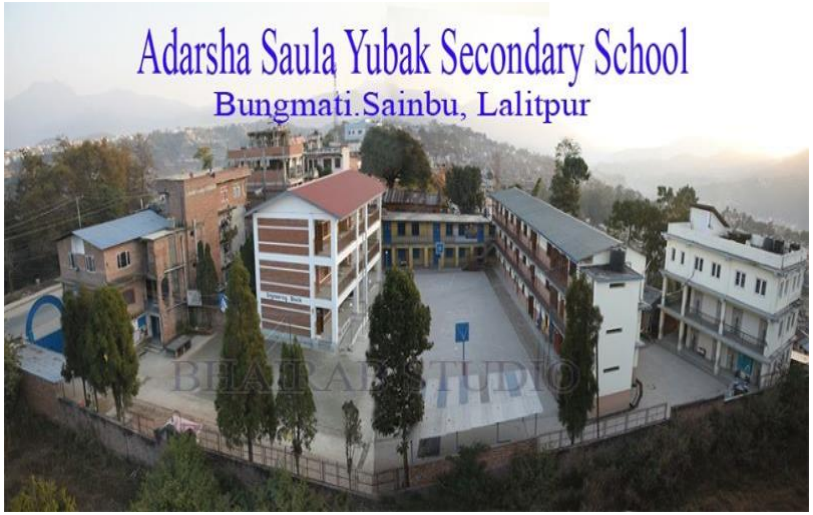
Proposal on SLaB Project

Aadarsha Saula Yubak Secondary School, Bungamati, Lalitpur



Introduction

Aadarsha Saula Yubak Secondary School was established in 1969 (2026 B.S.) It is located in Lalitpur district of Karyabinayak Municipality-25, Bungamati which is 8.3 km far from Kathmandu. Bungamati is a Newa town on a spur of land overlooking Bagmati River. This town is naturally as well as culturally beautiful. This town now has mixed demography which includes Newa, Brahmin, Chhetri, Tamang, Gurung, Limbu and many more. Population of this town is approximately 5,720 (census, 2011). It is the hometown of the deity Rato Machhindranath, regarded as the patron of the valley. The town is famous for woodcarvers as well.

Aadarsha Saula Yubak Secondary School is one of the best schools in the area and has been providing quality education to the students of the area from many years with the motto 'School is a learning centre.' The principal of the school is Mr. Saroj Bhakta Acharya and the management is co-operative. The total number of students in the school is about 1,800 with about 105 teaching staffs and 10 non-teaching staffs. The school has been divided into two blocks: block A where the students up to Grade 5 are taught

including bachelor's and master's students, block B where the students up to Grade 12 are taught consists of four buildings. Currently 35 of our little sisters are studying here from Grade 4 to 12.

The main purpose of establishing science lab in the school is to provide practical knowledge to the students. Science lab in the school has been lagging from some years due to lack of the essential equipments. This also will build leadership quality in the students and help them learn better.

Chemistry lab

Biology lab

Physics lab

Objectives

- To provide practical knowledge to the students.
- To provide necessary equipments and tools required for experiments to the students.

Syllabus of Science from Grade 8 to 12

I. Syllabus of Science of Grade 8

A. PHYSICS

1. Units & Measurement
2. Simple Machine
3. Pressure
4. Work, Energy & Power

5. Heat
6. Sound
7. Light
8. Magnetism
9. Electricity
10. Velocity & Acceleration

B. CHEMISTRY

1. Matter
2. Acid, Base & Salt
3. Mixture
4. Some useful chemicals
5. Metals & Non – Metals

C. Biology

1. Cell & Tissue
2. Life Process
3. Living - Beings

D. GEOLOGY & ASTRONOMY

1. Weather & climate
2. Earth & Space
3. Structure of earth

E. ENVIRONMENT SCIENCE

1. Environment & its balance
2. Environmental degradation & its conservation
3. Environment & sustainable development

II. Syllabus of Science of Grade 9

A. PHYSICS

1. Measurement
2. Force
3. Machine
4. Work, Energy & Power
5. Sound
6. Light
7. Electricity & Magnetism

B. CHEMISTRY

1. Classification of Elements
2. Chemical Reaction
3. Solubility
4. Some Gases
5. Metals
6. Chemical Fertilizers

C. BIOLOGY

1. Classification of Living Things
2. Lifecycle of some insects
3. Adaptation of some organisms
4. The cell tissue & organ
5. Skeletal System
6. Sense Organ
7. Evolution
8. Ecosystem
9. Micro Organisms
10. Human Nutrition

