



UNIT 12 FOLLOW UP OF ASSESSMENT OF LEARNING MATHEMATICS

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12.0 INTRODUCTION

Assessment is an integral and inseparable part of the learning-teaching process. Especially mathematics assessment tasks need to tap students ability to estimate the answer to an arithmetic calculation, construct a geometric figure, use a calculator, ruler or compass, produce a deductive argument complex problem solving. In the previous units (in unit-10 and 11), you have already learnt about the meaning and purposes of assessment in mathematics and different tools and techniques to collect valid and reliable information on the progress of the child in mathematics. The results on the performance and progress of individual child can be recorded either in the form of marks or grades. Besides, the qualitative description of child's performance and progress can be reflected in the progress card of the child. A systematic recording and reporting procedure is useful in providing feedback regarding the learner's progress to the parents, learner and other stakeholders.

In this unit, you will learn about the ways of collecting information regarding learner's performance and progress, the process of recording the learner's performance and how to report the assessment results to the learner, parents and other stakeholders. You will also learn about how to identify the issues in mathematics learning from the assessment results.

For completing this unit you need about 06 (Six) hours of study.



12.1 LEARNING OBJECTIVES

After going through this unit, you shall be able to

- identify the techniques of collecting and recording of the assessment information,
- understand the process of providing feedback on assessment to learners, parents and other stakeholders,
- plan for remedial and enrichment activities on the basis of diagnosing weakness and strength of the learners.

12.2 COLLECTION AND RECORDING ASSESSMENT INFORMATION

In the previous unit you have already learnt about different tools and techniques of assessing the learner's acquisition of mathematical knowledge and skills. Tools and techniques like written and oral tests, observation, interviewing the learner, portfolio analysis can help the teacher to collect data regarding the learner's performance in mathematics.

We accept that every child is unique and he/she learns differently from others. His/her learning mathematics does not take place only in the school or classroom. He/she learns the mathematical concepts from the immediate environment. For example: while purchasing articles from the market the child uses the mathematical calculations in his/her own way. Similarly, the community is the store house of a variety of mathematical knowledge and the child learns those in an informal way. So while collecting assessment information regarding the child, you have to keep the following points in your mind.

- What kind of information should be collected?
- What are the sources to collect information while assessing the child?
- In what way the information can be collected?

Different literatures on assessment suggest that a wide range of information should be collected regarding the assessment objects. Guba and Lincoln (1981) suggest that the evaluation generates five kinds of information:

- a) descriptive information regarding the evaluation objectives,
- b) information about relevant issues,
- c) information responsive to concerns of relevant audiences (here the parents and the teachers),
- d) information about values,
- e) information about standards to merits,



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While assessing the learner's performance in mathematics, you have to know the evaluation objectives which are essentially associated with the expected learning outcomes. In elementary school years, the learning outcomes are focused on developing *useful capabilities* and also on developing the ability to think and reason mathematically. *Useful capabilities* include conceptual understanding and ability to understand and solve problems in the areas of numbers, number operations, fractions, shapes and spatial thinking, measurement, problem solving, patterns and data handling (NCERT, 2008).

Including the above capabilities, the process of assessment in mathematics includes five major dimensions of mathematical learning for which the probable tools and techniques to be used are suggested in the following table (Table 12.1).

Table 12.1 Tools and techniques of assessment of mathematics learning

| Aspects to be assessed | Tools and techniques |
|--|---|
| Concepts and procedures | <ul style="list-style-type: none"> • Written, oral and performance tests and tasks. • Observation of interactions in classroom and elsewhere. |
| Mathematical reasoning | <ul style="list-style-type: none"> • Tests and/or tasks (written or oral) • Oral description of the process of solving any problem • Observation of interactions in the groups. • Observation of orderly approach to normal tasks. |
| Disposition towards mathematics | <ul style="list-style-type: none"> • Observing the participation of the child in different mathematical activities like mathematics exhibition, puzzles, games • Observation of learner's interest in collecting and preparing TLMs, reading articles relating to mathematics, Portfolios. • Child's participation in performing mathematical tasks. |
| Using mathematical knowledge to solve problems | <ul style="list-style-type: none"> • Written and oral tests. • Projects and assignments. • Observing learner in co-curricular activities. |
| Mathematical Communication | <ul style="list-style-type: none"> • Content analysis of communications (written articles, diagrams, pictures, and recorded interactions, portfolios) • Observation, interviews and interaction in the classroom and elsewhere. |

**Check your progress:**

E1. Observe the table -1 given above and suggest tools and techniques to assess the following areas of mathematics learning in addition to those given in the table.

