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The Educational Role of the Live Exhibits in a Zoo Collection

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Introduction

Along with Education staff at most zoos, the Education Staff at Chester Zoo believe that there is a very important role for live exhibits in the education of all of our visitors. However, for reasons of space, this article confines itself to their use by pupils and students within the formal education system - from pre-school to undergraduate level.

Our visitors - Up to 90 000 students/pupils from schools, colleges, and universities visit Chester Zoo each year. This is about 10% of our total number of visitors.

Using what is in the Zoo

The prime aim of a good zoo must be conservation. It therefore follows that the selection and range of animals kept will be determined by conservation needs and breeding programme requirements. Species which may well be extremely useful for education purposes may well not be kept at all, or may well not be replaced if movement to another zoo as part of a breeding programme is necessary. The need to maintain appropriate groups for breeding purposes means that, unless the size and finances of a zoo increase, there will be a trend towards keeping more specimens of the same species and fewer species.

For example, at Chester at present we have no common hippopotamuses and will not be keeping this species for the foreseeable future. We have no gorillas because we sent our two males to other zoos in the hope that they would then contribute to breeding programmes. The number of Primate species has been reduced giving a much better potential for long term breeding programmes with the species retained.

Meeting the animals' needs for privacy and security may well mean it is extremely difficult to see particular animals and certainly impossible to guarantee viewing. Avoiding petting and taming inevitably leads to a no-handling or minimum handling policy.

I most certainly subscribe to conservation being the prime aim of a good zoo, but it is important for the Education Division to use what is in the collection at any given time and to accept that it will have little influence on the collection. Nevertheless, there is still a vast range of animals and,

therefore, of opportunities and, indeed, there is a bonus. Chester Zoo is dependent on income from visitors. The visitors themselves and the ways in which their needs are met become part of the zoo and can be included in appropriate ways in the educational use of the zoo.

Using the Zoo appropriately

The Education Division has a basic philosophy which guides us and serves as a check list against which we decide whether or not to implement any ideas. There are seven major points in this philosophy.

1. **Anything to do with the zoo visit must fit into the curriculum.** The zoo visit may be a start point, an end point or in the middle, but must be part of the school work and enrich it.
2. **The visit must focus on the animals.** There is no point in coming to the zoo unless this is so - it's the sight of the live, the size, the smell, the sounds - no television programme can compare! Yet it can be easy to lose sight of this focus. I have seen children taken into a darkened classroom and shown a slide of a whale (which they would not be going to see) and a slide of a giraffe, when the real giraffe was 50 yards away. I have seen children brought to the zoo and given work which has merely encouraged label reading and 'head down' working.
3. **Work must be appropriate for the age and ability of the pupils/students.** This requires skilled professional judgements about teaching methods, vocabulary, concentration spans, concept levels, etc.
4. **Time in the zoo must NOT include work/activities which would be better done back at school or college.** Here we do use a little discretion to provide a change of activity (such as watching a puppet theatre show or listening to 'Storytime') as long as it is linked to the theme being studied and for very limited periods of time. Why should schools pay to come in and see a slide show - could not the time be better spent studying the real animals and the slides loaned or sold to the schools?
5. **Work must encourage first hand observation of the animals,** and, where recording of data is an integral part of the work, must be practicable in an outdoor situation.
6. **Visits should offer the opportunity to explore many aspects of the curriculum,** and not just be confined to biological areas.
7. **Anything offered must obviously have been thought through and prepared by an expert in that area,** whether in the age range or in the subject specialism.

Some examples

I now propose to look at examples of the ways in which we use the animals in the zoo. I deliberately flit from area to area and age range to age range for I am merely trying to indicate the available scope.

Mathematics - There is a lot of mathematics in the zoo. Work in other subject areas can lead into mathematics work or mathematics work can lead into other areas. Take 'Animals and their food': well designed data collection sheets can develop direct observation, careful recording, collation of results and presentation of data. The results obtained can lead into an understanding of biological aspects of carnivores/herbivores and the theme can be developed into the time spent eating, food values etc. It is vital to have quick recording methods (See figure 1 for part of a suggested data collection sheet for junior pupils - simple counting and mapping).

