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Every Child in School and Learning Well

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Evidence for Action



Hybrid Learning Program Evaluation Report

Aug – Sep, 2017

Hybrid Learning Program-Baseline Evaluation (Visit – 2) Report Aug – Sep, 2017

Hybrid Learning program is running in three states of India, i.e. Uttar Pradesh, Rajasthan and Maharashtra. The four research blocks of this program are in Rajasthan. Bassi is in Jaipur-District, Dausa & Sikrai are in Dausa-District along with a control block Rajgarh which is in Alwar-District. These are the part of the Google funded Dausa – Evaluation, which is a two-year long impact evaluation of the Model. It is designed to measure the impact of the Tablet based Digital group learning program on learning levels of children. In this span of two-year long evaluation there will be total 4 assessment visits. It has been planned to carry out Census-ASER as visit 1 and Baseline as visit 2 in 2017. Midline with ASER as visit 3 in 2018 and End line with ASER as visit 4 in 2019.

Since Baseline is also representative of the un-intervened status of children's learning levels hence it is a base to compare the four blocks i.e. treatment and control. The focus is children of grades 5th to 8th or age group 10 to 14. The digital content shared on tablets is focussed on Science, Math and English. The Baseline report specifically explains the overall design of the evaluation, development of the assessment tools for the Baseline evaluation and finally shares the comparative result from the Baseline assessment visit.

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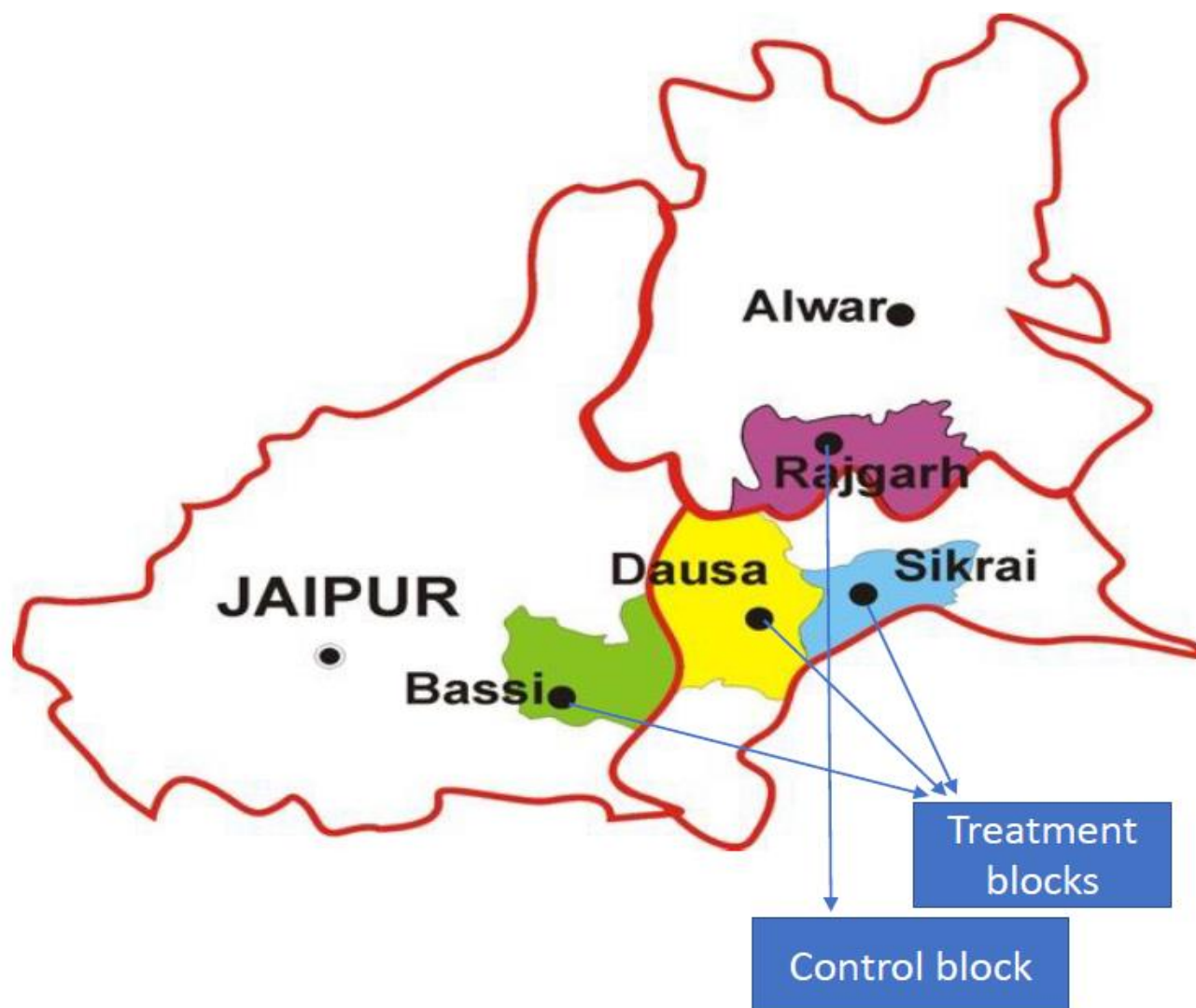
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DAUSA HYBRID LEARNING BASELINE EVALUATION

MAIN FINDINGS:



AUGUST-NOVEMBER, 2017
PRATHAM EDUCATION FOUNDATION-ASER CENTRE
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Executive Summary:

Since 2005, the Annual Status of Education Report (ASER) has been providing evidence of low learning levels among children of rural India. Children are usually studying at grade level in traditional classrooms but are not able to show corresponding performance. In the classrooms, there is a substantial number of non-readers who are unable to extract information from textbooks. These children in rural India are not able to avail technical facilities commonly available to urban children. Pratham has started an initiative named H-Learning/Hybrid Learning Program. In this program, groups of children (in the grades 5th to 8th) are provided with tablets which contain offline video content on English, Math and Science along with some other interesting videos. The aim of the program is to give children independent choice to study with fun, utilizing the interesting videos in the tablet and learning digital skills that will be useful later as well.

The Dausa-H-Learning program runs in 4 blocks of Dausa district in Rajasthan. This constitutes the intensive research location of the overall H-Learning Program. Here, the evaluation is planned to be done in all 296 villages out of which:

- 98 villages in Rajgarh block where there has been no prior Pratham activity will be **Control** villages (Group-1)

There will be **three treatment** groups:

- Digital + Print only in community: 73 villages in Bassi block, where Pratham has not worked previously (Group-2)
- Digital + Print in community and school: 66 villages in Dausa block, where Pratham Learning Centres(LCs) were run in 2014-15 (Group-3)
- Print in community: 57 villages in Sikrai block, where Pratham LC's were run in 2014-15 (Group-4)

Broad objective of evaluations: Understanding learning improvements and behaviour in H-Learning Program in a structured way.

Basic statistics

- A total of 294 villages, across all four blocks, have been a part of the Dausa Baseline Assessment.
- Overall on an average across blocks, subjects and grades, ~5527 children have been tested which is 99.7% testing.
- Across all blocks, the gender distribution is 45% girls: 55% boys
- The proportion of girls is higher in government schools as compared to the proportion of boys across all blocks. Similarly, the proportion of boys is higher in private schools as compared to the proportion of girls across all blocks.

Subject wise details of the assessment:

a) Math pen and paper assessment

- A total of 5521 children were tested on Math pen and paper assessment.
- The Math test was of a maximum score of 15 and overall across grades and blocks the test mean was 7.9. This indicates that the test is of medium level.

b) Hindi pen and paper assessment

- A total of 5519 children were tested on Hindi pen and paper assessment.
- The Hindi test was of a maximum score of 14 and overall across grades and blocks the test mean was 7.6. This indicates that the test is of medium level.

c) Science oral assessment

- A total of 5529 children were tested on Science oral assessment.
- The Science test was of a maximum score of 12 and overall across grades and blocks the test mean was 5.5 for grades 5 and 6 and 6.2 for grades 7 and 8. This indicates that the test is of medium level for grades 7 and 8, and of medium to slightly difficult level for grades 5 and 6.

d) English oral assessment

- A total of 5534 children were tested on English oral assessment.
- The English Test was of a maximum score of 52 and overall across grades and blocks the test mean was 31.4. This indicates that the test is of an easy level.

Grade wise results

- There is a grade wise progression in the Math assessment, where the overall results indicate that across the full tool and all items 43% children in grade 5, 51% in grade 6, 57% children in grade 7 and 53% children in grade 8 can solve the test items correctly.
- There is a grade wise progression in the Hindi assessment where the overall results indicate that across the full tool and all items in 50% children in grade 5, 57% in grade 6, 61% in grade 7 and 63% children in grade 8 can solve the test items correctly.
- There is a grade wise progression in the Science assessment where the overall results indicate that across the full tool and all items, 42% children in grade 5, 50% children in grade 6, 49% children in grade 7 and 53% children in grade 8 can solve the test items correctly.
- There is a grade wise progression in the Hindi assessment where the overall results indicate that across the full tool and all items in 45% children in grade 5, 51% in grade 6, 55% in grade 7 children and 60% in grade 8 can solve the test items correctly.

Block wise Results

- ✓ Math: Across blocks there is not much difference in performance, however, Sikrai shows relatively higher performance.

- Hindi: Across blocks there is not much difference in performance, however, Sikrai shows relatively higher performance.
- Science: Across blocks there is not much difference in performance, Sikrai shows relatively higher performance in grades 5, 6 and 8. Bassi shows a better performance among the four blocks in grade 7.
- English: Across blocks there is not much difference in performance, Bassi shows relatively higher performance.
- The Regression results indicate that Rajgarh's score in every subject is significantly different from either one or two of the treatment blocks, after controlling for other variables: For Hindi, its score is significantly higher than Bassi, for Math significantly higher than Bassi and Dausa, and for English and Science significantly higher than Dausa.

Summary of Regression analysis

- A child who could read the ASER Story scored significantly higher than those who could not in Hindi, Math and Science assessments.
- In the case of English assessment, children who could read sentences in the ASER English tool, performed significantly better than those who could not read the Sentences.
- Children who were at subtraction and higher levels in the ASER arithmetic tool, scored substantially higher in Math and Science assessments, as compared to children who could not solve the subtraction sum of ASER.
- Controlling for grade, older children perform considerably better only in the Hindi assessment.
- Controlling for all explanatory variables in the model, it is found that girls perform worse than boys in Math, English and Science assessments, while the effect of gender is insignificant in the Hindi assessment.
- Children learn as they proceed through grades. Children from grade 8 score the highest while those from grade 5 scored lowest.
- Children enrolled in private schools perform better than those in government schools, in all assessments.
- Children belonging to the scheduled castes (SCs) and tribes (STs) scored lower than those from the unreserved category in both English and Science assessments.
- The type of house the child lives acts as a proxy for household affluence. After controlling for all other variables associated with the child, the effect of household type on average scores is insignificant in all four assessments.
- Having reading materials (this includes newspapers, any textbook other than those provided from school), which is a proxy for the home learning environment, is positively correlated with learning levels in Hindi, English and Science.

- It was found that children with fathers have completed at least primary level of schooling, perform better in all four assessments. Children whose mothers have studied at least upto std 5 have a higher average score only in the English assessment, the effect is insignificant for the other three assessments.
- Having at least one member in the household who has completed schooling upto grade 12 led to a higher score in Hindi and English assessments (holding other things constant).

Psychometric properties of the assessment

- The Reliability coefficient of Math assessment is 0.9 which indicates that the reliability of the tool is very high. The assessment also indicates to have good validity coefficient.
- The Reliability coefficient of Hindi assessment is 0.8 which indicates that the reliability of the tool is very high. The assessment also indicates to have good validity coefficient.
- The Reliability coefficient of Science assessment is 0.7 which indicates that the reliability of the tool is high. The assessment also indicates to have good validity coefficient.
- The Reliability coefficient of English assessment is 0.9 which indicates that the reliability of the tool is very high. The assessment also indicates to have good validity coefficient.

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The Findings

I. The Program ¹

In rural India, most of the children are several grade levels behind (evidence from ASER reports²). In a typical classroom, the teacher usually teaches from the textbooks prescribed for that grade and many children miss out on the instructions. Information technology can be used to provide educational content at various levels to cater to the individual needs and interest areas of children. However, most IT related programs need trained and motivated teaching staff.

Pratham has taken an initiative named H Learning / Hybrid Learning Program. In this program, community based groups of children (in the grades 5th to 8th) are formed. They are given tablets which have offline video content on English, Math and Science along with other interesting videos.

Updated content is shared every three months. Each of the groups of children decide the time for their session during after school-hours. Since the tablet is kept in the village, venue of the session is also decided based on the group's convenience. Once a week, Pratham staff visit each village and talk to children about their progress and facilitate when there are any queries about the content. The aim of the program is to make learning fun, interesting and useful.

Detailed information on the Dausa Hybrid Learning Program design is provided in the appendix. (See Appendix A)

The Dausa H Learning program is a set of 4 Blocks which form an intensive research location of the overall H Learning Program of Pratham³. Here, the evaluation is planned to be done in all 296 villages out of which:

- 98 villages in Rajgarh where there has been no prior Pratham activity will be **Control** villages (Group-1)

There will be **three treatment** groups:

- 73 villages in Bassi where Pratham has not worked previously (Group-2)
- 66 villages in Dausa where Pratham learning camps were run in 2014-15 (Group-3)
- 57 villages in Sikrai where Pratham learning run in 2014-15 (Group-4)

The types of intervention planned in each of these 3 treatment groups have been summarized in Table 1

a. Types of interventions

There are 3 Treatment and 1 Control blocks among all 4 blocks:

- i. Bassi (T)

¹ More information about the H-learning program is available at <http://www.pratham.org/Programs/hybrid-learning>

² Annual Status of Education Report, from years 2006-2016 are available at www.asercentre.org

³ H-Learning Program of Pratham is running across selected number of blocks in Rajasthan, Maharashtra and Uttar Pradesh.

- ii. Dausa (T)
- iii. Sikrai (T)
- iv. Rajgarh (C)

In total, 2 types of interventions were planned for this control trial research - digital and print intervention which were provided at two kinds of locations i.e., school and community.

Table 1: The intervention plan

Block/ Group type	Rajgarh Control Group 1	Bassi Digital Group 2	Dausa Digital Group 3	Sikrai Print Group 4
Prior activity	None	None	LC in 2014-15	LC in 2014-15
Year 1: 2017-18				
Material	None	Digital year 1 + Print year 1	Digital year 1 + Print year 1	Print year 1
Location	None	Community	Community + School	Community
Year 2: 2018-19				
Material	None	Digital year 2 + Print year 2	Digital year 2 + Print year 2	Print year 2 + Digital year ½
Village count	98	73	66	57

Both the interventions for year 1 have been implemented in the community and have been launched in schools of selected villages.

Content details: A tablet loaded with Science, Math and English videos and print materials were provided to a group of approximately 5 children each. All the videos can be aligned with textbooks of grades 5 to 8.

In year-1: Both the digital and print interventions were given to all villages selected in Bassi and Dausa blocks where groups of children were formed by cluster resource leaders.⁴ Bassi is a new block without any prior intervention, and Dausa is an old block where Pratham has been working since 2014-15.

Only print intervention was given in Sikrai block in year-1 of the project.

In year-2: The only difference from year-1 is that digital intervention will be introduced in Sikrai block along with print.

⁴ Cluster resource leaders are team members who facilitate children in villages, in using the tablets.

b. Research questions that the Program intends to answer

Broad objective: Understanding learning improvements and behaviour in H Learning Program in a structured way. Locations and design for this evaluation have been specifically selected to answer the following questions:

- *Can digital intervention be given to children without a prior program that builds basic foundational skills? Can digital intervention replace the conventional Read India?*
- *Is a program to build foundational competencies important to run before digital intervention? Do we still need Read India along with digital interventions as a precursor?*
- *Is it better to have an intervention with both print and digital content or only a digital intervention is better? Is the digital intervention really worth?*
- *Is it better to have an Intervention both at school and community or only a community intervention better?*

II. Process

1. Assessment design

a. Objective of the assessment:

- **The main objective of conducting the Baseline Assessment** was to get an understanding about the learning levels of children (who are either studying in the grades 5 to 8 or are in the age group of 10 to 14) in subjects of English, Hindi, Science and Math.
- These children in the blocks of Bassi, Dausa and Sikrai will be a part of Digital and/or the Print learning program and Rajgarh has been considered as the control block where Pratham will not be implementing the Digital and/or Print learning program. The purpose is also to check if there is any significant difference in children's learning outcomes between the Treatment and Control blocks.
- ASER levels⁵ were duly considered before making the tools. Since the proportion of readers was high, two subjects - Hindi and Math - were administered in the regular pen and paper mode. As opposed to this, the other two subjects - English and Science - were administered orally.
- The objective was to assess them not on curriculum of their grades, rather on the common core and basics of the respective subject.
- The grade level for the common core content of assessment was kept (maximum) at grade 4 to 5 for English, Hindi and Math. For Science, grades 5 and 6 were assessed at grade 4

⁵ ASER Language, Math and English assessment was conducted in the months of March – May 2017 during the house listing process (Census visit 1). It was established that atleast ~85% children can read a std 1 level text, ~68% can do subtraction, and ~45% can do Division. There is not much difference in the learning levels across blocks.

to 5 level and grades 7 to 8 were assessed at grade 6 to 7 level. The objective behind this was to give an opportunity of solving the items correctly to even the lowest grade child of the cohort.

- There were multiple objectives behind visiting the households along with testing the child. First, to gather some household indicators. Second, to assess the child orally in two subjects within the comfort of his home. Third, to build rapport with the parents and finally, to reduce the fatigue effect by breaking the total testing time into two halves.⁶
- For oral testing, children were tested individually at home whereas for the pen and paper testing of Hindi and Math, they were tested in groups. These subjects were tested in a regular classroom type situation where children sit in groups and invigilators distribute the papers to them for reading and writing the responses. This type of testing was done in public areas of the village.⁷

b. Rationale of test administration: oral and pen and paper

The rationale for selecting the mode of administration was also that the English assessment was not of a very high difficulty, instead it was only slightly more difficult than the basic ASER English assessment. Science assessment was conducted orally because the purpose was to check whether children have knowledge of and understand certain concepts, and can recognize particular things. Both these assessments were conducted orally. Here, the focus was not on children's reading and comprehending on their own or writing, but on Recognition, Knowledge and Understanding of certain things.

Hindi is not a part of the H-Learning Content however it was assessed because Hindi has been used as a medium of transferring learning to children via print or digital methods. Most of the content in the H Learning Content is informative and hence, the Hindi text was kept informative. The overall purpose here was that children who are given some informative content in Hindi (as the medium of transferring knowledge) should be able to read and comprehend it to answer the questions pitched at Knowledge, Understanding, Interpretation and Evaluate levels.

Math assessment was focused on number recognition, operations and seeing differences when operations or numbers are given numerically versus when they are given in word problem form. Also, geometry and measurement were considered here. The usage and non-usage of vocabulary

⁶ In psychometric studies of cognitive performance that last several hours, there are two major potential influences on performance. Fatigue and loss of motivation may lead to a drop in performance while effects of practice on similar tasks can possibly help to improve results. (See, <https://www.ncbi.nlm.nih.gov/pubmed/10949903>)

⁷ A test can be called an 'individual test' in the sense that it can be administered to only one person at a time. The tests in these scales require oral responses from the examinee or necessitate that personal instructions about the materials be shared. Group test can be administered to a group of persons at a time. Group tests were designed as mass testing instruments; not only do they permit the simultaneous examination of large groups, but also use simplified instruction and administration procedures. Hence, requiring a minimum training on the part of examiner.

has been seen in the area/perimeter kind of items. ASER Math levels were the basis of construction of the math tool and the mode of administration was pen and paper as children need them to solve the items.

c. Framework of the assessment

Table 2: Baseline assessment

Subject	Method of testing	Alignment of assessment	Grade level	Key competencies assessed				
English	Oral	ASER results and H Learning program goals (Conversational English)	Below grade level 5	Letter recognition and reading	Word Recognition, Reading and Understanding	Sentence Recognition, Reading and Understanding	Sentence completion	
Science		H Learning program goals of the content and textbooks	Grade level 5 to 6 and 7 to 8	Recognition level items	Knowledge Level items	Reading and comprehension Level items		
Hindi	Pen and paper	ASER results and H Learning program goals (informative content)	Grade level 4 to 5	Reading and comprehending an informative text	Picking the right vocabulary,	Filling in the information as words	Open ended writing of answers	Judgment of concept by true or false
Math		ASER results and H Learning program goals of the content	Up to grade level 5	Numbers to Words and Words to numbers	Finding biggest number	Subtraction (number and word problems)	Division (number and word problems)	Geometry and area perimeter

d. Test (tools) development process

A systematic and step by step approach was taken to develop the assessment tools.

- Textbook mapping of Rajasthan's textbooks was done to understand what is being taught in grades 5 to 8 in Rajasthan.
- The H-Learning Content was reviewed and mapped separately to understand what was being taught. It was seen that the content was common and simple to understand for children who are in grades 5 to 8.
- Thorough discussions were held to understand what needs to be assessed in each subject and by which administration mode.

- Three rounds of piloting of the tools were conducted at the location i.e., Rajasthan to understand the quality of tools to review, edit and finalize them and also to check the feasibility and duration of the assessment.
- **English:** The English assessment tool was administered orally. For construction of the tool, ASER results were considered. The mapping work involved looking into the textbooks of Rajasthan (Dausa) as well as understanding the list of sight words (European framework) for conversational English (H Learning Program). The levels of the tool were developed to align with ASER English reading levels. In addition, there were Recognition and Understanding level items. Colorful images were used as stimulus for assessing effectively.
- **Hindi:** The Hindi assessment tool was administered as a pen and paper tool. Most of the content of H Learning is in the form of informative text. The main goal of the assessment was to check the comprehension of such texts. Also, this assessment has been made more or less in the form of a regular school type pen and paper assessment.
- **Math:** The Math assessment was administered as a pen and paper tool. For construction of the tool ASER results have been considered. The mapping work involves looking in to the text/books of Rajasthan (Dausa) as well as understanding the H-Learning content. The assessment has been constructed aligned to ASER levels and additionally to geometry and area perimeter.
- **Science:** The Science assessment tool was administered orally. For construction of the items, grades 5 to 6 were separated from grades 7 to 8. The textbook content and the H-Learning Content were utilized for assessing the children at Recognize, Knowledge and Comprehend levels. Colorful images were used as stimulus for assessing effectively.

For information on the development of the App, the training workshop and the village survey process, see Appendix B.

III. Sampling process for Dausa Baseline Assessment (Visit 2)

1. The census visit

a. HH and children visited and surveyed

Table 3: coverage of census visit

Block	Number of households visited	Number of households surveyed	Number of target children surveyed
Bassi	12,505	4,843	7,836
Dausa	18,667	6,900	10,907
Rajgarh	10,993	3,845	5,950
Sikrai	21,707	8,104	12,817
All blocks	63,872	23,692	37,510

More information about the census visit is provided in Appendix A.

The Dausa Hybrid Learning Evaluation is based on a Control-trial model, where four blocks from three districts of Rajasthan formed the focus locations of the study. Three of the blocks-Bassi (Jaipur dist.), Dausa and Sikrai (Dausa dist.) formed the **Treatment** group and Rajgarh (Alwar dist.)⁸ formed the **Control** group.

Dausa Baseline Assessment, the second visit in the study, emanated from a **Census** (visit-1) that was undertaken in the four locations to understand their demography, socio-economic structure and the basic learning levels (as per the ASER testing tool). The census was conducted between March and May 2017.

The census focused on children in grades 4 to 8 (in the academic year 2016-17) or in the age group of 10-14 years (applicable for children not enrolled in school). During the census visit, a total of 33,396 children were assessed on the ASER tools.

Post the census, the **Group Allocation process** was conducted between July and August 2017 to initiate the H Learning Program in the three treatment blocks. The H Learning Program is run by Pratham for children enrolled in grades 5 to 8. The Program is based on increments in learning

⁸ 74 villages of Bassi, 66 villages of Dausa, 57 villages of Sikrai and 99 villages of Rajgarh were covered in the census.

brought about by studying in groups using technological mediums. Thus, during the group allocation process of the Dausa H learning evaluation, children in grades 5 to 8 (as per academic year 2017-18)⁹ enlisted through the census process were assigned groups. However, the Control block remained untouched.

The **Dausa Baseline Assessment** (visit-2) covers in 73 villages in Bassi, 66 villages in Dausa, 98 villages in Rajgarh and 57 villages in Sikrai.¹⁰ The sampling process of this visit included all children enrolled in grades 5 to 8 and tested on the ASER tool (during the census visit or the in the group allocation process) as its base from all four blocks¹¹. An additional condition of sampling those enrolled in the H-learning Program was placed for the 3 treatment blocks¹². Thus, following the Simple Random Sampling (SRS) strategy, sampling was done from 22,176 children in the Treatment group and 4,141 children in the Control group.

In the sampling process, 7 children from each of the 4 grades in a village were randomly selected, making a total sample size of 28 children per village. In villages with less than 7 children per grade, all children of the grade formed part of the sample for the Baseline Assessment. Out of the 7 children sampled per grade in a village, only 5 were tested. An excess of 2 children was kept considering possible unavailability of children and/or their refusal to be tested.

IV. Dausa Baseline Assessment: main findings

Table 4: Number of villages visited, block wise

Block	Type	No. of villages
Bassi	Treatment	73
Dausa	Treatment	66
Rajgarh	Control	98
Sikrai	Treatment	57
Total		294

⁹ During the census, children in grades 4 through 8 (as per academic year 2016-17) were the focus group, however, during the grouping process for the H-learning Program, the then grade 8 (or the grade 9 as per the academic year 2017-18) were dropped as they had ceased in the ambit of the H-learning Program.

¹⁰ The Baseline Assessment was short of two villages. One village, **Kankwari** of Rajgarh was dropped post the census visit due to lack of testing data. Second village, **Badhcharanwas** of Bassi was dropped in the grouping process because there were only two children fitting in our Program.

¹¹ These conditions were placed in order to compare performance in the Baseline Assessment with their basic learning levels.

¹² Additional condition of evaluating the impact of the intervention was placed on the treatment group (through the H-learning Program) with the control group.

