INTEGRATED PEST MANAGEMENT

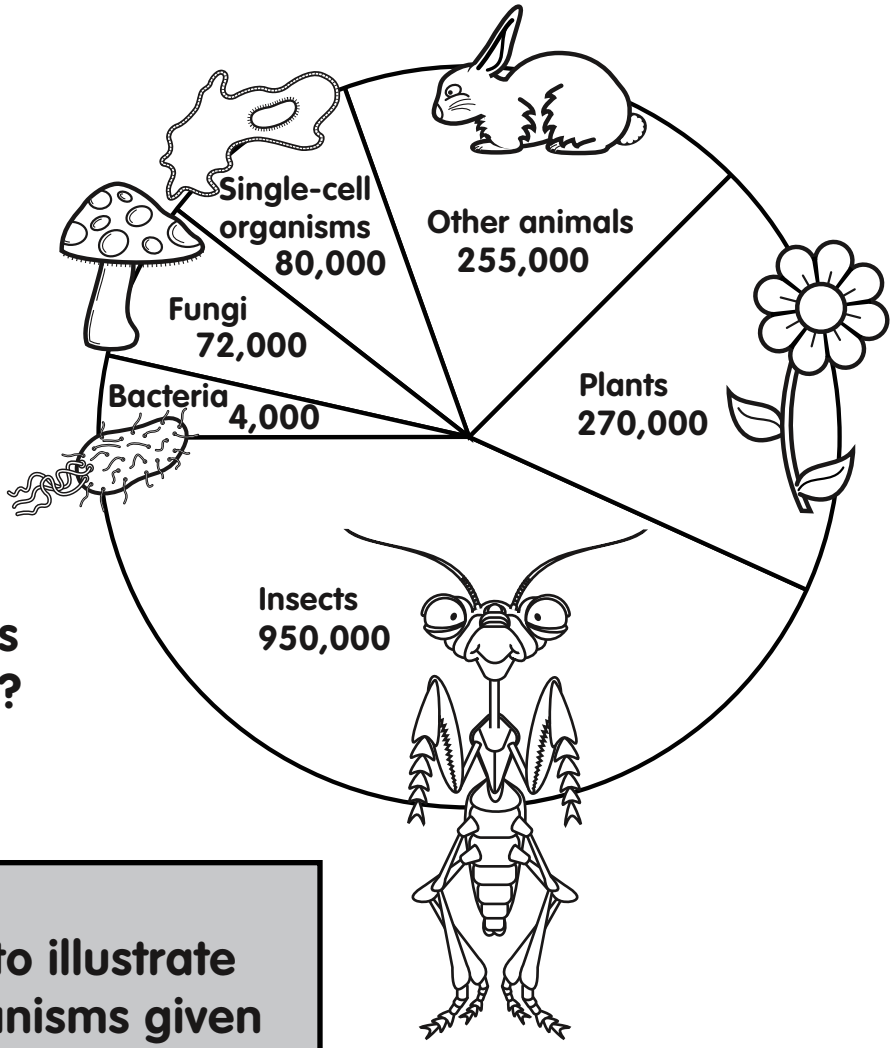
IPM

University of Connecticut
College of Agriculture and Natural Resources
Cooperative Extension System

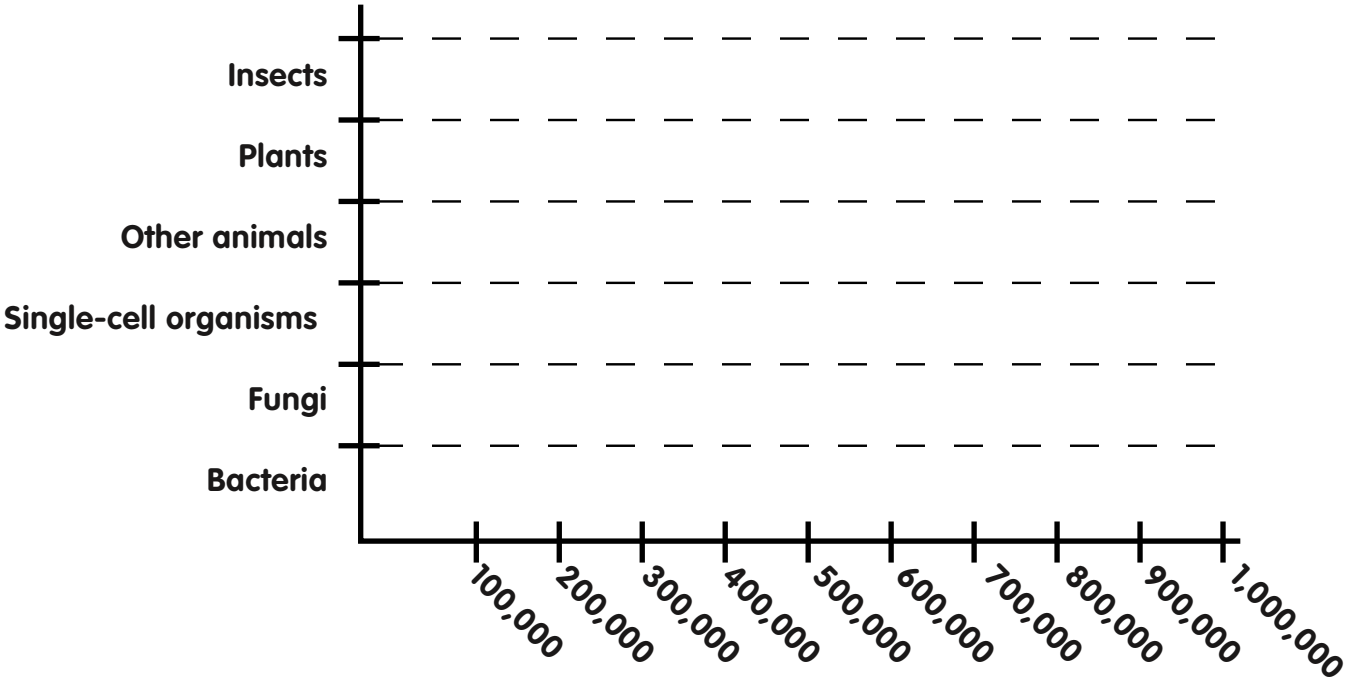
Biodiversity:

the variety of living things that inhabit the planet

Our planet has many different types of living things. Which of these groups do humans belong to?

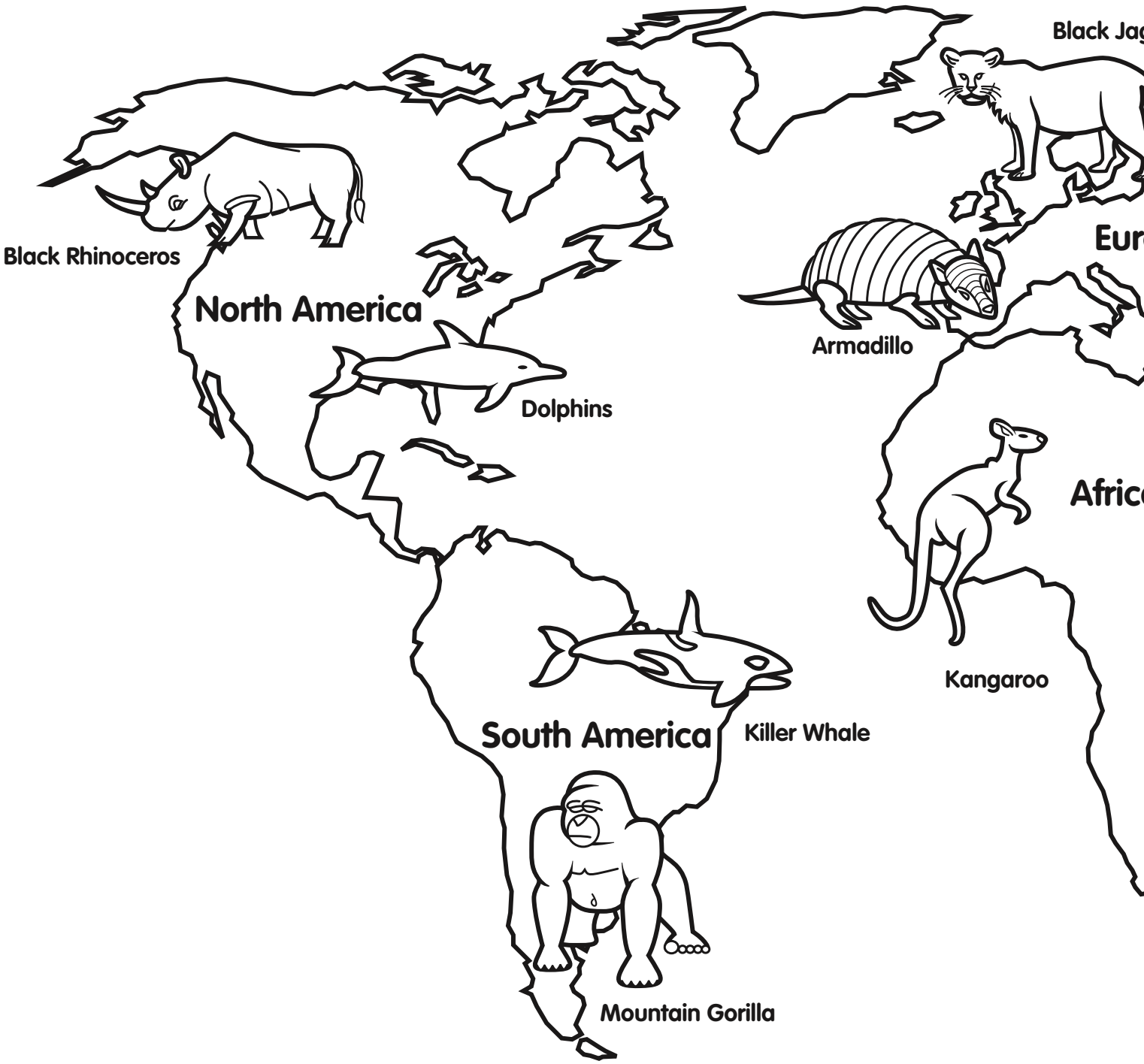


CHALLENGE:
Create a bar graph to illustrate the numbers of organisms given on the circle graph



Time Is Running Out

These endangered animals have gotten all mixed up!
Draw a line to help them find the continent they belong on.



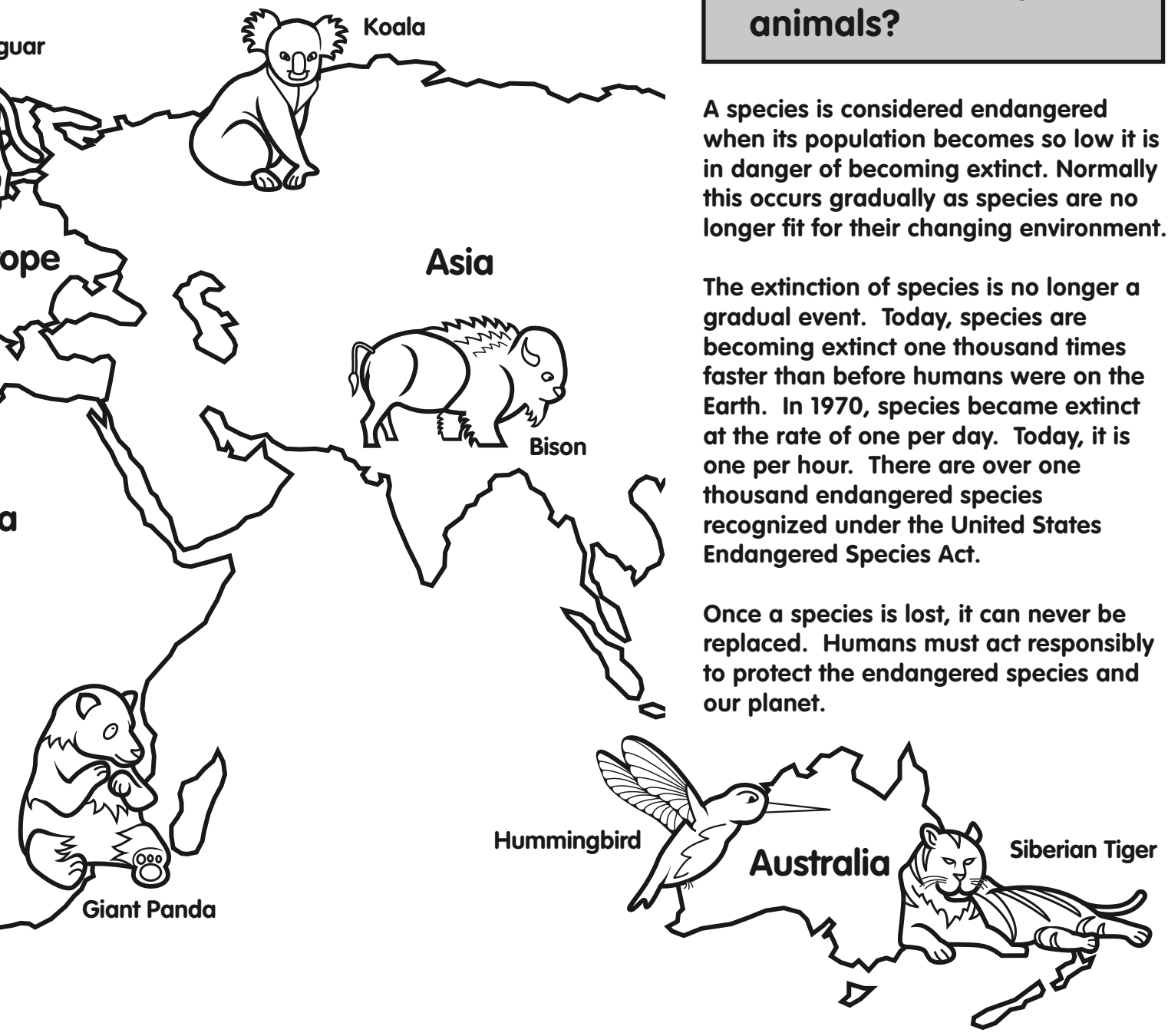
tain Gorilla, Black Rhinoceros. Asia: Giant Panda, Siberian Tiger. Australia: Kangaroo, Koala.

