Invasive Species Council of BC

Education Activities & Teacher Resources

Tackle Invasive Species "Hands-on" with your Students!

Invasive Species Council of British Columbia

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TOGETHER • PREVENT • RESTORE

This guide contains a range of activities that will engage your students, help them investigate invasive species in BC and their impacts, and explore ways we all can help prevent their spread.

Activites are suitable for use in both formal school programs, as well as for informal youth groups, camps and recreation programming, and can be done in any sequence. The activities are listed with suggested age / grade categories, but most of them can be adapted to suit almost any age and audience. Choose an activity to do every day of the week!

All feedback, comments and adaptations are welcome – let us know how you have used these activities and your experiences with them!

For further information and support, contact:

Invasive Species Council of British Columbia

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Thank you for your interest in invasive species!

Background on Invasive Species

Native Species: A species that naturally exists in an area. A native plant, for example, is a plant that has lived and evolved in a certain place for a long time (i.e. thousands of years) and is part of the natural ecosystem. Native species are adapted to local conditions, and have co-evolved with other competing species, predators, diseases, climate factors and other aspects of a region, and are part of a natural, balanced system.

Non-Native but Non-Invasive Species: Not all foreign / introduced species are invasive – many ornamental plants such as roses and tulips won't survive outside of gardens. Other introduced species such as tomatoes and wheat are beneficial food resources. However, others, such as the Asian long-horned beetle and the gypsy moth, have destroyed countless hectares of forest.

Invasive Species: Invasive species are non-native species that cause economic or environmental harm, and can spread rapidly to new areas. Many people are surprised to learn that some of the plants they have in their gardens or see along roadsides or in parks are invasive. Invasive plants can move into a habitat and completely take over from the original vegetation, as they don't have the competition, predators and diseases to keep them under control. Without these controls to slow them down, these plants grow faster and bigger than the native plants they are competing with. Some examples of introduced invasive species in British Columbia are: the Eurasian milfoil, purple loosestrife, orange hawkweed, leafy spurge, grey squirrels, and American bullfrogs.

Invasive Plant Characteristics:
There are four main distinguishing features of invasive plants:

- they are usually prolific seed producers,
- their seeds spread easily and effectively,
- they establish and spread quickly,
- they lack natural predators and diseases that keep them under control in their native locations.

Resources and Links:

Invasive Species Council of BC (ISCBC): http://www.bcinvasives.ca

Provincial Regional Committees: http://www.bcinvasives.ca/partners/committees

Weeds BC: http://www.weedsbc.ca

RBC Museum: Aliens Among Us: http://alienspecies.royalbcmuseum.bc.ca/eng/content/home

List of Activities

1) **From Here, From Away: An Active Game about Native and Non-Native Species**
   Elementary/ Intermediate Level Activity (Ages 8 – 14)
   Students engage in an active running game responding to their understanding of native ("*from here*") and non-native ("*from away*") species.

2) **We Are Being Invaded! An Active Game about Invasive Species Spread**
   Primary / Elementary age activity: (Ages 5 – 12)
   A fun, active game that demonstrates how invasive species can spread.

3) **Weedy Scavenger Hunt**
   Primary / Elementary / Intermediate Activity: (Ages 5 – 12) - also a good "buddy" class activity
   Students go on a scavenger hunt to look for things specifically related to plants that are invasive.

4) **Invasive Plant Field Guide**
   Elementary / Intermediate Grades (Ages 10 – 15)
   An exploration and research activity where students find and research invasive plants in their region, and create a class field guide.

5) **Native / Non-Native Plant Collage**
   Elementary / Intermediate Grade levels (Ages 6 – 14)
   A fun art activity where students create collages of native and non-native plants.

6) **"Wanted" Poster: Invasive Plants!**
   Elementary / Intermediate / Secondary grades (Ages 10 – 16)
   A fun art and research activity where students study an invasive plant of BC and design a creative "Wanted" poster for the plant.

7) **Invasive Plant Photo Scavenger Hunt**
   Intermediate/Secondary Grades (Ages 12 – 17)
   Students go on a field trip to look for and photograph native and invasive plants to design a field guide or Powerpoint slideshow.

8) **Bionic Bob to the Rescue Activity book**
   Primary / Elementary Activity (Ages 4 – 12)
   A fun, cartoon-filled 20-page activity book that highlights some of the main invasive plants in BC and their characteristics. Colouring pages, mazes, puzzles, crosswords and word searches.

ACTIVITY 1) From Here, From Away:
An Active Game about Native and Non-Native Species

Elementary/ Intermediate Level Activity (Ages 8 – 14)

STUDENTS ENGAGE IN AN ACTIVE RUNNING GAME RESPONDING TO THEIR UNDERSTANDING OF NATIVE ("*FROM HERE*") AND NON-NATIVE ("*FROM AWAY*") SPECIES.

Materials needed:

- 15 – 20 pictures of plants and animals, including some native and non-native species and some invasive species. Old calendars are good sources of nice animal and plant photos, or download some from the internet. Select species that are appropriate for the age of your group: e.g. *younger children* will need help with understanding the difference between native and non-native species: choose animals and plants that are familiar to them (e.g. things we eat from here (apples) / from away (pineapples); wild animals that are from BC (salmon, black bears) and elsewhere (lions, giraffe). The concept of invasive species can then be discussed with the group and several species identified in photos before the game begins. Use a wider range of species with older students, ensuring that they are familiar with the terms "invasive, native and non-native", and can name several invasive species in your area.
- 2 signs: "From Here" and "From Away"
- 2 signs: "Invasive" and "Non-Invasive"
- Outdoor field or large indoor area

Instructions:

1. Start by discussing safety. Explain that the students will be moving from one area to another so they need to watch where they are going and not bump anyone.

2. Do a group brainstorm to gauge the level of knowledge of the students: list some native plants and animals on the board or flip chart paper, as well as some non-native species, and discuss the concept of invasive species. Identify several invasive species common to your area, display the pictures and discuss if the group has seen / knows about them.

3. Put up signs in two areas about 10 meters apart one - *from here*, one - *from away*. Tell the group that you are going to hold up a picture of a plant or animal, and they are to run safely to the '*from here*' sign if it is a native plant or animal, or to the from away sign if it is an introduced plant or animal.
   - Define *from here* as a plant or animal living in this ecosystem for hundreds or thousands of years: provide some examples: e.g. black bear, salmon, Douglas fir tree, Red Cedar
   - Define *from away* as plants or animals not from BC, or species that were introduced by humans in the last two hundred years or so. E.g. tomatoes, tulips, bananas, oranges, tigers, Scotch broom, English ivy, purple loosestrife, snakehead fish.

4. With older students, explain some related terms as well: "native", "indigenous," and "from within its normal range" all mean *from here*. "Exotic"," introduced," "from outside its normal range", "aliens", "weeds" all mean *from away*.

5. Hold up a picture of a plant or animal and say its name. Give the students time to think, then say "go". The students should run to the sign which indicates from here or from away. Tell them to make up their own mind and not be swayed by the group. The group is not always right!

6. After the dust has settled, discuss whether the plant or animal was from here or from away. Repeat the process for fifteen or twenty plants and animals. You will probably find that the students are more aware and knowledgeable of animals than of plants. It is always worth reminding them of the importance of plants in the ecosystem!

7. After the running game, have the students work as a group to categorize the pictures of plants and animals into the two groups: from here or native and from away, or introduced. Lay the pictures out on the floor under the two signs.

8. Discuss the terms "invasive" and "non-invasive", and have the group sort the animals and plants into four categories, using the four signs laid out in the following quadrant:

	NON-INVASIVE – does not upset balance of ecosystems	**INVASIVE – upsets balance of ecosystems**
FROM HERE, native, indigenous, from within its normal range		
FROM AWAY, exotic, introduced, from outside its normal range		

9. Encourage discussion and ask the students if they have seen any of the plants and animals in the pictures.

ACTIVITY 2) We Are Being Invaded!
An Active Game about Invasive Species Spread

Primary / Elementary age activity: (Ages 5 – 12)

A FUN, ACTIVE GAME THAT DEMONSTRATES HOW INVASIVE SPECIES CAN SPREAD.

Materials Needed:

- Surveyors tape
- Outdoor field or large indoor area

Instructions:

1. Brainstorm with the group the terms introduced or foreign plant species/ native species / invasive species, and ensure they understand these definitions: introduced or foreign species are those that are brought by humans or animals into areas where they did not exist previously. An invasive species is one that can outcompete native species and can take over the habitat of the native species. Provide examples for your local region of each, and especially discuss and list several invasive species.

