

Curriculum designed around use and advocacy of natural building materials for an open learning centre in rural /tribal spaces.

Material: Mud/ Bamboo/ stones

Objective to use these materials:

1. Where are they found- what is around you? What can you do out of it?
2. Hands on simple experiments to work with the material- understand/ feel/ dissect/and then moving to simple experiments around building
3. And exploring its relationship with other disciplines such as :
 - Relation between geography and architecture
(In desert/ ambient temperature/ surroundings/ hills/ plains/ island houses/ heavy snowfall areas)
 - Relation between history and architecture (such as the humayun tomb's book by INTACH)
 - Study of buildings other than homes (temples/ market square)
 - Art / culture and architecture
 - Role of Festivals and design of houses
 - Ideas linked to culture and values such as the entrance door is set low in many village houses - you have to bow down and enter- to learn humility.
 - The nature of animal shelter buildings in the village
 - The rationale behind rangoli at entrance

Hands on activity in school curriculum around mud

1. Village tour to see the kind of houses in the village and study everything about the oldest houses/ draw what you see?
2. What materials did you find in the village- write and draw
3. Ask kids to dig mud and see layers.. Feel their texture, what happens when you dry it, which one becomes a dough which one falls from different heights... various experiments
4. Collect mud from different sources- near river, in the forest, more accessible to humans? Again divide and make mounds. Try building with different ones... which will build up? Which one will crack?
5. Modeling aspect- make clay models out of it
6. Explore mud's behaviour with fire- clay tiles
7. Explore idea of a bridge.. how do you cross a river?Take two pencils.. And ask them to connect... concept of bridging two things... arches, corbelling...
8. Go to the neighbouring village- or another state.to observe different houses
9. How do you increase the stickiness of mud and water resistivity (mix with urad dal's dough, jaggery to increase mud wall 's stickiness
10. Add different kinds of oil to mud and float on water.. How long does the mud float on water- and make it water resistant
11. See which mound with different oils attracts which kind of insects/ termites?

12. The science of why some insects prefer which oil. Which is poisonous?
13. Should you kill insects? Ethics?
14. Experiment with a termite infested wall- create a mound which will have termite food to attract them and keep away from the wall
15. Ogden nash Poem “ a primal termite knocked on wood...tasted it and found it good, that’s why your cousin may... fell through the floor and tasted hay.
16. Poems on mud wall? Insect?
17. Small scale home? Participate in the village house construction
18. Building a wall/ making a room

21. Concept of **pigments**

- Fibrous, leaves,vegetable, sands, henna leaf- colours ,
- lime burn hay and mix with mud... get black colour
- Colour theory

22. Concept of **lighting**

- Make a puncture in the mud mound- experiment
- box - hole in the mud mound...on roof? On walls? far/ near/ sun direction/ wind direction/ pour water
- Blow from one end and see. What happens
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Hands on activity in school curriculum around **Bamboo**

- How to model a bamboo
- Trip to bamboo grove
- Identify the snakes there
- Different types of bamboo- thickness/ shine/ length/ gaanth? / cut bamboo / how to cut it /when to cut it/ what season/ what time?
- Practices to treat bamboo for being insect resistant samavasyas/ sardi mein/ (don’t get insects) science behind cultural ideas on cutting bamboo and keep it in river...
- Make a flute? Make a wind chime?
- Cutting the bamboo- continuous nodes..longitudinally / thin bamboo strips/ transverse ? dissect completely
- Outer skin - cut wide/ thin strips- make trusses out of it/ bridges out of it/ can you make a monkey bar out of it- various structures out of it
- Craft with the outer shell
- Various weaving pattern... basket/ windows/ panes/
- What do you do when bamboo and mud come together
- Which part rots?
- Bamboo in water/-- find out which part of bamboo is water resistant
- Bamboo in oil
- Roof tiles out of bamboo
- Make two sticks stand?
- How do you bend it? Can you bend it? - dip it in hot water
- Stilts - learning to balance on bamboo- Burva tribe game