D. GEOLOGY & ASTRONOMY

1. Natural Disaster
2. The Earth in the Universe
3. Green House

III. Syllabus of Science of Grade 10

A. PHYSICS

1. Force
2. Pressure
3. Energy
4. Heat
5. Light
6. Electricity & Magnetism

B. CHEMISTRY

1. Classification of Elements
2. Chemical Reactions & Equations
3. Acid, Base & Salt
4. Metals
5. Carbon & its Compounds
6. Materials used in daily life

C. BIOLOGY

1. Human Nervous & Glandular Systems
2. Chromosomes & Sex Determination
3. Reproduction
4. Blood Circulation in Human Body

5. Heredity
6. Invertebrates
7. Environment Pollution & its Management

D. GEOLOGY & ASTRONOMY

1. History of the Earth
2. The Atmosphere
3. The Universe

IV. Syllabus of Science of Grade 11

A. PHYSICS

1. Machine
   - i. Units & Measurement
   - ii. Scalars & Vectors
   - iii. Kinematics
   - iv. Laws of Motion
   - v. Work, Energy & Power
   - vi. Circular Motion
   - vii. Equillibrium
   - viii. Rotational Dynamics
   - ix. Elasticity
   - x. Simple Harmonic Motion
   - xi. Hydrostatics
   - xii. Surface Tension
   - xiii. Fluid Dynamics
   - xiv. Gravity & Gravitation

2. Heat & Thermodynamics

- i. Heat & Temperature

ii. Thermal Expansion
iii. Calorimetry
iv. Change of State
v. Gases & Gas Laws
vi. Kinetic theory of Gases
vii. Hygrometry
viii. Transfer of Heat
ix. First Laws of Thermodynamics
x. Second Laws of Thermodynamics

3. Geometrical Optics

i. Photometry
ii. Reflection at Plane & Curved Surfaces
iii. Refraction through Prisms
iv. Lenses
v. Dispersion of Light
vi. Optical Instruments

4. Electrostatics

i. Fundamental Electrostatic Phenomena
ii. Electrostatic Force, Field & Potential
iii. Capacitor

B. CHEMISTRY

1. General & Physical Chemistry

i. Language of Chemistry
ii. Chemical Arithmetic
iii. Atomic Mass & Molecular Mass
iv. Avogadro's Hypothesis & its Application
v. Equivalent Mass
vi. Gaseous State

vii. Liquid State
viii. Solid State
ix. Atomic Structure
x. Nuclear Chemistry
xi. Electronic Theory of Valency Bonding
xii. Periodic Classification of Elements
xiii. Oxidation & Reduction
xiv. Equillibria

2. Inorganic Chemistry

i. Hydrogen
ii. Oxygen
iii. Ozone
iv. Water
v. Nitrogen & its Compounds
vi. Halogens (Chlorine, Bromine & Iodine)
vii. Carbon
viii. Phosphorous
ix. Sulphur
x. Boron & Silicon
xi. Environmental Pollution
xii. Metal & Metallurgical Principles
xiii. Alkali& Alkaline Earth Metals

3. Organic Chemistry

i. Alkanes
ii. Fundamental Principles of Organic Chemistry

C. BIOLOGY

1. Botany

i. Introduction to Biodiversity

ii. Monera
iii. Mycota
iv. Mucor
v. Yeast
vi. Lichen
vii. Virus
viii. Angiosperm
ix. Cell
x. Cell Organelles
xi. Cell Division
xii. Ecology
xiii. Plantae
xiv. Ecosystem
xv. Forest Conservation
xvi. Gymnosperms

2. Zoology

i. Earthworm
ii. Frog
iii. Introduction to kingdom Animalia
iv. Introduction to Protista
v. Paramecium
vi. Plasmodium
vii. Evolution
viii. Environmental Pollution
ix. Conservation of Wildlife Resources
x. Animal Behavior
xi. Introduction to Biology
xii. Origin of Life
xiii. Adaptation

