

Tansy Beetle Champions Project Resources

Lesson Plan

Overview: An optional resource useful for structuring activities around learning about the Tansy Beetle. Associated activity sheets provide more information regarding each activity.

See also: Tansy Beetle Fact Sheet available to download from this page: <https://www.buglife.org.uk/tansy-beetle-hub> and <https://www.buglife.org.uk/bugs-and-habitats/bug-month>

Teacher notes:

Science, Maths, ICT

Initial question: What is an invertebrate? What is an insect?

[Activity sheets: Invertebrates and Insects work sheet, Tansy Beetle Life Cycle, Tansy Beetle Habitat Choice]

Animals with no backbones; true insects are arthropods – meaning “jointed leg and body”. They all have six jointed legs; a head, thorax and abdomen; an exoskeleton; compound eyes; and antennae. Most have wings, though some are vestigial and some (like the Tansy beetle) fly only rarely. Insects are the only invertebrates to have developed the ability to fly.

Most insects hatch from eggs into larvae or nymphs. Some develop into pupae and then metamorphose into the adult form. It is estimated that there are somewhere between 2-8 million insect species on earth, though only around 1 million have been described.

<https://www.buglife.org.uk/bugs-and-habitats/terrestrial-invertebrates>

Further questions:

- How are invertebrates alike? How do they differ from vertebrates?
- Draw the life cycle of the Tansy beetle
- Discuss the need for proximity of Tansy plants for the Tansy beetle
- Discuss the impact flooding might have on the Tansy beetle
- Create a graph showing the difference between the numbers of Tansy beetles estimated to be on the banks of the River Ouse in the York area over the last three years.

[Activity: Insects Card Pack]

- Looking at the cards in the pack, how might you group similar invertebrates together?

- Students to work in groups to come up with grouping feature: wings, habitat, food, conservation status.
- What are the four orders of “insects” shown in the cards?

Lepidoptera (butterflies and moths), Coleoptera (beetles), Hymenoptera (bees, wasps, ants), Diptera (“true flies”: flies, hoverflies, mosquitoes)

Note that there are many other orders of insects such as Odonata (dragonflies and damselflies), Orthoptera (grasshoppers and crickets), Trichoptera (caddis flies) – around 28 in all.

More challenging activities

- Print the insect cards from Buglife website with fields left blank, except for the name. Divide cards into groups to research the information to fill them in
- Create a dichotomous key to differentiate an insect from a spider and to identify the four orders of insects on the cards

- Students in groups come up with grouping features other than order: habitat, food, conservation status

Note that insects in different orders may eat the same things. Insects are extremely versatile and occupy most ecological niches.

- How many species of each order live in the UK? In the world?

Lepidoptera: 2400/120000
 Coleoptera: 3900/300000
 Hymenoptera: 7100/135700
 Diptera: 6900/150000

<https://www.buglife.org.uk/bugs-and-habitats/main-groups-insects>

- Find some more examples from each order from around the world and create bar charts showing the range of sizes for each order you have found
 - Which order has the largest range of sizes?
 - How many times larger is the largest insect you have found compared to the smallest?

Insect sizes range from 0.3 mm (Fairy ‘Mymarid’ wasps) that are parasites on insect eggs, to the 30-cm wingspan of the American owl moth (1000x difference)

Teacher notes

Literacy, Science

Initial question: Saving the Tansy Beetle – research:

[Activity sheet: Tansy Beetle Life Cycle, Tansy Beetle Habitat Choice]

- How does a Tansy beetle reproduce?
 - How does the Tansy beetle find its food?
 - Why is the Tansy beetle called “The Jewel of York”?
 - Why is the Tansy beetle endangered?
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- Write a letter to the Lord Mayor of York to explain why the Tansy beetle is special and how people in Yorkshire can help it survive.
 - Design a poster explaining the habitat and food sources required by the Tansy beetle, explain why the Tansy beetle is endangered and what people can do to help.
 - Iridescence:
 - What does iridescence mean?
 - Can you find out how iridescence works?
 - Why might some insects (mostly beetles and butterflies) be iridescent?

