

Chimpanzee Enrichment

By Peter Dickinson, Welsh Mountain Zoo, with very special thanks to Primate/Alligator Keeper, Chantal Adams, who contributed to, criticised and corrected this document.

Dedicated to the memory of two very good friends, Penny and Flika.

Introduction:

This article makes no pretences at being a deep scientific study. It is primarily a compilation of enrichment activities for chimpanzees.

Where two or more chimpanzees are kept together they can, will, and do, invent and implement their own entertainment and games and "enrich" their lives. The more animals there are, the wider the span of ages and sexes the greater the number of scenarios and intrigues. This is natural behavior, 'chimpanzee politics' in the raw. Their daily entertainment can be vastly expanded by what is made available to them in their surroundings. This not only enhances social interaction but provides play opportunities. Cage design and furniture are fundamental to happy well adjusted animals. This should be considered from the outset and improved upon when the opportunity arises. One of the most important animal husbandry duties is for carers to provide "Environmental Enrichment" to their charges. Although a relatively new term, it is something which good animal keepers have been doing, when they had a minute, since the Ark. Be as it may it receives not a single mention in the classic 1973 Calgary Zoo In-Service Training Program or the 1980 National Extension Colleges Zoo Animal Management Course nor for that matter in the excellent 1987 updated version of the Metro Toronto Zoos Manual of Zoo Keeping. Official recognition of the existence and the importance of enrichment has been slow in coming. Some zoos today have staff, or even whole departments dedicated to this intriguing mix of art and science. Others expect their team to find the time within an already overstretched working day, and so paying just a token nod to the discipline. Enrichment needs time for planning, for constructing, for implementing as well as for observing and recording! Enrichment is not an **Extra**, it should be an integral part of daily animal husbandry.

I am aware of some collections which will give no consideration to an enrichment device unless it is 'natural' in appearance. Such noble aspirations are as limiting as they are pointless. It certainly reduces what you are able to offer. If you could be sure that your chimpanzees were ultimately to return to the wild then it would warrant some consideration. Even then I would consider that unfamiliar, unnatural objects could be mind expanding and be advantageous in preparing animals for an all too unfamiliar wild.

Enrichment is for the animals, but visitors enjoy it too. Why not advertise your enriching times. Let the keeper do a talk at the same time. You may get donations or perhaps new ideas. Sponsorship of enrichment projects is a distinct possibility.

One should try to enrich all the senses. Think of the 'tea bell'. You **hear** it and respond and perhaps react too (think of Pavlov's dog). Next you **see** the goodies laid out on the table, you **smell** the freshly baked bread and cakes. As you eat you **taste** the delicious spread and experience the different textures (**touch**) of crunchy biscuits and the soft but wobbly solid of blancmange. It sounds nice, and it probably is, once, twice, maybe three times but then it becomes boring. Something different is needed, give it a break of one or two weeks

and it will become as nice as it was in the first place. Routine enrichment is boring!!

It is not necessary to try and enrich all senses at all times. Concentrate on one or two and you will find that the others may follow on their own. Remember that an enrichment need not necessarily be seen to work to actually do so. The "cinema of the mind" can replay a blockbuster at the stimulation of a sense. My first real but fleeting love, some 38 years ago, wore a perfume which is barcoded in my brain. If I smell that scent today I relive the most wonderful experiences. Smell is one of the most important senses. Supermarkets are only too aware of this and use it to persuade you to purchase bread and other products.

There are a multitude of possible schemes that one could come up with. One of the simplest is outlined below:

	hear	see	smell	taste	touch
Monday	enrich				enrich
Tuesday		enrich		enrich	
Wednesday	enrich		enrich		
Thursday				enrich	enrich
Friday	enrich	enrich			
Saturday		enrich		enrich	
Sunday			enrich		enrich

Quite simply, other than by routine enrichment*, plus feeding and cleaning, try and concentrate on stimulating two or more of the five senses each day, at different times of the day (ideally am & pm). Remove any objects you have presented the following day and do not repeat for at least six days.

Remember that more than one sense may be activated by each enrichment presentation. TV/Video will quite obviously be both a **hear** and a **see** situation. However this could trigger a **touch** (it does in humans) which may in turn lead to **taste** or even **smell** .

When planning any enrichment activity always give consideration to Health & Safety. That is for the animals, yourself, the public and the exhibit. Use common sense coupled with experience. Avoid introducing anything into the exhibit which may cause injury to anyone or anything.

Checklist on the Enrichment item:

- Is it toxic?
- Can the animal injure itself with it?
- Can the animal injure another animal with it?
- Can the animal damage the exhibit with it?
- Can the enrichment cause aggressive behavior?
- Can the enrichment cause allergic reaction?
- Can the enrichment give opportunity to escape the exhibit?
- Can the enrichment be thrown from the exhibit?

Do a risk assessment with every planned enrichment. Where an enrichment is required to be securely fixed, it must be SECURELY fixed. Above all use common sense.

*Routine Enrichment is some thing which is done as part of the every day routine i.e. Termite mound fishing. All zoos will have at least a couple of these.