- a) Mathematical reasoning
- b) Concepts and procedures
- c) Mathematical communication

Only assessing learner's performance in mathematics is not sufficient, the learner's performance should be recorded and reported properly. Acquisition of individual learner's subject based knowledge; understanding and skills in mathematics can be recorded by the classroom teacher. Simultaneously the learner's attitude, interest towards mathematics learning should also be recorded. As we are focusing on the continuous and comprehensive evaluation (CCE), the recording of the learner's progress should go hand by hand with assessment. But the question may arise here that, how we can record the learner's performance in mathematics? What is the format to be used for recording the performance of the learner? In order to get answer to the questions we can analyze the situation given below:

Why is recording of assessment results necessary?

The main purpose of recording the assessment results is to monitor the learner's progress in different dimensions of development- achievement in scholastic areas, physical, cognitive, social, emotional, creativity and personality and such other areas indicative of a holistic growth and development. The record of assessment serves the requirements of different stakeholders:

- *It provides feedback to learner regarding his/ her progress along with the areas of his/her strength and weakness which in turn motivates for improving his/her learning.*
- *It provides information to teachers on the recent and the earlier results to estimate the trend of progress/development of the learner so as to make appropriate decisions regarding the management of teaching – learning activities for improvement and enrichment of students' learning.*
- *It intimates the parents regarding the status of learning growth of their child making them aware of the care to be taken in specific areas in which the child has problem and requires help and attention from the family.*
- *It is a permanent source for the administrators and planners of education basing on which the school effectiveness is evaluated and appropriate planning can be made for enhancement of quality of learning in the school.*

Besides these, reporting helps to present several attributes of each learner in the class which ordinarily is not possible to capture for a teacher on a single occasion. Small incidents about each learner recorded in different times when reviewed afterwards presents a holistic picture of the learners learning progress.



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Let us look into one classroom situation where a teacher is facing multiple challenges in recording the results of assessment of his students.

*Mr Ravi is an elementary school teacher, who teaches mathematics in the elementary classes. He is very resourceful. He uses different techniques to assess the learner's performance. Once during the teaching the concept of **fraction** he used the following tools and techniques to assess the learner's performance.*

- *He observed every individual learner's participation in the classroom discussion and records them in their individual profile.*
- *While the learners were engaged in different types of activities, he observed them how they are doing the tasks. Then he recorded individual learner's performance.*
- *He asked the learners to prepare materials and store those materials in portfolio. These materials demonstrated the learner's ability how they use and apply mathematics.*
- *After the completion of the unit, the teacher conducted a unit test. He put some written test items, oral questions in the unit test. Then after evaluating the papers he gave numerical scores to individual learner. He recorded these scores in the marks register meant for the class.*

On the basis of the case study given above now try to answer the following questions.

1. Why is it required to record of the learner's performance?
2. During the teaching of a particular concept, what did Mr Ravi assess and how did he record the assessment results?
3. In your school, how do you record the learner's performance in mathematics? Have you any format to record the performance?

No doubt, it is very important to record the progress of the learner after every conceptual area. In unit-16 of paper-3 you have already read about the recording procedure of the progress of the learners and the considerations in recording.

Check your progress:

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- E2. On the basis of your experience, write down the considerations in recording the learner's progress in mathematics.
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Different types of report cards are being used in different schools across the country. But the individual progress card to record the learner performance in mathematics suggested by the National Council for Educational Research & Training, New Delhi is given below.



