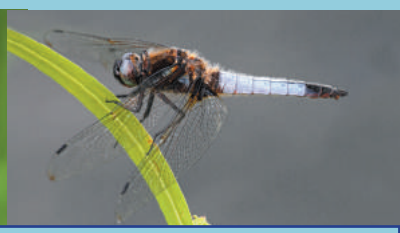
# British Dragonfly Society Education







# Teacher's Notes

Age: 5–11 years

## Introduction

Welcome to the British Dragonfly Society Education Pack. All, or some, of these slides can be used at any time dependant on the subject area being taught. The presentation has been created so that sections are easily extractable - for example sections on the food chain. The notes below show all the presentation slides accompanied by useful background information, and species common names, to assist teaching the subject matter. On most of the slides, dragonflies or damselflies are specifically referred to. However, if the term 'dragonfly' is used in a general statement, it refers to both dragonflies and damselflies. We hope you and your class enjoy using the pack and delving into the wonderful world of dragonflies!

## Curriculum Links

**England: KS1:** •Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. •Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. •Identify and name a variety of plants and animals in their habitats, including micro-habitats. **KS2:** •Construct and interpret a variety of food chains, identifying producers, predators and prey.

**Wales: KS2:** •Pupils should use and develop their skills, knowledge and understanding by investigating how animals and plants are independent yet rely on each other for survival.

**Scotland:** •By exploring interactions and energy flow between plants and animals (including humans) learners develop their understanding of how species depend on one another and on the environment for survival.

**1**


**Species:** left: Ruddy Darter (dragonfly), right: White-legged Damselfly.

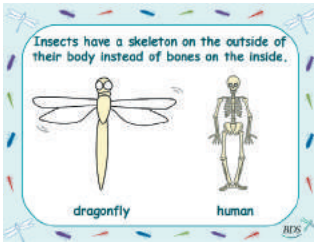
**2**


**Species:** Ruddy Darter (dragonfly)

**3**

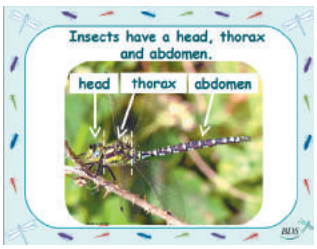

**Species:** Ruddy Darter (dragonfly)

**4**



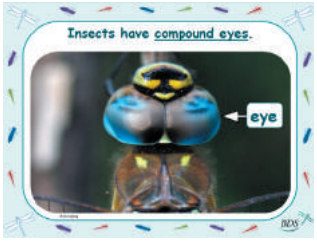

**Notes:** this is called an exoskeleton. Dragonfly exoskeletons are made of a protein called Chitin.

**5**




**Species:** Southern Hawker (dragonfly)

**6**

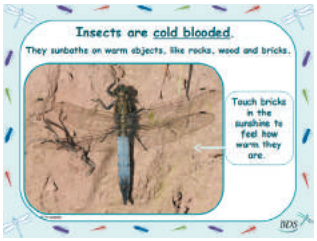



**Species:** Migrant Hawker (dragonfly).

**Notes:** a compound eye is made up of many lenses. Dragonflies have excellent eyesight for hunting, avoiding predators and seeing other dragonflies. Dragonflies can see in colour. The can see some colours humans cannot, such as ultraviolet.

# KS2 Teacher's Notes

## 7



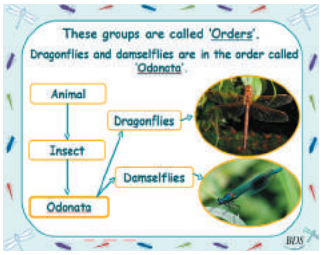

**Species:** Blacked-tailed Skimmer (dragonfly).

**Notes:** dragonflies are the same temperature as their surroundings. They cannot control their body temperature like humans can. They need to warm up their bodies in the sun before they can fly.

## 8


**Notes:** yellow group: (bees, ants & wasps) from left clockwise: wasp, bumblebee, honey bee. Purple group (beetles) from left clockwise: Lily Beetle, weevil, leaf beetle. Green group (butterflies and moths) left-right: Peacock Butterfly, Buff-tip Moth.

## 9




**Species:** top: Brown Hawker (dragonfly) bottom: Banded Demoiselle (damselfly)

**Notes:** animals in the same order are similar. They are from the same evolutionary ancestors. When people talk about 'dragonflies' they often mean dragonflies and damselflies, but they are actually different animals.

