

Designing Keys

Identifying the organisms we find in any habitat is essential to help us answer many questions about the habitat and the wider ecosystem. Keys are one of the simplest ways of doing this, and can be designed very simply.

This activity guides students through the process of developing and then using a key, whilst encouraging the observation of features of the organisms found within a pond.

Resources

- Powerpoint presentation (see end of pdf)
- Teachers' notes to support the presentation (see end of pdf)



Ponds – Using keys to unlock identification

- A pond contains a vast variety of plants(producers), predators and prey (consumers) and detritivores (decomposers/scavengers) many of which change as you go through the seasons.
- Scientists who study the relationship between living things (Ecologists) need to sort different living things into groups (categories) to help to identify them.
- This can be carried out by using an identification key.





Starter: Identification keys

“Keys” are used to help place living things into groups for easier identification

Put the following organisms (living things) into the correct category (group) using the boxes below
(two organisms can go into the same group)

Go to the next slide once you have selected which group each living thing should go into



6 legs, insect like,
possibly a larval stage
that will grow into
something else,
found underwater=
dragonfly nymph

8 legs, spends some
time around edge of
pond, sometimes on
surface, 2 main
segments to body =
swamp/raft spider

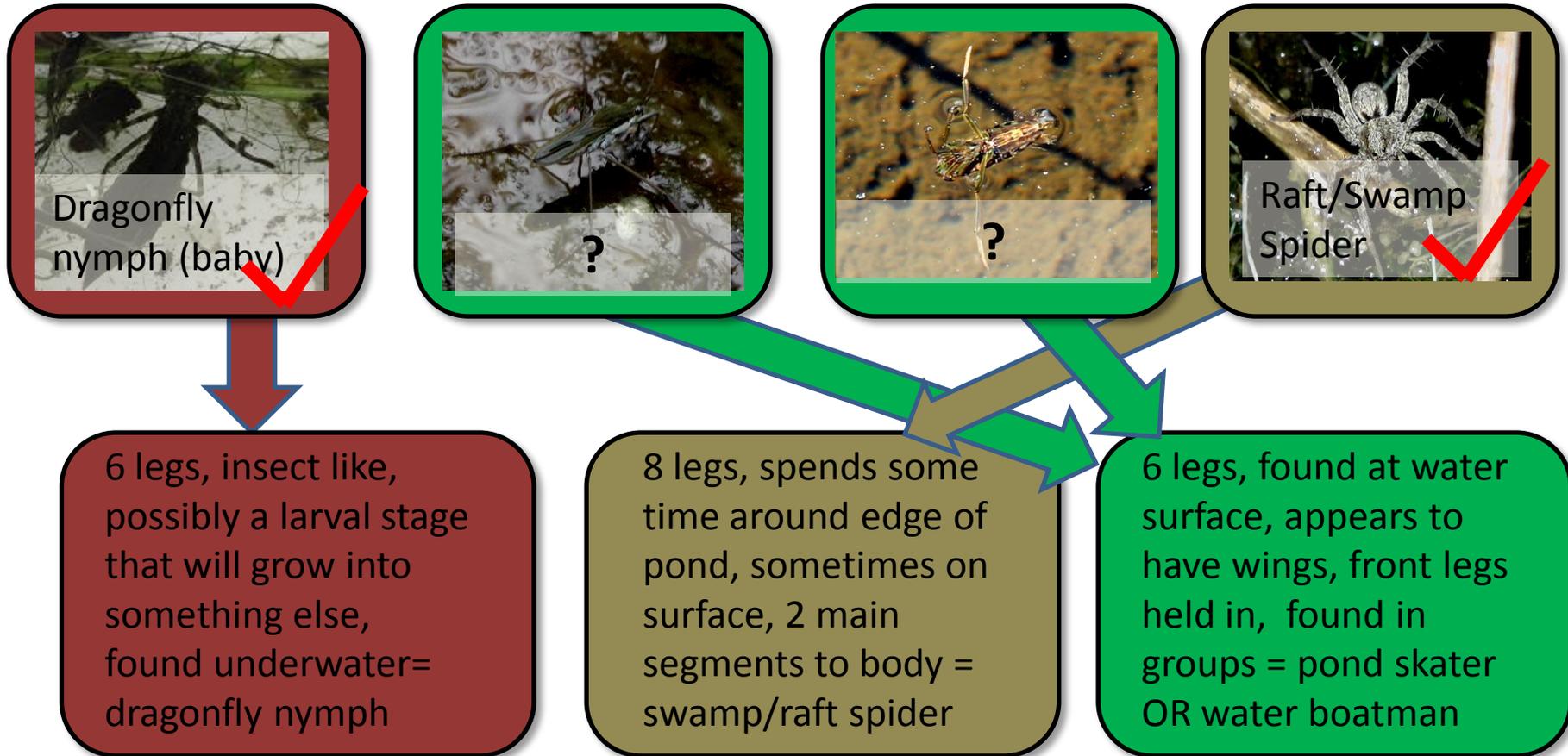
6 legs, found at water
surface, appears to
have wings, front legs
held in, found in
groups = pond skater
OR water boatman



Identification keys

If more than one living thing goes into a category you can come up with new categories until you end up with just one type of living thing in each category,.