The Baseline Assessment was conducted in 294 Villages. However, with reference to the Census Number of Villages, it was short of two villages.¹³

1. Sample description

Table 5: Total tested children, block wise and grade wise

Location		Total children (Nos.) by Grade			
Block	No. of villages	Grade 5	Grade 6	Grade7	Grade 8
Bassi	73	470	474	481	487
Dausa	66	460	459	451	451
Rajgarh	98	537	543	540	565
Sikrai	57	396	397	396	399
Total	294	1863	1873	1868	1902

- Per village and per grade, the ideal sample size that was expected to be tested was 5 children, so the total children found in each grade are approx. 1850 to 1900.
- In each block, the total number of children across grades depends on the number of villages. Sikrai block has the least number of villages, hence, the number of sampled children is smaller

¹³ See footnote no. 9

Table 6: Total tested children, block, grade and subject wise

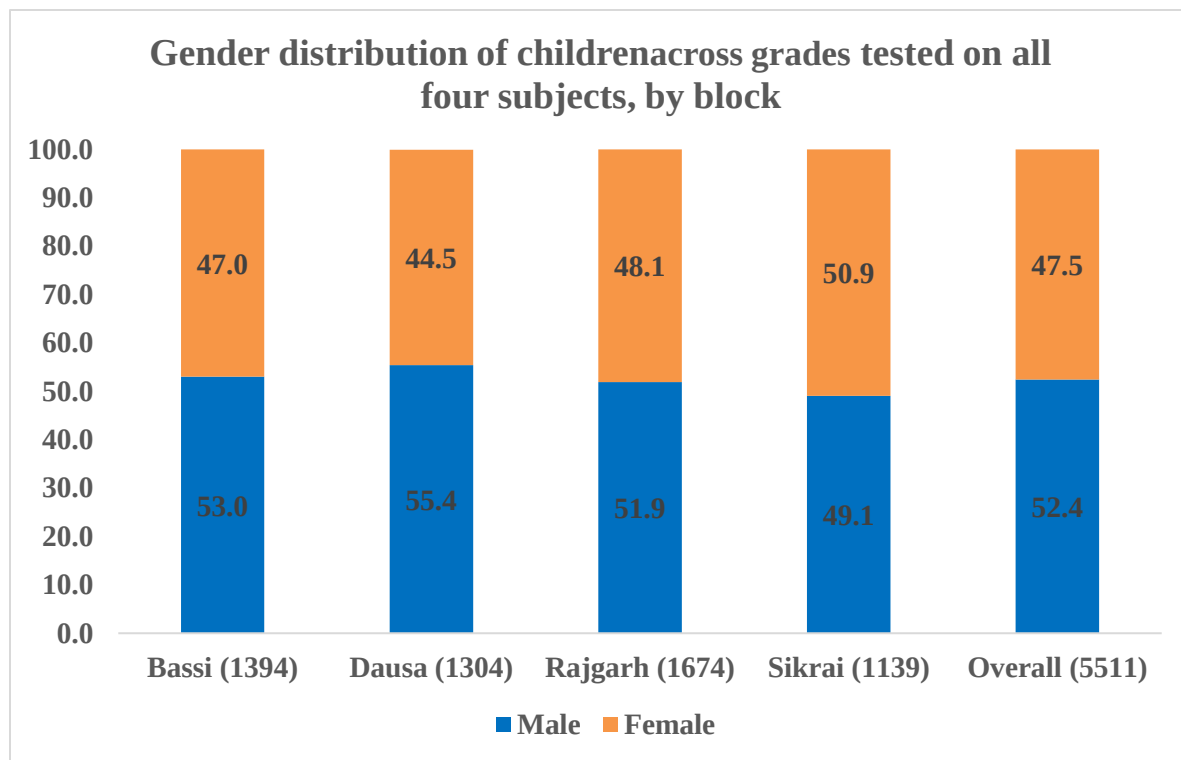
No. of children by grade and subject																	
Mode of testing		Pen and paper		Oral		Pen and paper		Oral		Pen and paper		Oral		Pen and paper		Oral	
Location		Hindi	Math	Science	English	Hindi	Math	Science	English	Hindi	Math	Science	English	Hindi	Math	Science	English
Block	No. of villages	Grade 5				Grade 6				Grade 7				Grade 8			
Bassi	73	337	337	337	338	348	348	348	348	349	350	349	349	360	360	361	361
Dausa	66	329	331	332	332	328	328	328	328	327	327	328	328	322	322	324	325
Rajgarh	98	409	409	407	407	415	415	417	417	416	416	415	416	438	438	438	438
Sikrai	57	283	282	283	283	288	288	291	291	284	284	284	285	286	286	288	288
Total	294	1358	1359	1359	1360	1379	1379	1384	1384	1376	1377	1376	1378	1406	1406	1411	1412

- There is little difference between the number of tested children and the number of children expected to be tested. Overall, it can be said that nearly 100% of children supposed to be tested, were tested in all four subjects in all blocks.
- In grade 6 and 8, small difference can be seen between pen and paper and oral, which can be attributed majorly to child's unavailability or refusal of further testing by children or parents etc.
- Overall, it can be seen that 99.7 % children have been tested across blocks. Details are mentioned in the Table 7.

Table 7: Average number and percentage of tested children across subjects

Blocks	Number of villages	Expected Number to be tested	English	Science	Math	Hindi	Average number of children tested in blocks	Average percentage of children tested in Blocks
Bassi	73	1408	1396	1395	1395	1394	1395	99.1
Dausa	66	1311	1313	1313	1308	1306	1310	99.9
Rajgarh	98	1687	1678	1678	1678	1678	1678	99.5
Sikrai	57	1139	1147	1147	1140	1141	1144	100
Overall	294	5545	5534	5533	5521	5519	5527	99.7
* Expected number of children is naturally less than the formula based calculation, due to unavailability of the children. (Formula based calculation means Number of villages × 5 children × 4 grades per block.								

Fig 1: Gender distribution of the tested children across grades, by block



- The proportion of boys is highest in Dausa, as compared to other blocks.
- The proportion of girls is highest in Sikrai, as compared to other blocks.
- There is not much difference in the boy:girl ratio across all the blocks.

Table 8: Schooling status of tested children, by block

Total (N)=5607		Enrollment distribution				Not enrolled/ out of school	
	Overall Enrollment	Boys		Girls			
Blocks		Govt.	Pvt.	Govt.	Pvt.	Boys	Girls
Bassi	99.6	52.7	47.2	69.9	30.0	0.5	0.3
Dausa	100	49.8	50.2	69.9	30.1	0	0
Rajgarh	99.8	52.8	47.1	72.0	28.0	0.2	0.1
Sikrai	100	54.3	45.3	74.1	25.2	0	0
Overall	99.8	52.4	47.5	71.5	28.3	0.2	0.1
*Bassi and Rajgarh have 0.1% boys in Other type of school, Bassi has 0.2% girls in Madarsa, Sikrai has 0.2% Boys and 0.3% Girls in Madarsa category.							

- The proportion of children not enrolled anywhere is very low in Bassi and Rajgarh. There are no such children in Dausa and Sikrai, within the group of tested children.
- The proportion of girls is higher in government schools as compared to the proportion of boys, across all blocks. Sikrai shows the highest proportion, followed by Rajgarh, Bassi and Dausa, respectively.
- Similarly, the proportion of boys is higher in private schools as compared to the proportion of girls across, all blocks.

2. Household characteristics in Dausa Baseline

Table 9: Distribution of open households as per reservation category

Block	(N)open HH	Reservation category				
		UR	ST	SC	OBC	EBC
Bassi	1165	19.7	39.7	23.4	17.2	0.2
Dausa	1174	8.5	34.3	24.9	31.9	0.3
Rajgarh	1393	8.8	36.9	18.4	35.8	0.1
Sikrai	1070	8.5	28.6	28.8	34.1	0.0
Total	4802	11.3	35.1	23.5	30.0	0.2

- Rajgarh has the highest number of households because of a higher number of villages, i.e., 98.
- Across all blocks, the highest proportion of people belong to the ST category.
- The highest % of UR (Unreserved) and ST (Schedule Tribe) category households are in Bassi block.
- The highest % of SC (Schedule Caste) and OBC (Other Backward Class) households is in Sikrai and Rajgarh block, respectively.

Table 10: Household indicators with positive response

Block	Open houses (No.)	Pucca houses (%)	Toilet (%)	Electricity connection (%)	Electricity available on the day of the visit (%)	TV (%)	Cable TV (%)	Purchase newspaper (%)	Reading materials other than school textbooks (%)	At least 1 person has completed XII (%)	At least 1 person knows how to use a computer (%)	Mobile phone (%)	2 wheeler (%)	4 wheeler (%)
Bassi	1165	80.5	80.3	90.7	70.4	67.7	77.2	25.2	38.1	47.3	29.2	99.1	72.5	11.1
Dausa	1174	81.9	69.1	88.8	88.0	45.1	85.4	8.8	27.1	36.8	17.8	98.7	58.5	12.9
Rajgarh	1393	89.6	57.3	79.6	77.9	46.2	61.0	9.0	25.1	32.2	15.9	93.7	58.2	10.0
Sikrai	1070	81.8	70.8	92.5	85.6	54.4	53.4	6.8	22.0	41.1	22.6	99.8	57.8	7.7
Total	4802	83.8	68.8	87.4	80.3	80.3	69.4	12.4	28.1	39.0	21.1	97.6	61.6	10.4

- **Infrastructure:** Across all blocks, an average of 84% households are pucca. However, Rajgarh block has 90% pucca households. Across all the blocks on an average 69% of households have toilet facilities. However, within the Blocks Rajgarh has only 57% households with toilets.
- **Facilities:** Across all blocks, around 87% households have an electricity connection. Out of these, 80 % had electricity available on the day of visit. Similarly, 5% households have television and out of these households, 69% have a cable connection. For all blocks, Almost 98% of households have a mobile phone, 62% have a 2-wheeler and only 10% households have a 4-wheeler.
- **Reading and Education:** Overall, only 12% households purchase a newspaper and 28% households have reading materials other than school textbooks. Similarly, there are 39% households which have at least 1 person who has completed XIIth and 21% households with at least 1 person who knows how to use a computer.

Testing

a. Baseline assessment (visit 2): Math.

The Math assessment had 10 items and was administered by pen and paper mode. It was administered The test was composed of items on Understanding of numbers, Subtraction, Division, Word problems, Geometry and Area Perimeter. The tool had two comparable samples for testing.

Table M.1: Framework of the math assessment

Items	Cognitive Level	Description
mat_q1a	Write numbers from number names	Hundreds
mat_q1b		Thousands
mat_q1c		Lakhs
mat_q2a	Write the biggest number	Three digits
mat_q2b		Four digits
mat_q3a	Subtraction	2 by 2 digit
mat_q3b		3 by 3 digit
mat_q4a	Division	2 by 1 digit
mat_q4b		3 by 1 digit
mat_q5	Subtraction word problem	3 by 3 digit
mat_q6	Division word problem	3 by 1 digit
mat_q7	Choose geometrical shape	Multiple Choice
mat_q8	Perimeter	With the usage of the term “Perimeter”
mat_q9	Choose angle	Multiple choice
mat_q10	Perimeter word problem	Without the usage of the term “Perimeter”

(i). Number of children tested

Table M.2 : Number of children tested, block and grade wise

Grades	Block				Total of grades
	Bassi	Dausa	Rajgarh	Sikrai	
5	337	331	409	282	1359
6	348	328	415	288	1379
7	350	327	416	284	1377
8	360	322	438	286	1406
Total of blocks	1395	1308	1678	1140	5521

(ii). Test mean

The math test was of a maximum score of 15. Table M.3 indicates the mean scores out of 15, for math.

Table M.3: Mean scores, block and grade-wise

Grade	Block				Overall of grades
	Bassi	Dausa	Rajgarh	Sikrai	
5	6.4	6.2	6.4	7.0	6.4
6	7.7	7.6	7.4	7.8	7.6
7	8.4	8.7	8.4	8.5	8.5
8	8.6	9.1	8.9	9	8.9
Overall of blocks	7.8	7.9	7.8	8.0	7.9

Table M.3 shows a clear progression in performance with grade. While there is little difference in the Mean scores across blocks, Sikrai shows a relatively higher performance in the Math Assessment.

The overall mean score of 7.9 out of 15 indicates an average percentage score of 52.7%, implying that the tool was of medium difficulty.

(iii). Performance of Children

- Comparison Across Blocks

Table M.4 : Item-wise performance at the block level

Items	Level	Description	Bassi	Dausa	Rajgarh	Sikrai	Overall
mat_q1a	Write from words to numbers	Hundreds	68.2	67.6	69.1	71.8	69.1
mat_q1b		Thousands	54.9	57.7	57.5	58.0	57.0
mat_q1c		Lakhs	19.4	19.8	20.6	21.4	20.3
mat_q2a	Write the biggest number	3-digit numbers	79.1	81.5	78.2	79.5	79.5
mat_q2b		4-digit numbers	48.0	53.0	49.1	50.7	50.1
mat_q3a	Subtraction	2 by 2 digit	74.2	76.2	75.7	78.1	76.0
mat_q3b		3 by 3 digit	67.0	70.7	67.7	69.2	68.6
mat_q4a	Division	2 by 1 digit	51.1	57.5	54.5	60.7	55.6
mat_q4b		3 by 1 digit	48.1	51.6	50.0	55.0	50.9
mat_q5	Subtraction word problem	3 by 3 digit	54.8	59.3	53.4	60.8	56.7
mat_q6	Division word problem	3 by 1 digit	29.8	32.3	32.5	37.1	32.7
mat_q7	Choose geometrical shape		62.7	57.2	58.9	60.3	59.7
mat_q8	Perimeter	With the usage of the term "Perimeter"	39.4	31.4	32.9	33.1	34.2
mat_q9	Choose angle		45.0	37.2	41.5	35.5	40.1
mat_q10	Perimeter word problem	Without the usage of the term "Perimeter"	38.8	35.0	36.0	37.5	36.8
Overall			52.0	52.5	51.8	53.9	52.5

The key trends observed from table M.4 are:

- There is not much difference in performance across blocks but Sikrai shows a relatively high performance. Out of 15 items, Sikrai is a high performer on 8 items, Dausa on 3 items and Bassi on 4 items.
- Only 20.3% children are able to correctly write the number from words with a place value of Lakhs, making the item the most difficult. 79.5% children are able to write the biggest number from the given three-digit numbers, making this item the easiest.
- A declining trend in performance is observed for writing numbers from words as the place value increases. Similarly, ability to write the biggest number, from the given set of numbers, increases as the digits in the numbers increase.
- 76% children can solve a 2 by 2-digit subtraction and 69% can solve a 3 by 3-digit subtraction. However, the performance drops to 57% when a 2 by 2-digit subtraction is contained in a word problem.
- 55.6% children can solve a 2 by 1-digit division and 51% can solve a 3 by 1-digit division. However, only 33% can solve a word problem containing a 3 by 1-digit division.
- Identifying a particular geometrical shape is easier than identifying a particular angle.
- Performance on word problem on perimeter with the reference to the term “Perimeter” is poorer than performance on word problem on perimeter without any reference to the term. This is visible in 3 blocks- Dausa, Rajgarh and Sikrai.

- Comparison across grades

Table M.5: Item-wise performance at the grade level

Items	Assessable competency	Description	Grade 5	Grade 6	Grade 7	Grade 8	Overall
mat_q1a	Write from words to numbers	Hundreds	62.2	66.7	72.6	75.2	69.2
mat_q1b		Thousands	46.1	55.2	62.2	64.3	57.0
mat_q1c		Lakhs	13.1	16.9	25.1	25.9	20.3
mat_q2a	Write the biggest number	Hundreds	70.1	77.5	84.0	86.4	79.5
mat_q2b		Thousands	42.4	46.5	54.5	57.2	50.1
mat_q3a	Subtraction	2 by 2 digit	70.9	77.8	77.9	77.5	76.0
mat_q3b		3 by 3 digit	63.0	65.9	72.1	73.6	68.6
mat_q4a	Division	2 by 1 digit	46.0	54.0	59.8	63.8	55.9
mat_q4b		3 by 1 digit	40.7	49.3	54.0	60.4	51.1
mat_q5	Subtraction word problem	3 by 3 digit	47.7	57.3	59.7	63.4	57.0
mat_q6	Division word problem	3 by 1 digit	23.8	31.2	35.4	41.1	32.9
mat_q7	Choose geometrical shape		46.6	56.4	65.9	69.8	59.7
mat_q8	Perimeter	With the usage of the term “Perimeter”	22.2	34.0	39.4	41.0	34.1
mat_q9	Choose angle		27.3	38.4	45.7	47.6	39.7
mat_q10	Perimeter word problem	Without the usage of the term “Perimeter”	24.6	34.1	42.7	45.6	36.7
Overall			43.1	50.7	56.7	59.5	52.5

The following are the key trends observed across the various assessed grades.

- A grade-wise progression in performance can be observed clearly in table M.5. Grade 8 shows the best performance in every item.
- Within a grade, a declining trend is observed in the items on writing numbers from words (number names). With increase in place value - from hundreds to lakhs - the items become more difficult. Even in grade 8, less than 26% children can write numbers from words of place value of lakhs.
- Similarly, in writing the largest number from among a set of numbers, children found the task easy when the numbers had 3 digits but the item becomes one of medium difficulty as the number of digits increases to 4. This is observable within every grade.
- 63% children in grade 8 can solve a subtraction word problem and 41% can solve a division word problem whereas children in grades 5 and 6 find the division word problem relatively difficult.
- Identifying a particular geometrical shape was found to be easier than identifying a particular type of angle. This is observed within grades and across grades. Performance on both items increases with grade.
- In grades 5, 7 and 8, the results are better on the perimeter item where there is no reference to the term “perimeter” but this difference is not visible in grade 6.

b. Baseline Assessment (visit 2): Hindi

The Hindi assessment was administered via pen and paper mode and had 14 items. The test required the child to read an informative text and answer the comprehension items based on the former. The test assessed children on understanding of the text and identifying the correct meaning of the terms from the text, classification of terms, writing open ended response to an item and, evaluating and identifying the true and false statements. The assessment was administered at a common location in the village.

Table H.1: Framework of the Hindi assessment

Items	Cognitive level	Description
hin_q1 ¹⁴ a	Knowledge	Match word with appropriate meaning
hin_q1b		Match word with appropriate meaning
hin_q1c		Match word with appropriate meaning
hin_q1d		Match word with appropriate meaning
hin_q1e		Match word with appropriate meaning
hin_q2 ¹⁵ a	Understand	Fill in the blanks
hin_q2b		Fill in the blanks
hin_q3 ¹⁶ a	Understand (Classify)	Categorization of terms basis understanding of text
hin_q3b		Categorization of terms basis understanding of text
hin_q4 ¹⁷	Apply	Open ended
hin_q5 ¹⁸ a	Evaluate	True False
hin_q5b		True False
hin_q5c		True False
hin_q5d		True False

(i). Number of children tested**Table H.2: Number of children tested block and grade-wise**

Grades	Block				Total
	Bassi	Dausa	Rajgarh	Sikrai	
5	337	329	409	283	1358
6	348	328	415	288	1379
7	349	327	416	284	1376
8	360	322	438	286	1406
Total	1394	1306	1678	1141	5519

¹⁴ Question 1 had five sub-parts (a-e), the question was knowledge level item, where in the child was required to match the words with their appropriate meaning.

¹⁵ Question 2 had two sub-parts (a-b), where in the child was required to complete statements with the appropriate words from the text.

¹⁶ Question 3 had two sub-parts (a-b) where in the child was to classify various food under vegetarian and non-vegetarian (in sample 1 of the testing tool) and various water sources under surface water and ground water sources. The child could pick terms from the text or based on his knowledge.

¹⁷ Question 4 was an open-ended item.

¹⁸ Question 5 had four sub-parts (a-d) where in the child was to mark a statement as 'True' or 'False' based on his evaluation of the text.

(ii). Test mean

The Hindi Test was of a maximum score of 14. Table H.3 indicates the mean score out of 14.

Table H.3: Mean Scores block and grade-wise

Grade	Block				Overall of grades
	Bassi	Dausa	Rajgarh	Sikrai	
5	6.4	6.0	6.0	6.5	6.2
6	7.5	7.0	6.7	7.4	7.1
7	8.2	8.6	8.2	8.1	8.3
8	8.6	9.5	8.5	9.0	8.8
Overall of blocks	7.7	7.8	7.4	7.8	7.6

Again, performance increases with grade. The mean scores do not vary much across blocks, however, Rajgarh shows a relatively low performance on the Hindi assessment.

The overall mean score of 7.6 out of 14 indicate an average percentage score of 54.3% implying the tool was of medium difficulty.

(iii). Performance of Children

- Comparison across blocks

Table H.4: Item wise performance at the block level

Items	Blocks				Overall of the blocks
	Bassi	Dausa	Rajgarh	Sikrai	
q1a	65.2	68.5	63.7	65.4	65.5
q1b	52.4	51.8	49.7	53.6	51.7
q1c	48.6	48.9	45.5	48.8	47.8
q1d	45.8	44.8	42.1	46.6	44.6
q1e	48.7	45.9	44.2	48.5	46.6
Q1 overall	52.1	52.0	49.0	52.6	51.2
q2a	73.5	73.4	73.4	70.9	71.8
q2b	49.4	47.5	46.4	48.6	47.9
Q2 overall	61.5	60.5	59.9	59.8	59.9
q3a	54.5	52	51.6	55.9	53.3
q3b	55.8	55.3	52.6	56	54.7
Q3 overall	55.2	53.7	52.1	56.0	54.0
q4	45.5	48.4	41.7	51.3	46.2
q5a	61	63.6	62.5	60.9	62
q5b	71.6	71.2	67.8	74.6	71
q5c	48.2	52.6	51.6	49.2	50.5
q5d	47.2	52.5	48.2	45.2	48.3
Q5 overall	57.0	60.0	57.5	57.5	58.0

The key findings from Table H.4 are:

- Across blocks, there is not much variation in performance on the items. However, it can be seen from that children from Sikrai have performed relatively high on most of the items.
- Item q2a required a child to complete a statement with the correct term from the text. It is the easiest item whereas item q1d required a child to match the correct meaning and is the most difficult item.
- From the point of view of assessable competency, the easiest question was q5, where a child had to evaluate and identify if the given statement is ‘True’ or ‘False’. The most difficult item is q4, the open-ended item.
- Comparison across grades

Table H.5: Item wise performance at the grade level

Items	Grades				Overall of grades
	5	6	7	8	
q1a	58.3	60.4	70.7	72.5	65.5
q1b	42.3	47.3	57.2	59.6	51.7
q1c	41.2	45.1	50.5	54.1	47.8
q1d	36.6	38.1	49.8	53.6	44.6
q1e	37	43.6	50	55.6	46.6
Q1 overall	43.1	46.9	55.6	59.1	51.2
q2a	57	69	77.3	83.6	71.8
q2b	33.7	42.7	55.2	59.5	47.9
Q2 overall	45.3	55.8	66.3	71.6	59.9
q3a	43.6	47	57.3	64.9	53.3
q3b	41.9	49.4	60.1	67.1	54.7
Q3 overall	42.7	48.2	58.7	66	54.0
q4	27	40	56.4	61	46.2
q5a	53.3	61.9	64.7	68.1	62.0
q5b	62.5	68.6	73	79.5	71.0
q5c	42.8	51.4	54.2	53.3	50.5
q5d	42.5	47.6	51.2	51.9	48.3
Q5 overall	50.3	57.4	60.8	63.2	57.9

The key findings at the grade level from Table H.5 are:

- There is a clear progression in performance with grade and a significant difference in performance is observed between grades 5 and 8.
- With reference to assessable competencies, the most difficult item is q4, the open-ended item in the tool. The item is a very difficult item for grade 5, with only 27% correct respondents but for grade 8, it is a medium difficulty item with 61% correct respondents. For grade 8, q4 is not the item with the worst performance on.
- The test results indicate that children of lower grades find vocabulary development, inferring meaning of words, writing responses in their own words very difficult as compared to understanding the text and picking responses from the text directly or indirectly. Also, understanding of the text increases as the grades progress.

c. Baseline assessment (visit 2): Science

The Science assessment was an oral assessment and had 12 items. Two sets of tools were developed for two grades groups; group A comprised of children in grades 5 and 6 and group B comprised of children in grades 7 and 8. The tool for group A was based on topics like water, food, human body, substances and solar system. The tool for group B was based on topics like light, energy, human body, substances, electricity and solar system. Six items, from human body and solar system, were common in the tools for both groups. Items assessed recognition, knowledge and understanding of key concepts from these topics. This was done to maintain the comparability of the tools. The tool was a colored booklet for the child to look at, and answer according to the questions asked by the surveyor.

Table S.1: Framework of the Science assessment

Items	Cognitive level	Items: grade 5-6	Items: grade 7-8
sci_q1	Recognize	कौनसा जीव पानी में नहीं रहता	कौनसी वस्तु पारदर्शी है
sci_q2	Recognize	कौनसा जीव मांस खाता है	सौर उर्जा कौनसा है
sci_q3	Knowledge	रक्त परिसंचरण तंत्र	रक्त परिसंचरण तंत्र
sci_q4	Understand	पोषक तत्व समूह	प्राकृतिक एवं कृत्रिम प्रकाश स्रोत
sci_q5	Understand	घुलनशील- अघुलनशील	अधिक उर्जा किसमे खर्च हुई
sci_q6	Knowledge	कंकाल तंत्र हड्डियों के नाम	कंकाल तंत्र हड्डियों के नाम
sci_q7	Understand	रिक्त स्थान- अनीमिया	रिक्त स्थान - प्रकाश मार्ग
sci_q8	Understand	गलती सुधर - पानी बर्फ प्रक्रिया	विद्युत् उर्जा के दो रूप
sci_q9	Understand	पाचन तंत्र रिक्त स्थान	पाचन तंत्र रिक्त स्थान
sci_q10	Knowledge	सौर मंडल प्र.1	सौर मंडल प्र.1
sci_q11	Understand	सौर मंडल प्र.2	सौर मंडल प्र.2

sci_q12	Understand	सौर मंडल प्र.3	सौर मंडल प्र.3
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**The highlighted cells indicate the items common to the tools for both groups.*

(iv). Number of children tested

Table S.2: Number of children tested block and grade-wise

Grades	Block				Total of grades
	Bassi	Dausa	Rajgarh	Sikrai	
5	337	332	407	283	1359
6	348	328	416	291	1383
7	349	328	415	284	1376
8	361	324	438	288	1411
Total of blocks	1395	1313	1678	1147	5529

(v). Test mean

The science test was of a maximum score of 12. Table S.3 indicates the mean scores out of 12.

Table S.3: Mean Scores block-wise and grade-wise

Grade	Block				Overall of grades
	Bassi	Dausa	Rajgarh	Sikrai	
5	5.3	4.7	4.3	5.5	5
6	6.2	5.7	5.7	6.4	6
Overall of blocks	5.8	5.2	5.0	6.0	5.5
7	6.1	5.6	6	5.9	5.9
8	6.6	6	6.4	6.7	6.4
Overall of blocks	6.4	5.8	6.2	6.3	6.2

There is a clear grade-wise progression in the mean scores, while there is not much variation across blocks. Both Sikrai and Bassi have the same overall mean score.

The overall mean scores of 5.5 for grades 5 and 6, and 6.2 for grades 7-8, out of 12, indicate average percentage scores of 45.8% and 51.7%, respectively. This implies that for higher-grade

groups, the test was of medium difficulty whereas for the lower grade group, it was medium to slightly difficult.

(vi). Performance of children

- Grades 5 and 6

Table S.4: Item wise performance at the block and grade level

Item	Item description	Grade 5					Grade 6				
		Bassi	Dausa	Rajgarh	Sikrai	Overall of blocks	Bassi	Dausa	Rajgarh	Sikrai	Overall of blocks
Sci_q1	कौनसा जीव पानी में नहीं रहता	95.6	94.9	93.9	98.2	95.7	98.6	98.5	96.4	98.3	98.0
Sci_q2	कौनसा जीव मांस खाता है	67.4	71.7	71.5	71.7	70.6	76.4	73.8	77.6	77.7	76.4
Sci_q3	रक्त परिसंचरण तंत्र	24	17.2	21.1	20.1	20.6	28.2	20.4	27.9	30.9	26.9
Sci_q4	पोषक तत्व समूह	22.9	9.9	13	18	16.0	24.1	16.8	21.6	25.4	22.0
Sci_q5	घुलनशील – अघुलनशील	52.8	39.8	44.7	53.4	47.7	62.6	58.2	57.9	60.5	59.8
Sci_q6	कंकाल तंत्र हड्डियों के नाम	43.6	36.8	39.3	48.8	42.1	50.3	46.3	48.6	57	50.6
Sci_q7	रिक्त स्थान – अनीमिया	30.9	22.6	23.1	30.4	26.8	35.9	29.6	31	39.2	33.9
Sci_q8	गलती सुधार - पानी बर्फ प्रक्रिया	66.5	62.7	49.4	67.8	61.6	75.3	70.7	60.6	74.6	70.3
Sci_q9	पाचन तंत्र रिक्त स्थान	15.4	4.8	4.9	12.7	9.5	17.8	7	12.5	21.7	14.8

Sci_q10	सौर मंडल प्र.1	46.3	46.4	34.9	44.2	43.0	56	57	45	53.3	52.8
Sci_q11	सौर मंडल प्र.2	30.3	35.2	27.5	38.5	32.9	45.1	48.8	43	50.5	46.9
Sci_q12	सौर मंडल प्र.3	37.4	31.9	30.2	41.7	35.3	48.6	43	44.7	51.9	47.1

The key findings of the science assessment for grades 5 and 6 are:

- Across blocks, there is not much variation in performance on each item; however, Sikrai shows a relatively better performance with the highest performance in 9 out of 12 items of the tool.
- Recognition level items are easier followed by knowledge and understand level items.
- The easiest item for this group is the ‘recognize’ level item from the topic of water, with an average of 97% correct responses across all blocks. The most difficult item in the tool is the ‘understand’ level item on the topic of human body, with only 12% correct responses.
- In each item, with an increase in grade, a progression in performance is observed.