Q.
What is the greatest threat to endangered animals?

A species is considered endangered when its population becomes so low it is in danger of becoming extinct. Normally this occurs gradually as species are no longer fit for their changing environment.

The extinction of species is no longer a gradual event. Today, species are becoming extinct one thousand times faster than before humans were on the Earth. In 1970, species became extinct at the rate of one per day. Today, it is one per hour. There are over one thousand endangered species recognized under the United States Endangered Species Act.

Once a species is lost, it can never be replaced. Humans must act responsibly to protect the endangered species and our planet.



A. Man! North America: Bison, Hummingbird. South America: Armadillo, Black Jaguar. Europe: Dolphins, Killer Whale. Africa: Moun

Plan Your Work, Work Your Plan.

Help Izzy unscramble these words using the six steps of Integrated Pest Management.

The 6 steps of IPM
Word Bank

Choose	Evaluate	Research
Action	Identfiy	Sample

Then use the circled letters to complete the phrase at the bottom of the page.

DETNIYFI

1. ___ ___ ___ ___ ___ ◯ ___ ___ the pest

SEHACRER

2. ___ ___ ___ ___ ◯ ___ ___ ___ its life style

MELASP

3. ___ ___ ◯ ___ ___ ___ the environment for pest population

CINATO

4. Determine ___ ___ ___ ___ ___ ◯ threshold

OSOEHC

5. ___ ___ ___ ___ ◯ ___ management tactics

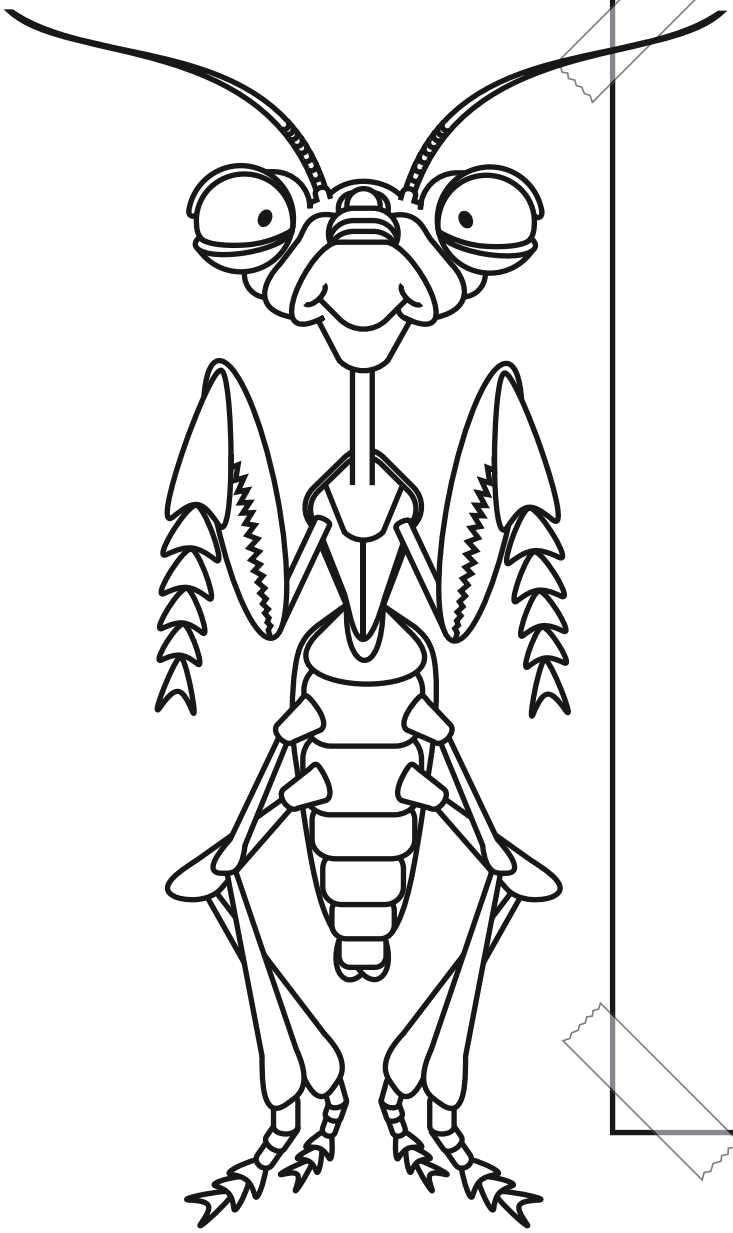
VETULAAE

6. ___ ___ ___ ___ ___ ___ ◯ ___ results

IZZY THE PRAYING ___ ___ ___ ___ ___ ___

Safety First!

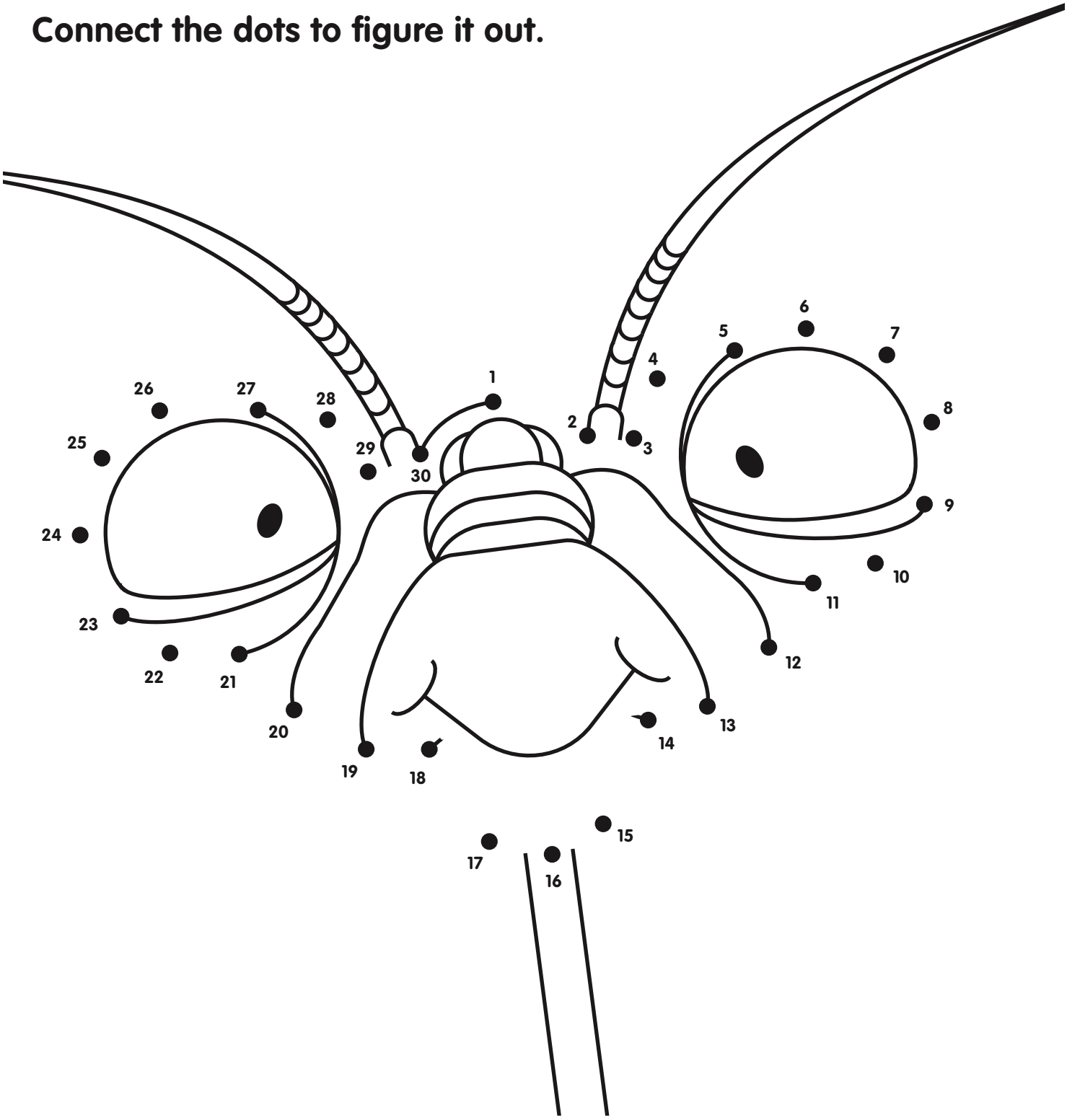
Draw a poster urging people to use IPM.



Our friends and families, woodlands and waters
Need our protection, each and every day.
We can help them without polluting
It's called the IPM way!

Who could this be?

Connect the dots to figure it out.



Hint: He is the official insect for the state of Connecticut and the mascot for IPM.

What's the Buzz?

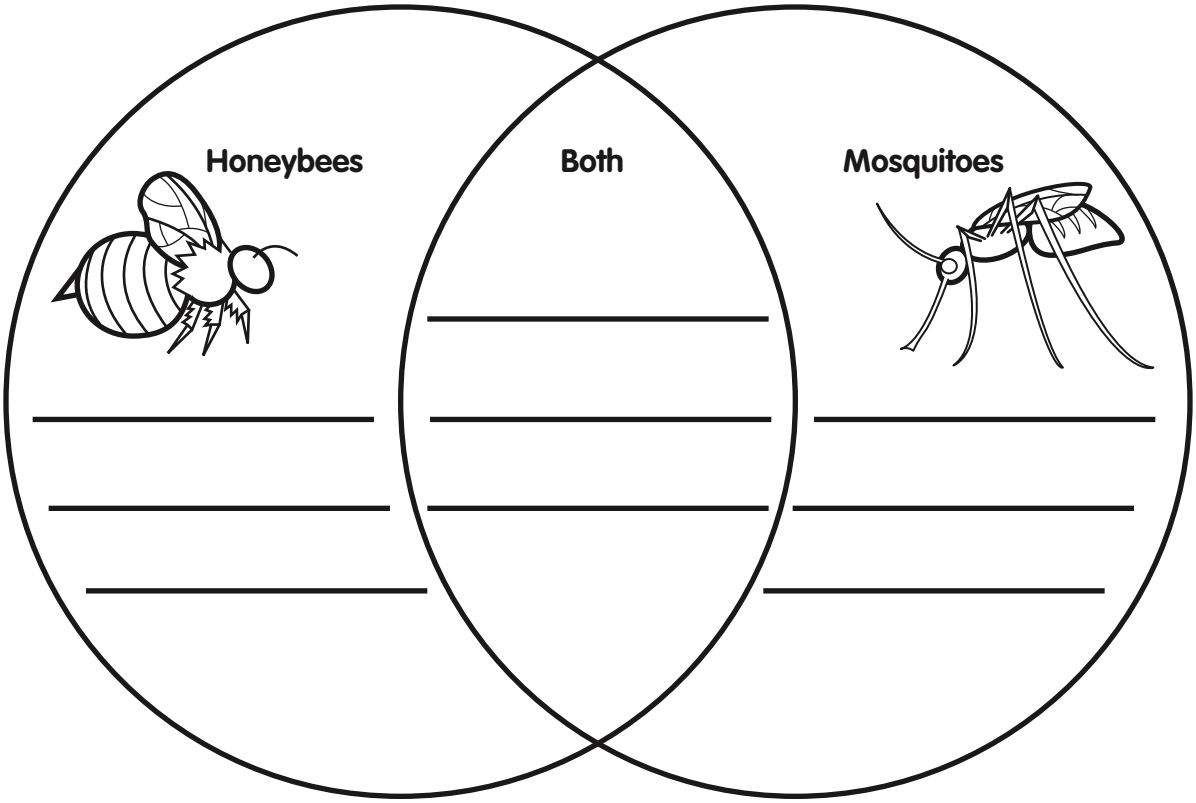
Each of these insects has some traits that are the same and some that are different. Write the traits where they belong in the diagram.

