Taxonomy Challenge

Recommended style of activity	
Public engagement: Self-led family drop-in activity.	**Schools:** Introduced topic then self-led sheets.
Suggested age range: 9-18 years	
Approximate time : 15 minutes for developing identification keys, 10 minutes for taxonomy challenge	

Background Science

Much of the life in the deep sea is unknown and scientists around the world are still discovering new species. Identifying species (living things which can interbreed) is important for many reasons other than just curiosity. Scientists in the ATLAS project are looking to identify 'Vulnerable Marine Ecosystems' or VMEs. This is where the creatures and the area they live in have been designated as ones that might be very badly affected by activities which damage the sea-bed such as trawling. Knowing which species are there will help with this aim. Identifying a range of species from an area will build up a picture of the biodiversity and any potential connections between the different species. Patterns of species diversity and numbers might also be revealed which could be changing in response to changes in temperature, food supply or ocean currents. This knowledge could help scientists predict how these creatures will be affected by a changing ocean in the future.

Identifying the species is the job of a taxonomist. They will start by sorting out collected creatures (specimens) into groups which they think are different species. Then they need to find out if they have already been named, or if they are potentially new to science! One way to do this is working through identification guides, some of which may have been written hundreds of years ago. Sometimes a taxonomist can just look at the outside of a creature but they may also need to dissect it or even take samples for DNA analysis.

In the following activities, you can develop your own identification guide and test out your taxonomic skills using a simplified identification guide based on some 'Ophiuroids' or Brittle Stars (a bit like a starfish) collected from the Mingulay Reef in Scotland.

Scottish Curriculum links (CfE):

I can distinguish between living and non living things. I can sort living things into groups and explain my decisions. **SCN 1-01a**

I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction. **SCN 2-01a**

Kit List:

For the create your own identification guide activity:

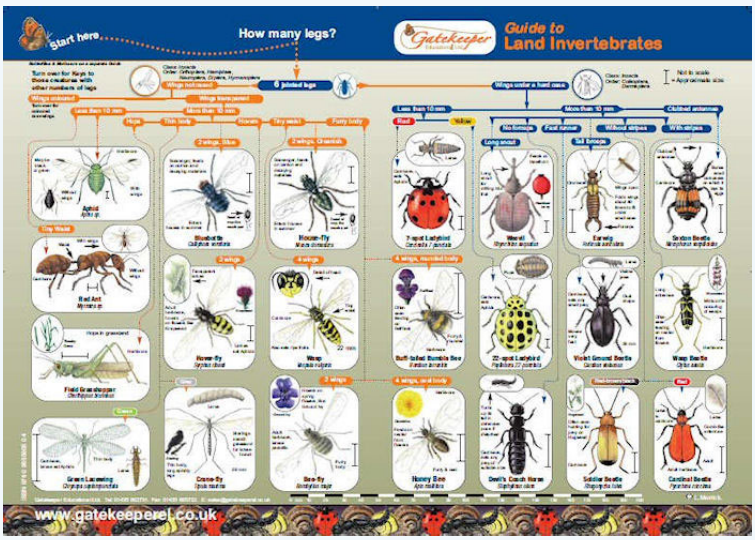
- Objects with a variety of shapes, colours and/or patterns e.g. liquorice allsorts sweets or children's building bricks.
- Paper/whiteboards & pens for developing the guides.

For testing your taxonomy skills:

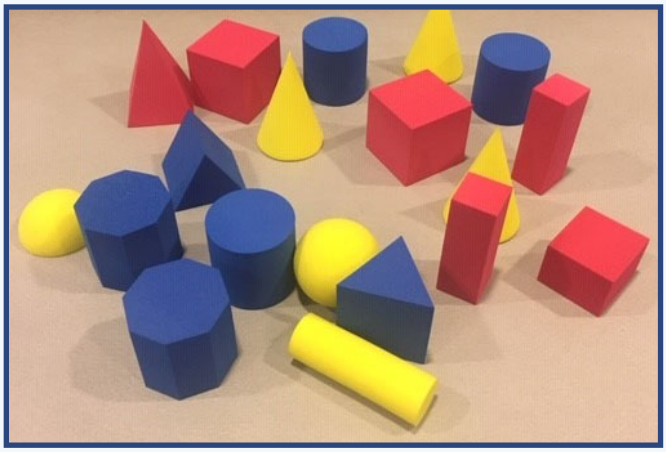
- 'Test your taxonomy skills' sheets—available online in the ATLAS Outreach Portfolio.

Developing your own key:

- Introduce the concept of dividing creatures into different groups or species based on what they look like.
- Give participants the objects to be used in the guide and discuss the ways in which they could start sorting them out, for example starting with colour or shape. You can use the key overleaf as an example or find similar ones here: https://www.gatekeeperel.co.uk/guides.php



Example identification key:



Start: Is it yellow?

Yes → Is it a cone?

- **Yes** → This is the '*Yellow Cone*' species
- **No** → Is it a sphere?
  - **Yes** → This is the '*Yellow Sphere*' species
  - **No** → Is it a hemisphere?
    - **Yes** → This is the '*Yellow Hemisphere*' species
    - **No** → This is the '*Yellow Rod*' species

No → Is it blue?

- **Yes** → Is it a cylinder?
  - **Yes** → This is the '*Blue Cylinder*' species
  - **No** → Does it have 5 sides or faces?
    - **Yes** → This is the '*Blue Prism*' species
    - **No** → This is the '*Blue Octagonal Prism*' species
- **No** → Is it a pyramid?
  - **Yes** → This is the '*Red Pyramid*' species
  - **No** → Is it a cube?
    - **Yes** → This is the '*Red Cube*' species
    - **No** → Is it taller than it is wide?
      - **Yes** → This is the '*Tall Red Cuboid*' species
      - **No** → This is the '*Short Red Cuboid*' species

With special thanks to Dr Georgios Kazanidis, Postdoctoral Research Associate in the University of Edinburgh, for his help in developing the content for this activity.

For more oceans-themed activities and experiments, please visit https://www.eu-atlas.org/education/education-packs

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