Studies have shown that repetition is the most effective form of learning. To this end, flashcards are one of the simplest and most successful tools for engaging students in the learning process. Flashcards allow students to take advantage of brief periods throughout the day, because they can easily be taken anywhere and also allow students to “compete” with themselves or against peers in group settings. The flashcards provided within this publication will help FFA participants prepare for the identification practicum portion of the National Environmental and Natural Resources Career Development Event.

Provided are 148 digital photographs of all plants, wildlife, and equipment found on the National FFA Career Development Event Handbook identification list (p. 139-140). Actual specimens from the Purdue University teaching collection will be used for the identification practicum when possible. While most specimens retain their coloration for decades, some may fade over short periods of time. To ensure students are prepared for these subtle changes, these flashcards were developed using digital photographs of specimens that will be displayed on the day of the contest. For the few items not currently housed within the Purdue University teaching collection, pictures may be used in lieu of specimens.

USING THE CARDS
Information on how to identify a particular species is listed on the back of each flashcard. The most important characteristics used for identification are always listed first.

Use the following pages to make flashcards by first printing the files with a color printer, then cutting along the dotted lines and folding the papers.

THE CONTEST
Participants will not be allowed to handle any of the practicum items. Students will be required to identify 50 plant/wildlife species or associated natural resource equipment from among a total of 148 listed on the attached cards. A participating student will have time to view a specimen and record an answer on the top of the scantron sheet before moving to the next station.
WATER QUALITY EQUIPMENT

Refractometer

Secchi disk

Thermometer
WATER QUALITY EQUIPMENT

Water bottle sampler

Water meter—physical and chemical parameters


AQUATIC EQUIPMENT

Aquatic net
AQUATIC EQUIPMENT

Bottom dredge

Photo: https://wildco.com/product_info.php?products_id=346&osCsid=a9b663b64f15d9272b99d98e932a

AQUATIC EQUIPMENT

Fish measuring board

AQUATIC EQUIPMENT

Plankton net

Photo: https://wildco.com/product_info.php?products_id=952&osCsid=a9b663b64f15d9272b99d98e932a
AQUATIC EQUIPMENT

Seine

Photo: https://wildco.com/product_info.php?products_id=793&osCsid=a9b663b64f15d0721c990d82e9632a

AQUATIC EQUIPMENT

Sieves

Photo: https://wildco.com/product_info.php?products_id=350&osCsid=a9b663b64f15d0721c990d82e9632a

AQUATIC EQUIPMENT

Stream bottom sampler

Photo: https://wildco.com/product_info.php?products_id=350&osCsid=a9b663b64f15d0721c990d82e9632a
WILDLIFE EQUIPMENT

Binoculars

Mammal trap

Snake/Reptile stick
WILDLIFE EQUIPMENT

Radio telemetry unit

GEOGRAPHICAL EQUIPMENT

GPS unit

WILDLIFE EQUIPMENT

Animal tags/bands
WEATHER EQUIPMENT

Barometer

Photo: http://upload.wikimedia.org/wikipedia/commons/9/9c/Dosen-barometer.jpg

Sling psychrometer

Photo: http://lib.store.yahoo.net/lib/purshelf/1130Ltoe.jpg

Rain gauge

Photo: http://lib.store.yahoo.net/lib/purshelf/1131Ltoe.jpg
WEATHER EQUIPMENT

Wind speed meter

FORESTRY EQUIPMENT

Biltmore stick

FORESTRY EQUIPMENT

Diameter tape
FORESTRY EQUIPMENT

Prism

FORESTRY EQUIPMENT

Tree increment borer

NATIVE SPECIES — Wildlife

Armadillo

*Characteristics:*

Shell-like, scaly skin covering back
Bony scutes cover head and long tail
Prominent claws on all four feet
Badger

*Characteristics:*
- White stripe from nose to back of head
- Black patches on cheeks
- Thick, stout body
- Large, heavy claws on forefeet

Beaver

*Characteristics:*
- Large, broad, and flattened tail
- Fur brown and thick
- Hind feet webbed

Bison

*Characteristics:*
- Large, thick body with brown fur
- Thicker fur on head and shoulders
- Horns on both male and female
Black bear

