

**Teacher Supplement for
Hummingbirds and Flowers:
A Study of Co-Adaptive Relationships Lesson Plan**

❖ **Finding and studying hummingbirds outside the classroom**

If you would like to study hummingbirds outside of a classroom, you need access to a garden or natural area. Hummingbirds can usually be seen around their favorite nectar source, the trumpet creeper, which is a common wildflower in SC, and can be planted in a butterfly garden or Carolina fence garden. Check out the following websites for more information on establishing a butterfly garden or a Carolina fence garden at your school: www.sclife.clemson.edu - under Schoolyard Ecology, www.scwf.org, or <http://business.clemson.edu/LFLearn/>. It is important to remember that studies of wild animals are not predictable, and students have to realize that the appearance of the bird is not guaranteed. Visit www.rubythroat.org for more tips on attracting hummingbirds to your garden.

❖ **Special slides in the presentation**

Slide 4 - teal arrow points to highly keeled sternum necessary for flight muscle attachment

Slide 10 - red arrow points to the base of the flower where nectaries (nectar producing structures inside the flower) are located. In case a student asks, there are also extrafloral nectaries located outside the flower. The blue arrow points to the stamens and anthers that are long and project out of the flower to contact the hummingbird's head. The green arrow points to the hummingbird's head which is yellow because it is covered in pollen.

Slide 11 - blue arrow points to the red throat of the adult male ruby-throated hummingbird. This is how they get their name. The bottom picture is of a female which does not have the red throat patch. Click on the speaker icon to hear the wingbeat sounds. If no sound comes up, download the sound file “wing beat” from our website. To do this, right click on “wing sound”, choose SAVE TARGET LINK AS, then save the sound file to your desktop. Insert the sound file into the presentation again by choosing INSERT, MOVIES AND SOUNDS, and SOUND FROM FILE. Choose “wing beat” from your desktop.

Slide 12 - Click on the speaker icon to hear the mating call. If no sound comes up, download the sound file “mating call” from our website. To do this, right click on “mating call”, choose SAVE TARGET LINK AS, then save the sound file to your desktop. Insert the sound file into the presentation again by choosing INSERT, MOVIES AND SOUNDS, and SOUND FROM FILE. Choose “mating call” from your desktop.

❖ **SC LIFE encourages the use of native plants**

The list of hummingbird plants has the scientific name next to the common name. Whenever possible, we try to use a native representative of the group of plants in question. For example, the is quite a bit of Japanese honeysuckle that

can be found in the plant trade, however, the native honeysuckle (called coral honeysuckle) is not nearly invasive as its Asian cousin, quite beautiful with its red flowers, and readily available in the plant trade from native plant distributors.

Quiz Answers

Slide 1 Fire Pink (*Silene virginica*) is a hummingbird plant because

- It has long, tubular flower
- The flower is red
- The reproductive parts of the flower extend out, away from the nectar source, in a position that can come into contact with the hummingbirds forehead
- The nectar of this plant is located at its base, which is at the end of a long, tubular flower
- There is not a very good landing platform

Slide 2 Columbine (*Aquilegia canadense*) is a hummingbird plant because

- It has long, tubular flower
- The flower is red
- The reproductive parts of the flower extend out, away from the nectar source, in a position that can come into contact with the hummingbirds forehead
- The nectar of this plant is located at the end of the long, tubular flower
- There is no good landing platform

Slide 3 Sandhills Day Flower (*Commelina sp.*) is not a hummingbird plant because

- The flower is not long and tubular
- The flower is blue
- The reproductive parts are not in a position that hummingbirds would come into contact with them
- There is no obvious nectar source

Slide 4 Turk's Cap Lily (*Lilium superbum*) is a hummingbird plant because

- The flower is somewhat tubular at its base
- The flower is reddish orange
- The reproductive parts of the flower extend out, away from the nectar source, in a position that can come into contact with the hummingbirds forehead
- There is no good landing platform

Slide 5 Rose (*Rosa sp.*) is not a hummingbird plant because

- The flower is not long and tubular (when open)
- The flower is pale pink
- It has a place to land (when open)

Slide 6 Daisy (*Leucanthemum sp.*) is not a hummingbird plant because

- The flower is not long and tubular
- The flower is white
- There is no obvious nectar source
- There is a great landing platform

Slide 7 Orange Jewelweed (*Impatiens capensis*) is a hummingbird plant because

- It has long, tubular flower
- The flower is reddish orange
- The nectar of this plant is located at the end of the long, tubular flower
- There is no good landing platform

Slide 8 Yellow Lady Slipper (*Cypripedium calceolus*) is not a hummingbird plant because

- The flower is not long and tubular
- The flower is yellow
- There is a landing platform

Slide 9 Arrowleaf (*Peltandra virginica*) is not a hummingbird plant because

- The flower is white
- The reproductive parts are not in a position that hummingbirds would come into contact with them
- There is no obvious nectar source

Slide 10 Flame Azalea (*Azalea calendulaceum*) is a hummingbird plant because

- The flower is somewhat tubular at its base
- The flower is reddish orange
- The reproductive parts of the flower extend out, away from the nectar source, in a position that can come into contact with the hummingbirds forehead
- The nectar of this plant is located at the end of the flower

Slide 11 Indian Paintbrush (*Castilleja coccinea*) is a hummingbird plant because

