Amar Kanti Secondary English School

Godawari-5, Lele, Lalitpur, Nepal

Proposal for Science Equipment

Introduction:

Amar kanti Secondary English School was established in 1996 AD (2052B.S.). It is located at Godawari-5, Lele, Lalitpur. It is founded with motto **"Education for All"**. Numerous ethnic groups like Newar, Chhetri, Tamang, Gurung and others major inhabitants residing in this locality. Most residents of this region work in private as well as public workplaces. Amar Kanti offers educational programs from play group to grade 10. It provides up to secondary level education with minimum fee structures and provides a scholarship scheme for deserving students. Amar Kanti believes and understands in **"Honesty and Loyalty".** Honesty and Loyalty deeply embedded in Amar Kanti heart. It encourages innovative learning through our academic and non-academic programs. Amar Kanti cultivates excellence in every student by engaging them in rigorous and relevant learning opportunities that promotes academic, physical, social and emotional growth.

There are 34 teachers, 650 students and 12 staff at Amar Kanti. Since its founding 27 years ago, the school management has been enhancing and upgrading for the benefit of quality education. The school management has been aspiring to be a centre of excellence that has developed children intellectually, physically, emotionally, socially and morally. We have imparted perfect schooling that has helped them acquire life-skills, sound character and positive attitude to excel in their lives. As a result, students graduated from here are benefitted in many ways not only in bookish knowledge but also in learning beyond the text.

Amar Kanti believes that students can only receive a high quality education if we offer them practical classes. Learners, therefore, should be taken to labs where they can learn by doing their own hands in order to retain information and gain a clear comprehension. In spite of our constant efforts in practical sessions, we are still striving to upgrade the standard of our labs with more equipment to ensure effective and memorable learning.

Existing Science Lab

Objective:

1. To help understand the concepts of science in practical way.
2. To develop cognitive abilities of children like critical thinking, problem solving, application, analysis.
3. To understand the nature of science like scientific enterprise, scientists and how they work, existence of scientific methods, interrelationships between science and technology and among the various disciplines of science.
4. To develop positive attitude towards scientific research like curiosity, interest, risk taking, objectivity, precision, confidence, perseverance, satisfaction, responsibility, consensus, collaboration, and liking science.

List of experiments

PHYSICS

SN	Name of Experiments	Equipments	Available Quantity	Required Quantity
1	Calculation of average time period of simple pendulum	-a simple pendulum bob and stand - stop watch	-	Pendulum bob and stand- 5
2	To determine upper fixed point in thermometer	-Beaker -stand -cork -delivery tube -Hypsometer -Thermometer -Burner -Tripod stand	Beaker, delivery tube, tripod stand, thermometer, stand	2 sets each
3	To demonstrate longitudinal wave	Slinky spring	-	4

4	To study reflection and refraction of light	Optical bench	-	1
5	To study electric circuit	-Battery -connecting wire -bulb -Switch	-	2 sets
6	To measure volume of irregular bodies	-Measuring cylinder		
7	To measure density of body	-Spring balance -Measuring cylinder	Meacuring cylinder-1	Measuring cylinder-3
8	To measure relative velocity	-Stop watch	-	4 sets
9.	To find velocity ratio. MA, VR of different simple machines.	-different types of pulleys -model of wheeland axel -inclined plane -wooden box -slotted weight with hanger -spring balance	Pully-1	4 sets each
10.	To show liquid pressure	-A glass vessel with different structures	-	4 sets each
11.	To measure pressure exerted by human lungs	-Manometer	-	5 sets
12.	To measure atmospheric pressure	-Barometer	-	1 set
13.	To measure human body temperature	-Clinical thermometer -digital thermometer	Clinical thermometer-1	5 sets each
14.	To measure boiling point and melting point of different substances.	-laboratory thermometer (alcohol/mercury)	Laboratory thermometer (mercury) -1	5 sets
15.	To measure the maximum and minimum temperature of different places	-maximum and minimum thermometer	-	1 set
16.	To show the image formed by curved mirror	-Optical bench -Concave/convex mirrors with stand	-	Optical bench-1 Concave and convex mirrors with stand-5 sets
17.	To show refraction of light through glass slab	-Optical board -Pins -glass slab	Glass slab-1	8 sets each
18.	To prove sound is produced by the vibration	-Tuning fork -rubber pad	1 set	5 sets each
19.	To demonstrate the propagation of sound	-Bell jar -electric bell -vaccum pump -9v, 6v battery	-	2 sets each
20.	To measure the distance of cliff depth of the pond or lake (Echolocation)	-Fathometer -hydrophone -stop watch		