There follows a list of enrichments primarily with Chimpanzees in mind. It should be appreciated that some of these are going to be controlled by enclosure design :

Cloth. A simple cloth can provide hours of amusement. You can vary the length given and the texture of the cloth presented. Although primarily to stimulate touch, cloths can be scented, a different scent each time it is offered. (think orange or strawberry or Channel No. 5) Every now and then soak the cloth in baby oil before you present it (perhaps even scented baby oil). The oil will transfer during play to hands, feet and coat. It does the animals good. **touch, smell**

Paintings/Posters. Why not have a painting or poster of the week/day hanging in the chimpanzee house where all animals can see it. They are highly observant and intelligent, who knows what they get out of it. Try Chimp posters, other animals, abstracts, bold colours. I have no doubt whatsoever that chimpanzees can recognise other chimpanzees in large colour photographs. **see**

Pets. A tank of mice, a fish tank, hermit crabs, stick insects or locusts set up, well out of reach will provide the opportunity to observe something which is constantly changing and out of the ordinary. This will also provide both smell and auditory stimulation. **smell, see, hear**

Mirror. Infrequent provision of a large mirror is a favoured amusement. Moreso for some animals than others. If a source of indestructible hand mirrors can be found, several can be introduced to the enclosure (a camping shop is a good source of supply). A mirror mobile placed in a draught with an appropriately angled light can produce a constantly changing myriad of light. Why not a mirror ball? A fairground mirror? **see**

Magic Carpet.

A big piece of carpet can become a tent, a huge cloak, something to hide under, something to lounge on, something to drag, to play tug of war with your cage mates. Carpets provide colour, differing textures. **touch**

Wind Chimes. Why not have several different chimes, bamboo, glass, metal, wood etc. Hang up a different one each day. Why not mix and match? **hear, see**

Radio. A radio can provide interest if set to a popular channel with a range of musical types. If you have a tame genius on staff why not work on the opportunity to allow animals to change radio stations themselves. **hear**

Television. The benefits of television are listed above. Video offers the opportunity to present the animals with something they like. Film of other chimp groups in the wild and captivity, wildlife films, video of themselves, dancing, music, "Planet of the Apes", the list is endless. Expect them to like the unexpected. Expect each chimp to have its own tastes. Ask anyone who has hand reared chimpanzees in the home what they liked to watch on TV. You may be surprised. **hear, see**

Music. Have you ever heard of the "Mozart Effect"? I have not found any references of its affect on chimpanzees. Definitely an area that is worth looking at. Explore the following links:

The Mozart Effect Online Resources on Music/Brain Research

<http://parenting-baby.com/Parenting-Baby-Music-Research/Music-Research.html>

or perhaps it is all a con

the Mozart Effect

<http://skepdic.com/mozart.html>

Possibly enriching.

Aromatherapy. A range of natural aromatherapy oils should be available in the chimp house. Use a different one each night. Note the animals reactions. Will a calming/relaxing oil work when there is irritability within the group? **smell**

Bedding. Bedding is one of the most important of enrichments. Animals will spend well over an hour collecting bedding, making and remaking their beds. The best overall bedding is "woodwool" (Exelsior in the US). Although it is more expensive than alternatives, the observed benefits to the animals is immense. Woodwool should be presented in an unfluffed block. The animals should be allowed to break up and collect what they need themselves. Doing this for them deprives them of important activity. Bedding can be made more interesting by adding different scents to it each day. Alternative beddings can be given at random. Sacking, Shredded paper, Branches, Paper Sacks, Leaves. Feeds, treats or other enrichments can be hidden in bedding. **touch, smell**

Fruit and Nut Boards. Boards of non-toxic timber, or freshly cut logs are drilled with masses of small holes of varying depths of 2 - 5 centimetres. The holes are tightly packed with small food items i.e peanuts, raisins, dried fruit and treats. Several boards are prepared and presented to the group. **touch, smell, see, taste**

Sound. I read somewhere of taped display or alarm calls being played to chimps. Not sure about that one, though these are sounds they would hear in the wild. It may stimulate alertness. Avoid anything which causes distress. How about greeting calls or happy grunts? **hear**

Shakers. You are going to need your maintenance department for this one. Get them to construct a small, but very strong container that can only be opened by you. The container should have several small holes in it (think of a large pepper pot). The container is filled with small treats by you. The only way the chimp can get these out is by shaking the pot. Once they have figured it out it will keep them busy for hours. There are products on the market (made for pigs, dogs and horses) that will do the job. If you choose one of these make sure it is strong enough.....and safe enough. **touch, smell, see, taste, hear**

Coloured Lights. Coloured lights have been shown to affect the behavior of chimps. Green coloured fluorescent light covers have been shown to decrease anxiety, pacing and rocking. (see "Colored Light as Environmental Enrichment for Captive Chimpanzees *Pan Troglodytes* " by J. Fritz, S.M. Howell and M.L. Schwandt). Definitely worth experimenting with. **see**

Back Brushes. Chimps love to have their backs scratched. Watch how often they rub their backs up and down wire or on logs to ease an itch. Fix a robust industrial nylon brush to wall or wire at back height. Although enriching such a fixture should be a permanent part of cage furniture. **touch**

