ACET Junior Academies'

Scheme of Work for Science

Big Idea – Living Things

Year 6 – Classification

About this unit:

PoS – Living things and their habitats

This unit builds on the Y4 Classification unit. There, students learned more about different groups of animals, with a focus on their features. Features of living things and properties of materials was a covered in depth in Y4, In Y6, the students will build on this, reinforcing what they know about the features of living things, and learning how to identify the key features. They learn how to use and make keys, and use them to help identify unfamiliar animals, and put them into the appropriate groups.

A theme of Y5 was scientists, and how they work, and in this Y6 unit, students should gain an understanding of why we group living things, and an appreciation of how hard it can be. Scientists, as well as school pupils, can struggle to identify what the key features of an animal are, and can also find it difficult to answer the questions on a key. However, by practising, we improve, and by using the keys we can be sure that we have grouped things correctly.

Finally, students will consider microorganisms (bacteria, virus and some fungi) as a group. These are living things which are often overlooked, and students often don't realise that they are just another group of living things, but that their key feature is that they are too small to be seen.

Unit structure

This unit is structured around five science enquiries:

1. How do we group living things?
2. Can you use keys?
3. Can you classify vertebrates?
4. Does it work for creatures you've never seen before?
5. What about the living things we can't see?

Links to previous and future National Curriculum units

Y4 – Classification

- KS3&4 Biology

<table>
<tr><th colspan="5">Enquiry 1: How do we group living things?</th></tr>
<tr><th>Links to previous learning</th><th colspan="2">Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="2">Y4 - Classification</td><td colspan="2">EA – Identifying, grouping and classifying

Asking questions
Making predictions
Observing and measuring</td><td rowspan="2">Can your children:
- Identify features which will help them group animals
- Give reasons for why they have grouped animals a certain way.</td><td rowspan="2">Horizontal:

Vertical:
KS3&4 Biology</td></tr>
<tr><td colspan="2">Key concepts:
Scientists put animals into groups so that we can study them, and learn more about them.
All animals have different features, which scientists use in order to put them into groups.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="3">Common misconceptions</th></tr>
<tr><td colspan="2">Classification, group, features, identify, justify, explain</td><td colspan="3">Students often forget that invertebrates are animals.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th colspan="2">Useful links</th></tr>
<tr><td colspan="2">Go outside and collect as many animals as they can – including photographs of animals it's impractical to bring inside. Students should be mindful of keeping the organisms safe, and of being able to return them where they came from.

Teacher could have some pictures of British animals – but it's important that the students have at least some real examples to use.

Look at all the animals the class have found. The students can decide how to group them. It doesn't matter how they do this – as long as they have criteria. They need to be able to justify their decisions. GD – show an awareness that some organisms don't fully 'fit' a group. How do they overcome this?

The teacher should take photos of all the organisms before they are returned outside – they will be identifying them next lesson.</td><td>Hand lenses
Containers to bring the animals inside</td><td colspan="2">https://www.youtube.com/watch?v=rzxFTrktN1c
Grouping invertebrates – a good introduction/reminder about the vertebrates in addition to the vertebrates!</td></tr>
</table>

<table>
<tr><th colspan="4">Enquiry 2: Can you use keys?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="3">Y4 - Classification</td><td>EA – Identifying, grouping and classifying

Asking questions
Making predictions
Observing and measuring</td><td rowspan="3">Can your children:
- Use a key to put an animal into a group
- Recognise where they may be making the wrong decision</td><td rowspan="3">Horizontal:

Vertical:
KS3&4 Biology</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>Scientists use keys to help identify living things, and to know which group they are in. It can be difficult to use keys, as it can be hard to decide whether a living thing has a feature or not.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Classification, group, features, identify, justify, explain, key</td><td colspan="2">Students often think that scientists just ‘know’ the answers to things – it’s important that they realise that they often have to make difficult decisions.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Using keys of British invertebrates (and possibly vertebrates), students should try and identify the animals they caught last lesson. Notice that all the animals have a scientific name – this is the same in all languages – opportunity for discussion of the significance of this. They may not be able to actually identify them – but they should be able to put them into named groups – e.g. huntsman, spider, woodlouse etc

There will probably be a number of animals that they can’t identify. Use this as an opportunity for discussion – is this because they don’t have enough information about it? Is it hard to tell whether it matches the picture? Are there features on their animal that don’t match the information?

