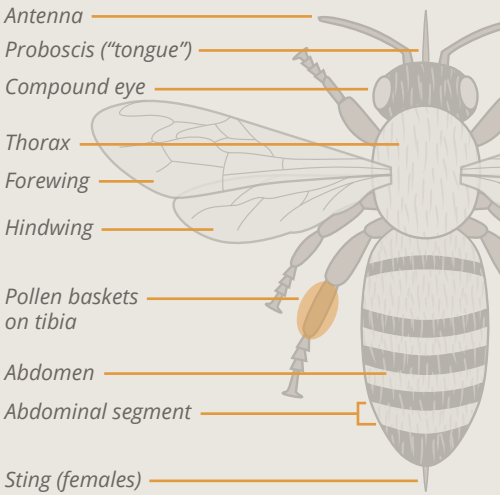
Pollinator Classification

It is important to note that, through the lens of scientific classification, the groupings in this guide differ in both number and diversity of species that are included. For example, the ***Honey Bee*** group contains a single species of bee (*Apis mellifera*), while ***Hairy Belly Bee*** covers a family containing hundreds of species (Megachilidae). On the title page for each pollinator category in this guide, the names in brackets indicate the taxonomic classification for each type of pollinator included in the group.

The categories in this book use familiar names to describe groups of pollinators that share similar physical characteristics (such as body shape) and ecological roles (such as foraging practices and nesting needs). With a basic understanding of the characteristics that differentiate these types of pollinators, you can participate in pollinator citizen science programs with ease. Further, by identifying which types of pollinators live in your backyard or local park, you can begin to understand which flowers and habitat resources are needed to support their conservation.

Basic Bee Anatomy

Over millions of years of co-evolution with plants, bees have evolved specialized body parts to help them accomplish the day to day needs for both themselves and flowers.
This diagram depicts the basic components of bee anatomy. Another notable characteristic is scopa. These are dense clusters of feather-like hairs on the bodies of female bees used to hold pollen grains as they move between flowers and their homes. Depending on the type of bee, scopa are usually located on the hind legs or the underside of the abdomen, making it appear yellow in colour. Common names for scopa on different types of bees include pollen baskets (corbicula), pollen pants, and hairy belly. Keep an eye out for notes on scopa placement to help differentiate the types of bees described in this guide.



Honey Bee (Apidae: *Apis*)

Keywords

Fuzzy

Pollen Baskets

Medium Size

Long Body

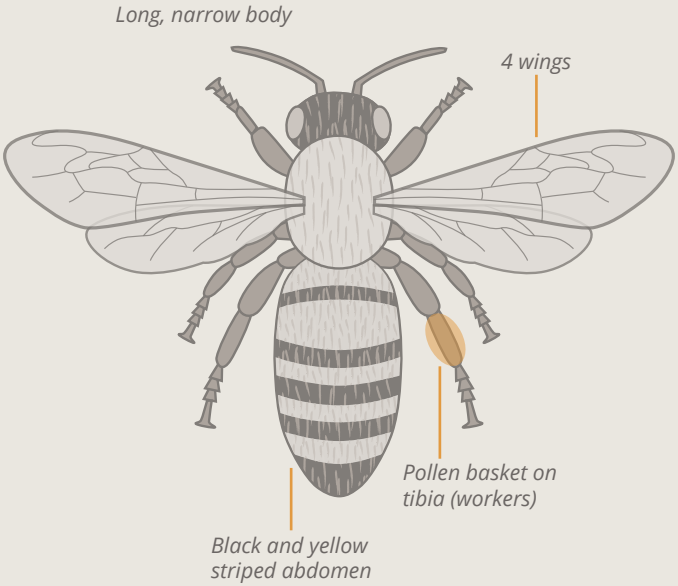
Striped

Yellow

Orange

Black

Apis mellifera, also known as the Western honey bee, are long-tongued bees in the family Apidae. Honey bees carry pollen on legs in baskets. The Western honey bee plays an important role in the economics of agricultural crop pollination, and is the only bee in North America that makes honey for winter food stores. Originally from Europe, honey bees live in hives containing tens of thousands of female workers and in most circumstances need human management (beekeepers) to survive in British Columbia.



