## Mathematics

NIPUNN- II is an endeavour for assessing and consolidating the learning levels of class II students of the Academic Session 2019-20 and to improve their preparedness for the upcoming session of 2020-21. The essence of the programme is to strengthen the conceptual understanding of the students by recognising any possible learning gaps and by working with all the students in a concentrated manner during the month of March 2020. It is important to note that this programme is not to label/segregate any student based on his/her performance in the assessment. However, the central idea is to enhance their preparedness for the next class such that the learning gaps do not trail.

The entire programme is divided into three phases:
Phase I-Baseline assessment
Phase II- Work with the students
Phase III- Endline assessment

## Phase I- Baseline assessment

1. Class ka Naksha (Baseline) assessment shall be undertaken by doing the suggested activities provided in the Annexure D. Teachers' may note their observations as students engage in the activities. While observing, teachers may kindly note that giving correct answer to a task is not the sole criterion for assessing the student's understanding. It is essential to observe how the student approaches the problem, his/her level of confidence and the reasoning given by the student. These observations shall be then filled in the Class Ka Naksha as provided in the ANNEXURE B by using the codes given below:

## Codes for Class ka Naksha

$\checkmark \checkmark$ If the student is able to complete the task comfortably every time and without support
$\checkmark \quad$ If the student is able to complete the task with support

- If the student faces challenges in doing the task

Kindly Note - If the student faces challenges in doing the task then assessment of further stages need not be conducted.

## 2. Record the Stage of each student in the Class ka Naksha (ANNEXURE B, Column 8)

There are 7 stages in all - Beginners and Stage I to Stage VI to determine the highest level of students' achievement. Kindly note that each stage is cumulative, i.e. parameters of stage 1 are included in the parameters of stage 2 and parameters of both stage 1 and stage 2 are included in stage 3 and so on.
Stage of the student may be determined by looking at the double ticks $\checkmark \checkmark$ recorded in each stage. For example: If a student is able to do the tasks of Stage I and Stage II with $\checkmark \checkmark$ and does the tasks of Stage III with the single tick $\checkmark$, then the student's highest achievement in this case would be considered as Stage II.
While observing, teachers may come across students who are yet to reach Stage I, these students shall be recorded as 'Beginners'.
3. Consolidated report (Baseline) - After recording the observations and Stage for each student in Class ka Naksha, a consolidated report shall be made in the format given in the ANNEXURE E. The report shall have the details of total number of students in each Stage at the beginning of NIPUNN - II. Any long absentee student who missed the assessment may be recorded too in the consolidated report.

## Phase II- Work with the students

1. Recognising the possible reasons for Learning Gaps: Before starting the learning module teachers are expected to identify the possible reasons for learning gaps. ANNEXURE $C$ is to be filled to understand the difficulties faced by the students such that teachers address those difficulties and plan their learning programme accordingly.
2. Work with the students - During the NIPUNN - II programme, teachers will work with all the students for improving their preparedness for the next class and for strengthening their conceptual understanding. However, one to one interaction should be made with the students with learning gaps. Individual learning plans should be made for these students and wherever needed, the help of Special Educator should be taken to re-enforce the learning.
A suggested weekly plan of activities is provided in the learning module attached as ANNEXURE F. Teachers are encouraged to incorporate their innovative and creative ideas to the suggestive activities such that students enjoy the process of learning. They may also revisit or modify the activities as per the level of each student's understanding.
3. Assessment points have been included in the Plan of activities to support teachers in deciding when to move from one activity to the next. They may also revisit or modify the activities as per the level of students' understanding.

## Phase III- Endline Assessment

1. Class ka Naksha (Endline) - After working with the students, an Endline assessment shall also be conducted through the similar activities as done during the Baseline assessment (ANNEXURE D). The same Class ka Naksha that was filled for the Baseline Assessment will be updated as per the student's performance in the Endline assessment. For Example: If a student had got $\checkmark$ in any parameter in the Baseline, he/she will be assessed again and the improvement will be recorded by updating the $\checkmark$ to $\checkmark \checkmark$. In case there is no significant improvement observed in the student's performance, teachers may refer to ANNEXURE C once again and work specifically on the limitations with the help of a Special Educator.
2. Consolidated report (Endline) - After updating the Class ka Naksha, the consolidated report will also be updated in the same format as done in the Baseline assessment.