2. Select one student to be an invasive plant. Ask him/her to select which plant she would like to be. It should be from her/his local region.

3. Students spread out in an indoor or outdoor area so most (not all) of them are still able to touch if they stretch out their arms and legs. The group represents a local forest (for BC it would be a temperate rainforest or boreal forest) or grassland area.

4. Provide the invasive species student with some long pieces of surveyors tape and have them tie a loop onto one wrist.

5. Explain to the group that native plant species are those that naturally inhabit an area. Ask the rest of the group to select a native plant that they would like to be; they all stay in one place to "put down their strong roots", wave their arms to represent branches blowing in the wind, and spread their seeds.

6. The invasive plant can "shoot" seeds, like a Himalayan balsam plant (also known as Policeman's helmet). To do this the student can move one arm and one leg and stretch out.

7. If a native plant gets touched, she/he will turn into an invasive plant and get some tape around his/her wrist. This student will then also be able to stretch out an arm and a leg and touch other plants in the area, turning them into invasive plants. This can be represented by passing out surveyors tape to each new invader.

8. Stop the game when most of the plants have been turned into invasive plants. Ask all the invasive plants to sit down and the native plants to remain standing.

9. Discuss with the group what happened during the game. Discuss what would happen to the birds, mammals and insects that depend on the native plant species for food and shelter if these native plant species all died because of the invasive plant species.

ACTIVTIY 3) Weedy Scavenger Hunt

Primary / Elementary / Intermediate Activity Ages 5 – 12 (also a good "buddy" class activity)

STUDENTS GO ON A SCAVENGER HUNT TO LOOK FOR THINGS SPECIFICALLY RELATED TO PLANTS THAT ARE INVASIVE.

Materials:

- Weedy Scavenger Hunt sheets, clipboards, pencils
- Plant / weed field guides for your area
- An area outdoors with a diversity of native and invasive plants

Instructions:

1. Discuss the rules and boundaries for the scavenger hunt. Explain that the students are not to pick anything, leave things the way they found them, stay on trails to prevent erosion) and point out physical boundaries (explain where the group can go).
   This is a good activity to do in partnership with an older group of students, if you are working with young children.

2. Once on the site, point out examples of native plants and invasive plants in the area. Discuss the beneficial and harmful impacts or effects of several of the plants (e.g. thorns that can injure / beautiful flowers that attract bees and hummingbirds).

3. Have the students work in pairs to search the area and fill out the checklist sheet: they can check off items or draw them. Note: this checklist can be used with younger students if they have a partner or "buddy" to help them read the list, OR if just younger children are on the scavenger hunt, create the list using drawings to indicate what the younger children are to look for.

4. After they have had enough time to explore and search an area, gather the students together and discuss their findings.

ACTIVITY 4) Invasive Plant Field Guide

Elementary / Intermediate Grades (Ages 10 – 15)

AN EXPLORATION AND RESEARCH ACTIVITY WHERE STUDENTS FIND AND RESEARCH INVASIVE PLANTS IN THEIR REGION, AND CREATE A CLASS FIELD GUIDE.

Materials Needed:

- Paper
- Felt Pens/ coloured pencils
- Information on invasive plants: field guide or from internet

Instructions:

1. Discuss the difference between native, introduced and invasive plants as a class.

2. Go on a short walk or field trip to explore native and invasive plants in your area: visit the school grounds or a nearby park or natural area. Have students work in pairs to list the number and types of plants they find, and draw or take pictures of them.

3. Have each student select one or two invasive plants from your region and make pages for a *Local Invasive Plant Field Guide*.

4. For each species page, have the students draw a picture of the plant and include its:
   - colour
   - size and shape,
   - where it came from,
   - where it is found,
   - how it spreads around,
   - how many seeds it produces a year,
   - if it has any predators or pests that feed on it, and
   - what native species and environments it impacts.

   Also include any safety hazards that the plant might possess: e.g. if it has spines or burrs, if its sap is toxic or dangerous to touch.

5. In the field guide, include examples of what to do if you find the invasive plant species.

6. When everyone has completed their two pages, compile all the pages together into a booklet and make a Field Guide for your area.

ACTIVITY 5) Native / Non-Native Plant Collage

Elementary / Intermediate Grade levels (Ages 6 – 14)

A FUN ART ACTIVITY WHERE STUDENTS CREATE COLLAGES OF NATIVE AND NON-NATIVE PLANTS.

Materials Needed:

- Gardening Magazines and/or calendars, or some pictures from the internet of native / non-native plants in BC
- Scissors
- Glue Sticks
- Construction Paper
- Felt Pens

Instructions: for each student -

1. Make a collection of pictures / drawings of native and non-native plants found in your region. Use magazines or pictures from websites for pictures to cut out.

2. As a class, discuss the meanings of native and non-native species. Native plant species are those that naturally inhabit an area, while non-native plant species have been transported into the area, where they did not exist before, by humans or animals.

   Provide some examples for the group.
   - For example, tulips (native to southern Europe and the Middle East, cultivated in Holland) and tiger lilies are native to BC.
   - Himalayan blackberries and oranges are examples of non-native species, while local huckleberries and blueberries are some examples of native plant species.

3. Then discuss the difference between an invasive species and a non-invasive species.

4. Classify the pictures and create a collage of collections of native and non-native plant species, labeling all plants and identifying the invasive ones with a special symbol or icon.

ACTIVITY 6) "Wanted" Poster: Invasive Plants!

Elementary / Intermediate / Secondary grades (Ages 10 – 16)

A FUN ART AND RESEARCH ACTIVITY WHERE STUDENTS STUDY AN INVASIVE PLANT OF BC AND DESIGN A CREATIVE "WANTED" POSTER FOR THE PLANT.

Materials Needed:

- Poster Paper
- Felt Pens/Pencil Crayons, paints
- Field guide to invasive species or information from internet

Instructions:

1. Discuss the difference between native, introduced and invasive plants as a group. Then have each student select an invasive plant from your region and make a "*Wanted: Dead or Alive*" Poster about it. Sketch out an example on the board or on a flip chart page, to help students remember all the elements for the poster.

2. On the poster, have students include examples of how the four main distinguishing features of invasive plants are represented:
   - they are usually prolific seed producers (many produce thousands of seeds)
   - their seeds spread easily and effectively
   - they establish and spread quickly
   - they lack natural predators and diseases that generally keep their population under control in their native locations

3. Also have students include on their poster: the plant's common and Latin name ("known as"). The common name is the name that the plant is usually called by, while the Latin name is its scientific name (genus species). For example, purple loosestrife is known as *Lythrum salicaria*.

4. The poster should also include species characteristics (colour, shape, size, etc), "Crimes committed" (impacts it has on the ecosystem), "Last seen" (where it is found), and draw a picture of the plant.

Tell students to add as much humour as they'd like! Share your "Wanted" posters with your community: ask to make a display in your local community centre, library or mall.

ACTIVITY 7) Invasive Plant Photo Scavenger Hunt

Intermediate/Secondary Grades (Ages 12 – 17)

STUDENTS GO ON A FIELD TRIP TO LOOK FOR AND PHOTOGRAPH NATIVE AND INVASIVE PLANTS TO DESIGN A FIELD GUIDE OR POWERPOINT SLIDESHOW.