The students shouldn’t just ‘give up’ – if they were a real scientist who needed to know what was living in the habitat, how would they find out what their animal is?</td><td>Hand lenses
Pictures of British animals – including those taken last lesson
Identification keys and books</td><td></td></tr>
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<table>
<tr><th colspan="4">Enquiry 3: Can you classify vertebrates?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="3">Y4 - Classification</td><td>EA – Identifying, grouping, classifying

Asking questions
Making predictions
Recording data</td><td rowspan="3">Can your children:
- State the features of each group of vertebrates
- Create their own key</td><td rowspan="3">Horizontal:

Vertical:
KS3&4 Biology</td></tr>
<tr><td>Key concepts:</td></tr>
<tr><td>There are 5 groups of vertebrates, with specific identifying features.
We can use the features to make keys, so other people can group animals.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Vertebrates, classification, bones, skeleton, fur, feathers, fins, beaks, eggs, live young, scales, moist skin, water, milk</td><td colspan="2">Students often think of vertebrates as ‘animals’, and of invertebrates as ‘something else’.</td></tr>
<tr><th>Suggested activities</th><th>Resources</th><th colspan="2">Useful links</th></tr>
<tr><td>Review classification of vertebrates from Y4.

Recall what the 5 groups of vertebrates are. Practise grouping vertebrates from pictures that they are given – ensure that some of these are of organisms unfamiliar to the students, and from unfamiliar habitats.

Students to create classification statements for each type of vertebrate, from observations of the pictures. Discuss whether all the students' classifications match. Do they all work?

Make a key to help y4 students identify what group a vertebrate could be in – these should be a series of yes/no questions.</td><td>See links

Pictures of vertebrates – more than one example of each group</td><td colspan="2">https://www.marwell.org.uk/downloads/ks2keysgliorioukeys.pdf
Useful teacher resource for making keys – although relates to a particular zoo

https://www.youtube.com/watch?v=M51AKJqx-7s
Good resource for more able students. Less able would be better off with a more visual key such as the one in the resource above (Marwell zoo)</td></tr>
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<table>
<tr><th colspan="4">Enquiry 4: Does it work for creatures you've never seen before?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="2">Y4 – Classification – students should have looked at similar animals in different places</td><td>EA – Problem solving

Asking questions
Making predictions</td><td rowspan="2">Can your children:
- Identify which features a 'weird' animal has in common with others in its group
- Suggest why an animal has developed an extreme/weird feature</td><td rowspan="2">Horizontal:
Y6 – evolution – adaptations and common ancestors

Vertical:
KS3&4 Biology</td></tr>
<tr><td>Key concepts:
Animals in the same group have similar features.
Some animals have developed weird or extreme features – but the rest of their features are like those of the other animals in their group</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Classification, invertebrate, extreme, different, similar, common, features</td><td colspan="2"></td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Students can research invertebrates from different countries. What do they have in common? What is different about them? Can they find a weird/extreme example of an invertebrate, and then find an animal that looks more boring/familiar that it is related to? Which features do they have in common, and which features make the original example weird/extreme?

Examine habitats from different countries – what types of animals would live there? Remember the invertebrates. Can you explain what differences there would be between them?

Is a British spider the same as an Australian spider/Scandinavian spider etc?

Greater Depth – what's in a name? and look at Linnaeus – what is the difference between their common names and scientific names.</td><td></td><td></td></tr>
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<table>
<tr><th colspan="4">Enquiry 5: What about the living things we can't see?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="2">Y4 Classification</td><td>Asking questions
Making predictions</td><td rowspan="2">Can your children:
- Describe what microorganisms are
- Tell you that washing with soap will remove microorganisms from our skin and prevent infections</td><td rowspan="2">Horizontal:

Vertical:
KS3&4 Biology</td></tr>
<tr><td>Key concepts:
There are living things that are so small we can't see them (microorganisms)
There are many different groups of microorganisms, just as there are with plants and animals</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Microorganism, germ, dangerous, beneficial, virus, bacteria, fungi, hygiene, soap, washing</td><td colspan="2">Microorganisms are all bad – most are good, but the 'bad' ones can be really dangerous.</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">Good opportunity to link to hygiene, and the Covid-19 outbreak.

Introduce the concept of micro-organisms. We think of them as 'germs', but there are different types. Many groups of microorganisms are very useful and helpful to humans.

Handwashing works on them all.

Antibiotics only kill bacteria – they have no effect on viruses.

See the link with resources from Public Health England. Choose activities suitable for your class – bear in mind the key concepts and assessment criteria above.</td><td>Y6 microorganisms</td><td>https://e-bug.eu/lang_eng/primary_pack/downloads/UK%20Junior%20Pack%20Complete.pdf</td></tr>
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