• Grades 7 and 8

Table S.5: Item wise performance at the block and grade level

Item	Item description	Grade 7					Grade 8				
		Bassi	Dausa	Rajgarh	Sikrai	Overall of blocks	Bassi	Dausa	Rajgarh	Sikrai	Overall of blocks
Sci_q1	कौनसी वस्तु पारदर्शी है	77.9	67.7	69.2	70.1	71.2	77	64.2	71	75	71.8
Sci_q2	सौर उर्जा कौनसा है	85.1	84.5	88	86.6	86.1	90.9	88	91.1	88.2	89.6
Sci_q3	रक्त परिसंचरण तंत्र	33	34.5	36.4	29.6	33.4	39.1	38.9	41.3	39.6	39.7
Sci_q4	प्राकृतिक एवं कृत्रिम प्रकाश स्रोत	48.7	43	54.5	43.7	47.5	54	49.4	50	52.4	51.5
Sci_q5	अधिक उर्जा किसमे	49.3	26.5	35.2	39.4	37.6	52.6	29.9	40.4	45.8	42.2

	खर्च हुई										
Sci_q6	कंकाल तंत्र हड्डियों के नाम	69.3	64.6	63.9	60.2	64.5	72.6	71.9	72.6	76	73.3
Sci_q7	रिक्त स्थान - प्रकाश मार्ग	42.7	36.3	37.6	37.3	38.5	45.2	38.9	44.8	47.9	44.2
Sci_q8	विद्युत् उर्जा के दो रूप	37.8	32.9	40.5	41.6	38.2	44.9	42.3	45	50	45.6
Sci_q9	पाचन तंत्र रिक्त स्थान	18.9	9.8	14.7	19	15.6	22.4	10.2	17.6	27.8	19.5
Sci_q10	सौर मंडल प्र.1	54.7	51.2	51.8	50	51.9	55.1	55.3	49.3	54.2	53.5
Sci_q11	सौर मंडल प्र.2	42.7	55.2	48.4	58.5	51.2	48.5	53.4	54.3	52.1	52.1
Sci_q12	सौर मंडल प्र.3	51.6	53.1	59.3	55.6	54.9	59.6	56.8	60.3	59.4	59.0

The key findings of the Science Assessment for grades 7 and 8 are:

- Bassi shows a better performance among the four blocks in grade 7, and Sikari shows a better performance in grade 8.
- Recognition level items are easier, followed by knowledge and understand level items.
- The ‘recognize’ level item on solar system is the easiest item for both grades with 88% correct respondents on an average. The most difficult item in the entire tool is the ‘understand’ level item from human body with only 17% correct respondents on an average.
- On all items, grade 8 out performs grade 7 with an exception in Dausa, where grade 7 shows a better performance than grade 8.

• Grade wise comparison on Anchor Items

The Science assessment had six anchor items in the tools of both grade groups. These items were from the common topics- human body and solar system. Table S.6 depicts a grade wise comparison of the performance on these items.

Table S.6: Grade wise comparison of Anchor Items

Item	Item Description	5	6	7	8
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Sci_q3	रक्त परिसंचरण तंत्र	20.6	26.9	33.4	39.7
Sci_q6	कंकाल तंत्र हड्डियों के नाम	42.1	50.6	64.5	73.3
Sci_q9	पाचन तंत्र रिक्त स्थान	9.5	14.8	15.6	19.5
Sci_q10	सौर मंडल प्र.1	43.0	52.8	51.9	53.5
Sci_q11	सौर मंडल प्र.2	32.9	46.9	51.2	52.1
Sci_q12	सौर मंडल प्र.3	35.3	47.1	54.9	59.0

d. Baseline Assessment (visit 2): English

The English test was an oral assessment that assessed children on competencies to recognize, read, listen and comprehend letters, words and sentences. The tool had two comparable samples for testing. A one-on-one assessment, the test was conducted within the comfort of a child's home.

Table E.1: Framework of English assessment

Level	Recognize			Read			Listen	Comprehend and tell meaning
Letter	Capital letters		Small letters	Capital letters		Small letters		
Words	2 letter words	3 letter words	4 letter words	2 letter word	3 letter word	4 letter word		
Sentences	Sentence recognition			Sentence/paragraph reading			Listening to sentence/ paragraph	Answer questions based on the sentence/para
								Read the sentences, fill in the blanks (preposition/ verb/ noun) and tell meaning

- Number of children tested

Table E.2: Number of children tested, block and grade-wise

Grades	Blocks				Total of grades
	Bassi	Dausa	Rajgarh	Sikrai	
5	338	332	407	283	1360
6	348	328	417	291	1384
7	349	328	416	285	1378
8	361	325	438	288	1412
Total of blocks	1396	1313	1678	1147	5534

(vii). Test mean

The English Test was of a maximum score of 52. Table E.3 indicates the mean scores out of 52 for English.

Table E.3: Mean score block and grade-wise

Grade	Block				Overall of grades
	Bassi	Dausa	Rajgarh	Sikrai	
5	28.2	27.7	26.8	28	27.6
6	31.8	30.9	29.8	30.9	30.8
7	33.3	32.6	32.5	31.9	32.6
8	34.9	33.9	34.1	35.1	34.5
Overall of blocks	32.1	31.3	30.9	31.5	31.4

There is a clear progression in results with grade. While there is not much difference in the Mean score across blocks, Bassi performs relatively higher in grades 5 through 7 and in grade 8 Sikrai shows the highest performance. Rajgarh seems to be the lowest here.

The overall Mean score of 31.4 out of 52 indicates an average percentage score of 60.4%, implying that the tool had a difficulty level between being medium and easy.

(viii). Performance of Children

- Comparison Across Blocks

Table E.4: Item-wise performance at the block level

Cognitive Level	Description	Bassi	Dausa	Rajgarh	Sikrai	Overall
Capital letter recognition	5 letters	97.0	96.4	96.9	97.2	96.9
Small letter recognition	5 letters	95.1	94.4	94.7	94.7	94.8
Word recognition	2 letter words	84.5	85.0	81.6	85.9	84.0
	3 letter words	79.2	79.7	77.1	80.1	78.9
	4 letter words	75.9	77.5	70.4	73.6	74.1
Sentence recognition	Overall of 2 sentences	78.3	80.7	75.5	74.3	77.2
Capital letter reading	5 letters	97.0	96.1	96.2	96.9	96.5
Small letter reading	5 letters	96.3	95.0	95.2	95.3	95.5
Word reading	2 letter words	50.1	51.5	46.6	51.5	49.7
	3 letter words	39.0	38.8	37.1	37.1	38.0
	4 letter words	37.8	39.7	35.8	37.6	37.6
Sentence reading	A paragraph of 4 sentences	32.5	28.8	29.7	28.9	30.0
Comprehension	Direct fact retrieve	46.8	41.7	39.8	41.8	42.5
	Direct fact retrieve	29.2	25.0	24.8	29.1	26.8
	Understanding	15.4	7.1	9.1	11.0	10.6
Understanding of grammar and sentence construction	Preposition	24.2	18.2	21.1	21.7	21.3
	Preposition	19.5	13.9	16.1	17.4	16.7
	Noun	18.4	11.8	13.8	15.9	14.9
	Verb	20.2	13.9	17.1	16.6	17.0

From table E.4, the key findings are:

- All Blocks, on an average, are performing more or less similarly on most of the items. Bassi performs relatively higher than the other blocks with highest scores on 12 of the 19 items
- The **easiest item is capital letter recognition** and the most difficult item is the comprehension item at the ‘understand’ level.
- The performance is best in the ‘letter’ domain and diminishes from ‘word’ to ‘sentence’.

- Within a domain, as assessable competencies increases from recognition to read to comprehension, there is a steady dip in performance. However, in the ‘letter’ domain, the dip in performance is negligible with increase in assessable competency. Also, ‘capital letter’ recognition and reading are easier than ‘small letter’ recognition and reading.
- In the ‘word’ domain, there is a steady dip in performance from recognizing words to reading words such that word recognition items are largely easy while word reading items are towards the difficult end of the spectrum. Further, across competencies within the domain, recognizing or reading two-letter words is easier than recognizing/reading four-letter words.
- Across blocks **77% children can recognize sentences; however, only 30% can read a text with four sentences.**

Table E.5: Comparison of performance on sentence reading of Baseline Assessment with that of census visit

Block	Average	Census result on sentence reading ¹⁹
Bassi	32.4	37.3
Dausa	28.9	37.8
Rajgarh	29.5	28.8
Sikrai	28.8	35.4

- Table E.5 shows a comparison of performance on sentence reading, between the Baseline English assessment and the English ASER tool (administered during the census visit) across blocks. Here, census results are better than those in the Baseline assessment. This is largely because the former group also had children who have now (academic year 2017-18) moved to grade 9, and these children are not a part of the H-learning program.
- The comprehension component in the ‘sentence’ domain had two sub-tasks: one was ‘reading comprehension’ and the other was on ‘understanding grammar and sentence construction’. Among the two sub-tasks the latter as a whole is very difficult with only 17% children being able to correctly respond to the items.
- In the reading comprehension task of the ‘Sentence’ domain, there were two fact retrieval items and one item at the understand level. **The ‘understand level’ item is the most difficult item in the whole tool, with only 11% correct respondents.** Among the fact retrieval items, one is of medium difficulty and one is a difficult item.
- In the ‘understanding grammar and sentence construction’ component of sentence comprehension, children perform better on items of preposition.

¹⁹ 33,400 children were tested on the ASER English tool during the Census visit held between Mar-May 2017. This group also included children of grade 9 (as per academic year 2017-18), who are not currently part of the H-learning program.

- Comparison Across Grades

Table E.6: Item wise performance at the grade level

Cognitive level	Description	Grade				Overall
		5	6	7	8	
Capital letter recognition	5 letters	94.6	96.9	97.7	98.2	96.9
Small letter recognition	5 letters	90.5	94.8	96.3	97.2	94.8
Word recognition	2 letter words	74.3	83.9	86.7	91.7	84.0
	3 letter words	67.2	78.6	82.3	87.6	78.9
	4 letter words	60.1	74.1	79.1	83.6	74.1
Sentence recognition	Overall of 2 sentences	64.5	75.4	79.2	85.4	77.2
Capital letter reading	5 letters	94.0	96.6	97.4	98.2	96.5
Small letter reading	5 letters	92.1	95.3	96.6	97.8	95.5
Word reading	2 letter words	38.5	49.1	53.2	58.5	49.7
	3 letter words	25.2	34.9	42.2	49.3	38.0
	4 letter words	26.1	35.3	40.7	48.6	37.6
Sentence reading	A paragraph of 4 sentences	18.6	25.8	33.5	41.6	30.0
Comprehension	Direct fact retrieve	30.3	40.7	45.8	52.9	42.5
	Direct fact retrieve	17.4	25.1	30.5	34.7	26.8
	Understanding	6.3	9.4	12.1	14.6	10.6
Understanding of grammar and sentence construction	Preposition	13.9	18.3	23.6	29.2	21.3
	Preposition	11.4	14.9	18.1	22.3	16.7
	Noun	10.3	13.8	16.6	18.9	14.9
	Verb	10.8	14.6	19.1	23.1	17.0

From table E.6, the key findings across the four grades are:

- Overall, the easiest item in the tool is capital letter recognition and the most difficult is reading comprehension item at the understand level.
- Every item shows a progressive trend in performance with grades.
- Within a grade, the performance dips as the assessable competency increases in terms of item difficulty from recognition to reading to comprehension.

- Findings on reading comprehension

The reading comprehension task in the ‘sentence’ domain had three items, two were of direct fact retrieval level, and one at the understand level. The administration of this task was slightly different from the regular administration- it was administered orally, and each item was first asked in English and if the child was unable to respond, the item was asked again in Hindi. However, the answers (keywords) were expected to be in English only.

Table E.7: Average performance on reading comprehension items

Grade	Response language	Block			
		Bassi	Dausa	Rajgarh	Sikrai
5	Hindi	26.4	21.5	22.0	23.6
	English	8.9	6.1	4.4	5.9
6	Hindi	27.4	28.5	27.8	27.0
	English	15.2	9.1	7.7	12.9
7	Hindi	28.8	27.7	30.5	30.3
	English	18.5	13.8	12.7	14.3
8	Hindi	29.8	28.8	30.8	31.3
	English	22.5	16.2	17.3	19.9

Table E.7 depicts the proportion of respondents in English and Hindi on each of the three items across blocks and grades. It can be clearly seen that most respondents responded in Hindi. The maximum respondents who responded in English are from Bassi.

- Comparing word comprehension with sentence comprehension

Table E.8: Word and sentence comprehension at the block and grade level

Word level reading and meaning						Sentence completion and comprehension (grammar)				
Block	Word reading and meaning	Grade				Sentence completion and comprehension	Grade			
		5	6	7	8		5	6	7	8
Bassi	Reading	23.1	26.2	29.4	30.8	Completion	18.5	18.3	20.6	23.8
	Meaning	20.3	27.2	30.9	35.5	Comprehension	5.6	9.4	11.6	14.7
Dausa	Reading	22.3	27.4	29.9	31.5	Completion	13.9	16.8	22.5	20.7
	Meaning	19.2	30.3	32	36.6	Comprehension	2.2	4.4	5.9	8.5
Rajgarh	Reading	22.4	26.3	28.6	27.5	Completion	15.1	18	24.9	24.7
	Meaning	15.9	22.3	31.2	36.8	Comprehension	2.9	5.5	7.5	10.3
Sikrai	Reading	20.6	26.7	29.7	28.2	Completion	18.4	21.2	23.8	27.1
	Meaning	20.1	26	28.7	40.7	Comprehension	2.7	5.1	6.6	12

Table E.8 shows a comparison across grades and blocks on the performance between word comprehension and Sentence comprehension. Across grades mostly children who can read and give the correct meaning of the words are higher than those who can only read the word. In Sentence comprehension (understanding grammar and sentence construction) shows that most children have understanding of grammar because they were able to complete the sentences but when asked for the meaning of the completed sentence less than 15% children were able to do the task.

V. Regression Analysis and Findings

The Baseline Assessment tested children on their conceptual understanding of topics common across grades 5 through 8 in the subjects of Hindi, Math, English and Science. While the former two subjects were written tests, the latter were orally administered.

Performance in the four subjects cannot be seen in isolation from a child's demographic characteristics, their enrolment status in schools and if enrolled; the school type, the kind of household they belong to as well their prior abilities in reading and arithmetic.

It has been found in studies within ASER Centre as well as globally, that children from richer households tend to perform better than their poorer counterparts, as they have access to better schools, afford additional support outside of school like tuition. Further, children of educated parent/s have an upper-hand in learning levels. Private schools are characterized with better infrastructural facilities, adequate number of teachers per grade etc. Quality of education also impacts student learning outcome. Studies also show that children who have mastered basic reading and arithmetic abilities stand a better chance to perform on subjects and concepts of higher order. It has been found that learning deficits in early grades (primary grades) tend to widen in higher grades. This is stronger specifically among girls in India, as boys tend to have a higher chance of being enrolled in schools in the first place. Further, girls may discontinue their studies particularly in their adolescent ages.

Learning levels tend to be affected by geographical characteristics too. Children from cities or in villages closer to the cities have access to better quality schools and therefore showcase better performance than their rural counterparts.

This section of the report aims to explore the factors that affect a child's performance in the various subjects he is assessed during the Baseline visit.

1. The Model

A linear regression model is used to first check whether baseline scores are significantly different across the intervention and control blocks. This model is augmented by other controls like the child's demographic and socio-economic status to understand the relationship between learning and these other explanatory variables.

The first layer of regressions assesses the difference in the average score across the treatment and control blocks using the following equation:

$$\text{Average score} = \alpha + \beta 1 \text{ block} + e \quad \text{Eq.(1)}$$

The second layer of regression is a multivariate linear regression²⁰, which controls for a child's basic learning abilities indicated by the ASER (Reading, Arithmetic and English) levels;

²⁰ Refer to appendix for the subject-wise regression results.

demographic characteristics like age and gender; schooling status measured by grade and the type of school²¹ and socio-economic status measured by the type of household the child lives in, household assets, parents' education status and reservation status of the family. The regression equation is as follows:

$$\text{Average score} = \alpha + \beta_1 \text{ block}^{22} + \beta_2 \text{ ASER (Reading /Math/English) level} + \beta_3 \text{ Age} + \beta_4 \text{ Gender} + \beta_5 \text{ Grade} + \beta_6 \text{ School type} + \beta_7 \text{ HH type} + \beta_8 \text{ HH (Assets)}^{23} + \beta_9 \text{ Education status of parents} + e$$

Eq.(2)

Where,

ASER Reading level = 1 if child is at Story (Std.II text) level
= 0 if child is below Story (Std.II text) level

ASER Math level = 1 if child is at least at Subtraction level
= 0 if child is below Subtraction level

ASER English level = 1 if child is at Sentence level
= 0 if child is below Sentence level

School type = 1 if child goes to government school
= 2 if child goes to private school
= 3 if child goes to Madarasa
= 4 if child goes to any other type of school

HH (household) type²⁴ = 1 if child lives in a *Kutcha* house
= 2 if child lives in a *Semi-Kutcha* house
= 3 if child lives in a *Pucca* house

Education status of parents = 1 if parents have completed schooling at least till grade 5
= 0 if parents have not completed schooling up to grade 5

²¹ Nearly all (99.8%) of the tested children were enrolled in schools.

²² Appendix D contains only a sample of augmented model/subject where in Rajgarh (control block) is the reference category.

²³ Assets' information was collected as it is during the ASER survey.

²⁴ Variable definition is taken from the ASER survey.

2. Findings

a. Effect of location

- **Hindi Assessment**

Table 11 : Hindi- Are baseline scores significantly different across blocks? (N=5519)

Block	Treatment type	Average Score	Bassi	Dausa	Rajgarh	Sikrai
Bassi	Digital + print at community level	7.67	NA	No	Yes	No
Dausa	Digital + print at school and community level	7.76	No	NA	Yes	No
Rajgarh	Control	7.37	Yes	Yes	NA	Yes
Sikrai	Print (Y1) + Digital & Print (Y2) at community level	7.75	No	No	Yes	NA

The above table compares the average scores across blocks, as per Eq.(1). It can be seen that the average score of the control block- Rajgarh is significantly lower than all the treatment blocks- Bassi, Dausa and Sikrai. Amongst the treatment blocks, there is no significant variations in the score.

After controlling for child's reading ability (measured by ASER Reading levels), demographic characteristics, socio-economic status and schooling status, the average score of Rajgarh is significantly higher than that of Bassi and not with the other two treatment blocks. Further, as per the augmented model, the average score of Bassi is significantly lower than the other 3 blocks.²⁵

- **Math Assessment**

Table 12: Math- Are baseline scores significantly Different across blocks? (N=5521)

Block	Treatment type	Average Score	Bassi	Dausa	Rajgarh	Sikrai
Bassi	Digital + Print at community level	7.81	NA	No	No	Yes
Dausa	Digital + Print at school and community level	7.88	No	NA	No	No
Rajgarh	Control	7.78	No	No	NA	No
Sikrai	Print (Y1) + Digital & Print (Y2) at community level	7.88	Yes	No	No	NA

²⁵ For more information, see Appendix D

The average scores (from Table 12) of the control block are not significantly different from any of the treatment blocks. Within the treatment group, the average score of only Bassi and Sikrai are significantly different.

On controlling for other explanatory variables, the average score of Rajgarh is significantly higher than that of Dausa and Bassi. Further, within the treatment group, the score of Bassi is significantly lower than Dausa and Sikrai.²⁶

- **English Assessment**

Table 13: English- Are baseline scores significantly Different across blocks? (N=5534)

Block	Treatment type	Average Score	Bassi	Dausa	Rajgarh	Sikrai
Bassi	Digital + Print at community level	32.11	NA	Yes	Yes	No
Dausa	Digital + Print at school and community level	31.25	Yes	NA	No	No
Rajgarh	Control	31.25	Yes	No	NA	Yes
Sikrai	Print (Y1) + Digital & Print (Y2) at community level	31.25	No	No	Yes	NA

From Table 13, it is seen that the average score of Rajgarh is significantly different from Bassi and Sikrai only. Amongst the treatment blocks, the average score of Bassi is significantly different from Dausa, but not from Sikrai. Further, there is no significant difference in the average scores of Dausa and Sikrai. Within the treatment group there is no significant difference in the average scores²⁷

On controlling other explanatory variables, the average score of the control block is significantly different only from Dausa.

- **Science Assessment**

Table 14: Science- Are baseline scores significantly Different across blocks? (N=5529)

Block	Treatment type	Average Score	Bassi	Dausa	Rajgarh	Sikrai
Bassi	Digital + Print at community level	6.07	NA	Yes	Yes	No
Dausa	Digital + Print at school and community level	5.50	Yes	NA	No	Yes
Rajgarh	Control	5.50	Yes	No	NA	Yes
Sikrai	Print (Y1) + Digital & Print (Y2) at community level	5.50	No	Yes	Yes	NA

²⁶ For more information, see Appendix D

²⁷ For more information, see Appendix D

The average score of Rajgarh and Dausa are significantly different from that of Bassi and Sikrai. On controlling for other explanatory variables as mentioned in Eq.(2), the average score of the control block is significantly different from one treatment block – Dausa. Further, within the treatment group, the blocks can be ranked in the order of highest to lowest scores as Sikrai, Bassi and Dausa²⁸

b. Effect of Basic learning abilities

ASER learning level was used as an explanatory variable to see whether foundational skills – basic reading and math ability – had any effect on higher learning outcomes. This foundational skill can also be viewed as a proxy for cognitive ability. Both Hindi and Math assessments were in written format and required the child to read and comprehend²⁹ or solve³⁰.

A child who could read the ASER Story scored significantly higher than those who could not in Hindi, Math and Science Assessments, while setting all other explanatory variables constant. In the case of English assessment, children who could read the Sentences in the ASER English tool, performed significantly better than those who could not read the Sentences.

Children who were at Subtraction and higher levels of the ASER arithmetic tool, scored significantly higher in Math and Science assessments as compared to children who could not solve the Subtraction sum of ASER.

c. Effect of child demographic characteristics

Controlling for grade older children perform significantly better only in Hindi assessment.

Controlling for all explanatory variables in the model, it is found that girls perform worse than boys in Math, English and Science assessments, while the effect of gender is insignificant in the Hindi assessment.

d. Effect of schooling

Children learn as they proceed through grades. Children from grade 8 score the highest while those from grade 5 scored lowest.

Children enrolled in private schools perform better than those in government schools in all assessments. However, this effect is significant in the Hindi assessment, among children who could not read the ASER story; in the Math assessment who could not solve the subtraction sum

²⁸ For more information, see Appendix D

²⁹ Hindi assessment tested children's comprehension skills based on a passage from topics available in the Rajasthan curriculum textbooks.

³⁰ Math assessment involved solving for word problems.

in ASER. With regard to the English assessment, children from private school showed a better performance irrespective of their foundational skills in English. In the Science assessment, children with foundation skills in reading and/or arithmetic and enrolled in private schools performed better than those from government schools.

e. Effect of socio-economic status of the household

Children belonging to the scheduled castes (SCs) and tribes (STs) scored lower than those from the unreserved category in both English and Science assessments. For Hindi and Math assessments, however, the effect of reservation category is insignificant after controlling for the economic status of the household of a child.

The type of house the child lives acts as a proxy for household affluence. After controlling for all other variables associated with the child, the effect of household type on average scores is insignificant in all four assessments.

Having reading materials (this includes newspapers, any textbook other than those provided from school), which is a proxy for the home learning environment, is positively correlated with learning levels in Hindi, English and Science.

f. Effect of parents' education

Literature states that having an educated parent implies additional support to a child's education at home. In this study, the education status of both parents was recorded as per the level of schooling they have completed. It was found that nearly 80% children had fathers who had completed at least primary level of schooling while only 26% had mothers who had the same schooling status. For the purpose of analysis, we looked at the effect on average scores of children whose parent/s had completed at least primary level of schooling. It was found that children of fathers who have completed at least primary level of schooling, perform better in all four assessments. Children of mothers who have studied at least upto std. 5 have a higher average score only in the English assessment, for the other three assessments the effect is insignificant.

Further, the learning achievements of a child can be influenced if any other member in the household (does not include parents as their information was already collected) is educated. It was found that having at least one member in the household who has completed schooling upto grade 12 led to a higher score in Hindi and English assessments (holding other things constant).

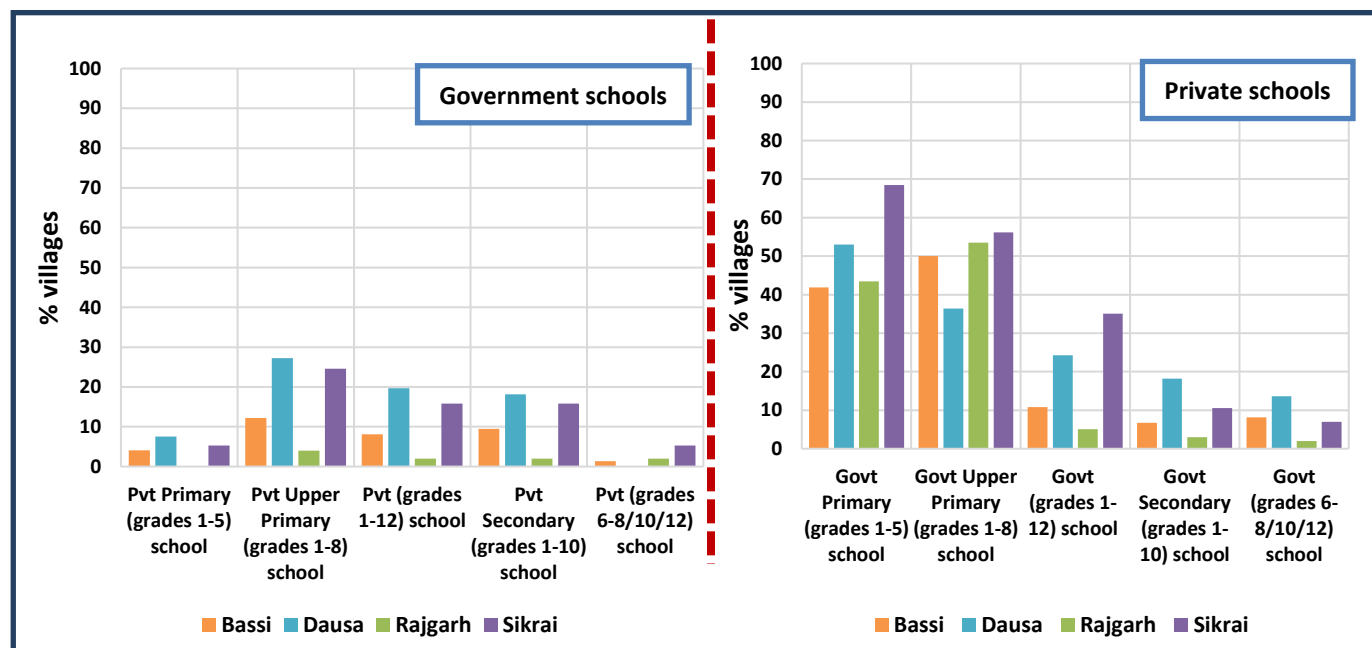
Appendix

Appendix A: Snapshot of the census visit

Table A.1: Enrollment of children

Block	Category	Children enrolled (N)	In government schools (%)	In private schools (%)	In Madarsa (%)
Bassi	Boys	4,058	44.7	55.3	0
	Girls	3,719	66.6	33.3	0
	All children	7,777	55.2	44.8	0
Dausa	Boys	5,757	46.1	54	0
	Girls	4,998	69.5	30.6	0
	All children	10,755	56.9	43.1	0
Rajgarh	Boys	3,089	55.5	44.6	0
	Girls	2,732	72.6	27.4	0
	All children	5,821	63.5	36.5	0
Sikrai	Boys	6,578	48	52	0.1
	Girls	6,071	66.8	33.1	0
	All children	12,649	57	42.9	0.1
All blocks	Boys	19,482	47.9	52.1	0
	Girls	17,520	68.4	31.5	0
	All children	37,002	57.6	42.3	0

Fig A.1: School type



- 50% of all villages have govt. primary school (grades 1-5) followed by 49.3% villages with govt. upper-primary school (grades 1-8). Villages in Sikrai lead other blocks in terms of villages with government schools of most types.
- 15.2% villages have private upper-primary school (grades 1-8). Dausa leads in terms of villages with private schools.

