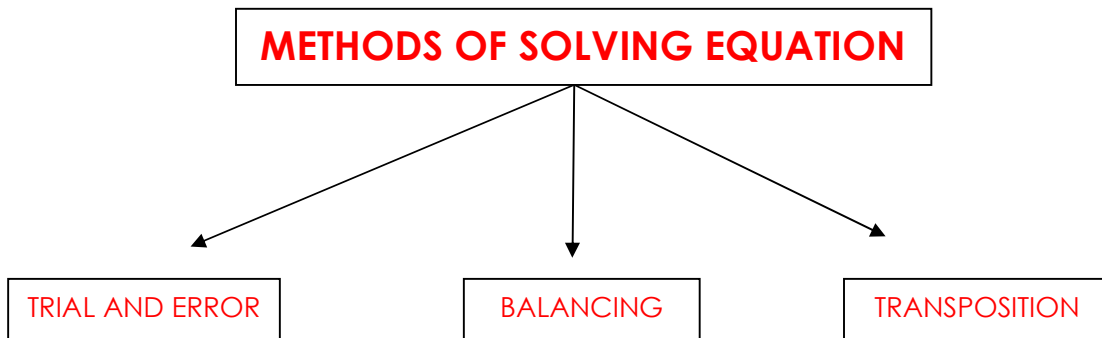
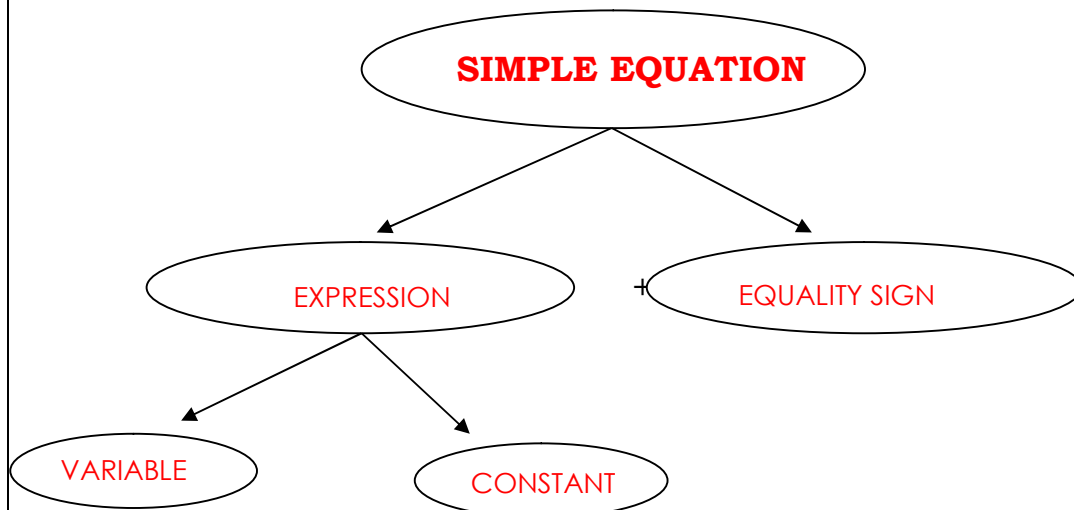


SHIVALIK PUBLIC SCHOOL
SECTOR-41 B
CHANDIGARH
Lesson Plan 2020-2021 (CBSE)

Std: VII		Term: I		Subject: MATHEMATICS	
Topic: - SIMPLE EQUATIONS - CHAPTER – 4		Sub-topics: - Forming an equation - Solving an equation - Methods to solve an equation ➤ Trial and error ➤ Balancing ➤ Transposing - Applications of simple equations			
1. Reference Book(s): NCERT text book of mathematics class VII					
2. Reference Web site(s): www. cbse.nic.in					
3.Technology:					
PPT	1	Reference Video(s):	3	Part 1: - Part 2: - Part3: -	https://youtu.be/v-GKJ0omfdE https://youtu.be/nKHb6WXfnUs https://youtu.be/xIJGWePWAQ
4. Other Teaching Aids:					
Class work sheet	--	Assignment, worksheet	Graphic organizer	--	Mind map
5. Extra:					
Smart class modules					
MIND MAP:					

MIND MAPS



Period 1	Duration: 40 minutes
Sub-topics - Forming of an equation - Solving an equation Trial and error method.	
Learning outcome(s): - Students will be able to understand what is an equation. - Students will be able to solve simple equation and framing equation out of the given statement. - Students will develop the ability to understand.	
Key Vocabulary: - Constant- A fixed quantity that does not change. - Variable-A variable is a symbol that we assign to an unknown value. - Simple equation- An equation consists of two expressions separated by an equal sign. - Coefficient- It is the number that is placed in front of a variable. - Arithmetic Operators- It is a mathematical function that takes two operands and performs a calculation on them. Basic arithmetic operators include: addition (+), subtraction (-), multiplication(X) and division (÷)	
Skills Developed: Understanding, applying, Critical thinking Analytical skills	
Opening/set induction	Duration: 5-6 minutes
Opening Strategy(ies)/ Curiosity Questions: Teacher will check the previous knowledge of the students by asking following questions: Q1. What do you mean by natural number? Q2. What do you mean by integers? Q3. What do you mean by constant? Q4. What do you mean by variables? Now, teacher will introduce the topic.	