Table 12.2 Record of Progress

| Child's Name: Class: | Recording results of | | | |
|---|----------------------|--------|--------|--|
| | Item-1 | Item-2 | Item-3 | |
| <p>Conceptual Area</p> <ol style="list-style-type: none"> 1. counting & concept of numbers 2. recognition of numerals and knowledge of number names 3. writing numerals 4. grouping round tens and ones <p>Mathematical reasoning</p> <p>Is able to appreciate alternate ways of solving problem</p> <p>Is able to invent his own new problem</p> <p>Is able to help others at solving problems</p> <p>Is able to appreciate source of others.</p> <p>Is able to use mathematical reasoning in other curricular area</p> <p>Mathematical Communication</p> <p>is able to explain why she did and hy/ how she solved the problem</p> <p>Is able to listen and follow explanations and solutions given by others</p> <p>Attitudes and Dispositions</p> <p>Is confident and willing to attempt new problems</p> <p>Is willing to persist with problems and does not give up too easily</p> <p>Seeks out and solves new problems.</p> <p>Enjoys doing mathematical problems</p> | | | | |

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(Source: Source Book on Assessment for Class I-V, Mathematics by NCERT)



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On the basis of the recording format given above, try to answer the questions given below.

1. In which content areas the learning progress of the learner can be recorded in this format?
2. What dimensions of mathematical reasoning can be assessed and recorded through this progress card?
3. What do you mean by mathematical communication? Is it necessary to assess the learner's skill in mathematical communication?
4. Are you assessing and recording the learner's progress in the areas like mathematical communication, learner's attitudes & disposition towards mathematics learning and his mathematical reasoning in your school?

While recording the learner's progress in this progress card you have to be cautious in the following aspects.

- You have to finalize the specific conceptual areas in which you want to assess the learner's performance.
- You have to conduct activities on that conceptual area, so that during the process of working you can assess the learner's performance.
- Acquisition of knowledge, understanding and skills in conceptual areas can be reflected in the progress card in the form of marks or grades. Task based assessments is emphasized, no assessment would be complete without paper-pencil tasks on worksheets.
- In addition, the common features on the specific content areas (aspects of mathematical reasoning, communication and attitudes) need to be observed objectively and recorded in appropriate form.

Not only the recording in this progress card will helpful you to get a holistic picture on the child's performance and learning progress, but the collection of material like teacher's analytical notes, sample of child's work, special work sheets designed to teach as well as assess can help you. Formal notes in the form of written records may be kept by you for future reference, but ongoing classroom observation in the form of mental notes you make as you teach and while children work should be a part of assessment.



ACTIVITY -1

An activity is given below. Read it carefully. Then note down the conceptual area(s) to which the activity relates. How this activity will help you to assess the learner's performance?

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Divide the children of the classes into small groups of 4/5. Give a collection of shapes (either only 3-D, or only 2-D, or mixed) to each group. Ask them to list those having a particular attribute.

- a. Which of the following shapes have more than 3 vertices?
- b. Which have a curved face?
- c. Which of them have at least one pair of sides equal?

Such type of recording can give a comprehensive picture (qualitative description of learner performance in mathematics) of the learner’s progress. Besides, recording format to compare the performance (in the form of marks secured by the children in summative tests) of all the children can be developed by the teacher. Such type of recording format is very common and used in our schools as mark registers.



ACTIVITY -2

Take any conceptual area(s) in mathematics from any class. Design learning activities on those conceptual areas. Allow your children to do those activities. Record the progress of individual child in a suitable recording format.

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12.3 IDENTIFICATION OF ISSUES IN MATHEMATICS LEARNING

Only recording the performances of the children is not sufficient and can not solve the purpose of assessment, rather its utility to plan for further learning of individual child is very important. So the reporting system should not be confined to the papers only. That should be designed to serve a variety of functions in the school. These include planning for instructional uses, reports to parents and other stakeholders. In this section you will read about the use of assessment results. The use of assessment results will focus on three major heads:

- i. Identifying strengths and weaknesses from the assessment results
- ii. Identifying and addressing typical problems in mathematics learning
- iii. Providing feedback to learners, parents and other stakeholders

12.3.1 Identifying Strengths and Weaknesses

Once the record is filled in and ready, you have to analyze the data critically. Here the recording of the assessment results of two teachers are given. Compare both the recording done by both the teachers carefully.



