

Arthropods outnumbered worksheet

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Biology
Arthropod Coloring Worksheet

Arthropods are a group of animals in the Kingdom Animalia. All arthropods have a hard exoskeleton made of chitin, a body divided into segments, and jointed appendages. Three main groups of the arthropods include the insects, arachnids, and crustaceans.

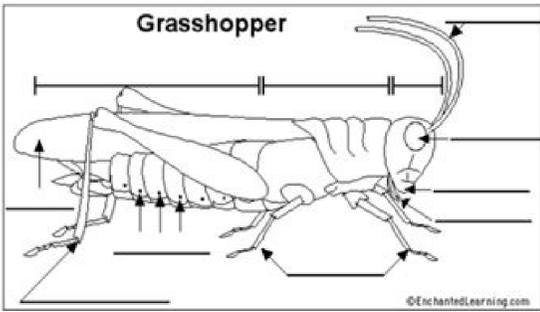
Insects

Insects have three body segments --- the head, thorax (middle region) and the abdomen. Often you can see segments on the abdomen of insects. Locate all the insects on the coloring sheet and **label and color** the head red, the thorax yellow, and the abdomen green. Insects have three sets of legs (6), which are attached to the thorax. **Label and color** all the insect legs blue. You will also note that each insect has a pair of antennae on the head. **Label and color** over the antennae in gray. The mouthparts of insects have a pair of **mandibles** (jaws) that chew food. Unlike the teeth of other animals, mandibles open from side to side. Locate the mandibles (they are only visible on two of the insects pictured) and **color and label** the mandibles purple. Some, but not all insects have wings, which also attach to the thorax. **Color and label** the wings pink. An additional body part can be seen on the grasshopper. This part is behind the head and covers and protects part of the thorax. It is called the **pronotum**. **Label and color** the pronotum brown.

Grasshoppers are a common type of arthropod. Read the definitions, then **label and color** the grasshopper anatomy diagram below:

- abdomen** - the segmented tail area of a grasshopper, which contains the heart, reproductive organs, and most of the digestive system (red)
- antennae** - like all insects, grasshoppers have 2 segmented antennae that sense touch and odors (gray)
- compound eye** - grasshoppers have 2 faceted eyes made up of many hexagonal lenses (light green)
- head** - the head is at the front end of the grasshopper's body and is the location of the brain, the two compound eyes, the mouth parts, and the points of attachment of its two antennae. (brown)
- jumping legs** - the long, hindmost pair of the grasshopper's six legs (dark green)
- mandibles** - the jaws, located near the tip of the head, by the palps; the jaws crush the food (purple)
- palps** - long, segmented mouth parts (under the jaws) that grasp the food (violet)
- spiracles** - a series of holes located along both sides of the abdomen; they are used for breathing
- thorax** - the middle area of the grasshopper's body - where the legs and wings are attached (tan)
- walking legs** - the four, short front legs that are used for walking (yellow)
- wings** - grasshoppers have two long wings, used for flying (light blue)

Figure 1 - External Grasshopper Anatomy



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Arthropods

	<p>Arthropods are the most numerous animals on earth. They have an exoskeleton, a segmented body, and jointed legs. They do not have a backbone and are cold-blooded.</p> <p>Can you discover other Arthropods?</p>	

Arthropod Sorting Activity

Arachnids	Crustaceans	Insects

Arthropods

Arthropods are the biggest group of invertebrates. All arthropods have an external skeleton that protects their body. They also have many legs.

INSECTS	ARACHNIDS	CRUSTACEANS	MYRIAPODS
<ul style="list-style-type: none"> • 6 legs. • Exoskeleton • 3 body parts (head, thorax and abdomen). • Two antennae. • Many have wings. • Examples are wasps, ants, butterflies... 	<ul style="list-style-type: none"> • 8 legs. • Exoskeleton. • 2 body parts (cephalothorax and abdomen). • Most have 8 eyes. • Don't have antennae or wings • Examples are spiders, scorpions... 	<ul style="list-style-type: none"> • 10 legs. • Exoskeleton. • 2 body parts (cephalothorax and abdomen). • Two antennae. • Examples are crabs, prawns... 	<ul style="list-style-type: none"> • Lots of legs. • Exoskeleton. • Two antennae. • Body has lots of segments.