Honeybees:

-make honey in hives
-have three body parts
-have antennae
-work together
-sting when angry
-have three pairs of legs

Mosquitoes:

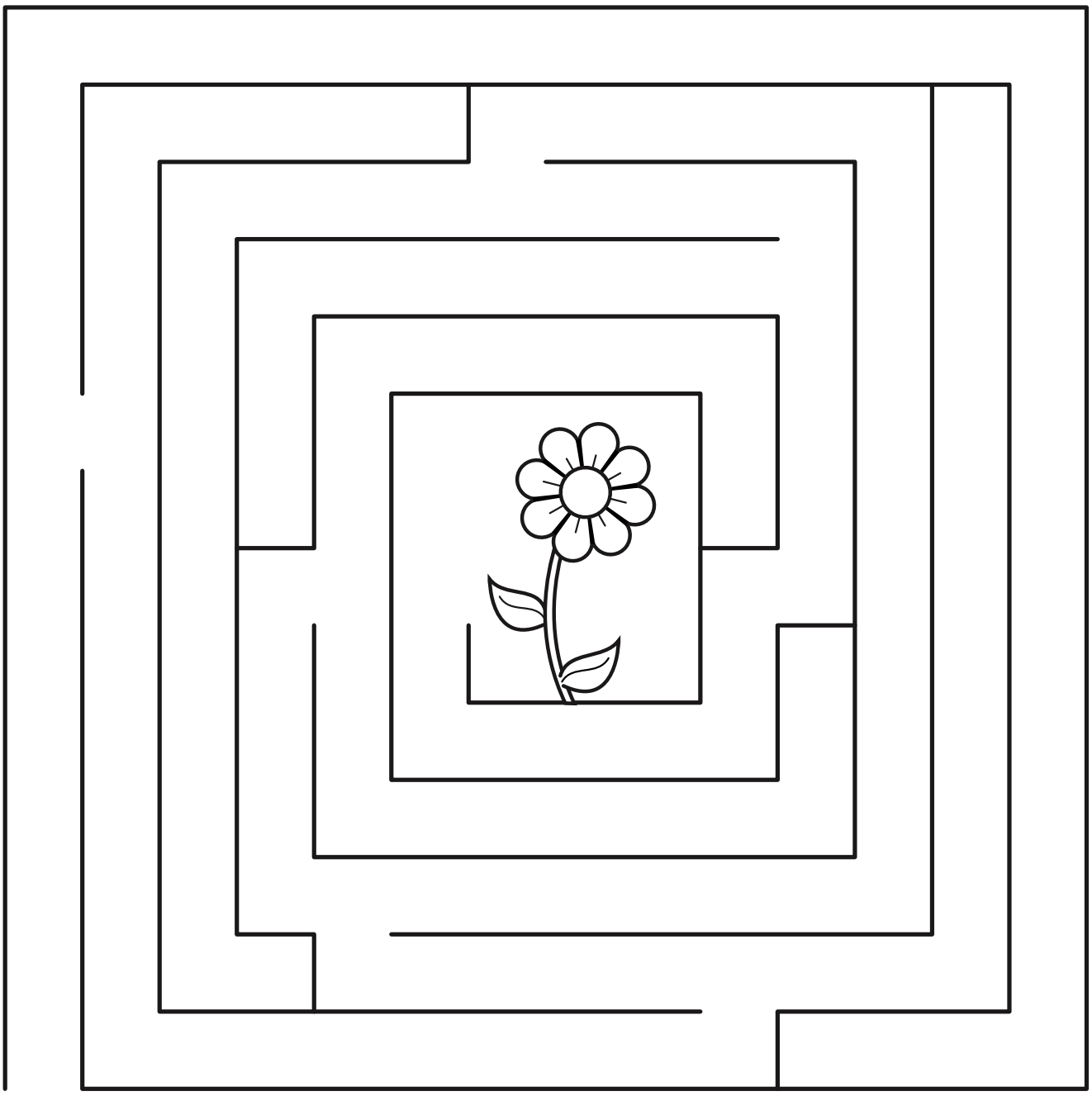
-have three pairs of legs
-have antennae
-live on damp, shady places like swamps
-eat nectar and suck blood (females only)
-cause disease
-have three body parts

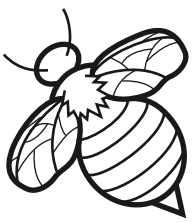


Tip:
To avoid mosquito bites, make sure that you dress right!

Make a "Bee"line

Help the forager bee find its way to the flower so it can gather the nectar.





Q.
Bees pollinate the most plants. Which group is second?

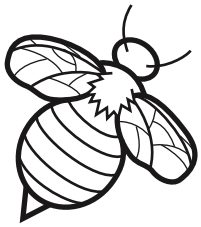
A. Butterflies!

Beehive Word Search

Honeybees work together. They cooperate. Division of labor is really great!

Can you find the secret hidden word?

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

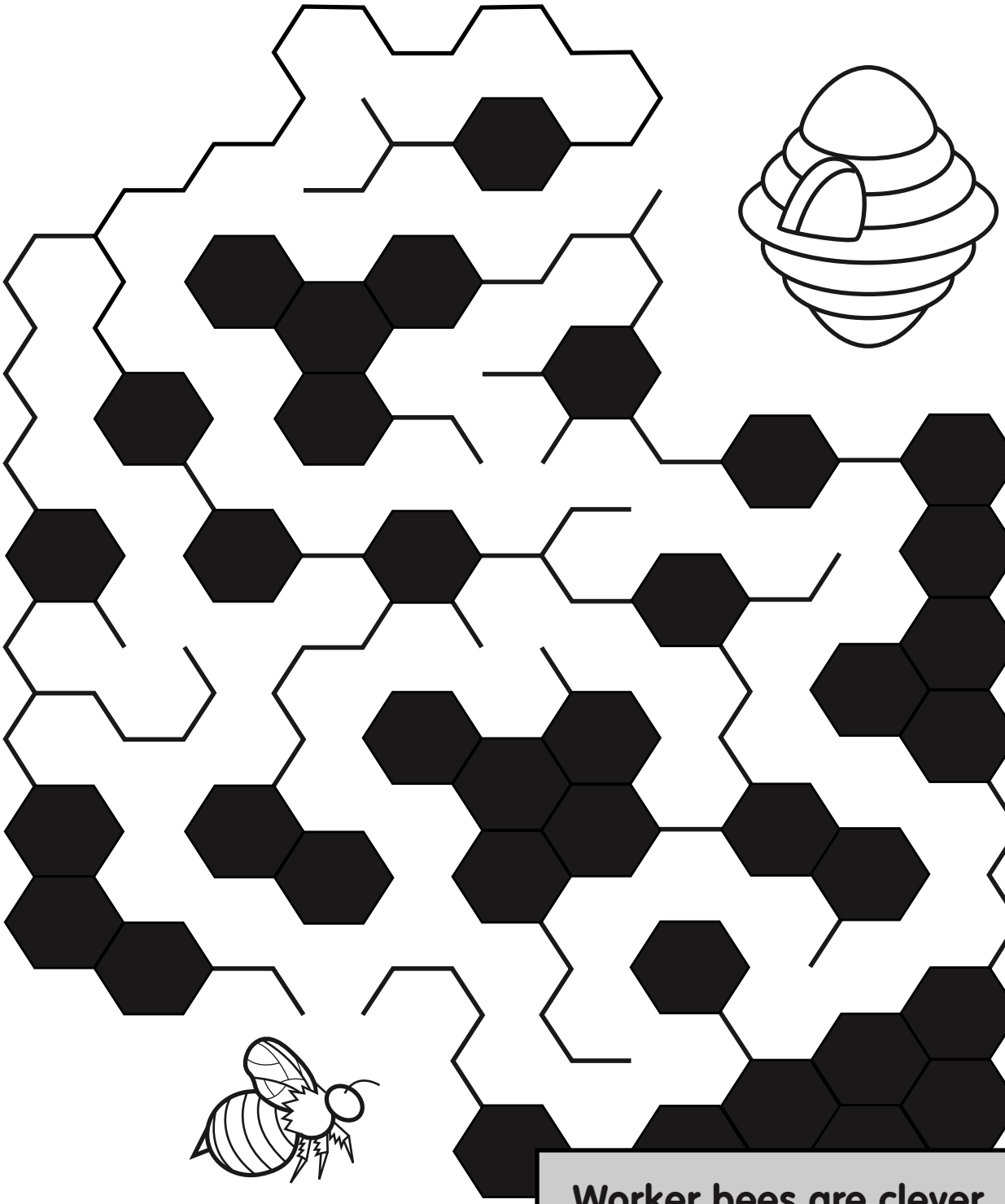


ADULT
BEESWAX
BROOD
COLONY
EGG
FORAGER
HIVE
HONEYCOMB
LARVA
METAMORPHOSIS
NECTAR
POLLEN
QUEEN
WAGGLE
WORKER

A. Honeycomb

It's Good to "Bee" Home

Help the worker bee find its way home to the hive.

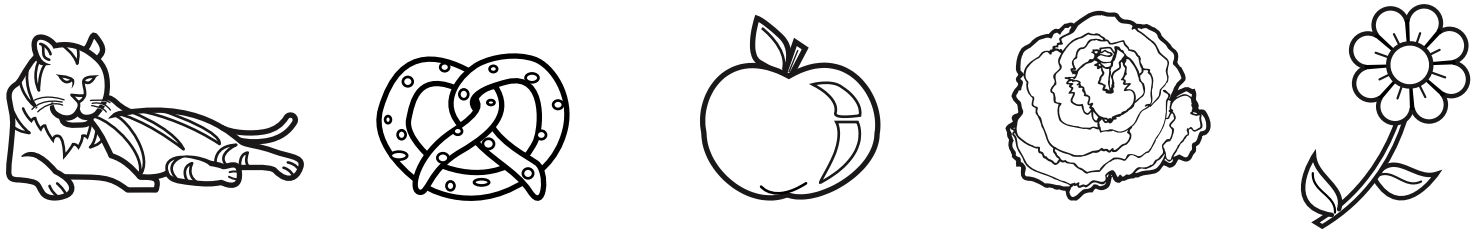


**Worker bees are clever.
When they need a home,
They just build a honeycomb!**

Nibble, Sip, and Grind

Match the insect to its food source.

Remember, each insect might have more than one food source, and two insects might eat the same food.