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Teacher-A

Aditi conducted an assessment on some selected conceptual areas of mathematics in class-V. She recorded the performance of the children as follows:

Table 12.3 Recording of assessment results

| Sl no | Name of the child | Marks obtained by students | | | |
|-------|-------------------|----------------------------|-----------------|---------------------|---------------|
| | | Oral (10) | Written (30) | Performance (10) | Total (50) |
| 1 | Sony | 6 | 23 | 6 | 35 |
| 2 | Sujata | 9 | 24 | 8 | 41 |
| 3 | Harish | 3 | 12 | 5 | 20 |
| 4 | John | 5 | 19 | 9 | 26 |
| 5 | Gabriela | 8 | 16 | 4 | 28 |

Teacher-B

Sneha analyzed the same assessment activity in different way. She recorded the performances of the children as follow.

Table 12.4

| Sl no | Name of the child | Marks obtained by students | | | | | |
|-------|----------------------|--|---|-------------------------------------|--|--|---------------|
| | | Fractions as part of a whole (10) | Fractions as part of a collection (10) | Fractions as division (10) | understanding equivalence of fractions (10) | Estimating fractional quantities (10) | Total (50) |
| 1 | Sony | 10 | 9 | 8 | 6 | 2 | 35 |
| 2 | Sujata | 10 | 10 | 7 | 10 | 4 | 41 |
| 3 | Harish | 7 | 6 | 5 | 2 | 0 | 20 |
| 4 | John | 7 | 7 | 6 | 4 | 2 | 26 |
| 5 | Gabriela | 8 | 8 | 6 | 4 | 2 | 28 |

Have you observed the difference between the two ways of recording of learner achievement?

In which aspects the first type of recording is different from the second one?

In the recording done by Mrs Aditi, the strengths and weaknesses of individual learner with respect to mode of responses to the test item can be obtained. But in the second



format, Mrs Sneha presented the assessment results with respect to conceptual areas given in the syllabus. In the second case, the teacher tries to analyze item wise, so that she can be able to identify the conceptual area which the child has not mastered. On the basis of the strengths and weaknesses of the child, plan for further learning can be made. So it is important on the part of the teacher to record the learning performances in such a way that he /she can get a comprehensive picture of each child’s learning performances.

Identifying the strengths and weaknesses of individual learner from the recording helps the teacher in the following ways:

- The learner can be motivated to learn those concepts which he has not mastered. Different learning experiences may be provided to the individual child to learn those concepts which he has not understood.
- Those children who have mastered a particular concept may be engaged in a variety of ways such as: helping other children to learn the concept, developing TLMs on the concept, assisting the teacher in other classroom activities.
- Students with good mathematical communication skills and positive attitude towards mathematics learning may be engaged in leading learning of mathematics, in different types of mathematical activities like organization of mathematics club, mathematics exhibition etc.



ACTIVITY-3

*Develop a unit test for class-V children in mathematics on the concept areas of **fraction**. Administer that test to class V children of your school. Identify the strength and weakness of individual child after proper recording of their learning outcomes. Prepare a short report how you will use the results.*

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12.3.2 Identifying and Addressing Typical Problems

During learning mathematics some children face peculiar difficulties in some situations. Such difficulties can not be identified from the reporting formats discussed earlier in the Tables no-2, 3 & 4. Those peculiar mistakes committed by the children can not be reflected in marks and grades. Let us observe the case study given below:

Mahesh is a class III student in a primary school. While learning the concept of ‘number name and writing the numbers’, he commits some mistakes frequently.



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Once the teacher calls a number name and asked Mahesh to write the number like 103, 210 123. In response Mahesh wrote the numbers like 1003, 20010 and 10023 respectively. The teacher gave Mahesh zero mark and recorded the mark in his progress card.

You might have observed that Mahesh was unable to write the three digit numbers correctly. But the peculiar problems can not be identified from the marks or the progress report card.