<u>ANIMALS AND THEIR FOOD</u>		<u>J.M.I.</u>
<p>As you go round to look at the animals in turn, do TWO things.</p> <p>1) Draw a line from the name of the animal to the type of food which it eats. You may have to look carefully to see remains of food about.</p> <p>2) In the column headed "Is it eating or not" put a ✓ if it is and a 'x' if it is not for EVERY SINGLE ANIMAL YOU CAN SEE IN THE ENCLOSURE.</p>		
Is it eating or not? ✓ or 'x'.	<u>Animal</u>	Food
	Giraffes 2	<div style="border: 1px solid black; border-radius: 50%; width: 100px; height: 100px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> Grass or hay </div>
	Zebras 3	
	One lot of monkeys in the Monkey House 4	
	Any cat, including tigers, where you can see food. 5	<div style="border: 1px solid black; border-radius: 50%; width: 100px; height: 100px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> Fruit, vegetables or seeds </div>
	Rhinoceroses 6	
	Elephants 7	
	Lions 8	
	Sea-lions 9	<div style="border: 1px solid black; border-radius: 50%; width: 100px; height: 100px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> Meat or fish </div>
	Penguins 10	
	Any cage of parrots 11	
	Any tortoise 1	
	Any of your choice: Name:	

Fig 1. Example data collection sheet for junior pupils - simple counting and mapping.

Or 'How popular are different animals?': again, appropriate data collection sheets can develop observation, recording and presentation of data.

A suggested data sheet could be as shown in figure 2.

HOW POPULAR ARE DIFFERENT ANIMALS? J.M.2.					
<p>You are going to count the number of people entering various animal houses or looking at particular animals over a set period of time. Go to the place your teacher gives you, look at your watch and then record the number of people entering your house or viewing the particular animals over 5 minutes.</p> <p>One of the group should carefully watch the time, another should put a mark for each person - adult or child - in the correct place on this worksheet, another should quietly tell the recorder 'adult' or 'child' as each person enters or is seen looking at the animals.</p> <p style="text-align: center;">DO NOT BLOCK THE ENTRANCES OR MAKE A NOISE</p>					
House or Enclosure	Tick where you are going	Time of start	Time of finish	Adults	Children
Example:-	✓	2.03	2.08	llll llll Total at end <input type="text" value="9"/>	llll llll <input type="text" value="10"/>
Aquarium				<input type="text"/>	<input type="text"/>
Bird House				<input type="text"/>	<input type="text"/>
Tropical House				<input type="text"/>	<input type="text"/>
Monkey House				<input type="text"/>	<input type="text"/>
Bison				<input type="text"/>	<input type="text"/>
Wallabies				<input type="text"/>	<input type="text"/>
Ostriches				<input type="text"/>	<input type="text"/>
Parrot House				<input type="text"/>	<input type="text"/>

Fig 2 Example data collection sheet - to encourage observation, recording and presentation of data.

Mathematical skills can be developed into exercises such as *devising* ways of testing popularity where there is no straightforward entrance/exit, one place etc., different times, different people - a host of more difficult situations. Overall, mathematical skills can include counting, estimation, numbers, distances, timing, tallying, mapping, recording methods, presentation methods, and the work is easily adapted for lower primary to older secondary.

Conservation - Take a topic such as *conservation* - a popular and often 'half-baked' approach is used. It is a complex topic. Much is better done in the classroom, BUT the sheer *enjoyment* of the animals can foster the wish to preserve them and the *role* of the zoo can be studied in the zoo.

Smaller children, given suitable preparation, can be asked to look out for and record in an easy way which of the animals have babies/young and this can lead to an indication of breeding successes, at an appropriate level of language and understanding, *and* a consequent discussion of how difficult it is to tell some young from adults. Older children can follow the same theme but extend it by looking for breeding awards, looking at numbers of young, linking what they see to rates of development, breeding groups and balance of sexes and even debating the question of surplus males.

This on-the-spot study (obviously associated with other points as well) is vastly superior to book work and even computer simulations! The visit to the zoo is a *real* situation - and easy to fit in to pre- and post-visit work of a wide range cutting across so many subject areas including biology, geography, ethics and morality (PSE, social responsibility or RE - call it what you will.)

Design/Technology/Art - At a Higher Education level we recently put a design project to a group of students for a highly durable, costed, interpretative item which involved the public in some physical activity. Design is central but so is the animal chosen, the particular aspect of interpretation, the execution, the evaluation. Another project we set was a shadow puppet project - this involved close observation of locomotion and then all that goes into the project up to the final stage, i.e. design, choice, costs, manufacturing, evaluation.

