

Appendix I

OBSERVATION SCHEDULE FOR HOME VISIT

- (1) Name of the Child :
- (2) School Age ,Sex & Standard :
- (3) Residential Address :
- (4) Type of family : (a) Nuclear
(b) Joint
- (5) Details of family :

Sr. No.	Age	Sex	Education	Spectacles	Earning or Dependent
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(6) Specific health problem of a child :

- (7) Family Income
- (1) Husband
 - (2) Wife
 - (3) Other family members
 - (4) Divident & other Incomes
i. e. pension etc.

(5) TOTAL :

(8) Benifits used by family :

- (1)House
- (a) Rented
 - (b) Ownership
 - (c) Provided by Employers.
 - (d) Size of the House :

(2)Medical Benefits :

(3)Free Education :

(4)Travel benefits :

(5)Any other benefits :

(9) Type of Meals :

(a)Vegetarian :

(b)Non - Vegetarian :

(c)Eggetarian :

(10) Menu for the family :

Week days	Week days	Week end & Holidays	Approximate consumption of child
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(11) Time schedule of child :

Activies done.

6.00 a.m. to 7.00 a.m.

7.00 a.m. to 8.00 a.m.

8.00 a.m. to 9.00 a.m.

9.00 a.m. to 10.00 a.m.

10.00 a.m. to 11.00 a.m.

11.00 a.m. to 12.00 noon

12 noon to 1.00 p.m.

1.00 p.m. to 2.00 p.m.

2.00 p.m. to 3.00 p.m.

3.00 p.m. to 4.00 p.m.

4.00 p.m. to 5.00 p.m.

5.00 p.m. to 6.00 p.m.

6.00 p.m. to 7.00 p.m.

7.00 p.m. to 8.00 p.m.

8.00p.m. to 9.00 p.m.

9.00 p.m. to 10.00 p.m.

10.00 p.m. to 11.00 p.m.

11.00 p.m. to 12.00 midnight.

(12) Achivement in School :

<u>GRADE</u>		<u>CLASS</u>	<u>PERCENTAGE</u>
Excellent	- A	I	60% and above
Good	- B	II	45% to 59%
satisfactory or			
Fair	- C	III	35% to 44%
Fail	- F	Fail	less than 35% marks

(13) Childs motivation for study :

(a) Engrossed & Eager to do

(b) Likes to do work

(c) Dislike but does the study

(d) Avoids study

(e) Hates study

(14) Place of study :

(a) size of the Room

(b) Height of celing

(c) Colour of Ceiling

(d) Colour of Wall

(e) Number & Size of Windows
& direction of windows

(f) Work area :

1) Height

- 2) Shape
- 3) Colour
- 4) Position in relation to Light.

(g) Number of people using

room & it's function.

(h) Source of light used for studies.

- (a) Flourescent
- (b) Incandescent
- (c) Watts used

(i) Type of artificial light used :

- (a) Direct
- (b) Indirect
- (c) Semi direct

Kind of light :

- (a) general light
- (b) Local light
- (c) Combination

(j) Total Number of lights fixtures in Room.

Number

used or not used

- (a) Ceiling
- (b) Wall

(c) Local

(k) Number of Reflectors used :

Type of Reflectors used :

(15) Amount of light available on work area.

(16) Amount of light available in room.

(17) Source of light :

- (a) Dust free
- (b) Partially covered with dust.
- (c) Fully covered with dust

(18) Reflectors used are :

- (a) Dust free
- (b) Partially covered with dust
- (c) Fully covered with dust.

(19) Posture of child when he studies :

- (a) Sitting Erect
- (b) Stooping
- (c) Lying down

(20) Glare Produced : (a) Direct

(b) Indirect

(21) Is there a shadow produced
in work area or not

Appendix II

Interview schedule of study area for home visit- (Quality and Quantity of Light)

General information about lighting in study area.

