

Zoo Activity Pack: Classification

This pack is designed to provide teachers with information to help you lead a trip to Colchester Zoo focusing on classification.



How to Use this Pack:

This Classification Pack was designed to help your students learn about the history of classification, and prepare them for a trip to Colchester Zoo.

The pack starts with information about the history of classification to help provide support for your sessions. There are also maps from the zoo that will help you plan your day, and your route around the zoo. We recommend all teachers read through this, and give copies to adult helpers attending your school trip. For information on feed times and encounters, please check the website.

The rest of the pack is broken into: pre-trip, at the zoo, and post-trip. Each of these sections starts with some general ideas, and then there are a variety of pre-made activities and worksheets. Activities are typically hands on 'games' that introduce and reinforce concepts. Worksheets are typically paper hand-outs teachers can photocopy and have pupils complete independently. Teachers can pick and choose which they want to use since all the activities/worksheets can be used independently (you can just use one worksheet if you wish; you don't need to complete the others).

The activities and worksheets included in this pack are for KS3 and 4 students.

We suggest using the pre-trip activities/worksheets prior to your trip to familiarise your pupils with vocabulary, context, and the animals they will see during your trip. The at the zoo activities/worksheets typically require information your pupils can gather while they are at Colchester Zoo and are designed for completion during your school trip. The post-trip activities/worksheets are designed to be used after your visit to help consolidate learning and build on information gathered during your school trip. Within these sections, the activities/worksheets can be used in any order.

If you would like any more guidance, or have any questions about any of the information contained within this pack, please contact our education department at education@colchesterzoo.org

Contents

Page

Map of the Colchester Zoo

1

Background Information

2

Pre-Trip

Ideas, Activities and Worksheets

4

At the Zoo

Ideas, Activities, and Worksheets

12

Post-Trip

Ideas, Activities, and Worksheets

19

Map KEYS

-  First Aid
-  Information
-  Gift Shop
-  Picnic Area
-  Play Area
-  Toilets
-  Fire Assembly Point
-  Face Painting



Download a more detailed map from our website:
www.colchesterzoo.org

Classification

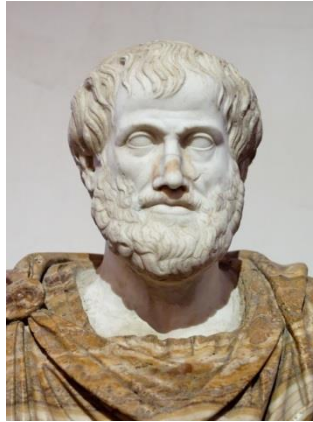
Background Information

- **4th Century BC** Aristotle writes “History of Animals” . This model remains largely unchanged until the 16th Century.
- **1551** Gessner publishes History of Animals in Zurich.
- **1738** Linnaeus published his system of classification of species.
- **1795** Hutton proposed the idea that the Earth was shaped by gradual forces.
- **1796** Cuvier published his theory that fossils were from species that had become extinct.
- **1798** Malthus' Essay on the Principle of Population is published.
- **1809** Lamarck’s theory of evolution published — Darwin born.
- **1830** Lyell proposed his geological theory of uniformitarianism.
- **1831** Darwin set out on the voyage of the Beagle.
- **1858** Wallace wrote to Darwin setting out his theory of natural selection. Darwin's and Wallace's ideas were presented to the Linnaean Society of London.
- **1859** Darwin published the Origin of Species.
- **1865** Mendel’s experiments on heredity published.