Learning Outcomes

Mathematics Outcomes

- Measure and calculate with metric measures
- Use bar charts, line graphs

Computing Outcomes

- Collect and present data appropriately

Science Outcomes

- Ask relevant questions and using different types of scientific enquiries to answer them
- Setting up simple practical enquiries, comparative and fair tests
- Making systematic and careful observations
- Identify that humans and some other animals have skeletons and muscles for support, protection and movement
- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Recognise that environments can change and that this can sometimes pose dangers to living things

English Outcomes

- Retrieve and record information from non-fiction books
- Articulating a need for Tansy beetle conservation
- Structuring a letter
- Read for a range of purposes
- Make inferences and justify predictions
- Identify and summarise ideas

Geography

- Describe and understand climate, rivers
- Use fieldwork to observe, measure and record

Computing

- Write programs to achieve specific goals – random walk
- Create graphs/present data
- Design a poster – images and text

This pack was developed as part of the Tansy Beetle Champions project, funded by Heritage Lottery Fund and the Ernest Cook Trust.



Invertebrates and Insects

Research and answer the following questions:

What is an invertebrate? Give examples of some invertebrates in the UK.

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What is an insect? Give examples of some insects you have seen.

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Tansy Beetle Life Cycle

Match the correct stage to each picture!

Adult beetle	Larva	Eggs	Pupa
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1.



2.



3.



4.

Photographs © Steven Falk, Dr Geoff Oxford

Which of these pictures show good Tansy beetle habitat?
(Circle 3)



Tansy

“The Jewel of York”



Order: Coleoptera
Latin Name: *Chrysolina graminis*
Length: 10 mm
Type of wings: Shield
Habitat: Wetland
Food example: Tansy
Conservation status: **Rare**

Photo: ©Steven Falk

Sexton

“The Burying Beetle”



Order: Coleoptera
Latin Name: *Nicrophorus vespillo*
Length: 30 mm
Type of wings: Shield
Habitat: Widespread
Food example: Dead animals
Conservation status: **Common**

Photo: ©Roger Labbett

Stag



Order: Coleoptera
Latin Name: *Lucanus cervus*
Length: 90 mm
Type of wings: Shield
Habitat: Woodlands/gardens
Food example: Tree sap
Conservation status: **Rare**

Photo: © Greg Hitchcock – www.grhphotography.co.uk

Five-spot Burnet



Order: Lepidoptera
Latin Name: *Zygaena trifolii*
Wingspan: 35 mm
Type of wings: Scaly
Habitat: Grassland
Food example: Common Bird's-foot
Trefoil
Conservation status: **Common**

Photo: © Claudia Watts

Puss Moth



Order: Lepidoptera

Latin Name: *Cerura vinula*

Wingspan: 45-70mm

Type of wings: Scaly

Habitat: Woodland, parkland

Food example: Poplar, willow, sallow
(as caterpillar), nectar (as adult)

Conservation status: **Common**

Photo: © Buglife

Small Tortoiseshell



Order: Lepidoptera

Latin Name: *Aglais urticae*

Wingspan: 55 mm

Type of wings: Scaly

Habitat: Fields/gardens

Food example: Nectar

Conservation status: **Common**

Photo: © Roger Key

Hornet Robber Fly



Order: Diptera

Latin Name: *Asilus crabroniformis*

Length: 25 mm

Type of wings: Membranous

Habitat: Heathlands, grasslands,
Southern England, West Wales

Food example: other insects eg
beetles, grasshoppers

Conservation status: **Rare**

Photo: @ Darren Bradley

Tawny Mining Bee



Order: Hymenoptera

Latin Name: *Andrena fulva*

Length: 18 mm

Type of wings: Membranous

Habitat: Gardens

Food example:

Garden plants, Fruit trees

Conservation status: **Common**

Photo: © Nigel Jones

St Mark's Fly



Order: Diptera

Latin Name: *Bibio marci*

Max Length: 12mm (males)

Type of wings: Membranous

Habitat: Woodland, rough grassland, wetland

Food example: Nectar

Conservation status: **Common**

Photo: © Dean Morley

Flesh Fly



Order: Diptera

Latin Name: *Sarcophaga sp.*

Length: 12 mm

Type of wings: Membranous

Habitat: Widespread

Food example: Dead animals

Conservation status: **Common**

Photo: © Jaybee www.phocus-on.co.uk

Pine hoverfly



Order: Diptera

Latin Name: *Blera fallax*

Length: 12 mm

Type of wings: Membranous

Habitat: Woodland

Food example: Rotting wood

Conservation status: **rare**

Photo: © Bastiaan Wakkie

Tree Bumblebee



Order: Hymenoptera

Latin Name: *Bombus hypnorum*

Length: 10-16 mm

Type of wings: Membranous

Habitat: Gardens

Food example: Nectar from raspberries and blackberries

Conservation status: **Common**

Photo: © Andre Karwath