Art - We have many visits from art colleges just because the zoo is a unique resource for Higher Education students, but the zoo is an excellent resource at a simpler level: drawing, models, ceramics.

I liked the Infant group brought for drawing and modelling whose teacher said it had been worth the visit for a variety of reasons, but still would have been worthwhile for just one - the eventual dawning that an elephant's legs are 'under' the body or the elephant collapses!

The zoo provides splendid opportunities to stress the need for accurate observation, e.g. do a drawing before you come; take it and look at the real animal; observe; go away and do it again.

Language work/English - An unbelievably rich field:

- the popular Roald Dahl Enormous Crocodile is great - but *see* real crocodile.
- imaginative writing/poetry is greatly stimulated by a zoo visit.
- and what about **Communication?**

I was inspired by the C13 carving of an elephant on one of the choir stalls of Chester Cathedral (obviously done by someone who had probably never seen an elephant for it has horse's legs!). It led me to realise that the zoo is a superb place for observation, description and vocabulary extension. Could you describe an animal to someone? What would their interpretation be?

Obviously, you don't *need* a living animal to do this, *but* include movement, noises, smells and it is much more attractive and more likely to be accurate. Link to symbolism - watch the lions etc. - are they used wisely in heraldry etc?

Information technology - Another area of activity which the zoo Education Division wishes to develop is I.T. At undergraduate level, recently, we had a student measuring breathing rates of mammals with a camcorder - then, back at university, the classic link with body size. The write up of that has now appeared in a scientific periodical (Worthington, *et al*, 1991). Recently we worked with a group of teachers on devising an I.T. project on the same theme but, interestingly, they did not ask the right questions and mixed Mammals and Reptiles etc. - this indicates a need for teamwork between teachers and zoo educators - a point I will return to later.

Undoubtedly observation and data collection in the zoo, together with reference book work outside, can provide fascinating data for use and therefore the development of skills in this area.

Animal movement is not only a useful biological study, but is so easily linked to **Dance, Drama, Music**.

Business Studies - with a rich field for observation - this time of layouts of the zoo, people's behaviour etc.

Architects - and the design of animal houses.

Geography - linked with fauna, which is so important in many parts of the world, is an obvious example, but there are many other aspects.

Psychology - and the devising and carrying out of observational studies - with all the consequent learning curves for the students!

Home Economics - and mass catering when you do not know how many will come!

Modern Languages - a variety of approaches and certainly a vocabulary helper!

I have left till last most areas of **Science** - but not just Biology.

There is a lot of **Physics** in animal studies.

Biology, I believe, needs little explanation:

- A study of *diversity of life*, from infant to secondary level, enjoyable and easy in the zoo.
- Locomotion. What a range - and it *can* be seen actually happening.
- Feeding, food chains, food webs and you can *see* the food and eating methods
- Five senses - and you can see *ears* moving
- Communication - and you can *see* it happening
- Size and shape
- Classification (diversity of life) - at any age level and ability level and, as in other examples, we take the guide lines of:

Observe; Record; Collate; Interpret;

as fundamental steps.

Figures 3a and 3b show a partly completed data collection sheet and a completed collation sheet showing the approach and the way the data can be collated. There are, of course, other approaches, particularly at the 'Designing how to tackle an investigation' level.

HERBIVORES (Plant eaters) Data Collection Sheet A **ANSWERS**

NAME _____






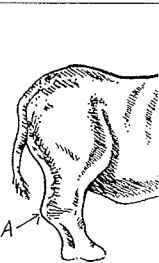
	GIRAFFE	ZEBRA	BLACK RHINOCEROS
Look carefully at the animals. Then draw in the: 1) mouth 2) eyes 3) ears			
Put a tick in the space if you see the ears moving in different directions from one another.	✓	✓	✓
What are they eating or what food can you see?	tree leaves or hay.	grass or hay.	tree leaves or hay.
Count the total number of animals.	_____ total	_____ total	_____ total
How many are feeding?	_____ feeding	_____ feeding	_____ feeding
If the body covering is patterned, draw part of it.	(see below)	(see below)	—
Describe the colour of the animal.	fawn and brownish	black and white (sometimes brownish)	grey.
Look at the back limbs, then on these diagrams, put an 'A' where the ankle is.			
How many toes are there on each foot?	2	1	3
What else can you see at the end of each toe, a claw, a nail or a hoof?	hoof	hoof	nail
What else have you noticed about <u>any</u> of these animals?			