Classification

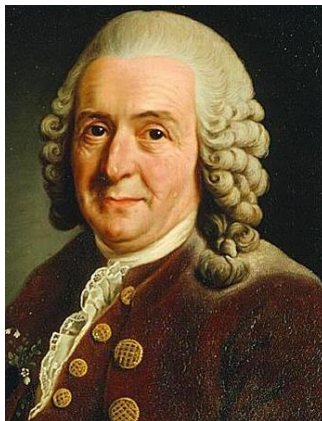
Background Information

Aristotle 384 BC– 322 BC



Aristotle was an ancient Greek Philosopher and scientist, renowned for being the tutor of Alexander the Great. His text “History of Animals” (*Historia Animalium*) is seen as a pioneering work of zoology and an attempt to apply philosophy to the natural world. Within this text Aristotle groups different species depending on their distinguishing features– for example animals with red blood and those without. He grouped in order from lowest to highest– a “ladder of nature” with humans at the highest point. Aristotle is widely regarded as being the first scientist to attempt to classify the natural world, and is also known for introducing the term “Binomial” (two names), which is the scientific way of classifying animals in terms of their genus and differences.

Carl Linnaeus 1707–1778



Linnaeus was a Swedish born botanist, zoologist and physician, and is known as being the father of taxonomy. He published the first edition of his famed work *Systema Naturæ* in the Netherlands in 1735, with the 10th and most important edition being published in 1758. The book outlines Linnaeus’ idea for hierarchical classification, dividing the natural world into the animal kingdom, plant kingdom and mineral kingdom. These are each divided into phylum, classes, then orders, families, genera and species.

Pre-Trip Classroom Ideas:

These are ideas to help teachers prepare their class before their visit to the zoo, in terms of gaining an understanding of classification. Use these ideas as a starting point with or without the pre-made activities and worksheets on the next pages.

1. Learn Vocabulary words with students (see next page for list)
2. Discuss the term “Classification” with the students
3. Explore the history of classification, from Aristotle to Linnaeus. Create a character timeline to show the important historical figures that have been involved in the creation production of modern classification techniques.
4. Search online for newly discovered species.
5. Have the students research an individual species and present it to the class, with an explanation of how they would classify the animal.
6. Have each student pick an animal they want to see at the zoo, and research the history of it’s classification– for example, the red panda was originally classified as part of the racoon family, but was given the name *Ailurus* (the Greek word for ‘cat’), because of its physical appearance. Students can then find out more about their animal at the zoo and create a short presentation or poster on the animal following their visit.

Pre-Trip Classroom Ideas:

Vocabulary Words:

Adaptation:	The process of change by which an organism or species becomes better suited to its environment.
Camouflage:	Colours and patterns that help an animal blend into its surroundings
Carnivore:	An animal that eats meat
Classification:	The process of organising things into classes or categories
Darwinism:	The theory of the evolution of species by natural selection
Endangered:	Decrease in population, it faces major threats, and it might go extinct.
Evolution:	The process by which different kinds of living organism are believed to have developed from earlier forms during the history of the earth.
Extinct:	All of that species is now dead; it is no longer found anywhere
Habitat:	The type of place an animal lives (e.g. savannah, rainforest, etc.)
Herbivore:	An animal that mainly eats plants.
Natural Selection:	the process whereby organisms better adapted to their environment tend to survive and produce more offspring
Omnivore:	An animal that eats plants and meat
Predator:	An animal that hunts and eats other animals
Prey:	An animal that is eaten by other animals
Species:	A group of animals that have similar characteristics and can produce offspring together.
Taxonomy:	The Classification of something, e.g. organisms
Vertebrate:	An animal of a large group distinguished by the possession of a backbone or spinal column, including mammals, birds, reptiles, amphibians, and fishes.
Invertebrate:	An animal lacking a backbone, such as an arthropod, mollusc, annelid, coelenterate, etc.

Pre-Trip Classroom Activities:

The Many Ways to Classify

This quick game will provide students with the understanding that there are many different ways to organise things, and give them an introduction into classification.

Time: 30 minutes

Subjects: Science

Materials Required: classification sheet (on next page), timer.

Discuss what is meant by the term classification with the class.