V. Syllabus of Science of Grade 12

A. PHYSICS

1. Wave & Optics

i. Wave Motion
ii. Mechanical Waves
iii. Waves in Pipes & Strings
iv. Acoustic Phenomena
v. Nature & Propagation of Light
vi. Interference
vii. Diffraction
viii. Polarization

2. Electricity & Magnestism

i. Direct Current Circuit
ii. Heat & Power
iii. Electrical Circuits
iv. Thermoelectric Effect
v. Chemical Effect of Current
vi. Magnetic Field
vii. Basic Concept of Magnetism
viii. Magnetic properties of Materials
ix. Electromagnetic Induction
x. Alternating Currents

3. Modern Physics

i. The Electron
ii. Photons
iii. Quantisation of Energy

iv. X- Rays
v. Nuclear Physics
vi. Radioactivity
vii. Nuclear Energy & other Sources of Energy
viii. Particle Physics & Cosmology

B. CHEMISTRY

1. General & Physical Chemistry

i. Volumetric Analysis
ii. Ionic Equillibrium
iii. Electro Chemistry

2. Organic Chemistry

i. Aromatic Hydrocarbons
ii. Haloalkanes & Haloarenes
iii. Alcohols & Phenols
iv. Nitro Compounds
v. Molecules of Life

3. Inorganic Chemistry

i. Heavy Metals

C. BIOLOGY

1. Botany

i. Anatomy & Physiology of Plants
ii. Genetics
iii. Developmental Biology
iv. Application of Biology

2. Zoology

i. Animal Tissues

ii. Development Biology
iii. Human Biology & Health
iv. Application of Biology

Action plan

SN	Activities	Date	How much day	Who	What to do	How
1	Meeting with a committee to write a proposal	Sep 5-8, 2021	4 days	Committee Members	Arranged a meeting	Discussion
2	Writing proposal for Science Lab	Sep 10 – 15, 2021	6 days	Committee Members	Writing	Writing
3	Forwarding proposal	Sep 16, 2021	1 day	Committee Members	Forwarding	Via Email
4	Waiting for the further response from the TGUP. LSF	Sep 18…	…	….	….	….
5	Installing science Materials in the Lab	Oct 1 – 5, 2021	6 days	Committee Members	Installing the Materials	Arranging Materials in the lab
6	Ready to do Practical Class	Round the year	….	students	experiments	Lab tasks

List of Experiments

PHYSICS

.	Experiments	Appartus Required	Available Appartus	Needed	Cost
1	To measure volume of hollow cylinders.	vernier calliper-16 hollow Culinder -16	Vernier Caliper-9Hollow Cylinder -9	Verner Calliper-7Hollow cylinder-7	
2	To measure volume of irregular glass plate.	Spherometer - 16	Spherometer - 8	Spherometer - 8	
3	To measure density of spherical steel ball.	micrometer screw gauge	Screwgauge - 10	Screwgauge - 6	
4	To find the value of g.	simple pendulum(bob)-3	X	Bob - 3	
5	Principle of moment.	Known weight, 1 m scale	Known weight-2 1m scale - 2	Known weight-3 1m scale - 5	
6	Archimede's Principle.	Ureka can, physical Balance	Ureka Can-1, Physical Balance-0	Ureka can -4 Physical Balance-2	
7	Specific gravity.	Nicholson Hydro meter Weigt box	x	Nicholson Hrdyometer-3 Small wt.box-3	
8	Coefficient of linear Expansion.	Pullingers Appartus	x	Pullingers Appartus - 2	
9	Specific Heat Capacity.	Thermometer,Calorimeter	Thermometer-3	Thermometer-2, Calorimeter - 5	
10	Melting Point of Solid.	Hard Glass Test tube	x	Hard Class Tube- 3	
11	Law of Reflection.	Mirror, Drawing Board	Mirror-8 Drawing Board-17	Mirror -8	
12	Law of refraction.	Glass Slab	Glass Slab-7	Glass Slab - 9	
13	Refractive index of Prism.	Prism	Prism - 3	Prism - 13	
14	Focal Length of Lens.	Optical Bench, Lenses	Optical Bench -1, Concave /convex-4/4	Optical Bench - 2 Concave/convex-5/5	