Link Statement:

The value that is not known or to be found is assigned a variable. Then the expressions are formed as per the conditions given in the question. Finally, the expressions are equated with values given in the equation.

Instructional Methodology**Duration: 15-18 minutes****Teaching Strategy (ies): Explanation****Discussion:****Tr. explains:**

After giving 5 chocolates to my friend, I am left with 3 chocolates. What is the initial number of chocolates I had?

Let the number of chocolates that the boy initially had = X

Then the expressions are formed as per the conditions given in the question.

Number of chocolates given to the friend = 5

Number of chocolates that the boy is left with = 3

Number of chocolates that the boy is left with = initial of number of chocolates he had – number of chocolates given to the friend

$$3 = X - 5$$

Therefore, the equation set up is $X - 5 = 3$.

Q1) Write the equations for the following statements:

1. The sum of three times X and 11 is 34.
2. If you subtract 5 from 6 times P , you get 7.
3. One fourth of m is 7.

Solutions:

a. Three times $X = 3X$

Sum of $3X$ and 11 = $3X + 11$

The equation is $3X + 11 = 34$

b. 6 times $P = 6P$

5 Subtract from $6P = 6P - 5$

The equation = $6P - 5 = 7$

c. One fourth of $m = \frac{m}{4}$

The equation = $\frac{m}{4} = 7$

Q 2) Write in statement form.

- I. $P + 4 = 15$
- II. $m - 7 = 3$
- III. $4p - 2 = 18$

Solution:

I. The sum of number p and 4 is 15

II. 7 subtracted from m is 3

III. Subtract 2 from 4 times p gives 18

Closure	Duration: 5 minutes
Closure strategy (ies): Verification – Think and Answer Q1. Write equations for the following statements: i. Z subtracted from y is 8 ii. Ten times a is 79 iii. Three fourth of g is 69 iv. Three times k plus 5 gets 24 v. Q2. Write the following equations in statement form: i. $A+8=9$ ii. $4S - 3 = 12$ iii. $8 + 3b = 20$ iv. $7n - 2 = 8$	
Assignment	
Exercise 4.1 (Q.4, Q.5, Q.6)	
Measuring attainment of LOs:	
To measure the attainment of LOs Exercise 4.1 (Q.4, Q.5, Q.6) will be discussed with the students.	

Period 2	Duration: 35 minutes
Sub-topics Solving an equation by Balancing method	
Learning outcome(s): - Students will be able to verify whether the given value is a solution of the equation or not. - Students will be able to solve simple equation. - Students will develop the ability to understand. - Students will be able to solve the equation doing same operation on both sides. - Students will be able to apply the concept of simple equations in real life situations.	
Key Vocabulary: - Constant- A fixed quantity that does not change. - Variable-A variable is a symbol that we assign to an unknown value. - Simple equation- An equation consists of two expressions separated by an equal sign. - Coefficient- It is the number that is placed in front of a variable. - Arithmetic Operators- It is a mathematical function that takes two operands and performs a calculation on them. Basic arithmetic operators include: addition (+), subtraction (-), multiplication(X) and division (÷)	
Skills Developed: understanding, applying, analyzing, creating	
Opening/set induction	Duration: 5-6 minutes
Opening Strategy(ies)/ Curiosity Questions: Teacher will check the previous knowledge of the students by asking following questions: Q1. What do you mean by constant? Q2. What do you mean by variables? Q3. What do you mean by Simple Equation? Now, teacher will introduce the topic.	
Link Statement: In an equation there is always an equality sign. The equality sign shows that the value of the expression to the left of the sign is equal to the value of the expression to the right of the sign. An equation is a condition on a variable that at least one of the two expressions must contain the variable. Solving of an equation is possible by	

Balancing method.

Instructional Methodology

Duration: 15-18 minutes

Teaching Strategy (ies): Explanation

Tr. explains:

TRIAL AND ERROR METHOD

To solve an equation by trial method, we substituting different values of the Variable and checking the equality of LHS and RHS is the trial and error method.