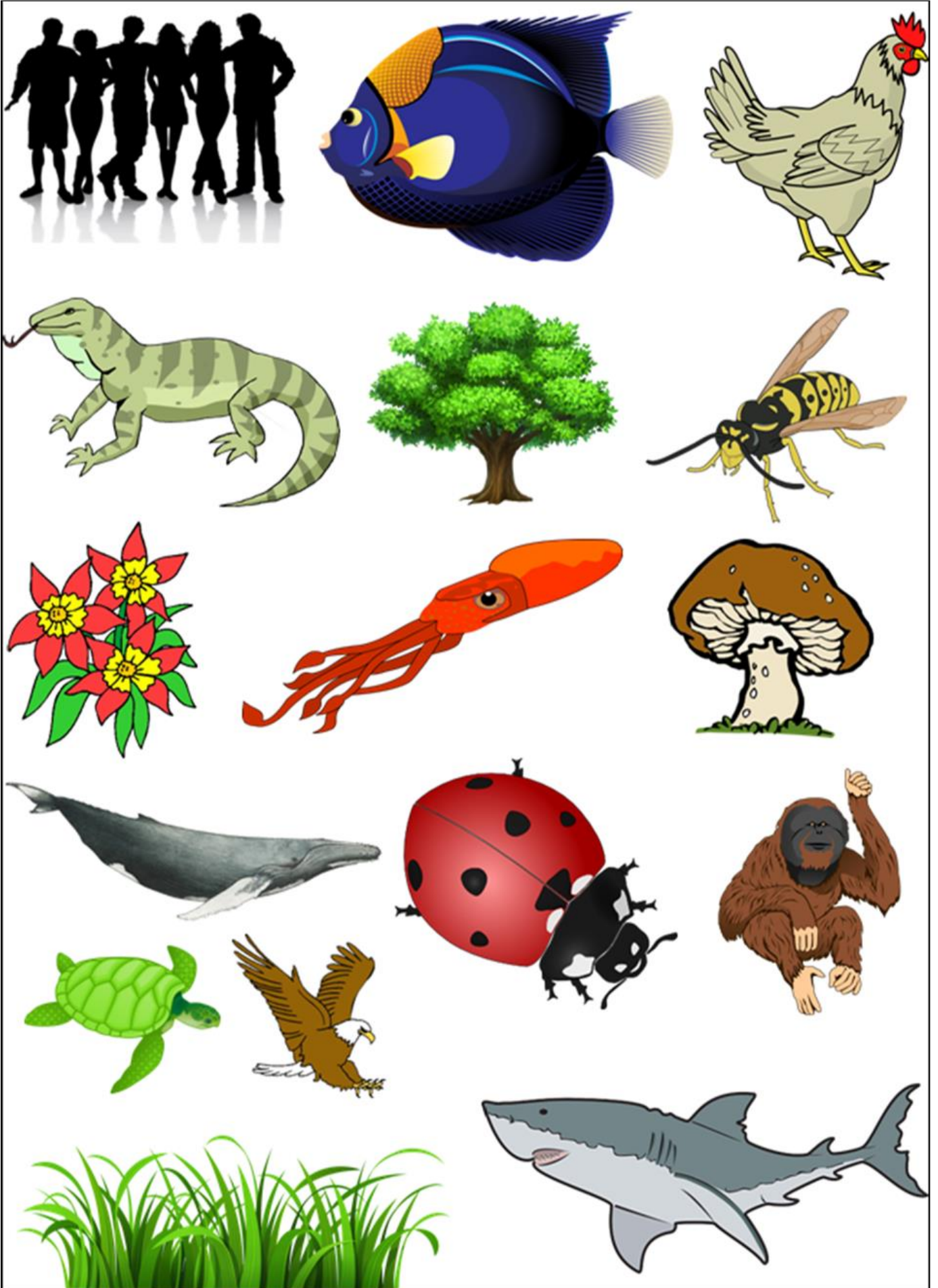
Hand each student one of the sheets overleaf, or feel free to create your own. Explain that the class will have a set time (30 seconds, 1 minute or 5 minutes depending on how long you have for this activity) to come up with as many different ways to group the things on the sheet as possible.

Some examples could include:

- Animals, Birds, Plants
- Things that are Green and things that are not.
- Land, Water, Air.

Those who come up with the most categories will be the winners. The students can compare what ideas they have had, and see if they can combine some of their ideas to make the most logical system they can.