15	Pascal's Law.	Hydraullic Press	x	Hydraullic Press - 2	
16	Magnetic Neutral Point.	Magnet , Compass	Magnet - 24, Compass-10	Magnetic compass-10	
17	Angle of Dip.	Dip Circle	x	Dip Circle-3	
18	Ohms Law.	Rheostat,Voltmeter,Ammeter, Battery	Rheostat-2, voltmeter-3 Ammeter - 3	Rheostat- 1 12V battery-5	
19.	Coefficient of viscosity.	Stokes method tube	stokes method tube - 1	Stokes method tube- 2	
20	Velocity of Sound.	Resonance Tube,tuning fork	Resonance tube -1 Tuning fork - 6	Resonance tube- 2 Tuning fork - 5	
21	Combination of resistances.	Meter bridge, p.o.box, jockey, gavanometer	Meter Bridge-4 P.O.Box - 4 Galvanometer - 3	jockey - 5	
22	Internal Resistance of cell.	Potentiometer	Potentiometer-1	Ptentio meter-2	
23	Characterstics of Diode and transistor.	Bread Board, diode, transistor	x	Bread Board-10 Transistor - 5 Diode – 20	

	BIOLOGY				
1	Preparation of Temporary Slide and permanent slides of root tips.	Slides - 80psc, Cover Slips-80,Eosin - 150 ml, aceto-carmine, aceto alcohol, blotting papers			
2	Museum specimen.	permanent slide of Oscillatoria, Rhizopus, Apis, Shark			
3	Population density of Plants.	Quadrats of 1m X 1m - 3 sets			
4	Study of Human skeleton and Rabbit skeleton.	1 set of Skeletons of Human and 1 set of Rabbit skeleton			
5	Determination of soil texture(Moisture content,pH,Water Holding Capacity).	Sieve -2 sets pH meter -1, Oven -1			

6	Study of Compound Microscope.	400X microscope - 5 sets		
7	Dissection of earthworm,frog mice.	Dissection kits - 2 sets, Trays - 5 sets, White mice - 20 psc ,Formaline		
8	Bacterial Growth.	Petri Dishes - 20 sets, Inoculating loops - 20 sets, Incubator, Laminar air flow, Nutrient agar dextrose, Autoclave, Aluminium fold, cotton		
9	Study of embrological slides.	Chart including development of fertilized egg to gastrulation		
10	study of plant tissues and anatomy of root, stem and leaf	charts of plant tissues and anatomy of root, stem and leaf		
11	Detection of sugar and albumin in solution.	Test tubes - 20 sets, Benedict's solution and Ninhydrin		
12	Blood group test.	Blood group test kit (Monoclonal Anti-Serum) - 2 sets		
13	measurement of B.P.	Stethoscope and sphygmomanometer - 3 sets		
14	Fermentation.	Kuhne's tube - 2 sets, brewer's yeast		
15	Water Quality Test(PH of water and Do of water).	Water quality testing kits for PH determination and Do calculation)		
16	Moll's half leaf experiment.	Wide neck bottles-2 psc, splited corks-2		

CHEMISTRY

1	Acid base titration.	Pipette,Burette,conical flask,funnel,stand with clamp,bunsen burner,watch glass,Volumetric flask,electronic weighing balance,beaker. Sodium Hydroxide,sodium carbonate,conc. hydrochloric acid, conc. sulphuric acid, oxalic acid, potassium permagnate	
2	Distillation (simple Distilllation).	Eudiometer tube,hard glass test tube,Round bottom Flask 1000ml, Silicon Heater,Condensor, adaptors,multiplug with serge protector	
3	Distillation plant (to produce distilled water).	Stainless steel vessel wit coil	
4	Electrolytic Cell.	Zinc and coper electrode	
5	Fire extinguisher.	Model of fire extinguisher -1	