1. Key findings of the census visit:

Table A.2: Number and percentage of children tested and not tested

Testing Status of	Number of Children	% Tested	% Not Tested
Overall	37510	89.1	11.0
Males	19654	89.2	10.8
Females	17856	88.9	11.1

2. Performance on ASER tools

Fig A.2: Reading levels in Hindi (N ~33,400)



Fig A.3 Math levels (N ~33,400)

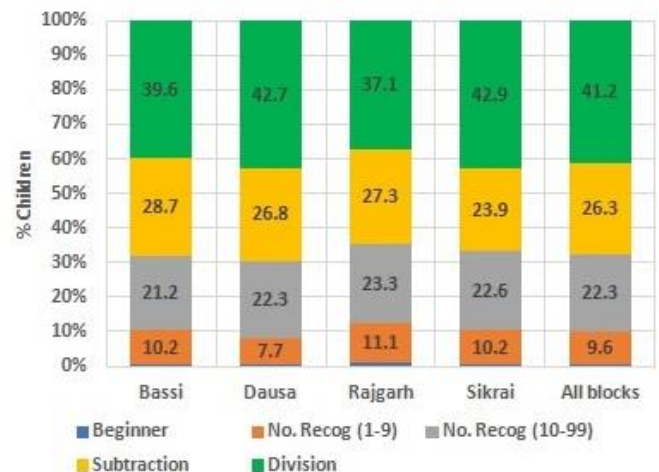


Fig A.3: Reading levels in English (N ~33,400)

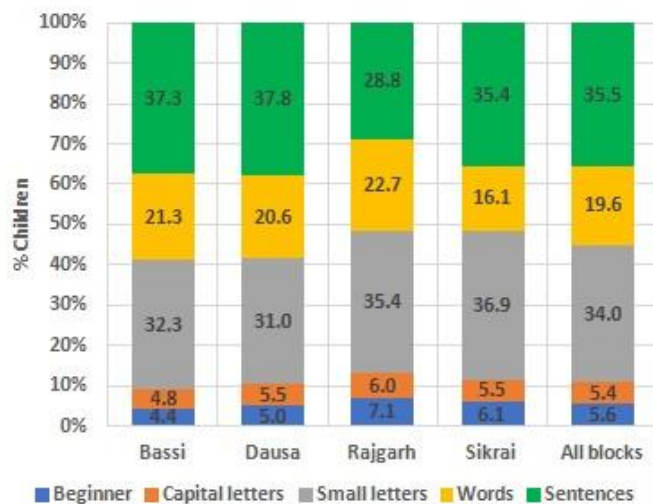


Fig A.4: English comprehension (words) (N~6,500)

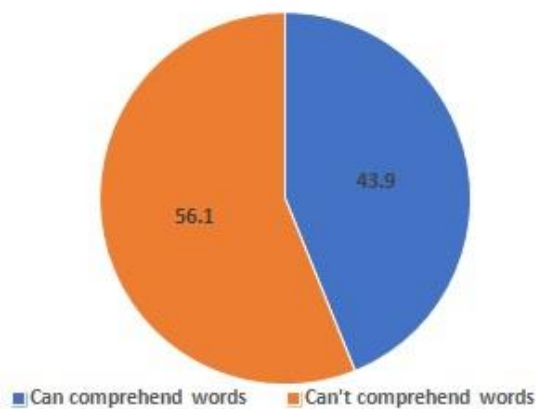
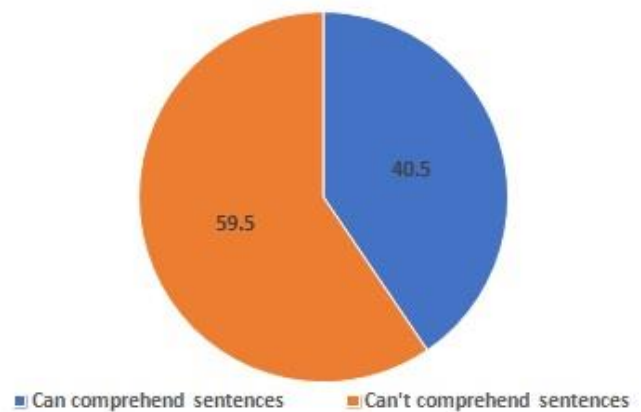


Fig A.5: English comprehension (sentences) (N~12,000)



- Overall, 85.3% children can read at least std I level text. This proportion is highest for Dausa - 87.2% and lowest for Rajgarh – 80.6%.
- Overall, 67.5% children can do subtraction or more. 41.2% can do division. Children in all blocks performed similarly on the ASER math test.

Appendix B: Other processes for the Baseline Assessment

1. Development of the app and its use in the assessment

Dausa Baseline data was collected through electronic tablets and an application was developed for recording the field level data. It was developed to replace traditional paper formats and minimize errors (missing or invalid entries) in field level data collection, to reduce manual effort of grading on paper and recording the same, eliminate data entry time and error in recording the results of “oral testing” and household facilities.

After collecting the pen and paper (written testing) formats from the field, the monitors graded and recorded the data on the tablets on a daily basis. Daily data entry saved time and reduced errors because the data was entered by the collectors themselves.

2. Piloting:

To understand feasibility in terms of testing time, pen and paper versions of tools and data recording formats with variables of interest were field piloted in Rajasthan

Two rounds of piloting were carried out to perfect functionalities of the App before the actual implementation. These pilots also helped to develop a core team for the field implementation.

3. The training workshop:

A five days residential training workshop was conducted for field enumerators and monitors. There were 4 subjects in the evaluation, i.e., Hindi, Math, English and Science.

The training team consisted of 2 project evaluation associates, 4 training facilitators from ASER Centre, Delhi. 2 support personnel from Sunai Technologies Pvt. Ltd (technology partner) provide

d technology support during the training.

The trainees were ~80 surveyors and 10 monitors, who were recruited for the field implementation. Most had previous experience of working during the Census visit of Dausa H-Learning evaluation.

Agenda :

- Day 1: Theory sessions explaining the village processes and formats to be filled.
- Day 2: Practical sessions on using the data recording application on the tablet.
- Day 3: Piloting of processes and the data recording application in the field setting.
- Day 4: Feedback and review.
- Day 5: Survey planning.

The objectives of the training workshop were:

- To train the participants on the components of tools (English, Hindi, Math and Science). and make them well versed with the answer keys of the items.
- To help the participants adapt to the app and the tablet to be able to conduct the digital assessment survey.
- To train the participants in the village processes like mapping, and household processes like observing and collecting household indicators.
- To train them on testing children one-on-one as well as in a group setting.

4. Village survey process

Team and survey plan : In each surveyed village, a team of 2 people collected the data and completed the testing process, over two days. There were a total of 68 surveyors in the 294 villages in all 4 blocks.

Table B.1: Block wise data collection plan

Block	Number of villages	Surveyor No.	Surveyor pair	Monitors No.	Total days taken for survey
Rajgarh	98	22	11	3	18
Bassi	73	18	9	2	16
Dausa	66	16	8	2	17
Sikrai	57	12	6	2	19
Total	294	68	34	9	

Baseline Assessment survey pack : Surveyors were provided with a village pack containing the tools, formats, instructions, and communication materials to be used in the village.

- The village pack contains:
 - Instruction Manual
 - Communication Pack – Sarpanch
 - Survey Booklet
 - Tools booklet
 - Tablet for data recording

Process: Before beginning the survey, the surveyors meet the *Sarpanch* or a village representative to explain the purpose of evaluation and take permission to survey the village. The first day was tracking households/children with the help of a tracking sheet and the map prepared

during the first visit (Census visit), collecting household information and conducting the oral assessment of at least 10-12 children. On the second day, they conducted the oral assessment of the remaining children, as well as a group assessment using pen and paper.

At the end of survey, the data for the village was synced from the tablet to a central server.

5. Real-time monitoring and support

The monitoring and support team comprising of **9 field monitors** was led by two evaluation associates and a project manager. The field monitors were selected from different blocks to provide support during the data collection process/periods.

Block wise team of monitors was created for all 4 blocks to closely monitor the data collection process. Each village was personally field monitored on at least 1 day during the survey. Villages with issues like less households, less number of children tested etc., were flagged and verified either via phone-calls or personal visits.

Table B.2: Real Time Field Monitoring Plan

Phase	Dates as per phase	Total number of days in a phase	Total Blocks	Total pairs of surveyors in 4 blocks	Total villages to be surveyed in a phase by 1 pair per block	Actual progress of total nos. of villages per phase
1 st	31 Aug. to 1 Sep.	2	4	34	4	34
2 nd	2 to 3 Sep.	2	4	34	4	68
3 rd	4 to 5 Sep.	2	4	34	4	102
4 th	6 to 7 Sep.	2	4	34	4	136
5 th	8 to 9 Sep.	2	4	34	4	170
6 th	10 to 11 Sep.	2	4	34	4	204
7 th	12 to 13 Sep.	2	4	34	4	238
8 th	14 to 15 Sep.	2	4	34	4	272
9 th	16 to 17 Sep.	2	4	24	4	294

6. Challenges during field data collection

- Overall, testing the same children on two different testing occasions was a demanding design. Additionally, testing children on 4 different subjects was a difficult and time consuming.
- Tracking sampled children within a fixed time line was challenging. Sometimes, children were not available in the village at the time of the survey, which increased the survey duration in some villages.

- Like the census visit, in some cases, size of villages and distribution of the hamlets posed difficulties. Group testing (pen and paper) was arduous since surveyors had to gather children from different hamlets (*tolas/dhanies*) in a village. It proved especially difficult for bigger villages, where hamlets were situated at a considerable distance from each other.
- Surveyors also had to overcome hurdles such as contaminated drinking water and the difficult terrain of the region.

Appendix C: Reliability and validity of the tools

1. Math

a. Quantitative measures of tool reliability and validity

The **Split half reliability**³¹ coefficient is on an average **0.8** for the Math Assessment in both test samples. The **Cronbach's alpha coefficient**³² is on an average **0.9** for both test samples. This indicates that the tools are highly reliable.

Internal Consistency³³ of the tool is a measure of both reliability and validity. The average inter item correlation coefficient is **0.4** and average item total correlation coefficient is **0.6**, this is indicative of a fairly high internal consistency in the tool.

b. Qualitative measures of validity

The **Face and Content validity** of the tools were met by developing a test for Math in accordance with the H- Learning program content in Math. A thorough analysis of the Rajasthan Math textbooks for its syllabus and vocabulary, and mapping of the H-learning program content was done prior to the development of the tool. Further, the ASER results obtained from the census visit were also observed as the base to maintain the difficulty level of the test content. All assessments were thoroughly piloted with children of relevant grades in similar type of schools (as our target group). For each assessable competency in Math assessment, a range of test items in terms of difficulty (easy, medium and difficult) were included.

Since the H-learning program focuses on math content based on grades 5 to 8, the purpose of the assessment was to gauge whether children understood basic arithmetic concepts before they had exposure to the H-learning Math content. All items were developed at a level below the child's actual grade level in terms of difficulty, considering that students have not fully attained the knowledge associated with their current grade.

The Math assessment tools also meet **Representation validity** as they were developed from a detailed assessment framework which in turn was developed after detailed mapping of Rajasthan Math textbooks and analyzing other documents like curriculum, H Learning content etc. This assessment framework attempts to measure each domain in several ways and at varying difficulties. Test items were created within this framework, and were reviewed by subject experts and modified as per the outcomes of the pilot field visits. Based on the objective of testing, this

³¹ Split half reliability: a reliability measure of a single sample of tool, by dividing the tool into two parts and calculating the correlation of the two parts.

³² Cronbach's Alpha coefficient: a reliability measure assessing reliability of the single sample of the tool and its internal consistency. It is the average of all split half correlations.

³³ Internal consistency: This is a measure of reliability per item and validity of the construct. It is also often referred to as item total correlation. It is the consistency of the items with each other and each item with the whole test.

framework can be used in future to construct more test items measuring performance on specific domains.

c. Rasch Modelling of the Math assessment

Fig. C.1: Item Person Map of the Math Assessment

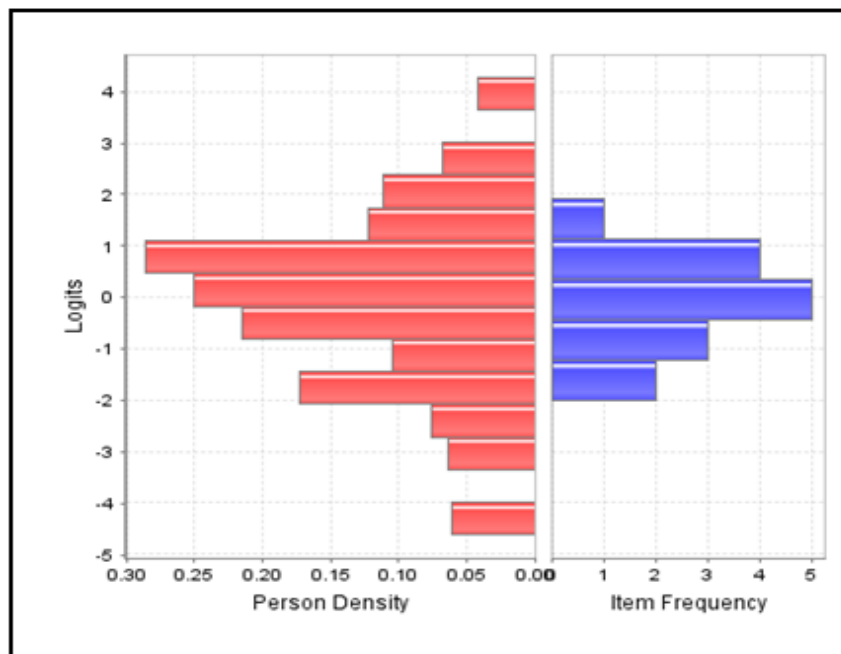


Table C.1: Item difficulty and score

Item	Difficulty	Score	Theta
mat_q1c	1.9	15	4.2
mat_q6	1.0	14	2.9
mat_q8	0.9	13	2.1
mat_q10	0.8	12	1.5
mat_q9	0.6	11	1.1
mat_q2b	0.0	10	0.7
mat_q4b	-0.1	9	0.3
mat_q4a	-0.3	8	0.0
mat_q5	-0.4	7	-0.4
mat_q1b	-0.4	6	-0.7
mat_q7	-0.6	5	-1.0
mat_q3b	-1.2	4	-1.4
mat_q1a	-1.2	3	-1.9
mat_q3a	-1.7	2	-2.4
mat_q2a	-2.0	1	-3.3
		0	-4.6

From the Item Person Map (Fig.C.1), it is visible that the items are ranging from -2.0 to 1.9 on the uni -dimensional scale. This is the range of Difficulty of the items. The items on the negative side of the mean (or *Theta* here), on the scale are the easiest items. 0.0 is the mean of items which indicates that the average item is situated here.

The Persons on the uni-dimensional scale are similarly spread from -4.6 as the least able to 4.2 as the most able. Table C.1 indicates the score and ability distribution.

The Item Person Map indicates that the items are spread within the limit of +/- 2 SD from the mean i.e., 0 and are neither very difficult nor very easy. It is a medium level test. However, there are some children who are at 2 and above on the scale and can do almost all the items correctly. The most difficult items are also easy for them. These are children who have scored 13 and

above on the test. Children who fall below -2 on the scale are unable to do any of the items correctly. Basically, they do not have items that match their ability levels. The test mean is 52.7% which indicate that the test was of medium to easy level for the children.

The Rasch Model Analysis also indicates that the tool is highly reliable and generates the reliability coefficient as 0.8.

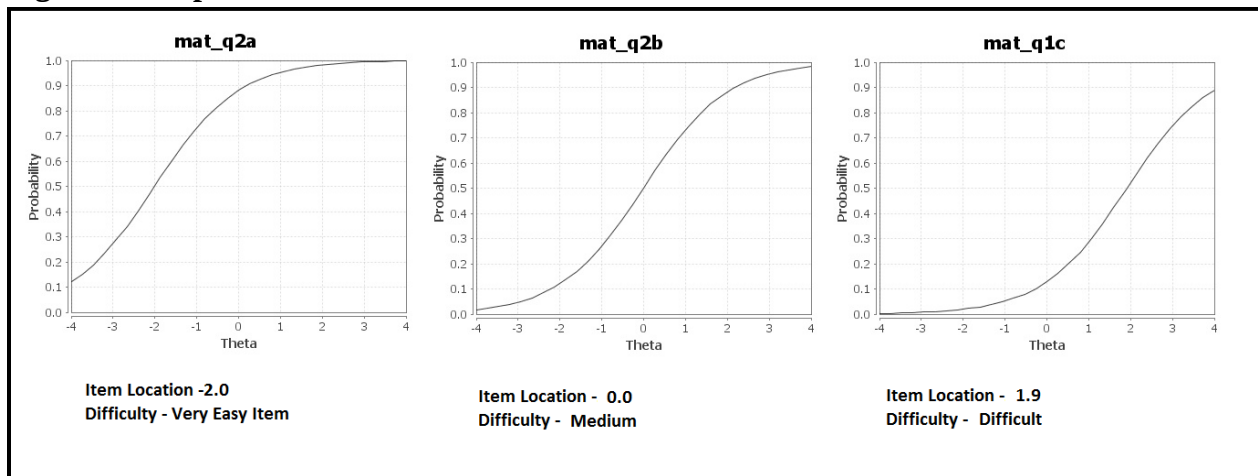
Table C.2: Distribution of children on each score of the test

Overall (N=5521)	Math score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	% of children	3.9	4.0	4.8	5.2	5.8	6.6	6.4	7.3	7.5	8.5	9.6	8.6	7.8	7.1	4.3	2.7

Table C.2 indicates the proportion of children on each score, ranging from 0 to 15.

Given below are some sample ICC curves³⁴ that show the easiest to the medium and most difficult level items. The easiest item can be solved correctly by anyone, even ones who are low on the ability scale whereas the medium level item has 50% probability of being solved correctly by someone with average ability. The most difficult item has a low probability of being correct even for high ability children.

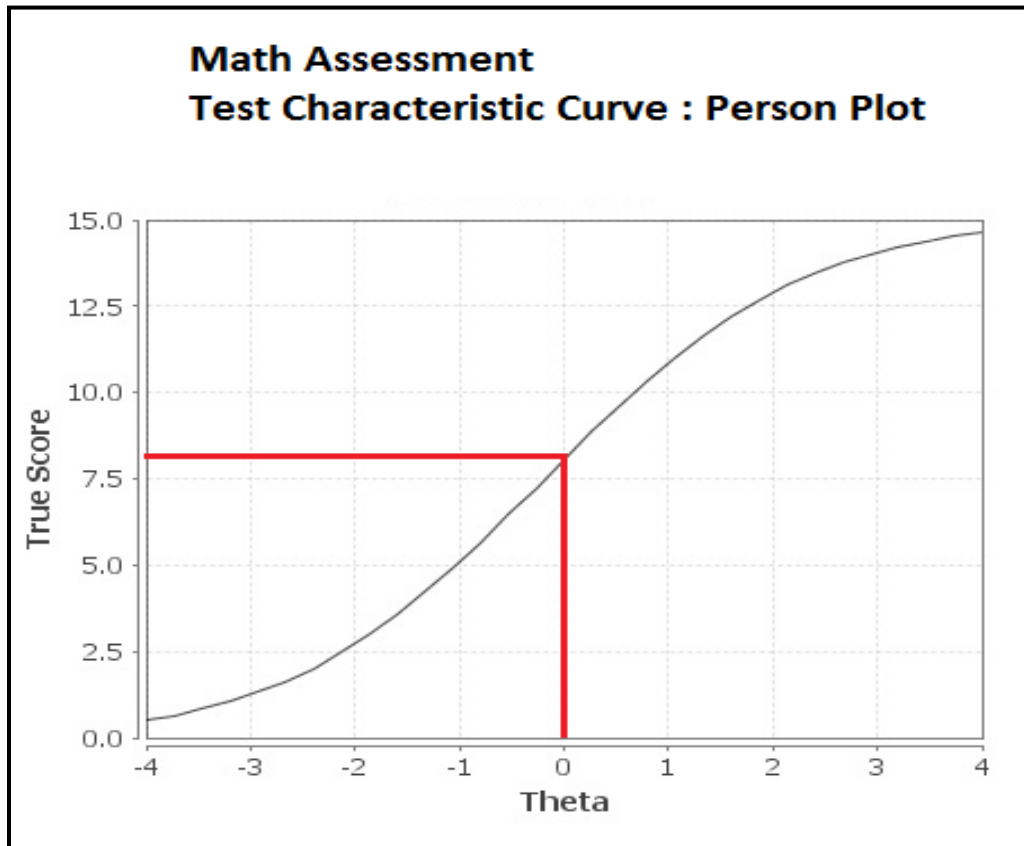
Fig. C.2: Sample Item Characteristic Curves



³⁴ ICC means Item characteristic curve which shows the difficulty of the items and the ability level of people who have a certain probability of getting the item correct. It is generated during the process of Rasch Model Analysis.

The Test Characteristic Curve (shown in Fig.C.3) reflects similar information about the Math assessment. The overall average score is 7.9 which is higher than the expected median (mean) score of 7.5, implying that the test is of medium difficulty.

Fig. C.3: Test Characteristic Curve



2. Hindi

a. Quantitative measures of tool reliability and validity

The **Split half reliability**³⁵ coefficient is on an average **0.7** for both samples of the Hindi assessment. The **Cronbach's alpha coefficient**³⁶ is also **0.9** for both samples. This indicates that each of the tool samples is highly reliable.

³⁵ Split Half Reliability: a reliability measure of a tool as a whole by dividing the tool into two parts and calculating the correlation of the two parts.

³⁶ Cronbach's Alpha Coefficient: a reliability measure assessing reliability of the tool as a whole and its internal consistency. It is the average of all Split half correlations.

Internal Consistency³⁷ of the tool is a measure of both reliability and validity. The average inter item correlation coefficient is **0.3** for both the samples and average item total correlation coefficient is **0.6** for both the samples. This is indicative of high internal consistency in the tool.

b. Qualitative measures of validity

Face and Content of the Hindi tools was met by developing a test of Hindi in accordance with the H-learning program content. A thorough analysis of the Rajasthan Hindi textbooks for its syllabus, vocabulary, H-learning content and the ASER reading levels of children from the census (where 80% of the children were story readers), was done prior to tool development. Further, the decision to conduct the test in pen and paper mode was taken because of a large proportion of readers in the four blocks. The H-learning content is majorly informative, hence, informative texts were made for the language tools.

All assessments were thoroughly piloted with children of relevant grades in similar type of schools (as our target group). For each assessable competency in Hindi Assessment, a range of test items in terms of difficulty (easy, medium and difficult) were included.

Since the program focus is Hindi content based on grades 5 to 8, the purpose of the assessment was to gauge whether children understood basic informative concepts or content in Hindi before the exposure to the H-learning Science and Math content which is usually transferred in Hindi. All items were developed at a level below the child's actual grade level in terms of difficulty, considering that the students have not fully attained the knowledge of their current grade at this level.

Representation validity of the tools was met from a detailed assessment framework. The framework was made after detailed mapping of Rajasthan textbooks and analyzing other documents like curriculum syllabus, H-Learning content etc. This framework attempts to measure each concept in a number of ways and at varying difficulties. Within this framework, test items were created which were reviewed by subject experts and modified based on the outcomes from pilot field visits. Based on the objective of testing this framework can be used in future to construct more test items measuring performance on specific domains.

³⁷ Internal consistency: This is a measure of reliability per item and also validity of the construct. It is also often referred to as item total correlation. It is the consistency of the items with each other and each item with the whole test.

c. Rasch Modelling of Hindi assessment

Fig. C.4: Item Person Map of the Hindi Assessment

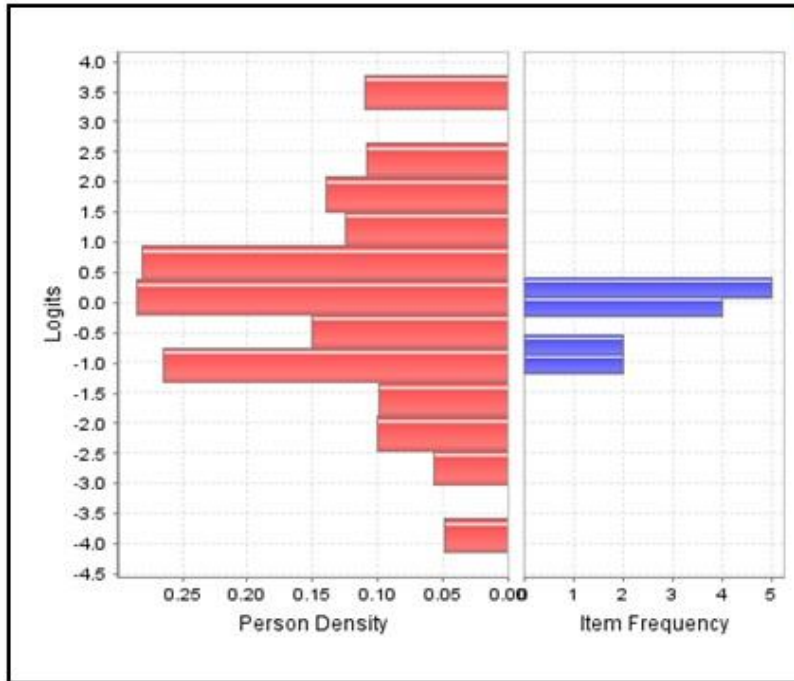


Table C.3: Item difficulty and score

Item	Difficulty	Score	Theta
q1d	0.4	14	3.8
q4	0.3	13	2.5
q1e	0.3	12	1.7
q1c	0.2	11	1.2
q2b	0.2	10	0.8
q5d	0.2	9	0.5
q5c	0.1	8	0.2
q1b	0.0	7	-0.2
q3a	-0.1	6	-0.5
q3b	-0.2	5	-0.8
q5a	-0.6	4	-1.1
q1a	-0.8	3	-1.5
q5b	-1.1	2	-2.1
q2a	-1.2	1	-2.9
		0	-4.1

From the Item Person Map (fig.C.4) it is visible that the items are ranging from -1.2 to 0.4 on the uni-dimensional scale. This is the range of Difficulty of the items. The items on the negative side of the mean (or *Theta* here) on the scale are the easiest items. 0.0 is the mean of items which indicates that the average item is situated here.

The Persons on the uni-dimensional scale are similarly spread from -4.1 as the least able to 3.8 as the most able. The scale given below indicates the proportion of children who have got the maximum to zero score.

The item person map indicates that the items are spread within the limit of approx. +/- 1 SD from the mean i.e., 0 and they are neither very difficult nor easy. It is a medium level test. However, there are some children who are above 0.4 on the scale and can do almost all the items correctly. The most difficult items are also easy for them. These are children who have scored 10 and above on the test. Children who fall below -1.2 item location on the ability scale are unable to do any of the given items correctly. Basically, they do not have items that match their ability levels. The test mean is 54.3% which indicates that the test was of medium difficulty level for the children.

The Rasch Model Analysis also indicates that the tool is highly reliable and generates the reliability coefficient as 0.7.

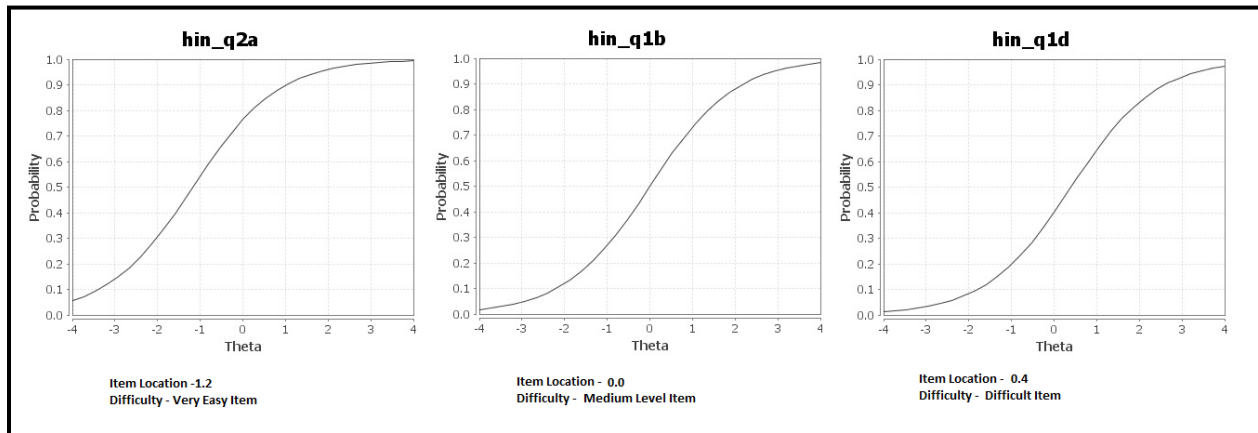
Table C.4: Distribution of children at each score

Overall (N=5519)	Hindi Total Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	% of Children	2.7	3.2	5.7	5.6	6.9	8.1	8.5	7.9	8.3	8.1	7.9	7.0	7.9	6.1	6.2

Table C.4 indicates the distribution of children on each score of the test ranging between 0 and 14.