**Note:- For filling the stage in column 8, teachers may note that the stage should be determined based on the highest level of achievement for each student. For example, if a student has $\checkmark \checkmark$ in columns 2 and 3 and $\checkmark$ in column 4 then she will be considered in Stage II, corresponding to the Stage of highest level of achievement.


Guidelines for Observation

| S. No. | $\begin{array}{c}\text { Learning Outcome } \\ \text { pointers }\end{array}$ | $\begin{array}{c}\text { Activities during which } \\ \text { observations can be done }\end{array}$ | How and What to observe |
| :---: | :--- | :--- | :--- |
| $\mathbf{1}$ | $\begin{array}{l}\text { Can count objects } \\ \text { and say how many } \\ \text { upto } 100\end{array}$ | $\begin{array}{l}\text { Kadam Naapna, } \\ \text { Idhar se udhar tak, } \\ \text { Stop taali game on Ganitmala, } \\ \text { Drawing a mathematical } \\ \text { painting }\end{array}$ | $\begin{array}{l}\text { Teacher observes whether the } \\ \text {-student is able to count comfortably without making any mistakes } \checkmark \checkmark \\ - \text { student is able to count but needs support only in transition numbers like going from } 69 \text { to } \\ 70 \text { and } 79 \text { to } 80 \checkmark \\ - \text { student has difficulty in counting ( }- \text { ) }\end{array}$ |
| $\mathbf{2}$ | $\begin{array}{l}\text { Comparing numbers } \\ \text { Up to 100 }\end{array}$ | $\begin{array}{l}\text { Within the context of making } \\ \text { designs with Rangometry or } \\ \text { any other material. }\end{array}$ | $\begin{array}{l}\text { Teacher asks comparison questions orally within the context of making designs with } \\ \text { Rangometry or with other materials. For instance she can ask, "In another school, two } \\ \text { students Akhila and Pooja were making designs with different coloured seeds. Akhila made an } \\ \text { elephant with 42 pieces and Pooja made an aeroplane with 39 pieces. Who do you think used } \\ \text { more pieces?" } \\ \text { Teacher observes whether the } \\ \text {-student is able to compare numbers based on her number sense ( } \checkmark \checkmark \text { ) }\end{array}$ |
| -student is not able to compare numbers ( - ) |  |  |  |$\}$


| 4 | Splitting 10 into 2 numbers in different ways | Ticket to ride, Mutthi ka khel, | Teacher observes whether student is able to <br> - tell the combination immediately ( $\checkmark \checkmark$ ) <br> - counts on fingers or mentally and then says the combination (1-1) $\checkmark$ <br> - is not able to think of the combination ( - ) |
| :---: | :---: | :---: | :---: |
| 5 | Recognising numbers with number sense Up to 100 (Symbols) | Maan Card with Ganitmala | During Maan Card activity with whole class teacher can observe 4-6 students at a time. <br> - Makes the correct number immediately <br> - Checks on the Class Ganitmala and then makes the correct number - Takes time to make <br> - Has difficulty in making the number (-) |
| 6 | Writing down numbers with number sense Up to 100 | Postman 2, Clip 4 with Empty number cards and Ganitmala | Teacher observes whether <br> - student is able to write any number without making any mistakes. $\checkmark$ <br> - student is able to write numbers in sequence <br> - student is not able to write numbers in sequence or not able to write any number. (-) |
| 7 | Solves day to day problems related to addition and subtraction | Through word problems | Teacher develops the context and asks the student the question orally. Teacher observes whether the students is able to <br> - understands the question herself and thinks mentally to find the answer $\checkmark \checkmark$ <br> - understand the question herself and counts on fingers, or using lines to find the answer $\checkmark$ <br> - is not able to understand the question herself ( - ) |