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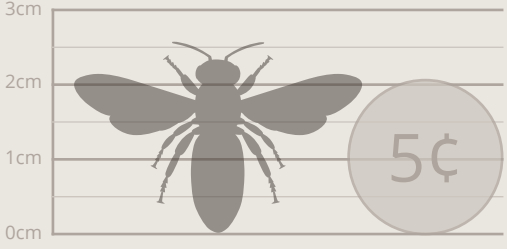


Western Honey Bee - *Apis mellifera*

Female worker bees carry wet pollen on dense clusters of hair referred to as pollen baskets or corbicula. Honey bees live in social colonies with one queen, many workers, and drones. After mating, a queen bee will spend most of her life laying eggs inside the hive. Female worker bees occupy a series of roles throughout their lifespan, from caring for baby bees to collecting nectar and pollen. The primary role of male drone bees is to mate with a virgin queen. They do not have stingers, nor do they gather nectar or pollen.

Female Worker Bee

Male Drone


Pollen Basket

Bumble Bee (Apidae: *Bombus*)

Keywords

Very Fuzzy

Loud Buzz

Pollen Baskets

Medium - Large

Round Body

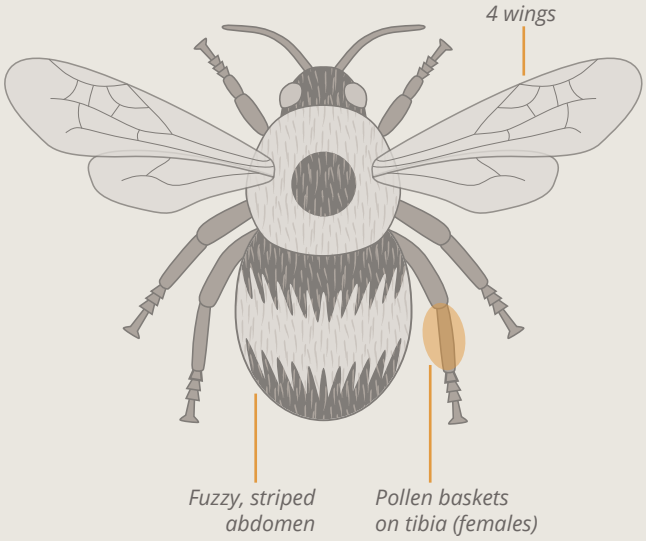
Striped

Yellow

Orange

Black

Bumble bees are in the family Apidae. They are medium to large fuzzy bees and usually have a deeper buzz sound than other bee groups. Bumble bees have queens and workers and therefore individuals can vary greatly in size depending on nutrition and their social role in the colony. Like honey bee workers, female bumble bees (including queens) also carry pollen on their hind legs in pollen baskets, also called their corbicula (one on each hind leg). Although bumble bee species can be observed by the colours on their abdomen, there are often variations in colour, even within a single species.



General Size Range

Yellow-Faced Bumble bee
Bombus vosnesenskii

Yellow face

Mostly black with single band of yellow

Nevada Bumble bee
Bombus nevadensis

Hairless black spot

Three yellow bands

Black tail

Mixed Bumble bee
Bombus mixtus

Yellow

Orange

Black

Two-Form Bumble bee
Bombus bifarius

Two dots on thorax

Blonde edges of thorax

Common Eastern Bumble bee
Bombus impatiens

Yellow thorax

Black face

1st segment yellow and remaining abdomen black

Black-Tailed Bumble bee
Bombus melanopygus

Bright orange segments

Hairy Belly Bee (Megachilidae)

