

## **CLASS - VII**

### **PROJECTS IN MATHEMATICS**

**PROJECT:** Set of activities in which pupils discover experiment and collect information by themselves in a natural situation to understand a concept and arrive at a conclusion may be called a PROJECT.

Project work will develop the skills in academic standards such as problem solving, logical thinking, mathematical communication, representing data in various forms in daily life situations. This approach is to encourage the pupils to participate, discuss (articulation) and take active part in class room processes.

Project work essentially involves the students in a group work and submitting a report by the students on a given topic, after they worked on it, discussed it and analyzed it from various angles and perspectives.

### **ASSIGNING PROJECTS – TEACHER’S ROLE**

1. Teachers must have a thorough awareness on projects to be assigned to the students.
2. Teachers must give specific and accurate instructions to the students.
3. Teachers must see that all the students must take part in the projects assigned.
4. Allot the projects individually on the basis of student’s capabilities and nature of the projects.
5. Teachers must see that children with different abilities are put in each group and give opportunity to select division of work according to their interesting task at the time of allotment of the project.
6. Teachers must analyze and encourage the pupil, while they work on the project.
7. Teachers should act as facilitators.
8. Proper arrangements must be made for the presentation and discussion of each student’s project, when the students must be told whom to meet to collect the information needed.
9. Allow the students to make use of the library, computer lab etc.
10. Give time and fix a date to present the project. Each project should be submitted within a week in the prescribed Proforma.
11. Each project can be allotted to more number of pupils just by changing the data available in and around the school.
12. The projects presented should be preserved for future reference and inspection.
13. Every mathematics teacher is more capable to prepare projects based on the Talent/Interest/ Capability of students.
14. Teacher also ideal to the students by adopting one difficult project from each class.
15. Procedure of the project should be expressed by the students using his own words.
16. Each student should submit 4 projects in an academic year.

Welcome your comments and suggestions.

# **PROFORMA**

## **Preliminary Information**

**Class** : 7

**Subject** : Mathematics

**Name of the Lesson/Unit** : TRIANGLES AND ITS PROPERTIES

**No. of the Project** : 1

**Allotment of work** :

*(i) Preparation of models*

- Master Sree Ram

*(ii) Measuring of sides and angles*

- Master Anji Kumar

*(iii) Recording of measure & angles in a tabular form*

- Master Prasanth

*(iv) Classification of triangles*

- Master Venkateswarlu

*(v) Presentation of the project*

- Master Kalyan Thanoj

## DETAILED INFORMATION OF THE PROJECT

### 1. Title of the Project :

Classification of triangles based on sides and angles.

### 2. Objectives of the project :

Identification of types of triangles according to its sides and angles.

### 3. Materials used :

Charts, Geometry box, Card board, Scissors, sketch pens, etc.

### 4. Tools :

- (i) Collection of information – Preparation of different types of models of triangles.
- (ii) Observation – Comparing the sides and angles.
- (iii) Comparison & Classification – Classifying the triangles based on sides and angles.

### 5. Procedure :

1. **Introduction** : I want to classify the triangles based on its sides and angles by preparing all types of triangles.

2. **Process** : Prepare different types of triangle models by using card board.

#### 3. Recording the data – based on sides

- (i) Measure and record each side of triangle and identify the name of the triangle.
- (ii) Record & classification of triangles based on sides.

S.No.	Side – 1	Side – 2	Side – 3	Type of the triangle
1	8 cm	8 cm	8 cm	Equilateral triangle
2	9 cm	10 cm	9 cm	Isosceles triangle
3	10 cm	7 cm	5 cm	Scalene triangle

#### Recording the data – based on angles

- (i) Measure and record all angles of triangles and identify the name of the triangle.
- (ii) Record & classification of triangles based on the angles.