A. General light

1. Does child have artificial light fixture in room where he studies ?
Yes-No
2. If ye, how many -----
3. What kind of bulb is used -----
4. Does it have shade -----
5. If yes, material out of which it is made opaque,
translucent or transparent -----
6. Does it hare diffuser type flat or bowl. -----

B. Task lighting

1. Is there a table or portable lamp for studying purpose.
2. Type of bulb used. (fluorescent in candescent clear, milky, white) -
watts.
3. Does lamp have diffuser. Yes - flat or bowl.
4. Is there a shade
5. Material of shade.
6. What is the direction of light from lamp. (direct, indirect semi direct)
7. While students are sitting on table and when light is on.
 - a. Whole of the bulb could be seen
 - b. Part of the bulb could be seen
8. If ~~seen~~ seen, is it
 - a. below eye level
 - b. above eye level
 - c. or at eye level

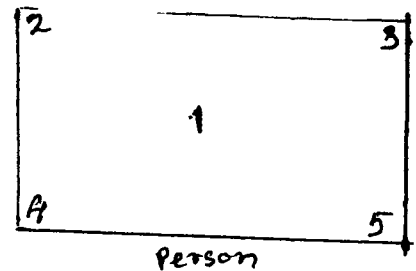
9. The placement of lamp in relation to the side of the person sitting (right, left, directly in front, on top of person, behind person)

II Measurement of portable lamp.

- a. Distance from bottom of shade to table top.
- b. Distance between the edge of the table next to student and lamp base.
- c. Distance of lamp base from book
- d. Distance from center of book and front edge of table.

III Quantity of light

- a. Reading at center of book (1 in figure)
- b. Reading at 4 corners of table or work plane.
 1. Upper left corner (2 in figure)
 2. Upper right corner (3 in figure)
 3. Lower left corner (4 in figure)
 4. Lower right corner (5 in figure)



- c. Measurement of light 40 cm straight in horizontal plane in
 1. upper direction of the table
 2. lower direction of the table
 3. right of the table
 4. left of the table
- d. if table is near wall only possible readings are taken.
- e. Reading sin four corner of room.
- f. Reading at farthest end of the room near the wall facing students study area.

Appendix III

Code Sheet

Q. 1.	Name of the child	001 to 400
Q. 2.	School Municipal	1
	Private	2
Q. 3.	Standard.	3
		4
		6
		8 Boy 1
		9 Girl 2
Q.4. Type of family	Nuclear	1
	Joint	2
Q.5. Family size	3 - 4	1
	5 - 6	2
	7 >	3
	Education of Post graduate	5
Parents	Graduate	4
	S. S. C.	3
	Primary Education	2
	Illiterate	1
Spots	Yes	1
	No	2
Heredity	Fathers side	1, 1-1, 1-2, 1-3
	Mothers side	2, 2-1, 2-2, 2-3
	Other Reason	3
	Earning	1
	Dependent	2
Q. 6.	Specific health	Good
		Average
		Poor

Q.7.	Total Income	100 to 500	1
		501 to 1000	2
		1001 to 1500	3
		1501 to 2000	4
		2001 to 2500	5
		2501 & above	6
		Per capita	Actual Income
	Number of people		
Q.8.	House	Rented	1
		Ownership	2
		Provided by Employer	3
	Size of house	One room	1
		One Rm Kitchen	2
		One B.R. Hall kitchen	3
		Two B.R.Hall kitchen	4
		Three B.R. & More	5
	Actual carpet area of the house	Medical benefit	yes 1
			No 2
Free Education		Yes 1	
		No 2	
Travel Benefit		Yes 1	
		No 2	
Other Benefit		Yes 1	
		No 2	
Type of Meal	Vegetarian	1	
	Non vegetarian	2	
	Eggetarian	3	
Actual	Calories		
	Protein		
	Vitamin A		
Time spent on actual time	Study		
	T. V.		
	Recreation and Play		

Achievement in school

60% and above	4
45 to 59	3
35 to 44	2
less than 35	1

Motivation for study

Engrossed and eager	5
Likes to do work	4
Dislike but does	3
Avoids	2
Hates	1

Place of Study

Size of room	
Ht of ceiling	
Colour of ceiling	
White	1
Very light	2
Medium light	3
Dark	4

Reflection

Colour of wall	
White	1
Very light	2
Medium	3
Dark	4

Reflection

Number

Size

Area

Direction

North	1
East	2
South	3
West	4
North East	5
South East	6
South West	7
North West	8

Work area		
	height	
Shape	Rectangular	1
	Square	2
	Round	3
Colour		
	Wood French Polish	1
	Wood dark Polish	2
	Painted	3
	Glass	4
	Sunmica	5
	Plastic sheet	6
	Table cloth	7
Position in relation to light		
	Directly on top	1
	Left side of person	2
	Right side	3
	Behind person	4
Number using Room		
Function of room		
	Multipurpose	1
	Living Room	2
	Bed Room	3
	Study	4
	Dining	5
	Kitchen	6
	Balcony	7
Source of light		
	Tube	1
	Bulb clear	2
	Milky	3
	Combination	4
	Watts used	
Total Lumens / Sq. feet.		

