

# NATURE DETECTIVES



Fall 2015

## Grasshoppers Have An Age-old Bad Reputation

Grasshoppers have a reputation for making a nuisance of themselves on farms and in gardens. Not all grasshoppers are pests, but none are welcomed.

General dislike for grasshoppers may have inspired a long-ago storyteller who created a tale about a lazy grasshopper and a tireless ant.

You probably remember this fable: the ant toils hard all summer to store food for the winter while grasshopper doesn't do a lick of work. Instead of working, grasshopper sings away the days with no thought for the approaching cold.



The fable is supposed to teach us to think ahead and prepare for the future. In some happier versions of the tale, it's clear by the end that grasshopper's singing is important too.

Pull Out and Save

## No Need for Grasshoppers to Prep for Winter



Grasshoppers don't prepare for winter because the simple truth is grasshopper adults don't live through cold weather. Grasshoppers lay eggs in clusters in the ground in late summer. When the weather turns cold, the adult grasshoppers die. But the eggs can survive winter to hatch into baby grasshoppers when the weather warms in spring.

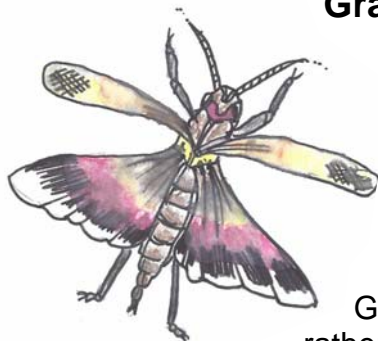
A few kinds of grasshoppers lay eggs in summer that hatch in fall instead of spring. Those baby grasshoppers survive freezing temperatures by hiding under leaf piles for protection. They don't eat until warm days arrive.

## Grasshopper Singing Is Really Fiddling

Male grasshoppers make noise using their legs and wings -- sort of like playing a violin or a fiddle. They don't fiddle to entertain the neighborhood ants. They fiddle to attract female grasshoppers and warn off competing males.

For an entertaining picture book version of the ant and grasshopper fable, check out [Ant and Grasshopper](#) by Luli Gray, illustrated by Giuliano Ferri.

## Grasshoppers Are Insects



Like all other insects, grasshoppers have six legs. They use all six for walking. The front two legs are also used to hold food. The muscular back two legs are extra large and made for jumping. Most kinds of grasshoppers also fly as adults, but even with two sets of wings, they aren't great fliers.

Grasshoppers tend to have rather short antennae.

Antennae give the insects their senses of touch and smell.

Hearing comes from a small area on each side of their body that works similar to the eardrum inside our ears.

Grasshoppers have five eyes. Three small eyes only detect light and dark. Two large eyes have many lenses and are called compound eyes. Their view is in color and they work especially well for seeing movement. We have only one lens in each eye, but if we look through a kaleidoscope, we get some sense of the image a grasshopper sees with its big eyes.

The outside of their bodies is hard because they have an exoskeleton, which means their skeletons are on the outside instead of the inside. Little holes in the exoskeleton allow grasshoppers to breathe.



### Hatching Egg to Molting Nymph to Flying Adult

When it is time to hatch, a baby grasshopper (nymph) emerges from its egg looking like a teeny adult grasshopper. Most kinds of grasshoppers hatch in the spring and immediately begin to eat and eat. Really wet weather is hard on tiny nymphs. They thrive when it is hot and dry.

As the nymph grows, its exoskeleton stays the same size. When that hard outer skin gets too tight, it splits at the back and the nymph climbs out. The "naked" nymph swallows air to swell its body as much as possible before the soft outer skin hardens to become its new exoskeleton. This happens 5-7 times before a nymph is an adult grasshopper. On most kinds of grasshoppers, little wing pads gradually grow into adult wings by the final molt.

### Find Them Where They Live

Grasshoppers are easy to find. There are over one hundred different kinds jumping around Colorado during summer and early fall. They like areas with soil that's easy for the females to push into to lay their clusters of eggs. It is easiest to find them on prairie grasslands and farm fields, but grasshoppers can be found all over Boulder County, except in the mountains above treeline.