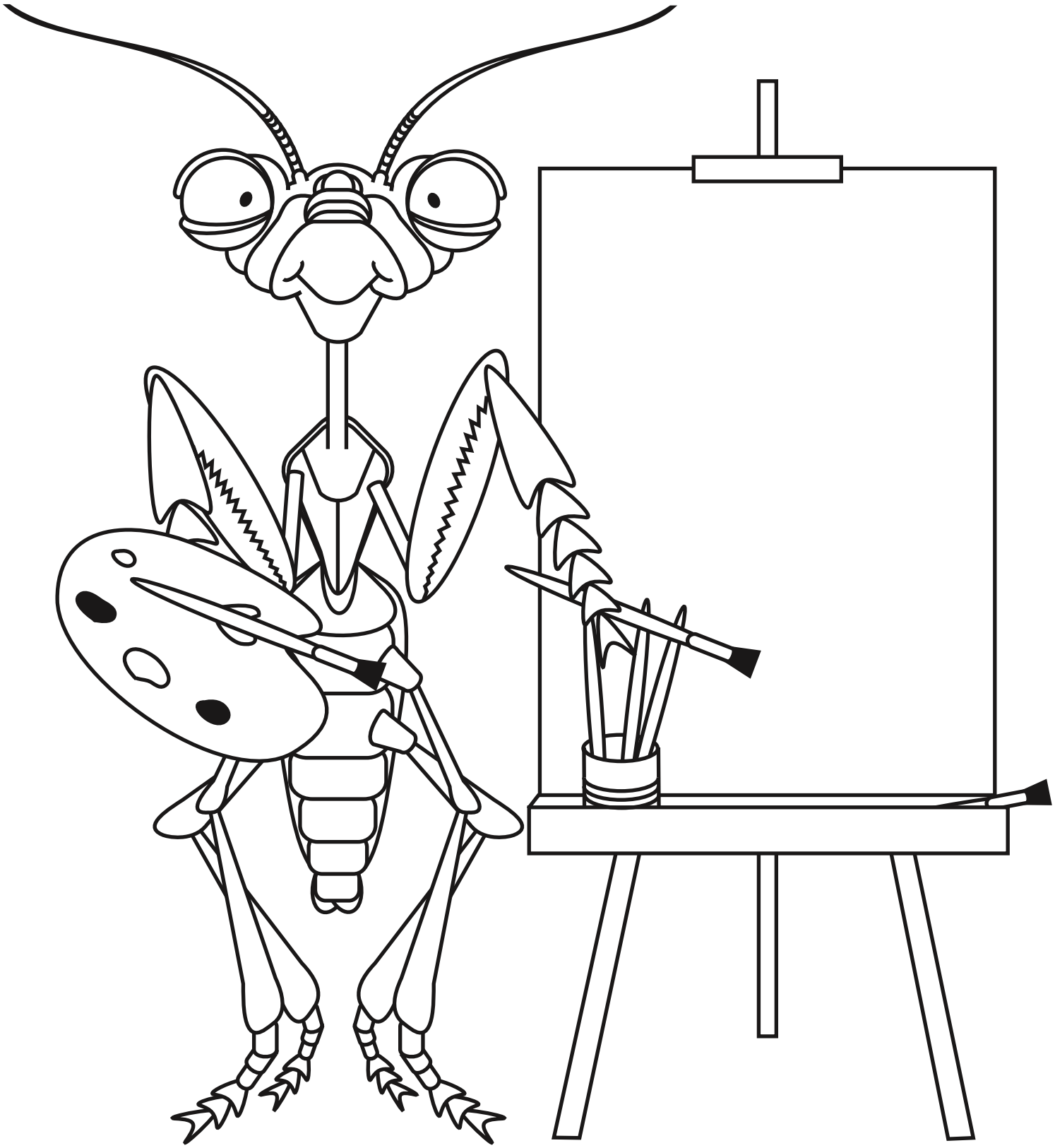


Q.

What's the difference between the reason a bee stings and a mosquito bites?

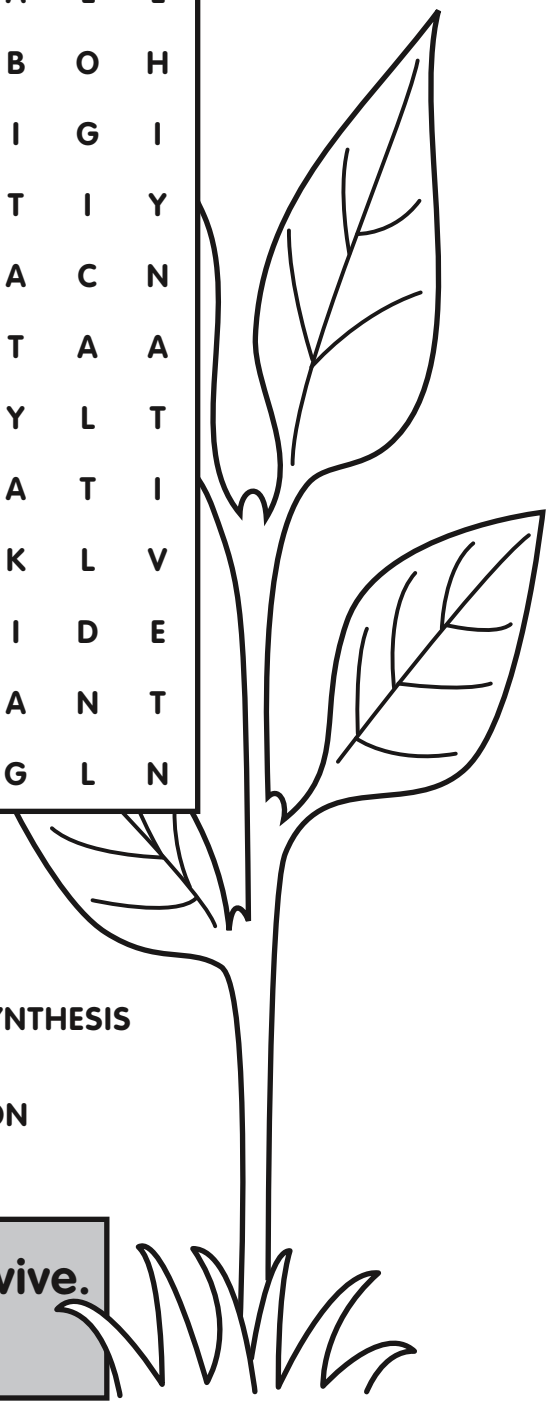
A. Mosquitoes bite to get blood for food. Bees sting when they feel threatened!

Paint your favorite insect



Let the Sun Shine In!

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

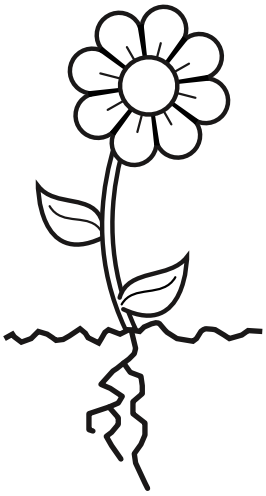


ALIEN
BIOLOGICAL
CARBON DIOXIDE
CHLOROPHYLL
CRABGRASS
DANDELION
DORMANT
ENDANGERED
EXHALE
EXTINCT
GERMINATE
HABITAT
HERBICIDE
INHALE
INVASIVE
NATIVE
OXYGEN
PHOTOSYNTHESIS
POISON
POLLUTION
WEED

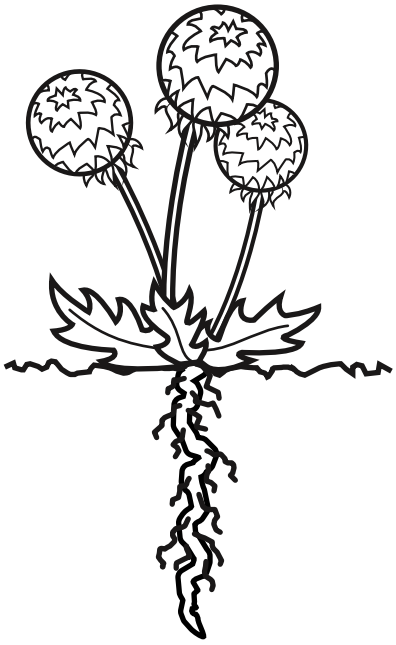
Without sunlight, green plants can't survive. Sunlight helps plants photosynthesize.

Weed Wise

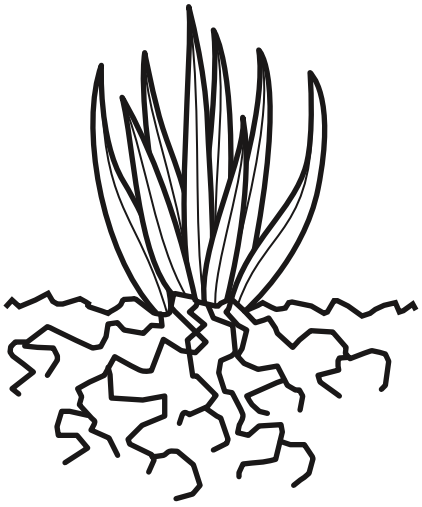
Can you choose which of these is the best weed?



- Very few seeds
- Few, shallow roots
- Doesn't crowd other plants



- Has a lot of seeds
- Strong, deep root
- Crowds other plants



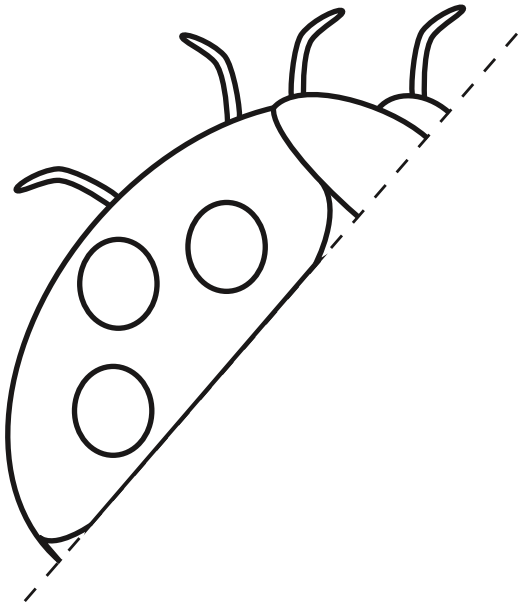
- Very few seeds
- Many strong roots
- Crowds other plants

When weeds invade your space,
Dig them up, don't leave a trace!
That's the best solution; IPM!

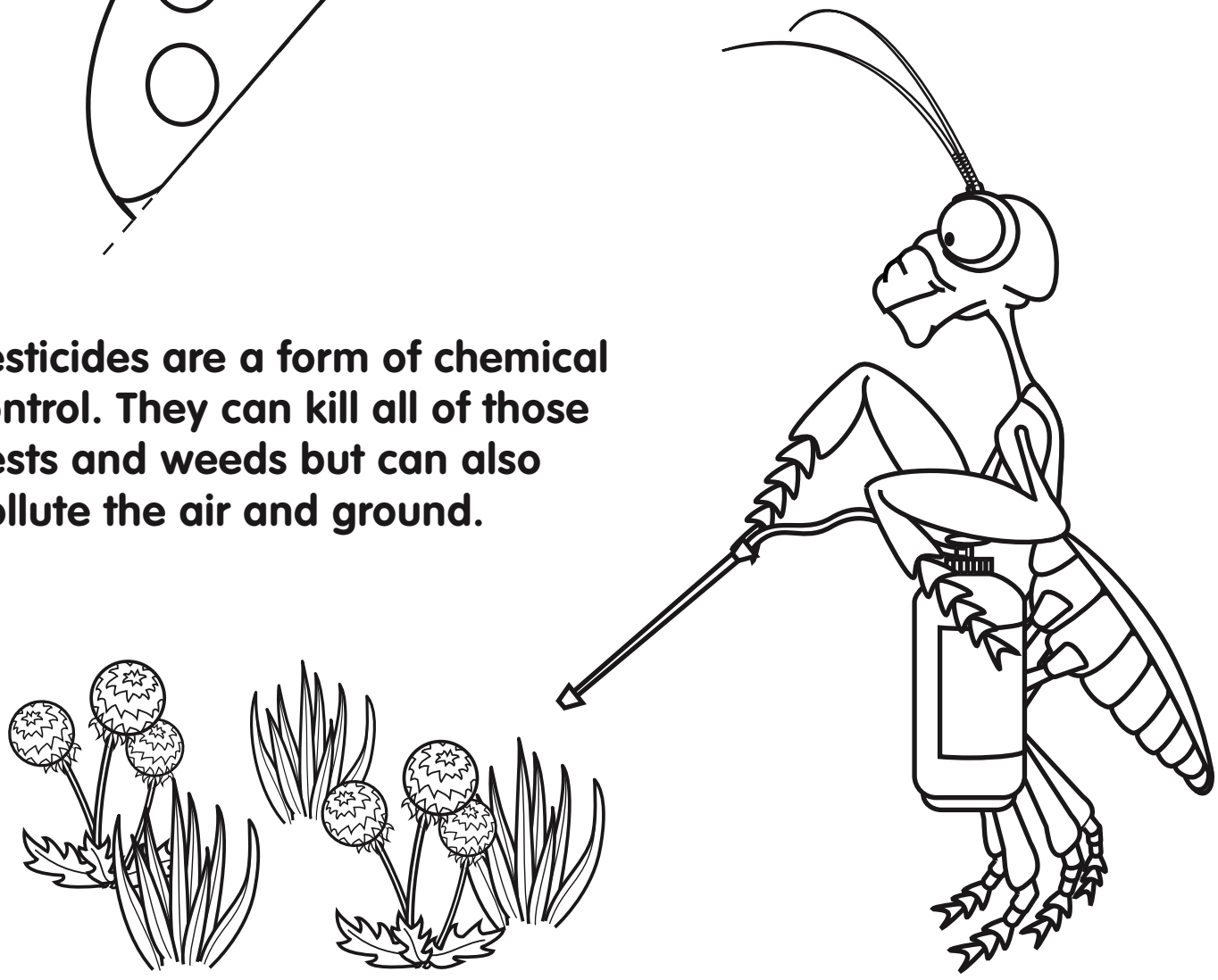
Draw your own perfect weed using the traits above.