Type of Artificial light used		
	Direct	1
	Indirect	2
	Semidirect	3
	Direct Diffused	4
	Indirect Diffused	5
Kind of light		
	General	1
	Local	1
	Combination	3
Total number of fixture		
	Wall	
	Ceiling	
	used regularly	
Number of reflector used	Type of reflector	
	Diffusing	1
	Mirror	2
	Shade	3
	Translucent	4
	Any other	5
Amount of light available in work area		
Available in Room		
Difference		

Coding Plan for analyzing the lighting condition

1. The quantity of light was coded as the actual lux and Lumens per square foot.
 2. visibility of lighted lamp (while studying) for nearest general and task light
3 = See the lamp
1 = Can not see the lamp
 3. Kind of lamp used for the nearest general and task lighting
3 = Incandescent clear & coloured
2 = Incandescent white
1 = Fluorescent
 4. Shielding of the lamp used for the nearest general lighting and task lighting.
4 = No shielding
3 = transparent shielding
2 = Opaque shielding
1 = translucent shielding
- (To obtain the direct glare score, th score for general and task light was added to get the total score for each student for item 2,3 and 4)
5. Characteristic of work surface was coded as follows
3 = shiny
1 = dull
2 = medium

6. Characteristic of lamp base was coded as follows

3 = shiny

1 = dull

2 = medium

9 = Not applicable

(Reflected glare score was the sum of items 5 and 6)

F. N. Not applicable responses were excluded from any score for this and subsequent item

7. Surrounding area in relation to light at the task was coded

2 = Somewhat dark

1 = Well lighted

8. Kind of task light in relation to general light was coded as

8 = task light only

6 = task light with less than 30 lumens/sqf

4 = task light with more than 30 lumens per square foot

2 = general light only

(Score for glare by contrast was sum of 7 & 8)

9. Direction of light from the light source (mean score for general and task light was taken)

2 = direct

5 = indirect

8 = Semi direct

10. Kind of lamp used in light source (Mean score for general and task light was taken)

1 = Incandescent clear & colour lamp

2 = Incandescent white

3 = Fluorescent

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11. Kind of shade used in the light sources (Mean score for general and task light was taken)
2.5 = no response
1 = opaque shade
2 = bare bulb
3 = transparent shade
4 = translucent shade
12. Shape of shade of task light
1 = Cone & bowl
2 = tall & narrow
3 = cylinder shape & flair bottom
9 = not applicable.
13. Size of shade, bottom diameter (mean for general light and task light for lights with shades were calculated)
1 = small, less than 4 inches
2 = medium, 4 to 10 inches
3 = large more than 10 inches
14. Size of the shade, depth of the shade (mean for general and task light was taken)
2 = not applicable
1 = small, less than 4 inches
2 = medium, 4-8 inches
3 = large, more than 8 inches
15. Top diameter of the shade of task light
1 = small, less than 4 inches
2 = medium, 4 to 6 inches
3 = large more than 6 inches
9 = Not applicable

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16. Height of the lamp
1 = small, less than 4 inches
2 = medium 4-6 inches
3 = large, 10 to 14 inches
9 = Not applicable
17. Size of the lamp used in light source (mean for general and task light was calculated)
3.5 = Not applicable
1 = 40 to 60 watts incandescent lamp
2 = 100 watts incandescent lamp
3 = 18 inches fluorescent lamp
4 = 24 inches fluorescent lamp
5 = 36 inches fluorescent lamp
6 = 48 inches fluorescent lamp
18. Spread of light over the task areas
2 = No response
1 = Only on the book
2 = Over 1/4 of the table
3 = Over half of the table
- (The score for distribution was sum of item 10 through 18)
19. Colour of the exterior of the shade (mean for general and task light was taken)
2.5 = No response
1 = dark to black
3 = medium light
3 = light
4 = white or off white