Keywords

Small

Round Body

Hairy Belly

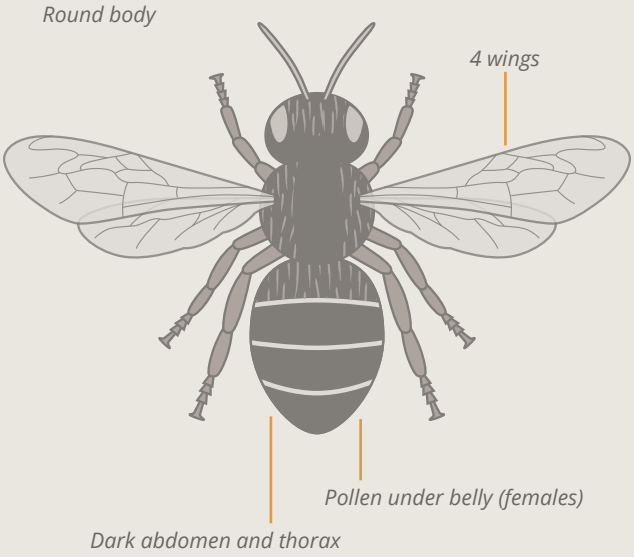
4 Wings

Metallic Blue

Metallic Green

Dark Colored

Hairy belly bees are small to medium-sized solitary bees in the family Megachilidae. Most hairy belly bees nest in tunnel-shaped cavities such as holes in trees or bamboo stakes placed in gardens. Female hairy belly bees re-purpose materials from nature to build walls in these cavities, including leaves, mud and tree bark. Hairy belly bees appear more rounded (bullet-shaped) than other bees. Females can be identified by a layer of scopa on the underside of their abdomen, often bright yellow when carrying pollen. Males do not have scopa on their bodies. Mason bees, leafcutter bees and resin bees are all a part of the hairy belly bee category.



General Size Range

Western Leafcutter Bee
Megachile perihirta

Hairy belly

Alfalfa Leafcutter Bee
Megachile rotundata

Hairy belly

Wool Carder Bee
Anthidium manicatum

Hairy belly

Black with yellow dot markings on abdomen

Blue Orchard Mason Bee
Osmia lignaria

Summer Mason Bee
Osmia densa

[no common name]
Osmia bella

Mining Bee (Andrenidae, Halictidae, Colletidae)

Keywords

Small

Narrow Body

Pollen Pants

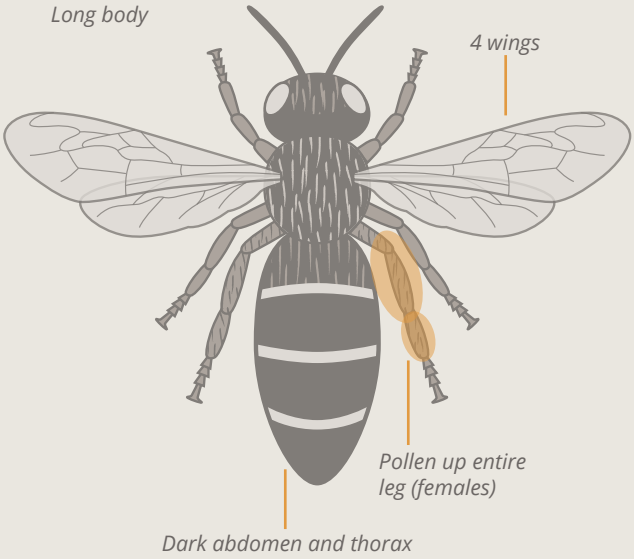
4 Wings

Minimal Hair

Dark Colored

Metallic Green

The mining bee category includes all ground nesting bees: **miners**, **sweat bees**, and **plasterer bees** (also referred to as polyester bees). Some females carry dry, dusted pollen on feathered scopa along the length of their legs, characteristically called “pollen pants”. Mining bees generally have dark, narrow bodies and minimal hair. A few species are bright metallic green.



General Size Range

Halictidae are short-tongued bees that nest in the ground. Some species in the family are bright green and female halictids carry dry pollen on the entire length of their legs, characteristically called “pollen pants”.

