Healthy Creek Packet

Created By: Alayna Press

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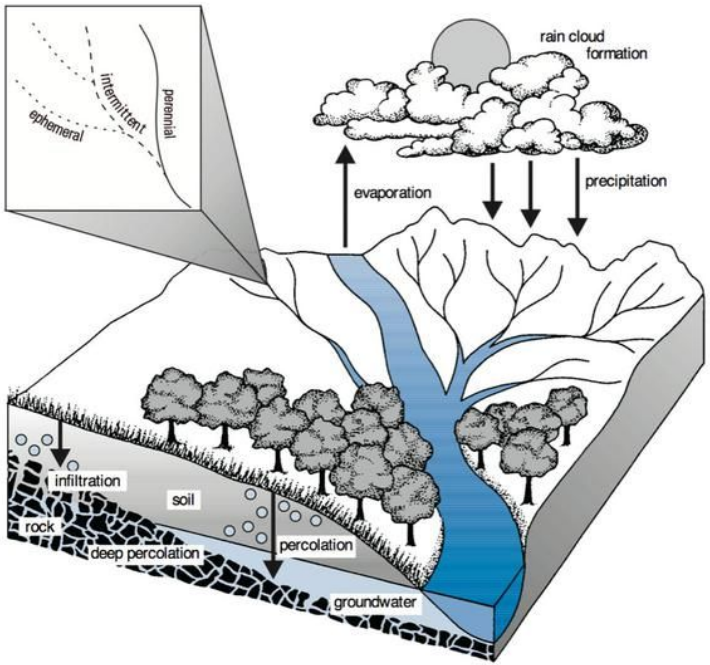
What is a Creek?



- Creeks are bodies of water that flow from a higher elevation to a lower elevation
- The words creek, stream, and river are all somewhat interchangeable. Creeks are smaller in size compared to rivers and streams.
- When rain falls, the rain water either seeps into the ground, evaporates back into the air, or becomes runoff.
- Runoff water is pulled downhill by gravity, and as it flows downhill it collects into streams, creeks, and rivers.

Why are Creeks Important?

- Habitat for aquatic and semi aquatic organisms
- Natural filtration system for runoff water
- Source of drinking water and food for animals
- Recreation for humans
- Natural transportation and distribution of organisms and resources

What can Make a Creek Unhealthy?

- No vegetation buffer around the stream, leading to erosion, and a lack of filtration of runoff water
- Fertilizer runoff and other pollutants
- No small debris or obstacles to aerate the water
- Regular disturbance from humans
- Fragmentation by roads and buildings