*Characteristics:*

- Usually black fur, other colors may dominate
- Light patch often on chest
- Lighter colored muzzle
- Lacks hump of shoulders (compare to grizzly bears)

Bobcat

*Characteristics:*

- Tail short and black only at tip
- Ear tufts short

Chipmunk

*Characteristics:*

- White eye stripes
- Two white stripes bordered by black on back
- Reddish color body
Cottontail

*Characteristics:*
- Large, white hind feet
- Large ears
- Cotton-ball-shaped tail—white below
- Neck rusty-red color
- Body fur brownish or grayish

Coyote

*Characteristics:*
- Resembles medium-sized dog
- Body grizzled gray or reddish gray
- Tail often with black tip

Elk

*Characteristics:*
- Males with multi-tined antlers
- Brown or tan on upper half of body
- Lower half of body much darker
Fox squirrel

*Characteristics:*
- Body fur rusty-orange mixed with gray
- Long tail with orange-tipped fur
- Belly orange

Gray squirrel

*Characteristics:*
- Body fur grayish
- Long tail with white-tipped fur
- Belly whitish

Gray wolf

*Characteristics:*
- Large size (relative to coyote)
- Large paws
- Large, blocky muzzle
- Assorted colors: gray, black, white, tan
Grizzly bear

*Characteristics:*

- Pronounced shoulder hump
- Short, round ears

Jack rabbit

*Characteristics:*

- Very long ears and hind legs
- Back gray interspersed with black
- Larger body than cottontail

Mole

*Characteristics:*

- Huge front feet and claws
- Short, naked tail
- Soft, “reversible” body fur
Moose

*Characteristics:*
- Large, paddled antlers
- Very large body with long legs
- Dark body fur, overall

Mountain goat

*Characteristics:*
- Long, shaggy white fur covering body
- Black hooves and horns

Mountain lion

*Characteristics:*
- Large, pale-brown, unspotted cat
- Relatively small head and long, dark-tipped tail
**Muskrat**

Characteristics:

- Body fur rich, dark brown
- Tail long, naked, and compressed from side-to-side

**Opossum**

Characteristics:

- Long, naked, round tail
- White face with black leathery ears

**Pocket gopher**

Characteristics:

- Long claws on front paws
- Eyes easily visible (unlike mole)
- Short, mostly naked tail
Polar bear

*Characteristics:* 
- Large, white bear 
- Small, rounded ears 
- Black nose

Porcupine

*Characteristics:* 
- Long hairs hiding short, barbed quills 
- Mostly brown color on body

Prairie dog

*Characteristics:* 
- Medium-sized, tan rodent 
- Short tail covered in fur 
- Small, rounded ears
**Pronghorn**

*Characteristics:*
- Short, “prong” antlers
- Tan or light-brown back
- Light, white color on chest and belly

![Pronghorn](http://animaldiversity.ummz.umich.edu/site/resources/phil_myers/classic/pronghorn2.jpg/medium.jpg)

**Raccoon**

*Characteristics:*
- Tail with alternating rings of yellowish white and black
- Black mask over eyes
- Body fur “salt and peppered”

![Raccoon](http://animaldiversity.ummz.umich.edu/site/resources/phil_myers/classic/raccoon.jpg/medium.jpg)

**Red fox**

*Characteristics:*
- Reddish-brown body
- Black legs and ear tufts
- Smaller size (relative to coyote)

![Red fox](http://animaldiversity.ummz.umich.edu/site/resources/phil_myers/classic/red-fox.jpg/medium.jpg)
Skunk

*Characteristics:*

- Mostly black body
- Variable amounts of white coloring on back

Weasel

*Characteristics:*

- Very long, cylindrical body
- Long tail tipped with black
- Short, rounded ears

White-tailed deer

*Characteristics:*

- Fawns reddish-brown with white spots
- White undersides
**Woodchuck**

*Characteristics:*
- Body fur grizzled, yellowish-brown, and frosted at tips
- Legs and feet dark brown or black
- Heavy-bodied

**Bald eagle**

*Characteristics:*
- White head and tail (adult)
- Mostly brown body
- Yellow, hooked beak
- Large, sharp talons

**Blue jay**

*Characteristics:*
- Crest on head
- Blue back with some black barring
- Whitish breast and belly
- Black necklace on throat
Brown pelican