Pest Control

Ladybugs are a form of biological control. They eat other pesky bugs without harming plants or soil. They also look the same on both sides. Draw the other half of this ladybug.

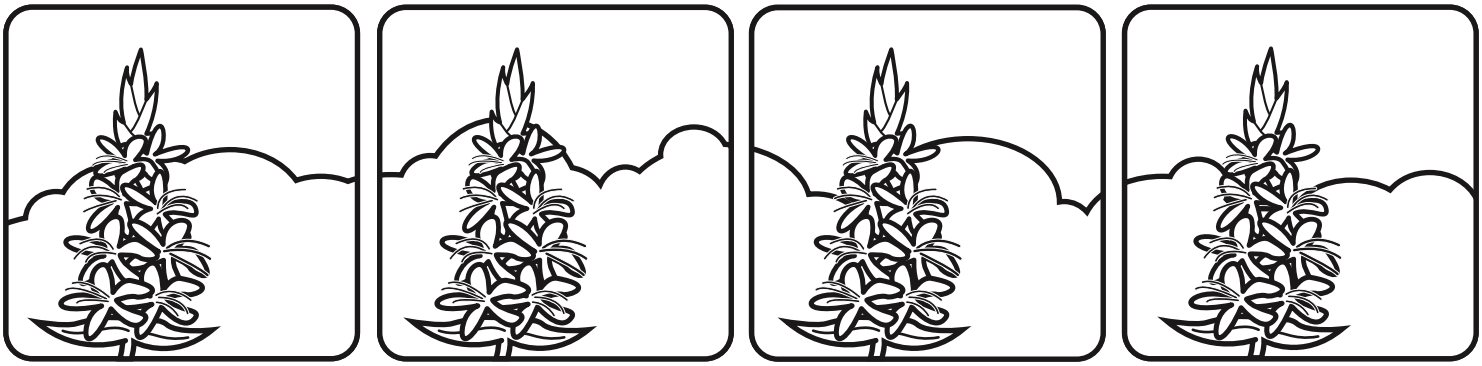


Pesticides are a form of chemical control. They can kill all of those pests and weeds but can also pollute the air and ground.

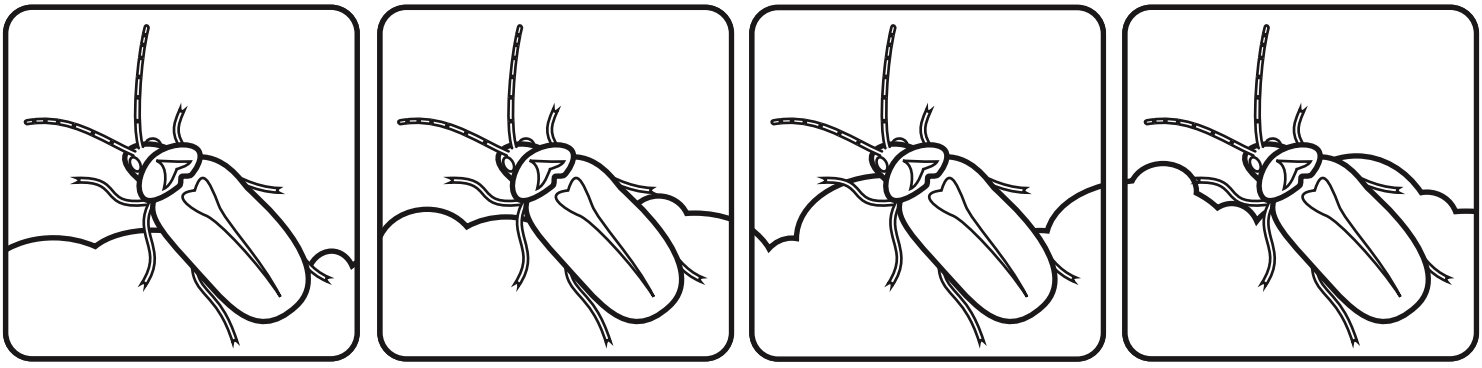


THE PUSHY PLANT GAME

1. Color and cut out your game deck.
2. Take turns rolling the dice but play as a team.
3. When an even number is rolled, two purple loosestrife cards from your deck are used to cover two beetle squares.
4. When an odd number is rolled, one beetle card from your deck is used to cover a purple loosestrife square.
5. Play continues until either purple loosestrife or beetles cover the board. The first team to cover all the purple loosestrife wins.



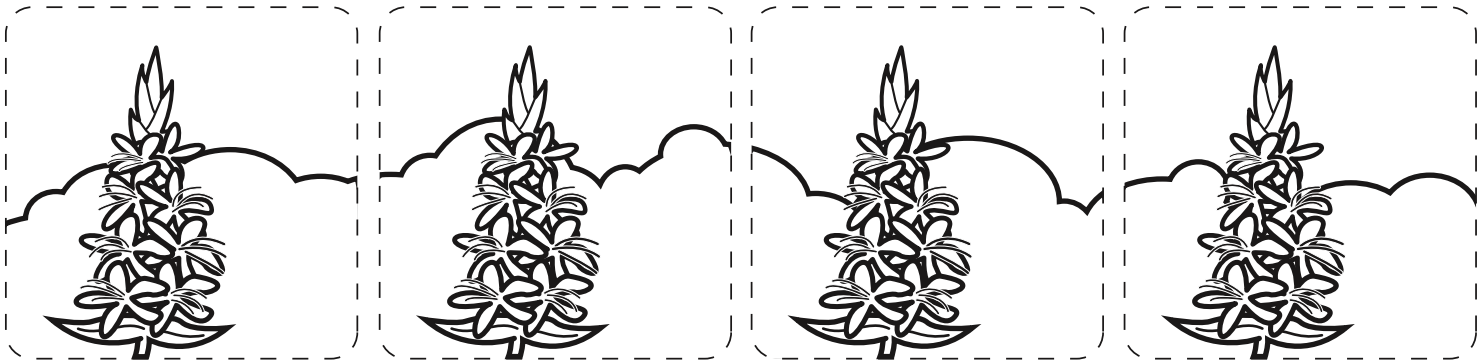
Purple Loosestrife

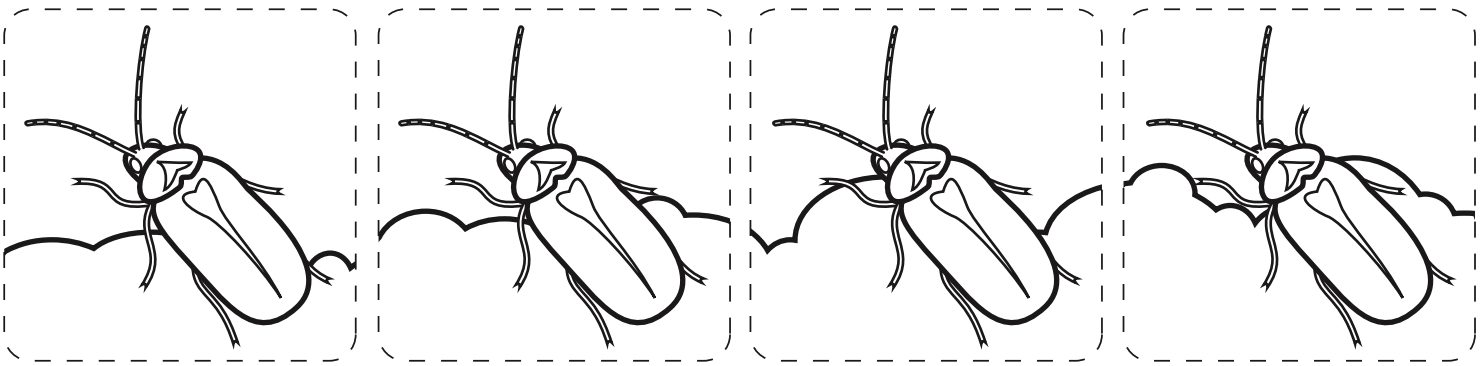


Galerucella Beetle

Because purple loosestrife clogs waterways and crowds out native wetland plants and animals, it has been nicknamed "Beautiful Killer" and "Marsh Monster". What nickname would you give this invasive plant?

Game Deck

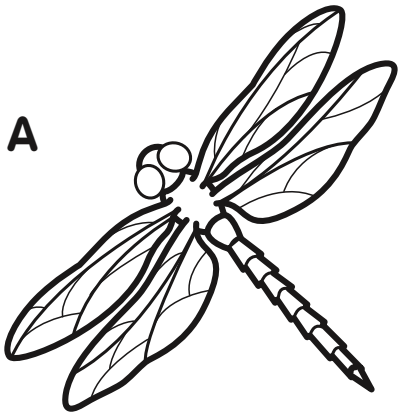




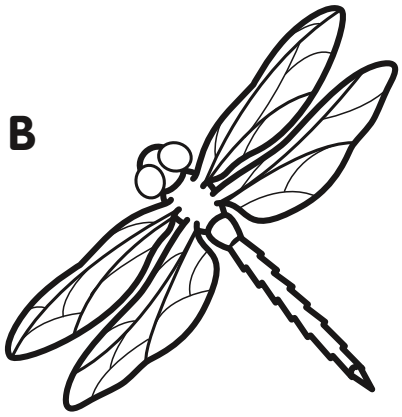
Nature's Bug Zapper!

Look closely to determine which of these dragonflies is different.

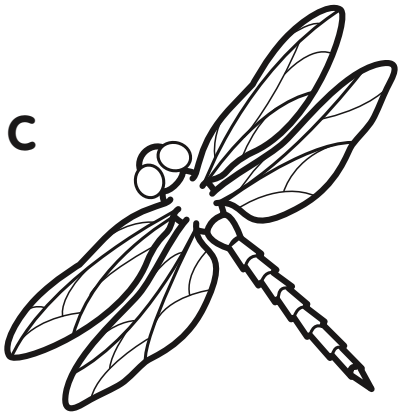
A



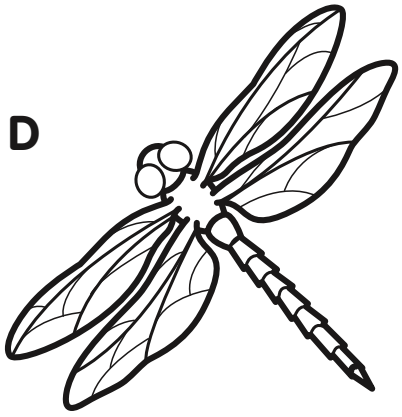
B



C



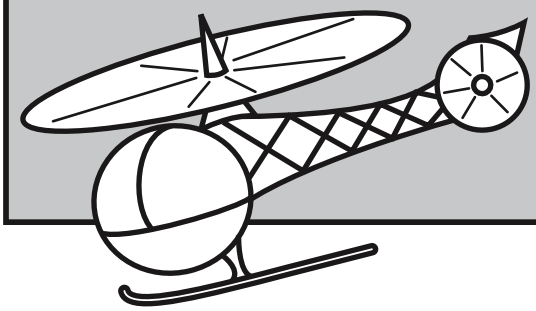
D



There are more than 4,800 different kinds of dragonflies. In fact, dragonflies are among the oldest winged insects that live on the Earth. They have been around for more than 300 million years. That means that they were inhabitants of the Earth long before dinosaurs roamed the land. Their ability to survive might be partially due to the fact that they are fabulous flyers. They can fly fast, and even fly backward. They feed on midges, mosquitoes, flies, wasps, and butterflies. While they feed on many insects, they are also food for many other creatures such as birds and spiders.