Buckets. Robust 5 gallon plastic buckets are a fun toy. They can collect water or grass in them, use them as drums, to throw, sit in/on, or walk round with them on their heads. A fun toy. touch, smell, see, hear

Hanging Lolly. Using a 5 gallon bucket make up a fruit juice solution. Pour 4" into bucket and freeze. Take a knotted rope about 6' in length. Place one knotted end in the bucket centering it on top of the ice. Fill the bucket to 1" below the rim with remaining juice and freeze again. The Hanging lolly should be suspended above the ground. Experiment with height. As an extra dimension small pieces of fruit can be frozen into the juice mix. touch, smell, see, taste

Mixed Species. For many species a mixed enclosure can be advantageous. One major plus is that it can be enriching. I am unaware of any collection which has had success in mixing anything else in with chimpanzees. The underlying message would seem to be that any enriching of this nature would be one sided and very short lived. Don't.

Sand Pit. All children enjoy sand pits. Chimpanzees are no exception. Use a corner of the enclosure and four 6-8 buckets of sand in a heap. As an extra interest you can bury peanuts in the sand or whole fruits. touch, smell, see

Herb Garden. Select a lesser used portion of the outside enclosure and firmly fix a frame (roughly 6' x 6') into the ground. Fit the frame with a strong, hinged, lockable lid. The lid should have quarter to half inch mesh covering it. The meshed frame should be 6" from the ground. In the ground below plant various herbs and spices. As these grow and the growing tips poke through the mesh they can be harvested by the chimps. touch, smell, see, taste

PVC Pipes. Several robust 30cm long, 6cm diameter pipes have honey or jam smeared on the inside. These are thrown into the enclosure. Animals will compete for different flavour tubes and have to figure out how to get to goodies within. They will usually use small sticks or blades of grass. An extra dimension can be added to this activity by adding scatter. Once you have thoroughly smeared the inside of the tubes add a handful of scatter feed. Place your hands on either end of the tube and shake thoroughly. The scatter will stick to the jam or honey through the full length of the tube. Why not do something different next time. Bung one end of the tube shut and set flavoured jelly inside. Remove the bung and present. touch, smell, see, taste

Party Poppers. Lengths of robust 'carpet tube' is cut into 4' lengths. A loaf of bread, woodwool or paper sacking is placed into the tube and packed down hard using a broom shaft. Treats are added, more wadding, more treats, more wadding until the tube is full. Party poppers can provide hours of play. touch, smell, see, taste

Bubbles. If you have a volunteer with time to spare encourage them to spend time blowing bubbles over the outside enclosure. There are relatively inexpensive machines which can do the job also. Properly situated they can provide diversion and pleasure to visiting children and chimpanzees at the same time. Possibly add scent to the bubble mix. touch, smell, see, taste

Glove puppets. The education centre could encourage kids to make puppets and put on a puppet show for the chimps. smell, see

Tug of war. Take a length of rope and thread it through the enclosure wire. Knot it in two places, eighteen inches apart. One knot on the

inside of the cage and one knot outside. Neither knot should be able to fit through the wire. A safe game of tug of war can be carried out without the risk of fingers being jammed. This is an off limits game involving keeping staff and chimpanzees. Not members of the public.

touch, smell, see

Kong Toys. These can be placed in the enclosure for 24 hours and then removed for a week. Next time they are put in why not have them full of set jelly or a fruit ice lolly or honey or other treats.

touch, smell, see, taste

Imitation.

Edinburgh Zoo came up with the innovative idea (or perhaps someone else had it first) of building an adventure playground for their chimpanzees AND building an identical one (outside of but clearly in sight of the enclosure) for humans. I have not read anything of how this has worked...but anything which improves on the suspended tyre can only be good. I feel fairly confident that the animals liked what they were given.

touch, smell, see, hear

Boomer Balls. If presented infrequently will provide hours of fun on their own. The larger balls have a removable plug and so can be filled with treats which will fall out as they are carried or rolled. Why not spray the balls with scent or flavourings or smear with jam?

touch, smell, see, taste

Termite Mound. A prime enrichment. A varying and imaginative array of different treats are placed in the tubes. Honey, various jams, treacle, maple syrup, ketchup, mustard, chutneys, mayo and more.

Try and add something different every day, no day being the same two days in a row. Place in different parts of the mound so they have to hunt to find their favourite. touch, smell, see, taste

Dippers. These are a sort of naked termite mound. Take three or four clear plastic open top containers and securely fix to the ground about a foot or so (out of finger/hand reach) of any meshed part of your enclosure. Fill the containers with liquid goodies. The only way these can be reached is with browse. Let the chimps figure it out for themselves. They can dip into the containers.