Evaluating Your Own Creek

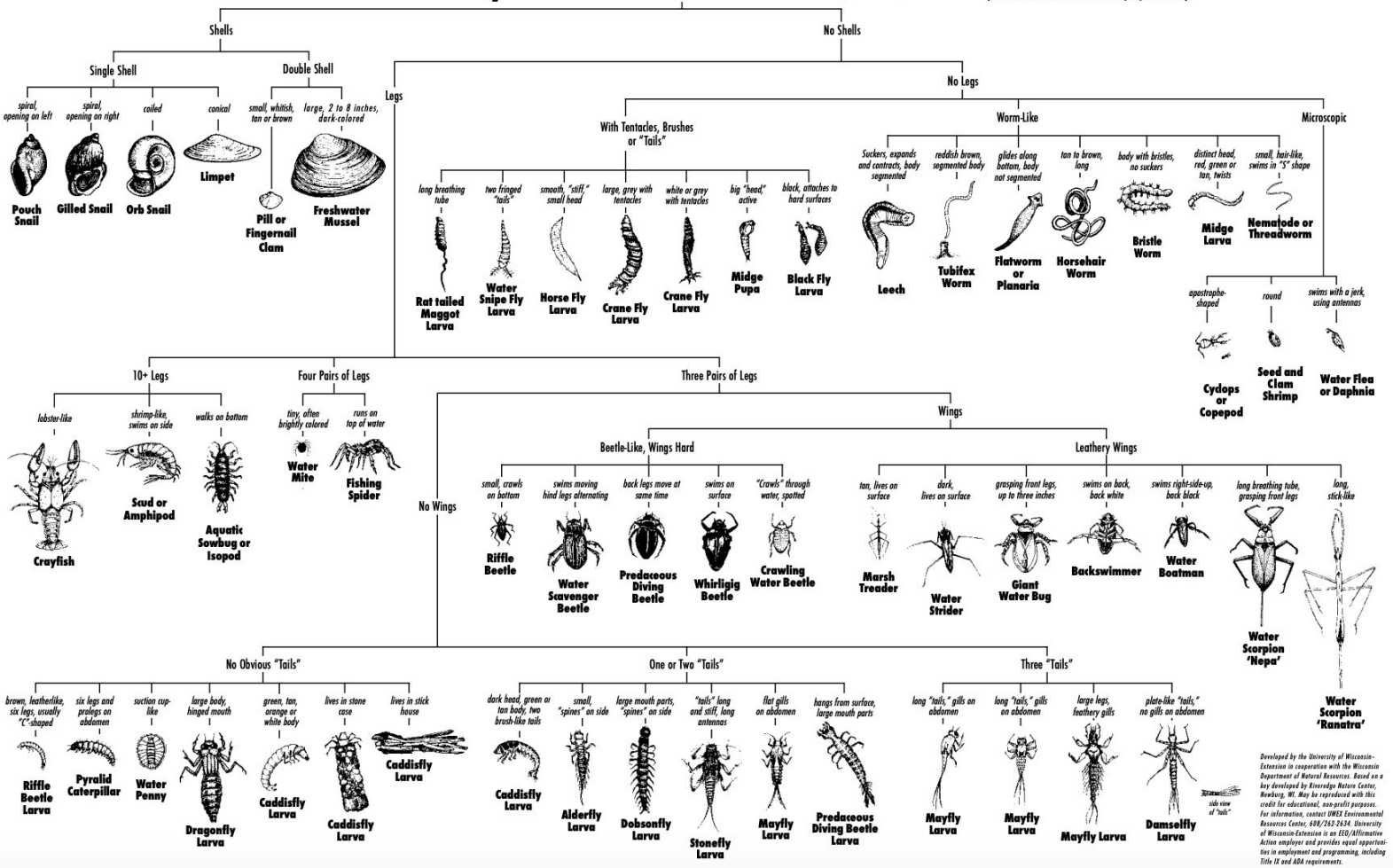
- Some general creek health indicators:
  - Lots of sand or silt at the bottom of the creek means there's too much erosion
  - Steep or caved in creek banks indicate too much erosion
  - Presence of certain bug larvae point a clean and healthy creek
  - Some organisms like leeches are very pollution tolerant, therefore large numbers of them in a creek point to the potential presence of pollution
  - Lots of vegetation along the creek shore is good, it prevents erosion and filters the water that runs off into the creek
  - Concrete creek bottom or sides without any meandering in the stream leads to polluted water that is not naturally filtered by a healthy creek structure

Kick - Seine Activity

- Kick-seining is a way to capture aquatic organisms in order to evaluate the health of the water ecosystem.
- The first step for this activity is to get a kick-seine net like the one shown in the picture to the left. A kick-seine net can be any large net tied at all 4 corners to 2 long sticks. The less space between the gaps in the net, the better
- Have one or two people hold the net and stick one end of it into the water so the edge of the net is touching the ground, like shown in the picture.
- If you are in a body of water that flows, then have another person walk upstream from the net, then turn around and start kicking up rocks and dirt as they slowly walk downstream towards the net.

Kick- Seine Activity Cont.

- If you are in still water that doesn't flow, then do the same thing, have the net holder and the net kicker stand facing each other with a few yards between them. But this time, while the kicker is moving towards the net, have the net holder(s) slowly move towards the kicker at the same time.
- Once the kicker is right in front of the net, have them reach down and grab the net by the bottom where it's touching the ground, then pull up the net so it becomes horizontal, like shown in the picture on the left. It's important to pull up from the bottom so that the things you catch don't escape
- Once you've pulled up the net, examine and identify the creatures that you caught. Some organisms are more tolerant to pollution than others, if you find organisms that have a low pollution tolerance, this is an indicator that your water ecosystem is healthy and clean


