

Sponsored Teachers' Training College, Purulia
Sem.-III, Course – 1.3.7B (Mathematics), Unit-II
Study Material

Topic: - Practical Activities Associated with Mathematics in Secondary Curriculum

1. Introduction

It is a great challenging task for Teachers' in a 21st century that, activity based mathematical instruction can lead to development among the learners. For this reason, different daily life activities including games, debates, practical activities, critical and higher order thinking ability, problem solving ability, project work, communication and collaborative activity through ICT etc. all these skills must require to integrate in the mathematical concepts among the learners.

2. Concepts of Practical Activities Associated with Mathematics

Generally, the practical activities of mathematics refers to the test or verify, justify and proof of mathematical truths, theories, theorems, postulates, formulae and principles by hand on practice. Students need to integrate the mathematical knowledge with different types of skills and experiences through active participation in practical activities associated with mathematics concepts. Through this kind of work student can gain practical experience in theoretical and abstract knowledge of mathematics.

The main purpose of practical activities in mathematics is to take a scientific approach to mathematics for secondary level students and to develop their skills in using teaching aids in mathematics.

3. Objectives of Practical Activities Associated with Mathematics Concepts

- To acquire the ability of proof by experimenting and justifying different types of mathematical information, principles, formulae, theorems.
- To increase critical and high thinking ability
- To emphasis on creative thinking and problem solving ability.
- To develop self-confidence among the learners.
- To help on grasp about theoretical and abstract concepts of mathematics among the learners.

- To acquire different skills in using various teaching learning materials (TLM) in Mathematics Laboratory.
- To awaken scientific and analytical attitude in the students.
- To increase the students' enthusiasm towards mathematics.
- To make proper real form in giving mathematical know ledges through experience and practice.

4. Needs of Practical Activities Associated with Mathematics Concepts

- The students can able to get the practical knowledge of mathematics.
- Students can actively participate through practical activities.
- Increases math problem solving ability in students.
- The mentality of group activity is created among the students.
- Innovative power grows in students.
- Students can develop their complex and high thinking abilities.
- The math-phobia among the students is removed.
- Students' learning is long lasting.
- Practical values are developed towards mathematics.
- Students are satisfied him selves with recreational activities of mathematics.

5. List of several Practical Activities Associated with mathematics concepts

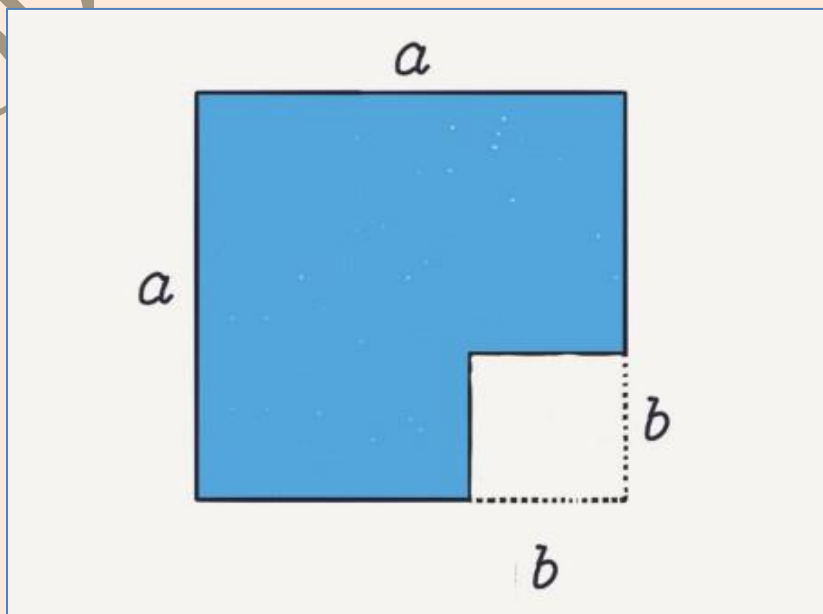
- Any charts or models on basic concepts of number systems
- Preparing a diagram or chart on representing real numbers with the help of number line
- Preparation on Irrational number model.
- Preparation of any charts, models or PPTs on concepts of base, index, power.
- Preparation of any charts, models or PPTs on fundamental laws of index.
- Preparation of any charts, models or PPTs on concept of Cartesian plane, co-ordinate structure and plotting any point.
- A model construction of Geoboard activities on co-ordinate geometry.
- Prepare a model, chart or PPTs on various types of linear simultaneous equations.
- Preparation of any model, chart or PPT to justify the truth of various proofs on regarding the properties of parallelogram.