You can add extra dimensions to this enrichment by giving three identical liquids but tinting them different colours using food dyes. Do chimps show colour preference? Have fun. touch, smell, see, taste

Browse. Browse is offered either on its own or as part of other enrichments. (See Termite Mound, Dippers above and Stretch below). Browse MUST be safe. Do not present anything unless you are positive it is harmless. As a general rule steer clear of evergreens (though Holme Oak is safe and all animals like it). Oak, Sycamore, Beech, Ash, Willow are all good but avoid acorns and beech mast. Size, length, number of leaves etc all need a little thought. Browse can be offered in pre cut lengths but is far better offered in whole branches. These can be securely fixed to other cage furniture within the enclosure. Ideally this will be as far as possible from the termite mound or whatever it is going to be used with. This way the chimps will have to make a special journey to utilise browse as a tool. touch, smell, see, taste

Fish. A novel but harmless object i.e. food, cloth, book, keys etc is placed a distance from enclosure bars. The chimps are given browse and the opportunity to stretch and fish for the novel object and drag it within reach. The animals will get much more pleasure from this undertaking if they believe they are doing it themselves without your

knowledge. It appeals to the mischievousness and get a greater sense of accomplishment and pleasure. **touch, smell, see, taste**

Clothes. Clothes are always appreciated. Avoid knitted garments or anything which may 'run'. Remove buttons or zips. Most chimps are bright enough to know what they have been given and will sometimes get dressed up. **touch, smell, see, hear**

Finger Painting. This won't work with all animals, just those with more patience. Offer a choice of non-toxic finger paints and allow the animals to apply the paint to paper. Some chimps can be allowed the paper and will hand it back afterwards. Others should 'paint' through the wire. Use fingers or brushes. Some will use twigs left over from browse. **touch, smell, see**

Peanut Wrap. Differing numbers of peanuts or other treats are wrapped in coloured papers. Chimps are given a choice of which colour they want. Over a period of weeks let them figure out which colour is the most rewarding. You need to be consistent for this to work.. **touch, smell, see, taste, hear**

Scrubbing Brushes. Chimps, when offered the tools, will often spend time cleaning their quarters. They don't make a very good job, but they do enjoy doing it. Robust scrubbing brushes are always good. We have, in the past, had animals wash down the walls of their quarters using a bucket and cloth. They stop occasionally to ring out cloth or shake any bedding off the cloth and then go on to sweep and bag up rubbish. **touch, smell, see, hear**

Training. Training is perhaps the most enriching activity of all. It can draw in all the senses. It allows both keeper and animal to have benefits and ultimately improves all round husbandry and well being an invaluable management tool . All enrichment staff should read **Kayce Cover**, Volume 1: *An Introduction To Bridge And Target Technique*. email: k_cover@hotmail.com for further info. **touch, smell, see, taste, hear**

Sign Language. Why not teach your chimps sign language? You don't have to go with any internationally recognised language, invent your own in house language, providing all carers with the key. Perhaps a chart in the chimp house. Start simply. Three signs and build up from there. Remember some animals, like people, are so much brighter than others. I have watched our animals sign to visitors, asking them to carry out certain behaviours. Whats more, the visitors react and do exactly what they are told. If the visitor is reproached by a member of staff the excuse is always "But the chimp asked me to do it". Signing can help with better animal management. **see, hear**

Speak to Your Animals. I always do. I speak to them exactly as I would speak to any human being. I don't believe in this anti-anthropomorphic rubbish. Spoken to daily it is surprising how much English Language (or whatever) they pick up and clearly understand. Even if your 'conversation' is one sided and addressed to a particular animal, the others are watching, listening and learning. "Joey' come here please. Show me your foot will you. No, not that one, the other one. Good man." It makes management so much easier. If you prefer to move along the pant/hoot chimp language road then why not? Different strokes for different folks. **see, hear**

Magazines. Magazines and colourful catalogues are enjoyed by some. They will spend time looking at pretty pictures. On some occasions it is worth placing a peanut or a smartie every hundred pages or so. Inevitably magazines will be ripped up. Save this enrichment for evening or wet days when the animals are locked in. Try and avoid them spreading torn up paper all over their enclosure. **touch, smell, see, taste, hear**

Combs. Comb your own hair. The animals watch. Present several identical combs to the animals. Let them imitate. **touch, smell, see**

Pinatas. Pinatas are fun, but take some time to construct. Liaise with your education department. Perhaps a local school or class will do the construction themselves. The pinata could be a model of a chimp, a leopard, an elephant. Why not a cartoon character or similar? The completed pinata can be stuffed with goodies and left in the enclosure. There is the opportunity to do Birthday pinatas for chimps or zoo visitors. The visitors could pay to treat the chimps. The pinata could be packed full of wrapped fruit and safe toys. Lots of fun. **touch, smell, see, taste, hear**

Hide & Seek. Small Food items/toys are hidden around the enclosure before the animals are given access. This can be done several days in a row and then stopped to be effective. **touch, smell, see, taste, hear**

Peek a Boo. In exactly the same way you would play with a young human infant. You hide behind a solid object appearing at irregular intervals to surprise. This is best done in conjunction with a mask or series of masks. **see, hear**

Chase. Only possible where you can run around a length of the enclosure on the outside and the chimp can do the same on the inside. First you chase the chimp, then they chase you. They won't always play this game. Some will more than others. We all have our 'off' days. Chimps do too. **see, hear**

Tickle. (Only experienced keepers with trusted animals) All chimps like being tickled. They will present their back to enclosure wire so that you can do this. They smile, laugh and enjoy. Highly appreciated. Can be used in conjunction with training. **touch, hear**

