



Creek Critters!

Science With Spokane County Water Resources

This belongs to: _____

Macroinvertebrates

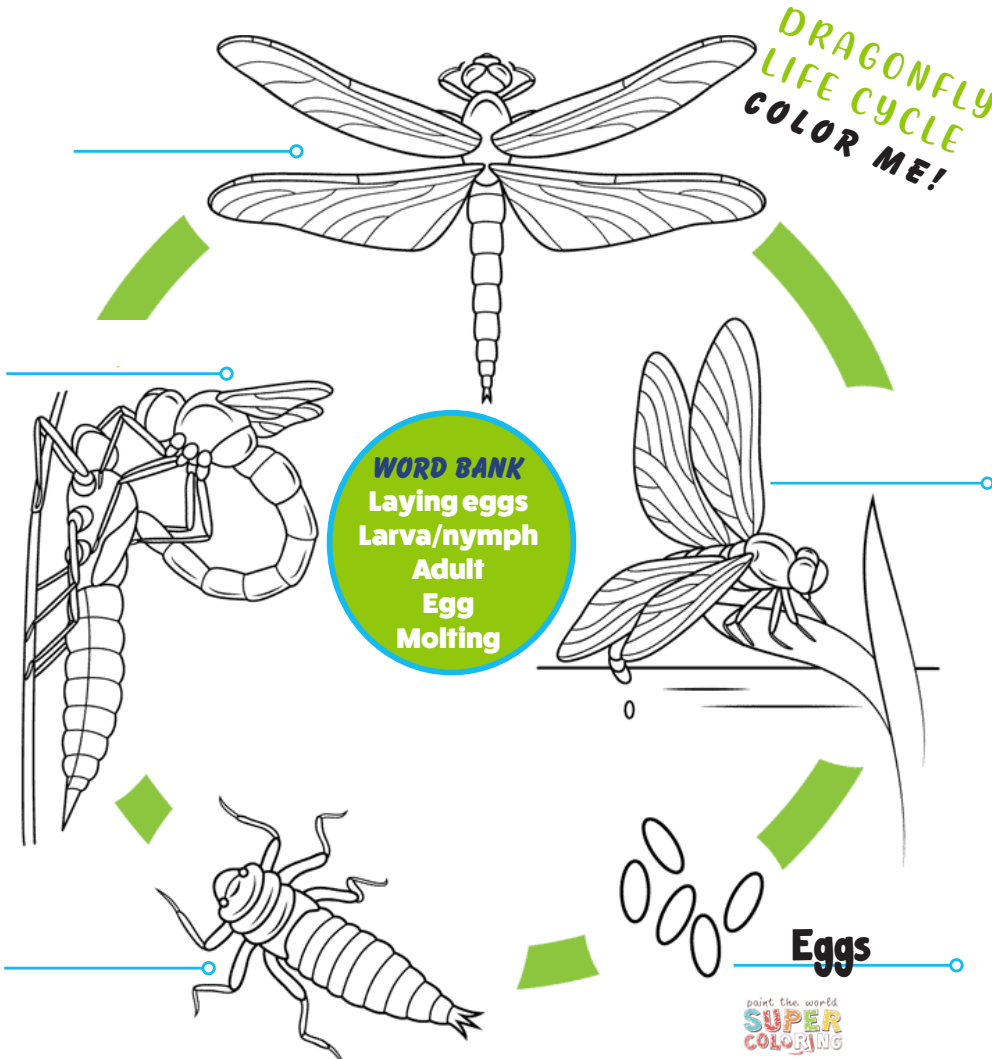
Fish, like the Redband Trout, eat aquatic bugs known as AQUATIC MACROINVERTEBRATES (macros for short). Macros live at the bottom of streams, rivers and lakes for most of their lives; some even live several years! The types of macros you find in a waterway can tell you how clean or dirty the water is! Scientists do field studies to collect and identify macros to monitor how healthy our local waterways are. Can you think of some macros you've seen before?

aquatic= live in the water

MACRO = large enough to see by the naked eye

INVERTEBRATES = animals with no backbone

Using the word bank, write the name of the life phase on the blue line.



Help the trout find the caddisfly!