- Preparation of any model, chart or PPT to justify the truth of various proofs on area related theorems of parallelogram.
- Preparation of any model, chart or PPT to justify the truth of various proofs of theorems on transversal and mid-point.
- Preparation of any model, chart or PPT to determine the area and perimeter of a triangle and various quadrilaterals.
- Preparation of any model, animated video, chart or PPT on Related to the concept of Factorization.
- Preparation of any model, chart or PPT on Construction of frequency distribution table of statistical data.
- Preparation of any model or chart on Construction of Histogram and Frequency Polygon.
- Preparation of any model, chart or PPT to determine the circumference of Circle .
- Preparation of any model, animated video, chart or PPT to determine the formula of area of circular region.
- Preparation of any model, chart or PPT to justify the truth of various proofs of theorems on related to various concurrence.

6. One Example – Geometric Proof of the Difference of Squares: $a^2 - b^2$

First we make a cut and split the shape into two different rectangles; the blue one and the white one that shown in the following figure.

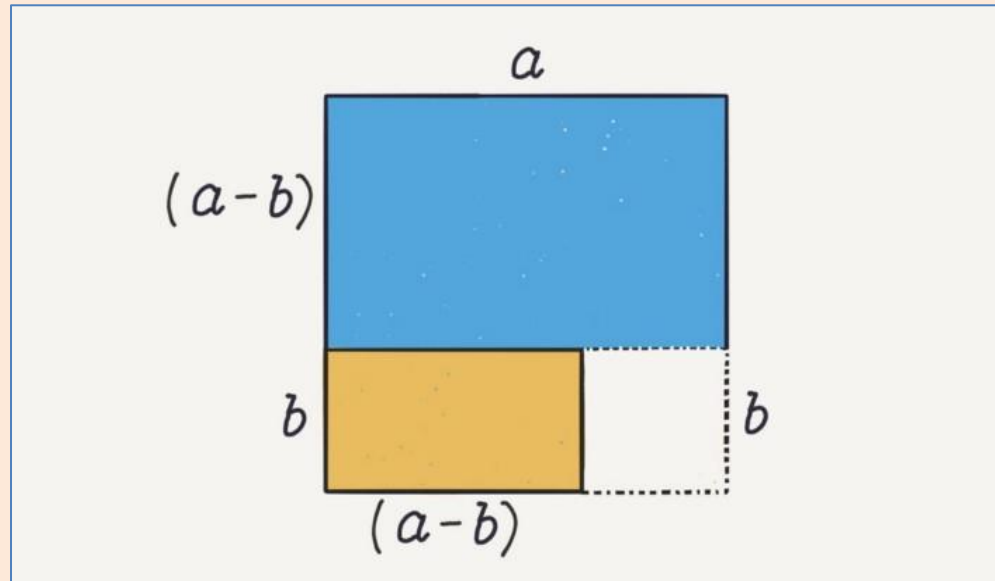
Step - I



The height of the blue rectangle now is $(a - b)$, and the height of the yellow rectangle is obviously b .

Now, if we flip the yellow rectangle and put next to the blue rectangle, we finish our rearranging that shown in the following figure.