Key to Macroinvertebrate Life in the River
(Sizes of illustrations are not proportional.)
Shells
No Shells
Single Shell
Double Shell
spiral, opening on left
spiral, opening on right
coiled
conical
small, whitish, tan or brown
large, 2 to 8 inches, dark-colored
Pouch Snail
Gilled Snail
Orb Snail
Limpet
Pill or Fingernail Clam
Freshwater Mussel
Legs
No Legs
With Tentacles, Brushes or "Tails"
Worm-Like
Microscopic
long breathing tube
two fringed "tails"
smooth, "stiff," small head
large, grey with tentacles
white or grey with tentacles
big "head," active
black, attaches to hard surfaces
Rat tailed Maggot Larva
Water Snipe Fly Larva
Horse Fly Larva
Crane Fly Larva
Crane Fly Larva
Midge Pupa
Black Fly Larva
Suckers, expands and contracts, body segmented
reddish brown, segmented body
glides along bottom, body not segmented
tan to brown, long
body with bristles, no suckers
distinct head, red, green or tan, twists
small, hair-like, swims in "S" shape
Leech
Tubifex Worm
Flatworm or Planaria
Horsehair Worm
Bristle Worm
Midge Larva
Nematode or Threadworm
apostrophe-shaped
round
swims with a jerk, using antennas
Cydops or Copepod
Seed and Clam Shrimp
Water Flea or Daphnia
10+ Legs
Four Pairs of Legs
Three Pairs of Legs
lobster-like
shrimp-like, swims on side
walks on bottom
tiny, often brightly colored
runs on top of water
Crayfish
Scud or Amphipod
Aquatic Sowbug or Isopod
Water Mite
Fishing Spider
Wings
Beetle-Like, Wings Hard
Leathery Wings
small, crawls on bottom
swims moving hind legs alternating
back legs move at same time
swims on surface
"Crawls" through water, spotted
Riffle Beetle
Water Savenger Beetle
Predaceous Diving Beetle
Whirligig Beetle
Crawling Water Beetle
tan, lives on surface
dark, lives on surface
grasping front legs, up to three inches
swims on back, back white
swims right-side-up, back black
long breathing tube, grasping front legs
long, stick-like
Marsh Treader
Water Strider
Giant Water Bug
Backswimmer
Water Boatman
Water Scorpion 'Nepa'
Water Scorpion 'Ranatra'
No Wings
No Obvious "Tails"
One or Two "Tails"
Three "Tails"
brown, leatherlike, six legs, usually "C"-shaped
six legs and prolegs on abdomen
suction cup-like
large body, hinged mouth
green, tan, orange or white body
lives in stone case
lives in stick house
Riffle Beetle Larva
Pyralid Caterpillar
Water Penny
Dragonfly Larva
Caddisfly Larva
Caddisfly Larva
Caddisfly Larva
dark head, green or tan body, two brush-like tails
small, "spines" on side
large mouth parts, "spines" on side
"tails" long and stiff, long antennas
flat gills on abdomen
bangs from surface, large mouth parts
Caddisfly Larva
Alderfly Larva
Dobsonfly Larva
Stonefly Larva
Mayfly Larva
Predaceous Diving Beetle Larva
long "tails," gills on abdomen
long "tails," gills on abdomen
large legs, feathery gills
plate-like "tails," no gills on abdomen
Mayfly Larva
Mayfly Larva
Mayfly Larva
Damselfly Larva
side view of "tails"
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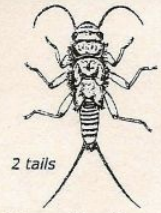
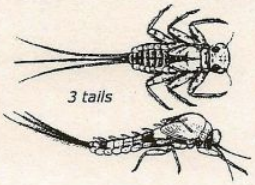
Macroinvertebrate Identification Key

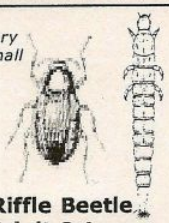
GROUP 1 – Very Intolerant of Pollution



Stonefly Nymph

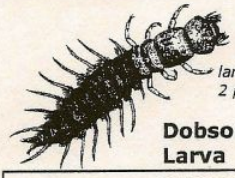


Mayfly Nymph

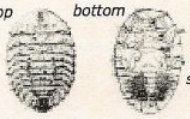


Riffle Beetle Adult & Larva

Caddisfly Larva



Dobsonfly Larva



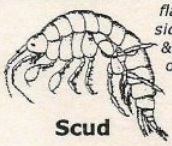
Water Penny Larva

Right-Handed Snail

GROUP 2 – Moderately Intolerant of Pollution

Damselfly Nymph

Dragonfly Nymph



Scud

Sowbug

flattened top to bottom (looks like a pill bug)