S.No.	Angle – 1	Angle – 2	Angle – 3	Type of the triangle
1	50°	60°	70°	Acute angled triangle
2	90°	50°	40°	Right angled triangle
3	120°	35°	25°	Obtuse angled triangle

#### 4. Analysis :

(i) I noticed that the triangles are 3 types based on sides, they are

S.No.	Type of triangle
1	Equilateral triangle
2	Isosceles triangle
3	Scalene triangle

(ii) I noticed that the triangles are 3 types based on angles, they are

S.No.	Type of triangle
1	Acute angled triangle
2	Right angled triangle
3	Obtuse angled triangle

#### 5. Conclusion :

S.No.	Name of the triangle	Description
1	Equilateral triangle	All the 3 sides are equal
2	Isosceles triangle	Any 2 sides are equal
3	Scalene triangle	No sides are equal
S.No.	Name of the triangle	Description
1	Acute angled triangle	All the angles are Acute angles
2	Right angled triangle	Any one of the angle is Right angle
3	Obtuse angled triangle	Any one of the angle is Obtuse angle

#### 6. Experiences of the students :

- (i) I prepared scalene triangle very easily.
- (ii) First, I tried to draw an Isosceles triangle but failed 2 times, then I used set squares to draw the isosceles triangle, and then I draw another isosceles triangle without set square.
- (iii) I collected some objects which are in the shape of triangles and I traced it on card board and then prepared models of triangles by cutting the card board to identify the types of triangles according to angles.
- (iv) While measuring the sides, I started from 1 instead of 0 for some times on the scale, it leads some wrong results.
- (v) While measuring the angles, I measured exterior angles instead of interior angles it leads some wrong results.

## **7. Doubts & Questions :**

1. Is every acute angled triangle is an equilateral triangle and every equilateral triangle is an acute angled triangle?
2. Is any triangle has more than two acute angles?
3. Is any triangle has more than one right angle?
4. Is any triangle has more than on obtuse angle?

## **8. Acknowledgement :**

1. Convey our sincere thanks to who are cooperate and putting their earnest efforts in completing the project.

## **9. Reference Books/Resources :**

1. Class – VII Mathematics text book

## **10. Signature of the student(s) :**

## CLASS – VII : LESSON WISE PROJECTS

S. No.	Name of the Lesson	Title of the Project
1	INTEGERS	<ol style="list-style-type: none"> <li>Representation of addition, subtraction and multiplication of integers on number line by preparing the tables.</li> <li>Check the properties of integers under addition and multiplication by using daily life situations.</li> </ol>
2	FRACTIONS, DECIMALS AND RATIONAL NUMBERS	<ol style="list-style-type: none"> <li>Represent multiplication and division of decimal fractions by using suitable figures.</li> <li>Write some rational numbers between 2 and -2 and find their values upto three decimal places.</li> </ol>
3	SIMPLE EQUATIONS	<ol style="list-style-type: none"> <li>Collect some simple equations in your daily life situations (about numbers, perimeters of , ages, lengths of objects, heights of students, marks of the students)</li> </ol>
4	LINES AND ANGLES	<ol style="list-style-type: none"> <li>Identify the locations that are parallel lines which are intersecting by a transversal in our daily life situations and list out all pairs of angles in tabular form.</li> </ol>
5	TRIANGLE AND ITS PROPERTIES	<ol style="list-style-type: none"> <li>Prepare different types of triangle models and classify them according to its sides and angles.</li> <li>Prepare models of triangles by selecting measurements of sides (check whether are they formed triangle or not) and find sum of all interior angles. Find the relation between interior and exterior angles.</li> </ol>
6	RATIO - APPLICATION	<ol style="list-style-type: none"> <li>Collect the information of students and consumption of rice in your school/hostel. If 40 more students joined, find the quantity of rice required. If 60 students are gone for picnic, find the quantity of rice required. Identify and solve the daily life situation which comes under direct and indirect proportion.</li> </ol>
7	DATA HANDLING	<ol style="list-style-type: none"> <li>Collect data of your class student's heights, weights and consumption of food items in hostel/school. Prepare a tabular form and find Mean, Median and Mode of the data.</li> <li>Collect the marks obtained by you in SA-1 and SA-2 examinations and record the data. Represent it in Double Bar Graph and Pie-diagram.</li> </ol>
8	CONGRUENCY OF TRIANGLES	<ol style="list-style-type: none"> <li>Prepare the models of triangles and check criterion for congruencies of triangles. (SSS, SAS, ASA, RHS)</li> </ol>