Materials Needed:

- Digital cameras or cell phones
- Paper, pencils, clipboards
- Local invasive plant field guide or information from the internet
- Local field guide to native plants

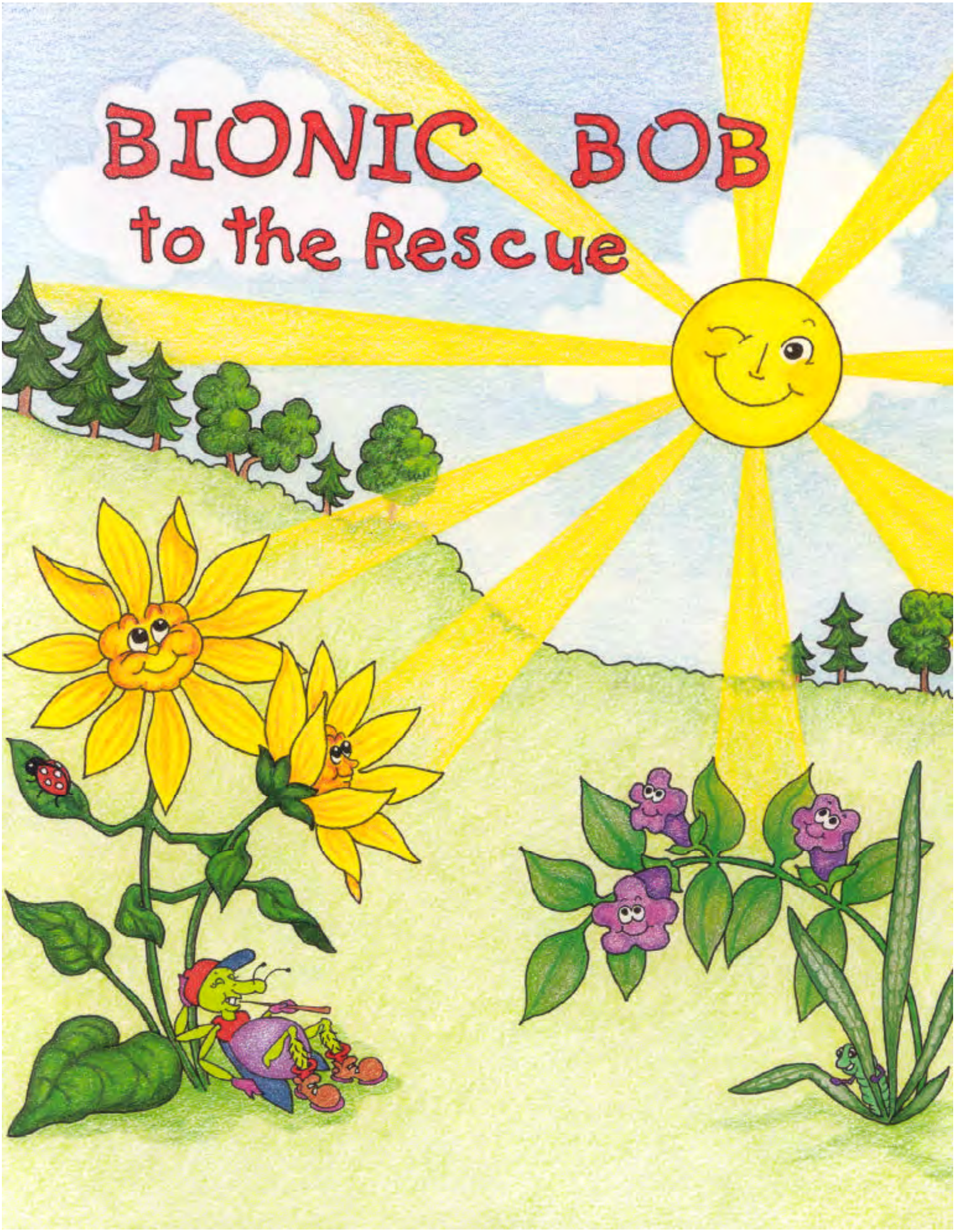
Instructions:

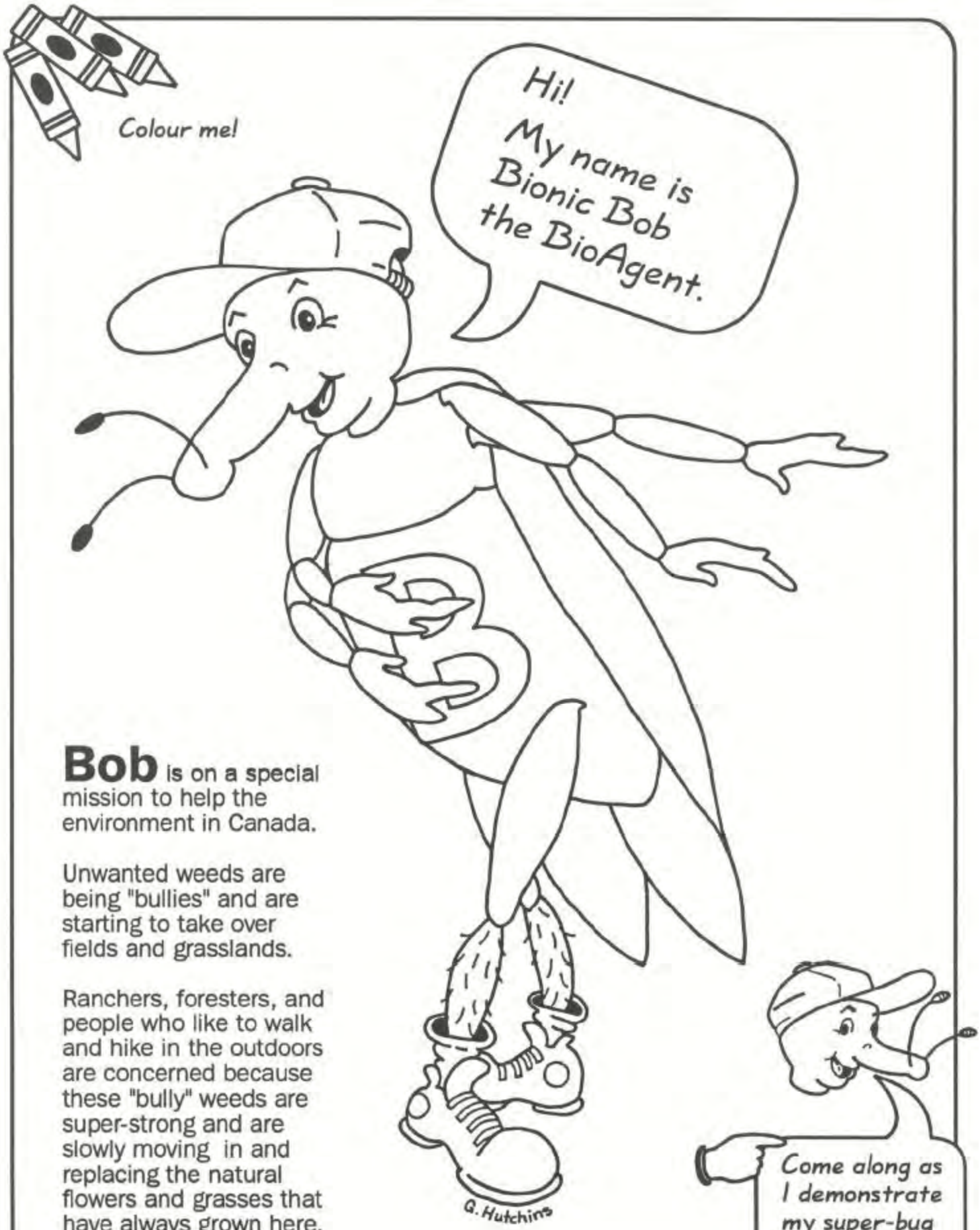
1. Head out with the class on a scavenger hunt to search for native and invasive plants in your region, and take along invasive and native plant field guides or information from the web. Park naturalists, gardeners, farmers, ranchers, local government employees or your regional invasive species committee can help identify what plants are invasive and where they might be located, and sometimes can accompany you on your tour. The Invasive Species Council of BC lists regional committees on their website: http://www.bcinvasives.ca/partners/committees

2. Note: make sure you know about any plants that might be dangerous or hazardous to touch. Discuss with the group the general safety precautions to take and describe any hazards you might come across on the scavenger hunt. Make sure to stay on the trails.

3. Have students work in pairs to take pictures of (or draw) as many invasive plants and native plants that they can find (at least two native and two invasive species for each student). Have students write down what the species name is, where they found it, and the date. Find out more about the area and if any community or environmental groups are working to manage the invasive plants.

4. Put together an online or printed booklet of the photos everyone took, and create your own local native and invasive plant field guide OR Powerpoint slideshow. Include some of the impacts that the invasive plants are having in your region, and discuss whether the invasive plants are impacting the native plants you included, and how. Show your guide or slideshow to another class, or a community group.