To extend this activity, the students can go on to research how scientists classify the subjects, and cut out the images on the worksheet and arrange them onto a classification key.



Pre-Trip Classroom Activities:

Classification Keys

We are constantly finding new ways in which to classify the natural world. This activity will show students how varied classification has been over time, and how important it is for modern science to have a set format.

Time: 1 hour of preparation, 30 minutes to present

Subjects: Science

Materials Required: list of animals (on next page), scissors, paper

Discuss what we mean by the term Classification with the students. Explore a variety of different ways in which historical figures have classified the natural world. Some key classification techniques to explore include the following:

- Aristotle- often called the father of classification, who compiled the Historia Animalium. He classified animals by their blood colour and body types.
- Celestial Emporium of Benevolent Knowledge. This is from a Chinese encyclopaedia. This is a very creative way of classifying animals.
- Carl Linnaeus – The System of Nature. This is essentially the model of classification that scientists use today. This is best discussed following the activity to show how modern scientists are classifying nature.

Provide the class with the list of creatures overleaf, or create your own. Split the class into small groups and have them research these animals. They can then work as teams to create their own unique, imaginative classification keys by cutting out and rearranging the list. Compare how each group have created different keys depending on their own thoughts and opinions.

Giraffe	Toad
Penguin	Crocodile
Stick Insect	Jellyfish
Panda	Anaconda
Slug	Orca
Kangaroo	Human

Pre-Trip Classroom Activities:

Classmate Classification

Students can put their new found knowledge of classification into practise by organising each other into different categories. They can use a range of variables such as hair length, height, age and shoe size.

Time: 30 minutes

Subjects: Science, Maths

Materials Required: Measuring tapes, paper, pencils, graph paper.

Split the class into groups of roughly 4-5 students and explain that they will be measuring some differences between themselves and creating a classification key. They will need to make sure they record all their measurements and findings clearly.

The data they collect can then be added to a class data set, which the students can then use to produce different graphs and pie charts.

These can then be used to discuss variation amongst populations, distribution curves and even statistical outliers.

Students can then take their findings and produce dichotomous branching keys within their groups to help them identify each student.

For an alternative session, why not use jars of buttons or sweets?

Pre-Trip Classroom Activities:

What am I?

This fun game gets students use their reasoning skills to discover which animal they have been given.

Time: 30 minutes

Subjects: Science

Materials Required: Animal cards (two of each animal), headbands

For this activity you will need an even number of students. Each student should be given an animal picture card which can be stuck onto their headbands (so that the student cannot see what animal they have).

Students then have to move around the room, trying to work out which animal they have. They can ask one question at a time to other students, but cannot ask 'what animal am I?'. The players should ask instead about colours, habitats, flying abilities etc.

Once the student has discovered what animal they are, they then have to find their matching partner– the first pair can be declared the winner.

To take this game further, remove the images from the cards, or have students research unusual animals to use in the game.

At the Zoo Ideas:

These are ideas to help your class focus during their trip to the zoo. Use these ideas as a starting point with or without the pre-made activities and worksheets on the next pages.

1. Use the worksheets in this pack to help focus your students
2. Encourage students to spend time observing the animals. Some unique animal behaviours can only be seen if we watch very carefully.
3. Have students make a detailed sketch of a zoo animal, sketching encourages careful observation.
4. Take photos of the animals and around the zoo. When you get back to school make a photo scrapbook of your trip.
5. Attend the feeds, displays or talks and have your students take notes. Often the keepers are available afterwards to answer questions if you want to learn more.
6. Give the students the genus of several species, of the teachers choosing, and get the students to find animals at the zoo who are in that genus. For example for the genus *Panthera* the students will have to find the tigers and lions.
7. Within the groups, give the students a habitat and ask them to find animals that live in that habitat and get them to make notes on what the adaptations that animal has. When back in the classroom the groups have to find similarities between the animals.

At the Zoo Ideas: Senses Scavenger Hunt

Subjects: Art, Science

Draw pictures of the animals or things when you find them:



At the Zoo Activities

Comparing Apes and Monkeys

Find three apes species and three monkey species. When you find a species write down what they look like, using the table below to help you separate the apes and monkeys.

