Background information

Year F, unit 1: Needs of living things

Common early years perceptions

In the early years, students will have very many different understandings about the world based largely on the values and teachings of their parents. It is therefore unfair to consider their views and beliefs as misconceptions since life's journey of understanding is so very new. The ideas below are intended to provide some way of making the curriculum explicit with careful consideration of student views of the world.

Needs that students may perceive as basic for life

Students may identify some needs that they perceive to be essential to life. Daily routines such as bathing, washing clothes and cleaning teeth could be suggested as necessary because students are told avoidance of these can lead to illness (and perhaps, a child could interpret, non-survival). Taking of certain medications for some students could be essential to ensure their survival; for example, epinephrine auto-injectors (Epi-pen®) for severely allergic students. 'Love' may also be considered an essential need for living.

Teachers should be positive about the divergent thinking and observation that gives rise to these suggestions. The emphasis should be on the common needs with suggestions that there are lots of animals that grow up alone for instance, and therefore they do not need love. There is a PowerPoint resource that specifically looks at animals that grow up alone and those that have parents that care for them. See 'Animals that grow up in families', Queensland Museum website http://www.southbank.qm.qld.gov.au/Learning+Resources/~/media/Documents/Learning%20resources/QM/Resources/Kids%20collection/animals-that-grow-up-in-families-v2.ppt (2012)

For young children, shelter can be considered as a home if need be. Homes not only provide a place to rest but also protection from danger and somewhere warm when it is cold.

Alternative class pets

Alternative class pets include silkworms, a worm farm, stick insects, crickets, a class fish, guinea pigs or mice. Each has a few unique requirements and it is expected that high standards of animal ethics be adhered to. An excellent resource is 'Keeping live insects', Queensland Museum website http://www.qm.qld.gov.au/Find+out+about/Animals+of+Queensland/Insects/Keeping+insects+at+home (2012)

Museum of Victoria has produced an excellent book on bugs – Henderson, Alan and Deanna; Sinclair, Jessie 2008, *Bugs Alive: A guide to keeping Australian invertebrates*, Museum Victoria, Melbourne. The book can be purchased from CSIRO Publishing at http://www.publish.csiro.au/pid/5871.htm (2012)

How animals use their senses to meet their needs

The opportunity exists to extend student understanding and inquiry by exploring the senses which animals use to meet their needs. 'Primary Connections', Australian Academy of Science website http://science.org.au/primaryconnections/curriculum-resources/staying-alive.html (2102) has developed a unit called *Staying Alive* that is a good example of a complementary unit.

'Bugs', Museum of Victoria website http://museumvictoria.com.au/bugs/ (2012) is an excellent Early Years online resource that explores this also.