Groom. (Only experienced keepers with trusted animals) All chimps like being groomed and sometimes to groom. They not only enjoy the activity but seem to enjoy watching it being carried out on others. Again this can be used in conjunction with training. It is important as a means of examining parts of the body in event of injury. **touch, hear**

Scratch and Sniff. Magazines often contain scratch and sniff cards advertising a variety of products. Collect these together. Show the chimps what to do. Give them a card each. **touch, smell, see**

Lava lamp. Most chimp houses will, or should, have a night light. Why not use a lava lamp. It will do the same job as well as providing an endlessly changing interest. **see**

Enclosures. Should where possible contain poles, branches, nets, ropes, fire hose, bungee cord, tyres, hammocks, platforms and visual barriers in the form of landscaping, boulders, large tree trunks etc. Visual barriers and escape routes are very important for group harmony. There should be a facility whereby the position of logs, ropes and hoses can have their positions changed on a regular basis,

ideally monthly. Simple changes of this nature are perhaps the simplest most effective enrichment. **touch, smell, see, taste, hear**

Panto. A seasonal idea. Why not have your local school come and perform their Christmas/Eid/Diwali/etc play for the chimps. Take it from me the animals will like it. The kids will like it. The local press will like it and the zoo will benefit. Ideal time to draw peoples attention to enrichment. **see, hear**

Platforms. Will allow the opportunity for 'drumming' as well as a place to rest when warm, congregate upon away from damp ground and shelter under when raining. They are also one of the most effective visual barriers allowing opportunity for 'peek-a-boo' play. As a rigid structure they may allow the opportunity to fix other enrichment devices upon it i.e. metal drums of different tones. Positioning of the platforms may allow access to views/vistas not available elsewhere. Fixed floor platforms on raised springs add an extra dimension to an already important fixture (I saw one of these being used by Celebes Macaques in Newquay Zoo). **touch, smell, see, hear**

Extended Access. Why not let your animals have 24 hour access to their enclosure/hall every now and again? Or extend access till after dark? That is do something different to the norm. A change is as good as a rest. Providing the weather is clement a night outside could be quite enriching. **touch, smell, see, hear**

Substrates. Few collections are lucky enough to be able to change their enclosure substrate. Straw, Shavings, Wood wool, Aubiose, Bark Chippings are all enjoyed. Vary the thickness, each can provide its own interests and activity. Even a bare concrete or tiled floor is appreciated for sliding around on. The biggest advantage to a thick substrate is being able to really hide a scatter feed within it. This provides hours of activity. Try not to stick with the same boring old substrate because it looks good, is less messy, makes less work. Change is good. **touch, smell, see, taste, hear**

Pine Cones. Pine cones can have small food treats jammed down into the bristles before being scattered around the enclosure. Education centre involvement could be a help. Kids clubs? Competition for the most attractive pine cone? **touch, smell, see, taste**

Pillows. If you are lucky enough to get hold of some strong burlap or canvas bags, pack these tightly with woodwool or straw and secure tightly. Throw two or three into the chimps. Let them compete, chase, pillow fight. As an alternative on other days suspend one or all with short ropes. **touch, smell, see**

Pass the Parcel. A food item (say a bunch of bananas) is securely wrapped in a bag within a bag within a bag within a bag within a box within a box within a box and so on. This is thrown into the enclosure. The chimps will compete for it or for bits of it until the winner gets the prize. Extra dimensions can be added by adding small food treats within layers or even oiled or scented cloths. Great fun to watch. **touch, smell, see, taste, hear**

Hats. Hats, like clothes can provide hours or minutes of fun. Show them how to put them on. Let them imitate. **touch, smell, see**

Toothpaste. Not for all chimps. Brush your teeth using a childrens flavoured toothpaste. Let them imitate you. Give them their own

toothpaste. A fun and beneficial training exercise. **touch, smell, see, taste**

Puzzle Feeders. There are any number of puzzle feeders you can make for the chimps. The important thing is that they should be indestructible and rewarding. One of the simplest is a length of capped plastic pipe. This is cable tied to the outside of the cage. There are holes drilled in the top and one hole at one end on the bottom. Treats are placed in the pipe. The only way to remove these is to insert sticks in the top holes and slide the treats along till they fall out of the single bottom hole and so be eaten. Can provide hours of extra activity on rainy days, in the evening. Some animals will quickly become accomplished at this. **touch, smell, see, taste**

Make-up. A safe non-toxic childrens nail varnish is easy to apply. Non toxic face paints can be applied to hands and feet. This enrichment could be used in conjunction with a mirror. Okay, okay its not for you...but some chimps actually like it! **touch, smell, see**

Ice Cubes. On hot days the chimps enjoy ice. This could be plain water or frozen juice or even food items frozen in layers through the cube. We usually give the frozen juice in the containers in which it has been frozen. The containers themselves then become an enrichment. **touch, smell, see, taste**

Water Play. Fix a hose securely to the cage side. Turn the hose on and allow the chimps a half hour or so play. They will splash, they will spit water at you but most of all they will have fun. You can add extra dimensions by also giving them several water containers to fill up and carry about or set the hose on mist or jet. This is summer play. They should be allowed to go out into the sun to dry out afterwards.....avoid cool windy weather. **touch, smell, see, taste, hear**