20. Colour of the interior of th shade (mean for general and task light was taken)
2.5 = no response
1 = dark or black
2 = medium light
3 = light
4 = white or off white
21. Characteristic of lamp base was coded as follows.
2 = no response
1 = shiny
3 = dull
9 = Not applicable
22. Reflectance level of work surface by colour
2.5 = no response
1 = dark to black
2 = medium light
3 = dull
9 = Not applicable
23. Reflectance level of work surface by texture
2.5 = no response
1 = shiny
2 = dull
24. Colour of ceiling
1 = dark to black
2 = medium light
3 = light
4 = white or of white

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25. Colour of wall
1 = dark to black
2 = medium light
3 = light
4 = white or off white
26. Colour of the floor
1 = Dark to black
2 = medium light
3 = light
4 = whit or off white
27. Kind of lamp used in light source
1 = incandescent clear
2 = incandescent white
3 = Fluorescent
28. Shielding of the light source (mean for general and task light was taken)
1 = no shielding
2 = transparent shielding
3 = Opaque shielding
4 = translucent shielding
29. Nature of the light from lamp
1 = clear & bright
3 = diffused
2 = no response
30. Type of light used for studying
2 = no response
1 = task light only
2 = general light only
3 = task light and general light

31. Duration of study time
2 = no response
1 = less than 2 hours
2 = 2-4 hours
3 = more than 4 hours
32. Actual number of hours of study with artificial light at the table was categorised in to three groups
2 = no response
1 = less than 1 hour
2 = 1-2 hours
3 = more than 2 hours
33. Space available for individual use was categorised in four groups
2.5 = no response
1 = less than 4 square feet
2 = 4-6 square feet
2 = 6-8 square feet
4 = more than 8 square feet
34. Location of study area was coded as follows.
1 = study room
2 = living room
3 = bed room
4 = kitchen
5 = dining room
6 = multipurpose room
7 = verandah

35. Desk placement in the room was categorised as follows
2.5 = no response
1 = against window
2 = in the center of room
3 = against the wall or corner of the room
36. Postural position while studying
2 = sit on floor
2 = sit on divan, bed or sofa
3 = sit at table
37. Other places of study
2 = stooping on floor
1 = stair case, gallery, otta
2 = bed divan
3 = sofa
38. Sharing of room was coded according to the number of persons sharing the room
1 = no one else
2 = one other person
3 = two other persons
4 = more than 2 persons
39. Sharing of table was also coded according to the number of persons sharing the table.
1 = one
2 = two
3 = three
4 = four
5 = more than four

40. Presence of task light in study area was coded according to whether the task light was present or not
 1 = No
 2 = Yes
42. Actual quantity of light at task was recorded in lux.
 scoring plan for evaluating the adequacy of lighting condition.

I. Quantity of light was based on some of known standards.

The total point allotted for quantity of light was 40 out of 100

1. Cases below 30 lumens, the recommendation for quantity of light according to Indian Standard Institute were given score of 10 points
2. 31 through 50 lumens were given score of 20 points.
3. 51 through 70 lumens were given a score of 30 points
4. 70 lumens 40 points

- II. Quality of light was scored according to the factors contributing to good quality lighting for studying. Total points allotted for quality of light were 40 points out of 100. Equal weight was given to quantity and quality of lighting because both are equally important in lighting installation.

The breakdown of the 40 points for quality of light is as follows.

A. Glare.	8
Direct glare	3
Score of 14 to 18	1
Score of 9 - 13	2
Score of 5 - 8	3
Reflected glare	2
Score of 4 - 6	1
Score of 1 - 3	2
Glare by contrast	3
Score of 8 - 10	1
Score of 5 - 7.....	2