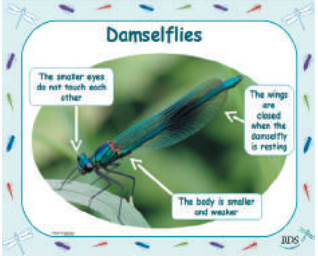
## 10


**Species:** top: Brown Hawker (dragonfly) bottom: Banded Demoiselle (damselfly)

## 11

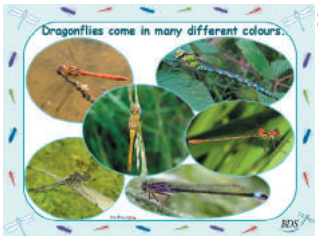

**Species:** Brown Hawker (dragonfly)

## 12




**Species:** Banded Demoiselle (damselfly)

## 13



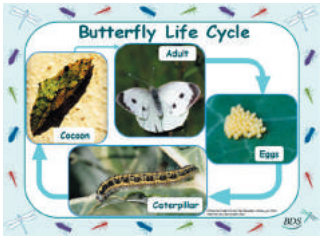

**Species:** top left: Common Darter (dragonfly), right: Southern Hawker (dragonfly). Middle left: Ruddy Darter (dragonfly), right: Emerald Damselfly. Bottom left: Black Darter (dragonfly), right: Blue-tailed Damselfly.

## 14


**Species:** left: Azure Damselfly, right: Common Hawker (dragonfly).

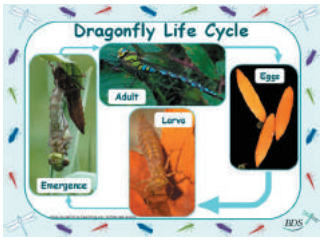
**The following two slides compare the butterfly and dragonfly life cycles.**

## 15




**Notes:** Large White Butterfly: the eggs are laid and the larva (a caterpillar) hatches out. This eats and grows until it reaches a certain size and then forms a pupa. This is the **resting stage,** when massive changes happen to the body, resulting in the adult emerging. This is called **complete metamorphosis.**

## 16




**Notes:** Southern Hawker Dragonfly: the eggs are laid and the larva hatches out. This eats, grows and moults (sheds the old exoskeleton) many times. Each time, the larva gets bigger and gradually looks more like the adult. Once it reaches a certain size, the larva climbs out of the water and moults a final time, with the developed adult emerging. This is called **incomplete metamorphosis**. There is **no resting stage** where massive changes take place.

**The following slides look at the life cycle in more detail.**

## 17

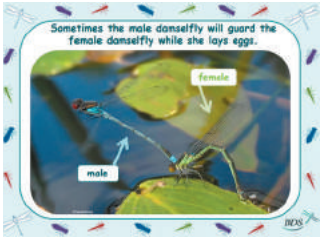
**Laying Eggs**


**Species:** Southern Hawker (dragonfly).

**Notes:** The 'ovipositor' is used to lay eggs inside plants, moss or wood. Those which lay eggs into water have no ovipositor. Instead, they dip their abdomen into water and release eggs.

# KS2 Teacher's Notes

**18**

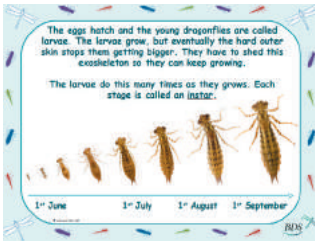



**Species:** pair of Red-eyed Damselflies.

**Notes:** males dragonflies and damselflies guard females to prevent other males from mating with her. They hold the female behind the head or perch or fly near her. Some males even go underwater with the female during laying.

**The Larval Stage**

**19**




**Notes:** this slide illustrates larval development, showing how each stage is larger than the previous one and has more features like the adult.

**Emergence**

**20**


**Notes:** the emergence of a Northern Emerald (dragonfly). The larva has climbed out of the water and crawled onto a plant to emerge. The plant must have enough space for the adult. The larvae wave their legs or abdomen to check. The adult then bursts from the larval skin.

**21**


**Notes:** the emergence of a Northern Emerald (dragonfly).

**22**

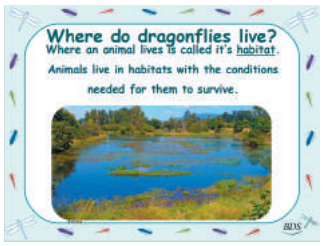

**Notes:** a newly emerged Northern Emerald (dragonfly). At this immature stage, dragonflies are called 'teneral'. They have shiny wings and have not yet developed full adult colours.

**23**


**Notes:** if you have a nearby pond, you can look for exuviae on plants near, or emerging from, the water, e.g. reeds. You can take them back to the classroom to use in further lessons, such as subjects for art classes.