Don't forget about the lesser apes, such as gibbons.

Once this is completed look at the differences and similarities between the apes and monkeys.

APES

MONKEYS

At the Zoo Activities

Find two examples of a carnivore, herbivore and omnivore and write in bullet points the common features the two species share. Fill in the boxes below with the answers.

Omnivore

Carnivore

Herbivore

Counting Animal Classification - page 1

Find five examples of each type of animal.
Record the number of individual animals you observe of each type.
The first one has been done as an example.

Mammals

Animals with fur



Species (types of animal)	Lion				
Number of individual animals	3				

With 5 species (types) of mammals there was a total of: _____ individual animals

Birds

Animals with feathers

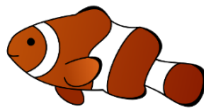


Species (types of animal)					
Number of individual animals					

With 5 species (types) of birds there was a total of: _____ individual animals

Fish

Live in water and breathe through gills



Species (types of animal)					
Number of individual animals					

With 5 species (types) of fish there was a total of: _____ individual animals

The most numerous type of animal I observed was the: _____

Find five examples of each type of animal.
Record the number of individual animals you observe of each type.

Amphibians

Animals with soft, wet skin (often life in land and water)



Species (types of animal)	Lion				
Number of individual animals	3				

With 5 species (types) of amphibians there was a total of: _____ individual animals



Reptiles

Animals with scaly, leathery skin

Species (types of animal)					
Number of individual animals					

With 5 species (types) of birds there was a total of: _____ individual animals

Invertebrates

Animals without bones (e.g. seastars, insects, spiders, etc.)