*Characteristics:*

- Large pouch under bill
- Neck chestnut-colored in back, yellow in front
- Body brownish overall

Brown thrasher

*Characteristics:*

- Reddish brown on head, back, and tail
- Heavily streaked belly
- Long tail

Calliope hummingbird

*Characteristics:*

- Extremely small
- Relatively short bill and tail
- Iridescent Carmine streaks form V on male throat

Canada goose

*Characteristics:*
Black head and neck
White “chin strap”

Cardinal

*Characteristics:*
Red color overall, except black face
Cone-shaped orange bill
Crest on head

Cooper’s hawk

*Characteristics:*
Brown barring on breast and belly
Long tail, rounded when folded
Head gray, darker than back
Crissal’s thrasher

*Characteristics:*
- Distinct chestnut patch on underside of tail
- Long, decurved bill
- Long, slender body

Photo: http://www.roysephotos.com/CrissalThrasher1.jpg

Eastern bluebird

*Characteristics:*
- Deep blue along head, back, and tail
- Reddish along throat and breast
- White belly

Great-horned owl

*Characteristics:*
- Large ear tufts
- White throat
- Hooked beak
- Sharp talons
Great blue heron

Characteristics:
Long neck, legs, and bill
Large, bluish-gray body
Ornate plumes on head, neck, and back

Golden eagle

Characteristics:
Large brown body
Large, hooked beak and sharp talons

Kestrel

Characteristics:
Two black stripes on face
Reddish-brown back and tail
Hooked beak
Sharp talons
Least tern

*Characteristics:*
- Gray back
- White breast and belly
- Black cap and nape
- White forehead
- Orange-yellow bill with dark tip

Mallard

*Characteristics:*
- Metallic-green head on male
- Red breast

Mountain bluebird

*Characteristics:*
- Sky-blue back
- Paler, grayish on breast and belly
Osprey

*Characteristics:*
- Dark-brown back
- White breast and belly
- Dark eye stripe
- Very large talons with rough toe pads

Purple martin

*Characteristics:*
- Glossy, purplish-blue body
- Forked tail

Quail

*Characteristics:*
- Large, round body with small head
- Short bill
**Red-tailed hawk**

*Characteristics:*
- Red tail
- White breast with reddish brown spots across belly
- Hooked beak and sharp talons

**Ruby-throated hummingbird**

*Characteristics:*
- Small body
- Large, slender beak
- Iridescent throat

**Turkey**

*Characteristics:*
- Naked head
- Large size
- Iridescent body feathers
**White pelican**

*Characteristics:*
- Entirely white body
- Large pouch under bill

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**Wood duck**

*Characteristics:*
- Glossy iridescent body
- Head with large crest
- Red breast

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**Alligator**

*Characteristics:*
- Tip of snout broad (crocodiles’ snouts are narrow and pointed)
- Varying color from gray to green
- Long body with armored scales overall
Alligator snapping turtle

*Characteristics:*

- Large head
- Long, spined tail
- Shell with prominent ridges (more prominent than on common snapping turtle)

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Black rat snake

*Characteristics:*

- Body coloration black as adults
- Juveniles with brown and gray blotches
- Belly marked with light and dark squares

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Bullfrog

*Characteristics:*

- Large size
- No dorsolateral ridge
- Ridge around eardrum
Collared lizard

*Characteristics:*
- Two stripes around neck
- Long tail relative to body
- Small body scales

Common snapping turtle

*Characteristics:*
- Large head
- Long tail
- Shell with prominent ridges (less prominent than on alligator snapping turtle)

Copperhead snake

*Characteristics:*
- Saddle-shaped pattern
- Pit organ between eye and nose
- Arrow-shaped head, wider than neck
Coral snake

*Characteristics:*
- Distinct bands with abrupt edges (red touches yellow)
- Small body, diameter of a pencil

Corn snake

*Characteristics:*
- Blotches on back with dark borders
- Maize-like pattern on belly
- No pit organ

Cottonmouth

*Characteristics:*
- Large, thick body as adults
- White on inside of mouth
- Pattern variable, sometimes monotone
**Crocodile**

*Characteristics:*
- Tip of snout narrow (compared to alligator)
- Color varying from gray to green
- Long body with armored scales overall