Macro Life Cycle

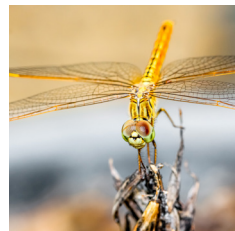
Most of the macros you'll find in creeks are juvenile (child) larvae or pupa that look very different from adults. Many live most of their lives underwater, until their final molting stage when their exoskeleton cracks open and wings emerge to become flying adults for the last part of their life cycles.



6 months before hatching



Lives in water 3-4 years in the larval stage



Lives 2-4 months on land as adults



Molting into an adult with wings

Table Manners!

Macros have specialized mouth pieces to help them gather food or hunt.

Draw a line from the feeding habit to the correct mouth.



Caddisfly



Dragonfly



Black Fly Larvae

Scraper

Use chewing mouthparts to shred, cut, bite and bore leaves and plants that fall into the water.

Collector

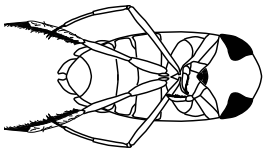
Physically gathers or filters algae, bacteria, feces and plants from the water or bottom.

Biter

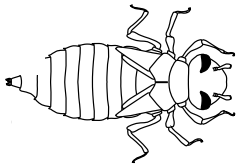
Predators that chase, capture and kill prey.

WHO AM I ?

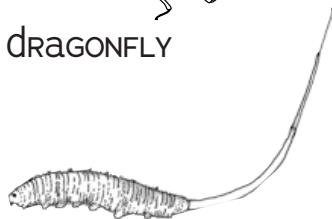
Read the clue and then draw a line to match it with who you think it is!



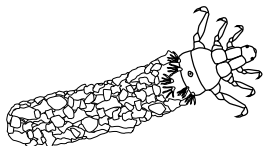
Water boatman



Dragonfly



Rat tailed Maggot



Caddisfly

- 1 I protect my soft body by building a home of small rocks or twigs that I drag around. Wherever I am, that's home.
- 2 I use my oar-shaped hind legs to swim. I don't have gills; I carry my air supply with me under my shell-like covering.
- 3 I have jaws that can reach out and snap my prey, including small fish and tadpoles! I'm the greatest hunter of all the macros!
- 4 I have a long, rat-like breathing tail. It works like a snorkel, allowing me to breathe air on the surface while I'm underwater.

FRESHWATER FOOD CHAIN

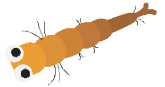
Draw arrows to show who eats who.



Sun



Minnow



Mosquito Larvae



Heron



Adult Trout

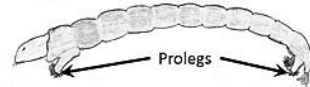
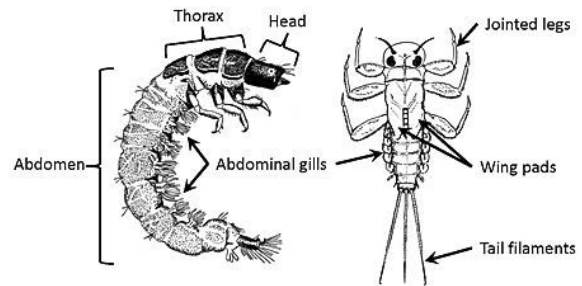


Algae



Dragonfly Nymph

COMMON ANATOMY OF MACROS (BODY PARTS)



STROUD
WATER RESEARCH CENTER

Collect Your Own Macros!

We've included a net, laminated field guide, and magnifying glass so you can do your own collection at a local creek, lake or pond. Just bring any container or bucket, light colored, or clear is best, so you can see the macros. An old ice cube tray and spoon works great for sorting the different types you find. Always go with an adult.

Visit our website for step-by-step directions on how to collect your own macros!

www.spokanecounty.org/wrc

Go to Resource Library > Teacher / Parents > Water Science Kits

INSTRUCTIONS (For Cut-out Bug Pieces)

GRADES 3 - 6

Creek Critter Game!

Hello Stream Scientist, yes, YOU! We need YOUR help. We are about to release Red Band Trout that we've raised over the winter. We've narrowed down our release to two streams. Your job is to identify the macroinvertebrates in both creeks to determine which is healthier, and better for our fish release. Are YOU ready?

1 Start with Cricket Creek (red pieces). Use the laminated Dichotomous Key and pictures to identify each cut-out bug you find. Keep track of what you find using your data sheet (*on the back*). Repeat with Crooked Creek.