Drinks. In our zoo we have two main drinking sessions. The drink allows us the opportunity to get a close look at all animals. They are all very individual in their habits, some drinking several pints at each session whereas some don't drink for days in a row. Changes in drinking habits are an extra opportunity for us to spot something amiss. We make drinking times more interesting by offering a daily changing variety. Morning is a cool drink of juice, either orange, lemon, blackcurrant, lime, apple, raspberry etc. In the evening we give a warm drink of Horlicks, Drinking chocolate, Ovaltine or similar. This is made up with a few pints of milk and hot water. All animals are allowed to drink as much as they like at each session. They all have their favourite flavours. **touch, smell, see, taste**

Squirt Bottle. Fill a clean empty squeeze bottle with juice. Squirt this directly into the chimps mouth. You increase the distance you squirt from, they will too. Fun for keeper as well as chimp. **touch, smell, see, taste**

Frozen Fruit. Much appreciated on a hot day. Freeze surplus oranges, apples, bananas. Place in outside enclosure when it is hot. Frozen fruit juice/milk cartons work just as well. **touch, smell, see, taste**

Hanging Sheets. Put an ad in the paper or ask zoological society members for old clean sheets. Everyone has some knocking about somewhere. Use these along with cable ties to change the outlook of their sleeping quarters/ day dens/ enclosures. Securely fix the sheets to all wire surfaces obstructing normal view. If you are lucky enough to have a wire roof on your quarters hang several sheets from these too. Hours of fun. **touch, smell, see**

Fan. A fan on its own, placed a sensible distance from the cage can provide fun. The chimpanzees will often stand in the draught catching the wind in their mouths. Further dimensions can be added by using this in conjunction with mobiles or wind chimes. touch, smell, see, taste, hear

Mobile. Purchase several mobiles (or get your education department to make them). Bright gaudy colours, animals, holograms. Mobile of the day. Suspend just out of reach of the chimps. Perhaps allow them several twigs of a length where with a little bit of patience they can just touch and move the mobile. Why not use the mobile in conjunction with the fan? touch, see

Juice Holes.

Most people are familiar with wild chimps scrunching up wads of leaves to act as a sponge and extract water from holes in branches. You can present a similar scenario. Use a robust plastic container with a narrow access hole and strap this securely to another item of cage furniture. Put in your juice (orange, apple, grape, tomato, grapefruit, cranberry, mango etc) and let the animals figure out for themselves the best way to access this. N.B. young animals may be get their hands in and help themselves to something the adults will need a tool to do. Make leaves or woodwool bedding available.

touch, smell, see, taste

Boxes. Zoos inevitably collect cardboard boxes. Why not collect together 50 or 70 or so? Pack a den solid with them. Let the chimps burrow, bash, squash, thump and generally have a good time. Good evening entertainment. Squashed and flattened boxes will inevitably be used as bedding. touch, smell, see, taste, hear

Peanut Butter/Honey Bombs. Used empty plastic drink containers have peanut butter or honey smeared on the inside. A small amount of food scatter is added and the container is given a shake. The food will adhere to the walls of the container. Once you have several prepared, bomb the enclosure when the chimps are least likely to expect it.

touch, smell, see, taste, hear

Food Presentation.

Food is of course the one thing that all chimps get excited about. That is, providing that it not the same repetitive fare each day. You cannot argue that a balanced diet is good for the body but then a varied diet is good for the mind. I would argue too that a varied diet over a week or two more than balances itself out. What did your chimpanzees get today? Two typical examples for ours are as follows:

Day 1: Apples (4 varieties), Oranges, Kiwi Fruit, Pears (3 varieties), Chestnuts, Mangoes (2 varieties), Cranberries, Carrots, Boiled Potatoes, Red Currants, Hard Boiled Eggs, Red Cabbage, Leeks, Onions, Fruit Loaf, Mazuri trio munch, Fresh Mint, Aubergine, Broccoli, Squash, Garlic, Mixed Chillies, Asparagus, Sweet Potatoes, Cress, Okra, Tomatoes, Red & Green Peppers, Strawberries, Celery, Bananas

Day 2: apples 7,700 gm, bananas 12,166 gm, sweet corn 4,928 gm, tomatoes 1,589 gms, mixed salad 550 gms, carrots 1,342 gms, lettuce 3,360 gms, melon 1776 gms, pears 672 gms, grapes 3,941 gms, celery 1,800 gms, shallots 250 gms, pineapple 3,200 gms, guava 580 gms, artichokes 800 gms, spring onions 240 gms, dates 681 gms, dried prunes 1,750 gms, satsumas 1,394 gms, pomegranate 990 gms, alfalfa sprouts 125 gms, mixed herbs 300 gms, wholemeal bread 2,800 gms. (Day 2 was taken from an accurately measured diet several years ago)

The next day it was different as was the day before. The only consistent figure was the average amount each chimp received which was approximately 4.8 kg per day.

