

# Students' ways of expression in science classrooms

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## Vigyan Pratibha (VP) project:

- A school science and mathematics student nurture program
- Works through Learning Units (LUs)
- Includes teacher development workshops, student cluster camps, school visits and content development

## Learning Units (LUs):

- Learning modules built around the school curriculum but with extensions beyond the textbook
- Science, Mathematics and Local context topics
- To be conducted in smaller groups as part of science circles

## School visits:

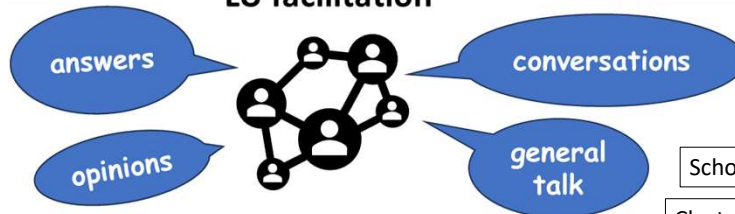
- Part of project implementation
- Teacher or VP member conducts the LU with students
- Feedback for refining LU content
- Feedback for student learning

## Aspects of LU conduction:

- Facilitated by school teachers
- Student participation
- Discussion and collaborative learning
- Enhanced by 'resources' brought by students into the classroom

VP members Teachers

LU facilitation



Modes we use

- School Visits
- Cluster camps
- Postal program\*
- Observation
- Students' written work

## Students' ways of expression in classrooms

Law/Formula	Terminology
Textbook material	
Method	Names
Language	Processes
Local practices	Native language
Language	Experiences
Processes	Colloquial expression

\*Postal Program was carried out during pandemic time and the following year using postal mail (Reema Mani, Amish Parmar, Sarita Kamat)

## Varied use of terminologies

## Challenging each other

### LU: Rediscover, describe and draw Birds

Day: August 31, 2017 Weather: - Cloudy, little rain.  
Time: 8am से 2:30 am तक

बिरिक-बिरिक - कबके आवाज निकालता है।  
बिरिक-बिरिक - कबके आवाज निकालता है।  
black colour patch chocolate brown colour garden  
गुली कितनी है।  
Bird was sitting on a fence for few minutes.  
There were crows nearby by garden fence.  
There was another sparrow sitting next to it but it did not have black colour throat.  
For 3 minutes, bird sat on fence. It was calling loudly. Another sparrow was sitting next to it. After that they both flew away.  
Then in another place in garden, saw 3 more sparrows sitting on the ground.

### Sound of bird 'बिरिक बिरिक'

- Informal terminology*
- Allows expression of student's authentic observation
  - Enhances the description of the bird
  - Serves as primary documentation

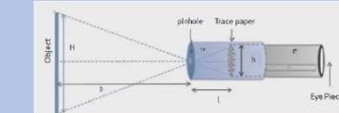
(Student's work)

### LU: Pinhole camera

\*Student 1: Height of pole is 180 cm by calculation

\*Student 2: Student 1's height itself is 150 cm!

Making a pinhole camera and using it to measure height of a distant object (eg: pole)



A different way of finding correctness of the calculated answer!

\* Not literal quotes, but based on observation

### LU: Bringing back shine to copper

Q.6. Which of the following food substances cannot be stored in copper utensils? Why?  
Buttermilk, common salt, pickles, unvarnished chutney, rice.....  
Add a few more food items to this list.

Can be stored	Cannot be stored	Not sure
Pickles	Buttermilk	Salt
Unvarnished	Pickles	Unvarnished
Almonds	So-damned	Unvarnished
Rice grains	Soy, Citruses	Soy, Citruses
Debuogen	Phyllanthus Emblica	Sober

(Student's work from postal)

### Scientific terminology

- Name of food that cannot be stored in copper vessel: *Phyllanthus emblica* (scientific name of amla/ Indian gooseberry)
- None of the other items are in their scientific names!

## From daily experiences

### LU: Evaporation\*

Question asked by the facilitator:  
Have you seen evaporation in your surroundings?  
Response by a student: When we wash clothes at home, we squeeze them, but we also spread them out on a string, otherwise they do not dry well.

*Implicit understanding of the phenomenon of evaporation and its relation to surface area!*

\*Not literal quotes, but based on observation

## Some more....

- Bent pipe experiment suggested by a student - as evidence in response to a query by another student about light travelling in a straight line
- Classification of millipede as a crawling animal or as an animal with legs? - nuances of classification

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