BIONIC BOB
to the Rescue



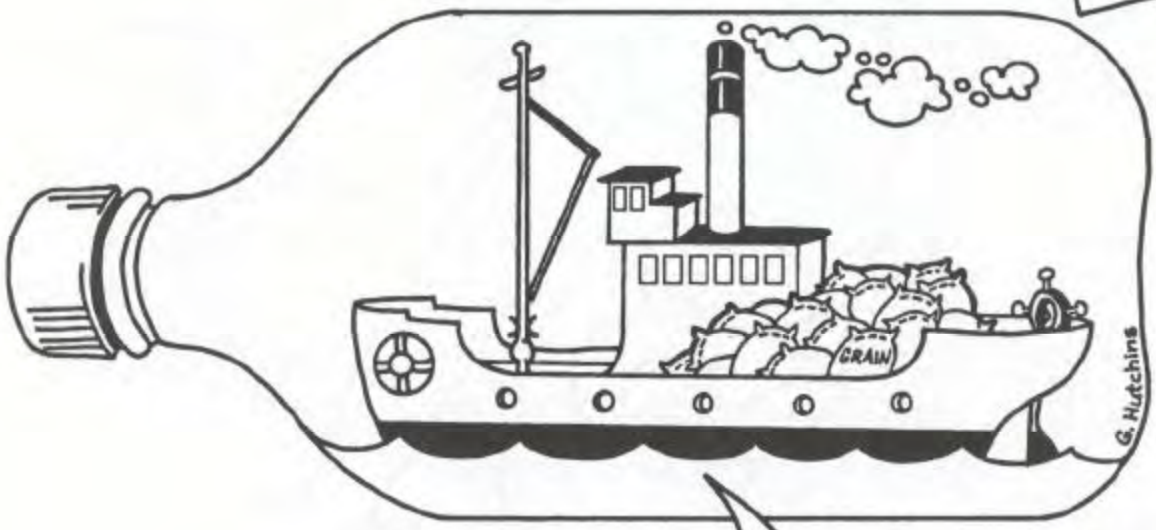
Bob is on a special mission to help the environment in Canada.

Unwanted weeds are being "bullies" and are starting to take over fields and grasslands.

Ranchers, foresters, and people who like to walk and hike in the outdoors are concerned because these "bully" weeds are super-strong and are slowly moving in and replacing the natural flowers and grasses that have always grown here.

Some weed seeds

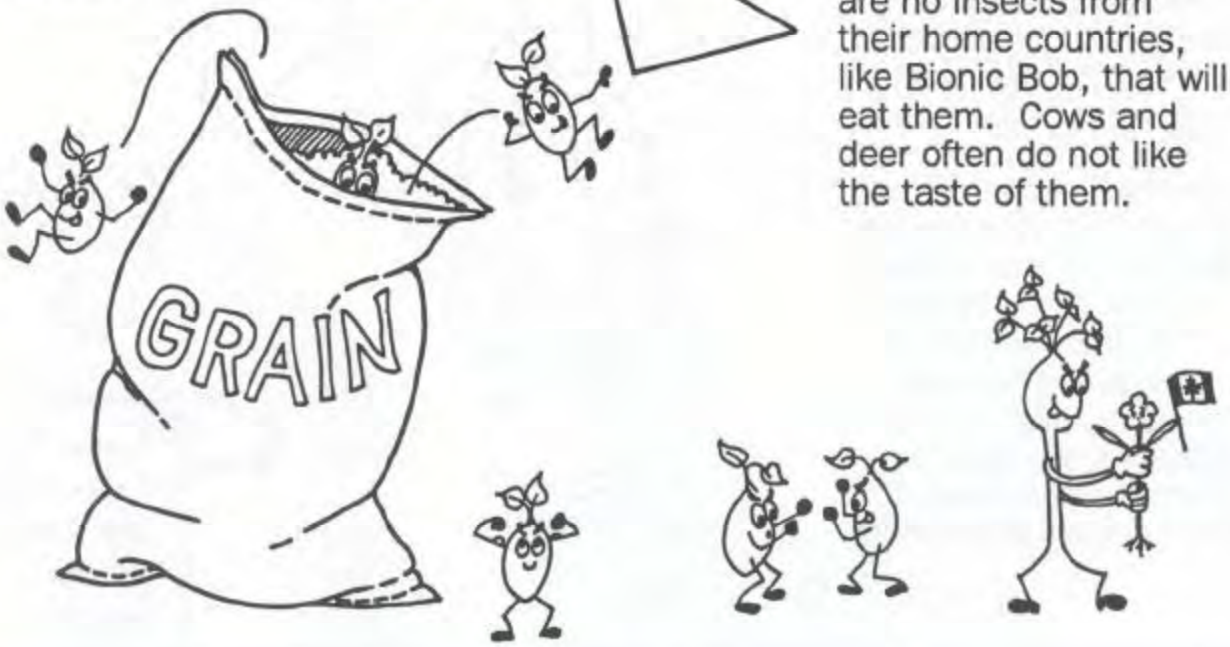
first came to Canada
as stow-aways in bags of grain
from faraway places
like Europe and Asia.



Weeds

from other places like it here.

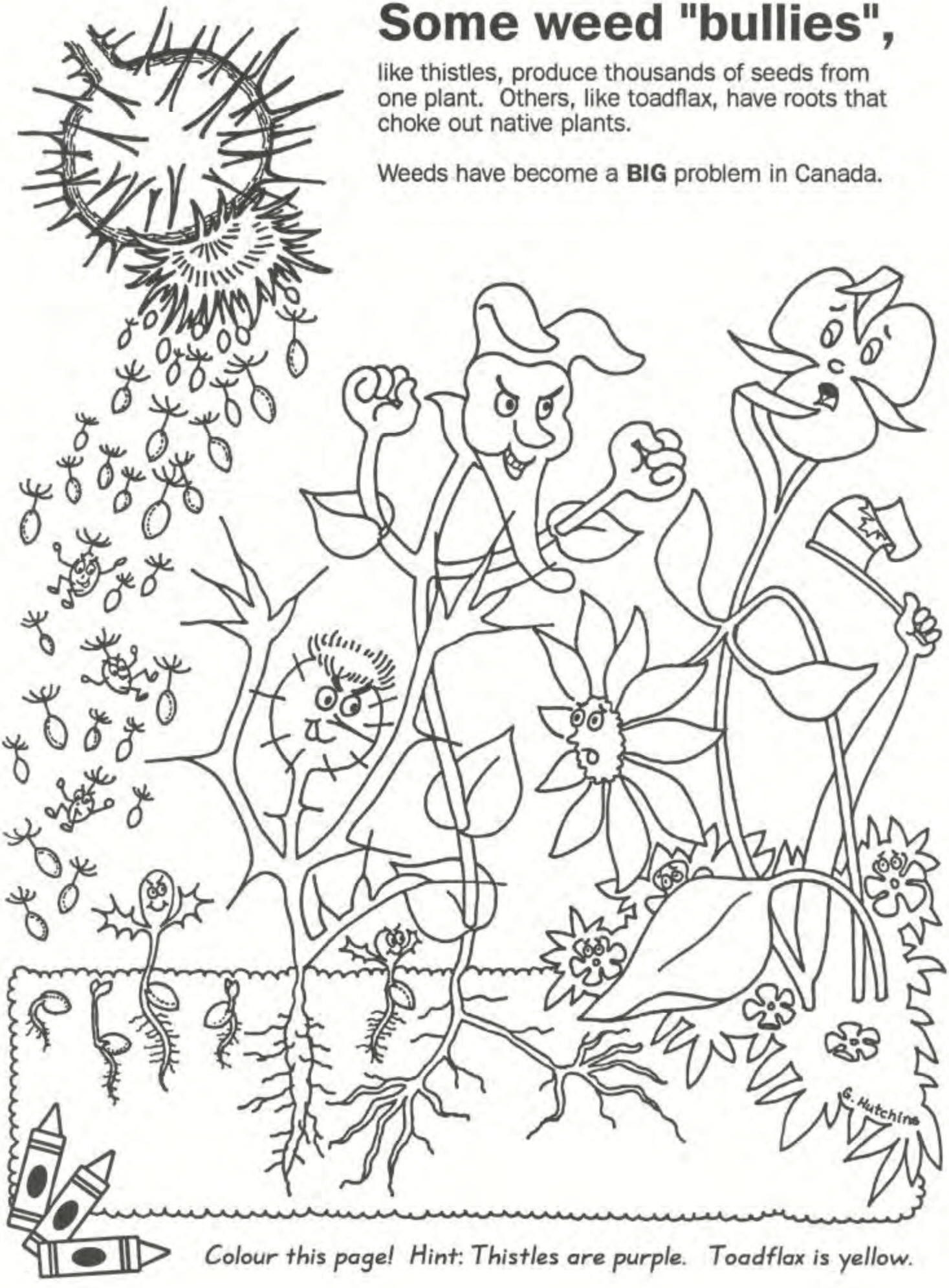
They quickly grow and spread because there are no insects from their home countries, like Bionic Bob, that will eat them. Cows and deer often do not like the taste of them.