S. No.	Name of the Lesson	Title of the Project
9	CONSTRUCTION OF TRIANGLES	1. Identify the possible situations that a triangle can be constructed and construct a triangle with the measurements of $AB=7\text{ cm}$ , $A=60^\circ$ and $C=40^\circ$ .
10	ALGEBRAIC EXPRESSIONS	1. Collect the expressions of one term, two unlike terms, three unlike terms, more than one unlike terms and write name of the variables and name of the expression, degree of each term and expression in a tabular form.
11	EXPONENTS	1. Find the product and ratio of income of any two families in simplest form.
12	QUADRILATERALS	1. Prepare the models of types of quadrilaterals and write the properties of each quadrilateral. Write your opinion about sum of interior angles of each quadrilateral.
13	AREA AND PERIMETER	1. Prepare some models of parallelograms and rhombuses; find the area of parallelogram by changing it as rectangle. Find the area of the triangle and rhombus. 2. Find the relationship between circumference and its diameter of a circle. 3. Identify the rectangular and square paths in your surroundings and find the areas of the paths by measuring the dimensions and write in tabular form.
14	UNDERSTANDING 3D AND 2D SHAPES	1. Prepare physical models of 3D shapes 2. Draw the figures of 3D shapes on 2D surfaces by using Isometric dot sheet.
15	SYMMETRY	1. Collect some alphabets, regular shapes and figures. Draw symmetrical lines and identify which contains rotational symmetry. Write them in a tabular form.

## CLASS – VII : LESSON WISE ASSIGNMENTS

S. NO.	NAME OF THE LESSON	ASSIGNMENTS
1	INTEGERS	<p><b><u>Assignment-1</u></b></p> <p>1. Find the product using suitable properties            (i) <math>625 \times (-35) + (-625) \times 65</math>      (ii) <math>7 \times (50 - 2)</math>            (iii) <math>15 \times (-35) \times (-7) \times (-12)</math></p> <p>2. The temperature at 12 noon was <math>10^{\circ}\text{C}</math> above zero. If it decreases at the rate of <math>2^{\circ}\text{C}</math> per hour until midnight, at what time would the temperature be <math>8^{\circ}\text{C}</math> below zero? What would be the temperature at midnight?</p>
2	FRACTIONS, DECIMALS AND RATIONAL NUMBERS	<p><b><u>Assignment-1</u></b></p> <p>1. Narendra reads <math>\frac{1}{4}</math>, of a part novel in 1 hour. What part of the book will he have read in <math>2\frac{1}{2}</math> hours?</p> <p>2. Write the following decimals in expanded form.            i) 55.5    ii) 5.55    iii) 303.03    iv) 30.303    v) 1234.56</p> <p><b><u>Assignment-2</u></b></p> <p>1. Measure the dimensions of your black board and find the area.</p> <p>2. A truck covers a distance of 102.5 km in 2.5 hours. If the truck is travelling at the same speed throughout the journey what is the distance covered by it in 1 hour?</p> <p>3. What is the equivalent rational number for with            (i) denominator 12      (ii) numerator -75</p>
3	SIMPLE EQUATIONS	<p>1. Sum of 5 consecutive integers is 60. Find the integers?</p> <p>2. Solve <math>9x + 15 = 13x - 17</math></p> <p>3. Total number of the boys and girls in a class is 104. If the number of girls is 20 more than that of boys. Find the number of boys. Solve and check your result.</p> <p>4. A number is divided into two parts such that one part is 10 more than the other. If two parts are in the ratio 5:3, find the number and the two parts.</p> <p><i>Note: Teacher guides the students to prepare simple equations with their own knowledge and solve it and check their result.</i></p>
		<p><b><u>Assignment-1</u></b></p> <p>1. Two adjacent angles are <math>50^{\circ}</math> and <math>130^{\circ}</math> do they form a linear pair? Draw a picture and check it.</p> <p>2. Give some examples for vertically opposite angles in your surroundings.</p> <p><b><u>Assignment-2</u></b></p> <p>1. In a given figure, 'l' and 'm' are intersected by a transversal 'n', is <math>l \parallel m</math>? Find all remaining angles?</p>