Consolidated report - Class 2

| Aspects of Number sense | Number of students in a particular <br> stage as on <br> (Baseline NIPUNN - II) <br> $\checkmark \checkmark$ <br> only | Number of students in a particular <br> stage as on <br> (Endline NIPUNN - II) <br> only |  |
| :--- | :--- | :--- | :--- |
| Stage I | Is able to count objects up to 100 |  |  |
| Stage II | Stage I and <br> Is able to compare numbers up to 100 |  |  |
| Stage III | Stage II and <br> Is able to count with structure up to 100 |  |  |
| Stage IV | Stage III and <br> Is able to split 10 into 2 numbers in different ways |  |  |
| Stage V | Stage IV and <br> Is able to recognise and write numbers with number <br> sense |  |  |
| Stage VI | Stage V and <br> Solves day to day problems related to addition and <br> subtraction |  |  |
| Beginners | Students who are yet to reach Stage I |  |  |
| Students who were not assessed for any unavoidable reason |  |  |  |
| Total number of students |  |  |  |

## Plan of activities - A Reference guide for Teachers

| Week 1 - Counting objects up to 50 |  |  |
| :---: | :---: | :---: |
| Kadam napna up to 30/40/50-3-4 students stand at the same starting point and are each asked to take 30 (or 40 or 50 ) steps but keeping one foot in front of the other. Will they reach the same point? students find out by doing it. | 1-2 times |  |
| Making 20-A pair of students come from each team. One student throws the dice and puts as many balls in a basket. Then the second student gets a turn. Each team has to collect 20 balls. The first team to complete the target wins. | 1-2 times |  |
| Idhar se udha rtak - From this end of the board to that end, how many Rangometry barfi pieces can we arrange in a straight line? Students estimate and then find out. Later there can be discussion about whose estimate was closest or farthest etc. | 1-2 times | Sankhyabodh Manual, page no. 73 |
| Mutthi me kitne - One student picks up as many beads/seeds (imli seeds, rajma) as she can in her fist. Other students guess how many could be in her fist. Then they count and find out. Can also be played in pairs. | 1 time | Math Magic <br> Page no. 9-11 |

- Sankhyabodh Manual for Mathematics has been uploaded along with the Teacher Workshop Circular No. 1.54/ET/SCERT/201819/PRTMathInset/573237 dated 21.08.2019.

| Week 2-Counting objects up to 100 |  |  |
| :--- | :--- | :--- | :--- |
| Stop taali game on Ganitmala | Daily | Sankhyabodh Manual, <br> page no. 77 |
| Kadam napna up to 30/40/50 | $1-2$ times |  |
| Dice game - Who will collect 20 balls first ? | $1-2$ times |  |
| Drawing a mathematical painting - Students may draw a picture using shapes and colour them later. <br> At the end they find out number of times a particular shape was used. (student can also count in her <br> friend's painting - they can work in teams) <br> In each team, students compare the number of times each shape has been used. <br> *Teacher can show the shapes to be included. | Math Magic <br> Page no. 17 |  |
| Idhar se udhar tak kitne tukde |  |  |

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| Week 3 - Towards structured counting |  |  |
| :---: | :---: | :---: |
| Stop taali game on Ganitmala | Daily | Sankhyabodh <br> Manual, page no. 77 |
| Ganitmala Clip 1 - Teacher puts the clip on Ganitmala and asks, "how many beads from beginning till the butterfly?" One student counts and finds outs. Activity is repeated with 2-3 numbers. <br> Ganitmala Clip 2 - Teacher asks the students to put the clip at a specified number. Can be repeated with 2-3 numbers. | 2-3 times | Sankhyabodh <br> Manual, page no. $76,79$ |
| Sher haathi with Small Ganitmala - Students take turns to put the clip at the number specified by the teacher on the small Ganitmala. | 2-3 times | Sankhyabodh <br> Manual, page no. 79 |
| Kamra napna- Similar activity can also be done to measure desk/blackboard using hand span. In each case students get to estimate the length of different objects.Discussion on why is there a difference when different students measure. | 1 time | Sankhyabodh <br> Manual, page no. 69 |
| Two design activity for Number combinations of 10 -Students work in teams of 2. Each student makes a figure of their choice using Rangometry pieces, but together they can use only 10 pieces. Later the name of the two figures made by each team and the number of pieces used to make them can be noted. | 1 time |  |
| Assessment point: Can compare numbers up to 100 with number sense |  |  |


| Week 4 - Structured counting up to 100 |  |  |
| :--- | :---: | :--- |
| Stop activity with number cards on Ganitmala | Daily | Sankhyabodh <br> Manual, page no. 86 |
| Sher hathi activity with small Ganitmala. | $3-4$ times | Sankhyabodh <br> Manual, page no. 79 |
| Two design activity for Number combinations of 10 | 1 time |  |
| Mutthi ka khel for number combinations of 10 - Can be played for few minutes daily | $1-2$ times | Sankhyabodh <br> Manual, page no. 61 |