Budgeting

Common Science Equipments of TGUP & Aadarsha Saula Yubak HSS

	S.N.	Unit	Quantity	Item Description	Unit Price	Amount
Safety Equipments	1	set	6	Nitrile Safety gloves (Hard gloves acid proof)	300	1800
				Total		**1800**
General Lab Equipments	2	pcs	1	Thermometer	190	190
	3	pcs	6	Glass rods	720	4320
	4	pcs	12	250ml Borosilicate beaker	126	1512
	5	pcs	3	100ml Borosilicate Measuring Cylinder	490	1470
	6	pcs	12	70mm Funnel/ Funnel medium	167	2004
	7	pcs	12	Borosilicate test tube 25mm*150mm	40	480
	8	pcs	24	Wash bottle 250ml	81	1944
	9	pcs	12	Pipette 10ml	215	2580
				Total		**14500**
Physics	10	pcs	1	AC DC 0-24V Power supply/ Battery 9V	225	225
	11	pcs	1	Circuit Breadboards	325	325
	12	pcs	1	Plane mirrors	69	69
	13	pcs	1	Diode	20	20
	14	pcs	1	Weight box 200g	1725	1725
	15	pcs	1+1+1+1	Multimeters: Voltmeter, Ammeter, Galvanometer, Potentiometer	525+525+532+2700	4282
				Total		**6646**
Biology	16	pcs	2	Compound Microscope 400x	6500	13000
	17	pcs	20	Microscope Glass Slides	510	10200

	18	pcs	20	Microscope Glass Slides Cover Slips	125	2500
	19	pcs	1	Bromthyol Blue Stain/ Cotton blue stain	225	225
	20	pcs	1	Isopropyl Alcohol/Aceto Alcohol	1325	1325
	21	pcs	5	Classroom Dissection Kit	438	2190
	22	set	10	Inoculating loops	390	3900
	23	pcs	5	Dissection pans/ trays 10*12mm	557	2785
				Total		**36125**
Chemistry	24	pcs	1	Periodic table	375	375
	25	set	2	Copper density rods	175	350
	26	set	2	Zinc density rods	175	350
	27	bot	6	Ethanol 95% 4L/ Retified spirit 400ml	181	1086
	28	set	1	Stop watch	656	656
	29	pcs	1	Calorimeter	625	625
				Total		**3442**
				Grand Total		**62,513**

Extra Science Equipments

Physics

	Particulars	Quantity	Unit Price	Amount
1	Vernier calliper- IME type	1	555.00	555.00
2	Spherometer	1	600.00	600.00
3	Micrometer screwgauge (Dial type beaker)	1	11,975.00	11,975.00
4	Simple pendulum (bob)- set of 6 pcs	1	630.00	630.00
5	Meter scale, wooden, 1meter	1	94.00	94.00
6	Eureka can	1	94.00	94.00
7	Physical Balance	1	4,275.00	4,275.00

8	Nicholson Hydro meter	1	590.00	590.00
9	Pullingers Appartus	1	4,470.00	4,470.00
10	Hard Glass Test tube	1	28.00	28.00
11	Drawing Board 12*18 with cork sheets	1	690.00	690.00
12	Glass Slab 75*50*18	1	125.00	125.00
13	Prism 38*38	1	94.00	94.00
14	Optical Bench, 1 meter SS rod	1	6,500.00	6,500.00
15	Hand Lens 75mm	1	225.00	225.00
16	Hydraullic Press	1	1,969.00	1,969.00
17	Magnetic compass 75mm	1	90.00	90.00
18	Dip Circle	1	6,750.00	6,750.00
19	Rheostat 100 ohm, 8"	1	1,238.00	1,238.00
20	Stokes method tube	1	725.00	725.00
21	Resonance Tube apparatus, complete set	1	2,625.00	2,625.00
22	Meter bridge with copper strips & meter scale	1	2,475.00	2,475.00
23	P.O. Box, Normal	1	6,600.00	6,600.00
24	Jockey	1	175.00	175.00
25	Transistor	1	30.00	30.00
	Total			**53,622.00**

Chemistry

	Particulars	Unit	Quantity	Unit Price	Amount
1	Atomic Model: Chemistry, 120 ball Junior	set	1	1963.00	1963.00
2	Wire Gauze	pcs	24	45.00	1080.00
3	Woulfe's Bottle (250 ml)	pcs	6	413.00	2478.00
4	Kipp's apparatus 1 ltrs capacity PVC	pcs	2	2850.00	5700.00
5	Burettle (50ml)	pcs	6	620.00	3720.00
6	Triangular foil	pcs	12	225.00	2700.00
7	Test tube stand 16mm*31 hole	pcs	12	315.00	3780.00