5	TRIANGLE AND ITS PROPERTIES	<p><b>Assignment-1</b></p> <ol style="list-style-type: none"> <li>Check whether the following measurements form a triangle.             <ol style="list-style-type: none"> <li>4cm, 5cm and 6cm</li> <li>7cm, 7cm and 7cm</li> <li>5cm, 5cm and 10 cm</li> <li>3cm, 5cm and 7cm</li> </ol> </li> <li>In ABC <math>\angle A = 40^\circ, \angle B = 55^\circ</math>, Find <math>\angle C = ?</math></li> <li>The angles of triangle are in the ratio 2:3:4. Find the angles?</li> </ol> <p><b>Assignment-2</b></p> <ol style="list-style-type: none"> <li>One angle of triangle ABC is <math>20^\circ</math> and the two angles are equal. Find the measure of each equal angles?</li> <li>In a right-angled triangle, one acute angle is <math>30^\circ</math>. Find the other acute angle?</li> </ol>
6	RATIO - APPLICATIONS	<p><b>Assignment-1</b></p> <ol style="list-style-type: none"> <li>A jeep travels 120km in 3 hours at a constant speed. In how many hours will the jeep covers 180 km.</li> <li>A carpenter allows 15% discount on his goods. Find the marked price of a chair which is sold by him for Rs.680.</li> </ol> <p><b>Assignment-2</b></p> <ol style="list-style-type: none"> <li>A former sold 2 bullocks for Rs.24000 each. On one bullock he gained 25% and on the other he lost 20%. Find his total profit or loss percent?</li> <li>A dealer allows a discount of 10% and still gains by 10%. What should be the marked price if the cost price is Rs.900?</li> <li>A man sold two cycles for Rs.3000 each gaining 20% on one and losing 20% on the other. Find his gain or loss percentage on the whole transaction.</li> </ol>
7	DATA HANDLING	<p><b>Assignment-1</b></p> <ol style="list-style-type: none"> <li>The monthly salaries of 09 employees are Rs.15000, Rs.22000, Rs.9000, Rs.38000, Rs.63000, Rs.72000, Rs.105000, Rs.87000. Calculate median of the data.</li> </ol> <p><b>Assignment-2</b></p> <ol style="list-style-type: none"> <li>The following are the different person's monthly expenditure food and house rents. Present these date in the following table and draw bar- graph.</li> </ol>

		<p><b>Assignment-1</b></p> <p>1. The monthly salaries of 09 employees are Rs.15000, Rs.22000, Rs.9000, Rs.38000, Rs.63000, Rs.72000, Rs.105000, Rs.87000. Calculate median of the data.</p> <p><b>Assignment-2</b></p> <p>2. The following are the different person's monthly expenditure food and house rents. Present these data in the following table and draw bar-graph.</p> <table border="1"> <thead> <tr> <th>S. No</th> <th>Name of the person</th> <th>Food expenditure</th> <th>House rent</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Ramesh</td> <td>15000</td> <td>6000</td> </tr> <tr> <td>2</td> <td>Ravi</td> <td>20000</td> <td>7000</td> </tr> <tr> <td>3</td> <td>Radha</td> <td>18000</td> <td>6000</td> </tr> <tr> <td>4</td> <td>Shekar</td> <td>22000</td> <td>8000</td> </tr> <tr> <td>5</td> <td>Seetha</td> <td>10000</td> <td>4000</td> </tr> <tr> <td>6</td> <td>Manish</td> <td>14000</td> <td>6000</td> </tr> <tr> <td>7</td> <td>Mounika</td> <td>25000</td> <td>12000</td> </tr> </tbody> </table> <p>2. Data collect rice consumed in your hostel for 10 consecutive days and find the average rice consumption and its mode.</p> <p>3. Collect the monthly electricity charges of your school from your office for the months from Jan-2015 to Sep-2015 and calculate the mean of the monthly electricity charges of your school.</p> <p><b>Assignment-3</b></p> <p>1. Collect the item wise expenditure of your family in a month and represent it as a Pie-diagram</p> <p>2. Collect the different data present in the form of bar-graph and Pie-charts in magazines, news papers.... Etc. and present them on your school bulletin board.</p>	S. No	Name of the person	Food expenditure	House rent	1	Ramesh	15000	6000	2	Ravi	20000	7000	3	Radha	18000	6000	4	Shekar	22000	8000	5	Seetha	10000	4000	6	Manish	14000	6000	7	Mounika	25000	12000
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8	CONGRUENCY OF TRIANGLES	<p><b>Assignment-1</b></p> <p>1. Draw congruency figures in your surroundings.</p> <p>2. Explain criteria for congruency of triangles with examples.</p>																																
9	CONSTRUCTIONS OF TRIANGLES	<p><b>Assignment-1</b></p> <p>Construct <math>\triangle PQR</math> in which <math>QR = 5.5\text{cm}</math>, <math>QP = 5.5\text{cm}</math>, and <math>\angle Q = 60^\circ</math>. Construct a right-angled <math>\triangle ABC</math> such that <math>\angle B = 90^\circ</math>, <math>AB = 8\text{cm}</math> and <math>AC = 10\text{cm}</math></p>																																
10	ALGEBRAIC EXPRESSIONS	<p><b>Assignment-1</b></p> <p>1. Write the expression <math>5x^2 - 4 - 3x^2 + 6x + 8 + 5x - 13</math> in simplified form. Find its value when <math>x = -2</math>.</p> <p>2. The relationship between speed(s), distance(d) and time(t) is given by <math>s = \frac{d}{t}</math>. Find the value of s if <math>d = 135\text{ m}</math> and <math>t = 10\text{ seconds}</math>.</p> <p><b>Assignment-2</b></p> <p>3. What should be taken away from <math>3x^2 - 4y^2 + 5xy + 20</math> to get <math>-x^2 - y^2 + 6xy + 20</math>.</p> <p>4. The sum of three expressions is <math>8 + 13a + 7a^2</math>. Two of them are <math>2a^2 + 3a + 2</math> and <math>3a^2 - 4a + 1</math>. Find the third expression.</p>																																