Q.

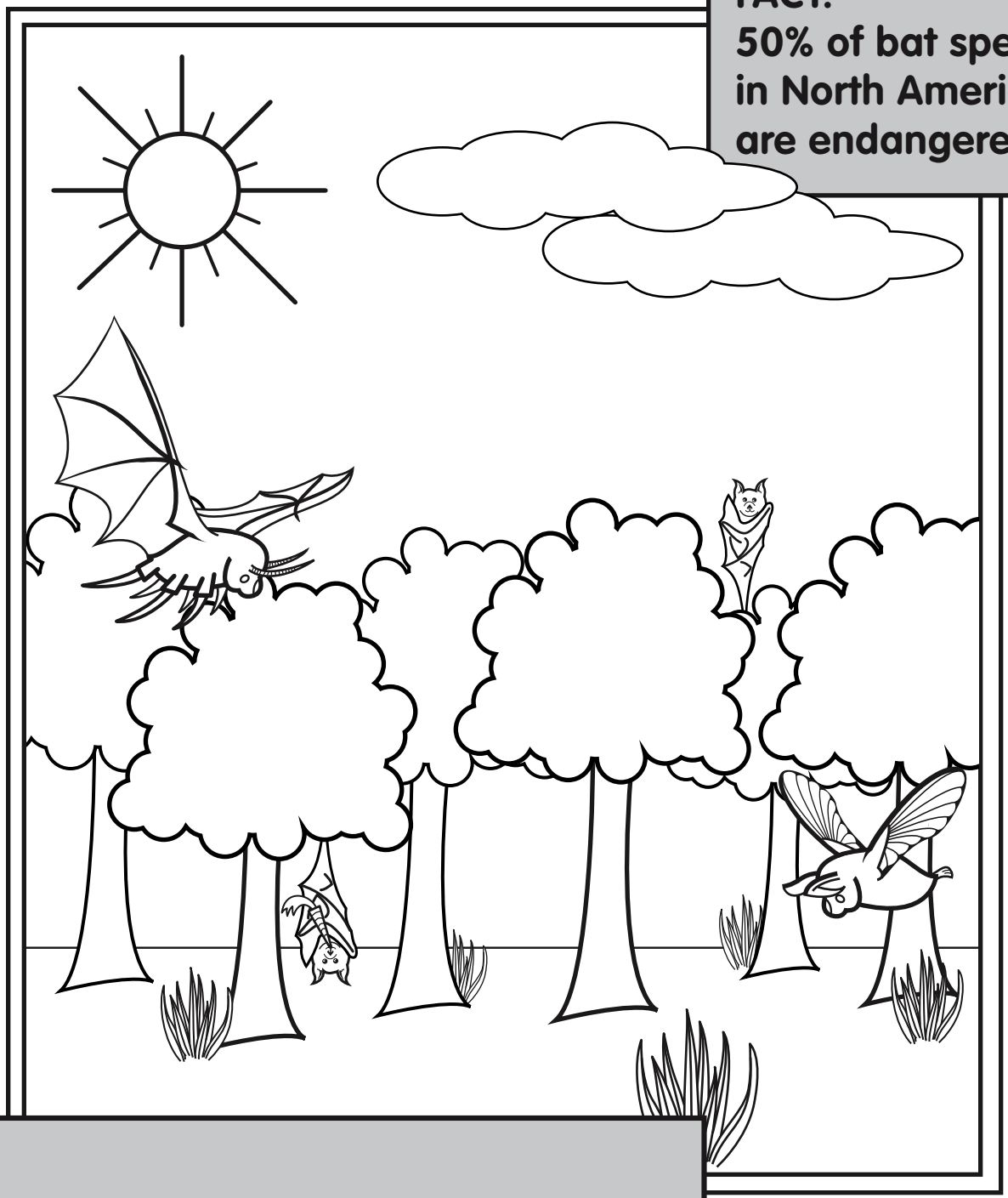
How is a dragonfly like a helicopter?



A. Both can hover in flight!

Bug Busters

Can you find 5 things wrong with this picture?



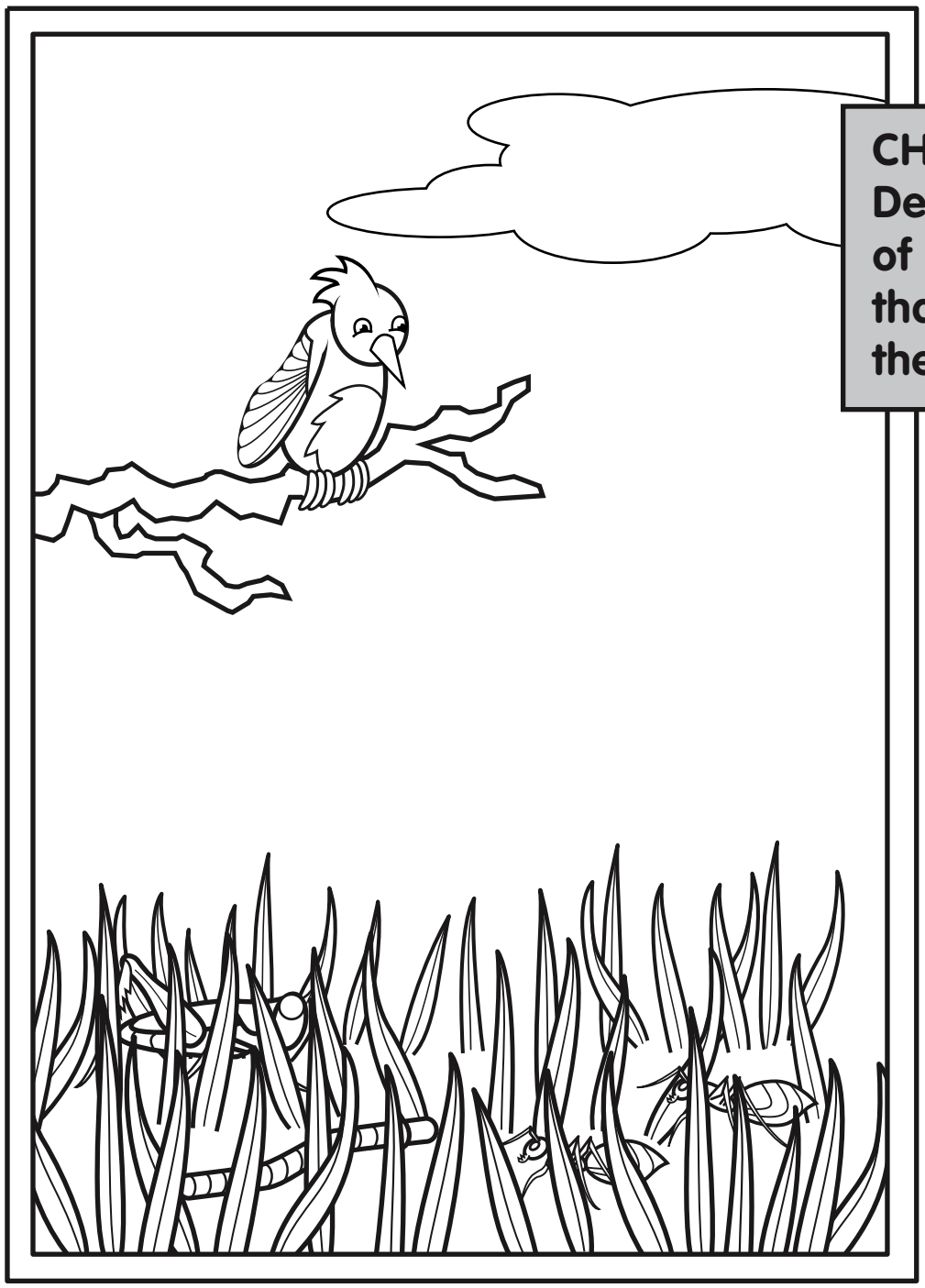
FACT:
50% of bat species in North America are endangered!

Q.
If a bat can eat 600 insects in an hour, How many can they eat in a minute?

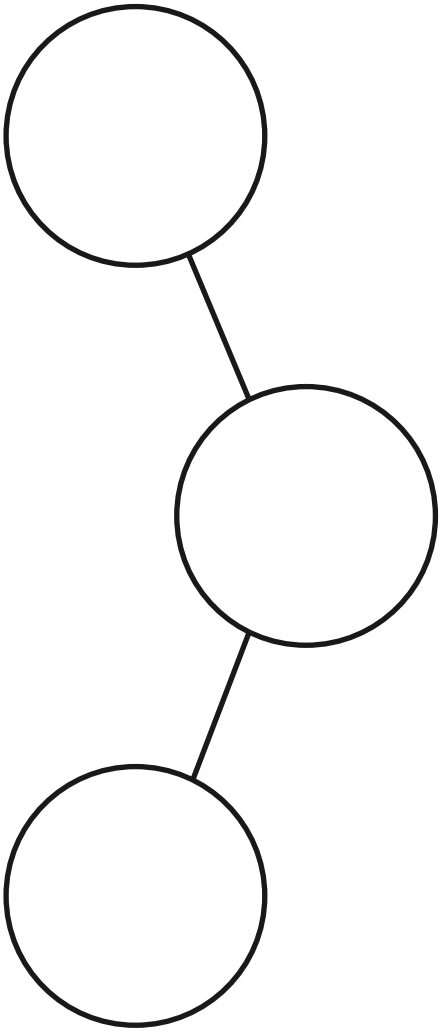
A. 10 per minute. Bats out during the day, bat hanging up, eating carrot, 6 legged bat, feathers on bat

If You Can't Run, Hide!

Help the hungry bird to find its prey among the grass.

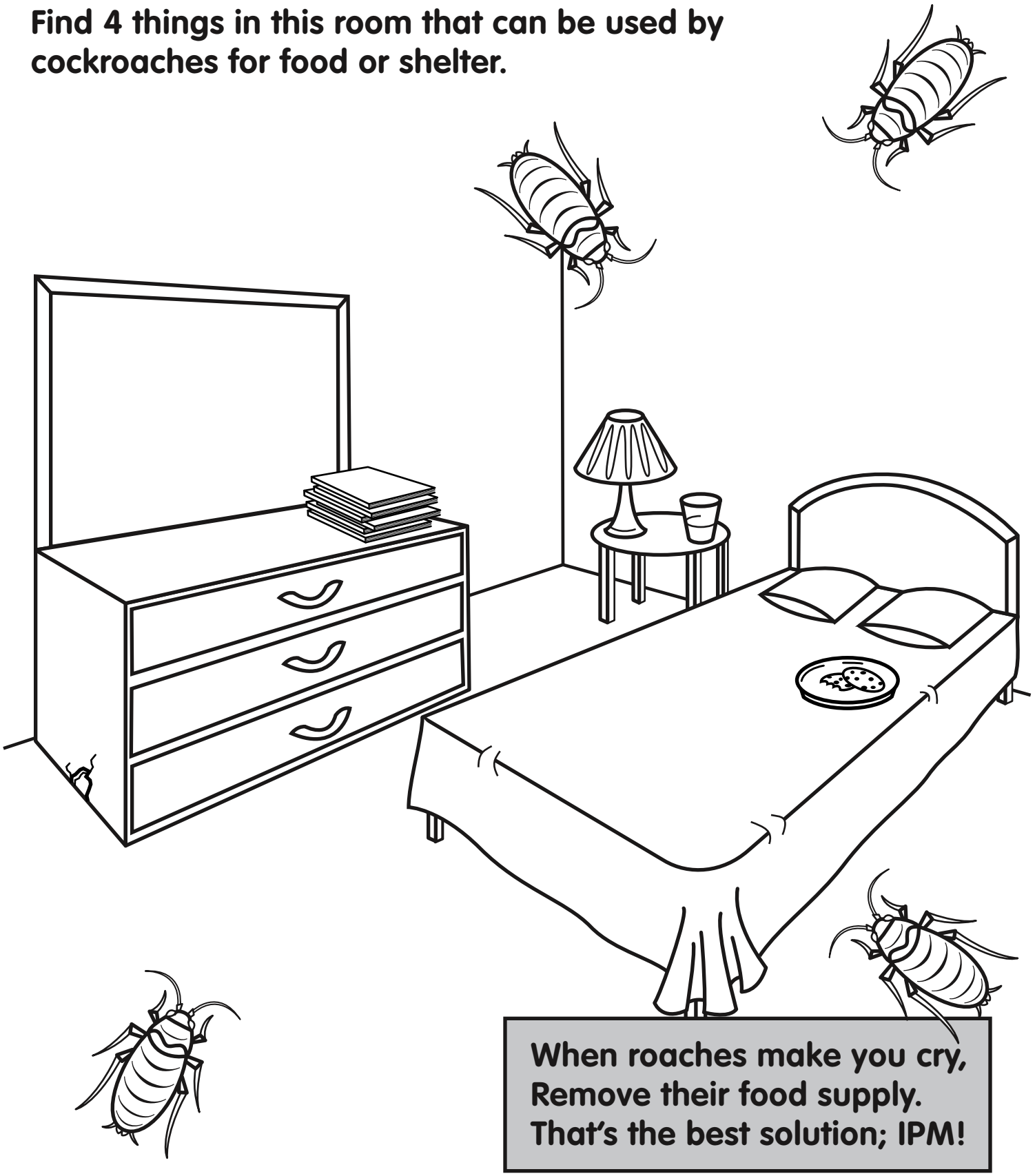


CHALLENGE:
Develop a diagram of a food chain that includes the bird and its prey!