We do purchase fruit and veg. This is supplemented daily by donated fruit and vegetables from supermarkets. We never know what or how much of any item we are going to get on any day. The food quality is high. We never present anything to our animals which we would not eat ourselves. The excitement that feeding time creates is a pleasure to observe. You can see their faces literally light up as they spot favourite items. Vocalisations at this time are high. There is no aggression. We normally feed in piles in set locations. On occasion we will spread the feed or hide under bedding. Sometimes we will divide the feed up and seal it up in cardboard boxes.

touch, smell, see, taste, hear

Computer. Technology has come along a long way in recent years. Most music shops have a stand where prospective customers can press a choice of buttons to hear music samples. Why not offer the chimps the opportunity to do the same. The buttons for choice could be made just that bit more robust and positioned just so the chimps can reach them. Could be interesting. The same technology could be used for a slide show. Perhaps configured to project on to a whole wall of the chimp enclosure. touch, see, hear

Slide Shows. See above. touch, see, hear

Music Board. We have a plastic music board designed for young children. Children can walk on it and each time they touch a certain bit it plays a musical note and a little light comes on. We can change it so that the note becomes a dog bark, a duck quack, a bell or a cats miaow. We rig this up outside of the chimp cage so that it is just reachable by finger. Needs supervision. Some animals are better at it than others. All are interested. touch, see, hear

Forage/Scatter Feed.

Scatter feed is an ongoing enrichment, used alone or as a part of something else. Scatter mix should be constantly changing, an ever expanding range of goodies and ideally time consuming to collect. We only rarely use Fruit/Veg as scatter. Our staple mix consists of parrot mix (sunflower seed, dried banana, dried fruit, peanuts in shell, shelled peanuts, biscuit, corn), Chinchilla mix (alfalfa pellets, alfalfa stalk, wheat extrusions, flaked peas, hipro soya, dried carrots), poultry corn, mixed bird seed, mixed dried cat and dog food, Mazuri old world monkey (banana flavour), Mazuri trio munch, mixed nuts in shell. As other items become available they are added to the mix. One week it may be chestnuts and the next it could be pecans, popcorn or dried coconut. The whole mix is made just that bit more interesting by adding a few handfuls of sweets. We normally use Smarties and five different flavours of Millions, but even these change and we will include jelly babies or mini mints. Scatter feed is strictly limited. It is not looked on as a food and quantities used kept to a minimum. touch, smell, see, taste

Birthday Party.

Every few years we have a chimp 'Birthday Party'. Using plastic crates as a table we cover this with a disposable table cloth. We then lay out the table with paper plates and cups. We give cakes, buns and soft drinks. The whole set up looks a feast for the eyes. Once we let the chimps out it is obvious that they think so too. Over the years we have had a variety of reactions. It is enriching, it is fun. From a publicity point of view it is nice to celebrate momentous

events, 21st, 30th etc. The debris afterwards can keep the animals occupied for hours. **touch, smell, see, taste, hear**

Modeling Clay.

Everyone like modeling clay. It is a very tactile medium. Chimps like it too. They can squash it, knead it, roll it. Make it more interesting by folding small food items like nuts and raisins into the clay. It can take hours for them to find them all. Use natural clay, not manufactured.

touch, smell, see, taste

Visitors.

Never thought of visitors being enriching? They are one of the prime enrichers. Those of us who work in 'seasonal' zoos are only too aware of this. During the "off" season the animals positively relish the attentions of the few visitors they see. During the peak visiting times of year the chimps can decide for themselves if they want to relate to people at all. They have 'choice' which is an important part of life. Having 'choice' is enrichment in itself. It is interesting to note the empathy between some visitors and chimps albeit through glass. The use of visitors as enrichment can be utilised better by educational displays, particularly those which name and identify the animals, family trees, describe behaviors and facial gestures. **see, hear**

Keepers. Keepers are enriching too. Some aren't of course. All zoo staff should be periodically fired with enthusiasm. Perhaps this document will give them some ideas.

I have read, searched and consulted a huge number of articles to come up with the list of enrichments above, though some are original. Some of these articles and further reading in no particular order are listed below:

Field, D.A. (Ed) (1998). "Guidelines for Environmental Enrichment" Association of British Wild Animal Keepers

Shepherdson, D.J., Mellen, J.D., Hutchins, M. (Eds) 1998 "Second Nature - Environmental Enrichment for Captive Animals" Smithsonian Institution Press

Johnson, S. (Coordinator) (2000). "Enrichment Workbook For Sacramento Zoo Volunteers" Sacramento Zoological Society

The Newsletter

Published by The Primate Foundation of Arizona, P.O.Box 20027, Mesa, Arizona 85277-0027

Folsom City Zoo Behavioural Enrichment Guidebook

Poole, T., Law, G. "Inexpensive ways of improving zoo enclosures for mammals" International Academy of Animal Welfare Science, UFAW, Potters Bar, UK

Brent, L., (Ed) (2001) "The Care and Management of Captive Chimpanzees" A Publication of the American Society of Primatologists

