

Columbia College Occupational Olympics

Natural Resources

Criteria

- I. Part I. Plant ID – 40 points – 20 samples at two points each.
 - A. The samples will be freshly cut foliage and reproductive parts, and/or herbarium specimens. The score sheet for Plant Identification will be matching. The students will write the proper number on the line adjacent to the plant's scientific name (common name next to it). See “The Woody Vegetation of the Columbia College Campus” (below) for plants that may appear on this section.

- II. Part II. Animal ID – 40 points - 20 animals at two points each.
 - A. Live animals, mounted specimens, track casts, skins, pelts, antlers, scat, and wildlife camera photos may be used. The score sheet for Animal Identification will be matching. The students will write the proper number on the line adjacent to the animal's scientific name (common name next to it). See “The Animals of the Columbia College Campus” (below) for animals that may appear on this section.

- III. Part III. Manipulative Skills (hands on) - 30 points.

Test is to include any three of the following activities using a minimum of one from each category at ten points each. This section is scored on a continuum scale: From 1-10 points per activity.

- IV.
 - A. Dendrochronology
 1. Given a log cross section, determine the age of a tree counting the pith as two years.
 2. Given a log cross section determine the time period of a drought.
 3. Given a log round cross section determine if a fire is indicated in the growth rings.
 4. Using a long round, determine the time period in which a release cut was made.
 - B. Measurements/Instrumentation
 1. Determine the elevation of a given indicated point, on a topographical/contour map. Ten points possible - 2 per contour intervals off of the correct answer.
 2. Determine the location of two geographical sites, give the latitude and longitude using GPS equipment. 5 points each.
 - C. Environmental Analysis
 1. The student will be given five plaster track casts at two points each to identify.
 2. Given one of the following: Given a Life Zone such as Lower Montane Zone, Upper Montane Zone, Sub Alpine Zone, Alpine Zone, or Foothill Oak Woodland, indicate the primary plants that occupy the Life Zone. Name up to five.

Suggested Study Guides:

The John Muir Laws Field Guide to the Sierra Nevada (ISBN-13: 9781597140522) by John Muir
Laws

The National Audubon Society Field Guide to California (ISBN 978-0679446781) by Alden and
Heath

WOODY VEGETATION OF THE COLUMBIA COLLEGE CAMPUS

GYMNOSPERMS (NON-FLOWERING SEED-PLANTS)

Division Ginkgophyta

Class Ginkgoopsida

Order Ginkgoales

GINKGOACEA – Ginkgo Family

* *Ginkgo biloba* (L.) (ginkgo)

Division Pinophyta

Class Pinopsida

Order Pinales

CUPRESSACEAE – Cypress Family

Calocedrus decurrens (incense cedar)

* *Metasequoia glyptostroboides* (dawn redwood)

* *Sequoia sempervirens* (coast redwood)

* *Sequoiadendron giganteum* (giant sequoia)

PINACEAE – Pine Family

* *Abies concolor* (white fir)

* *Picea pungens* (Colorado blue spruce)

Pinus sabiniana (foothill gray pine)

Pinus ponderosa (ponderosa pine)

Pinus lambertiana (sugar pine)

* *Pinus contorta* (lodgepole pine)

* *Pinus jeffreyi* (Jeffrey pine)

* *Pseudotsuga menziesii* (Douglas fir)

continued...

ANGIOSPERMS (FLOWERING PLANTS)

Division Magnoliophyta

Class Magnoliopsida (Dicots)

Subclass Asteridae

Order Asterales

ASTERACEAE or COMPOSITAE – Sunflower or Daisy Family

Baccharis pilularis (coyote brush)

Ericameria arborescens (golden fleece)

Order Dipsacales

CAPRIFOLIACEAE – Honeysuckle Family

Sambucus mexicana (blue elderberry)

Subclass Dilleniidae

Order Ericales

ERICACEAE – Heather or Blueberry Family

Arbutus menziesii (madrone)

* *Arctostaphylos* spp. (various horticultural species)