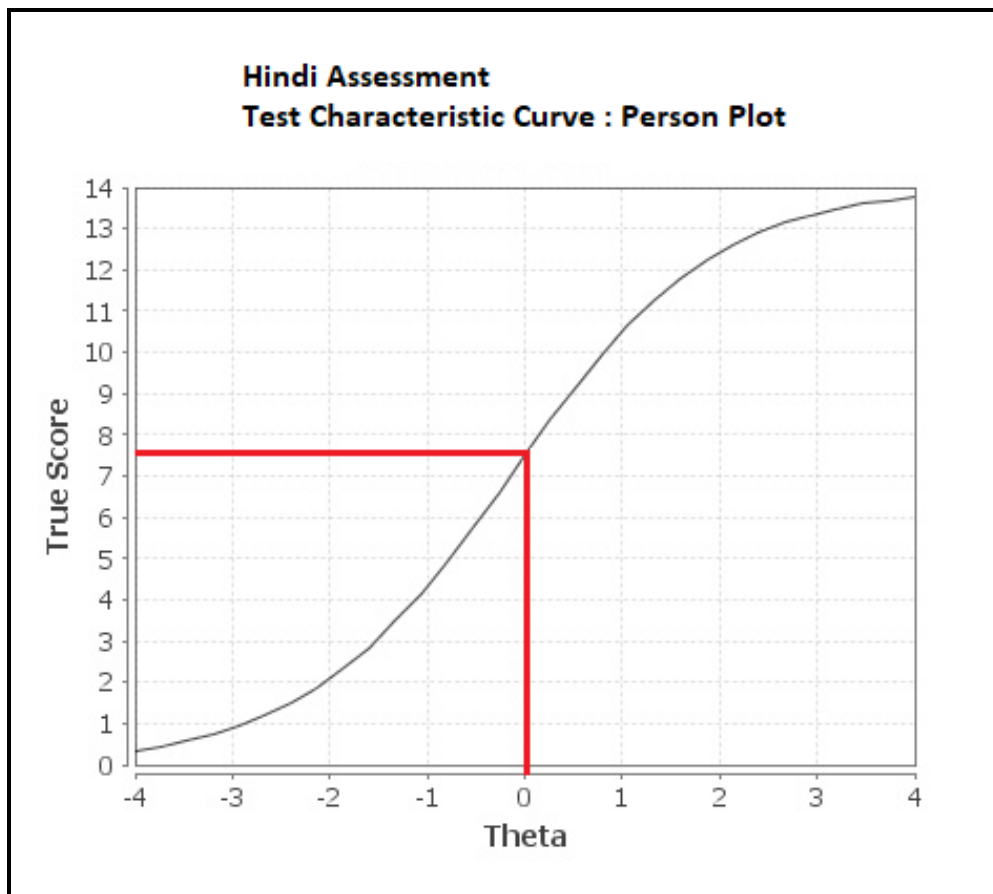
Given below (Fig C.5) are some sample ICC curves³⁸ that would show the easiest to the medium level and most difficult items. The easiest item can be solved correctly by any person who is even low on the ability scale whereas the medium level item has 50% probability of being correct by an average ability person. The most difficult item has low probability of being correct even for the high ability children.

Fig.C.5: Sample Item Characteristic Curves



³⁸ ICC means Item characteristic curve which shows the difficulty of the items and the ability level of people who have a certain probability of getting the item correct. It is generated during the process of Rasch Model Analysis.

Fig.C.6: Test Characteristic Curve



The Test Characteristic curve (fig. C.6) reflects that in the Hindi assessment, the mean score is 7.6 which is above the expected median (mean) score of 7 out of 14, implying that the test was relatively easy even for child with average ability.

3. Science

a. Quantitative measures of tool reliability and validity

The **split half reliability**³⁹ coefficient is **0.6** for Science Assessment, for both grade groups. The average **Cronbach's alpha coefficient**⁴⁰ is also **0.8** for both grade groups. This indicates that the tools are highly reliable.

³⁹Split half reliability: a reliability measure of a tool as a whole by dividing the tool into two parts and calculating the correlation of the two parts.

⁴⁰ Cronbach's Alpha coefficient: a reliability measure assessing reliability of the tool as a whole and its internal consistency. It is the average of all Split half correlations.

Internal Consistency⁴¹ of the tool is a measure of both reliability and validity. The average inter item correlation coefficient is **0.3** and average item total correlation coefficient is **0.5** for the tools of both grade groups, this is indicative of fair amount of internal consistency in the tool.

b. Qualitative measures of validity

Face and Content validity of the Science tools were met by developing assessments in accordance with the H-learning program content in Science. A thorough analysis of Rajasthan Science textbooks for its syllabus and vocabulary and the H-learning content were done prior to the development of the tool.

All assessments were thoroughly piloted with children of relevant grades in similar type of schools (as our target group). For each topic in the Science assessment, a pattern of assessing was followed to create items, the levels of which are usually Recognize, Knowledge and Understand.

Since the focus of the program is Science content based on grades 5 to 8, the purpose of the assessment was to gauge children's familiarity with key concepts in Science. Familiarity is assessed through items at different pitched assessable competencies. All items were developed at a level below the child's actual grade level in terms of difficulty, considering that the students have not fully attained the knowledge associated with their current grade at this level.

The Science tools meet **Representation validity** as they were developed from a detailed assessment framework. This framework was developed after detailed a mapping of Rajasthan textbooks and analyzing other documents like curriculum, H-learning content etc. This assessment framework attempts to measure each topic in a number of ways and at varying difficulties. Test items were created within this framework and were then reviewed by subject experts and modified based on the outcomes of pilot field visits. Based on the objective of testing, this framework can be used in future to construct more test items measuring performance on specific domains.

⁴¹Internal consistency: This is a measure of reliability per item and also validity of the construct. It is also often referred to as item total correlation. It is the consistency of the items with each other and each item with the whole test.

c. Rasch Modelling of Science assessment

- **Grades 5 and 6**

Fig.C.7: Item Person Map of the Science assessment for grades 5 & 6

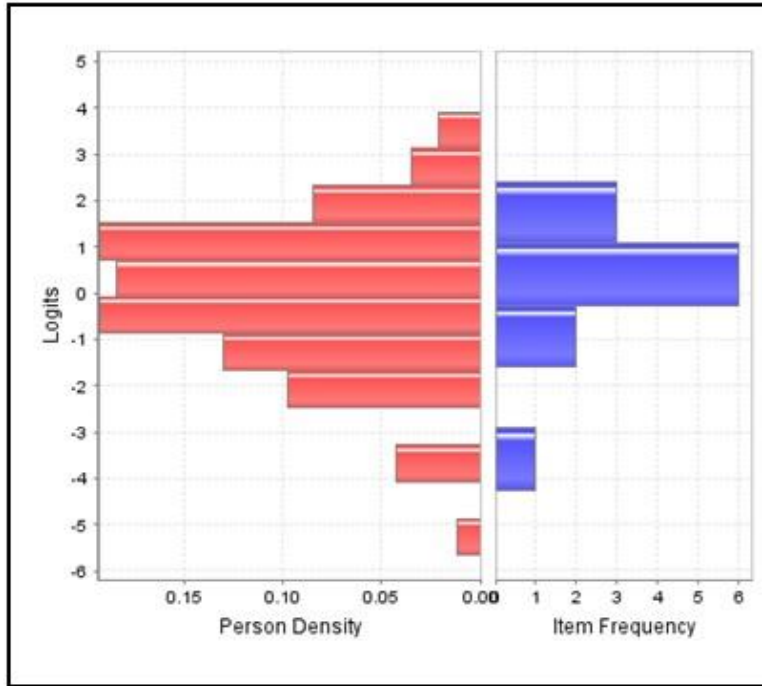


Table C.5: Item difficulty and score

Item	Difficulty	Score	Theta
sci_q9	2.4	12	4.6
sci_q4	1.8	11	3.3
sci_q3	1.4	10	2.4
sci_q7	1.1	9	1.7
sci_q11	0.6	8	1.2
sci_q12	0.5	7	0.8
sci_q6	0.2	6	0.3
sci_q10	0.2	5	-0.2
sci_q5	-0.2	4	-0.7
sci_q8	-0.8	3	-1.2
sci_q2	-1.3	2	-2.1
sci_q1	-4.3	1	-3.5
		0	-5.4

The Item Person Map (Fig.C.7) shows that the items range from -4.3 to 2.4 on the uni-dimensional scale. This is the range of Difficulty of the items. The items on the negative side of the mean (or *Theta* here) on the scale are the easiest items. 0.0 is the mean of items which indicates that the average item is situated here.

The Persons on the uni-dimensional scale are similarly spread from -5.4 as the least able to 4.6 as the most able. Table C.5 indicates the score and ability distribution. The item person map indicates that the items are spread within the limit of -4.3 to 2.4 SD from the mean i.e., 0 and has a wide range of items that are very easy to extremely difficult.

The test is slightly difficult because most of the items fall above the mean on the item scale i.e., 0.0. There are some children who are above 2.4 on the ability scale and can do almost all the items correctly. The most difficult items are also easy for them. These are the children who have scored 12 on the test. Children who fall below -4.3 item location on the ability scale are unable to do any of the given items correctly. Basically, they do not have items that match their ability levels. The test mean is 45.8% which indicates that the test was slightly difficult for the children.

The Rasch Model Analysis also indicates that the tool is highly reliable and generates the reliability coefficient as 0.7.

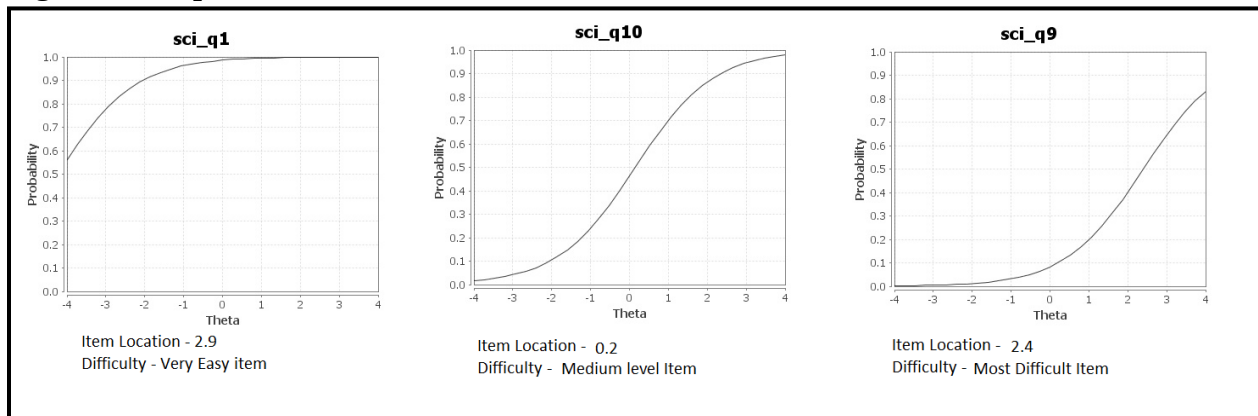
Table C.6: Distribution of children on each score of the test

Grade 5 & 6 (N=2742)	Science score	0	1	2	3	4	5	6	7	8	9	10	11	12
	% of Children	0.9	3.4	7.8	10.4	13.9	14.7	14.7	13.1	9.5	6.8	2.8	1.7	0.4

Table C.6 depicts the proportion of children on each score ranging between 0 and 12.

Given below (Fig. C.8) are some sample ICC curves⁴² that would show the easiest, medium and the most difficult level items. The easiest item can be solved correctly by any person, even one who is low on the ability scale whereas the medium level item has 50% probability of being correct by an average ability person. The most difficult item has a low probability of being correct even for high ability children.

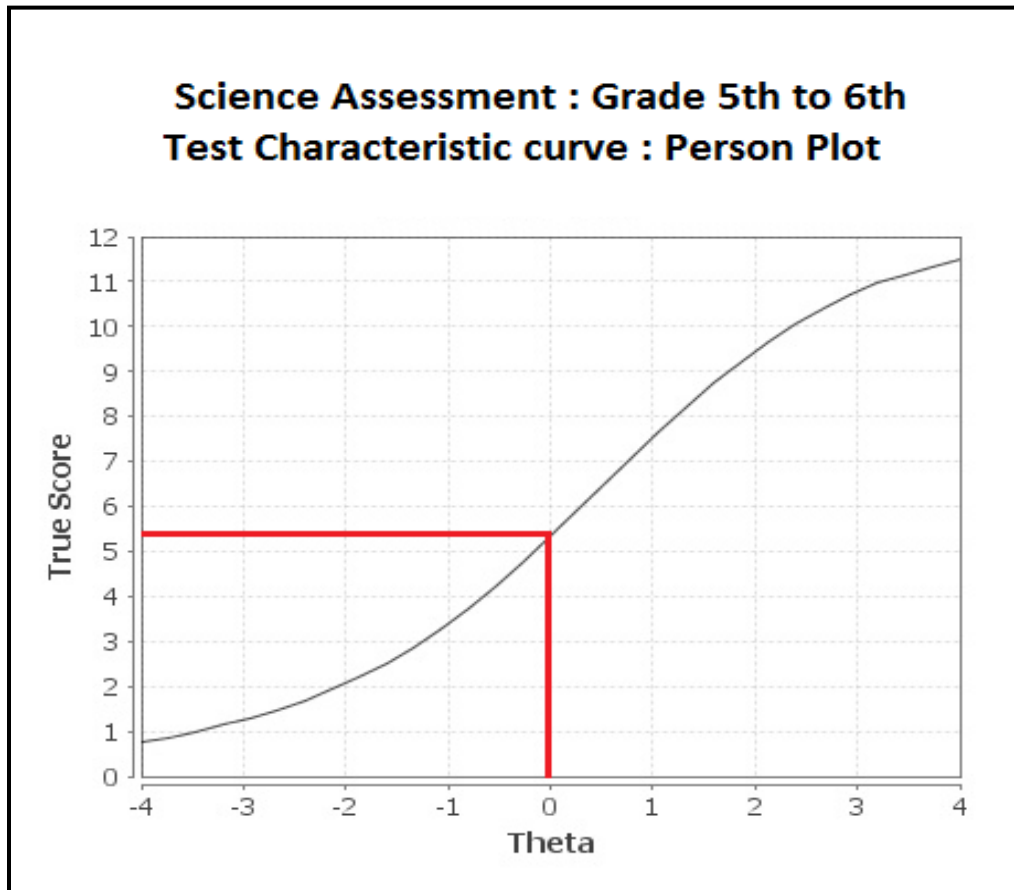
Fig. C.8: Sample Item Characteristic Curves



⁴² ICC means Item characteristic curve which shows the difficulty of the items and the ability level of people who have a certain probability of getting the item correct. It is generated during the process of Rasch Model Analysis.

The Test Characteristic curve (shown in Fig.C.9) also reflects that in the Science assessment, for Grade 5 to 6, the average score is 5.5 which is lower than the expected median (mean) score of 6. This implies that the tool was slightly difficult for a child with average ability.

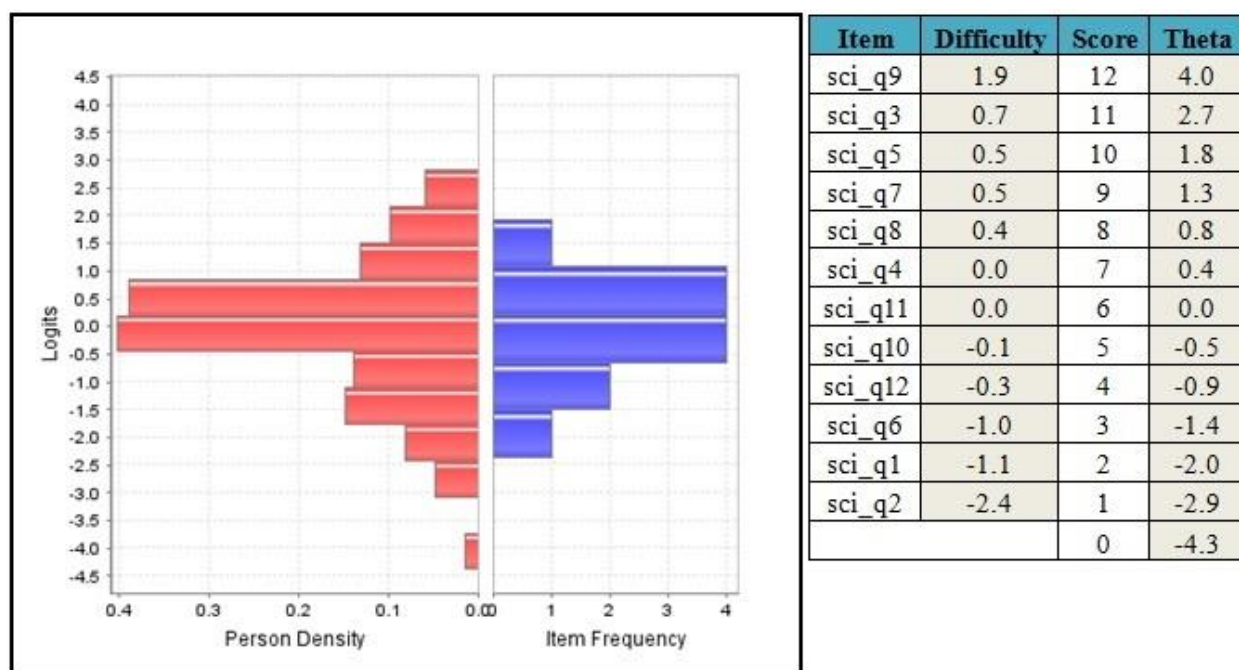
Fig.C.9: Test Characteristic Curve



- **Grade 7 to 8**

**Fig. C.10: Item Person Map of the
Science assessment for grades 7 and 8**

**Table C.7: Item difficulty and
score**



From the Item Person Map (Fig.C.10), it is visible that the items are ranging from -2.4 to 1.9 on the uni-dimensional scale. This is the range of Difficulty of the items. The items on the negative side of the mean (or *Theta* here) on the scale are the easiest items. 0.0 is the mean of items which indicates that the average item is situated here.

The Persons on the uni-dimensional scale are similarly spread from -4.3 as the least able to 2.9 as the most able. Table C.7 indicates the score and ability distribution.

The item person map indicates that the items are spread within the limit of -2.4 to 1.9 SD from the mean i.e., 0 and has a range of items that are easy to difficult. It is a medium level test because equal number of the items fall above and below the mean on item scale i.e., 0.0. There are some children who are above 1.9 on the ability scale and can do almost all the items correctly. The most difficult items are also easy for them. These are the children who have scored 12 on the test. Those children who are below -2.4 item location on the ability scale are unable to do any of the given items correctly. Basically, they do not have items that match their ability levels. The test mean is 51.3% which indicates that the test was of medium level for the children.

The Rasch Model Analysis also indicates that the tool is highly reliable and generates the reliability coefficient as 0.7.

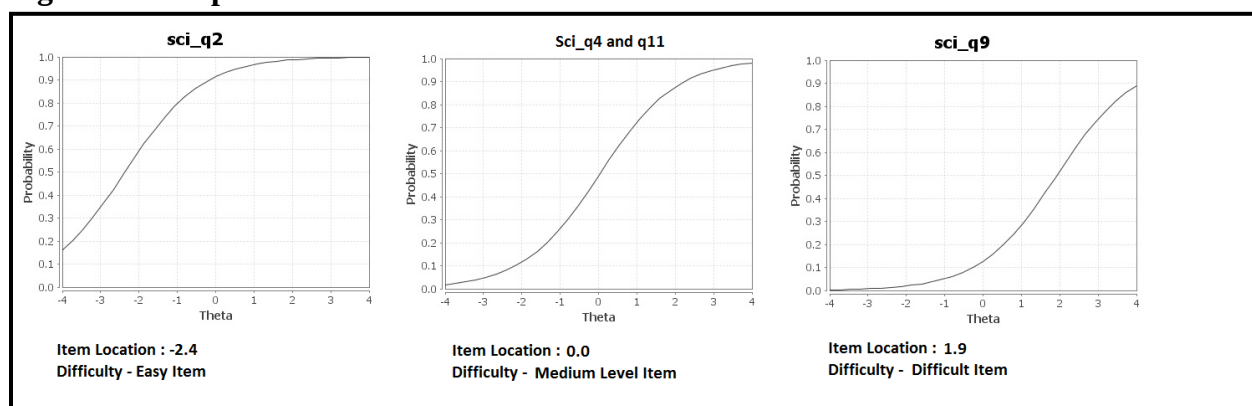
Table C.8: Distribution of Children on each Score of the Test

Grade 7 & 8 (N=2787)	Science Score	0	1	2	3	4	5	6	7	8	9	10	11	12
	% of Children	0.9	3.1	5.2	9.6	9.1	12.7	13.6	12.8	12.7	8.5	6.3	3.8	1.7

Table C.8 shows the proportion of children on each score ranging between 0 and 12.

Given below (Fig.C.11) are some sample ICC curves⁴³ that would show the easiest to the medium level and most difficult items. The easiest item can be solved correctly by any person who is even low on the ability scale whereas the medium level item has 50% probability of being correct by an average ability person. The most difficult item has low probability of being correct even for the high ability children.

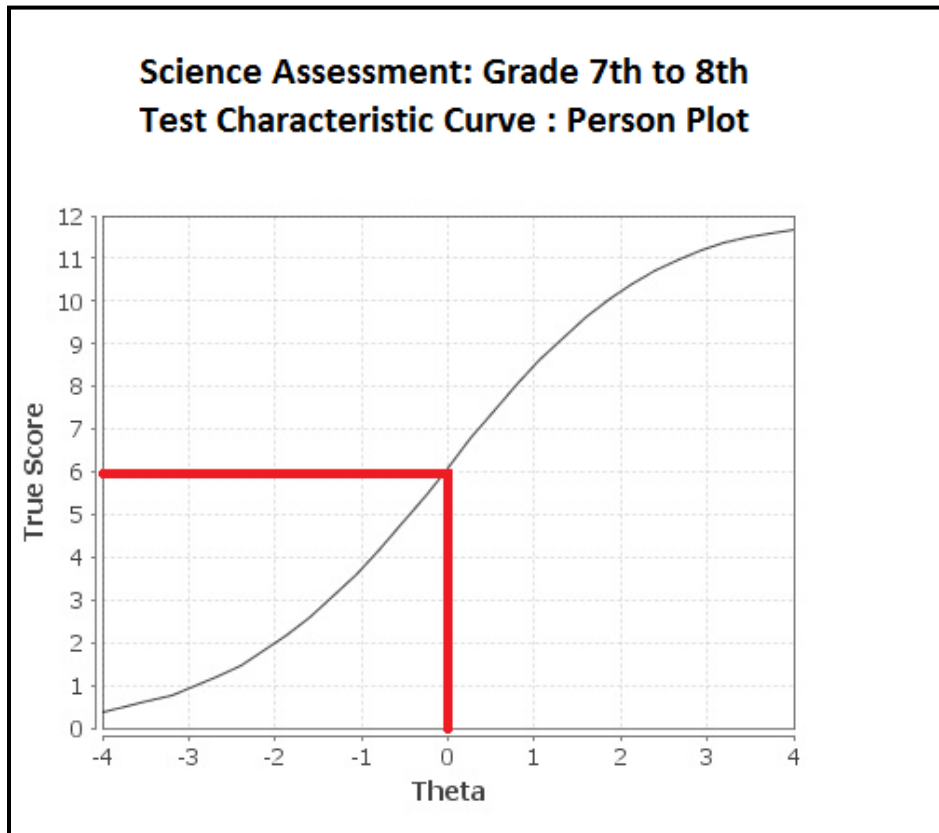
Fig. C.11: Sample Item Characteristic Curves



⁴³ ICC means Item characteristic curve which shows the difficulty of the items and the ability level of people who have a certain probability of getting the item correct. It is generated during the process of Rasch Model Analysis.

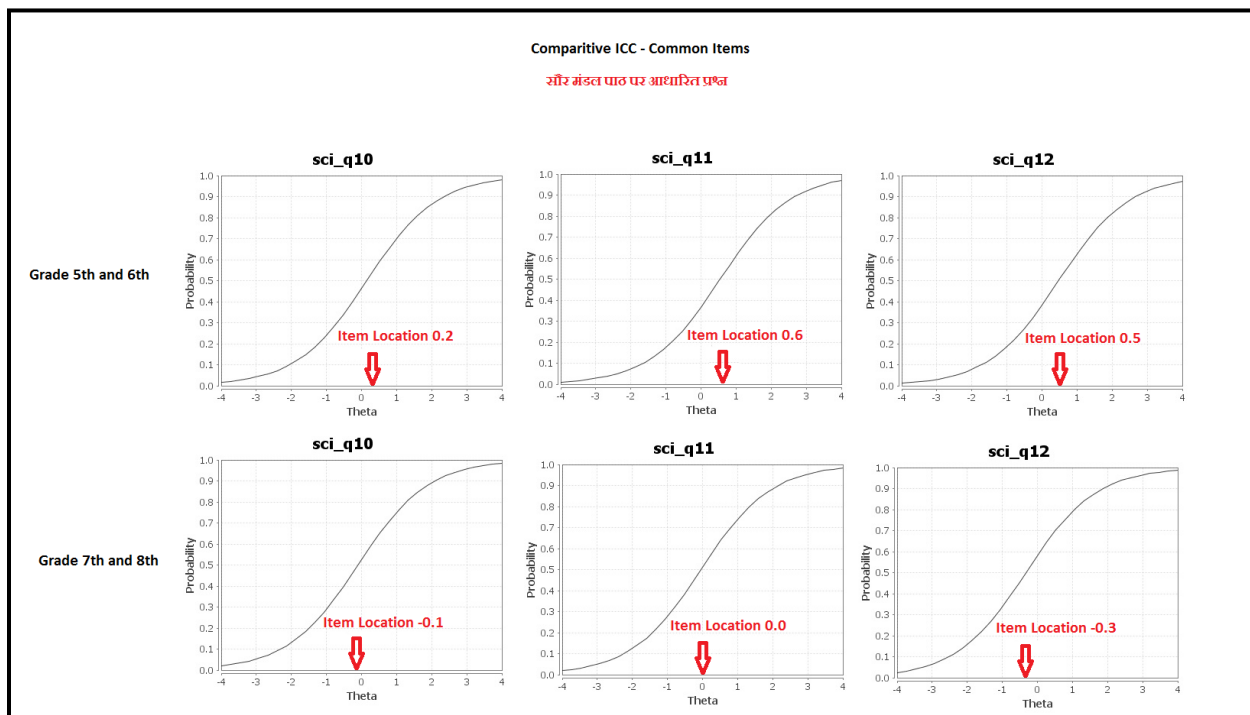
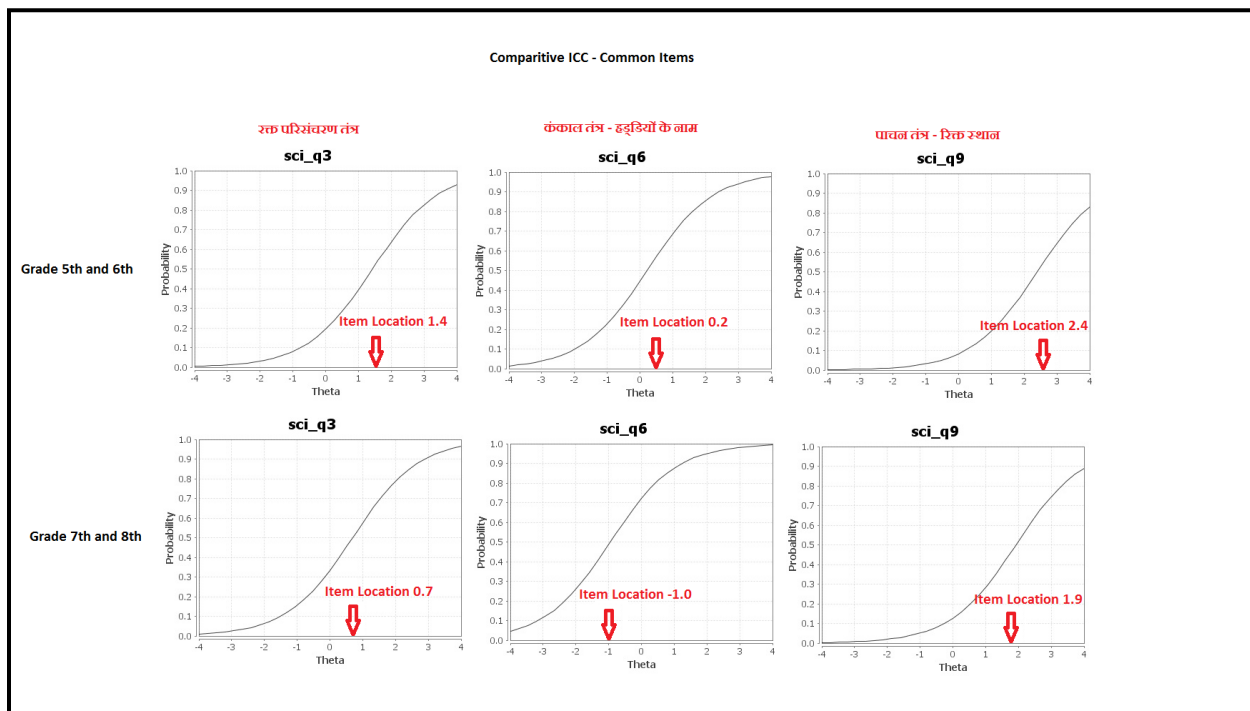
The Test Characteristic curve (Fig.C.11) also reflects that in the Science assessment for Grade 7 to 8, the average score is 6.2 which is higher than the expected median (mean) score of 6 implying that the test was slightly easier for a child of average ability.