🔥 **CREEK 1 = CRICKET CREEK**
COLLECT AND IDENTIFY ALL OF THE RED MACRO PIECES

💧 **CREEK 2 = CROOKED CREEK**
COLLECT AND IDENTIFY ALL OF THE GREEN MACRO PIECES

2 After you have identified every macroinvertebrate, use the data sheet (*on the back*) to calculate the overall water quality score.

3 **ANSWER:** Which creek is the healthiest for our trout?

Find the answer key on our website to see if you were right!

www.spokanecounty.org/wrc

Go to Resource Library > Teacher / Parents > Water Science Kits



DICHOTOMOUS

This is a BIG word but it just means that when things are very different, we will divide them into groups to organize them.

KEY

A guide with pictures to help you.

WHOA, COOL! Background info. to help with the game.

MACROS TELL US HOW HEALTHY WATER IS!

Since macros live most of their lives underwater, the types and amounts we find in waterways can tell us how healthy or unhealthy the water is. All macros get sorted into three groups based on how sensitive they are to unhealthy water.

Macros and the water you drink!



Some areas of the Spokane river and local lakes drain into the aquifer, in other areas the aquifer seeps into the surface water. How clean the water is on the surface can be an indicator of how clean the water is below. Macros are one way to help us know how healthy the water is on the surface!

Like a picky eater, I'm picky about my habitat! Only the cleanest water for me!

Like goldilocks, I am right in the middle. I can do clean or dirty water.

I'll leech on to any habitat! I thrive in dirty water.

Stonefly

Crayfish

Leech

GROUP 1 SENSITIVE

Live in Healthy Water

CLEAR, CLEAN, COLD WATER

GROUP 2 SOMEWHAT SENSITIVE

GROUP 3 TOLERANT

Live in Unhealthy water

MUDDY, POLLUTED, SLOW-MOVING

Creek Critter Game! Data Sheet GRADES 3-6

This Data Sheet is Adapted from Stroud Research Center Materials. <https://stroudcenter.org/>

STROUD
WATER RESEARCH CENTER

🐸 CREEK 1 DATA: CRICKET CREEK Water Quality Score is:

Group 1: Sensitive	
☐	Stoneflies
☐	Mayflies
☐	Other Caddisflies
☐	Dobsonflies, Fishflies, and Alderflies
☐	Riffle Beetle Larvae/Adults
☐	Water Pennies
☐	Right-Handed/Gilled Snails
☐	Aquatic Snipe Flies

 X 3 =
TOTAL

Group 2: Somewhat Sensitive	
☐	Damselflies
☐	Dragonflies
☐	Sowbugs
☐	Scuds
☐	Crane Flies
☐	Clams/Mussels
☐	Crayfish
☐	Net-Spinning Caddisflies

 X 2 =
TOTAL

Group 3: Tolerant	
☐	Midge Flies
☐	Black Flies
☐	Planarians
☐	Leeches
☐	Left-Handed/Lunged Snails
☐	Aquatic Worms
☐	Rat-Tailed Maggots

 X 1 =
TOTAL

INSTRUCTIONS

- 1 Use this data sheet to add a tally mark to each macro you find.
- 2 Count up the tally marks in each column and write the total.
- 3 Multiply the total by the water quality value for that group.
- 4 Add together the numbers in each box to find the overall score for your creek! Use the Pollution Tolerance Key below to determine the creek's water quality rating.

POLLUTION TOLERANCE KEY

SCORE	RATING
23 or more	Excellent
17-22	Good
11-16	Fair
10 or less	Poor

Based on each creek's Pollution Tolerance Rating, which creek is best for the trout release?

CIRCLE ONE

🐸 CROOKED CREEK

🐸 CRICKET CREEK

🐸 CREEK 2 DATA: CROOKED CREEK Water Quality Score is:

Group 1: Sensitive	
☐	Stoneflies
☐	Mayflies
☐	Other Caddisflies
☐	Dobsonflies, Fishflies, and Alderflies
☐	Riffle Beetle Larvae/Adults
☐	Water Pennies
☐	Right-Handed/Gilled Snails
☐	Aquatic Snipe Flies

 X 3 =
TOTAL

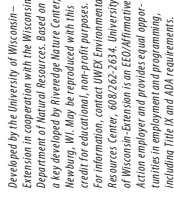
Group 2: Somewhat Sensitive	
☐	Damselflies
☐	Dragonflies
☐	Sowbugs
☐	Scuds
☐	Crane Flies
☐	Clams/Mussels
☐	Crayfish
☐	Net-Spinning Caddisflies

 X 2 =
TOTAL

Group 3: Tolerant	
☐	Midge Flies
☐	Black Flies
☐	Planarians
☐	Leeches
☐	Left-Handed/Lunged Snails
☐	Aquatic Worms
☐	Rat-Tailed Maggots

 X 1 =
TOTAL

(Sizes of illustrations are not proportional.)