[no common name]
Halictus rubicundus

Faded stripes along abdomen

Pollen pants

Green Metallic Bee
Agapostemon texanus

Metallic, bright green color

Pollen pants

[no common name]
Dufourea maura

Pollen pants

Andrenidae are short-tongued bees called mining bees because they nest in the ground. Females carry dry pollen on their hind legs and thorax. All *Andrena* have short hairs found in depressions on their face called facial fovea.

[no common name]
Andrena prunorum

Pollen pants

Tips of wings appear smoky or burnt

[no common name]
Andrena perplexa

Pollen pants

[no common name]
Andrena pallidifovea

Pollen pants

Facial fovea

Colletidae are short-tongued bees, also called polyester bees that secrete a waterproof lining around their nests to protect their young from water, fungus and bacteria in the soil.

[no common name]
Colletes hyalinus

Pollen pants

Rain drop shaped abdomen

[no common name]
Colletes compactus hesperius

Pollen pants

Modest Masked Bee
Hylaeus modestus

No pollen hairs

MINING BEE

Hover Fly (Syrphidae)

Keywords

Bulging Eyes

Short Antennae

2 Wings

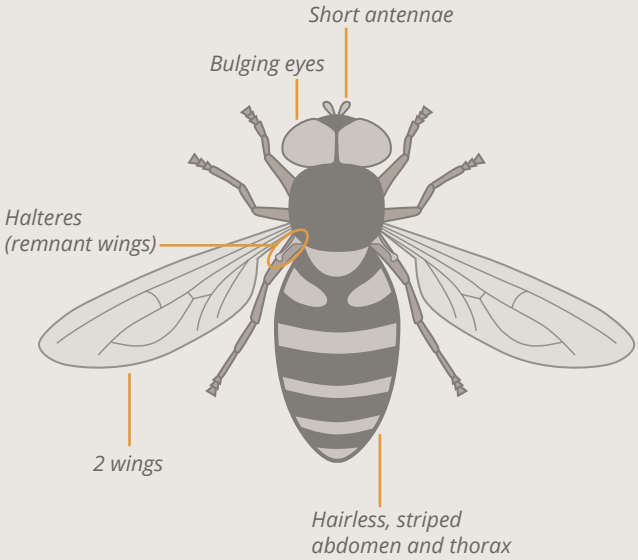
Mimic Bees

Striped

Yellow

Black

Hover flies, also referred to as flower flies, often mimic the look of bees with body colouration and sometimes even hair. They are distinguishable by their eyes which have a ski goggle appearance covering their entire length of face. Unlike bees, which have four wings, hover flies have two wings along with a pair of small appendages called halteres (remnant wings). They also have very small antennae relative to the longer, more conspicuous antennae of bees. Many kinds of hover flies appear to hover with stop-start abrupt movements, which is observably distinct from the smoother flight pattern of bees. They are good pollinators of open faced flowers, and often dominate pollination in high altitude zones.