In mathematics learning at the early school level, students commit several errors which are broadly of five types:

- Reading errors (R) - committed if the child could not read a key word or symbol in the written problem to the extent that this prevented him/her from proceeding further along an appropriate problem-solving path
- Comprehension errors (C) - committed when the child had been able to read all the words in the question, but had not grasped the overall meaning of the words and, therefore, was unable to proceed further along an appropriate problem-solving path.
- Transformation errors (T) - committed when the child had understood what the questions wanted him/her to find out but was unable to identify the operation, or sequence of operations, needed to solve the problem.
- Process skills errors (P) - committed when the child identified an appropriate operation, or sequence of operations, but did not know the procedures necessary to carry out these operations accurately.
- Encoding errors (E) - committed when the child correctly worked out the solution to a problem, but could not express this solution in an acceptable written form.

Newman(1977) suggested a diagnostic process of structured interview to identify the typical mistakes in mathematics learning committed by the learner . Such type of errors committed by the learners should be identified at the right time and appropriate interventions may be given to rectify them. Therefore, you should observe each child during the teaching-learning process. When you suspect that some children are committing typical errors over a period of time, you have to use further diagnostic processes to identify the errors. You may record these results using codes or descriptive sentences.

Check your progress:

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- E3. Give one example in mathematics where children face typical problem. As a teacher what type of support would you like to provide to that child?
- E4. Give one example of each of the five types of errors committed by children in primary classes.
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12.3.3 Providing Feedback

Helping the students and parents to take the decision on the basis of learning outcome is a part of the school evaluation system. A particular decision may depend upon specific information. So a viable reporting system should be in place to help the learner, his/her parents and other stakeholders to use the assessment outcomes. After discussing the reporting procedure, we shall look at who needs information and how these people use it.

(I) Feedback to the learners:

Learner is at the centre stage of all educational activities in the school. All the educational activities are planned according to the need and interest of the learner. Therefore, there has been increased emphasis in education on the importance of feedback to learners. The feedback to the learner is basically of two folds: to which level he/she has achieved the educational objectives and the way of communication of this information to them.

On the basis of the assessment outcomes, the child may be empowered to take decisions for his learning in mathematics. They may be guided to take right decisions in the following areas:

- The knowledge of learning achievement improves subsequent learning. The learner may be guided to take decision on the nature of curricular preparation.
- In which conceptual areas the child has specific learning difficulties should be informed to the learner. If the learner is doing mistakes in the division of fractional number, he/she need not be once again oriented on all the concepts of fractional number, rather he/she may be provided with additional instruction to perform division operations only.
- On the basis of the learning outcomes, the teacher may identify specific learning difficulties of individual learner. On the basis of that, daily interaction between the teacher and the student may be done. This will help the learner to be motivated to learn.
- Though the results of the formative assessment provide periodical feedback to the learner to identify his/her problems and eradicate the problems, on the other hand summative assessment helps the learner to take long term plan for improving the performance in mathematics.

Mathematics is the school subject in which the children are subjected to demonstrate very high level performance by the parents and teachers irrespective of their levels of capacity to learn. Therefore, while providing feedback on mathematics to the young learners, you need to be extremely careful on the following aspects:

- The results of assessment should be provided correctly and accurately without any change.



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- The feedback should be conveyed to the learner individually and not in groups as far as possible.
- No disparaging comment should be given on poor performance by the learner.
- You should discuss with the learner in a very cordial and encouraging manner as to the ways of improving his/her further performance.
- Be honest with the learners. Do not adopt any pretension while providing feedback.

(II) Feedback to the parents

We have already discussed the system of record keeping of student's progress. Further the information regarding student progress needs to be systematically reported. Section 24(d) & 24(e) of the Right of Children to Free and Compulsory Education Act, 2009 states

A teacher appointed under sub-section (1) of section 23 will perform the following duties, namely;-

- (d) *Assess the learning ability of each child and accordingly supplement additional instructions, if any, as required;*
- (e) *Hold regular meetings with parents and guardians and appraise them about the regularity in attendance, ability to learn, progress made in learning and other relevant information about the child*

It is clear that, the teacher has to appraise the parents regarding the progress of the child in learning in the meetings. On the other hand, Parents also need to know how their children are doing in school and good reporting practices should result in improved relations between home and school. Reporting to parents on learning progress in mathematics can enable them

- To know to what extent the child has learned,
- To take care of the study at home,
- To monitor whether the child is doing the mathematical projects activities, homework given to him by the school,
- To discuss with the teachers on student's learning and development,
- To help the child by providing with other reference books and supporting materials.