- Seeds in a bamboo pot
- Sustainability of using bamboo

Hands on activity in school curriculum around **stones**

- How to model a stone- shine/ rub/ make a spark
- External trips- collect various kinds of stones
- Mix everything together- puzzle- who can separate your pile quickly?
- How do you compress stones to take smallest space?
- Various kinds of stones- colours
- Rubbing stones- to get powder
- Building stones-- connect two columns
- Mix stone / mud/ bamboo
- Show pictures of various stone houses- slates in himalayas/
- Here is a pile of stones- take however much you want... game to talk about limits / fairness
- Under the stone ecology
- Draw and see what is under the stone
- Moisture under the stone- do some science experiments
- Mud/ stone/ water / bamboo- make something out of it?
- Painting on rocks-
- Stones on cemetery- draw the lifecycle of the tribal who died. Muriya gonds.. Gonds of bastar
- Folklore/ religious symbols around natural material... use of stones depicting an ancestor
- Proverbs... "maanne se bhagwaan , nahin maanne se kutta".
- Stones used in sacrifice of animals

Hands on activity in school curriculum around **wood**

- How to cut wood so that it can be used for construction?
- Cut sections of wood/ cross section/longitudinal strips
- See how wood grains behave under the sun - see how the cracks develop
- Get an idea of grains in wood. Which cracks more.. Cross sectional/ longitudinal
- How does wood grow? In concentric circles.. So how do u cut it so u can use it without cracking?
- Cut it diagonal/ squares?
- Seasons when you don't cut wood? When do you cut. When sun is high and
- Experiment thin slice.. Dip it in water and expose it in sun and one which is not dipped in water.
- Which wood is used for which purpose?
- Studying wood
- Wood's relationship to fire/ water/ oil/ air
- Survey of people's preferences on the kind of wood for particular building requirements- example: frames of certain wood

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Hands on activity in school curriculum around **iron/copper/**

- Walk in the village to find iron

Hands on activity in school curriculum around **agricultural byproducts**

- Thatch roofs
- How and why we should cultivate certain kinds of rice
- Fibrous plants available- to make room or added to mud mortar to make it more tensile

Hands on experiments about agriculture additives to mud mortar/ wood/ bamboo?

- Its relationship...Why linseed cultivation is important? That oil is used as a water resistant. Its oil cake is added to the plaster mix.

Hands on activity in school curriculum around **taking care of your house**

Hands on activity in school curriculum around **sanitation**

Build a ecosan toilet?

Soak pit and septic tank toilet -

Poop demarcated areas in village

A curriculum around the Science behind actual building

What depth to build ?

Foundation

Plinth?

walls/ windows/ beams/ roofs/ lintels/ door/ windows/ flooring/ lofts / thickness of wall

Height of building vs depth of foundation

Bonding

Sun / wind

Effect of earthquake/ flood

and Themes

- Cement and its contribution to Co2 emissions
- Science of cow dung-coated mud walls
- Science of other traditional techniques mud flooring at the Padmanabhapuram Palace in Kerala; brick walls at the Lakshmana temple, Chhattisgarh; or the houses in Dharamshala made of sun-dried earth blocks
- Economics of an earth friendly home
- Preparing a step-by-step guideline for building 'earth homes'
- Sloping vs flat roofs- and its impact on heat
- Different types of natural homes- Adobe, COB, Wattle and daub, use of bamboo
- Learn about the work of few activists like :
 - Dharamshala-based Didi Contractor,

- Chennai-based Benny Kuriakose,
- Kerala-based Eugene Pandala and
- Goa-based Gerard da Cunha
- legendary Laurie Baker in the 1960s.