Some weed "bullies",

like thistles, produce thousands of seeds from one plant. Others, like toadflax, have roots that choke out native plants.

Weeds have become a **BIG** problem in Canada.



Colour this page! Hint: Thistles are purple. Toadflax is yellow.

BIONIC BOB the BIOAGENT to the Rescue!

Here's where I enter the picture ... I was brought over from the country where the unwanted weeds came from.

Some of my family and friends are coming over too, once Scientists check them out.

Colour me and my pals!

Before Bob could come

to Canada, Scientists had to make sure that he would eat only the certain "bully" weed for which he was chosen, and that he would not start munching on any native plants.

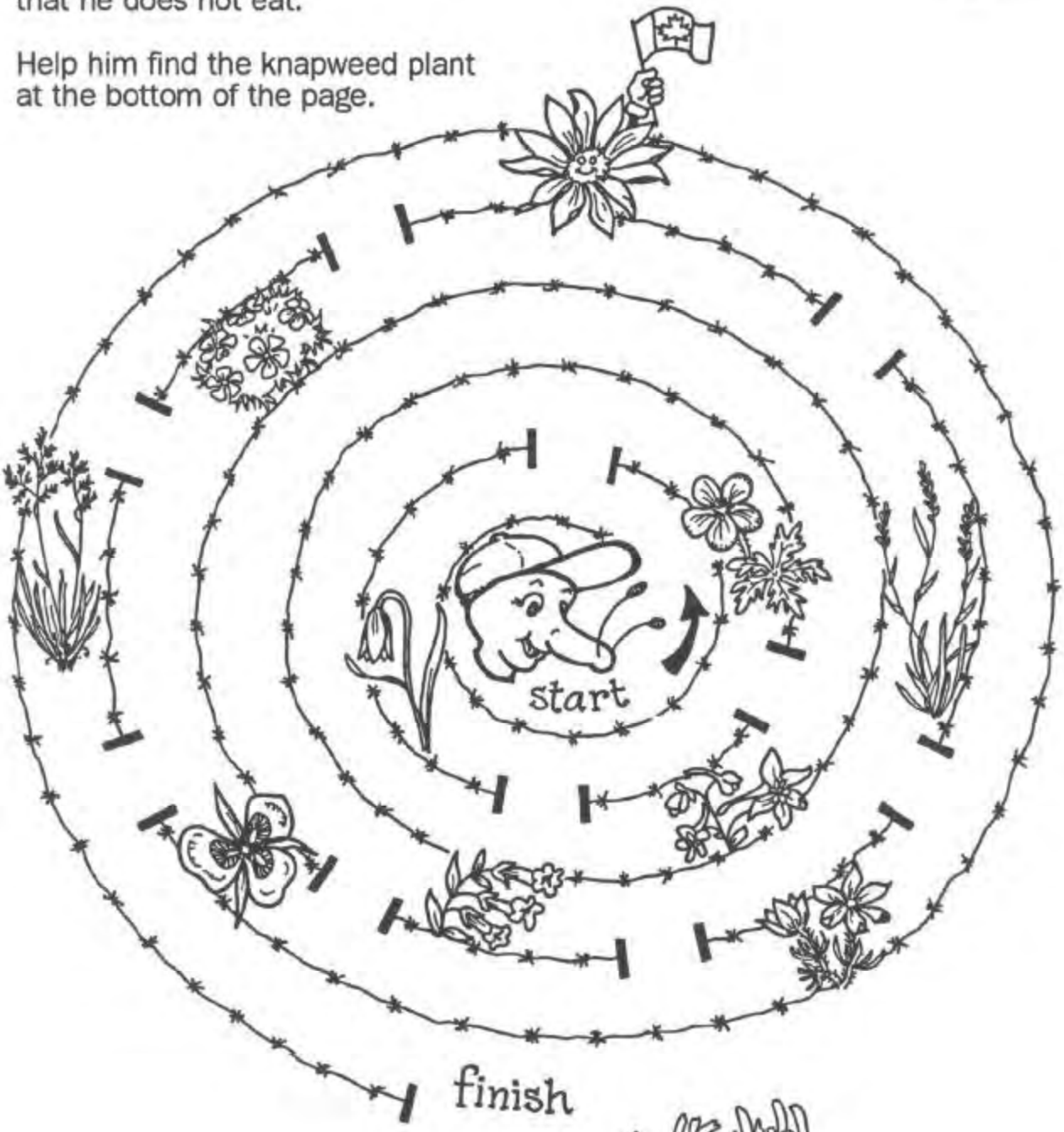
Colour me!


Colour me! The plant is a balsam root. Its flowers have yellow petals with a brown center.
I'd rather DIE than eat this!
D
Glenda Hutchins

NATIVE PLANT MAZE

Bionic Bob is hungry! But he is surrounded by native North American plants that he does not eat.

Help him find the knapweed plant at the bottom of the page.

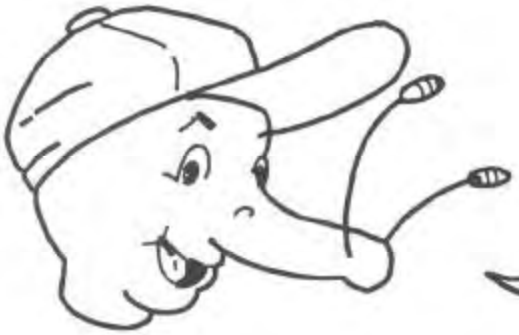



WOW!
Looks like your native plants could use some help in this field.
I'll zoom on in and see what I can do!

How many of Bob's buddies can you find in this picture?

There are lots because there
is plenty for them to eat with
so many "bullies" on the loose!