- It has long, tubular flower
- The flower is red
- The nectar of this plant is located at the end of the long, tubular flower
- There is no good landing platform

Slide 12 Giant Chickweed (*Myosoton aquaticum*) is not a hummingbird plant because

- The flower is not long and tubular
- The flower is white
- The reproductive parts are not in a position that hummingbirds would come into contact with them (not long enough to reach a hummingbird's forehead)
- There is a great landing platform

Slide 13 Coral Honeysuckle (*Lonicera sempervirens*) is a hummingbird plant because

- It has long, tubular flower
- The flower is red
- The reproductive parts of the flower extend out, away from the nectar source, in a position that can come into contact with the hummingbirds forehead
- The nectar of this plant is located at the end of the long, tubular flower
- There is no good landing platform

Slide 14 Yellow milkwort (*Polygala sp.*) is not a hummingbird plant because

- The flower is not long and tubular
- The flower is yellowish orange
- There is a landing platform

Slide 15 Ohio Spiderwort (*Tradescantia sp.*) is not a hummingbird plant because

- The flower is not long and tubular
- The flower is white
- The reproductive parts are not in a position that hummingbirds would come into contact with them (not long enough to reach the hummingbird's forehead)
- There is no obvious nectar source
- There is a great landing platform

Slide 16 Bee Balm (*Monarda didyma*) is a hummingbird plant because

- It has long, tubular flower
- The flower is red
- The reproductive parts of the flower extend out, away from the nectar source, in a position that can come into contact with the hummingbirds forehead
- The nectar of this plant is located at the end of the long, tubular flower
- There is no good landing platform

Examples of Some Hummingbird Nectar Flowers (* indicates exotics):

common name	scientific name	wildflower, tree, vine or shrub
Bleeding heart	<i>Dicentra eximia</i>	wildflower
blue phlox	<i>Phlox divaricata</i>	wildflower
carpet bugle*	<i>Ajuga reptans</i>	wildflower
columbine	<i>Aquilegia canadensis</i>	wildflower
coral bells*	<i>Heuchera micranthaa</i>	wildflower
fire pink	<i>Silene virginica</i>	wildflower
lyre-leaved sage	<i>Salvia lyrata</i>	wildflower
scarlet lychnis	<i>Lychnis coronaria</i>	wildflower
virginia bluebell	<i>Mertensia virginica</i>	wildflower
beardtongues	<i>Penstemon digitalis</i>	wildflower
blazing star	<i>Liatris cylindracea</i>	wildflower
canada lily	<i>Lilium canadense</i>	wildflower
canna*	<i>Canna sp.</i>	wildflower
common geranium*	<i>Geranium sp.</i>	wildflower
daylily*	<i>Hemerocallis fulva</i>	wildflower
garden phlox	<i>Phlox paniculata</i>	wildflower
indian paintbrush	<i>Castilleja coccinea</i>	wildflower
iris*	<i>Iris sp.</i>	wildflower
turk's cap lily	<i>Lilium superbum</i>	wildflower
bee-balm	<i>Monarda didyma</i>	wildflower
cardinal flower	<i>Lobelia cardinalis</i>	wildflower
jewelweed	<i>Impatiens capensis</i>	wildflower
purple bergamot	<i>Monardia media</i>	wildflower
red turtlehead	<i>Chelone obliqua</i>	wildflower
smartweed	<i>Polygonum hydropiper</i>	wildflower
spider flower	<i>Cleome bouitteana</i>	wildflower
wild bergamot	<i>Monardia fistulosa</i>	wildflower
Flame azalea	<i>Rhododendron calendulaceum</i>	shrub
lilac*	<i>Syringa sp.</i>	shrub
pink azalea	<i>Rhododendron nudiflorum</i>	shrub
winter jasmine*	<i>Jasminum nudiflorum</i>	shrub
beauty bush*	<i>Kolkwitzia amabilis</i>	shrub
weigela*	<i>Weigela sp.</i>	shrub
sweet azalea	<i>Rhododendron canescens</i>	shrub
butterfly bush*	<i>Buddleja sp.</i>	shrub
rose of sharon*	<i>Hibiscus syriacus</i>	shrub
Flowering crabapple	<i>Malus floribunda</i>	tree
horsechestnut	<i>Aesculus hippocastenum</i>	tree
red buckeye	<i>Aesculus pavia</i>	tree
yellow poplar	<i>Liriodendron tulipifera</i>	tree
locust	<i>Robinia pseudoacacia</i>	tree
mimosa*	<i>Mimosa sp.</i>	tree
Trumpet creeper	<i>Campsis radicans</i>	vine
trumpet honeysuckle	<i>Lonicera sempervirens</i>	vine
cypress vine*	<i>Ipomoea quamoclit</i>	vine
indian pink	<i>Spigelia marlandica</i>	wildflower
lantana*	<i>Lantana camara</i>	shrub
cross vine	<i>Bigonia capreolata</i>	vine

References

Hilton, Bill Jr. 2004. Operation RubyThroat. Hilton Pond Center for Piedmont Natural History. Accessed November 15, 2004.

USDA-Natural Resource Conservation Service, Wildlife Habitat Management Institute, Wildlife Habitat Council. 1999. Ruby-throated Hummingbird (*Archilochus colubris*) Fish and Wildlife Habitat Management Leaflet no. 14.