Resources

- Learning Curve article-Krishna
- Meenakshi- Puvudham
- Thannal and Vasthukam in Kerala; <http://thannal.com/natural-building-resources/>
- Saorabh Phadke , Dharamsala, <http://dharmalaya.in/earthen-masonry-training/>
- **<Debasmita's links>**
- <http://lauriebaker.net/> <COSTFORD>
- http://www.earth-auroville.com/training_overview_en.php
- Hunarshaala, <http://www.hunnarshala.org/artisan-school.html>
- Satya prakash varanasi
- Centre for Sustainable technologies, IISC
- <http://www.sustainablebuild.co.uk/>
- Subash Basu , Mud Brick Architect trainer
- Made in Earth in Bengaluru, <https://madeinearth.in/topics/workshops/>

<http://www.thehindu.com/society/the-new-age-of-earth-homes/article18246547.ece>

Children's activities

1. For Classes 3-5 ; Digantar : Kal Aaj aur Aage : Buildings in your village

Books from Arvind Gupta Website as reference

2. [ENTURIES OF SOLAR PASSIVE HOUSES - B. KEN, P. JOHN](#) AMAZING BOOK
3. [ARCHITECTURE FOR THE POOR - HASAN FATAY](#) MASTERPIECE ON MUD ARCHES
4. [LAURIE BAKER - GERARD DA CUNHA + OTHERS](#) WONDERFUL ARTICLES
5. [LAURIE BAKER OTHER SIDE - E. BAKER](#) [MEMOIRS OF ELIZABETH BAKER]
6. [POETRY IN MUD - SUKU DASS](#) TRIBUTE TO THE MASTER
7. [LAURIE BAKER THE UNSEEN SIDE - BENNY KURIAKOSE](#) TRIBUTE TO THE MASTER
8. [BRICK WORK - LAURIE BAKER](#) UTILITY OF BRICKS
9. [HOUSES - HOW TO REDUCE BUILDING COSTS - JOGINDER SINGH](#) [ENGLISH / HINDI]
10. [MUD - LAURIE BAKER](#) [ENGLISH / HINDI]
11. [MANUAL - COST CUTTING FOR STRONG HOUSING - LAURIE BAKER](#) HI-DENSITY
12. [EARTHQUAKE - LAURIE BAKER](#)

13. [A MANUAL FOR COST CUTS FOR STRONG ACCEPTABLE HOUSING - LAURIE BAKER](#)
14. [RURAL HOUSE PLANS - LAURIE BAKER](#)
15. [RUBBISH - LAURIE BAKER](#)
16. [RURAL COMMUNITY BUILDINGS - LAURIE BAKER](#)
17. [ARCHITECTURE FOR THE PEOPLE - LAURIE BAKER talks to JOGINDER SINGH](#)
18. [LAURIE BAKER'S CREATIVE JOURNEY - JOGINDER SINGH](#)
19. [OF ARCHITECTURAL TRUTHS AND LIES - LAURIE BAKER](#)
20. [HERE WAS A BAKER - VIJAY PRASHANTH \(TRIBUTE\)](#)
21. [THE BRICK MASTER OF KERALA - ADAM HOCHSCHILD](#)
22. [CALL A BRICK WALL A BRICK WALL - S. RAMANATHAANAIYAR](#)
23. [MASTER MASON - G. SHANKAR \(TRIBUTE\)](#)
24. [BAKER OF INDIA - GERARD DA CUNHA \(TRIBUTE\)](#)
25. [SIGNIFICANCE OF LAURIE BAKER - Dr. B. SHASHI BHOOSHAN \(TRIBUTE\)](#)
26. [BAKER ENGLAND BORN NATIVE INDIAN ARCHITECT- GAUTAM BHATIA A TRIBUTE](#)
27. [LAURIE BAKER A TRIBUTE - HIMANSHU BURTE \(TRIBUTE\)](#)
28. [OF MUD AND MEN - ARCHITECTURE AS A POLITICAL ACT - MILLER](#)
29. [LAURIE BAKER - THE TELEGRAPH UK -](#)
30. [ADOBE CONSTRUCTION- SOURABH PHADKE](#) SIMPLE BOOK
31. [COB CONSTRUCTION - SOURABH PHADKE](#) SIMPLE BOOK
32. [NATURAL ADDITIVES - SOURABH PHADKE](#) SIMPLE BOOK
33. [RAMMED EARTH CONSTRUCTION - SOURABH PHADKE](#) SIMPLE BOOK
34. [WATTLE AND DAUB CONSTRUCTION - SOURABH PHADKE](#) SIMPLE BOOK