Fig 3a Example data collection sheet - to encourage observation, recording and interpretation of biological information (see text).

	Giraffe	Zebra	Rhino	Cheetah	Lion	Eagle owl	Ostrich	Condor
Ears moved in different directions								
Ears not visible or not moving								
Eyes at side of head								?
Eyes at front of head								?
Ankle positioned about half way up leg						?		?
Ankle positioned much nearer ground				✓	✓	?		?
One, two or three toes								
Four or five toes								
Claws at end of toes								
No claws at end of toes								
Patterned body covering							?	?
No pattern on body covering							?	?
Numbers of animals	2	10	4	3	4	2	2	2
TOTAL of animals bracketed	16			9				
Number feeding	2	8	3	0	0	0	2	0
TOTAL of animals bracketed	13			0				
Half, or more than half, of totals feeding								
Less than half of total feeding								

Fig 3b Example data collation sheet - to encourage observation, recording and interpretation of biological information (see text).

Enough examples - I could go on. I believe that they *together* will develop skills, knowledge and understanding in most areas of the curriculum.

Primary schools tend to cut across 'subject areas' naturally. Secondary schools are more varied, but I was encouraged recently by a visit from twelve teachers from one school who came to discuss work programmes which would interlock - Mathematics, Biology, Art, Technology, Home Economics, Information Technology, Business Studies, Modern Languages. We did it! This has led me neatly into - it is fine to say all this can be done - but HOW?

How can this be achieved?

Best by a partnership

The children's teachers:

know the children

|

know what the children know

|

know how they want the work to progress after the visit

|

have certain facilities in school which the zoo cannot provide

|

BUT

|

do not usually know much about the zoo, its animals, what could/will work and what will not.

The Zoo Education Staff:

know the schools (all have many years of experience in schools)

|

know their own subject areas.

|

know the zoo

|

know what is likely to work and what is not feasible

|

BUT

|

do not know those particular children and their pattern of work.

So add together the expertise within the partnership through:

1. Joint Working Parties and the publishing of the results for others to use.
2. Teacher's Courses on using the zoo - especially on particular themes.
3. Discussions during pre-visits with individual teachers.
4. Provide tested materials in published form - information, ideas, worked out schemes on particular topics for particular age groups. In fact, set up complete 'Do-it-yourself' programmes. We call them 'Teachers Packs'. They include suggested pre- and post-visit work and detailed work for use in the zoo.

These approaches are our main areas of work, but we do do some teaching ourselves and I believe this is vital as it is so easy to 'get out of touch'.

Conclusion

Of course - it sounds easy and it is not.

- We have tried teaching 'locomotion' on a hot day when all the animals are asleep! - and then tried to find ways round the problem so that we can help other teachers.

- We have had to overcome the heart-break of just publishing a full Teachers' Pack on the savannah - and the day it went to print the zoo went out of vultures!
- We try to accept that the zoo is a conservation agent and therefore the welfare of animals and the long term are the main themes, despite the limitations these place on the work we do.
- We try to juggle a small department to cover all the subject and age level expertise that is needed and we are going some way to achieve this by appointing one year staff with expertise in specific areas of the curriculum (for example, this year we have a physicist).
- BUT despite all the problems it is fun trying even if we do not always succeed AND we are not alone. Closer links with other zoos, museums and other out-of-school education centres all help for we are NOT competing. We are complementing each other for, in the end, it is what the children get out of any visit out-of-school which is important.

References

- Anon. (1984). *Mathematics in the Zoo: A Teachers' Pack for Work in Mathematics. Suitable for the Junior Age Range*. A Zoo Education Department Publication, North of England Zoological Society.
- Anon. (1986). *African Savannah. A Teachers' Pack. Recommended for the 9 years to 13 years age group*. A Joint Trafford Junior Teachers'/Zoo Education Department Working Party Publication, North of England Zoological Society.
- Worthington, J., Young, J.S. and Altrincham, J.D. (1991). The scaling of respiration frequency and energy uptake with mass. *J. exper. Biol.* **161** : 533-536