Now the question may arise here what are different methods to appraise the parents about the child's progress and learning. No doubt, the progress card (written communication) can help the parents to get an information regarding child's learning and progress. But a comprehensive reporting system covers a variety of ways. Convening parent-teacher meetings, meeting of the Mother-Teacher Association (MTA) to discuss and share the learning outcome is very helpful. The parent-teacher meeting can act as an important supplement to the written report of student's progress.

While preparing and conducting the parents meeting to appraise them about the child's progress in learning mathematics the following points may be kept in mind:



Table 12.5 Considerations for parent-teacher meeting

| What to do in the meeting? | Description |
|--|--|
| Teacher has to make plan for the meeting | <ul style="list-style-type: none"> ● the venue and timing of the meeting, ● what type of information regarding the child to be communicated. ● Organizing information well in advance what you are going to present before them. ● arrangement of written assignments and portfolio of the child that to be shown to the parents |
| Begin the meeting in a positive manner | <ul style="list-style-type: none"> ● welcome them to the meeting so that they will feel comfortable ● make positive comment on the child's performance |
| Presenting the student's strong points first | <ul style="list-style-type: none"> ● give appropriate examples on the student's strength ● show the parents evidence of students performance e.g. portfolio, pictures, projects, written assignments ● comparison of the improvement in two assessment event |
| Encourage parents to participate and share | <ul style="list-style-type: none"> ● listening the parents carefully ● noting down what are their expectations ● get information about the child's activities at home |
| Plan a course of action cooperatively | <ul style="list-style-type: none"> ● appraise them what they will do at their home ● say them how they can support their child |
| Using good human skills during the meeting | <ul style="list-style-type: none"> ● explaining in understandable words, try to avoid technical terms ● willing to accept their feelings , do not reject their suggestions ● do not compare one child's performance with another |

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(III) Feedback to other stakeholders:

The learning achievements in mathematics are also providing useful feedback to the administrators, teachers, monitoring personnel.

- You, as the mathematics teacher, need to evaluate your own strengths and weaknesses which might have some impact on the performance of the learner. If the learners are doing well in some aspects of a conceptual area, but poorly in others, you need to examine your instructional procedure.
- The summative assessment outcomes indicate the effectiveness of the school and teacher. On the basis of the results, planning for teacher capacity building in mathematics may be made. In which areas of the content the teachers need content upgradation programme and what type of pedagogical skills they required.
- Learner's performances in mathematics provide useful feedback to take decisions regarding types of materials required for the teachers and learners in mathematics. The learner's behavior gives insight to review the vision of mathematics learning, the nature of textbook, the instructional strategies and the assessment procedure to be adopted by the school and the state authorities.
- The planning for monitoring of the teacher's activity and providing need based on-site support to the teacher can be obtained from the assessment outcomes of the learners.

Parents, teachers and administrators should work as partners in the learning of the child. The assessment outcomes provide feedback to all the partners. On the basis of the outcomes they should jointly plan for a better mathematics education in the schools.

12.4 FOLLOW UP MEASURES OF ASSESSMENT IN MATHEMATICS

You have already read about remediation in unit-16 of paper-3. Diagnosing students learning difficulties involves two levels of evaluation. First, students who need some form of remediation must be identified. Consistently poor performance in mathematics implies the need to intervene and modify student behavior. Second, the specific areas of weakness must be determined. One example of a class may be taken:

In a class during the teaching of division of fractions the following weaknesses were observed. Some children faced problem to divide a proper fraction with another proper fraction. Three/ four students performed the operation correctly, but can not communicate the operation correctly while some children found problem in dividing a proper fraction by 1.

After careful observation of the problems of the learners, the teacher can go for extensive diagnostic testing. Then the specific learning difficulties of individual learner may be



identified and noted in his personal profile. The teacher may plan for providing remedial activities to the learner to overcome his learning difficulties.