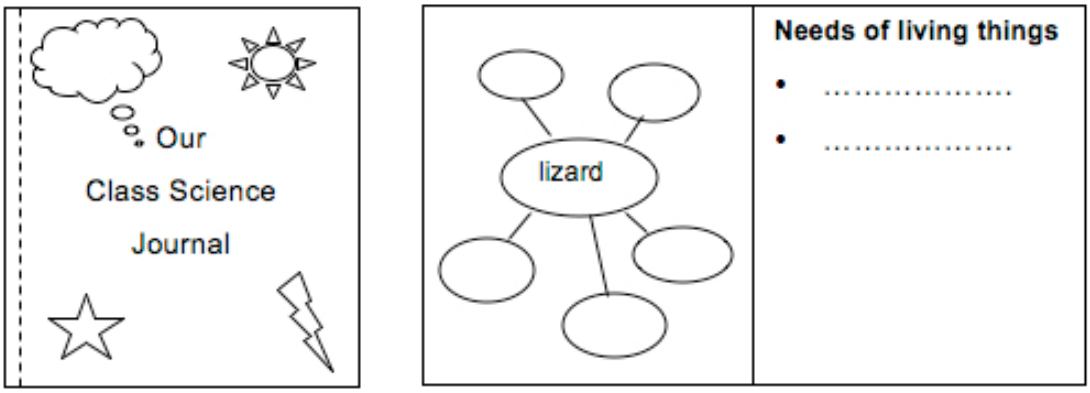
Delivering the intended curriculum

Mealworms are used in this unit because of their suitability as a classroom animal (cost, resilience, maintenance time, handling, speed of growth). They are also a good choice for the delivery of year 2 and year 4 curriculum descriptions. By ensuring that the language and focus questions used are aimed at the delivery of the specific year levels content, then the reuse of an activity should in fact build a depth of knowledge rather than prove repetitive. For example, foundation students should be guided to look at needs, senses, questioning and communicating and not naming the life cycle phases. These may be known by some students and used in conversation but are not the intention of the teaching. In this way, the Australian Curriculum provides for the systematic, spiralled development of scientific understanding, application and inquiry skills.

Class science journaling

A class science journal can be easily made from large pieces of art or painting paper stapled on one side. Ideally it should be the size of a commercial 'big book' used for shared reading. Alternately, a digital version could be created.

Sample layout for a class science journal.



A class science journal is used for a number of purposes.

- To record student ideas including prior knowledge, observations and statements of learning
- To model scientific text types such as labelled diagrams, lists, drawings, simple tables and graphs, mind maps and other appropriate graphic organisers
- To list activities for group work or free-choice activities

- To keep a record of the class' learning journey, including photos and printed worksheets, for reviewing
- To demonstrate to parents the learning their child is engaged in (or has missed).

It is important to write neatly and in a large font so all students can see the text from where they are sitting.

Students should also have their own science journal for recording their observations and ideas. These could be based on teacher modelling in the class science journal (eg a simple labelled diagram) or students own drawings/writing about what they have observed. A scrapbook makes a good student science journal.

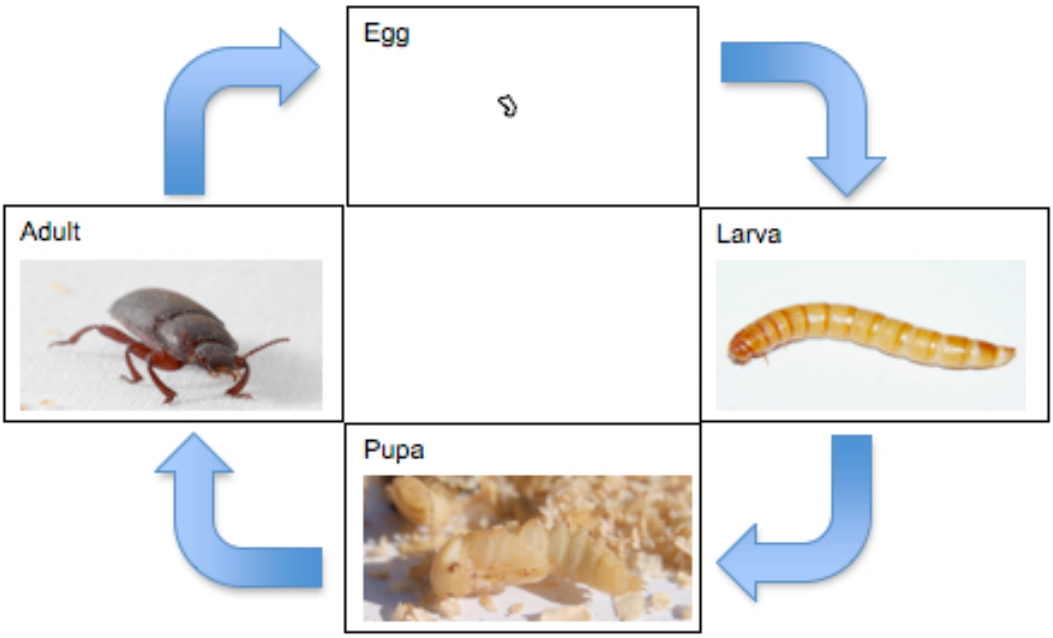
Mealworms for classroom learning

Mealworms are an excellent short-term classroom pet that provides rich hands-on experiences for teaching aspects of the Australian Curriculum: Science. They are inexpensive, resilient, low maintenance, harmless, can be handled safely and go through abrupt or complete metamorphosis.