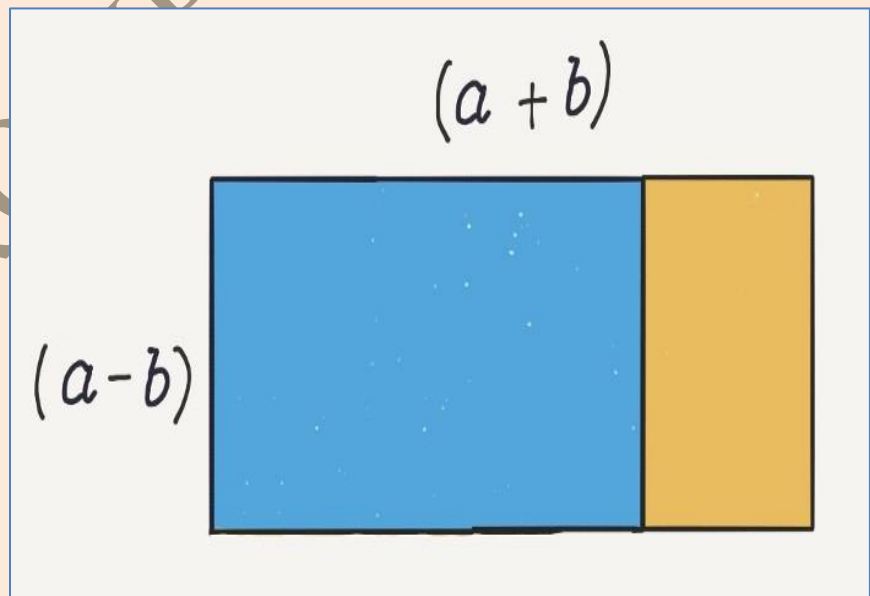
Step - II



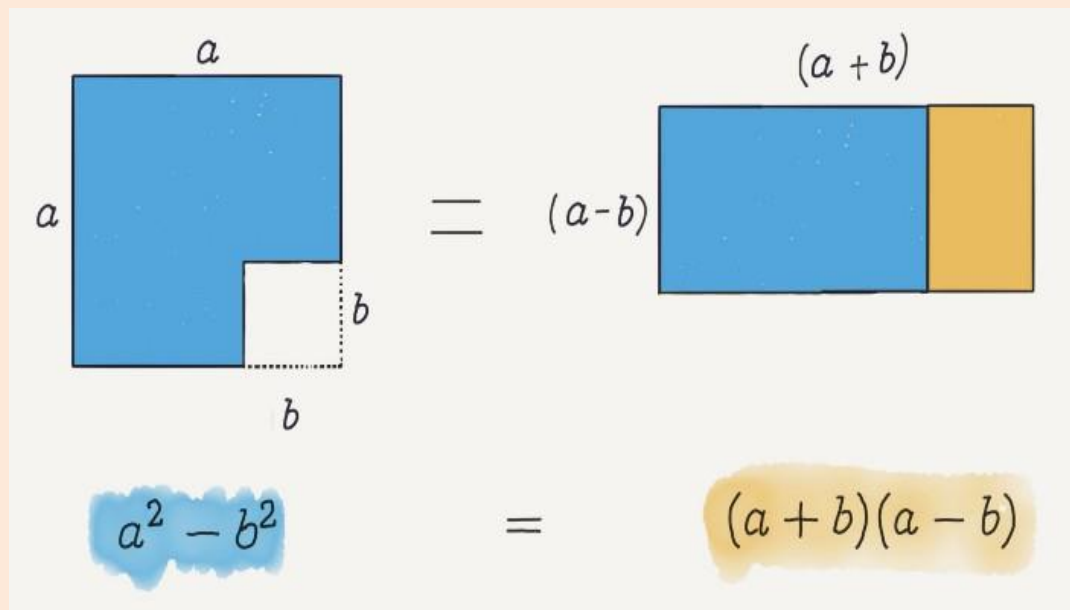
Since the area of a rectangle is height times width, the area of the combined rectangle is-
 $(a + b)(a - b)$.

This rectangle has the same area as the original shape that shown in the following figure.

Step - III



Step - IV



Final Geometrical figure of difference of squares of any two quantities

Meaning & Concept of Co-Curricular Activities –

Broadly speaking co-curricular activities are those activities which are organized outside the classroom situation. These have indirect reference to actual instructional work that goes on in the classroom. Although no provision has been made for these activities in the syllabus but provision has been made for these in the curriculum.

As the modern educational theory and practice gives top most priority on all round development of the child there is the vitality of the organization of these activities, in the present educational situation. So for bringing harmonious and balanced development of the child in addition to the syllabus this can be supplemented through curricular activities, but the co-curricular activities play significant role. These activities are otherwise called as extra-curricular activities.

So it can be said that the co-curricular or extra-curricular activities are accepted as an integral part of the entire curriculum.

Definition of Co-Curricular Activities –

The activities that give equal importance to the intellectual development of the students as well as physical development, social development, moral development, spiritual development, economic development, aesthetic and mental development by which all round development of students is achieved, and then these activities are called **Co-curricular activities**.

Some important definitions:

- **The International Dictionary of Education (1977):** “Activities recognized by a school or college which are not part of the academic curriculum but are acknowledged to be an essential part of the life of an educational institution. Co-curricular activities include sports, school bands, student newspaper etc. They may also be classified as ‘Extracurricular’ i.e. activities outside the usual duties of a job, as extra class activities.”
- **Bhatia (1996):** “Co-curricular activities may be defined as the activities undertaken to strengthen the classroom learning as well as other activities both inside and outside the classroom to develop the personality of the child.”

So, a co-curricular activity is defined as a program or out-of-class activity, supervised and/ or financed by the school, which provides curriculum-related learning and character building experiences.

List of Some Co-curricular activities in mathematics

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|--------------------------------|---|
| ➤ Art and Drama in mathematics | ➤ Debates on Mathematics |
| ➤ Drawing and Painting | ➤ Brainstorming Activities |
| ➤ Abacus | ➤ Math puzzles and Fun Games |
| ➤ Math Club Activities | ➤ Quizzes on Mathematics |
| ➤ Math Poster | ➤ Activities on identify mathematical fallacy |
| ➤ Math exhibition | ➤ Annual Magazine on Mathematics |
| ➤ Math Lab Activities | |
| ➤ Mental or Vedic Mathematics | |