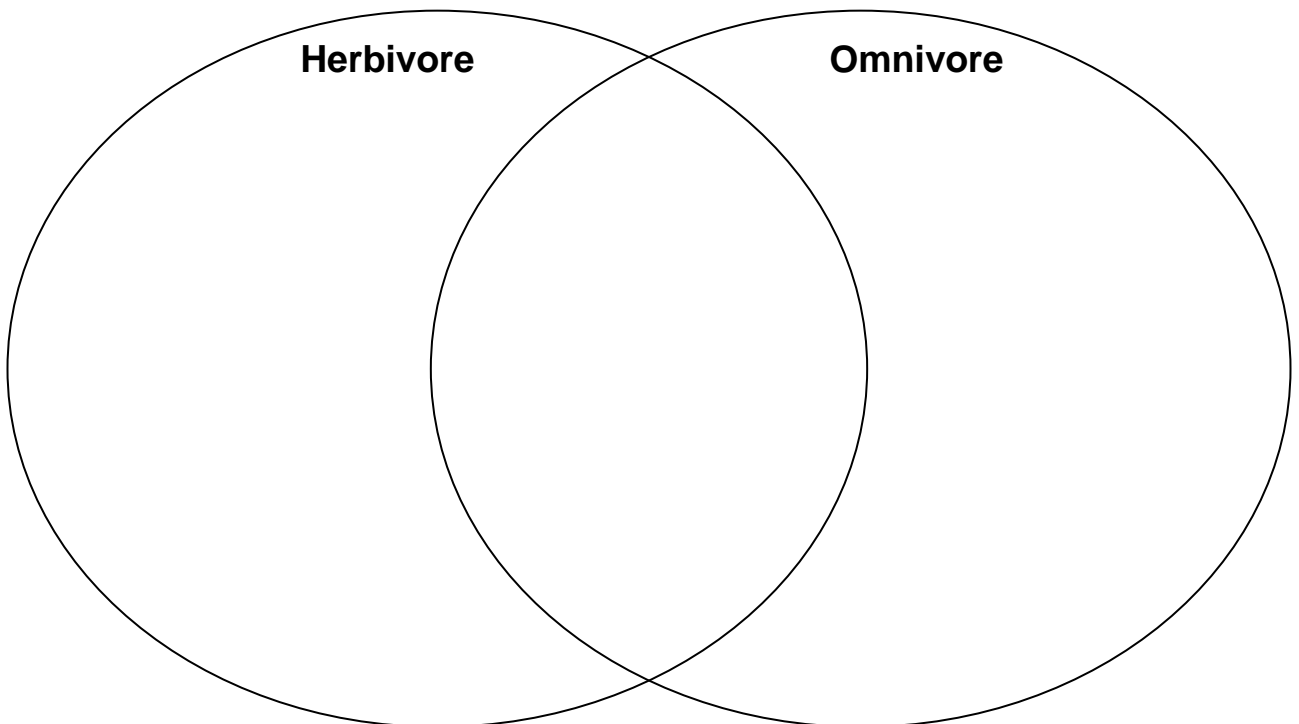
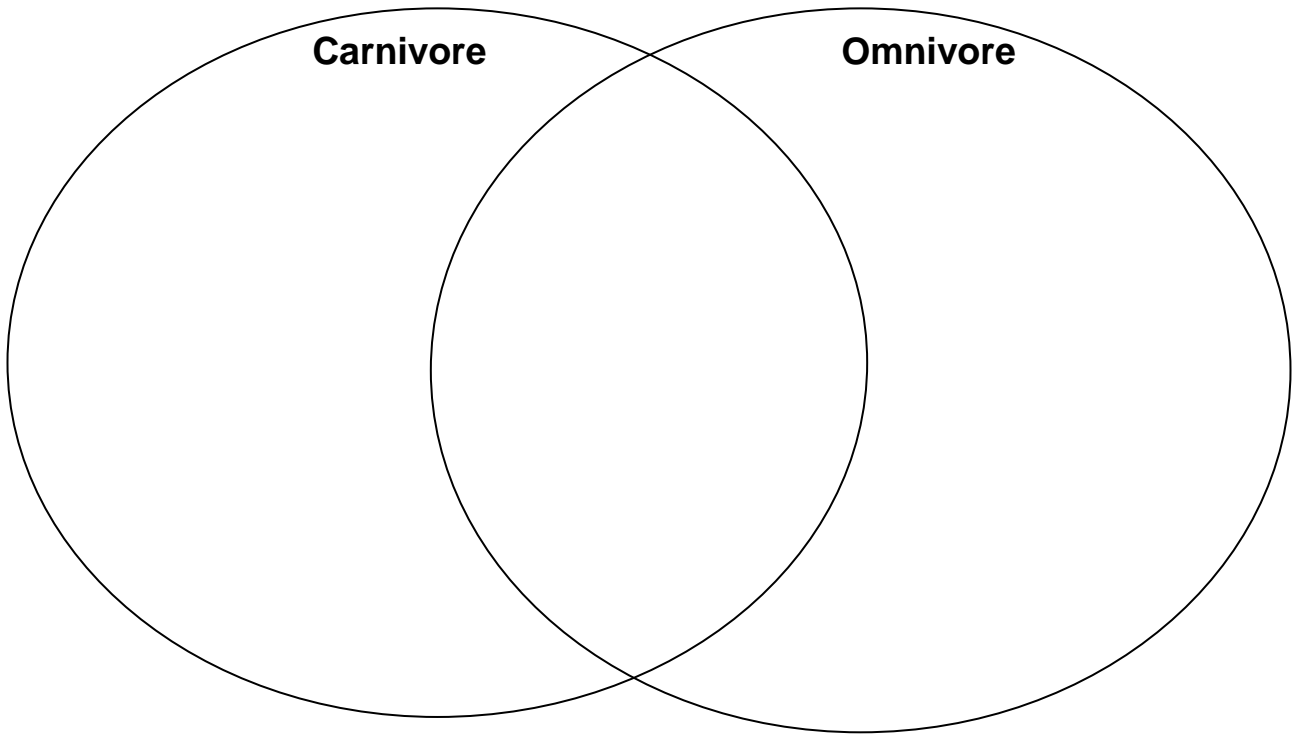
Species (types of animal)					
Number of individual animals					

With 5 species (types) of invertebrates there was a total of: _____ individual animals

The most numerous type of animal I observed was the: _____

At the Zoo Activities

Look at one different carnivore species and one different omnivore species and fill in the Venn diagrams below. Venn are good for comparing sets of objects that have similar traits. Do the same for one herbivore species and one omnivore species.