## Grasshopper Munchies

Despite their name, not all grasshoppers eat grass. Grasshoppers are picky about which kinds of plants they eat. Some eat many different greens and some eat only one particular type of plant. Grasshopper leaf chewing creates holes with ragged edges. Be a detective to see if you can find leaves that a grasshopper likely nibbled.

## Our Grasshoppers Have Funny Names

Out of all the grasshoppers that live in Colorado, there are three groups or kinds that are most common around Boulder County.

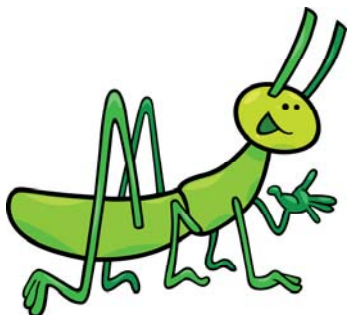
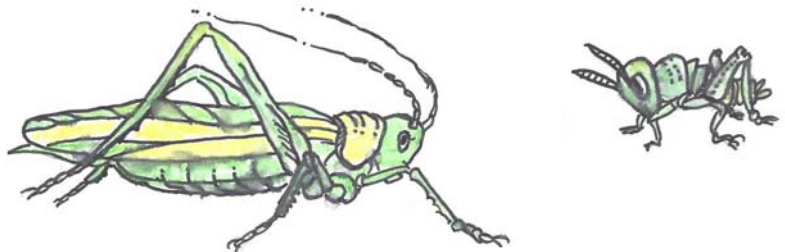
**Slant-faced** grasshoppers eat grass and are typically small. In summer you can hear them singing in grassy meadows. **Spur-throated** grasshoppers are the hoppers most often seen, and they eat leafy plants and some eat grasses too. **Banded-wing** grasshoppers munch grasses or other plants. They readily fly and like to sit in the sun. Some make clicking sounds with their wings when they fly.

## Grasshoppers For Dinner...Or Not

Grasshoppers are high in protein and vitamins and are an important food source for many animals. Coyotes, foxes, skunks, wild turkeys, kestrels, owls and other birds and mammals eat grasshoppers. In many parts of the world, so do people. We tend to grow up thinking all bugs are dirty and just plain yucky, but more than half the people in the world recognize insects as an important food source. If we cooked them properly, we just might find them tasty too.

Grasshoppers avoid becoming dinner by having bodies that match the colors of the plants they eat. They jump or fly as soon as their big eyes notice something moving beside or behind them.

Some grasshoppers can produce a stinky dark fluid to gross out possible predators.



### Grasshopper joke:

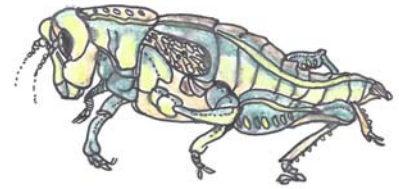
What do you call a grasshopper that squirts stinky stuff on you as it hops away?

(Turn the page to find the answer.)

## Eye-to-Eye with a Grasshopper



Grasshoppers may be much smaller than we are, but they can get away fast! Part of the reason they get their jumping legs moving so quickly has to do with their eyesight.



Most grasshoppers have three small eyes that just see light and dark. Their two big compound eyes work very differently than ours, and they are also very good at detecting motion. This helps them make those fast getaways!

See how close you can get to a grasshopper before it jumps away. Go outside where there are grasshoppers. If you are very patient and very slow, you might be able to get pretty close. Look carefully at its big eyes and long legs.

There are over 70 species (or different types) of grasshoppers along the Front Range in Colorado! See how many different types you can find. How do they differ from each other?



Think about grasshopper eyes compared with your eyes. Imagine if you had compound eyes. When might they be useful to have?

## Oh Fiddlesticks!

Grasshoppers usually make sounds by rubbing their legs and wings together, kind of like using a bow on a fiddle.

Look for different objects you can rub together to see if you can make different sounds.

Be **careful** to not use something that might break or hurt you. Make grasshopper music!



Joke answer: A **gross**-hopper!