Item analysis data can also provide a basis for remedial work in mathematics. Though the test results in a class can clarify and correct many specific points, item analysis frequently brings to light general areas of weakness requiring more focused attention. On the basis of the specific learning difficulties of the learner, the teacher may revisit particular concepts. Item analysis may indicate a general weakness, in understanding principles or in the ability to interpret the data in a word problem in mathematics. Such information makes it possible to focus remedial work directly on the particular areas of weakness.

Nature of the remedial activities: After diagnosis of the specific learning difficulties of the learner the teacher has to plan for remedial activities to overcome the learning difficulties and help him/her in learning. The remedial activities could focus on the following:

- Individualized in nature.
- More interesting and provides alternate learning experience to the child i.e. different learning experience from the earlier one
- Based on the experience of the child.
- More material intensive.
- Presented in step wise. The task may be broken into smaller steps, where after each step the learning progress can be assessed.

Enrichment activities in mathematics: Like the children with learning difficulties, there are some children who are doing well. The teacher should help those children to enrich their potential. A conducive and enriched environment may be provided to those children so they can learn to optimize their ability. The nature of enrichment activities are follows:

- The activities involve higher order thinking.
- As far as possible open ended items may be given as enriched activities for them.
- While performing mathematical calculations, the time may be delimited for those children. Some times within a specific time period, they may be asked to solve more problems.
- The children may be encouraged to find alternate solutions to a given problem and formulate more mathematical problems as a part of enrichment activity.

This is how the recording and reporting of learning outcomes in mathematics can be done and used in our schools. A well designed recording and reporting practice can be



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helpful in creating a conducive learning environment in the school. The assessment results can be best utilized with a scientific recording and reporting system. The teacher can plan for optimizing the learning of individual learner on the basis of the outcomes.

12.5 LET US SUM UP

The main points of the unit are summarized here:

- In the primary class mathematics, the focus of assessment would be on understanding of how children learn mathematics, understanding the mathematical concepts and understanding now the child understands mathematics.
- Not a single tool or technique can help the teacher to assess all the dimensions. Tools and techniques like written and oral test, assignment, portfolio, project, observation etc can be used to assess learning progress.
- The teacher can collect information regarding the learning progress of the child through continuous observation during learning, performing home tasks and assignments and other activities.
- Recording is a process of systematic documentation of evidences of student's learning performance and progress in different school subjects gathered by using various tools and techniques.
- While recording the learner's performance in mathematics learning, the performance of the child in conceptual area, mathematical reasoning, mathematical communication, attitude and disposition have to be evaluated and recorded.
- The outcomes of learner's performance have to be shared among parents, teachers and other stakeholders.
- Individual strengths and weaknesses can be identifies and those can be used for planning learning experiences.
- After identifying difficulties, remediation programme may be planned for those children who have specific learning difficulties.

12.6 MODEL ANSWERS TO CHECK YOUR PROGRESS

E2. While recording the learner's progress the following points should be kept in mind:

- Recording has to be done individually.
- The recording format may vary depending upon the nature of data.
- Recording should be objective, continuous, valid and simple.



- Recording may be done in such a manner so that the stakeholders can get enough information from that.
- Recording should reflect both the quantitative data as well as qualitative description of learner's performance in mathematics learning.

E3. During the learning of mathematics, some children face typical problem in column wise additions. For example

$$\begin{array}{r} 14 \\ + 8 \\ \hline 94 \end{array}$$

Such type of problems may be arising due to the non-comprehension of the place-value concept. In this case, the child should provide with the concept of tens and ones with the help of concrete materials. Then the concept of column wise addition may be given.

12.7 SUGGESTED READINGS & REFERENCES

CBSE (2010). *Continuous and comprehensive evaluation-manual for teachers classes VI to VII*. New Delhi: CBSE.

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12.8 UNIT-END EXERCISES

1. Differentiate between recording and reporting.
2. Discuss the implications of reporting for teachers, parents and learners.
3. How would the progress chart benefit you as a teacher?