Restaurant for Roaches!

Find 4 things in this room that can be used by cockroaches for food or shelter.

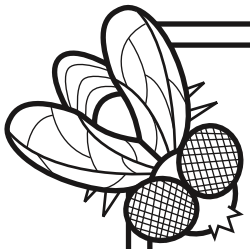


**When roaches make you cry,
Remove their food supply.
That's the best solution; IPM!**

A. Crack in the dresser, stack of magazines, cup of water, cookies in the bed

Snap the Trap!

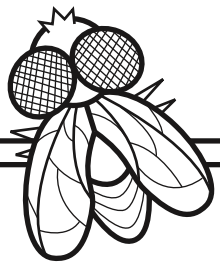
Design a trap to capture these pesky flies.



Right size,right bait
No way to escape!

Remember, a good trap:

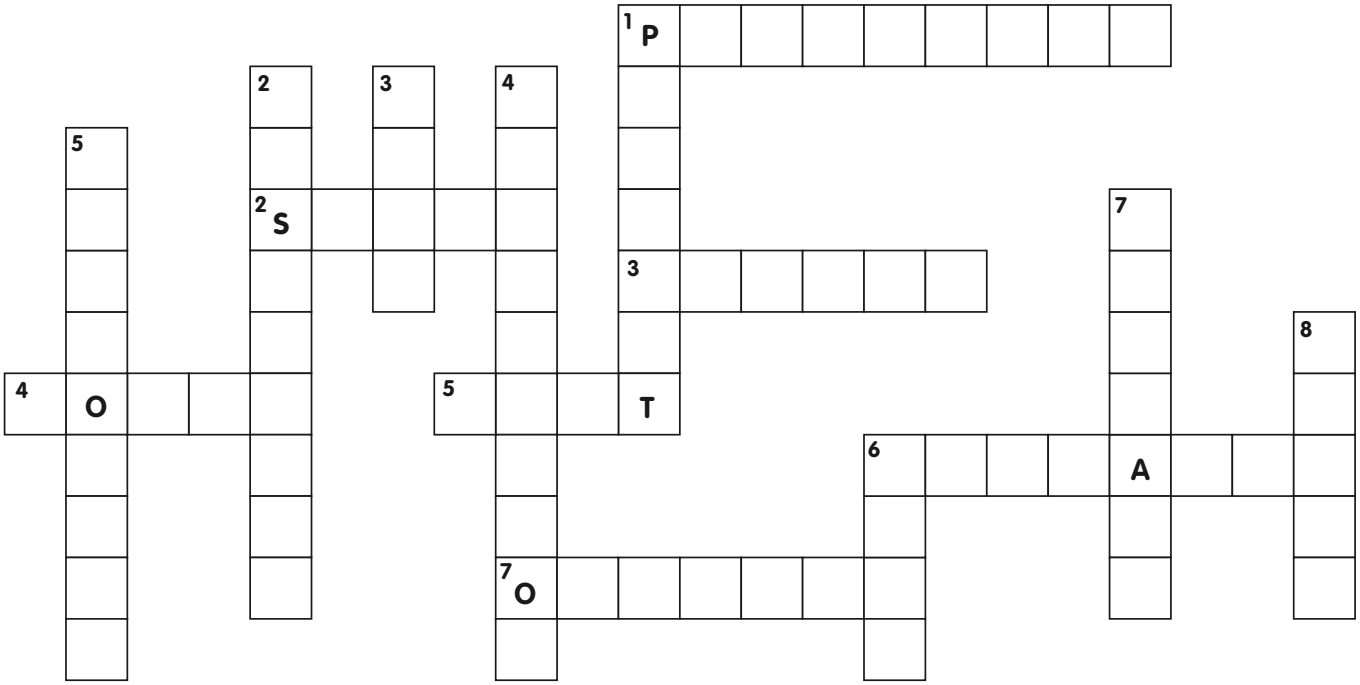
- must be the right size
- must use the right bait
- must provide no way to escape
- must be placed in the right location
- may need to hold, but not harm the creature



IPM Crossword

Word Bank:

Dragonfly	Observe	Insect	Swamp	Bait	Population	Marsh	Predict
Pollution	Wetland	Toxic	Predator	Trap	Pesticide	Prey	



ACROSS

1. material that contaminates and damages the natural environment
2. a seasonally flooded bottomland with more woody plants than a marsh and better drainage than a bog
3. a cold blooded animal with six legs that is usually hatched from an egg
4. something that hurts plants, animals, and our environment
5. a color, smell, or thing that will attract the desired prey
6. a living thing that hunts another for survival, usually food
7. to study closely using all of one's senses

DOWN

1. make an educated guess based on available information
2. a chemical used to kill pests
3. a mechanical device used to capture prey
4. all living things inhabiting a specific area
5. any of various large insects having a long slender body and two pairs of narrow, net-veined wings
6. an animal that is hunted for food
7. a lowland area, such as a marsh or swamp, that is saturated with moisture
8. an area of soft, wet, low-lying land, characterized by grassy vegetation

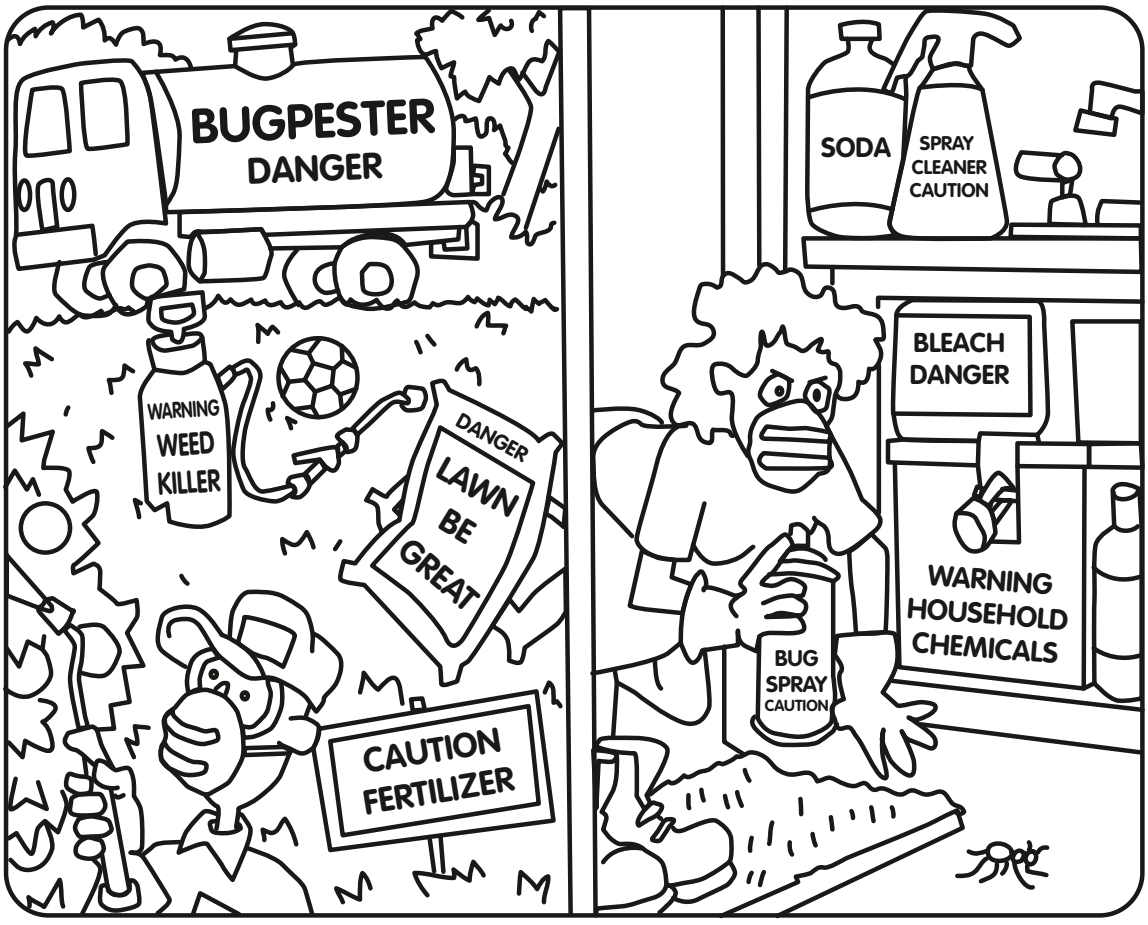
Answers: ACROSS: 1. Pollution 2. Swamp 3. Insect 4. Toxic 5. Bait 6. Predator 7. Observe
DOWN: 1. Predict 2. Pesticide 3. Trap 4. Population 5. Dragonfly 6. Prey 7. Wetland 8. Marsh

Pesticides on the Move

Circle or underline the warning words and labels in the picture below.

Q.
What protective gear are the people wearing to protect them from the chemicals?

While the use of chemicals should be saved as a last resort, sometimes it is the best course of action against pests and weeds. Responsibility and caution should always be used when chemicals are the only way to go.



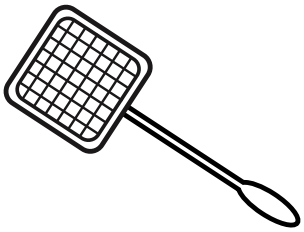
Source: Pest Patrol: A Backyard Activity Book for Kids, PA IPM

Activity: Discuss the dangers of playing on chemically-treated lawns or storing chemicals with food and beverages.

A. Face masks, gloves, man has goggles!

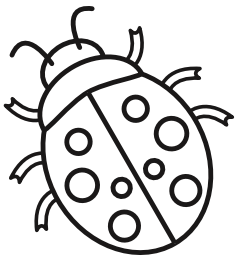
There's a Wiser Way!

Match the picture with the type of control it represents.

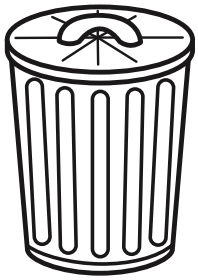


Chemical Control

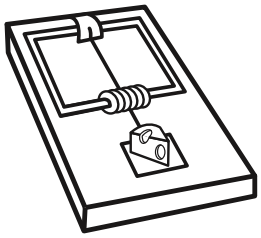
Biological Control



Mechanical Control



Physical Control



Cultural Control

IPM offers a scientific approach as well as an alternative to indiscriminate chemical use in the management of pests. Combining identification and an understanding of the pest with a variety of environmentally friendly methods of management, IPM seeks to reduce the use of potentially dangerous chemicals among municipalities, families, and the farming community.

In a series of steps, the pest is identified, the impact of the pest population is estimated, and the choice of action is determined. Sometimes, particularly for the homeowner, the best choice is NO action. For example, spotting several Japanese beetles feeding on rose bushes would not justify taking action, particularly when the action could make the problem much worse. Homeowners frequently purchase "traps" that have attractants for Japanese beetles. They can attract hundreds of beetles that will mate and produce many more beetles to infest your gardens.

So, while chemicals are not universally condemned, they are not the first choice for control. Thoughtful choices must be made, depending on the situation, the potential impact of the pest, and the damage it is capable of causing. When chemical control is deemed necessary as an IPM method, careful attention is given to the toxicity of the chemical, the amount applied, and the safety precautions required.

Put the right plants in the right place.