FAR-OUT FACTS

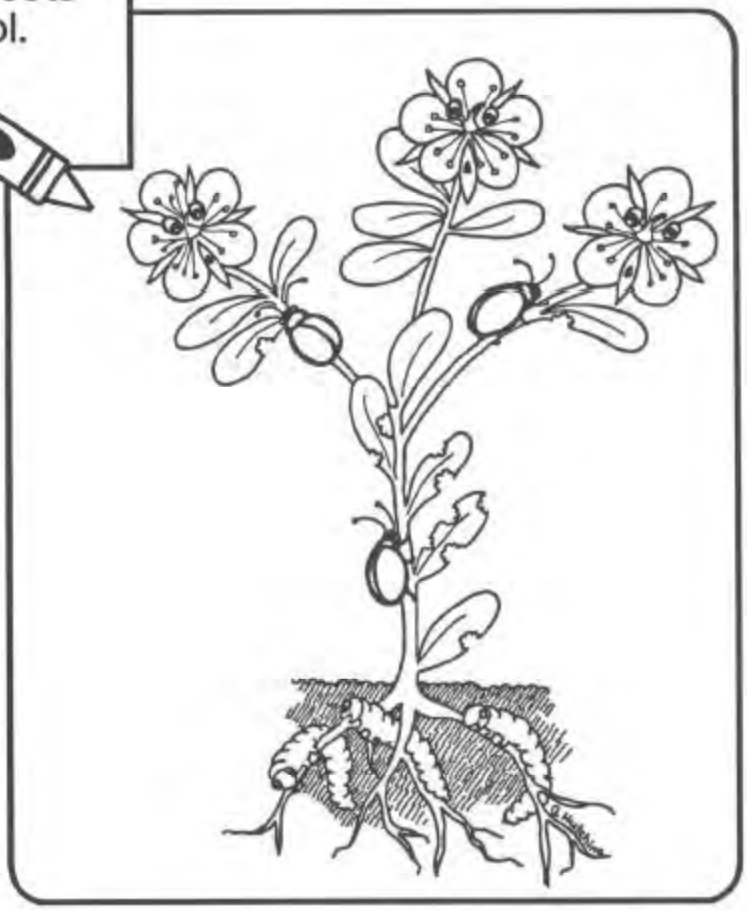


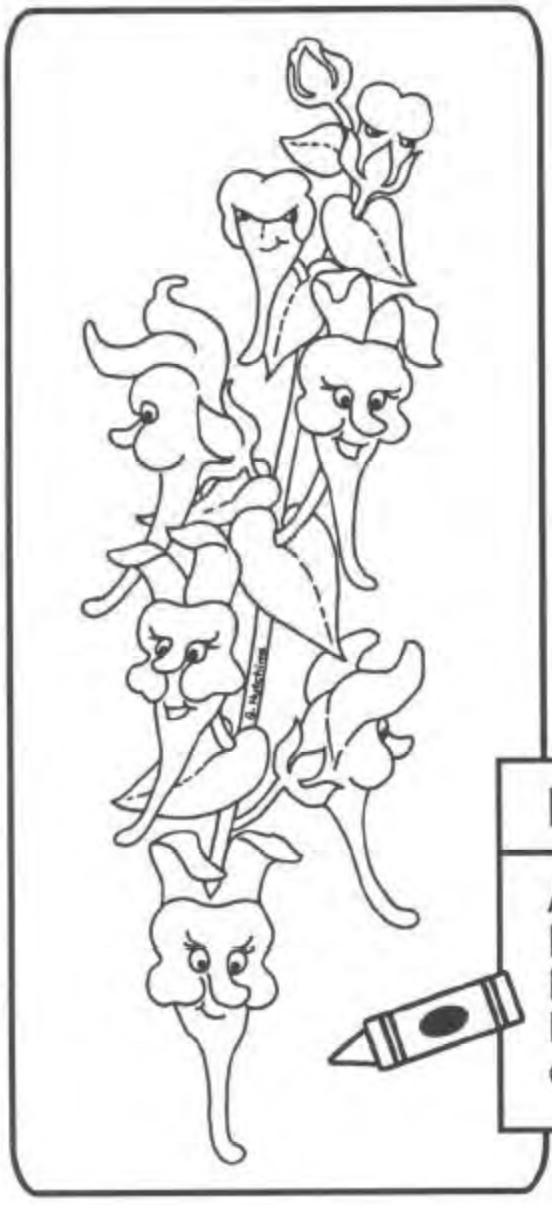
Here's a close-up look at 4 of the bullies that are invading grasslands and forests in B.C.

ST. JOHN'S WORT

The first bionic BioAgents ever released in B.C. were invited to dine on my roots and leaves. Now I am under control.

My flowers are yellow.





DALMATIAN TOADFLAX

Another name for me is "Butter and Eggs". Do not let my sunny yellow colour fool you because I, too, am on the unwanted weeds list. You can find me along roadsides and even in people's gardens!

SPOTTED KNAPWEED

I can produce over 1000 seeds in one season. I spread my seeds by hitch-hiking on people's trucks or on animals' fur.

Colour my "hair" purple.

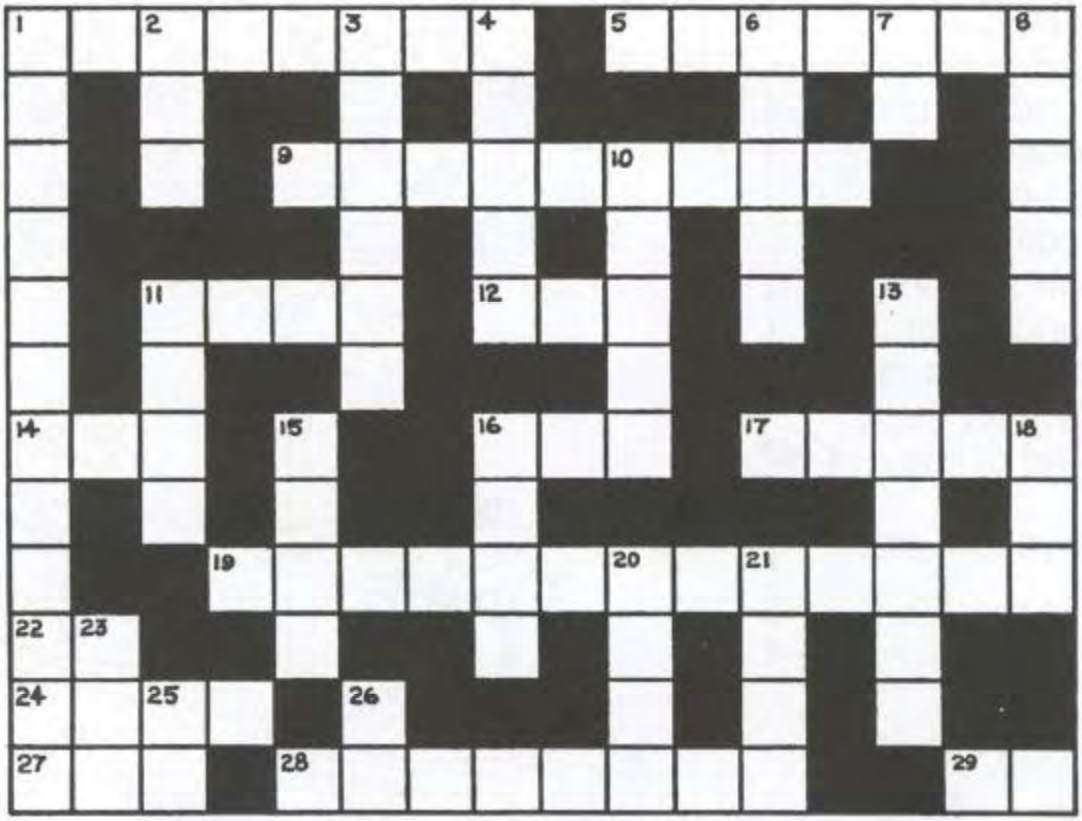
LEAFY SPURGE

Watch out when you break open my stem. I ooze a milky-coloured juice that can poison cows and other livestock. It is no wonder they want to get rid of me.

I am a yellow-green flower.

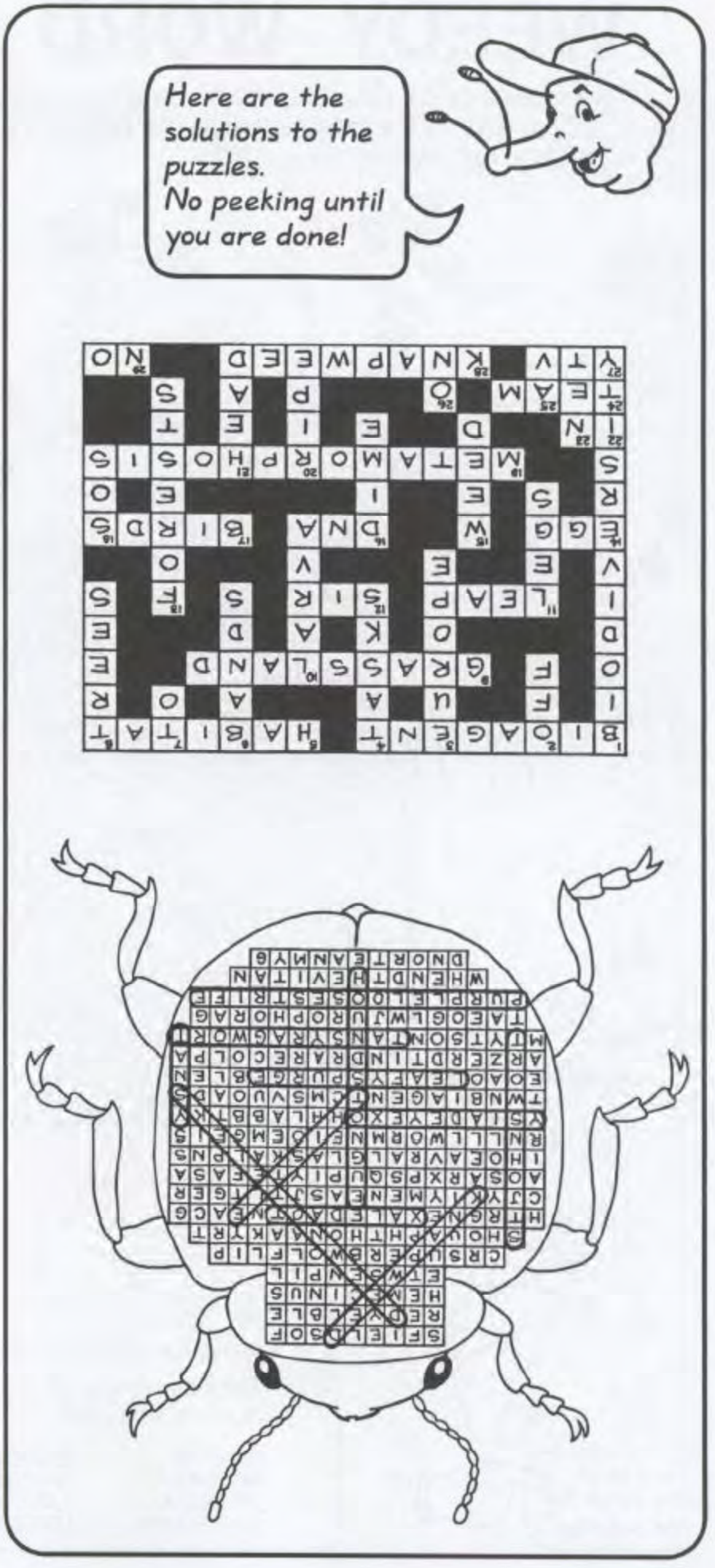
CLUES ACROSS:

1. An insect that eats unwanted weeds is called a --------
5. An animal's home is its -------
9. Word for an area where cattle and sheep graze
11. Look before you ----
12. Opposite of madame
14. All insects and birds begin as this
16. Deoxyribonucleic acid
17. Winged creatures
19. Word for changes that an insect goes through in growth
22. Opposite of OUT
24. A ---- of bioagents help control weeds
27. Abbreviation for "youth television" on cable vision
28. An unwanted weed that "hitch-hikes" on fur and vehicles
29. Will bioagents eat native plants?



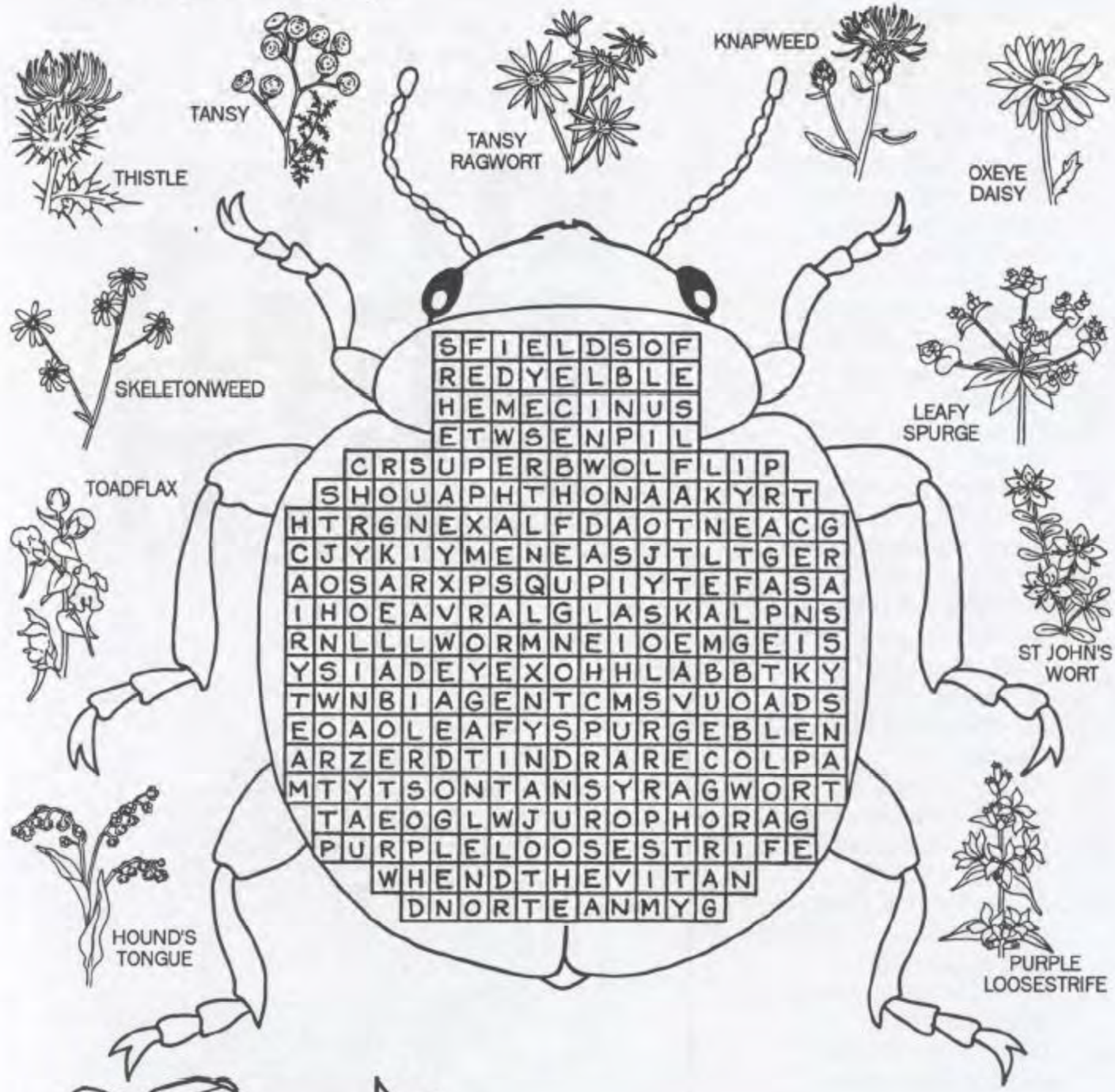
CLUES DOWN:

1. The right number of plants and animals in an area is called ----------.
2. Turn the light --- when you leave a room
3. Place where many weed seeds came from
4. Bionic Bob and his friends have many important ----- to perform
6. Birds that are being studied may have ----- around their legs
7. -- and fro
8. Forests have lots of these
10. The wingless, often wormlike form of a newly hatched insect
11. An insect has six ----
13. Find this Ministry number in your phone-book if you see unwanted weeds
15. An unwanted plant is called a ----
16. Penny, nickel, ----
18. Morse code for "Help"
20. Don't pick fruit until it's ----
21. An insect has three body parts: ----, thorax and abdomen
23. A --- comes in handy when catching butterflies (Please release them after you've studied them!)
25. Abbreviation for "audiovisual"
26. Opposite of OFF