| Week 5 - Structured counting up to 100 |  |  |
| :--- | :---: | :--- |
| Simple word problems orally can be done daily for few minutes | Daily |  |
| Sher hathi activity with small Ganitmala. | $3-4$ times | Sankhyabodh Manual, <br> page no. 79 |
| Mutthi ka khel for number combinations of 10-Can be played for few minutes daily | $1-2$ times | Sankhyabodh Manual, <br> page no. 61 |
| Postman - Teacher involves students in a story. The postman needs help in delivering the letters. <br> The desks in the class become the houses in the street. On some of the 'houses' (desks), the house <br> number is written, but some of them are missing. Will the students help the postman by writing <br> the house numbers on the other desks? Then the student who is the Postman picks up the letters <br> finds the correct street and delivers it to the correct house. | Math Magic <br> Page no. 12-13 |  |
| Assessment point: <br> Can count using structure of 10 up to 100 |  |  |

## Week 6 - Structured counting up to 100

| Simple word problems can be done daily for few minutes orally. | Daily |  |
| :---: | :---: | :---: |
| Maan card with Ganitmala - Each pair of students are given a set of Maan cards. Teacher puts the clip on the Ganitmala and all the students make the number at which the clip is located using their Maan cards. | 3-4 times | Sankhyabodh Manual, page no. 82 |
| Market situation - Enact a market situation like fruit shop, stationary shop etc. Different items are displayed with price tags (up to 20). Students are given set of cards with numbers from 1 to 10 . Students have to give one or more cards on which the dots together sums up to the amount on the price tag to buy a particular item. For example to buy a item with price tag 12 , the student can give cards with 5 and 7 on them or cards with 8 and 4 on them etc. | 1 time |  |
| Tickets for train - Students have to board trains named as train no. 7, train no. 8, train no. 9 and so on by showing 2 cards which together make that number. For this, teacher keeps set of cards with numbers up to 10. For ex. Students can show 6 and 2, or 5 and 3, or 4 and 4 to board the train no. 8. Students holding placards of 7,8,9 and 10 are standing and after showing their 'tickets' students board the train and then the train and the students get a chance to move around together as well. | 1 time | Math Magic <br> Page no. 81-83 |
| Postman activity can be revisited. This time the teacher draws the houses in different streets on the blackboard. The streets can start with different house numbers like $26,32,38$ etc. One student helps the Postman by writing the numbers of the other houses in the street. Then the student who is the Postman picks up the letters finds the correct street and delivers it to the correct house. | 1 time |  |
| Assessment point: <br> Writing down numbers with number sense up to 100 <br> Solves day to day problems related to addition and subtraction |  |  |

## Word problems

1. Maitri has started going for music classes. Eight (8) students were taking the classes with her. She convinced 4 more friends also to join along with her. How many students are taking the classes together now?

Later, 3 students who lived a little further decided to leave the music classes with Maitri. Now how many students are taking music classes in Maitri's group?
2. A Drawing Mela was organized for students at Gandhi Park on Sunday. 22 students reached there by 10 AM . They had got crayon packets for 15 students. How many more crayon packets do they need to get?

After some time, 14 more students joined them. How many students participated in the Drawing Mela this Sunday?
3. Suhail is a juice vendor. He is popular for his 'Ganne ka ras'. He opened his shop on the very first day of the season. People usually come in the morning and evening on their way to work or back to have the juice in his shop.

On the first day, 25 people had juice in the morning. In the evening, 27 people had juice. So how many glasses did he sell on the first day?
The next day it rained heavily so less people came. On that day he sold 20 glasses less than the day before. How much did he sell on that day?
4. Mahi and Saloni were playing bouncing ball game. Mahi bounced 39 times in one go and Saloni bounced 45 times in one go. How many more times did Saloni bounced the ball as compared to Mahi?

In the next round, Mahi bounced the ball 60 times and Saloni bounced the ball 48 times. How many more times does Saloni have to bounce the ball so that she matches Saloni's record?
5. Sahil is reading a book of 52 pages. He has read 45 pages. How many pages does he need to read to complete the book?