Fig. C.11: Test Characteristic Curve



- Rasch Model Interpretation of the Common Items

Fig. C.12: Item Characteristic Curves of the anchor items (a comparison of grade groups)



On all anchor items in the Science assessment, it has been observed that children in Grade 5 and 6 perform lower as compared to the children who are in Grade 7 and 8. From the above Item Characteristic Curves (Fig. S.7), it can be seen that the location of item changes as the grades changes. The arrows indicate the item location on the uni-dimensional scale of the Rasch model and it points that at this level an average child has 50% probability of correctly responding to the item. Children those who are above that point have greater than 50% probability and children those who are below that point have lesser than 50% probability to get that item correct.

Item Location is the common indicator of item difficulty as well as person's ability. The higher the grade, the more number of children fall in the category of above average as per item location. The change in item location is indicative of the fact that children's ability levels are higher in the higher grades.

4. English assessment

a. Quantitative measures of tool reliability and validity

The Split Half reliability⁴⁴ coefficient is **0.9** for the English Assessment in both test samples. The average **Cronbach's alpha coefficient**⁴⁵ is on an average **0.9** for both test samples. This indicates that the tools are highly reliable.

Internal Consistency⁴⁶ of the tool is a measure of both reliability and validity. The average inter item correlation coefficient is **0.3** and average item total correlation coefficient is **0.6**, this is indicative of high internal consistency in the tool.

b. Qualitative measures of validity

The **Face and Content validity** of the tools were met by developing a test of English in accordance with the H- Learning program content. A thorough analysis of the Rajasthan English textbooks for its syllabus, vocabulary, H Learning content, enlisting of frequently used words or vocabulary in the program were done prior to the development of the tool. Further, the ASER results obtained from the census visit were also observed as the base to maintain the difficulty level of the test content. All assessments were thoroughly piloted with children of relevant grades in similar type of schools (as our target group). For each domain in English Assessment, a range of test items in terms of difficulty (easy, medium and difficult) were included. Recognition to Reading to Comprehending was framed in a structured tool at letter, word and sentence level.

⁴⁴ Split half reliability: a reliability measure of a tool as a whole by dividing the tool into two parts and calculating the correlation of the two parts.

⁴⁵ Cronbach's Alpha coefficient: a reliability measure assessing reliability of the tool as a whole and its internal consistency. It is the average of all Split half correlations.

⁴⁶ Internal consistency: This is a measure of reliability per item and also validity of the construct. It is also often referred to as item total correlation. It is the consistency of the items with each other and each item with the whole test.

Since the program focus is conversational and basic English, the vocabulary was matched with that of the ASER tool and of Grades below 5. All items were developed at a level below the child's actual grade level in terms of difficulty considering that the student is in his current grade and has not fully attained the knowledge associated with his current grade at this level.

The English tools also meet **Representation validity** as they were developed from a detailed assessment framework which in turn was developed after detailed mapping of Rajasthan English textbooks and analyzing other documents like curriculum syllabus, H-Learning content etc. This assessment framework attempts to measure each domain in a number of ways and at varying difficulties. Test items were created according to this framework, which were reviewed by subject experts and modified based on the outcomes of pilot field visits. Based on the objective of testing, this framework can be used in future to construct more test items measuring performance on specific domains.

c. Rasch Modelling of English assessment

Fig. C.13: Item Person Map of the English assessment

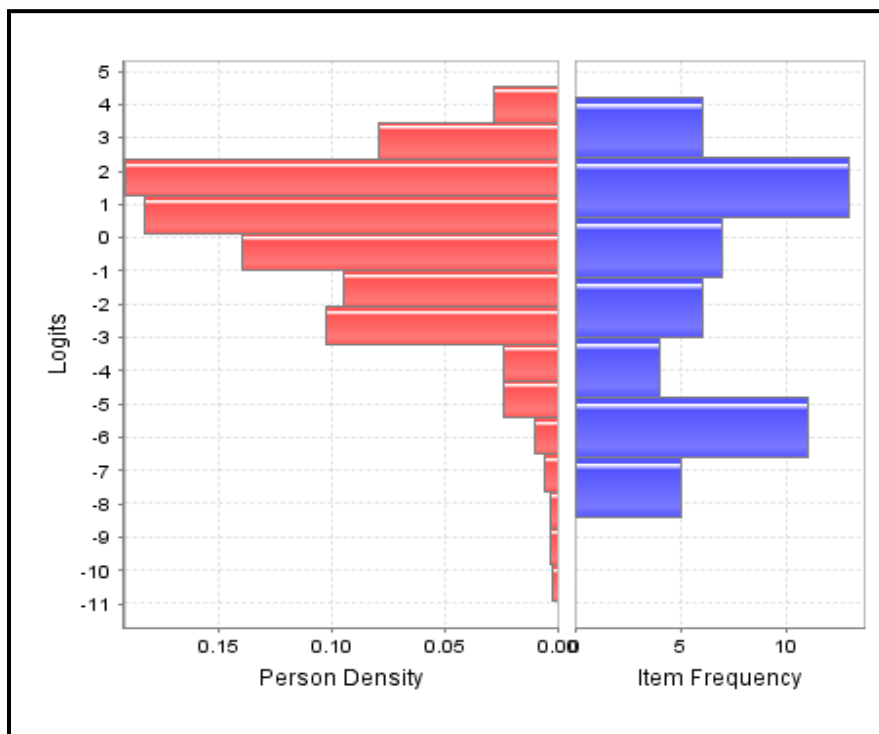


Table C.9: Item difficulty and score

Item	Difficulty	Item	Difficulty	Score	Theta	Score	Theta
eng_fillmn3	4.2	eng_wordrd1	-1.2	52	7.1	25	-1.4
eng_sentmn_e3	4.1	eng_word_rec4	-1.7	51	5.8	24	-1.8
eng_fillmn2	4.0	eng_sen_rec1	-1.9	50	5.0	23	-2.1
eng_fillmn4	3.8	eng_sen_rec2	-2.1	49	4.5	22	-2.4
eng_sentmn_h3	3.5	eng_word_rec3	-2.2	48	4.1	21	-2.7
eng_sentmn_e2	3.1	eng_word_rec2	-2.8	47	3.8	20	-3.1
eng_sentmn_e1	2.4	eng_sml_read5	-3.7	46	3.5	19	-3.4
eng_fillmn1	2.1	eng_cap_read5	-4.0	45	3.2	18	-3.7
eng_wordmn5	2.1	eng_sml_rec_5	-4.7	44	2.9	17	-4.0
eng_wordmn3	2.0	eng_sml_rec_4	-4.8	43	2.7	16	-4.3
eng_fillword3	2.0	eng_sml_read4	-4.8	42	2.5	15	-4.5
eng_wordmn6	2.0	eng_sml_rec_3	-5.0	41	2.3	14	-4.8
eng_wordmn4	1.9	eng_sml_rec_2	-5.1	40	2.1	13	-5.1
eng_fillword4	1.8	eng_cap_rec_5	-5.4	39	1.9	12	-5.3
eng_wordmn2	1.8	eng_cap_read4	-5.5	38	1.7	11	-5.6
eng_fillword2	1.8	eng_sml_rec_1	-5.5	37	1.5	10	-5.8
eng_sentmn_h2	1.7	eng_cap_rec_4	-5.6	36	1.3	9	-6.1
eng_sen_read	1.6	eng_sml_read3	-5.7	35	1.1	8	-6.3
eng_fillword1	1.4	eng_cap_rec_3	-5.9	34	0.9	7	-6.6
eng_wordmn1	0.6	eng_cap_rec_2	-6.0	33	0.6	6	-6.9
eng_sentmn_h1	0.5	eng_cap_read3	-6.6	32	0.4	5	-7.3
eng_wordrd4	0.3	eng_sml_read2	-6.8	31	0.2	4	-7.6
eng_wordrd5	0.2	eng_cap_read2	-7.3	30	-0.1	3	-8.1
eng_wordrd6	0.1	eng_cap_rec_1	-7.7	29	-0.3	2	-8.6
eng_wordrd3	0.0	eng_sml_read1	-7.9	28	-0.6	1	-9.5
eng_wordrd2	-0.4	eng_cap_read1	-8.4	27	-0.8	0	-10.8
				26	-1.1		

From the Item Person Map (Fig. C.13) it is visible that the items are ranging from -8.4 to 4.2 on the uni-dimensional scale. This is the range of Difficulty of the items. The items on the negative side of the mean (or *Theta* here), on the scale are the easiest items. 0.0 is the mean of items which indicates that the average item is situated here.

The Persons on the uni-dimensional scale are similarly spread from -10.8 as the least able to 7.1 as the most able. Table C.9 indicates the score and ability distribution.

The item person map indicates that the items are spread within the limit of -8.4 to 4.2 SD from the mean i.e., 0 and they range between being very easy to extremely difficult. There are some children who are at 7.1 and above on the ability scale and can do almost all the items correctly. The most difficult items are also easy for them. These are the children who have scored 49 and above on the test. Children who fall below -8.2 on the ability scale are unable to do any of the given items correctly. Basically, they do not have items that match their ability levels. The test mean is 60.4%, indicating that the test was of medium to easy level for the children.

The Rasch Model Analysis also indicates that the tool is highly reliable and generates the reliability coefficient as 0.9.

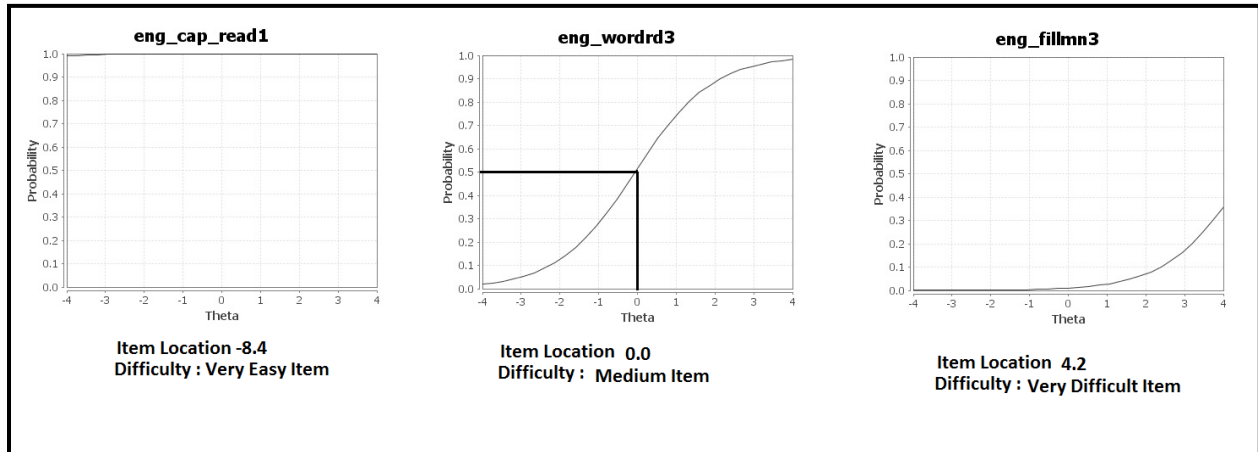
Table C.10: Distribution of Children on each Score of the Test

Overall (N=5534)	English Score	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	% of Children	0.2	0.1	0.2	0.3	0.0	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.4	0.7	0.8	0.8
	English Score	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
	% of Children	0.9	0.9	2.7	2.4	2.9	3.6	3.0	3.7	4.1	3.7	4.1	4.1	3.6	4.0	4.1	4.3	3.6	
	English Score	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	% of Children	3.8	3.9	3.5	3.4	3.6	3.1	2.8	2.7	2.3	2.1	1.6	1.4	0.8	1.0	0.7	0.5	0.3	1.0

Table C.10 shows the proportion of children on each score ranging from 0 to 52.

Given below are some sample ICC curves⁴⁷ that show the easiest to the medium level and most difficult items. The easiest item can be solved correctly by any person, even one who is low on the ability scale whereas the medium level item has 50% probability of being correct by an average ability person. The most difficult item has low probability of being correct even for high ability children.

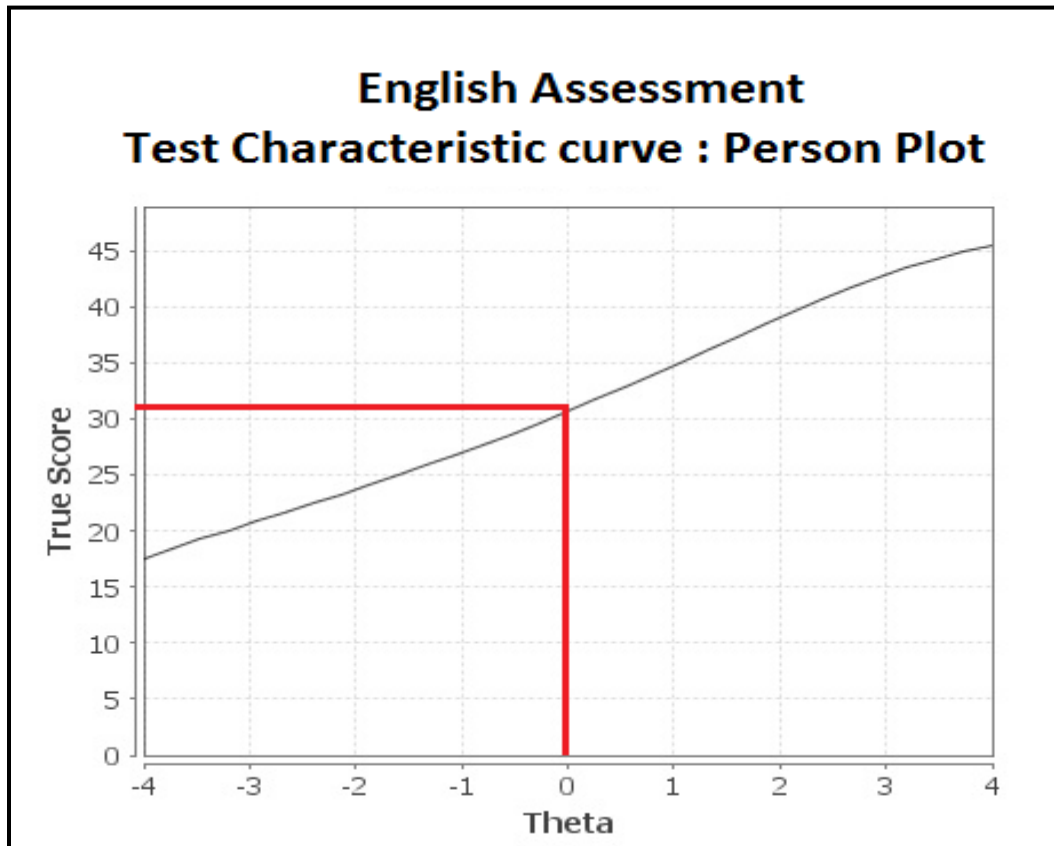
Fig. C.14: Sample Item Characteristic Curves



⁴⁷ ICC means Item characteristic curve, which shows the difficulty of the items and the ability level of people who have a certain probability of getting the item correct. It is generated during the process of Rasch Model Analysis.

The Test Characteristic curve (shown in Fig.E.3) also reflects the similar information about the English assessment, the overall average score is 31.4 which is higher than the expected median (mean) score of 26 implying that the test is easier even for an individual with average ability.

Fig. E.3: Test Characteristic Curve



Appendix D: Regression

Table D.1: Hindi Assessment (Total children=4744)

Average score in Hindi	Coefficient	Robust Std. Err.	Significance
Bassi	-0.74	0.14	**
Dausa	0.03	0.14	
Rajgarh	reference		
Sikrai	-0.05	0.14	
Age	0.14	0.05	**
Girl	0.00	0.10	
Child is in Std. 5	reference		
Child is in Std. 6	0.45	0.15	**
Child is in Std. 7	1.28	0.18	**
Child is in Std. 8	1.62	0.21	**
Child can read ASER story	2.25	0.14	**
Government	reference		
Private	0.91	0.20	**
Madarsa	1.57	2.95	
Other	-1.83	1.81	
Interaction of ASER (story) with school type			
ASER (story) reader & govt school	reference		
ASER (story) reader & pvt school	0.05	0.23	
ASER (story) reader & madarsa	0.00	(empty)	
ASER (story) reader & other school	0.00	(omitted)	
Child lives in <i>kutcha</i> house	reference		
Child lives in semi- <i>kutcha</i> house	-0.56	0.32	
Child lives in <i>pucca</i> house	0.11	0.30	
Child belongs to the UR	reference		
Child belongs to the ST	-0.26	0.17	
Child belongs to the SC	-0.30	0.18	
Child belongs to the OBC	-0.27	0.18	
Child belongs to the EBC	-0.35	1.09	
Do not know reservation category	-4.48	0.29	**
HH has 4-wheeler	-0.15	0.16	
HH has 2-wheeler	0.06	0.11	
HH has electricity	-0.10	0.13	
HH has toilet	0.14	0.12	
HH has TV	0.64	0.11	**
HH has reading materials (other than text-books)	0.41	0.12	**
A member in HH has completed Std.12th	0.32	0.12	**
HH has computer	0.04	0.14	

HH has mobile	0.37	0.47	
Father has completed (at least) upto Std. 5	0.37	0.13	**
Mother has completed (at least) upto Std.5	0.11	0.12	
Constant	2.64	0.76	**

Table D.2: Test of Significance in the average scores of Hindi as per the augmented model (N=4744)

Block	Treatment type	Bassi (as reference)	Dausa (as reference)	Rajgarh (as reference)	Sikrai (as reference)
Bassi (as reference)	Digital + Print at community level	NA	Yes (score of Dausa is higher)	Yes (score of Rajgarh is higher)	Yes (score of Sikrai is higher)
Dausa (as reference)	Digital + Print at school and community level	Yes (score of Dausa is higher)	NA	No	No
Rajgarh (as reference)	Control	Yes (score of Rajgarh is higher)	No	NA	No
Sikrai (as reference)	Print (Y1) + Digital & Print (Y2) at community level	Yes (score of Sikrai is higher)	No	No	NA

Table D.3: Math Assessment (Total children=4744)

Average score in Math	Coefficient	Robust Std. Err.	Significance
Bassi	-0.81	0.14	**
Dausa	-0.36	0.14	**
Rajgarh	reference		
Sikrai	-0.13	0.14	
Age	0.07	0.05	
Girl	-0.74	0.10	**
Child is in Std. 5	reference		
Child is in Std. 6	0.35	0.1	**
Child is in Std. 7	0.99	0.2	**
Child is in Std. 8	1.25	0.2	**
Child can read ASER story	1.73	0.12	**

Child can solve ASER subtraction &/or Division	2.72	0.15	**
Government	reference		
Private	0.77	0.22	**
Madarsa	-0.71	1.25	
Other	1.69	0.23	**
Interaction of ASER arithmetic level with school type			
ASER (Subtraction and above) level & govt school	reference		
ASER (Subtraction and above) level & pvt school	0.25	0.24	
ASER (Subtraction and above) level & madarsa	0.00	(empty)	
ASER (Subtraction and above) level & other school	-2.47	2.08	
Child lives in <i>kutcha</i> house	reference		
Child lives in semi- <i>kutcha</i> house	-0.10	0.30	
Child lives in <i>pucca</i> house	0.41	0.27	
Child belongs to the UR	reference		
Child belongs to the ST	-0.21	0.16	
Child belongs to the SC	0.00	0.18	
Child belongs to the OBC	-0.10	0.16	
Child belongs to the EBC	0.23	0.85	
Do not know reservation category	-0.80	0.29	**
HH has 4-wheeler	-0.11	0.15	
HH has 2-wheeler	0.01	0.11	
HH has electricity	-0.03	0.12	
HH has toilet	0.34	0.11	**
HH has TV	0.35	0.11	**
HH has reading materials (other than text-books)	0.22	0.11	
A member in HH has completed Std.12th	0.14	0.11	
HH has computer	0.00	0.13	
HH has mobile	0.45	0.45	
Father has completed (at least) upto Std. 5	0.32	0.13	**
Mother has completed (at least) upto Std.5	-0.01	0.11	
Constant	2.42	0.71	**

Table D.4: Test of Significance in the average scores of Math as per the augmented model (N=4744)

Block	Treatment type	Bassi (as reference)	Dausa (as reference)	Rajgarh (as reference)	Sikrai (as reference)
Bassi (as reference)	Digital + Print at community level	NA	Yes (score of Dausa is higher)	Yes (score of Rajgarh is higher)	Yes (score of Sikrai is higher)
Dausa (as reference)	Digital + Print at school and community level	Yes (score of Dausa is higher)	NA	Yes (score of Rajgarh is higher)	No
Rajgarh (as reference)	Control	Yes (score of Rajgarh is higher)	Yes (score of Rajgarh is higher)	NA	No
Sikrai (as reference)	Print (Y1) + Digital & Print (Y2) at community level	Yes (score of Sikrai is higher)	No	No	NA

Table D.5: English Assessment (Total children=4756)

Average score in English	Coefficient	Robust Std. Err.	Significance
Bassi	-0.39	0.30	
Dausa	-0.86	0.30	**
Rajgarh	reference		
Sikrai	-0.32	0.30	
Age	-0.02	0.11	
Girl	-0.65	0.21	**
Child is in Std. 5	reference		
Child is in Std. 6	2.22	0.33	**
Child is in Std. 7	3.58	0.39	**
Child is in Std. 8	4.70	0.45	**
Child can read ASER (English) sentences	9.20	0.30	**
Government	reference		
Private	2.69	0.30	**

Madarsa	1.13	1.72	
Other	8.39	0.67	**
Interaction of ASER English level with school type			
ASER (English) sentence reader & govt school	reference		
ASER (English) sentence reader & pvt school	-0.91	0.42	**
ASER (English) sentence reader & madarsa	0.00	(empty)	
ASER (English) sentence reader & other school	-10.56	0.74	**
Child lives in <i>kutch</i> a house	reference		
Child lives in semi- <i>kutch</i> a house	0.57	0.71	
Child lives in <i>pucca</i> house	1.12	0.64	
Child belongs to the UR	reference		
Child belongs to the ST	-1.37	0.37	**
Child belongs to the SC	-2.00	0.39	**
Child belongs to the OBC	-1.12	0.38	**
Child belongs to the EBC	-1.89	2.01	
Do not know reservation category	-10.55	0.55	**
HH has 4-wheeler	0.46	0.32	
HH has 2-wheeler	0.02	0.24	
HH has electricity	-0.77	0.27	**
HH has toilet	0.66	0.25	**
HH has TV	0.82	0.23	**
HH has reading materials (other than text-books)	0.56	0.25	**
A member in HH has completed Std.12th	0.50	0.24	**
HH has computer	1.03	0.28	**
HH has mobile	1.13	0.92	
Father has completed (at least) upto Std. 5	1.31	0.29	**
Mother has completed (at least) upto Std.5	1.02	0.24	**
Constant	23.00	1.59	**

Table D.6: Test of Significance in the average scores of English as per the augmented model (N=4756)

Block	Treatment type	Bassi (as reference)	Dausa (as reference)	Rajgarh (as reference)	Sikrai (as reference)
Bassi (as reference)	Digital + Print at community level	NA	No	No	No
Dausa (as reference)	Digital + Print at school and	No	NA	Yes (score of Rajgarh is	No

	community level			higher)	
Rajgarh (as reference)	Control	No	Yes (score of Rajgarh is higher)	NA	No
Sikrai (as reference)	Print (Y1) + Digital & Print (Y2) at community level	No	No	No	NA

Table D.7: Science assessment (Total Children=4752)

Average score in Science	Coefficient	Robust Std. Err.	Significance
Bassi	-0.07	0.19	
Dausa	-0.37	0.10	**
Rajgarh	reference		
Sikrai	0.19	0.10	
Age	0.04	0.04	
Girl	-0.36	0.07	**
Child is in Std. 5	reference		
Child is in Std. 6	0.74	0.10	**
Child is in Std. 7	0.52	0.12	**
Child is in Std. 8	0.87	0.14	**
Child can read ASER story	0.72	0.10	**
Child can solve ASER subtraction &/or Division	0.78	0.10	**
Government	reference		
Private	0.19	0.15	
Madarsa	0.49	1.15	
Other	-1.36	0.16	**
Interaction of ASER (story) with school type			
ASER (story) reader & govt school	reference		
ASER (story) reader & pvt school	0.40	0.16	**
ASER (story) reader & madarsa	0.00	(empty)	
ASER (story) reader & other school	0.00	(omitted)	
Interaction of ASER (subtraction & above) with school type			
ASER (subtraction & above) level & govt school	reference		
ASER (subtraction & above) level & pvt school	0.02	0.17	
ASER (subtraction & above) level & madarsa	0.00	(empty)	

school			
ASER (subtraction & above) level & other school	3.02	0.80	**
Child lives in <i>kutcha</i> house	reference		
Child lives in semi- <i>kutcha</i> house	-0.04	0.22	
Child lives in <i>pucca</i> house	0.11	0.20	
Child belongs to the UR	reference		
Child belongs to the ST	-0.31	0.12	**
Child belongs to the SC	-0.51	0.13	**
Child belongs to the OBC	-0.18	0.13	
Child belongs to the EBC	-0.37	0.39	
Do not know reservation category	2.44	0.21	**
HH has 4-wheeler	0.11	0.11	
HH has 2-wheeler	-0.17	0.08	**
HH has electricity	-0.23	0.09	**
HH has toilet	0.08	0.08	
HH has TV	0.31	0.08	**
HH has reading materials (other than text-books)	0.22	0.08	**
A member in HH has completed Std.12th	0.12	0.08	
HH has computer	0.24	0.10	**
HH has mobile	0.50	0.33	
Father has completed upto Std. 5	0.23	0.09	**
Mother has completed upto Std.5	0.01	0.08	
Constant	3.40	0.52	**

Table D.8: Test of Significance in the average scores of Science as per the augmented model (N=4752)

Block	Treatment type	Bassi (as reference)	Dausa (as reference)	Rajgarh (as reference)	Sikrai (as reference)
Bassi (as reference)	Digital + Print at community level	NA	Yes (score of Bassi is higher)	No	Yes (score of Sikrai is higher)
Dausa (as reference)	Digital + Print at school and community level	Yes (score of Bassi is higher)	NA	Yes (score of Rajgarh is higher)	Yes (score of Sikrai is higher)
Rajgarh (as reference)	Control	No	Yes (score of Rajgarh is higher)	NA	No
Sikrai (as reference)	Print (Y1) + Digital & Print (Y2) at community level	Yes (score of Sikrai is higher)	Yes (score of Sikrai is higher)	No	NA

Annexure: Assessment tools – Math, Hindi, Science and English

Glossary

Glossary

Rasch Model: Named after Georg Rasch, the Rasch Model is a psychometric mathematical model for analyzing data, to answer questions on an assessment or questionnaire responses, as a function of the trade-off between (a) the respondent's abilities, attitudes or personality traits and (b) the item difficulty. In the Rasch model, the probability of a specified response (e.g. right/wrong answer) is modeled as a function of person and item parameters.

Simply put, Rasch model is a model of intent. It is a mathematical model which calibrates people's ability and item difficulty on a uni-dimensional logit or logarithmic unit scale. As the ability of the person increases, the probability of him or her getting the answers correct also increases. The item mean is always 0 (*Theta*) indicating 50% probability of a correct response by an individual with average ability. When a person's location on the latent trait is equal to the difficulty of the item, there is by definition a 0.5 probability of a correct response in the Rasch Model. Specifically, in the original Rasch model, the probability of a correct response is modeled as logistic function of the difference between the person and item parameter.

Reliability: a testing tool is called 'reliable' if it generates similar results, without significant difference in the mean scores, every time it is administered on the same population provided it is not impacted with any intervention to improve learning levels. Thus, if test items made within a construct or frame of assessment, have been designed for same purpose, with same item difficulty distribution, they will generate similar results.

There are various methods to check reliability of an assessment. It is often seen that reliability and validity of assessments go hand in hand. Moreover, they are either both high or both low. In educational assessments, a reliability coefficient of 0.7 or above implies that the tool is highly reliable and valid. There are certain statistical methods which are a measure of both reliability and validity. Reliability is for the tool as a whole and within a tool by check on internal consistency. Split Half correlation and the Cronbach's Alpha are reliability measure of a tool as a whole. Inter-item and item-total correlations measure internal consistency. *The Cronbach's Alpha is a measure of internal consistency as well.* It is preferred that the tool as a whole obtains a reliability coefficient of 0.7 or above while the inter-item-total correlations are positive. This difference is kept because within a tool while the items pertain to a single construct, they may pertain to multiple domains within a construct. As the domains vary, the correlations within them need not be higher due to the requirements of different competencies across domain. For e.g., math, geometry and number operations are different domains and therefore the items from these domains tend to show a low positive correlation.