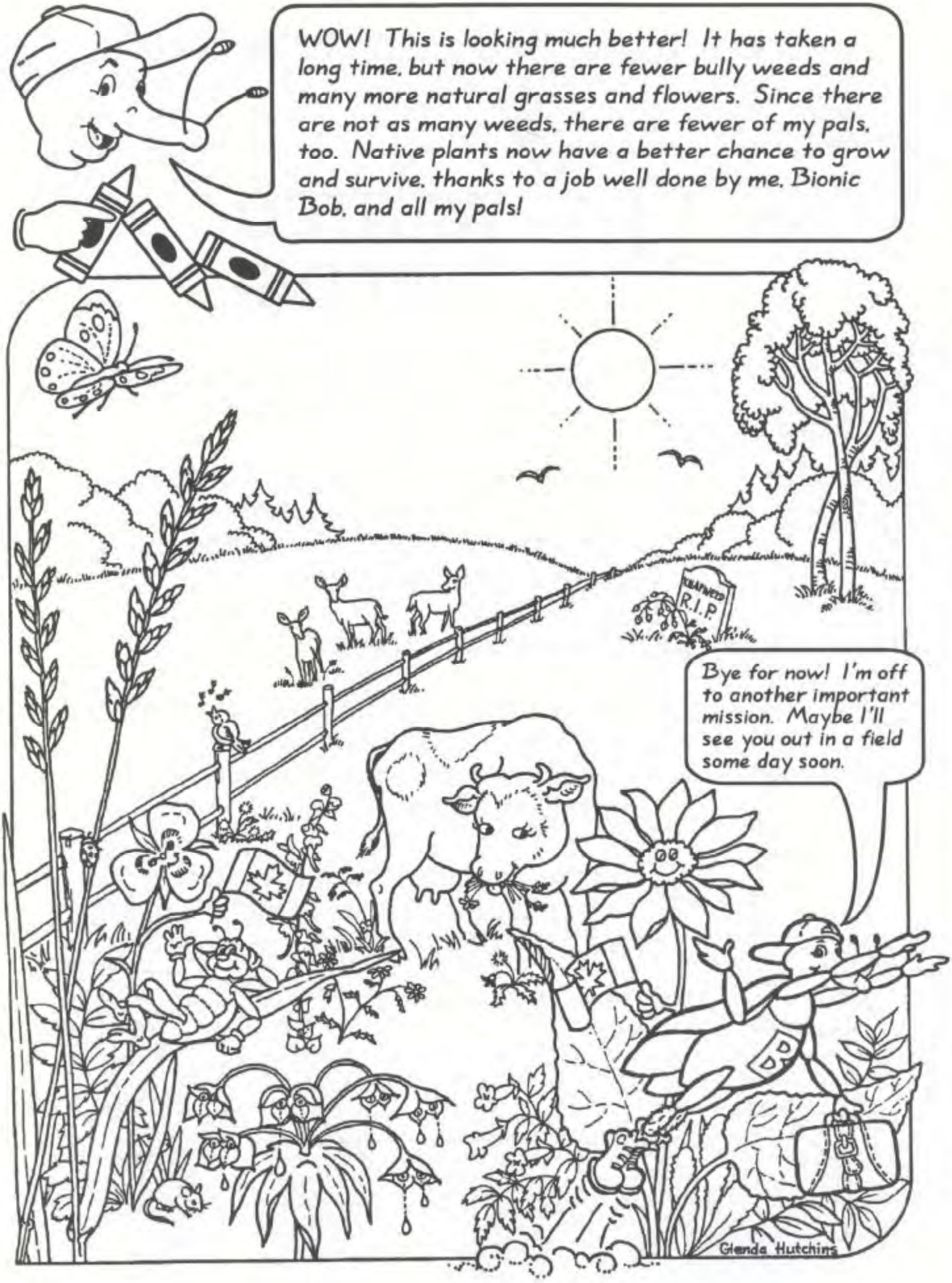
WEEDY WORD SEARCH

The names of 11 different unwanted weeds are scattered around this page. Can you find all the names inside the beetle? Look forward, backward, vertically, and diagonally.

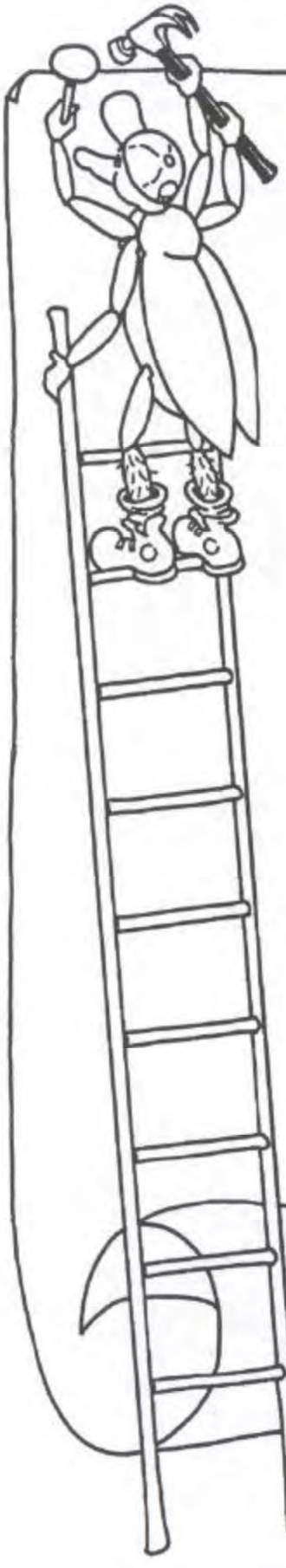


For a real challenge, try to find these names of some of Bob's friends:

AGAPETA
APHTHONA
APLOCERA
CHRYSOLINA
ETEOBALEA
GYMNAETRON
LARINUS
LOBESIA
MECINUS
TYRIA
UROPHORA


WOW! This is looking much better! It has taken a long time, but now there are fewer bully weeds and many more natural grasses and flowers. Since there are not as many weeds, there are fewer of my pals, too. Native plants now have a better chance to grow and survive, thanks to a job well done by me, Bionic Bob, and all my pals!
R.I.P.
Bye for now! I'm off to another important mission. Maybe I'll see you out in a field some day soon.
Glenda Hutchins

Here's how YOU can help Bob!



Un-WANTED WEEDS

1. Learn to recognize "bully" weeds that now make their home in B.C.
2. Explore your backyard and school grounds for unwanted weeds. Report sightings to the nearest Forest Service office.
3. Pull out weeds by their roots.
4. Be a scout and check around your parents' vehicle before leaving a weed-infested area. Remove attached weeds.
5. There are other "bullies" on the unwanted weeds list. Find out more by contacting the Forest Service.

Thanks for helping!

LEAFY
SPURGE

THISTLE

HOUND'S-TONGUE

DALMATIAN
TOADFLAX

RUSH
SKELETONWEED

SPOTTED
KNAPWEED

ST. JOHNS-WORT

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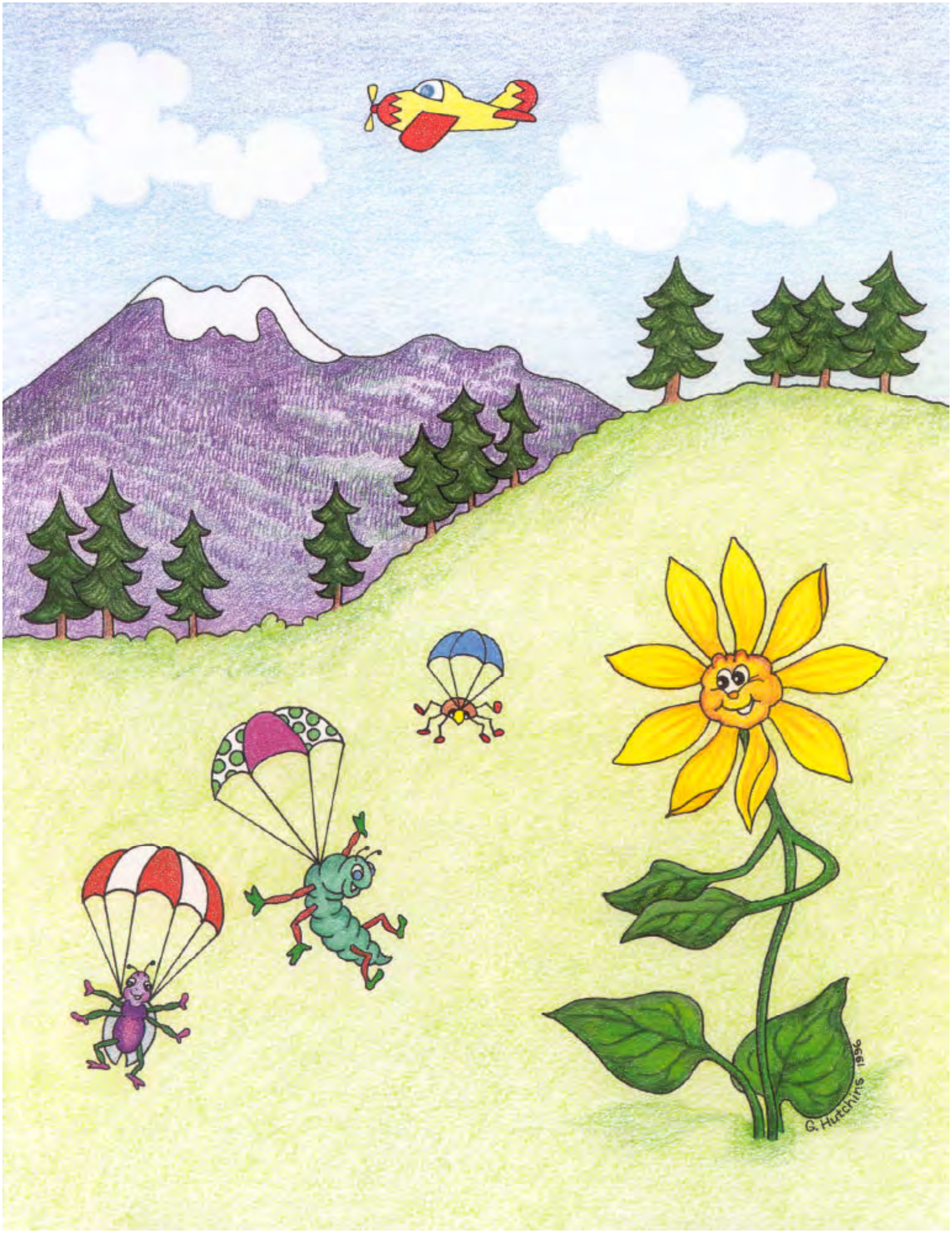
G. Hutchins 1996