Go to the next slide to see this in action.





At this stage we can see that they are different but need one more step in the key to separate them.



6 legs, found at water surface, appears to have wings, front legs held in, found in groups = pond skater OR water boatman

Floats on back with body just under the water surface = Water Boatman



Floats with body above water surface, legs hold it above the water = Pond Skater





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Challenge:

You are going to sample a variety of pond life using pond nets and create your own identification key from the living things you discover.

Equipment needed:



white dish or tray
at least 5cm deep



Pond net



Plastic gloves



Digital camera,
notebook, pencil,
Identification guide
book/internet guide

Need to know beforehand:

Make sure you remove samples carefully and replace all animals and plants back where you found them. Don't just throw the water from the tray back in, lower your tray to the water level to empty it. Throwing a pond skater back into the water from 1 metre high would be like dropping you off the London Eye!





Challenge:

You are going to sample a variety of pond life using pond nets and create your own identification key from the living things you discover.

Method:

- 1) Gloves on to protect you and the samples.
- 2) Half fill your plastic white tray/dish with water from the pond you are sampling, allow it to settle.
- 3) Dip your net in carefully, if you move too fast you will catch less, try sampling at the surface first, once you have swept from side to side a few times remove your net and empty it's contents into your tray . Make a note or take a picture of any features, behaviour or any characteristics of any living things you find.
- 4) Repeat this again half way down into the water , making notes on finds, then repeat by sampling the mud/sand at the bottom of the pond, again noting any finds.
- 5) Take your notes, sketches and pictures back to the lab for sorting.