**Diamondback rattlesnake**

*Characteristics:*
- Diamond pattern on back
- Tail tipped with a “rattle”
- Pit organ between eye and nostril
- Arrow-shaped head, wider than neck

**Fence lizard**

*Characteristics:*
- Spiny scales
- Long toes with small claws
- Long tail
Garter snake

*Characteristics:*
Three longitudinal stripes along body
Small head
Plain belly

Green anole lizard

*Characteristics:*
Long, pointed snout
Tail long relative to body
Long toes on back feet

Gray tree frog

*Characteristics:*
Mottled markings resembling bark on back
Large, sticky toepads
Red-eared slider

*Characteristics:*

- Stripe running behind the eye (unlike spot on painted turtle)
- Flattened shell
- Smooth edges of shell

Ring neck snake

*Characteristics:*

- Ring around neck (not always complete)
- Small body, diameter of a pencil

Rubber boa snake

*Characteristics:*

- Smooth, rubber, glossy appearance
- Head similar in size to neck

Scarlet king snake

*Characteristics:*
Distinct bands with abrupt edges (red touches black)
Body small, diameter of pencil

Timber rattlesnake

*Characteristics:*
V-shaped chevron pattern on back
Pit organ between eye and nostril
Tail tipped with a “rattle”

Woodhouse’s toad

*Characteristics:*
Short, plump body covered in warts
Variable dark markings on body
One to six warts per dark marking
Blue catfish

*Characteristics:*

“Whiskers” and a forked tail
Small adipose fin at rear of back
No dark spots (as in channel catfish)

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Bluegill

*Characteristics:*

Black ear flap
Long pointed pectoral fin
Small mouth
Flattened, pan-like body

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Channel catfish

*Characteristics:*

Small, dark spots along side
“Whiskers” and adipose fin
(like other catfish)
Clam

*Characteristics:*

Two hard shells protecting soft innards

Crab

*Characteristics:*

Six walking legs with two large pincers
Hard exoskeleton
Eyes at the ends of stalks
Round, circular body

Crappie

*Characteristics:*

Small depression at “forehead”
Mottling spots on sides
Large, pan-like body (flattened)
One dorsal (back) fin
Crayfish

*Characteristics:*

- Eight walking legs, two large pincers
- Long antennae
- Cylindrical body
- Resembles lobster, but much smaller

Flathead catfish

*Characteristics:*

- Pronounced flat head (viewed from side)
- “Whiskers” and adipose fin (like other catfish)

Largemouth bass

*Characteristics:*

- Corner of jaw extends beyond eye
- Two dorsal (back) fins
- Dorsal fins not well connected
Lobster

**Characteristics:**
- Very red in color (much more than crayfish)
- Very large claws
- Much larger body than crayfish

![Lobster](http://thumbs.dreamstime.com/thumb_175/1187059171dyl0mH.jpg)

Salmon

**Characteristics:**
- Dark bands on back
- Adipose fin near rear of back (like catfish)
- Lack whiskers (unlike catfish)

![Salmon](http://www.scuba-equipment-usa.com/marine/AP/R4/images/lismata_ambonis.jpg)

Shrimp

**Characteristics:**
- Mostly very small in size
- Similar in body structure to lobster or crayfish
- Exoskeleton softer than similar species

![Shrimp](http://www.scuba-equipment-usa.com/marine/AP/R4/images/lismata_ambonis.jpg)
Smallmouth bass

*Characteristics:*
- Corner of jaw does not extend beyond eye
- Two dorsal (back) fins
- Dorsal fins well connected

Sturgeon

*Characteristics:*
- Flat, shovel-like nose
- Sharp, hard scales covering body

Trout

*Characteristics:*
- Long adipose fin
- Light spots covering sides
- Lack whiskers (unlike catfish)
Walleye

*Characteristics:*
- Large eyes
- Large mouth filled with sharp teeth
- Large, black spot at rear of first dorsal fin
- Three to four dark saddles on back, extending down sides

Yellow bullhead catfish

*Characteristics:*
- White or yellow chin whiskers
- Long anal fin (near back of belly)
- “Whiskers” and adipose fin (like other catfish)

Chinese tallow

*Characteristics:*
- Heart-shaped leaves with pointed tip
- Alternate, whorled leaves
- Light-gray bark