Background information

Mealworms are the larvae of a beetle known as the Darkling Beetle and are not worms at all. They get their name from their prominence in days gone by when they found their way into the flour and grains that were carried on ships for long journeys. Flour was then often called 'meal' and therefore the Darkling Beetle was known as a 'mealworm'. Today mealworms are bred as a major food source of pet reptiles because they are very high in protein. You can even buy them on the internet, prepared for human consumption.

Life cycle of mealworms.



Where to buy

Many pet stores stock mealworms, as they are a major food source for reptiles. They are also available via the internet.

To raise mealworms, you will need:

- mealworms (Buy large ones if possible as they are closer to pupating; one dish usually contains enough for two classes of students.)
- 1–2 packets of unprocessed or natural bran, depending on how long you have them as pets. (Generic brand is fine. If not available, use oats.)
- container with lid and holes in lid (eg ice cream container or shoebox. The bigger the surface area the better the mealworms grow.)
- non-dyed, recycled kitchen paper towel
- fresh supply of carrots (2 or 3 fresh peelings per day)
- plastic spoons and paper cups/petri dishes for handling.

Before showing mealworms to students remove the packaging on the mealworm container but keep to show to students. Sticky tape a strip of paper around the side of the container to disguise the mealworms.

Introducing mealworms to students

1. Hold up the container of mealworms showing students the holes in the lid. Ask students why the lid might have holes in it (could indicate some living thing because of need for air).
2. Explain that you have animals in the container and the class is going to be able to look after them as class pets. Explain that the animals cannot hurt them and remind them they are living things so must be handled carefully and kindly. (Ensure students do not have sunscreen or insect repellent on their hands.)
3. Show the label of the container telling the students they are called mealworms. Remove the paper strip so students can see the sides of the container.
4. Remove the lid and carefully lift/spoon out a mealworm into a clear cup or petri dish.
5. Allow a little discussion, reminding students that mealworms may look unpleasant but they are harmless and if students are careful you will give them a mealworm each to observe. They can leave it in the cup or hold it in their hand but they must be sitting down and they must not hurt it.
6. Spoon a mealworm and a little bran into small containers (one per student) and ask some students to help distribute them.
7. Allow time for observing, sharing ideas with others, identifying external features and responding to questions.
8. Call for student attention and display the shoebox that will house the mealworms in the classroom.
9. Hold up the small container the mealworms came in and ask students why we might be going to keep the mealworms in the shoebox. Guide students to discuss room to move and point out that mealworms in the wild come out at night so the darkness of the box will make them feel safe.
10. Explain that because the mealworms are living and growing, they have needs. Discuss what these might be, modelling the set up below, showing the bran, carrot/apple, moist paper towel, and holes in the lid to meet these needs (see reasons below).
11. Sticky tape the package label onto the shoebox and write an appropriate label such as ‘please handle gently’.

Modelling the set up

1. Make holes in the shoebox lid. (Mealworms do not escape but they are nocturnal so like it reasonably dark and they need air.)
2. Place bran in shoebox to a depth of about 5 cm. (This is their shelter as well as food).
3. Dampen 2 sheets of kitchen paper and form into loose balls. Place anywhere on top of bran. (This provides water and extra shelter for larva. They make burrows in the paper. Keep slightly moist.)
4. Peel 3 or 4 shavings of carrot or apple and place on top of bran. (These provide more food and water. They need changing every day if possible.)
5. Place mealworms into their new home. They will burrow into the bran.
6. Secure lid and place shoebox in a safe place **indoors** away from predators like ants and lizards. If climate is cool or air conditioning operates placing the box in a warmer place will speed the growth of the mealworms.

Maintenance (involve students)

1. Check mealworms at least once daily to replace carrot/apple and to ensure well being/growth of mealworms.
2. Separate pupa and then beetles into separate containers, as larvae and beetles both reportedly eat the inactive pupa. Beetles will also eat the eggs.
3. Check bran is not going mouldy and replace/top up once a week with fresh bran.
4. Re-dampen paper towel when needed.
5. If you want to sort and observe the eggs you need a fine sieve and a digital microscope or hand lens. They are small white bean shapes and very difficult to see.
6. Some mealworms may die. They go dark brown. Remove from box.

What to do when you have finished

Mealworms can be released into garden beds. They are found in the wild and will probably become a food source for local wildlife.