Split Half Reliability: This is the correlation between the halves of a testing tool. A test can be divided into halves by randomly dividing basis the number of items or dividing items as odd and even numbered items or basis difficulty levels of the items.

Cronbach's Alpha Coefficient: The average of all possible Split Half Correlations is the Cronbach's alpha coefficient.

Inter-item and Item-total Correlations: This is simple correlation (Pearson's r) between each item of the tool and of each item with the total score obtained in the tool by the sample on which the tool was administered. Inter-item and Item-total correlations should be positive for a tool that is reliable and thus, internally consistent.

Validity: The validity of a measurement tool, in education, is considered to be the degree to which the assessment measures what it claims to measure. In psychometrics, validity has a particular application known as test validity: the degree to which evidence and theory support the interpretations of test scores as entailed by proposed uses of tests.

Face and Content Validity: Face and Content validity is a non-statistical type of validity that involves the systematic examination of the test content to determine whether it covers a representative sample of the domain to be measured. Content validity evidence involves the degree to which the content of the test matches a content domain associated with the construct. It is also termed face validity as by the face of the test a subject expert can judge whether it is measuring according to the criterion of the assessable construct or not. A test has content validity built into it by inclusion of carefully selected items. Items are chosen so that they comply with the test specification which is drawn up by a thorough examination of the subject domain.

Representation Validity: Representation validity also known as translation validity is about the extent to which an abstract theoretical construct can be turned into a specific practical test. The experts are able to review the items and comment on whether the items cover a representative sample of the domain.

Item characteristic curve: ICC shows the difficulty of the items and the ability level of people who have a certain probability of getting the item correct. It is generated during the process of Rasch Model Analysis. It gives various kinds of information. The OX axis is basically the unidimensional scale which indicates probability of a child at different ability levels to be able to solve an item correctly. It also indicates the difficulty of the item by item location. Zero point on the scale is the mean, and positive SD indicates more difficult items or the more able children. Similarly, negative SD indicates more easy items or the less able children.

Dausa Assessment - Baseline (Visit-2)

English Oral Tool



M

X

Z

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N

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Y

V

B

H

a

h

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y

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they

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will

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for

go

me

out

new

take

like

This is a long road.

I like to play.

She has many pens.

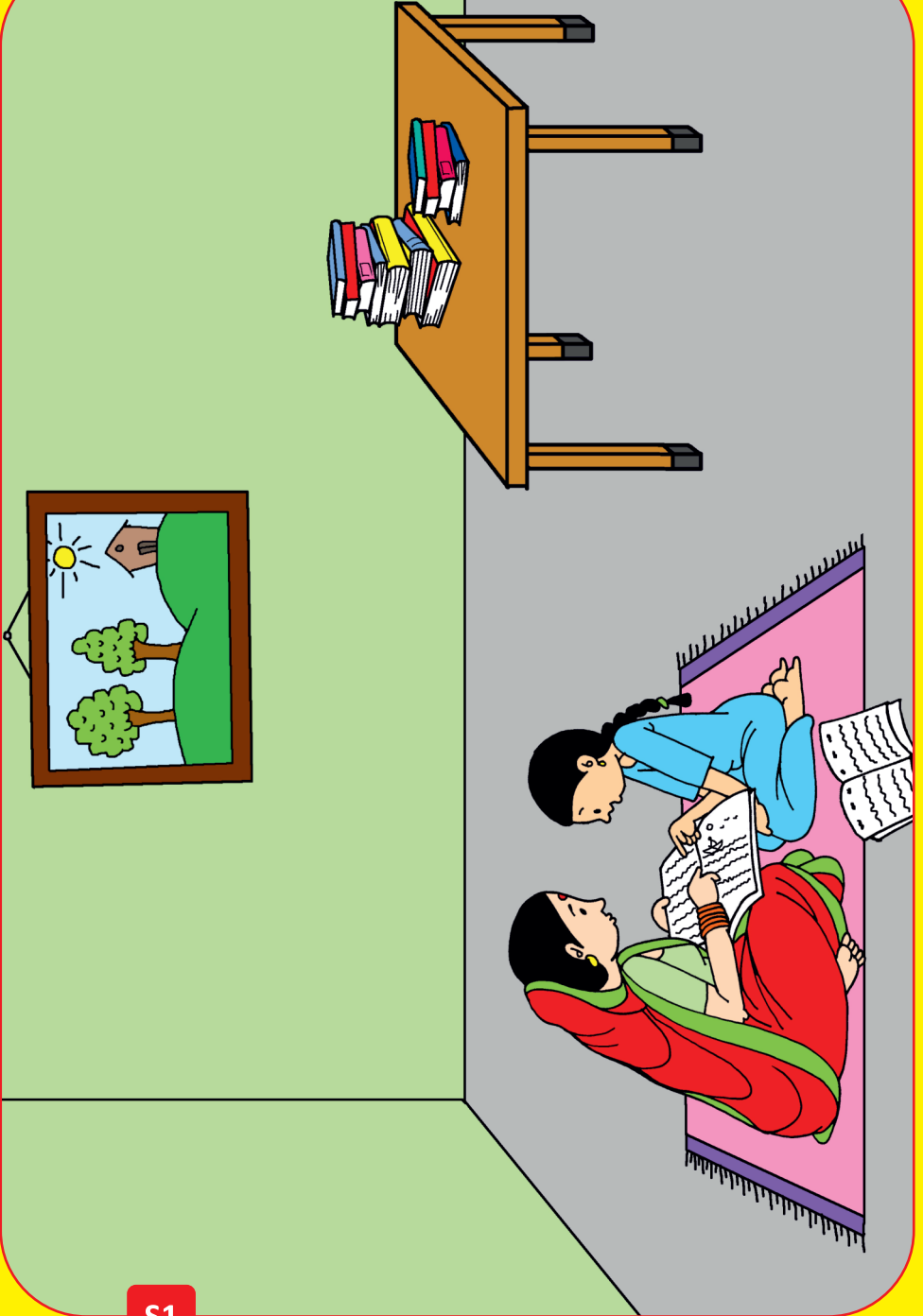
My kite is red.

Rani goes to school.

She likes her teacher.

Her teacher reads stories.

Rani wants to read stories.



The books are _____ the table.

at

in

on

from

The girl is _____ the room.

The _____ is on the wall.

sitting

picture

table

eating

The girl is _____ with her mother.

B

O

V

K

M

E

R

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T

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m

x

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This is a small door.

I like to sleep.

She has many books.

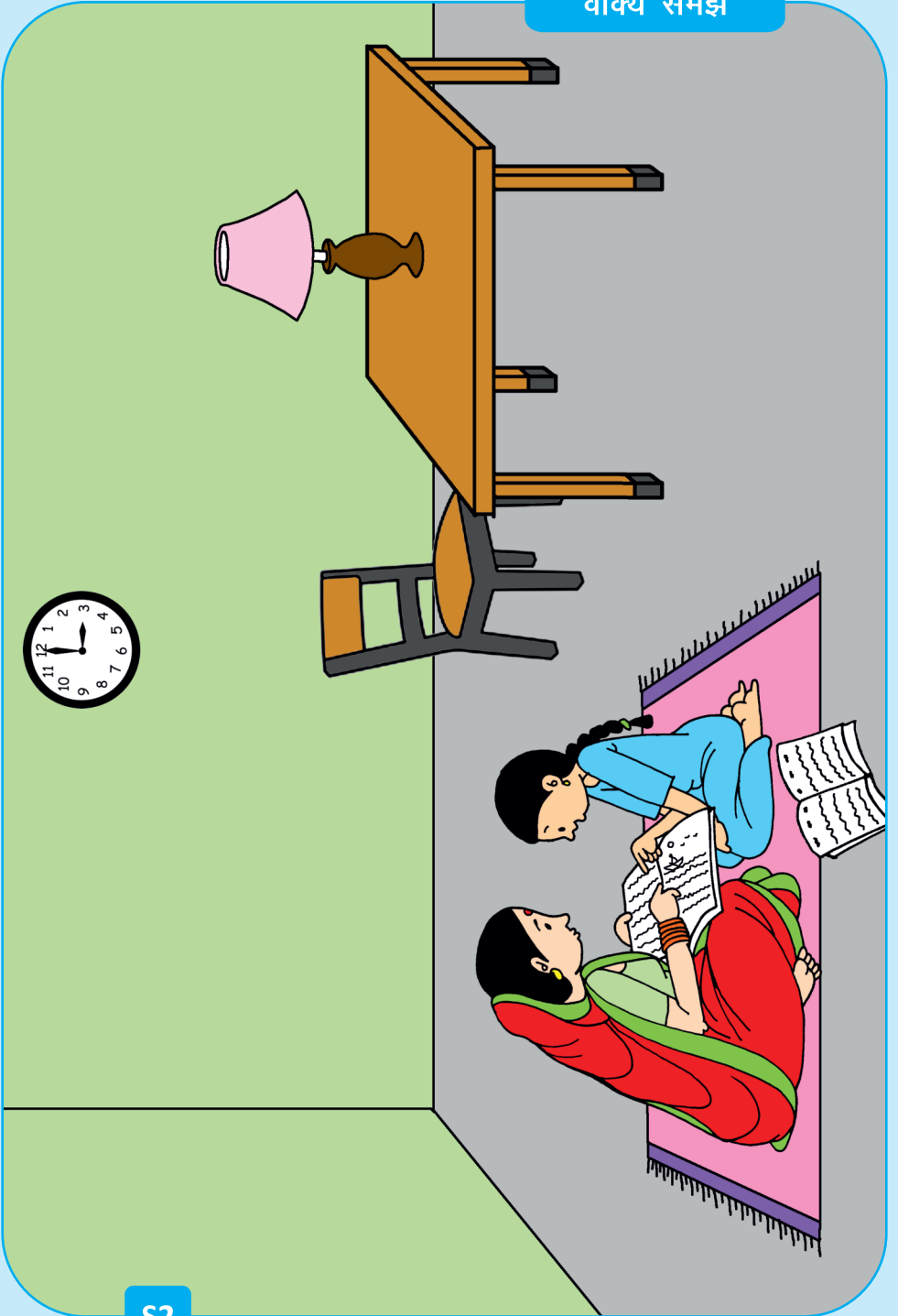
My shirt is red.

Amit goes to school.

He likes his teacher.

His teacher reads books.

Amit wants to read books.



The chair is _____ the room.

in

at

from

on

The mat is _____ the floor.

The _____ is on the wall.

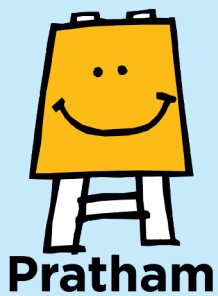
chair

clock

dancing

reading

The girl is _____ with her mother.

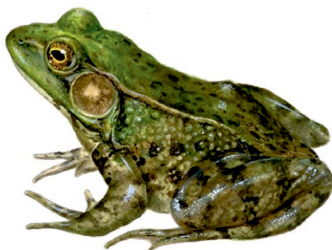


Dausa Assessment - Baseline (Visit-2)

Science Oral Tool

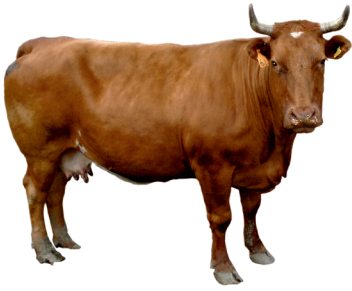


Q1. इनमें से कौन-सा जीव जल में नहीं रहता है?



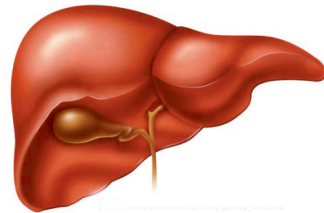
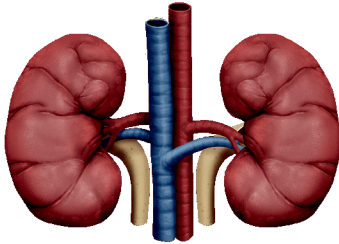
Q2.

इनमें से कौन-सा जीव 'मांस' खाता है?



Q3.

नीचे हमारे शरीर के कुछ अंगों के चित्र दिए गए हैं। इनमें से कौन-सा अंग 'रक्त परिसंचरण तंत्र' का हिस्सा है?



Q4.

नीचे तीन प्रकार के खाने वाले पदार्थ दिए गए हैं। जिनमें अलग-अलग प्रकार के पोषक तत्व अधिक मात्रा में पाए जाते हैं। आपको बताना है कि इनमें से कौन-से समूह में कौन-सा तत्व सबसे अधिक पाया जाता है- वसा/प्रोटीन/कार्बोहायड्रेट।

समूह 1

आलू

ब्रेड

रोटी

समूह 2

मूंगफली

घी

नारियल

समूह 3

अंडे

दूध

मछली

वसा

प्रोटीन

कार्बोहायड्रेट

Q5.

नीचे कुछ पदार्थों के नाम दिए गए हैं। इनमें से कुछ पदार्थ पानी में ऐसे घुल जाते हैं की अलग से दिखाई नहीं देते। आपको बताना है कौन-सा पदार्थ पानी में घुलनशील है और कौन-सा पदार्थ अघुलनशील है।

तेल

शहद

निम्बू का रस

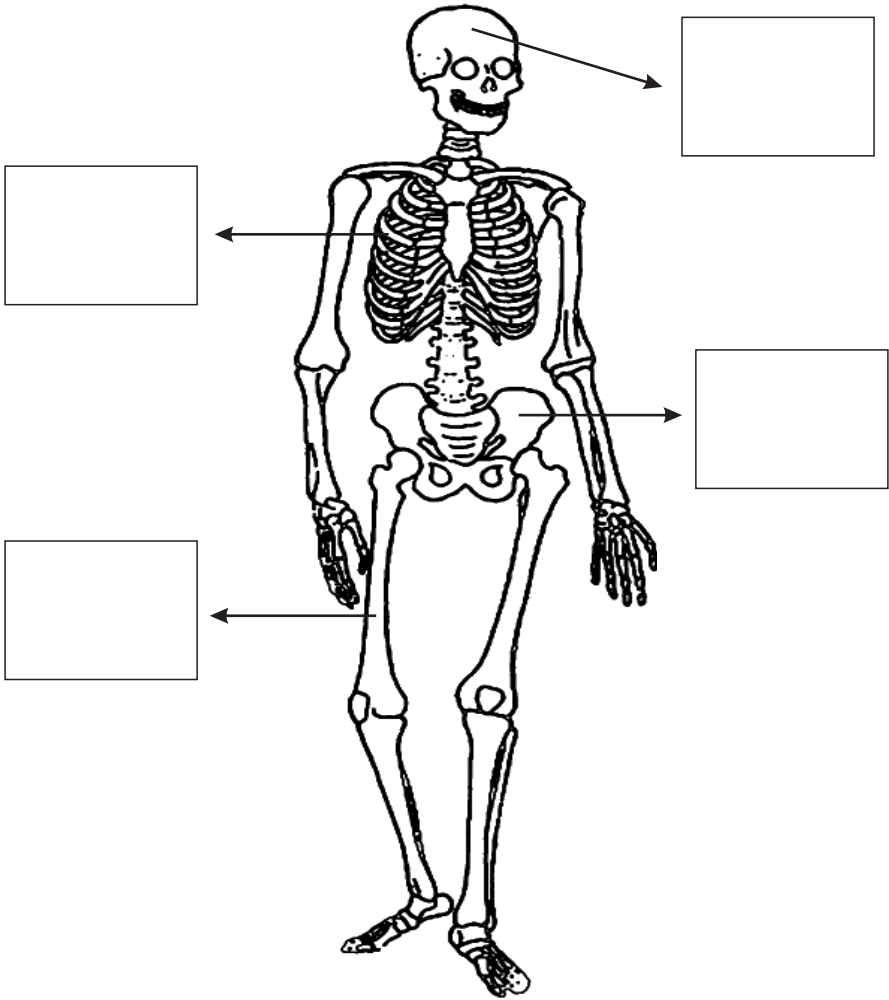
शक्कर

रेत

लकड़ी का बुरादा

Q6.

नीचे मानव कंकाल तंत्र का चित्र दिया गया है। कंकाल तंत्र में चिह्नित हड्डियों के नाम नीचे दिए गए बक्से से चुनकर बताएँ।



फीमर, कुल्हे की हड्डी,
पसलियाँ, खोपड़ी, रीढ़ की हड्डी

Q7.

नीचे दी गई पंक्तियों में कोष्ठक से सही शब्द चुनकर रिक्त स्थानों को भरें।

हमारे शरीर में सभी पोषक तत्व आवश्यक मात्रा में होने ज़रूरी हैं। यदि किसी भी पोषक तत्व की मात्रा में कमी आ जाए तो कई प्रकार की बीमारियाँ हो सकती हैं। ऐसा ही एक आवश्यक तत्व है लोह। लोह

(खून के बनने/हड्डियों की मज़बूती) के लिए लाभदायक होता है। लोह सबसे अधिक

(हरी सब्जियों/खट्टे फलों) में पाया जाता है।

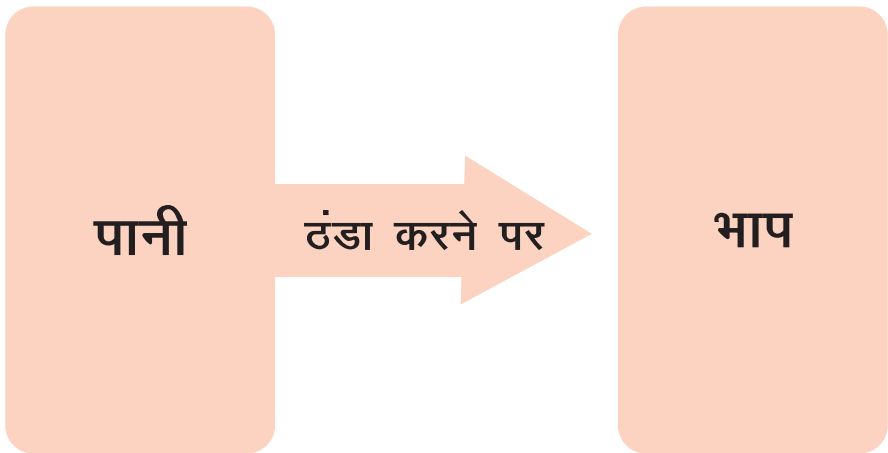
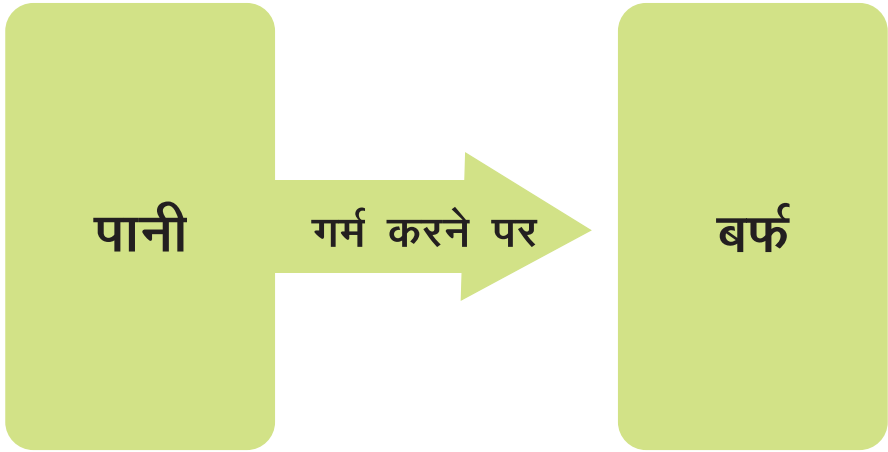
लोह की कमी से(अनीमिया/घेंगा)

रोग हो जाता है। इस रोग में

(कमज़ोरी/रात में देखने में मुश्किल) होती है।

Q8.

नीचे पानी की बर्फ और भाप में बदलने की प्रक्रिया दर्शाई गई है। इनमें कुछ गलतियाँ हैं, आपको इन्हें ढूँढकर सुधारना है।



Q9.

नीचे दिए गए बक्से से सही शब्द चुनकर रिक्त स्थानों को भरें और पाचन की प्रक्रिया को पूरा करें।

मानव पाचन प्रक्रिया

.....
में लार की मदद से
खाना चिपचिपा और
लसलसा बन जाता
है।



खाना

.....
से होते हुए आमाशय
में जाता है।



आंत से खाना

.....
में इकट्ठा होता है
जहाँ से अपचित
खाना बाहर निकाल
दिया जाता है।



आमाशय और

.....
में खाना पाचक रसों
द्वारा पचता है।

श्वास नली, आमाशय, मलाशय,
मुँह, आंत, ग्रसिका, फेफड़े

सौर मंडल

हमें आकाश में सबसे अधिक चमकदार जो तारा (Star) दिखाई देता है वह सूर्य (Sun) है। सूर्य सौर मंडल (Solar system) का केंद्र है और पृथ्वी (Earth) जैसे अन्य कई ग्रह (Planet) सूर्य के चारों ओर परिक्रमा (Revolution) करते हैं। सूर्य से बढ़ती दूरी के अनुसार इन ग्रहों का क्रम कुछ इस प्रकार है— बुध (Mercury), शुक्र (Venus), पृथ्वी (Earth), मंगल (Mars), बृहस्पति (Jupiter), शनि (Saturn), अरुण (Uranus) और वरुण (Neptune)।

प्रत्येक ग्रह की अपनी अनोखी विशेषता है। शनि ग्रह की पहचान उसके चारों तरफ दिखाई देने वाले छल्लों से की जा सकती है। सौर मंडल में पृथ्वी ही सिर्फ ऐसा ग्रह है जहाँ जीवन पाया गया है। इसका तीन तिहाई हिस्सा पानी की उपस्थिति के कारण नीला दिखाई देता है। यह सूर्य के चारों ओर 365 दिन में परिक्रमा पूरी करती है और साथ ही अपनी धुरी पर भी लट्टू की तरह निरंतर घूर्णन (Rotation) करती है। इसी के कारण ही दिन और रात होते हैं। पृथ्वी और अन्य ग्रहों के चारों ओर उपग्रह परिक्रमा करते हैं। चन्द्रमा (Moon) पृथ्वी का एकमात्र प्राकृतिक उपग्रह (Natural satellite) है।

ऊपर दिए गए पाठ के आधार पर नीचे पूछे गए प्रश्नों के उत्तर दें।

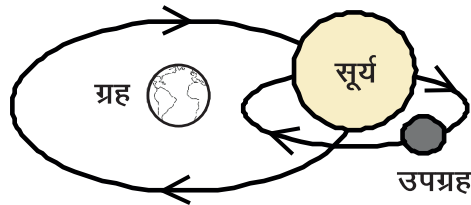
Q10. सौर मंडल में सभी ग्रह किस के चारों ओर चक्कर काट रहे हैं?
दिए गए विकल्पों में से सही विकल्प चुनें।

- i) पृथ्वी
- ii) चन्द्रमा
- iii) सूर्य
- iv) शनि

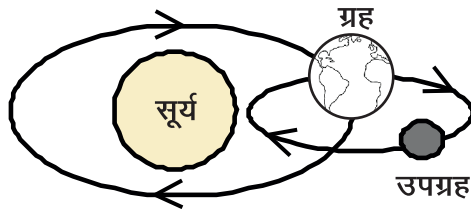
Q11.

सौर मंडल में ग्रह, सूर्य और उपग्रह की गति किस प्रकार होती है? दिए गए विकल्पों में से सही विकल्प चुनें।

- i) ग्रह के चारों ओर सूर्य चक्कर काटता है और सूर्य के चारों ओर उपग्रह चक्कर काटता है।



- ii) सूर्य के चारों ओर ग्रह चक्कर काटता है और ग्रह के चारों ओर उपग्रह चक्कर काटता है।



Q12.

दिन रात होने के पीछे का क्या कारण है? दिए गए विकल्पों में से सही विकल्प चुनें।

- i) जब पृथ्वी सूर्य से दूर चली जाती है तब रात हो जाती है।
ii) जब पृथ्वी चन्द्रमा के पास आ जाती है तब रात हो जाती है।
iii) पृथ्वी के अपनी धुरी पर घूमने के कारण दिन और रात होते हैं।

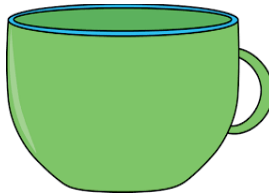
Dausa Assessment - Baseline (Visit-2)

Science Oral Tool



Q1.

कुछ वस्तुएँ ऐसी होती हैं जिनमें से प्रकाश आर पार जा सकता है। इनमें से कौन-सी वस्तु 'पारदर्शी' है?



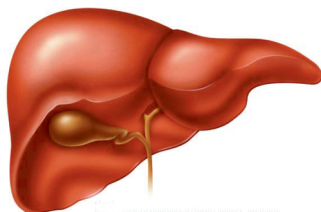
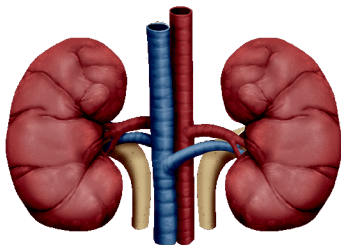
Q2.

नीचे दिए गए चित्रों में ऊर्जा के कुछ प्रकार दिखाए गए हैं। इनमें से 'सौर ऊर्जा' का चित्र कौन-सा है?



Q3.

नीचे हमारे शरीर के कुछ अंगों के चित्र दिए गए हैं। इनमें से कौन-सा अंग 'रक्त परिसंचरण तंत्र' का हिस्सा है?



Q4.

नीचे प्रकाश के कुछ स्रोतों के नाम दिए गए हैं। आपको बताना है इनमें से कौन-से प्रकाश स्रोत प्राकृतिक हैं और कौन-से कृत्रिम हैं?

बल्ब

सूर्य

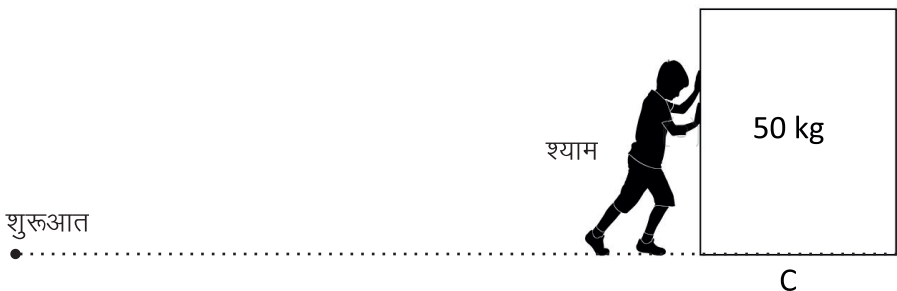
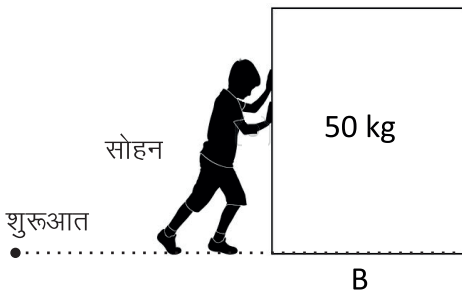
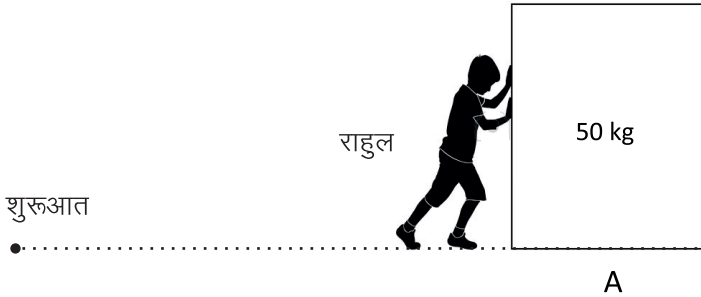
मोमबत्ती

टॉर्च

तारे

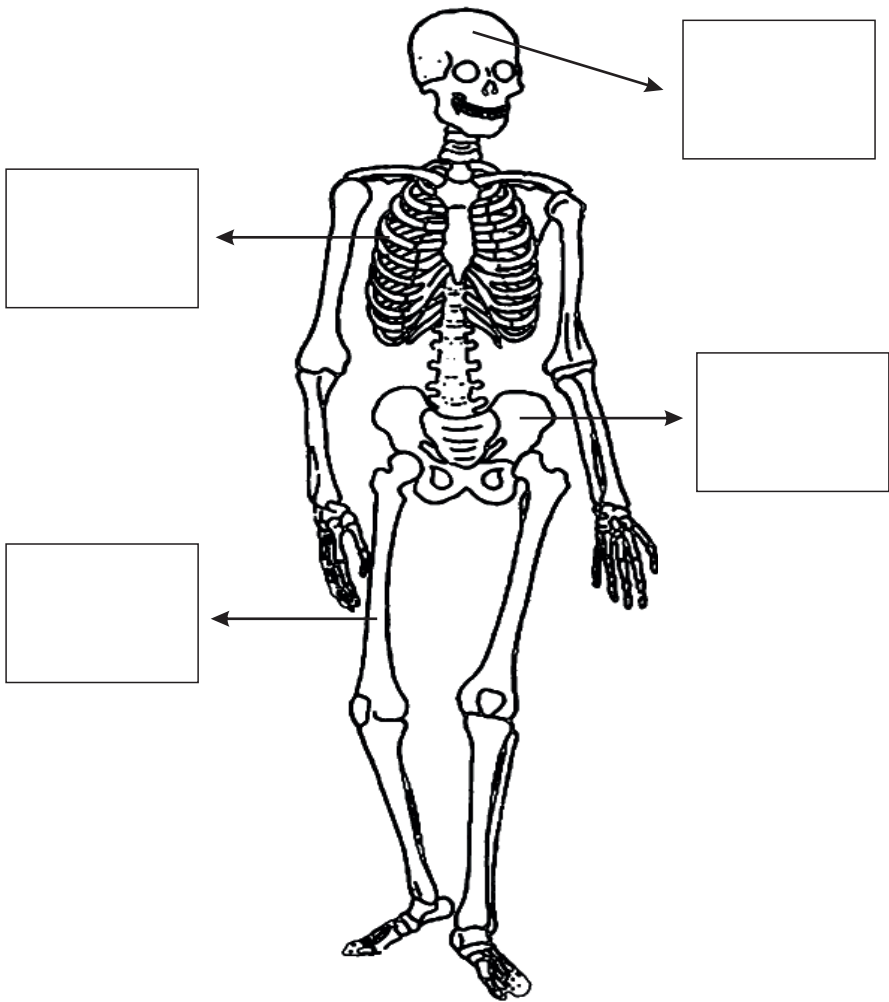
Q5.