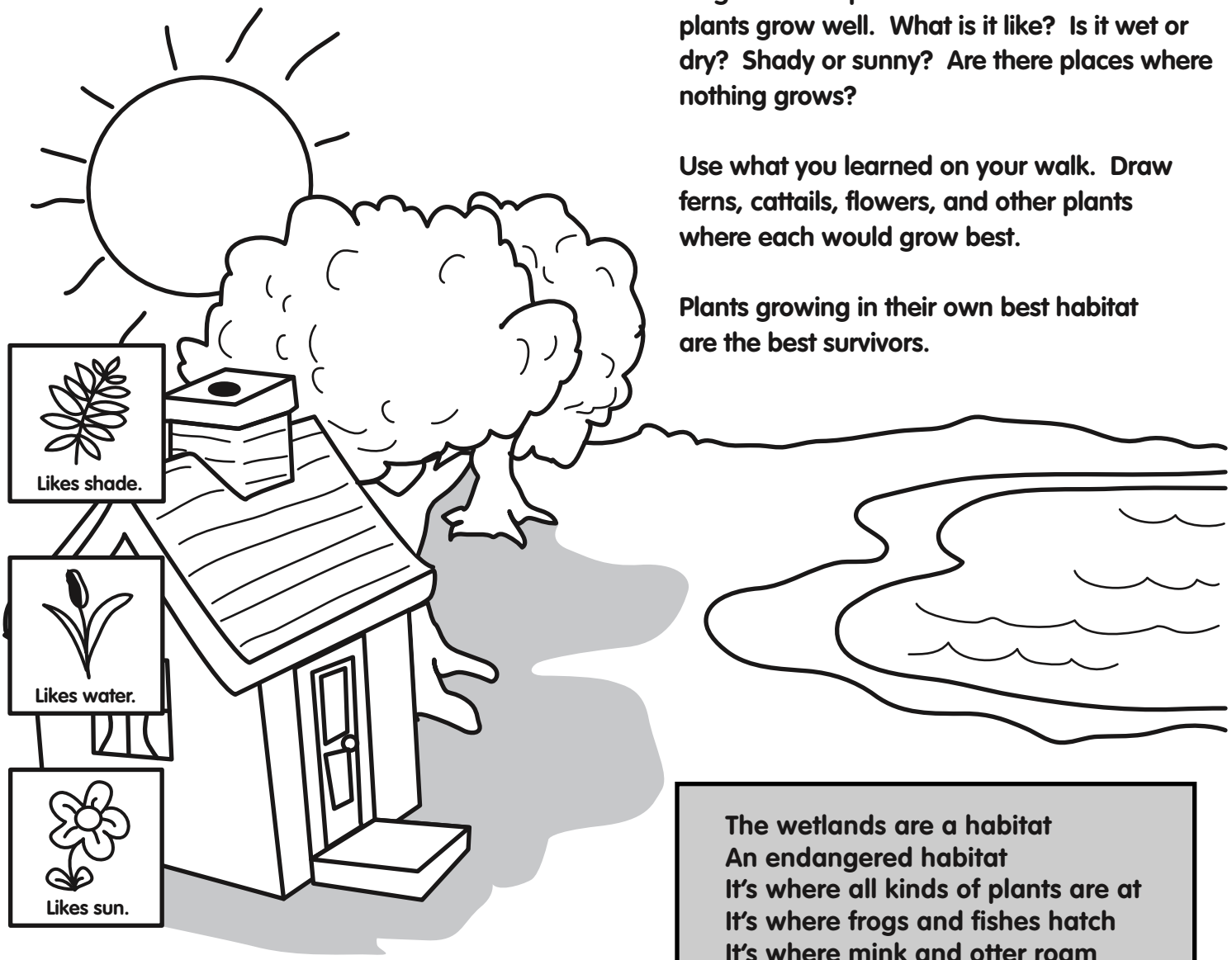
Draw a line from the plants to where they would grow best in the picture.

You do best in a certain kind of habitat. So do plants! To grow and thrive, it's important to have the right conditions. Be a friend to plants. Notice where each grows best. Then let it grow there!

Walk around your lawn, schoolyard, or neighborhood park. Notice where different plants grow well. What is it like? Is it wet or dry? Shady or sunny? Are there places where nothing grows?

Use what you learned on your walk. Draw ferns, cattails, flowers, and other plants where each would grow best.

Plants growing in their own best habitat are the best survivors.



The wetlands are a habitat
An endangered habitat
It's where all kinds of plants are at
It's where frogs and fishes hatch
It's where mink and otter roam
It's where many birds call home
It's where lots of insects breed
Wetlands need our help indeed!

Source: Pest Patrol: A Backyard Activity Book for Kids, PA IPM

Izzy comes to life!

Color both sides of Izzy (next page).
Cut him out and piece him together to make your own Izzy.

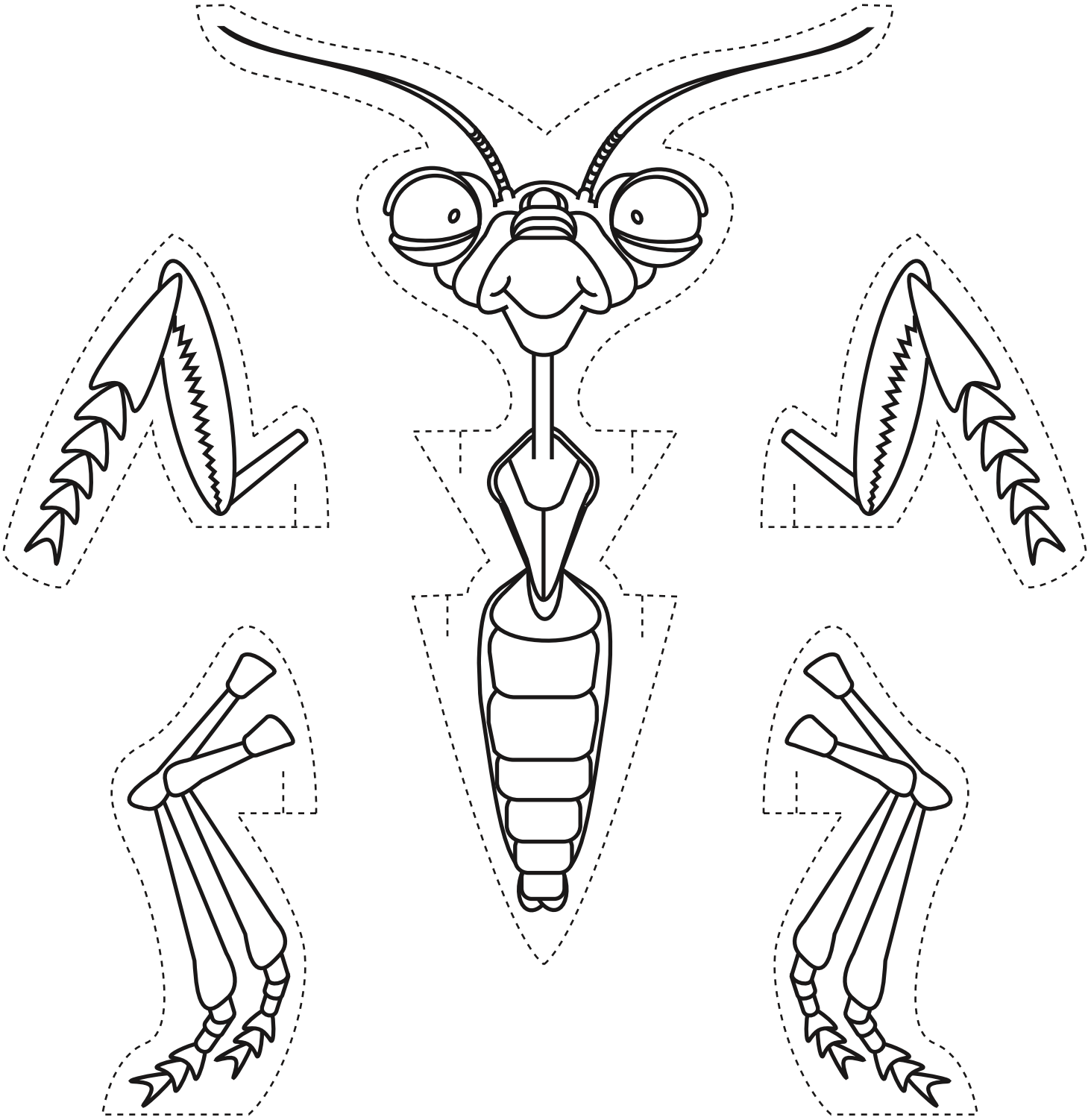


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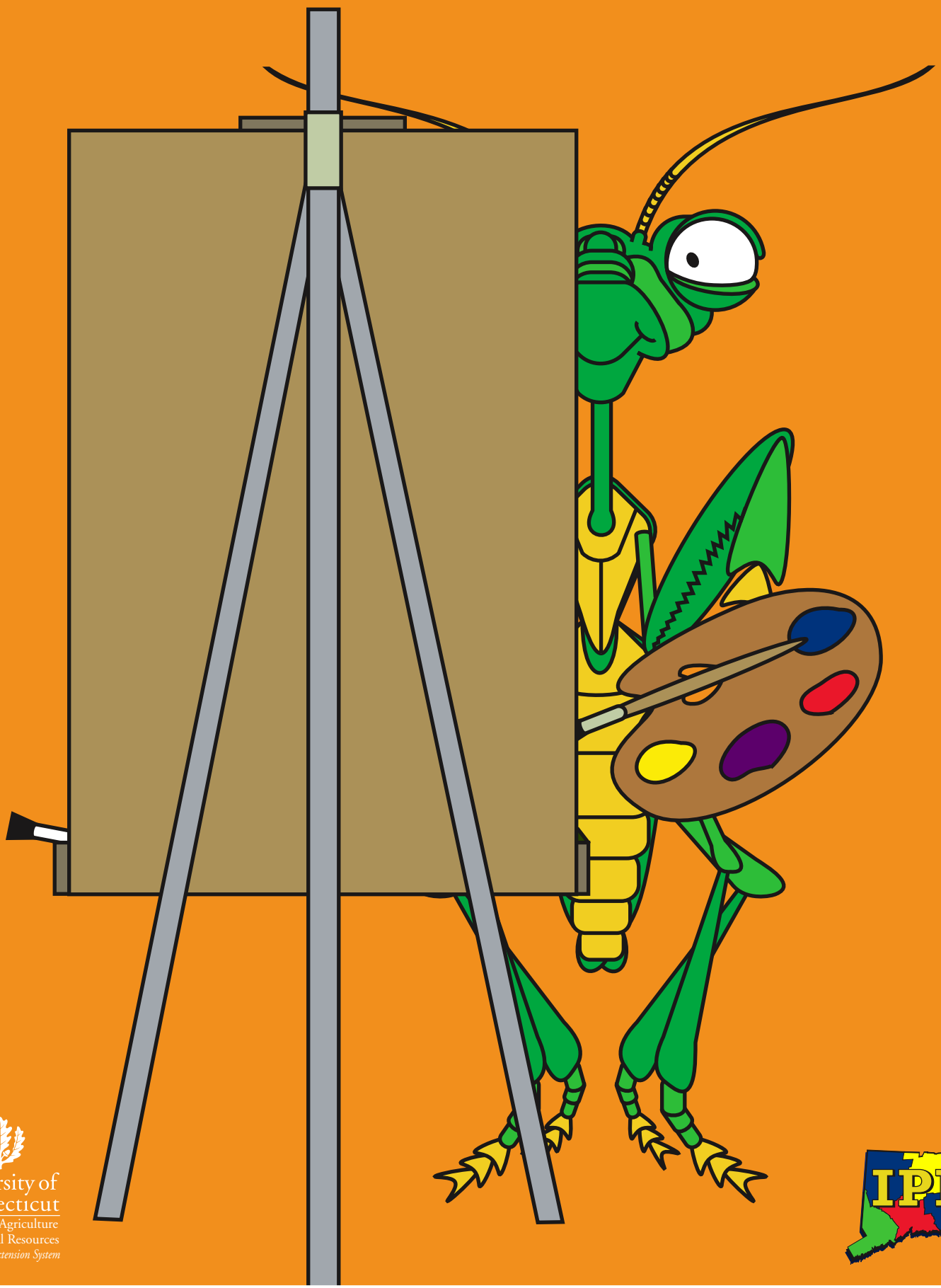
Illustration and graphic design by Kevin Noonan Jr., University of Connecticut



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