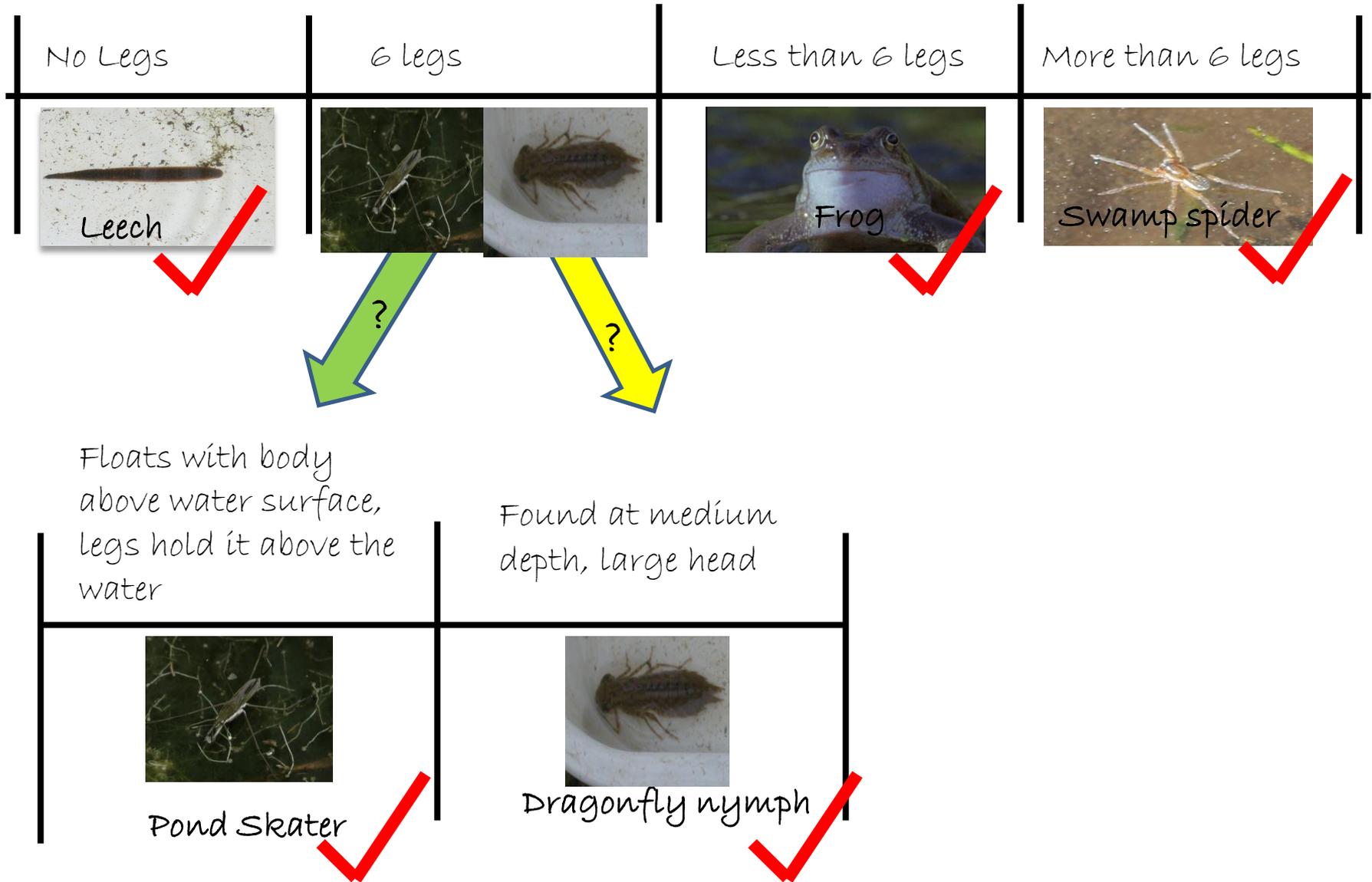
5 species found

Results:

- 1) Draw your results up in a table like this but first fill in the headings for each column e.g. No legs, Less than 6 legs, 6 legs, more than 6 legs, found at surface, found in the detritus (mud/leaves/rotting material) at the bottom of the pond, hairy, 2 segments etc

No Legs	6 legs	Less than 6 legs	More than 6 legs
			

- 2) Place your findings into each column and continue adding columns underneath until each "category" has only one organism in it, then use your guide book/the internet to help identify what you have found. See the next slide for an example.





Conclusions:

- 1) Did using a key help you to identify the samples?
- 2) Why do biologists put organisms into groups?
- 3) How do scientists make sure that living things have the same name in different countries?
- 4) What is a nymph and what is a larvae?
- 5) How did the species you find change from one depth or location in the pond to another?
- 6) Do you think you would find different species at different times of the year?
- 7) Why might you find different organisms at different times of the year?





Ponds – Using keys to unlock identification

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Age group: 14-18 years (the resource is adaptable for different levels as required by the facilitator)

Curriculum links and keywords: keys, identification, classification, aquatic life, adaptations, food chains, food webs, life cycles.

Group size: up to 30 students

Locations: anywhere with a pond or static water that is safe to access

Time needed: 1 hour

Learning outcomes: For students to create an identification key to analyse and sort different living things into groups (categories) to help to identify them.

Note: No specialist knowledge is required but students will need to be able to place organisms into groups based on their features. If extension is needed, students could look both at qualitative and quantitative surveys of life in ponds.

Preparation: Guidebooks if needed, pond nets, white tubs or trays, plastic gloves, access to internet in the classroom, magnifying glasses if possible, digital cameras, notebooks, pencils.

Activity

1) Open the PowerPoint included in this download

Basic info:

- A pond contains a vast variety of plants (producers), predators and prey (consumers) and detritivores (decomposers/scavengers) many of which change as you go through the seasons.
- Scientists who study the relationship between living things (Ecologists) need to sort different living things into groups (categories) to help to identify them.
- This can be carried out by using an identification key.

Slide 1: The PowerPoint begins with an introductory video clip to ponds (click on the link in the PowerPoint to open the video which is already loaded onto YouTube). To preview the clip see: http://www.youtube.com/watch?v=STasskXuUIQ&feature=channel_video_title

Slides 2, 3 and 4: Introduction to identification keys includes a starter on how to construct a basic key from scratch.

Slide 5: Introduces the challenge activity where students sample a variety of pond life using pond nets and create their own identification key from the living things they discover. This can be adapted to student ability. It includes a “need to know section” on ethics in biology.

Slide 6: Challenge instructions and method.

Slide 7: Results section including clear guide that takes students through the key-making process.

Slide 9: Conclusion questions.

Questions for students to consider:

- 1) Did using a key help you to identify the samples?
- 2) Why do biologists put organisms into groups?
- 3) How do scientists make sure that living things have the same name in different countries?
- 4) What is a nymph and what is a larvae?
- 5) How did the species you find change from one depth or location in the pond to another?
- 6) Do you think you would find different species at different times of the year?
- 7) Why might you find different organisms at different times of the year?