Others **live in water** and breathe through **gills**:
shrimp (gamba)
(Otros viven en el agua y respiran por branquias como la gamba)



Take a look at these videos, if you like.
(Mira estos videos si te opetece)
<https://www.youtube.com/watch?v=X5v8YVjg16c>
English

<https://www.youtube.com/watch?v=3Y1arVVT8Q0>
Spanish

Threatened2013 Figure 1. Rocky Mountain Tailed frog, *Ascaphus montanus*. A) adult male, Bonner County, Idaho. B) tadpole, Idaho County, Idaho. Photos: Gary Nafis Figure 2. Mitochondrial DNA genetic variation within the Rocky Mountain Tailed Frog. A) Maximum-likelihood tree estimated from cytochrome b sequence data under the HKY+Γ model of sequence evolution, using Coastal Tailed Frog sequences as the outgroup. Letters indicate different mtDNA haplotypes. Numbers above branches are maximum-likelihood bootstrap values (100 replicates); those below branches are Bayesian estimates of nodal support (4 chains of 107 generations each). B) Distribution of mtDNA haplotypes within the range of the Rocky Mountain Tailed Frog, indicating the northern and southern clades. Source: after Nielson et al. (2006) Figure 3. Distribution of *Ascaphus montanus* in North America. The U.S. locations indicated on the map are occurrences of the species at the level of county (Idaho and Montana) or subcounty (Washington and Oregon). Adapted from Green et al. (in press) Figure 4. Range of *Ascaphus montanus* in Canada. Localities (= element occurrences) are indicated as red dots (Source: British Columbia Conservation Data Centre 2012). Open symbols show approximate locations of unconfirmed records from Montana electrofishing surveys 2008 - 2012 (modifications to map by Ian Adams) Figure 5. Frog observations during fish sampling (electrofishing) by Montana Dept. of Fish, Wildlife and Parks personnel in the Canadian Flathead River watershed, 2008 - 2012. If validated, the two southeastern and the far northern records (red symbols) increase the known distribution of the species within the Flathead (Map source: Amber Steed, Montana Dept. of Fish, Wildlife and Parks) Figure 6. Estimates of A) area of range extent within occupied drainages and B) index of area of occupancy for the Rocky Mountain Tailed Frog in Canada. Source: BC Conservation Data Centre (2012). The extent of occurrence using a minimum convex polygon and including the intervening unoccupied habitat is 1,900 km² (or 3,300 km² including recent unconfirmed Montana electrofishing records, not shown) Figure 7. Rocky Mountain Tailed Frog tadpole and adult distribution in A) the Yahk River watershed and B) the Flathead River watershed based on data from timed searches in 2001 (Yahk) and 2003 (Flathead) during late summer. Source: Dupuis and Friele (2006) Figure 8. Distribution of Rocky Mountain Tailed Frog habitat in A) the Yahk River watershed and B) the Flathead River watershed in southeast British Columbia (source: adapted from Cordilleran Geoscience and ESSA Technologies 2010). Figure 9. Anticipated effects of climate change on ecosystem distribution in southern British Columbia. The maps show a progressive loss of the Engelmann Spruce/Subalpine Fir (ESSF) ecological zone and its replacement by the Interior Cedar/Hemlock Zone (ICH) ecological zone in the mountains of the extreme southeast, as well as the spread of the Bunch Grass (BG) ecological zone in the southern Rocky Mountain Trench. The ecological zones are: CDF, Coastal Douglas-fir; CWH, Coastal Western Hemlock; BG, Bunchgrass; PP, Ponderosa Pine; IDF, Interior Douglas-fir; ICH, Interior Cedar-Hemlock; SDPS, Sub-boreal Pine and Spruce; SBS, Sub-boreal Spruce; BWBS, Boreal White and Black Spruce; MH, Mountain Hemlock; ESSF, Engelmann Spruce-Subalpine Fir; MS, Montane Spruce; SWB, Spruce-Willow-Birch; AT, Alpine Tundra. After Hamann and Wang (2006). Figure 10. Wildlife Habitat Areas (WHAs) for Rocky Mountain Tailed Frogs (established in A) the Yahk River watershed (purple stream sections) and B) the Flathead River watershed (red stream sections). Source: Ascaphus Consulting (2005). Document Information Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status reports are working documents used in assigning the status of wildlife species suspected of being at risk. This report may be cited as follows: COSEWIC. 2013. COSEWIC assessment and status report on the Rocky Mountain Tailed Frog *Ascaphus montanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 46 pp. Previous report(s): COSEWIC. 2000. COSEWIC assessment and status report on the Rocky Mountain Tailed Frog *Ascaphus montanus* and the Coast Tailed Frog *Ascaphus truei* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-29 pp. Production note: COSEWIC would like to acknowledge David M. Green for writing the update status report on the Rocky Mountain Tailed Frog (*Ascaphus montanus*) in Canada, prepared under contract with Environment Canada. This report was overseen and edited by Kristiina Ovaska, Co-chair of the COSEWIC Amphibians and Reptiles Specialist Subcommittee. For additional copies contact: COSEWIC Secretariat c/o Canadian Wildlife Service Environment Canada Ottawa, ON K1A 0H3 Tel.: 819-953-3215 Fax: 819-994-3684 COSEWIC E-mail: COSEWIC@ec.gc.ca or E-mail: COSEWIC@ec.gc.ca. Egalement disponible en français sous le titre Evaluation et Rapport de situation du COSEWIC sur la Grenouille-à-queue des Rocheuses (*Ascaphus montanus*) au Canada. Cover illustration/photo: Rocky Mountain Tailed Frog - Reproduced with permission by Bureau of Fisheries, New York State Department of Environmental Conservation. ©Her Majesty the Queen in Right of Canada, 2014. Catalogue No. CW69-14/195-2014E-PDF ISBN 978-1-100-23536-3 COSEWIC Assessment Summary Common name Rocky Mountain Tailed Frog Scientific name *Ascaphus montanus* Status Threatened Reason for designation In Canada, this unusual stream-breeding frog is restricted to two unconnected watersheds, where it relies on small, forested fast-flowing streams. Habitat damage from sedimentation due primarily to roads, logging, and fires, and loss of terrestrial dispersal habitat from logging and wood harvesting are key threats. The total population is small, consisting of approximately 3000 adults, which increases the vulnerability of the population to environmental perturbations. Increases in habitat protection and a moratorium on mining in the Flathead River portion of the range resulted in a change of status from Endangered. Occurrence British Columbia Status