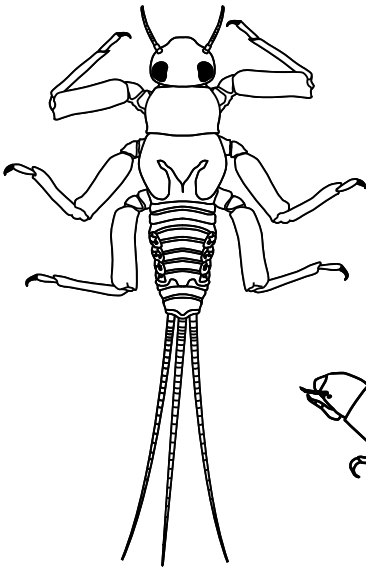


1. Start at the top. 2. At each “T” or intersection, stop as though it’s a stop sign and answer the question. For example, the first question is Shell or No Shell. If you

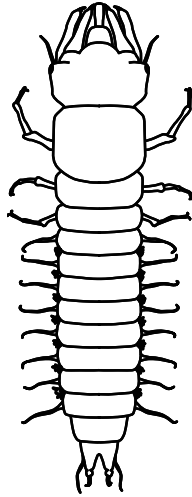
For detailed instructions, visit www.spokanecounty.org/wrc > Go to Resource Library > Teacher / Parents > Water Science Kits

Common Stream Critters

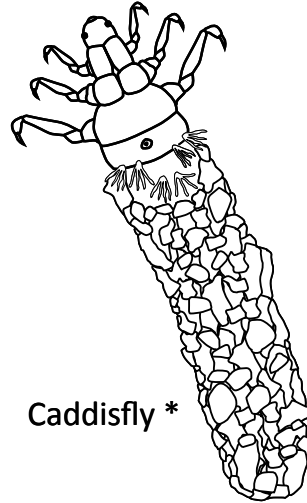
* These insects will transform into winged fliers when they mature