Cranefly

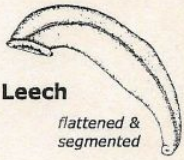
Clam/Mussel

GROUP 3 – Fairly Tolerant of Pollution

Midge Larva

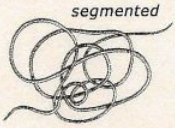
Planaria

Black Fly Larva



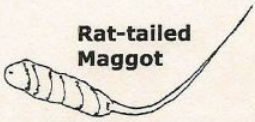
Leech

GROUP 4 – Very Tolerant of Pollution

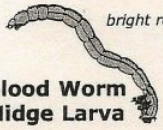


Aquatic Worms

Left-Handed Snail



Rat-tailed Maggot



Blood Worm Midge Larva

Acquiring a Kick-Seine Net

- Kick-Seine nets can be bought online at many locations. The links below are a few options.
- https://www.acornnaturalists.com/products/freshwater-marine-ecosystems/aquatic-nets-sampling-equipment/economy-grade-kick-net.html
- https://www.basspro.com/shop/en/ranger-seine-net
- https://www.forestry-suppliers.com/product_pages/products.php?mi=36621&itemnum=78012&redir=Y
- However these nets can be expensive. There are several ways to make your own kick-seine nets for cheap.
- One option is to make one out of a window screen. The articles below explains how to do this.
- https://thedragonflywoman.com/2016/11/06/making-a-kick-net-by-hand/
- https://streamsidescience.usu.edu/ou-files/Missing-macro/kick-net.pdf
- It can also be made with mesh fabric, the article below explains this method.
- http://www.streamexplorers.org/get-active/things-you-can-do-yourself/seine-bugs
- Basically, any tightly woven net or mesh material secured between two long sticks will suffice for this activity, just make sure the edge of your net is able to touch directly onto the floor of your water body

How Can You Help Your Creek?

- <u>Do these with the help of an adult, and with the permission of the property owner.</u>
- Some options:
  - Go on a creek hike and pick up litter and trash as you go (with the help of an adult)
  - Don’t mow or pull vegetation along a creek bank, leave a few feet of buffer around the creek for natural vegetation
  - Plant native plants along the creek bank
  - Put biochar in a mesh bag or tube and put it in your creek as a natural filter (Google Biochar and water filtration for more information)
  - Remove big pieces of debris that are blocking the flow of water
  - Avoid using pesticides or other chemicals on outdoor areas like yards

Extra Resources

“How to Care for Urban Creeks”

https://www.environment.sa.gov.au/goodliving/posts/2017/03/urban-creeks

“12 Things You Can do to Clean Up Your Rivers, Streams”

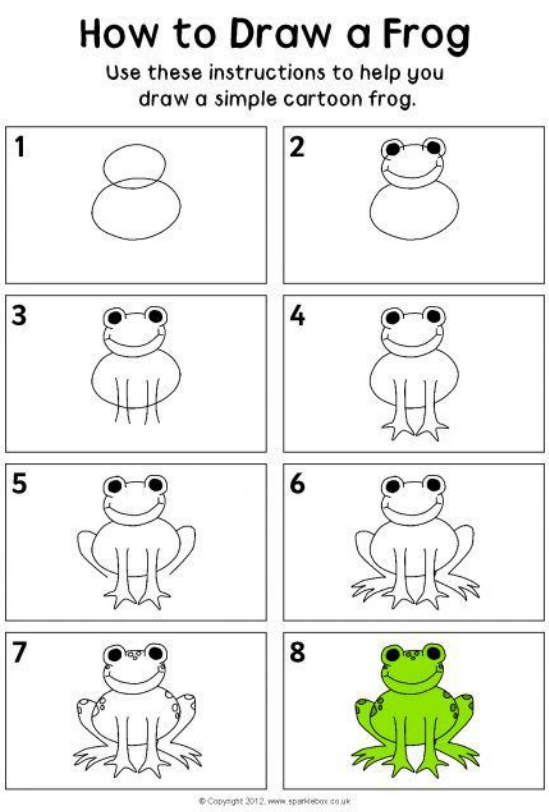
https://www.cbf.org/join-us/more-things-you-can-do/12-things-you-can-do-to-clean.html