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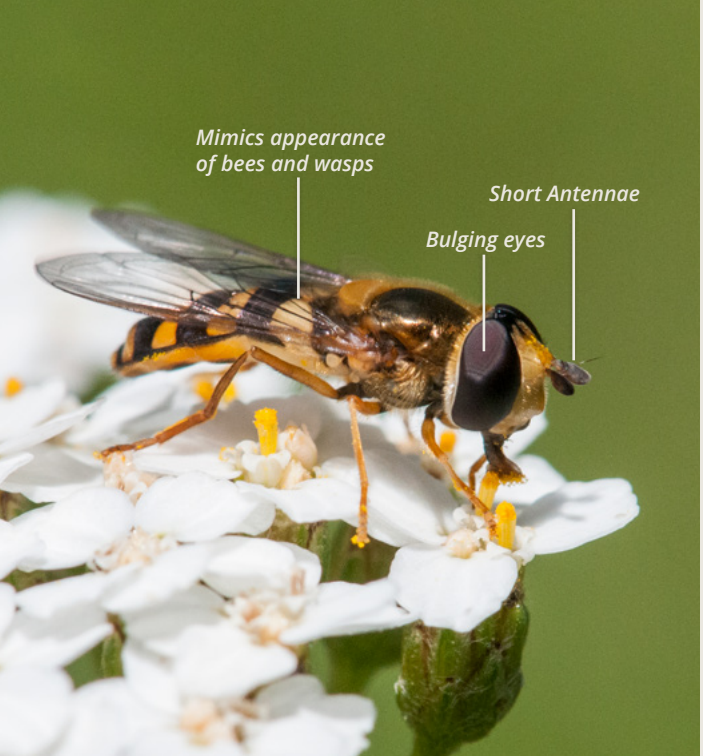
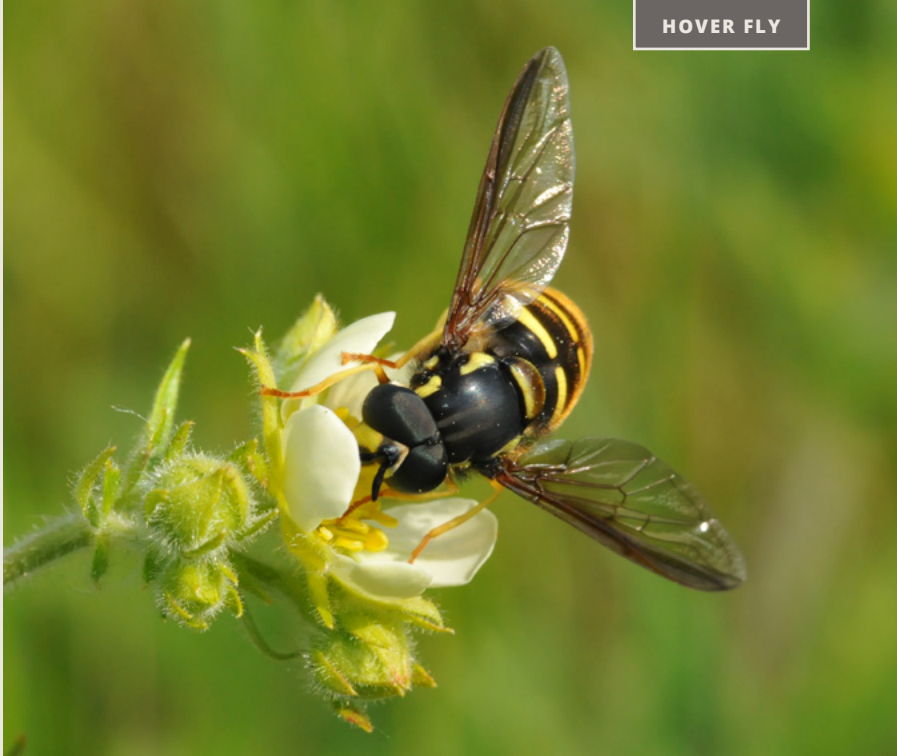

Mimics appearance
of bees and wasps
Short Antennae
Bulging eyes


HOVER FLY



HOVER FLY

Butterfly (Lepidoptera)

Keywords

4 Large Wings

Colorful

Patterns

Butterflies are conspicuous and beautiful insects that fly using two sets of wings. The bodies and wings of butterflies and other Lepidopterans are covered in minute delicate scales, and species vary greatly in both size and colour. There are about 187 species found in BC, but only a handful that are common in urban centres. Butterfly populations thrive in grassland and coastal meadows in British Columbia. Two common non-native butterflies are Cabbage White and European Skipper. A rare butterfly found in Vancouver is Johnson's Hairstreak. While butterflies generally pollinate and feed on nectar from daytime-blooming flowers, moths (their nocturnal counterparts) generally pollinate night-blooming flowers.