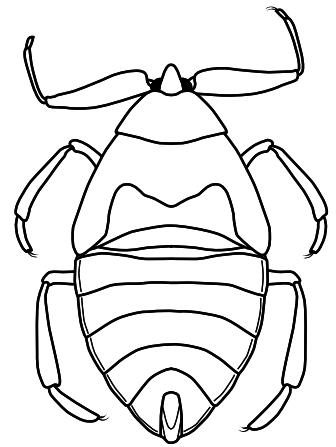
Mayfly *



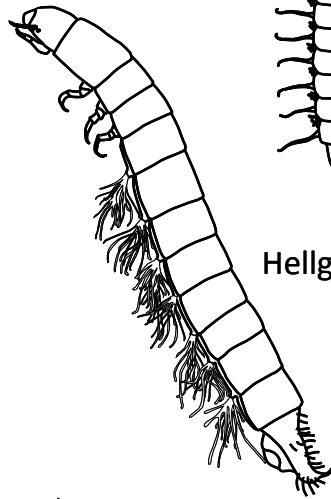
Hellgrammite *



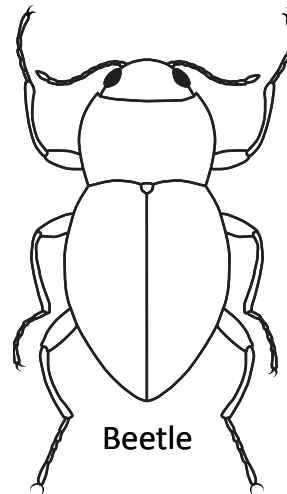
Caddisfly *



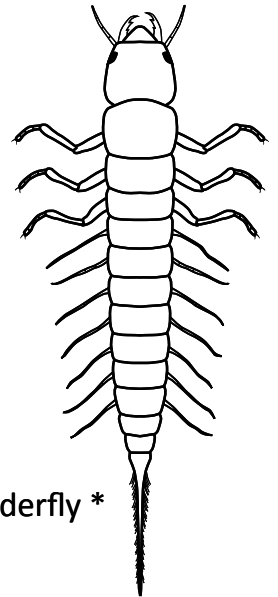
Giant Water Bug



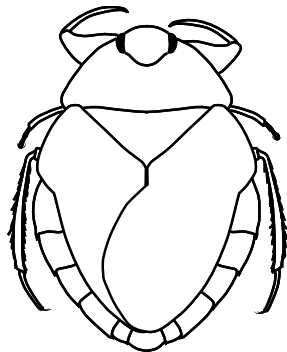
Beetle Larvae



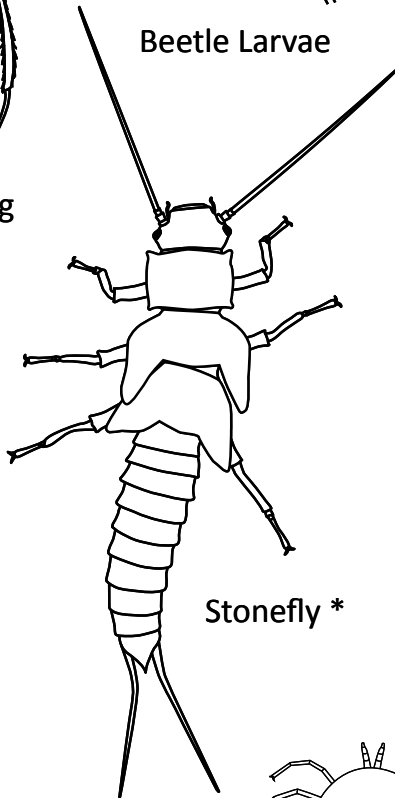
Beetle



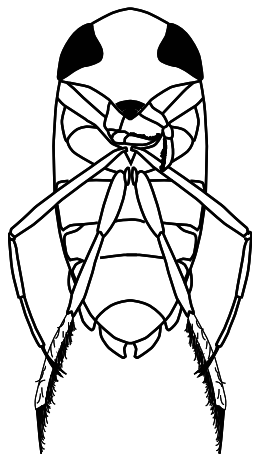
Alderfly *



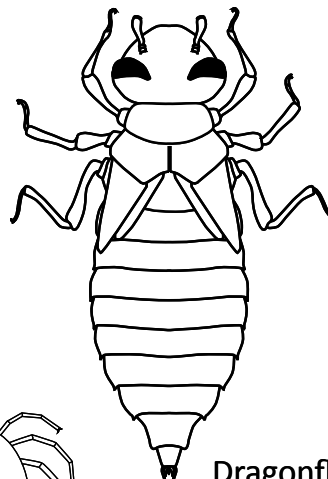
Creeping Water Bug



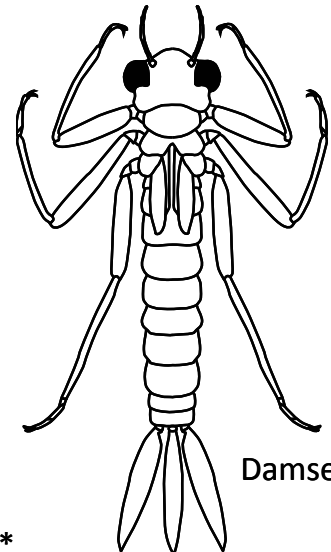
Stonefly *



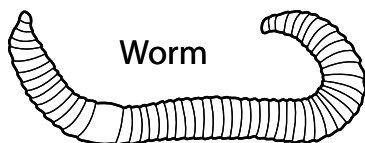
Water Boatman



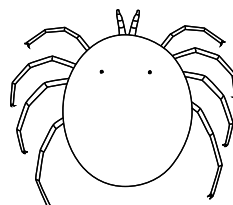
Dragonfly*



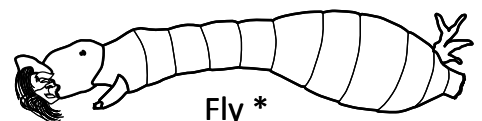
Damselfly *



Worm



Mite



Fly *

CREEK CRITTER GAME PIECES GRADE 3-6

Print, cut and sort using your dichotomous key. Green pieces = Crooked Creek, Red pieces = Cricket Creek

CROOKED CREEK PIECES



CRICKET CREEK PIECES