**Habitat**

**24**




**Notes:** none.

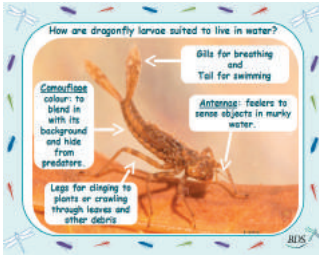
**25**


**Species:** left: Hawker larva (dragonfly), right: Red-eyed Damselfly.

**26**


**Species**: Large Red Damselfly larva.

**27**




**Species**: Large Red Damselfly larva.

**28**


**Notes:** examples of species which live in ponds and lakes: Southern Hawker (dragonfly), Broad-bodied Chaser (dragonfly) and Large Red Damselfly.

**29**

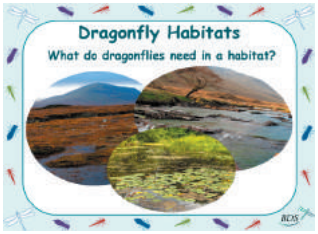

**Notes:** examples of species which live in rivers and streams: Golden-ringed Dragonfly, Emperor Dragonfly and Beautiful Demoiselle (damselfly).

# KS2 Teacher's Notes

**30**

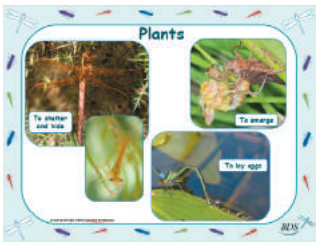

**Notes:** examples of species which live in bogs and heaths: Northern Emerald (dragonfly), White-faced Darter (dragonfly) and Small Red Damselfly.

**31**



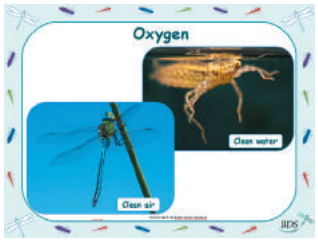

**Notes:** none.

**32**



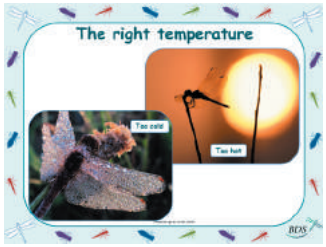

**Species:** left: Brown Hawker (dragonfly), larva: damselfly. Right, top: Northern Emerald (dragonfly), bottom: pair of Red-eyed Damselflies.

**33**




**Species:** top: Hawker larva. Bottom: Emperor (dragonfly). Dragonfly larvae breathe underwater in a similar way to fish, taking oxygen directly from the water.

**34**

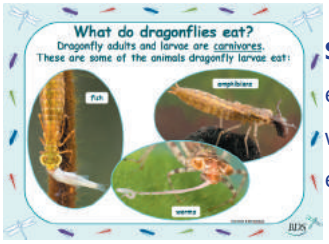



**Species:** these are not British species. The species are unknown. Because dragonflies are cold-blooded, they do not have energy to move in cold weather and can overheat easily in hot weather.

**35**


**Species:** left: Red-eyed Damselfly. right: damselfly larva eating a worm. Dragonflies obtain their water from the body fluids of the animals they eat.

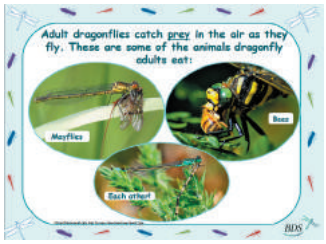
**36**




**Species:** left: Emperor larva (dragonfly) eating a fish. middle: damselfly larva eating worm. right: Hawker larva (dragonfly) eating a small frog.

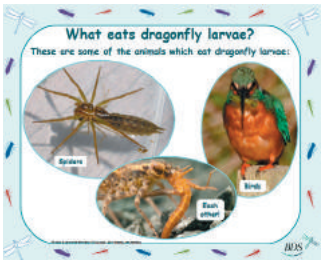
## Food chains

**37**




**Species:** left: Red-eyed Damselfly eating a mayfly. middle: Blue-tailed Damselfly eating a Common Blue Damselfly. right: Golden-ringed Dragonfly eating a bee.

**38**

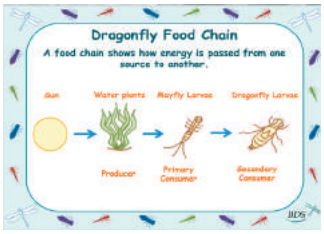



**Species:** left: Raft Spider eating dragonfly larva. middle: hawker larva (dragonfly) eating damselfly larva. right: Kingfisher eating dragonfly larva.