Score of 2 - 4.....	3
B. Direction	5
Score of less than 2.....	1
Score of 3 - 4.....	3
Score of 5 & above.....	5
C. Distribution	5
Score of 5 - 11.....	1
Score of 12 - 18.....	3
Score of 19 - 25.....	5
D. Diffusion	5
Score of 3 - 5.....	1
Score of 6 - 7	3
Score above 7.....	5
E. Reflectance of Surroundings	9
Colour of ceiling.....	3
Score of 1.....	0
Score of 2.....	1
Score of 3.....	2
Score of 4.....	3
Colour of wall.....	3
Score of 1.....	0
Score of 2.....	1
Score of 3.....	2
Score of 4.....	3
Colour of floor.....	3
Score of 1.....	0
Score of 2.....	1
Score of 3.....	2
Score of 4.....	3

F.	Reflectance from shade of the luminaires.....	3
	Score of 1 - 1 - 2.....	1
	Score of 2 - 1 - 3.....	2
	Score of 3- 1 - 4.....	3
G.	Reflectance of work surface.....	5
	<u>By colour</u>	
	Score of 1.....	0
	Score of 2.....	1
	Score of 3.....	2
	Score of 4.....	3
	<u>By texture</u>	
	Score of 1.....	1
	Score of 3.....	2
III.	Related Condition.....	20 points
	Desk size.....	3
	Score of 1.....	2
	Score of 2.....	3
	Score of 3.....	2
	Score of 4.....	1
	Desk placement	5
	Score of 1.....	1
	Score of 2.....	3
	Score of 3.....	5
	Study Posture	5
	Score of 1.....	1
	Score of 2.....	3
	Score of 3.....	5
	Type of lights used.....	7
	Score of 1.....	1
	Score of 2.....	3
	Score of 3.....	7
	Total.....	100 points

Appendix IV

List of Municipal Schools.

1. Nana chowk Municipal School
2. Gilder lane Municipal School
3. Mumbadevi Municipal Secondary School
4. Topiwala Municipal Secondary School
5. Woolen Mill Municipal Secondary School
6. Prabhadevi Municipal Secondary School
7. Prabhat colony - Santacruz East Municipal School
8. Parle East Municipal School
9. Gokhale Road Municipal Secondary School, Dadar
10. Worli Naka Municipal Secondary School,

List of Private Schools.

1. G. D. Somani Memorial High School, Colaba.
2. St. Joseph High school, Colaba.
3. Green Lawns High school, Warden Road.
4. Prabhadevi Convent, Prabhadevi.
5. St. Michels Church High School, Mahim.
6. Pupil's Own High School, Khar.
7. Bloomingdale - Jasudben M. L. Experimental High School, Khar.
8. Parle Tilak Vidyalaya, Parle East.
9. Lady Vasanji Girls School, Andheri East.
10. New Era High School, Huges Road.

Appendix V

Questionnaire cum Observation Schedule School

1. Name of the School
2. Total number of Divisions
3. Total number of children in each Division
4. Size and shape of the room
 - a) Length
 - b) Breadth (width)
 - c) Number and sizes of each windows / window area
 - d) Direction in which room opens
5. Amount of natural light (average) available in the room
6. Number of lighting fixtures used / available in the room
 - a) Location of lighting fixtures
 - b) Height of lighting fixtures from work area
 - c) Type of light — Incandescent or fluorescent
 - d) Type and number of reflector used on fixture : Transperant or opaque or combination
 - e) colour of light :
White
Yellow
any other
7. Watts and Voltage of bulbs used in a class room
8. Amount of light available from blackboard to desks.
10. criteria used for sitting pattern
 - a) Roll nos. according to surname
 - b) Height of children
 - c) Rank obtained
 - d) eye defect
 - e) any other

-
11. colour of desk
 - 1) White
 - 2) light
 - 3) Dark
 12. texture of desk Rough/smooth
 13. Colour of walls White/bright/Dark
 14. Colour of ceiling
 15. Bulbs and source of light used is
 - a) Free of dust & dirt
 - b) Partially covered with dust & dirt
 - c) fully covered with dust & dirt
 16. Reflectors are
 - a) Dusty
 - b) Free of dust & dirt
 17. Number of children having Eye defect in class
 18. Quality of light in room
 - glare
 - a) Reflected
 - b) Direct glare
 - Shadows produced
 - a) improper placement of light source
 - b) Wrong placement of work table
 19. Quality of light available in room (Natural / Artificial)
 - a) Bench near window
 - b) First row
 - c) last row
 - d) Bench away from window

average