तीन दोस्तों ने एक ही स्थान से 50kg के एक जैसे डिब्बों को धक्का देना शुरू किया। राहुल डिब्बे को खिसकाकर A बिंदु तक, सोहन डिब्बे को खिसकाकर B बिंदु तक और श्याम C बिंदु तक ले गया। इन तीनों लोगों द्वारा खर्च की गई ऊर्जा के अनुसार बढ़ते क्रम में इनके नाम बताओ।



Q6.

नीचे मानव कंकाल तंत्र का चित्र दिया गया है। कंकाल तंत्र में चिह्नित हड्डियों के नाम नीचे दिए गए बक्से से चुनकर बताएँ।



फीमर, कुल्हे की हड्डी,
पसलियाँ, खोपड़ी, रीढ़ की हड्डी

Q7.

नीचे दी गई पंक्तियों में कोष्ठक से सही शब्द चुनकर रिक्त स्थानों को भरें।

अंधेरे कमरे में हमें कुछ नहीं दिखाई देता। लेकिन मोमबत्ती के प्रकाश से हमें चीजें दिखाई देने लगती हैं। प्रकाश के कारण ही हमें वस्तुएँ दिखाई देती हैं।

प्रकाश किरण का मार्ग

(सीधा/घुमावदार) होता है। जब प्रकाश किरण

किसी माध्यम से चलकर किसी

(पारदर्शी/अपारदर्शी) वस्तु से टकराती है तब वह

वापिस उसी माध्यम में लौट आती है। प्रकाश की

इस घटना को

(अपवर्तन/परावर्तन) कहते हैं। इसका एक उदाहरण

है समतल दर्पण में वस्तु का प्रतिबिम्ब बनना। समतल

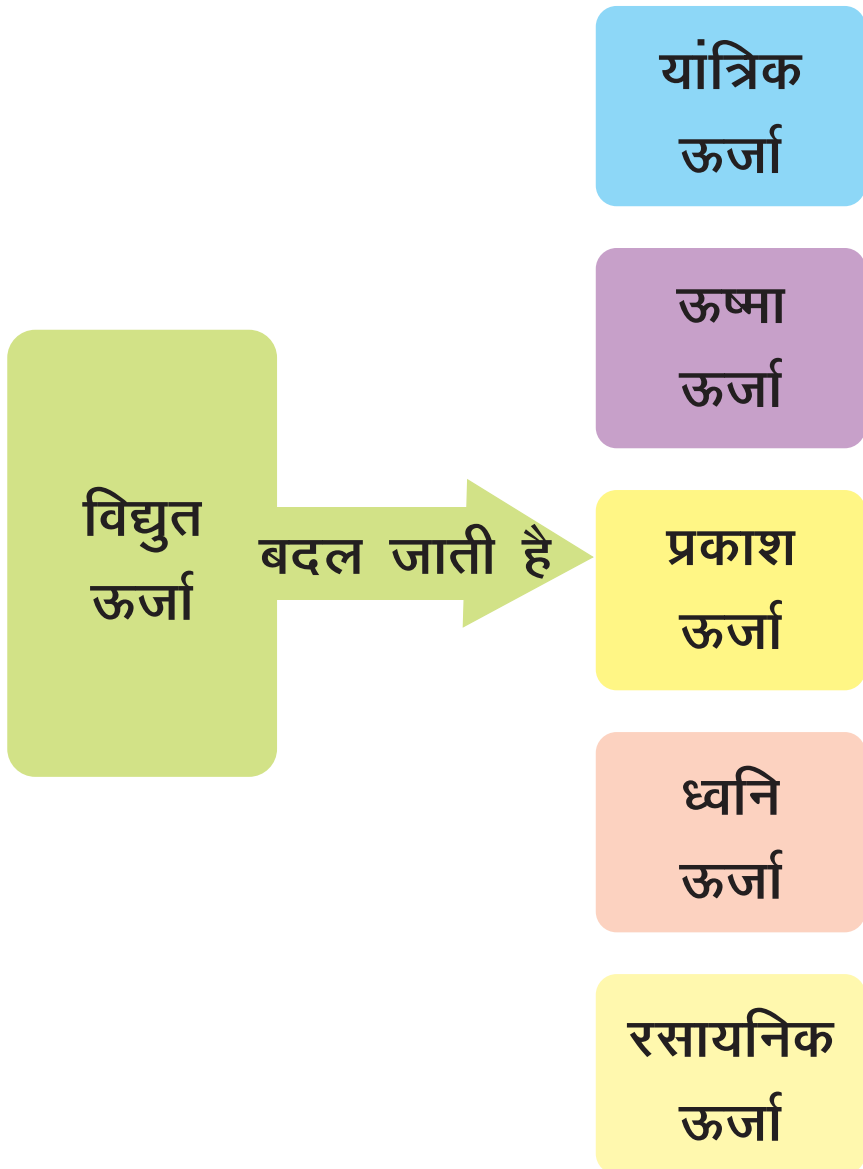
दर्पण में वस्तु का प्रतिबिम्ब

(उल्टा/सीधा) बनता है।

Q8.

नीचे पानी की बर्फ और भाप में बदलने की प्रक्रिया दर्शाई गई है। इनमें कुछ गलतियाँ हैं, आपको इन्हें ढूँढकर सुधारना है।

*इनमें से दो चुनें



Q9.

नीचे दिए गए बक्से से सही शब्द चुनकर रिक्त स्थानों को भरें और पाचन की प्रक्रिया को पूरा करें।

मानव पाचन प्रक्रिया

.....
में लार की मदद से
खाना चिपचिपा और
लसलसा बन जाता
है।



खाना

.....
से होते हुए आमाशय
में जाता है।



आंत से खाना

.....
में इकट्ठा होता है
जहाँ से अपचित
खाना बाहर निकाल
दिया जाता है।



आमाशय और

.....
में खाना पाचक रसों
द्वारा पचता है।

श्वास नली, आमाशय, मलाशय,
मुँह, आंत, ग्रसिका, फेफड़े

सौर मंडल

हमें आकाश में सबसे अधिक चमकदार जो तारा (Star) दिखाई देता है वह सूर्य (Sun) है। सूर्य सौर मंडल (Solar system) का केंद्र है और पृथ्वी (Earth) जैसे अन्य कई ग्रह (Planet) सूर्य के चारों ओर परिक्रमा (Revolution) करते हैं। सूर्य से बढ़ती दूरी के अनुसार इन ग्रहों का क्रम कुछ इस प्रकार है— बुध (Mercury), शुक्र (Venus), पृथ्वी (Earth), मंगल (Mars), बृहस्पति (Jupiter), शनि (Saturn), अरुण (Uranus) और वरुण (Neptune)।

प्रत्येक ग्रह की अपनी अनोखी विशेषता है। शनि ग्रह की पहचान उसके चारों तरफ दिखाई देने वाले छल्लों से की जा सकती है। सौर मंडल में पृथ्वी ही सिर्फ ऐसा ग्रह है जहाँ जीवन पाया गया है। इसका तीन तिहाई हिस्सा पानी की उपस्थिति के कारण नीला दिखाई देता है। यह सूर्य के चारों ओर 365 दिन में परिक्रमा पूरी करती है और साथ ही अपनी धुरी पर भी लट्टू की तरह निरंतर घूर्णन (Rotation) करती है। इसी के कारण ही दिन और रात होते हैं। पृथ्वी और अन्य ग्रहों के चारों ओर उपग्रह परिक्रमा करते हैं। चन्द्रमा (Moon) पृथ्वी का एकमात्र प्राकृतिक उपग्रह (Natural satellite) है।

ऊपर दिए गए पाठ के आधार पर नीचे पूछे गए प्रश्नों के उत्तर दें।

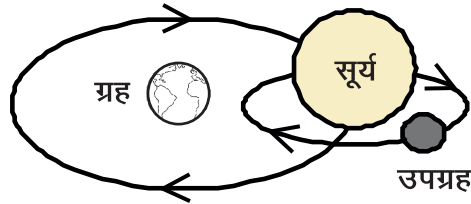
Q10. सौर मंडल में सभी ग्रह किस के चारों ओर चक्कर काट रहे हैं?
दिए गए विकल्पों में से सही विकल्प चुनें।

- i) पृथ्वी
- ii) चन्द्रमा
- iii) सूर्य
- iv) शनि

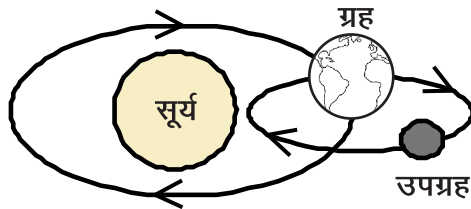
Q11.

सौर मंडल में ग्रह, सूर्य और उपग्रह की गति किस प्रकार होती है? दिए गए विकल्पों में से सही विकल्प चुनें।

- i) ग्रह के चारों ओर सूर्य चक्कर काटता है और सूर्य के चारों ओर उपग्रह चक्कर काटता है।



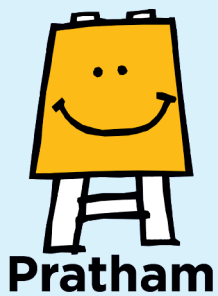
- ii) सूर्य के चारों ओर ग्रह चक्कर काटता है और ग्रह के चारों ओर उपग्रह चक्कर काटता है।



Q12.

दिन रात होने के पीछे का क्या कारण है? दिए गए विकल्पों में से सही विकल्प चुनें।

- i) जब पृथ्वी सूर्य से दूर चली जाती है तब रात हो जाती है।
ii) जब पृथ्वी चन्द्रमा के पास आ जाती है तब रात हो जाती है।
iii) पृथ्वी के अपनी धुरी पर घूमने के कारण दिन और रात होते हैं।



बच्चे का नाम		कक्षा	
स्कूल का नाम			
शुरु होने का समय		खत्म होने का समय	

नीचे दिए गए लेख को ध्यान से पढ़ें और उस पर आधारित प्रश्नों के उत्तर दें।

पौष्टिक भोजन एक प्लेट में



भोजन करते समय क्या आपने सोचा है कि जो आप खा रहे हैं, वह आपके लिए पर्याप्त है या नहीं? कहीं कुछ कमी तो नहीं? क्या यह सेहत के लिए फायदेमंद है?

क्या आप जानते हैं कि आजकल लोग 'पौष्टिक भोजन एक प्लेट में' के बारे में बात कर रहे हैं। इससे लोगों को आसानी से समझ आता है कि उन्हें कितनी मात्रा में दाल-रोटी, सब्जी, फल आदि खाना चाहिए। एक ऐसी प्लेट जिसमें संतुलित मात्रा में रोटी, सब्जी, दाल, फल हो, उसे पौष्टिक भोजन की प्लेट कहते हैं।

इसके अनुसार आप की आधी प्लेट सब्जी और फल से भरी होनी चाहिए। उसके बाद बारी आती है, गेहूँ, बाजरा आदि की जिनसे रोटी बनती है। इसे एक चौथाई ($1/4$) जगह मिलनी चाहिए।

रोटी के अलावा, एक चौथाई ($1/4$) प्लेट में दालें, सलाद आदि होना चाहिए। अगर आप मांसाहारी भोजन खाते हैं तो वह भी शामिल किया जा सकता है। संतुलित मात्रा में यह सभी चीजें खाना ही पौष्टिक भोजन कहलाता है।

इस भोजन की प्लेट के अलावा यह याद रखना भी ज़रूरी है कि जिस तेल में भोजन बने, वह भी स्वास्थ्य के लिए अच्छा हो।

खूब सारा पानी पीना भी आवश्यक है। कितना? तकरीबन 7-8 गिलास हर रोज़। पौष्टिक भोजन के साथ-साथ यह भी ज़रूरी है कि आप खूब खेलें, भागें और चुस्त तंदरुस्त रहें।

Q1. नीचे दिए गए शब्दों के सामने सही अर्थ वाले शब्दों को डिब्बे से चुन कर लिखें।

शब्द	समान अर्थ वाले शब्द
आवश्यक	
पर्याप्त	
तंदुरुस्त	
आहार	
प्लेट	

थाली
स्वस्थ
भोजन
ज़रूरी
पूरा

Q2. नीचे दिए गए वाक्यों में रिक्त स्थानों की पूर्ति पाठ की समझ के आधार पर करें।

- एक प्लेट जिसमें रोटी, सब्जी, दाल, फल आदि हो, उसे भोजन की प्लेट कहते हैं।
- हमें भोजन बनाने में ऐसे का इस्तेमाल करना चाहिए, जो स्वास्थ्य के लिए अच्छा हो।

Q3. कुछ लोग मांसाहारी होते हैं और कुछ लोग शाकाहारी। नीचे दी गई जगह में चार शाकाहारी और चार मांसाहारी खाने की चीजों के नाम लिखें।

- शाकाहारी =
.....
- मांसाहारी =
.....

Q4. संतुलित भोजन के अलावा तंदुरुस्त रहने के लिए आपको और क्या-क्या करना चाहिए?

.....
.....

Q5. नीचे दिए गए वाक्यों को पढ़ें और संतुलित भोजन के बारे में सही वाक्य के सामने सही का निशान (✓) लगाएँ तथा गलत वाक्य के सामने गलत का निशान (X) लगाएँ।

- मिनी को रोटी-चावल पसंद नहीं है। उसने आज सब्जी, फल और थोड़ा सलाद खाया है। ☐
- रंजना को सब कुछ पसंद है। उसने आज रोटी, दाल, सब्जी, सलाद, फल और एक गिलास दूध पिया है। ☐
- सलीम को पालक पसंद नहीं है। उसने आज रोटी, दाल, अंडा, फल और सलाद खाया है। ☐
- राजू को सलाद पसंद है। उसने आज एक कटोरा सलाद खाया और आधी कटोरी दाल खाई है। ☐

बच्चे का नाम		कक्षा	
स्कूल का नाम			
शुरु होने का समय		खत्म होने का समय	

नीचे दिए गए लेख को ध्यान से पढ़ें और उस पर आधारित प्रश्नों के उत्तर दें।

जल और जीवन



जल हमारे जीवन के लिए अत्यंत आवश्यक है जल के बिना जीवन संभव ही नहीं है। हम सभी जल का उपयोग सिर्फ पीने के लिए ही नहीं करते बल्कि जल के कई और आवश्यक उपयोग भी हैं जैसे- खाना-पकाना, कपड़े धोना, नहाना, पौधों में पानी डालना इत्यादि।

क्या आप जानते हैं कि एक मानव शरीर में लगभग सत्तर प्रतिशत (70%) जल होता है। आपने कभी सोचा है कि यह जल हमें मिलता कैसे है? पृथ्वी पर जल के कई साधन हैं जैसे- सागर, झील, तालाब, नदी, इत्यादि। जो हमें ज़मीन पर स्थिर या बहते हुए अवस्था में दिखते हैं। दूसरे जल के साधन जिसके मुख्य स्रोत में शामिल हैं- कुआँ, बावली इत्यादि। जो हमें ज़मीन के अंदर से मिलते हैं। लेकिन जल का सबसे मुख्य साधन है वर्षा।

वर्षा जल पृथ्वी पर जल का शुद्ध रूप है, जिसमें किसी भी प्रकार की अशुद्धियाँ नहीं होती हैं। लेकिन बारिश होते समय उसमें धूल के कण, गैस और अनेक अन्य अशुद्धियाँ मिल जाती हैं। यह बारिश का पानी जमा होता है तालाबों, झीलों और नदियों में फिर अन्य प्रकारों के कार्यों और ज़रूरतों के लिए उपयोग होता है। बारिश के पानी को जमा करने की प्रक्रिया वर्षा जल संग्रहण कहलाती है।

Q1. नीचे दिए गए शब्दों के सामने सही अर्थ वाले शब्दों को डिब्बे से चुन कर लिखें।

शब्द	समान अर्थ वाले शब्द
पृथ्वी	
अनेक	
प्रक्रिया	
शरीर	
उपयोग	

बहुत
धरती
इस्तेमाल
कार्यविधि
देह

Q2. नीचे दिए गए वाक्यों में रिक्त स्थानों की पूर्ति पाठ की समझ के आधार पर करें।

- a) एक मानव शरीर में लगभग तक जल होता है।
- b) बारिश को जमा करने की वर्षा जल संग्रहण कहलाती है।

Q3. कुछ लोग भूमि जल का प्रयोग करते हैं और कुछ लोग भूमिगत जल का। नीचे दी गई जगह में चार भूमि जल और चार भूमिगत जल के स्रोत लिखें।

- a) भूमि जल =
.....
- b) भूमिगत जल =
.....

Q4. वर्षा जल पृथ्वी पर जल का शुद्ध रूप होते हुए भी अशुद्ध क्यों हो जाता है?

.....
.....

Q5. नीचे दिए गए वाक्यों को पढ़ें और जल के स्रोतों के बारे में सही वाक्य के सामने सही का निशान (✓) लगाएँ तथा गलत वाक्य के सामने गलत का निशान (X) लगाएँ।

- a) हमें पानी बारिश से भी मिलता है जो नदियों, झीलों और तालाबों आदि में जमा होता है। ☐
- b) पृथ्वी पर जल के अनेक स्रोत हैं जैसे- सागर, झील, नदी, कुआँ, बावली तथा वर्षा जल आदि। ☐
- c) पृथ्वी पर जल के कई स्रोत हैं जो सिर्फ पृथ्वी के बाहरी स्तर पर होते हैं। ☐
- d) ज़मीन के अंदर ही पानी के स्रोत होते हैं बाहर नहीं। ☐

MTS1

बच्चे का नाम		कक्षा	
स्कूल का पूरा नाम			
माता का नाम		ज़िला	
ब्लॉक		गाँव का नाम	
शुरु होने का समय		ख़त्म होने का समय	

Q1. शब्दों में दी गई संख्याओं को अंको (numbers) में लिखें।

उदाहरण: एक सौ तेईस
(One hundred and twenty three)

123

i) चार सौ उन्तीस
(Four hundred and twenty nine)

ii) तीन हज़ार दो सौ सत्रह
(Three thousand two hundred and seventeen)

iii) चार लाख दो हज़ार नौ
(Four lakh two thousand and nine)

Q2. दी गई संख्याओं में से सबसे बड़ी संख्या (biggest number) चुनकर डिब्बे में लिखें।

उदाहरण: 23, 42, 33, 11

42

i) 368, 407, 398, 460

ii) 6276, 7306, 6596, 7046

Q3. हल करें।

i)

$$\begin{array}{r} 63 \\ -39 \\ \hline \end{array}$$

ii)

$$\begin{array}{r} 624 \\ -368 \\ \hline \end{array}$$

Q4. हल करें।

i)

$$4 \overline{) 75}$$

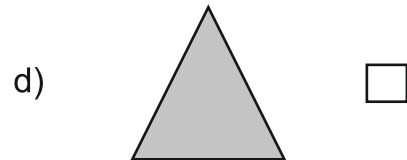
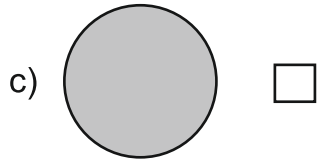
ii)

$$7 \overline{) 868}$$

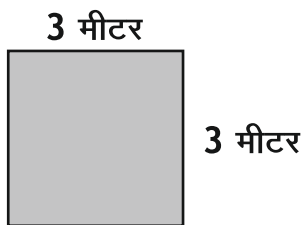
Q5. अनुराग 345 रुपये लेकर बाज़ार गया। उसने बाज़ार से 157 रुपये का सामान खरीदा। बताएँ, अब अनुराग के पास कितने रुपये बाकी बचे होंगे?

Q6. महिमा फूलों के गुलदस्ते बनाकर बेचती है। वह 5 फूलों का एक गुलदस्ता बनाती है। बताएँ, उसने 735 फूलों से कुल कितने गुलदस्ते बनाए होंगे?

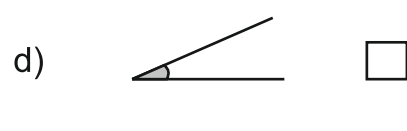
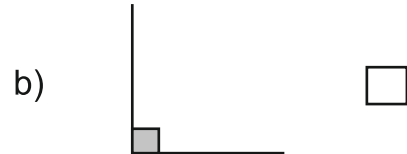
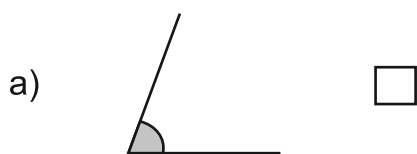
Q7. नीचे दी गई आकृतियों (shapes) में से त्रिकोण (triangle) चुनकर सही का निशान (✓) लगाएँ।



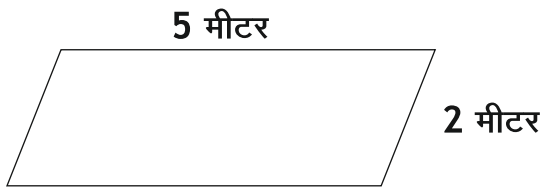
Q8. नीचे दी गई आकृति (shape) का परिमाप (perimeter) निकालें।



Q9. नीचे दिए गए कोणों (angles) में से अधिक कोण (obtuse) चुनकर सही का निशान (✓) लगाएँ।



Q10. पूजा रोज़ सुबह अपने बगीचे के चारों ओर एक बार दौड़ती है। उसके बगीचे का आकार (shape) नीचे चित्र में दिखाया गया है। बताएँ, पूजा रोज़ कितने मीटर दौड़ती होगी?



रफ़ कार्य के लिए

सिर्फ़ सर्वेक्षक के लिए (बच्चे इस भाग को न भरें)

Q1.	0	1	2
i)			
ii)			
iii)			

Q2.	0	1	2
i)			
ii)			

Q3.	0	1	2
i)			
ii)			

Q4.	0	1	2
i)			
ii)			

Q5.	0	1	2

Q6.	0	1	2

Q7.	0	1	2

Q8.	0	1	2

Q9.	0	1	2

Q10.	0	1	2

MTS2

बच्चे का नाम		कक्षा	
स्कूल का पूरा नाम			
माता का नाम		ज़िला	
ब्लॉक		गाँव का नाम	
शुरु होने का समय		ख़त्म होने का समय	

Q1. शब्दों में दी गई संख्याओं को अंको (numbers) में लिखें।

उदाहरण:	एक सौ तेईस (One hundred and twenty three)	123
i)	तीन सौ सत्रह (Three hundred and seventeen)	
ii)	चार हज़ार एक सौ उन्तीस (Four thousand one hundred and twenty nine)	
iii)	दो लाख तीन हज़ार चार (Two lakh three thousand and four)	

Q2. दी गई संख्याओं में से सबसे बड़ी संख्या (biggest number) चुनकर डिब्बे में लिखें।

उदाहरण:	23, 42, 33, 11	42
i)	276, 380, 269, 309	
ii)	8095, 7165, 8105, 7685	

Q3. हल करें।

i)	$\begin{array}{r} 71 \\ -35 \\ \hline \end{array}$	ii)	$\begin{array}{r} 832 \\ -489 \\ \hline \end{array}$
----	--	-----	--

Q4. हल करें।

i)

$$5 \overline{) 79}$$

ii)

$$6 \overline{) 816}$$

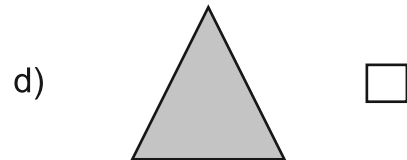
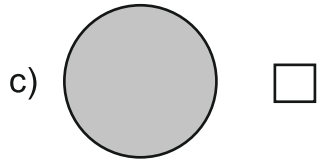
Q5.

साहिल के पास 324 रुपये थे। उसने अपने लिए 186 रुपये की कमीज़ (shirt) खरीदी। बताएँ, अब उसके पास कितने रुपये बाकी बचे होंगे?

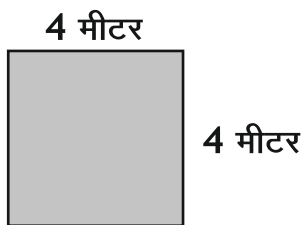
Q6.

अमन लकड़ी की मेज़ (table) बनाकर बेचता है। वह एक दिन में 7 मेज़ बनाता है। बताएँ, कुल कितने दिन में उसने 896 मेज़ बनायी होंगी?

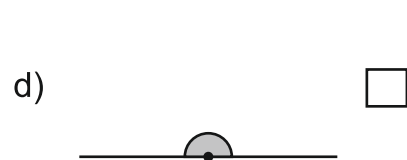
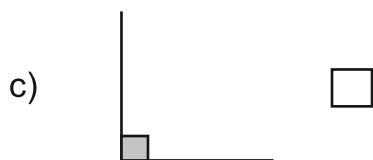
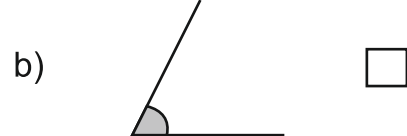
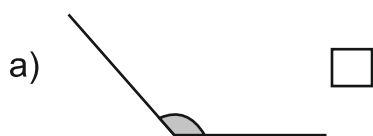
Q7. नीचे दी गई आकृतियों (shapes) में से आयत (rectangle) चुनकर सही का निशान (✓) लगाएँ।



Q8. नीचे दी गई आकृति (shape) का परिमाप (perimeter) निकालें।



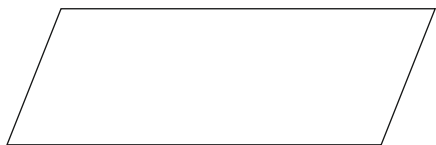
Q9. नीचे दिए गए कोणों (angles) में से न्यूनकोण (acute angle) चुनकर सही का निशान (✓) लगाएँ।



Q10.

केतन रोज़ मैदान के चारों ओर एक बार दौड़ता है। मैदान का आकार (shape) नीचे चित्र में दिखाया गया है। बताएँ, केतन रोज़ कितने मीटर दौड़ता होगा?

6 मीटर



3 मीटर

रफ़ कार्य के लिए

सिर्फ़ सर्वेक्षक के लिए (बच्चे इस भाग को न भरें)

Q1.	0	1	2
i)			
ii)			
iii)			

Q2.	0	1	2
i)			
ii)			

Q3.	0	1	2
i)			
ii)			

Q4.	0	1	2
i)			
ii)			

Q5.	0	1	2

Q6.	0	1	2

Q7.	0	1	2

Q8.	0	1	2

Q9.	0	1	2

Q10.	0	1	2