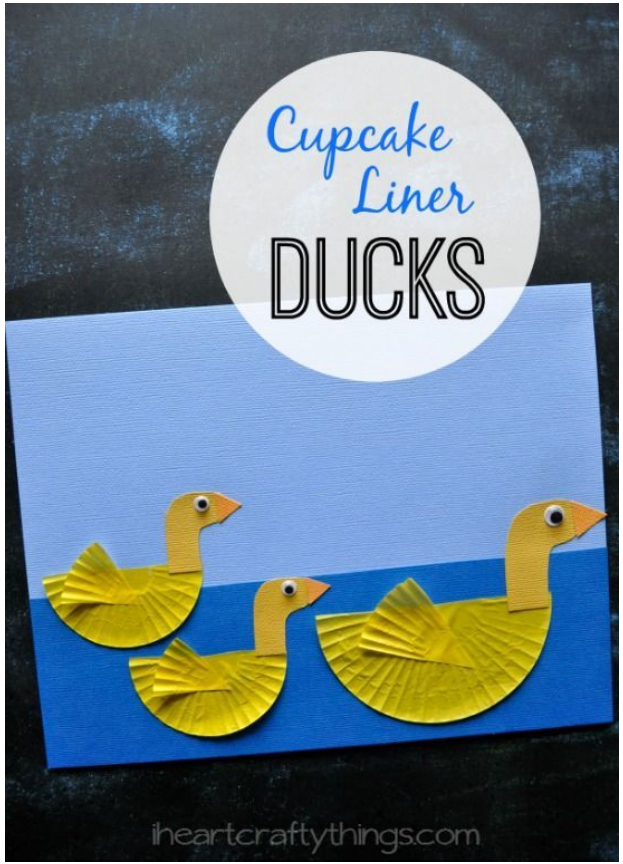
“Creek Care Guide”

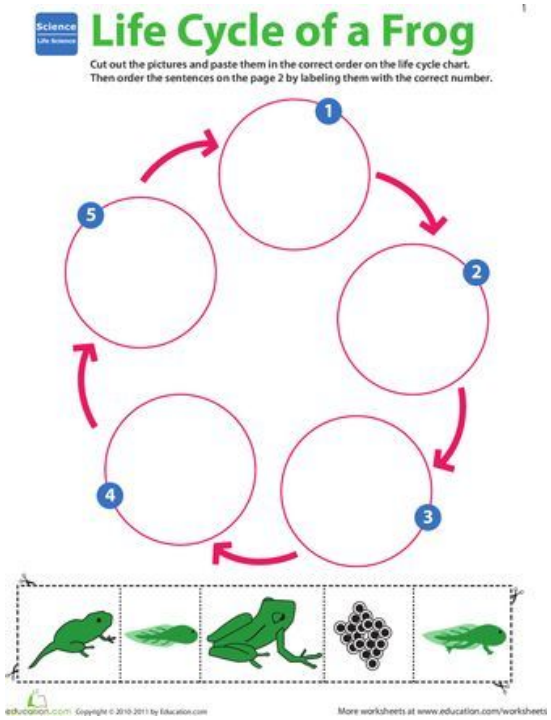
http://lagunacreek.org/wp-content/uploads/2011/08/Creek-Care-GuideFinal.pdf

Activities

- Simulate the filtration effect of streams
  - Get a container with holes (berry container, strainer, flower pot)
  - Fill the container with gravel and sticks, layer paper towels on top (the paper towel represents vegetation)
  - Take muddy water and run it over the container, catching the water in a bowl below
  - The water that comes out should be a bit clearer than the muddy water that went in
- Find a Rainbow
  - Go on a creek hike and find as many colors as you can
  - Bring along a handful or crayons, markers, etc, with you for each color, so you can compare them to what you find
- Play word games
  - Teach kids how to spell advanced aquatic vocabulary words by playing hangman
  - Take turns acting out and guessing vocabulary words like “precipitation” the way you would play charades


How to Draw a Frog
Use these instructions to help you draw a simple cartoon frog.
1
2
3
4
5
6
7
8
© Copyright 2012, www.sparkleboxcouk


Cupcake Liner
DUCKS
iheartcraftythings.com


Science
Life Science
Life Cycle of a Frog
Cut out the pictures and paste them in the correct order on the life cycle chart.
Then order the sentences on the page 2 by labeling them with the correct number.
1
2
3
4
5
More worksheets at www.education.com/worksheets

(make your own creek cross-section)