Example:

Solve $3x + 5 = 17$

now we start to substitute different values of x

Solution:

value of x	LHS = $3x + 5$	RHS = 17
1	$3x + 5 = 3 \times 1 + 5 = 8$	17
2	$3x + 5 = 3 \times 2 + 5 = 11$	17
3	$3x + 5 = 3 \times 3 + 5 = 14$	17
4	$3x + 5 = 3 \times 4 + 5 = 17$	17

For $x = 4$, LHS = RHS. The required solution is $x = 4$.

BALANCING METHOD

To solve an equation by balancing method, we add the same number to both sides of an equality. we subtract the same number to both sides of an equality. we multiply the same number to both sides of an equality. we divide the same number to both sides of an equality.

For example:

Solve $3n + 7 = 25$

Solution:

To separate the variable n on the LHS of the equation.

Firstly, we subtract 7 from both side of an equation

$$3n + 7 - 7 = 25 - 7$$

$$3n = 18$$

Now, we divide by 3 on both side of an equation

$$\frac{3n}{3} = \frac{18}{3}$$

$$n = 6$$

which is the solution.

Solve $3t = 42$

Solution:

To separate the variable t on the LHS of the equation.
 Firstly, we divide 3 from both side of an equation

$$\frac{3t}{3} = \frac{42}{3}$$

$$t = 14$$

which is the solution

Class Assignment: Problem solving questions**Solve:**

1. $X - 1 = 9$
2. $Y + 4 = 9$
3. $2m + 5 = 15$

Closure**Duration: 5 minutes****Closure strategy (ies): Think and Answer****Solve:**

$$1) \frac{p}{5} = \frac{7}{15}$$

$$2) 3s = -9$$

$$3) 2q - 6 = 0$$

$$4) 10p + 10 = 100$$

Assignment

- Exercise 4.2 (Q.1, Q.2, Q.4)

Measuring attainment of LOs:

- To measure the attainment of LOs Exercise 4.2 (Q.1, Q.2, Q.4) will be discussed with the students.
- **Class activity** based on forming equation from the given statement and vice versa will be done with the students.

Innovative content to explain Hot spots:

With the balance method we can solve equations by doing the same operation on both sides of the = sign.
 A balance is an old weighing instrument with a scale/ weighing on both sides. On both sides of the balance we put a part of the equation. What is to the left of the = sign in the equation goes on the left- hand scale and what is to the right of the = sign

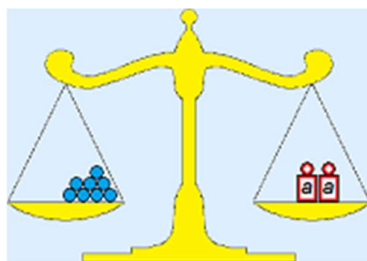
in the equation goes on the right -hand scale. Now we start removing or adding things from or to the scale until we are left with the answer.

For example: Given is the equation $4z + 11 = 6z + 3$. We can make the balance by taking bags of balls for z and separate balls for the numbers.



On both sides we have separate balls. This means that on both sides we can remove three marbles without losing the equilibrium of the balance (the balance remains balanced). We will get $4z + 8 = 6z$. we can also remove 4 bags of balls without losing the equilibrium of the balance.

We will get: $8 = 2z$



When two bags are equal to 8 balls, there must be $8 : 2 = 4$ balls in each bag.

We get, $z = 4$

We can use the balance method with other equations also.

Period 3	Duration: 35 minutes
Solving an equation by Transposing method.	
Learning outcome(s): - Students will be able to verify whether the given value is a solution of the equation or not. - Students will be able to solve simple equation. - Students will develop the ability to understand. - Students will be able to solve the equation by using transposing method. - Students will be able to apply the concept of simple equations in real life situations.	
Key Vocabulary: - Constant- A fixed quantity that does not change. - Variable-A variable is a symbol that we assign to an unknown value. - Simple equation- An equation consists of two expressions separated by an equal sign. - Coefficient- It is the number that is placed in front of a variable - Arithmetic Operators- It is a mathematical function that takes two operands and performs a calculation on them. Basic arithmetic operators include: addition (+), subtraction (-), multiplication(X) and division (÷)	
Skills Developed: understanding, applying, analyzing	
Opening/set induction	Duration: 5-6 minutes
Opening Strategy(ies)/ Curiosity Questions: Teacher will check the previous knowledge of the students by asking following questions: Q1. What do you mean by constant? Q2. What do you mean by variables? Q3. What do you mean by Simple Equation? Q4. What do you mean by sign of equality? Now, teacher will introduce the topic.	
Link Statement: In an equation there is always an equality sign. The equality sign shows that the value of the expression to the left of the sign is equal to the value of the expression to the right of the sign. An equation is a condition on a variable that at least one of	
Std: VII	Subject: Mathematics Term: I Topic: Simple equations

the two expressions must contain the variable. Solving of an equation is possible by Transposing method.