Post-Trip Classroom Ideas:

These are ideas to help teachers relate animals they have seen at the zoo to further learning about classification. Use these ideas as a starting point with or without the pre-made activities and worksheets on the next pages.

1. With any animal from the zoo use that animal and find its classification from species all the way through to kingdom.
2. As a class share/print off photos of animals from the zoo. Then using visual similarities sort the photos out into kingdom then into phylum and so on stopping at genus.
3. Look into how DNA is used to classify species, and use examples of animals that have only been correctly classified due to their DNA. For example the Red panda.
4. There are many ways species can be grouped. Create a game where the students are given pictures and in groups ask them to sort the pictures out into groups of the teachers choosing. They can have pictures of skulls, teeth, body covering etc.
5. You can also repeat the game above using non-animal images, such as cars.
6. As you have gone round the zoo, you will see that there are many subspecies. For example Colchester Zoo has reticulated giraffe. Using animals from the zoo, look into their family more and see what subspecies are within that family, and what variations they have that class them as a subspecies.

Post-Trip Classroom Activities:

One Big Family

This activity can be used to help visualise how diverse one family of animal or plant can be and help with the understanding of biodiversity.

Time: 45mins research and prep. 30-45mins creating.

Subject: Science

Materials: Pictures of animals and plants from nature magazines, scissors, paper and glue.

The students are given a particular family of animal (e.g. Felidae) or plant and have the students research into the similarities found within the family. This will help to ensure the images are correct. Once this is done the students have to find images of the species found within that family.

Once they have found enough images go around the class and ask the student what they have found and what key similarities they have use to.

The students can now start creating a collage. The teacher can decide the size of the paper (A4 or A3) and if they should work in groups or on there own.

When allocating what animal or plant family to use it is recommended that the teacher decides who gets what. This ensures a broad range of animal/plant families are used and prevents any repetition.

This could lead to a classroom display or a display around the school.

Post-Trip Classroom Activities:

Minibeast Classification

This is a hands on activity allowing the students to do basic classification outside of the classroom.

Time: 45-60mins

Subject: Science

Materials: Magnifying glasses, bug viewers, white trays and pooters. Pencils, pad and ID key.

Before heading out into the school grounds go over basic invertebrate classification of the invertebrates you are likely to find. This can be done as a class discussion or pre-prepared hands out.

- **Insects:** 6 legs, 3 body segments.
- **Arachnid:** 8 legs, 2 body segments.
- **Molluscs:** 0 legs, 1 'foot', 1 body segment.
- **Myriapods:** 8+ legs, multiple body segments.

For older classes do a more in-depth classification and cover more invertebrates species.

Next head out into the school grounds. Teachers may want to check different areas out beforehand to see which area has the most life.

Around leave litter, under bushes and trees and among flowers are good spots. Also under rocks and wood are good havens for lots of invertebrates. Remember to put the rocks and wood back once finished.

When the students find an invertebrate they can use the classification key to identify them. They can also take a sketch of the invertebrate and once they are back in the classroom do some research and identify the individual. If there is a pond on site why not do some pond dipping?

Post-Trip Classroom Activities:

The Yes No Game

This game can focus students on what is used in classification as well as being used as a recap.

Time: 20mins

Subject: Science

Materials: None

This game can be done in either a group or as a whole class.

One student has to think of animal or a plant. The other students then ask questions to find out what animal/plant the student is thinking of.

The student being asked the questions can only reply YES or NO.

This activity can be done towards the end of the class time and can help the teacher assess how well the students understand the subject.

For older classes more complex questions can be asked as well as more lesser known animals/plants being thought of.

Helpful hint: if the teacher thinks the students may change their minds whilst being asked the questions, the teacher can delegate the species or ask for the student to write the species down before starting.

We hope you enjoyed your trip to



**Learning about
Classification**