Arctostaphylos viscida (white-leaf manzanita)

Order Malpighiales

SALICACEAE – Willow Family

Populus fremontii (Fremont cottonwood)

Populus tremuloides (quaking aspen)

Salix gooddingii (black willow)

Order Malvales

MALVACEAE – Mallow Family

Fremontodendron californicum (flannel bush)

Subclass Hamamelidae

Order Fagales

BETULACEAE – Birch Family

Alnus rhombifolia (white alder)

FAGACEAE – Beech Family

Quercus kelloggii (black oak)

Quercus wislizenii (interior live oak)

Quercus chrysolepsis (canyon live oak)

Quercus lobatta (valley oak)

Quercus douglasii (blue oak)

Subclass Magnoliidae

Order Ranunculales

BERBERIDACEAE Family

Berberis aquifolium (Oregon grape)

Subclass Rosidae

Order Cornales

CORNACEAE – Dogwood Family

Cornus nuttallii (mountain dogwood)

Order Fabales

FABACEAE or LEGUMINOSAE – Bean or Pea Family

Cercis occidentalis (redbud)

Order Rhamnales

RHAMNACEAE – Buckthorn Family

Ceanothus cuneatus (buckbrush)

Rhamnus rubra (Sierra coffee berry)

Order Rosales

ROSACEAE – Rose Family

Cercocarpus betuloides (birch-leaf mountain mahogany)

Heteromeles arbutifolia (toyon)

Prunus sp. (cherry)

Rosa californica (California rose)

Rubus spp. (blackberry)

Order Santales

VISCACEAE or SANTALACEAE

Arceuthobium spp. (dwarf mistletoe)

Phoradendron spp. (leafy mistletoe)

Order Sapindales

ANACARDIACEAE – Cashew or Sumac Family

Toxicodendron diversilobum (poison oak)

SAPINDACEAE – Soapberry Family

Aesculus californica (California buckeye)

SIMAROUBACEAE Family

**Ailanthus altissima* (tree of heaven)

Order Vitales

VITACEAE Family

Vitis californica (California wild grape)

Vertebrate Animals of the Columbia College Campus

Fish

- **Lepomis macrochirus* (bluegill)
- **Micropterus salmoides* (largemouth bass)
- **Oncorhynchus mykiss* (rainbow trout)

Amphibians

- Anaxyrus boreas halophilus* (California toad)
- Pseudacris regilla* (Pacific treefrog)
- **Lithobates catesbeianus* (American bullfrog)
- Ensatina eschscholtzii platensis* (Sierra Nevada ensatina)

Reptiles

- Contia tenuis* (sharp-tailed snake)
- Diadophis punctatus* (ring-necked snake)
- Thamnophis* sp. (garter snake)
- Pituophis catenifer* (gopher snake)
- Crotalus oreganus* (Pacific rattle snake)
- Sceloporus occidentalis* (western fence lizard)
- Uta stansburiana elegans* (side-blotched lizard)
- Elgaria coerulea palmeri* (Sierra alligator lizard)
- Eumeces gilberti* (Gilbert's skink)
- **Trachemys scripta elegans* (red-eared slider)
- Actinemys marmorata* (western pond turtle)

Birds

- Ardea herodias* (great blue heron)
- Branta canadensis* (Canada goose)
- Anas platyrhynchos* (mallard)
- Pandion haliaetus* (osprey)
- Accipiter striatus* (sharp-shinned hawk)
- Buteo jamaicensis* (red-tailed hawk)
- Cathartes aura* (turkey vulture)
- Callipepla californica* (California quail)
- **Meleagris gallopavo* (wild turkey)
- Columbia fasciata* (band-tailed pigeon)
- Zenaida macroura* (morning dove)
- Otus kennicottii* (western screech-owl)
- Tyto alba* (barn owl)
- Calypte anna* (Anna's hummingbird)
- Ceryle alcyon* (belted kingfisher)
- Melanerpes formicivorus* (acorn woodpecker)
- Cyanocitta stelleri* (Stellar's jay)
- Aphelocoma californica* (western scrub jay)
- Baeolophus inornatus* (oak titmouse)
- Psaltriparus minimus* (bushtit)
- Sitta canadensis* (red-breasted nuthatch)
- Sialia mexicana* (western bluebird)

