

O-R-E Observing and Brainstorming

Objective

- To practice observation skills
- To generate a list of questions for use in other activities
- To explore the value of different questions for different applications
- To practice group activities and cooperation
- To have a respectful exploration of living organisms

Materials

- Some animal(s) (or any object) to be the focus of the investigation
Mealworms, crickets, ants, pillbugs, hamsters, for examples
Technically this can be anything, even leaves or rocks or plastic bugs
- A secure place for the activity to take place
This could be indoors or outdoors, but, if you use live, captive animals, outdoors can be very distracting for children
A clean surface and container for the animals – for mealworms a plastic plate or plastic shoebox lid will do the job

Procedure

You can never teach when bugs are out (try it sometime and you'll see!)

This activity is focused on *observation skills* and *respectful interactions*.

After explaining the activity and guidelines for a respectful interaction (we are huge) give students, in groups of three or four, a plate full of mealworms. Have students generate a list of questions they think of while observing the animals. These questions should be anything that comes to mind. It might be worthwhile to briefly introduce the concept of *brainstorming* if you haven't already (before the bugs go out!)

This sort of group observation activity also requires certain skills from the teacher (or in inquiry-based activities, the 'facilitator'). While the students are observing bugs, the teacher's job is to wander around and look in on each team. Do not spend too long at any particular group – it is better to go around more than once if there is time. Things to pay attention to when wandering:

- Are students focused on the activity (this should rarely be an issue with live animals)
- Is any group having difficulty determining whether or not a question is 'good'
 - During a brainstorming session there are really no 'bad' questions, but some may not be appropriate for this activity (like, "what's on TV tonight?")
 - It may be useful to prompt them but try to not give them any questions per se, they should think of them on their own. Occasionally, it is helpful to actually give a seed question to a group, such as; "Where do you think it likes to live?" or "What questions can you think of about where it likes to live?"
- Which group is generating the longest list

- During the wrap up at the end of the observation, start with the group that has the *shortest* list. If you begin with the long lists, the last groups will have nothing new to add.
- Everyone is ‘following the rules’ and ‘playing well with other children’ (no matter their age!)
 - The timing of an activity like this is important. There are no real clear guidelines, but there is a point after which the ‘slowest’ group has gotten on track and before the ‘fastest’ has lost focus – *that* is when to stop!
- Collect the bugs!
 - Give a ten-second warning before you collect them so students know to wrap it up – they may not want to give them up!

Qualifying the Questions

Transfer the lists of questions to the board starting with the group with the shortest list. Have students state their questions loudly; it is best to not repeat, just write on the board as they recite. This allows other voices of ‘expertise’ to exist in the room

The list of questions compiled should be fairly long – perhaps 20 or 30 questions

If your class had difficulty coming up with that many, lead a discussion to round out the list – ‘what other questions can you think of now that we’ve thought about it a while?’

Go back over the list with the class and ‘qualify’ each question. Use the following categories

O – Observation

These are questions that could be answered by simply watching the animal

Does it shed its skin?

When is it most active?

Can it fly?

How long does it live?

R – Research

These are questions that can only be answered by looking it up or asking an expert

Does it have a heart? A brain?

Where does it live in the wild?

E – Experimentation

These questions can be answered (or addressed) with data collected from a good experimental design. These are the most useful questions for science fairs.

What does it eat? (This would become a preference test)

Can it see color?

What is its habitat like? (A series of preference tests, too)

Select one or more of the **E** questions and discuss an experimental design that would help answer them. Consider issues such as how to measure the results, how to control for *confounding variables* (oh my!), and what the biggest problems might be with the design.

If you have time and can work it into your curriculum, you have a perfect motivation to do some experiments! If you are doing averages and graphing in math, here is a good place to get some numbers! For social studies you can investigate how other cultures eat these guys! (and so on....!) These questions can lead to lists of descriptive words or action words for poems or stories. Either way, the follow-up activity will be inherently interesting to the class because it originated with their observations, and this portion of the science process is a valuable lesson on its own.