The Shape of Enrichment

<http://www.enrichment.org/>

The Care and Management of Chimpanzees in Captive Environments

<http://www.nagonline.net/Diets%20pdf/Chimpanzee%20Nutrition.pdf>

ANIMAL ENRICHMENT PROGRAM

<http://www.csew.com/enrich/>

The Honolulu Zoo's

Animal Environmental Enrichment Program

http://www.honolulu zoo.org/enrichment_activities.htm

Enrichment Online

<http://www.enrichmentonline.org/help/index.asp>

Environmental Enrichment Scrapbook

<http://www.well.com/user/abs/dbs/eesb/>

Primate Enrichment Network

<http://primate-enrichment.net/>

Enrichment and Occupational Devices

for Orang utans and Chimpanzees

http://www.awionline.org/Lab_animals/biblio/izn-mur.htm

**REASONS AND RISKS ASSOCIATED WITH MANIPULATING CAPTIVE PRIMATES'
SOCIAL ENVIRONMENTS**

<http://www.ufaw.org.uk/journal/Volume.2%20abstracts.htm>

Evaluation of a chimpanzee enrichment enclosure

http://www.awionline.org/Lab_animals/biblio/jmp20-2.htm

CAPTIVE CHIMPANZEES - Enrichment programs

<http://www.faunafoundation.org/sanct/chimps/captive.html>

The Foraging Behavior Enrichment of Primates in Taipei Zoo

http://www.seaza.org/Conference/7th_conference/scientific_papers/foraging_behavior_enrichment_of.htm

CARING FOR CHIMPANZEES

http://www.lausd.k12.ca.us/NH_Zoo_Magnet/earthwatch/caring_chimp_ellman.html

Environmental Enrichment - Primate Enrichment

http://www.zooregon.org/Cards/Enrichment/exhibit_enrich.htm#Primate

Environmental Enrichment (EE) for Captive Animals

<http://www.iwec.org/enrichment.htm>

Care and Enrichment

<http://www.srprc.org/srprc/enrichment.html>

Working for Chimp Change

http://www.savethechimps.org/news_stpete.asp

LUCY'S CHOICE PRIMATE LINKS

<http://veederandld.20m.com/primates.html>

Ropes as Environmental Enrichment for Captive Chimpanzees (Pan troglodytes): Sex Similarities in Use

<http://lsv1.la.asu.edu/ubep99/abstracts/abst58/>

Environmental Enrichment Information Resources for Nonhuman Primates

<http://netvet.wustl.edu/species/primates/primenv.htm>

Primate Enrichment Network

<http://primate-enrichment.net/>

Using Inexpensive Feeding Equipment and Techniques for Primate Enrichment

<http://www.psyeta.org/hia/vol8/rice.html>

Articles on Environmental Enrichment and Psychological Well-Being

<http://www.brown.edu/Research/Primate/enrich.html>

Environmental Enrichment for Primates

http://www.awionline.org/lab_animals/biblio/enrich.htm

Environmental Enrichment for Nonhuman Primates Resource Guide

<http://www.nal.usda.gov/awic/pubs/primates/primate.htm>

FINAL REPORT ON ENVIRONMENT ENHANCEMENT TO PROMOTE THE PSYCHOLOGICAL WELL-BEING OF NONHUMAN PRIMATES

<http://www.aphis.usda.gov/ac/eejuly15.html>

Environmental Enrichment -- Operant Conditioning

<http://www.primate.wisc.edu/pin/owagner.html>

CHIMPANZEE PROGRAM OF CARE

<http://www.cwu.edu/~cwuchci/standards%20of%20care/soc5.htm>

Section of Language and Intelligence

<http://www.pri.kyoto-u.ac.jp/koudou-shinkei/shikou/reference/ref01.htm>

Laboratory Primate Advocacy Group

<http://www.lpag.org/mentalHealth/mentalHealthHome.html>

The Primates Home Page

<http://www.geocities.com/willc7/index.html>

Emory University Policy On Environmental Enrichment For Nonhuman Primates

<http://www.emory.edu/IACUC/pdfs/EEPpolicyNHP.pdf>

Caring for Chimpanzees

http://www.earthwatch.org/expeditions/fouts_02/theproject.html

Chimp Challenge: It's Play With A Purpose For Non-Human and Human Primates

http://www.azadocents.org/Chimp_challenge.pdf

SOCIAL ENRICHMENT

<http://www.cwu.edu/%7Ecwuchci/enrichment.html>

Animal Communication: the Ape language Controversy

<http://www.fortunecity.com/greenfield/twyford/73/opening.html>

Language in Apes: How Much Do They Know and How Much Should We Teach Them

<http://www.math.uwaterloo.ca/%7Edmswizte/apelang.html>

Chimpanzees Use of Sign Language

<http://friendsofwashoe.org/textsite/chimpuseofsign.htm>

Enrichment at CHCI

<http://friendsofwashoe.org/textsite/enrichmentt.htm>

I know that this list of links is not exhaustive because I have gone through dozens more. Several of these websites also have extensive lists of paper references. If you have further ideas or suggestions for enrichments then please email me and I will include these into an update.

Please, I encourage you to feel free to distribute this current article (either by forwarding over the internet or printing out and posting it), unedited, as widely as possible. The more animals that benefit the better. Thank You.

Peter Dickinson
14 David Edwards Close,
Hen Golwyn,
Bae Colwyn,
Conwy,
Gogledd Cymru,
LL29 9UE
United Kingdom

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Peter@elvinhow.prestel.co.uk