**English ivy**

*Characteristics:*

- Evergreen vine
- Grows along ground and up trees
- Dull green, lobed leaves
- Very common urban invasive

![Photo: http://www.gri.msstate.edu/ipams/Species_images/HEHE/english-ivy-2.jpg](http://www.gri.msstate.edu/ipams/Species_images/HEHE/english-ivy-2.jpg)

**Himalaya blackberry**

*Characteristics:*

- Oval, very serrated leaves
- Fruit a dark, black berry when ripe
- Branch with red, recurved thorns


**Hydrilla**

*Characteristics:*

- Leaves whorled
- Submerged in water
- Grows to form thick mats
- Strap-like, pointed leaves

![Photo: http://plants.ifas.ufl.edu/images/hydver/hydver.jpg](http://plants.ifas.ufl.edu/images/hydver/hydver.jpg)
**Kudzu**

*Characteristics:*
- Vibrant green vine
- Three-lobed leaves


**Leafy spurge**

*Characteristics:*
- Long, lance-shaped leaves surrounding stalk
- Flat-topped structure of yellow, petal-like bracts


**Melaleuca**

*Characteristics:*
- Evergreen tree with layered, peeling bark
- Narrow, lance-shaped leaves

Photo: [http://upload.wikimedia.org/wikipedia/commons/8/8e/Melaleuca_quinquenervia_%28leaves%29.jpg](http://upload.wikimedia.org/wikipedia/commons/8/8e/Melaleuca_quinquenervia_%28leaves%29.jpg)
Mimosa tree

*Characteristics:*
- Delicate, fern-like foliage
- Bright, vibrant pink flower

Purple loosestrife

*Characteristics:*
- Tall stalks of bright purple flowers
- Whorled or opposite leaves
- Angled stem
- Wet environments

Saltcedar

*Characteristics:*
- Shrubby plant with reddish-brown bark
- Flat leaves resembling evergreen shrub
- Grows well on riversides
Asiatic clam

**Characteristics:**
Oval shape, very deep at the hinge
Dark coloration, generally yellow-green to brown

![Asiatic clam](http://www.iisgcp.org/exoticsp/AsianClam.htm)

Asian long-horned beetle

**Characteristics:**
Long black and white antennae
White spots running along sides of back

![Asian long-horned beetle](http://westernmassgeocachers.org/More_Info/asian_longhorned_beetle_1.jpg)

Brown trout

**Characteristics:**
Many large, dark spots from gill cover to base of tail
Adipose fin at rear of back

![Brown trout](http://www.iisgcp.org/exoticsp/BrownTrout.htm)
Carp

*Characteristics:*
- Two barbells (whiskers) on each side of upper jaw
- Large scales
- Large dorsal (back) fin

Chinese mitten crab

*Characteristics:*
- Distinguishing patches of dark hair on white-tipped claws

Chukkar

*Characteristics:*
- Incomplete black stripes on belly
- Black eye stripe leading to breast
- White throat patch
**English sparrow**

*Characteristics:*
- Males with brown and black stripes on back
- Prominent black bib
- Whitish breast and belly

**European starling**

*Characteristics:*
- Black, iridescent body
- Yellow beak
- White tips on feathers of breeding male

**Feral hog**

*Characteristics:*
- Strongly resemble domesticated pigs
- Color highly variable
Fire ant

*Characteristics:*

Body coloration from reddish-brown to reddish-black

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Norway rat

*Characteristics:*

Fur coarse
Color variable
Tail long, scaly, and scantily furred

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Nutria

*Characteristics:*

Resembles a beaver, but with a long slender tail
Dense, brownish fur with thick, gray undercoat
Ring-necked pheasant

*Characteristics:*

- White ring around neck
- Iridescent dark-colored head
- Body feathers a variety of brown and tan colors

Sea lamprey

*Characteristics:*

- Elongated, slender body with paired fins
- Dorsal fin long and disjunct
- Gray body with black mottling

Talapia

*Characteristics:*

- Back fin starting above gills and extending to tail
- Body flattened side to side

Zebra mussel

*Characteristics:*

- Triangular in shape
- Dark and light bands
- Hard shell

Photo: http://www.sanctuariesimon.org/monterey/images/build/what_zebra_mussels.jpg