General Size Range

Painted Lady
Vanessa cardui

Canadian Tiger Swallowtail
Papilio canadensis

Pacific Orange Tip
Anthocharis sara

Cabbage White
Pieris rapae

Lorquin's Admiral
Limenitis lorquini

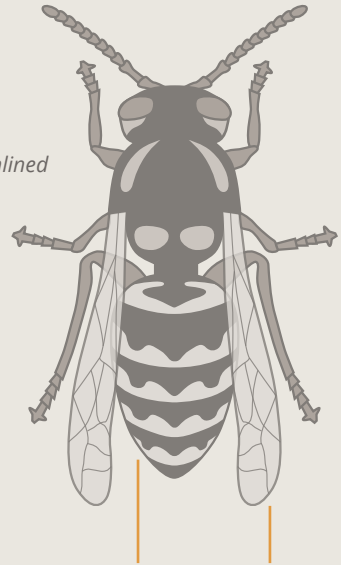
Silvery Blue
Glaucopsyche lygdamus

Wasp (Vespidae and other families)

Keywords

Long Body
4 Narrow Wings
Narrow Waist
Long Antennae
Minimal Hair
Shiny
Striped
Yellow
Black

Wasps are diverse in size, shape, and colour, spanning several families in the order Hymenoptera. Vespid wasps – described in this section – are the most common family in BC. Bees are also Hymenopterans, and therefore share physical similarities with wasps. They are often distinguishable by having fewer visible hairs, and lack scopa (pollen-collecting hairs). Their bodies may appear smooth, often with a visible constriction (narrowed “waist”) between their thorax and abdomen. While some Vespid species are solitary, most are social, forming colonies with queens, workers and drones (similar to honey bees). Vespid wasps are omnivorous, provisioning their kin with a wide variety of forage and small prey items including other insects and spiders. Some species also feed on nectar, pollinating plants in the process.



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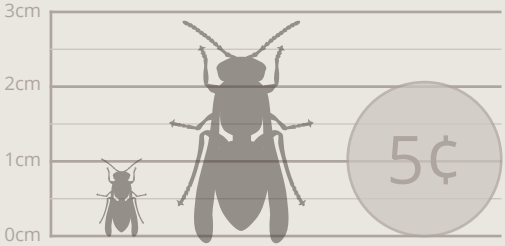

European Paper Wasp
Polistes dominula

Common Yellowjacket
Vespula alascensis

Bald-Faced Hornet
Dolichovespula maculata

Complimentary Resources

THE ENVIRONMENTAL YOUTH ALLIANCE (EYA) is an award-winning charity providing youth with experiential environmental learning in Metro Vancouver since 1989. EYA inspires young environmental leaders through unique nature experiences in urban spaces, including pollinator citizen science and habitat stewardship programs. **www.eya.ca**

THE POLLINATION ECOLOGY LAB was founded by Dr. Elizabeth Elle, Professor of Biology at Simon Fraser University in Community and Evolutionary Ecology. The lab has several research projects underway on the topics of Pollinator Diversity and Crop Pollination. **www.sfu.ca/people/eelle**

BORDER FREE BEES (BFB) is an award-winning public art initiative headed by Cameron Cartiere, Associate Professor at Emily Carr University of Art + Design and Nancy Holmes, Associate Professor in Creative Studies at University of British Columbia, Okanagan. Our mission raises awareness of the plight of wild pollinators, empowers communities to engage in solutions for habitat loss, and transforms underutilized urban sites into aesthetically pleasing and scientifically viable pollinator pastures. **www.borderfreebees.com**

POLLINATOR PARTNERSHIP's mission is to promote the health of pollinators, critical to food and ecosystems, through conservation, education, and research. **www.pollinator.org/canada.htm**

Acknowledgments

BOOK DESIGN & IMAGES

This book was designed by Geoffrey Campbell (BFB) and written by Erin Udal and Marika van Reeuwyk (EYA).
For questions and inquiries, please email Border Free Bees: **info@borderfreebees.com**.

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This visual guide was created to help educate the public on how to identify common pollinators in British Columbia. It serves as an introduction to the common groups of pollinators including Honey Bees, Bumble Bees, Hairy Belly Bees, Mining Bees, Wasps, Hover Flies and Butterflies. With a basic understanding of the characteristics that differentiate these types of pollinators you can participate in pollinator citizen science programs with ease.

Common Pollinators of British Columbia was created by Border Free Bees and the Environmental Youth Alliance in collaboration with a number of other strategic partners.

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