Instructional Methodology

Duration: 15-18 minutes

Teaching Strategy (ies): Explanation

Tr. explains:

The most common method used for solving an equation is transposing method. There are some rules are followed in transposing method,

1. Sign of + becomes –
2. Sign of – becomes +
3. Sign of $\times$ becomes $\div$
4. Sign of $\div$ becomes $\times$

We will learn about transposing a number, i.e., moving it from one side to the other.

Q1) Solve $12p - 5 = 19$

Solution:

$$12p - 5 = 19$$

Here we will move 5 to the other side by changing its sign.

$$12p = 19 + 5$$

$$12p = 24$$

Now, we will shift 12 to the other side, we get

$$P = 24 \div 12$$

$$P = 2$$

Which is a solution

Q2) Solve $4m + 12 = 24$

Solution:

$$4m + 12 = 24$$

Here we will move 12 to the other side by changing its sign.

$$4m = 24 - 12$$

$$4m = 12$$

Now, we will shift 4 to the other side, we get

$$P = 12 \div 4$$

$$P = 3$$

Which is a solution

Self-reading:

Solve by using transposing method

1. $4 = 5p - 10$
2. $16 = 4 + 3(t + 2)$
3. $5p - 2 = -4$
4. $2x + 4 = 12$

Closure**Duration: 5 minutes****Closure strategy (ies): Global Connections**

- Construct 4 equations starting with $x = 2$
- Construct 3 equations starting with $x = -2$

Assignment

- Exercise 4.3 (Q.1, Q.2)

Measuring attainment of LOs:

To measure the attainment of LOs Exercise 4.3 (Q.1, Q.2) will be discussed with the students.

Period 4	Duration: 35 minutes
Sub-topics Applications of simple equations	
Learning outcome(s): - Students will be able to verify whether the given value is a solution of the equation or not. - Students will be able to solve simple equation. - Students will develop the ability to understand. - Students will be able to solve the equation by using transposing method. - Students will be able to apply the concept of simple equations in real life situations.	
Key Vocabulary: - Constant- A fixed quantity that does not change. - Variable-A variable is a symbol that we assign to an unknown value. - Simple equation- An equation consists of two expressions separated by an equal sign. - Coefficient- It is the number that is placed in front of a variable Arithmetic Operators- It is a mathematical function that takes two operands and performs a calculation on them. Basic arithmetic operators include: addition (+), subtraction (-), multiplication(X) and division (÷)	
Skills Developed: understanding, applying, analyzing	
Opening/set induction	Duration: 5-6 minutes
Opening Strategy(ies)? Curiosity Questions: Teacher will check the previous knowledge of the students by asking following questions: Q1. What do you mean by constant? Q2. What do you mean by variables? Q3. What do you mean by Simple Equation? Q4. What do you mean by sign of equality? Q5. What is the use of simple equations in our real life? Now, teacher will introduce the topic.	

Link Statement:

we have learnt how to solve simple equations. The method is first to form equations corresponding to such situations and then to solve those equations to give the solution to the puzzle problems.

Instructional Methodology**Duration: 15-18 minutes****Teaching Strategy (ies): Explanation****Discussion:**

The sum of three times a number and 11 is 32. Find the number.

Solution:

Let the number be x

Three times a number = $3x$

Sum of three times a number and 11 = $3x + 11$

Therefore, $3x + 11 = 32$

$$3x = 32 - 11$$

$$3x = 21$$

$$X = 21 \div 3$$

$$X = 7$$

Which is the required number.

Tr. explains:

Raja's father's age is 5 years more than three times Raja's age. Find Raja's age, if his father is 44 years old.

Solution:

Let Raja's age be y

His father's age is 44

Therefore, $3y + 5 = 44$

$$3y = 44 - 5$$

$$3y = 39$$

$$Y = 39 \div 3$$

$$Y = 13$$

Which is the Raja's age.

Experiential content:

Students would be able to Identify linear equation in one variable and develop skills of performing various operations of transposition and balancing to find variable.

Closure	Duration: 5 minutes
Closure strategy (ies): Discuss Suraj is now half as old as his father. 20 years ago, Suraj's father was six times Suraj's age. What are their ages now?	
Assignment	
Exercise 4.4(Q.2, Q.3)	
Measuring attainment of LOs:	
To measure the attainment of LOs Exercise 4.4 (Q.2, Q.3) will be discussed with the students.	