21.	To study about static electricity	-Glass rod -ebonite rod		5 sets each
22.	To demonstrate conductors and insulator	-electric wire -bulb -dry cell -glass rod	-	1 set each
23.	To verify Ohm's law	-Ohm's law set -Multimeter	-	2 sets
24.	To determine A.C. frequency	- sonometer	-	1
25.	To make simple cell and study it's defects	-copper plate -zinc plate -Glass container -dil. Sulphuric acid	-	3 pcs each
26.	To demonstrate about the combination of resistors and their properties	-Bulb -battery -switch -voltmeter -ammeter -conducting wire	-	3 sets each
27.	To study about dynamo and internal resistance of cell	-Dynamo -Potentiometer -PO Rheostat	-	2 sets each
28.	To show combination of cells and their properties	-Electric wire -bulb -battery -Switch	-	3 sets each
29.	To electroplate an iron nail with copper	-copper plate -iron nail -copper sulphate solution -DC supply (6V) -beaker -connecting wire	Copper sulphate	3 sets each
30	To make an electro magnet	-DC source(6v) -solenoid wire -iron -nail -pins	-	5 sets
31.	To determine Archmides principle	-Hydrostatic balance with weight box -Ureka can -top pan balance -spring balance	-	3 sets each
32.	To demonstrate magnetic lines of force around a bar magnet and properties of magnet	-Board -bar magnet -magnetic compass -iron dust -different types of magnet (U-shaped, horse, shoe shaped, circular, cylindrical)	Bar magnet-2	Board- 5 Bar mgnet-5 Magnetic compass-5, Iron dust-1 Different types of magnet-1 set each

33.	To study electric bell	Electric bell	-	1
34.	To study about solar heater	A model of solar heater	-	1
35.	To demonstrate dispersion of light	Prisms of different size	1	5
35.	To show light is a form of energy	-Magnifying glass -concave mirror	1 each	5 sets each
36.	To prove white light consist 7 colors	-Newton's colour Disc	1	4
37.	To show types and properties of shadow formed by opaque bodies	-Torch light	-	4 set
38.	To find angle of dip and angle of declination	- A dip circle	-	1 set

Chemistry

SN	Experiments	Equipment's	Available Quantity	Required Quantity
1	To show dissolving of salt in water is a physical change	A porcelain basin, a wire gauze, a tripod stand, burner		Porcelain basin-4 Wire gauze-12
2.	To demonstrate sublimation process	Porcelain basin, burner, tripod stand, funnel, wire gauze, test tube, cotton, camphor		Camphor-5pkt Cotton-1pkt
3.	To demonstrate burning of a magnesium ribbon is a chemical change	Magnesium ribbon, burner, tongs/forceps	1set	3 sets each
4.	To show the change in color of acid, base and salt with different indicators	Blue litmus paper, red litmus paper, methylorange, phenolphthalein, PH paper, PH meter, PH scale	-	Litmus paper 3 pkt each, Methylorange-1 Phenolphthalein-1, Ph paper-4 pkt, Ph meter-1, Ph scale-3sets
5.	To study classification of elements	A chart of periodic table	-	3
6.	To show filtration process	Stand, funnel, beakers, glass rod, filter paper	Stand-2, funnel-2, beakers-3, glass rod-1, filter paper-1 pkt	5sets each
7.	Laboratory preparation of gases (Hydrogen, Oxygen, Nitrogen, Carbondioxide, Ammonia)	Glass tube, triangular file, rubber cork, cork borer, Gas jar, beehive shelf, watch glass, wash bottle, wire gauze, tripod	Galss tube-2 rubber cork-3 Gas jar-2 beehive shelf-2 watch glass-2 wire gauze-3 tripod stand-3	5sets each Chemical 1 set each