Carduelis psaltria (lesser goldfinch)
Agelaius phoeniceus (red-winged blackbird)
Petrochelidon pyrrhonota (cliff swallow)

Mammals

Didelphis virginiana (opossum)
Peromyscus sp. (deer mouse)
Neotoma sp. (wood rat)
Sciurus griseus (gray squirrel)
Lepus californicus (black-tailed jackrabbit)
Procyon lotor (raccoon)
Bassariscus astutus (ringtail)
Mephitis mephitis (striped skunk)
Spilogale gracilis (western spotted skunk)
Urocyon cinereoargenteus (gray fox)
Canis latrans (coyote)
Puma concolor (mountain lion)
Ursus americanus (American black bear)
Odocoileus hemionus columbianus (Columbian black-tailed deer)

(* indicates non-native to the area of the Columbia College campus)

Additional California species not known to occur on the Columbia College Campus that may be used for this test.

Erethizon dorsatum (porcupine)
Castor canadensis (American beaver)
Tamiasciurus douglasii (Douglas squirrel)
Glaucomys sabrinus (northern flying squirrel)
Aplodontia rufa (mountain beaver)
Lontra canadensis (North American river otter)
Taxidea taxus (American badger)
Gulo gulo (wolverine)
Martes pennanti (fisher)
Martes americana (American pine marten)
Mustela erminea (short-tailed weasel)
Lynx rufus (bobcat)
Vulpes vulpes necator (Sierra Nevada red fox)
Odocoileus hemionus (mule deer)
Cervus canadensis (elk)
Antilocapra americana (pronghorn)

Binomial Nomenclature:

Genus and species are always either underlined or *italicized*.

Genus is always capitalized.

Species is never capitalized.

“sp.” after genus means species is not important to context or unknown

“spp.” after genus means there are multiple species being referred to in the genus

Pinus ponderosa

Genus species

Pinus ponderosa

Genus species

Linnean System:

A nested hierarchy, where Kingdom is the most inclusive group (taxon) and Species is the least inclusive group (taxon). Often group (taxon) names are in Latin or Greek. Most taxa also have “common names”. Placement within the Linnean system is based on evolutionary history.

<u>Taxa</u>	<u>Human</u>	<u>Fly Agaric</u>	<u>Ginkgo tree</u>	<u>Madrone</u>	<u>Black Oak</u>	<u>Blue Oak</u>
Kingdom	Animalia	Fungi	Plantae	Plantae	Plantae	Plantae
Division	Chordata	Basidiomycota	Ginkgophyta	Magnoliophyta	Magnoliophyta	Magnoliophyta
Class	Mammalia	Agaricomycetes	Ginkgoopsida	Magnoliopsida	Magnoliopsida	Magnoliopsida
Order	Primates	Agaricales	Ginkgoales	Ericales	Fagales	Fagales
Family	Hominidae	Amanitaceae	Ginkgoaceae	Ericaceae	Fagaceae	Fagaceae
Genus	<i>Homo</i>	<i>Amanita</i>	<i>Ginkgo</i>	<i>Arbutus</i>	<i>Quercus</i>	<i>Quercus</i>
Species	<i>sapiens</i>	<i>muscaria</i>	<i>biloba</i>	<i>menziesii</i>	<i>kelloggii</i>	<i>lobata</i>

Taxa

Kingdom

Division (Phylum)

Class

Order

Family

Genus

Species

Singular vs. Plural endings (suffixes)

1 genus, 2 genera

1 species, 2 species

1 taxon, 2 taxa

Taxon Endings (suffixes)

- phyta = division (“plants”) (e.g. Division Magnoliophyta)

- ales = order (e.g. Order Salicales)

- aceae = family (e.g. Salicaceae Family)