**39**


**Species:** from top-left clockwise: spider eating Common Blue Damselfly, Hornet eating Migrant Hawker, Hobby eating dragonfly.

**40**




**Notes:** the arrow in the food chain represents the transfer of energy. Plants are called producers because they make their own food using the sun's energy. Animals are called consumers because they eat other plants and animals.

**41**


**Species:** Southern Hawker larva (dragonfly).

# KS2 Teacher's Notes

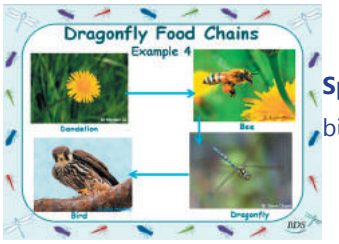
**42**


**Species:** butterfly: Common Blue and dragonfly: Four-spotted Chaser.

**43**

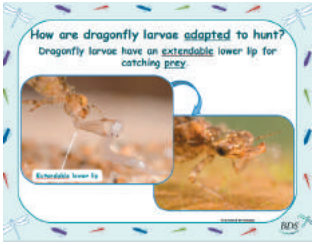

**Species:** water flea: Daphnia species, spider: Raft Spider, Large Red Damselfly Larva

**44**




**Species:** dragonfly: Southern Hawker and bird: Hobby.

**45**




**Notes:** the extendible lower lip is called a 'labium'. It is like a fast, powerful arm, shooting out at high speed and grabbing prey with the pincer-like tip. It then draws the prey back to the jaws. Both dragonfly and damselfly larvae have a labium.

**46**


**Species:** Southern Hawker (dragonfly).

**47**


**Species:** Southern Hawker (dragonfly).

**48**


**Species:** Beautiful Demoiselle (damselfly)

**49**


**Species:** left: spider eating a Common Blue Damselfly. right: Kingfisher with a Hawker larva.

**50**


**Species:** top: Common Blue Damselfly. bottom: mosquito. **Notes:** experiments have been carried out using dragonfly larvae to eat mosquito larvae in tropical countries. This may help reduce malaria, a deadly disease spread by mosquitoes.

**51**


**Notes:** because they are cold-blooded, dragonflies are closely linked to temperature. Dragonflies are also very mobile, due to flight. Many dragonfly species are moving to new areas as the climate changes, e.g. Southern Hawker populations are moving north in the UK. Scientists are using dragonflies to monitor climate change impacts on wildlife.

**52**


**Notes:** the biggest dragonfly ever to exist was pre-historic and had a wingspan of 70-75cm. They were able to reach such sizes 300 million years ago because there was more oxygen in the atmosphere. This allowed insects to fulfil their oxygen needs, even when such a large size.

**53**


**Notes:** there are many myths about dragonflies. In Japan, dragonflies represent good luck, strength and happiness. In most of Europe and America they are considered bad luck, for example known as 'horse stinger' in English and 'gwas-y-neidr' ('adder's servant') in Welsh.

# KS2 Teacher's Notes

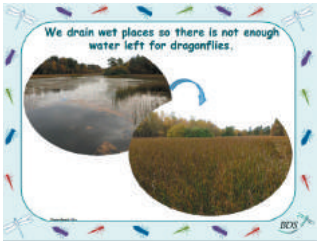
**54**


**Species:** Common Darter (dragonfly).

**55**


**Species:** White-faced Darter (dragonfly).

**56**




**Notes:** an example of this is the draining of farmland ponds in the UK. These ponds used to exist to provide farm animals with water but many are no longer used and have been filled with soil to grow crops on.

**57**


**Notes:** pollution removes the four main resources a dragonfly needs: oxygen, water, plants and food.

**58**


**Species:** left: Red-eyed Damselfly eating a mayfly. right: Golden-ringed Dragonfly eating a bee.

**Notes:** for example, some chemicals used to control pests on farms kill other insects like bees. These insects are food which dragonflies need.

**59**


**Notes:** for information on how to dig a pond, visit the publications page on the British Dragonfly Society website.

**60**


**Notes:** record the date, location, name of the recorder and all the species you find. Then add these records to the national database. You can find information on how to do this, including a link to our Dragonfly App and identification help, on our website. It is quick, simple to do and very rewarding.

**61**


**Notes:** for example, children can carry out school projects, create dragonfly posters and artwork or carry out assemblies to teach other pupils what they have learnt about dragonflies.

**62**


**Notes:** children can make sure they do not litter or pollute a dragonflies habitat. Children could take part in a local volunteer group which works to clear littered ponds.

**63**


**Notes:** visit our website for more information about dragonflies, educational activities and details of dragonfly events across the country.

**64**


**Notes:** none.

**65**


**Notes:** none.