11	EXPONENTS	<p><b>Assignment-1</b></p> <ol style="list-style-type: none"> <li><math>9^2 \times 9^{18} \times 9^{10}</math></li> <li><math>(-6)^9 / (-6)^9</math></li> <li>If <math>5^6 \times 5^{2x} = 5^{10}</math> then find x.</li> <li><math>(-7)^7 \times (-7)^8</math></li> <li>Simplify <math>\left(\frac{x^a}{x^b}\right)^a \times \left(\frac{x^b}{x^a}\right)^a \times \left(\frac{x^a}{x^a}\right)^b</math></li> </ol> <p><b>Assignment-2</b></p> <ol style="list-style-type: none"> <li>Simplify <math>2^{3a+7} \times 2^{7a+3}</math></li> <li>Simplify <math>\left(\left(\frac{-5}{6}\right)^2\right)^5</math>.</li> </ol>
12	QUADRILATERALS	<ol style="list-style-type: none"> <li>Write the properties of all types of quadrilaterals?</li> </ol>
13	AREA AND PERIMETER	<p><b>Assignment-1</b></p> <ol style="list-style-type: none"> <li>Find the base of a triangle whose area is <math>220 \text{ cm}^2</math>, and height is 11cm.</li> <li>In a parallelogram the base and the height is in the ratio of 5:2. If the area of the Parallelograms is 360sq.cms. Find its base and height.</li> <li>The length of diagonal of a Rhombus whose area 216 sq.cm is 24cms. Then find the length of second diagonal.</li> </ol> <p><b>Assignment-2</b></p> <ol style="list-style-type: none"> <li>If the circumference of a circle is 33cm. Find its diameter?</li> <li>A verandah 2m wide is constructed all around a room of dimensions 8m x 5m. Find the area of the verandah?</li> </ol>
14	UNDERSTANDING OF 3D AND 2D SHAPES	<p><b>Assignment-1</b></p> <ol style="list-style-type: none"> <li>Identify the number of faces, edges and vertices of cube, cuboids and pyramid as in table form.</li> <li>Three cubes each with 2cm edge are placed side by side to form a Cuboid. Draw an oblique or isometric sketch of this cuboid.</li> </ol>
15	SYMMETRY	<p><b>Assignment-1</b></p> <ol style="list-style-type: none"> <li>Draw the line of symmetry in the alphabets from A to Z.</li> <li>Draw some rangoli's which have symmetry.</li> <li>Collect the some picture and draw the line of symmetry where applicable.</li> </ol>