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Wright. 1949. *Handbook of Frogs and Toads of the United States and Canada*. Comstock Publishing Company, Inc. New York. Biographical Summary of Report Writer(s) Prof. David M. Green obtained his B.Sc. in Zoology from the University of British Columbia and his M.Sc. and Ph.D., both also in Zoology, from the University of Guelph. He came to the Redpath Museum of McGill University in 1986 and is now a Full Professor and the Director of the Museum. Prof. Green was Chair of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and served as co-chair of COSEWIC's Amphibians and Reptiles Subcommittee for 14 years. He was a member of the Science Advisory Council of Fisheries and Oceans Canada and the Council of Canadian Academies' Panel on the State and Trends of Biodiversity Science in Canada. He is an Associate Editor for the journal *Diversity and Distributions* and the *Zoological Journal of the Linnean Society*, and is a Fellow of the Linnean Society of London. Prof. Green's research concerns the ecology, genetics, and evolution of amphibians. He has particular interests in species at risk, including the determinants of species' ranges and population declines, population dynamics, dispersal and recruitment in amphibians, and declining amphibian populations. He has authored over 120 refereed publications and book chapters, and more than 100 miscellaneous other publications and reports. True to his calling, few of his publications fail to mention amphibians in some manner. His most recent book is "North American Amphibians. Diversity and Distribution" (University of California Press, 2013) with co-authors Linda A. Weir, Gary S. Casper and Michael J. Lannoo. Collections Examined No collections were re-examined specifically for this report. Aboriginal Traditional Knowledge (ATK) No ATK relevant to Rocky Mountain Tailed Frog was available at the time of drafting this report. Appendix 1. Threats Calculator for the Rocky Mountain Tailed Frog (source: Govindarajulu pers. comm. 2013). Species or Ecosystem Ascaphus montanus, Rocky Mountain Tailed Frog Date: 20, Feb 2013 Assessor(s): David Green, Melissa Todd, Dave Fraser, Purnima Govindarajulu, Ted Antifeau, Ian Adams, Kristiina Ovaska, Lea Gelling Overall Threat Impact Calculation Help: Threat Impact Threat Impact (descriptions) Level 1 Threat Impact Counts high range low range A Very High 0 0 B High 1 0 C Medium 1 0 D Low 4 5 - Calculated Overall Threat Impact: High High Threats Assessment Worksheet Table. Number Threat Impact (calculated) Criterion Impact (calculated) Scope (next 10 Yrs) Severity (10 Yrs or 3 Gen.) Timing Comments 1 Residential & commercial development - - - - - 1.1 Housing & urban areas - - - - - It is probably intolerant of persistent turbidity and excessive siltation, both consequences of agricultural and urbanization activities (Scott and Crossman 1973) 1.2 Commercial & industrial areas - - - - - 1.3 Tourism & recreation areas - - - - - 2 Agriculture & aquaculture - - - - - 2.1 Annual & perennial non-timber crops - - - - - 2.2 Wood & pulp plantations - - - - - 2.3 Livestock farming & ranching - Negligible Negligible (

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