8	Silicon heater 1000ml capacity	set	2	1450.00	2900.00
9	Surge Protector	pcs	2	1325.00	2650.00
10	Model of fire extinguisher -1	set	1	2950.00	2950.00
11	Volumetric flask (100ml)	pcs	12	280.00	3360.00
12	Wash Brush small	pcs	6	75.00	450.00
13	Wash brush medium	pcs	6	90.00	540.00
14	Sand Bath	pcs	6	145.00	870.00
15	R.B. Flask 24/29 with socket 250ml	set	2	340.00	680.00
16	Universal indicator solution 125ml	bott	1	219.00	219.00
17	Thistle Funnel	pcs	12	57.00	684.00
18	Ferrous sulphate 500gm	pkt	1	381.50	381.50
19	Diamond glass cutter pen size best quality	pcs	6	175.00	1050.00
	Total				38,155.50

Biology

	Particular	**Quantity**	**Unit**	**Unit Price**	**Amount**
	CHARTS all rexane biovisual				
1	Semi technical Description of Papollionaual, Solanaceal, Liliaceal	1	pcs	1450.00	1450.00
2	Developmeny of Embryo / Fertilized egg to gestation of Frog	1	pcs	1450.00	1450.00
3	T.S. of stem, root and leaf of Dicot and Monocot plants.	1	pcs	1450.00	1450.00
4	Plant tissue (Simple and Complex Permanent tissue)	1	pcs	1450.00	1450.00
5	Marchantia, Pinus (Vegetative and Reproductive structures)	1	pcs	1450.00	1450.00
	Chemicals	1	pcs		0.00
1	Auto- carrine stain	1	pcs	225.00	225.00
2	Dextrose Agar	1	pcs	5850.00	5850.00

3	Nutrient agar 500gm	1	pcs	5562.00	5562.00
4	Benedict's solution 500ml	1	pcs	389.00	389.00
5	Ninhydrin 25gm AR	1	pcs	2142.00	2142.00
6	Xylene 500ml	1	pcs	606.00	606.00
7	Kuhne's tube	1	set	1350.00	1350.00
8	Eusin125 ml	1	pcs	169.00	169.00
9	Yeast 500 gm	1	pcs	4228.00	4228.00
	Apparatus				
1	Quadrats (1x1m2) =2	1	pcs	975.00	975.00
2	Respiroscope =1	1	pcs	1725.00	1725.00
3	Blood group test kit or anti serum for blood test	2	set	950.00	1900.00
4	Wide neck bottles	1	pcs	490.00	490.00
5	Spilited corks	1	pcs	50.00	50.00
	Materials for dissection /study				
1	Eathworms	10	pcs	9.00	90.00
2	Frog	10	pcs	65.00	650.00
3	White Mice: Male	5	pcs	300.00	1500.00
4	White Mice: Female	5		300.00	1500.00
5	Rabbit bones	1	set	2250.00	2250.00
6	Human skeleton	1	set	3600.00	3600.00
	Museum Specimens and slides				
1	Slide of Oscillatoria	1	pcs	75.00	75.00
2	Slide if Rhizopus	1	pcs	75.00	75.00
3	Museum specimen of Mushroom	1	pcs	400.00	400.00
4	Different types of lichens	1	pcs	400.00	400.00
	Dissection				
1	Formaline 5 lit	1	bott	1800.00	1800.00
	Total				**45,251.00**

Amount Summary

S.N.	Particulars	Amount
1	Common TGUP & Aadarsha Saula List	62,513
2	Physics Extra	53,622
3	Chemistry Extra	38,155
4	Biology Extra	45,521
	Total	**Rs. 199,811**

Note# extra 13 per cent VAT will be applied to the quoted rates while invoicing

Monitoring/Evaluation

All our activities and materials will be closely watched by the teachers. Regular monitoring is done by them. Every teachers has to report about their experiment and activities to their coordinators and finally all these reporting reaches the principal.

Committee members

1. Hima Tamang (CM) – Leader
2. Aastha Bajracharya (CM) – Leader
3. Saroj Bhakta Acharya (Principal) - Member
4. Laxman Babu Tiwari (School Level Science Teacher) - Member
5. Gyan Bhakta Maharjan (Physics) - Member
6. Shreeram Thapa (Physics) - Member
7. Chinta Mahara (Chemistry) - Member
8. Dharma Bhakta Thapa (Chemistry) - Member
9. Kesharman Bishwokarma (School Level Science Teacher) _ Member
10. Mamita Shakya (Biology) – Member
11. Sabina Brahmacharya (School Level Science Teacher) - Member
12. Manoj Thapa (Physics) - Member