		stand, clamp and stand, test tube brush, test tube holder, spirit lamp, Bunsen burner, woulfe's bottle, conical flask, hard glass test tube, thistle funnel, glass rod, asbestos sheet, water trough, lime tower **Chemical required** Calcium chloride, Granulated zinc, sulphuric acid, Hydrochloric acid, Hydrogen peroxide, potassium chlorate, Ammonium chloride, sodium nitrite, calcium Hydroxide, sodium hyudroxide, potassium hydroxide, sodium, manganese dioxide	clamp and stand-2 test tube brush-2 test tube holder-2 spirit lamp-2 woulfe's bottle-1 conical flask-1 hard glass test tube-1 thistle funnel-2 glass rod-1	
8.	To show distillation process	Distillation set		
9.	To separate –soluble and insoluble solids -volatile and non-volatile solids -insoluble solids	Porcelain basin, tripod stand and wire guaze, funnel and filter papers, Beakers, Test tubes, Burner, Asbestos sheet, conical flask, water trough, glass retort	tripod stand-3, wire guaze-3, funnel and filter papers-3, Beakers-2, Test tubes-6, Burner-1, Conical flask-1, Water trough -3	3 sets each
10.	To compare the reactivity of different metals	Zinc power, copper fillings, aluminium powder, iron fillings	Iron fillings-	1 pkt each
11.	To study the rusting of iron	Test tubes, clean iron nails, corks, anhydrous calcium chloride, vascelin, distilled water	Test tubes-6pcs	Test tubes- 1doz, anhydrous calcium chloride-1, vascelin-1, distilled water-1
12.	To explain about chromatography	Adsorbent chromatogram	-	1 set

Biology

SN	Experiments	Equipments	Available Quantity	Required Quantity

1.	To study onion cell/blood cells, permanent slides	A compound microscope, cover slip, glass slides, glycerine/formaline, drawtube, Dissection set(brushes, dropper, needles), Blotting paper, petri dish, Permanent slides: amoeba, paramecium, animal cell, spirogyra etc, plant tissues	Cover slip-1, Permanent lides: Amoeba-1, Parameciu m-1, animal cell-1, spirogyra-1,	Cover slip-3pkt, Glass slikes-1set, Glycerine/ Formaline-1, Draw tube-4, dissection set-5sets, Blotting paper-2sets, petri dish-4, permanent slides-6sets, plant tissues; 6sets
2.	To study different vertebrates and invertebrates and classify them	Biological specimens (octopus, starfish pila, seahorse etc)	Octopus-1, Starfish-1, Seahorse-1	Each 5sets
3.	To study vegetative structure and spores of the mushroom/fern -making a spore print	A hand lens, glass slides, cover slip, compound microscope, glycireine	Microscope-2	Hand lens-5 Slides-1set Compound microscope-6
4.	To study the model of human skeletal system	Model of human skeleton and chart of human skeleton	1	2sets
5.	To study about human heart, lungs, kidney, digestive system, eye	Model of human body having all body organs	-	1 set
6.	To study solar and lunar eclipse	Globe, torch light, tennis ball	-	Each 2
7.	To study solar system, constellation, galaxy, meteor, meteorites	Chart of solar system, galaxy, constellation	-	Each 2
8.	To study weather	Hygrometer, barometer, Anemometer, Maximum and minimum thermometer	-	Each 2
9.	To show the formation of fossil	Plaster of paris, petroleum jelly spoon, plastic cups, soap case, leaf	-	Each 2 sets
10.	To study the parts of flower	A model chart of	-	2

		flower		
11.	To explain various methods of vegetative propagation in plants	Model chart of vegetative propagation in plants	-	2
12.	To study different phases of the moon	A model chart of phases of the moon	-	2

Some science equipment for Primary Level

SN	Experiments	Equipments	Available Quantity	Required Quantity
1.	To study traffic light	A model of traffic light	-	2
2.	To study about first aid box	A set of firstaid box	-	2
3.	To study clock	A clock	-	2
4.	T study types of food and nutrition	Chart of food and nutrition	-	2
5.	To study the classification of animals	Chart classifying vertebrates and invertebrates	-	2
6.	To identify soluble and insoluble substances	Beaker, stirring rods	-	2 sets each
7.	To demonstrate the formation of clouds and rainfalls	Beaker, burner, tripod stand, wire gauze	-	2 sets each
8.	To measure volume of liquids:	Measuring can, Measuring cylinder	-	2 sets each
9.	To demonstrate solar system, phases of the moon, changes in seasons	-model of solar system, Model of phases of the moon	-	2 sets each
10.	To measure the length, breadth	Measuring tape, scale and height	-	Model of water cycle

Budgeting

PHYSICS

SN	Required Equipments	Required Quantity	Estimated Price
1	-a simple pendulum bob and stand - stop watch	5 set each	8100/-
2	-Beaker -stand	2 sets each	6550/-

	-cork -delivery tube -Hypsometer -Thermometer -Burner -Tripod stand		
3	Slinky spring	4	1500/-
4	Optical bench	1	3000/-
5	-Battery -connecting wire -bulb -Switch	2 sets	3200/-
6	-Measuring cylinder		2285/-
7	-Spring balance -Measuring cylinder	3 sets each	2730/-
8	-Stop watch	4 sets	3100/-
9.	-different types of pulleys -model of wheel and axel -inclined plane -wooden box -slotted weight with hanger -spring balance	4 sets each	17400/-
10.	-A glass vessel with different structures	4 sets each	1800/-
11.	-Manometer	5 sets	22500/-
12.	-Barometer	1 set	1550/-
13.	-Clinical thermometer -digital thermometer	5 sets each	3750/-
14.	-laboratory thermometer (alcohol/mercury)	5 sets	875/-
15.	-maximum and minimum thermometer	1 set	650/-
16.	-Optical bench -Concave/convex mirrors with stand	Optical bench-1 Concave and convex mirrors with stand-5 sets	3000/- 1250/-
17.	-Optical board -Pins -glass slab	8 sets each	6000/-
18.	-Tuning fork -rubber pad	5 sets each	2250/-
19.	-Bell jar -electric bell -vaccum pump -9v, 6v battery	2 sets each	12550/-
20.	-Fathometer -hydrophone -stop watch		2275/-
21.	-Glass rod -ebonite rod	5 sets each	3000/-
22.	-electric wire	1 set each	1025/-

	-bulb -dry cell -glass rod		
23.	-Ohm's law set -Multimeter	2 sets	7500/-
24.	- sonometer	1	1250/-
25.	-copper plate -zinc plate -Glass container -dil. Sulphuric acid	3 pcs each	4125/-
26.	-Bulb -battery -switch -voltmeter -ammeter -conducting wire	3 sets each	6900/-
27.	-Dynamo -Potentiometer -PO Rheostat	2 sets each	7500/-
28.	-Electric wire -bulb -battery -Switch	3 sets each	2325/-
29.	-copper plate -iron nail -copper sulphate solution -DC supply (6V) -beaker -connecting wire	3 sets each	8925/-
30	-DC source(6v) -solenoid wire -iron -nail -pins	5 sets	5250/-
31.	-Hydrostatic balance with weight box -Ureka can -top pan balance -spring balance	3 sets each	8475/-
32.	-Board -bar magnet -magnetic compass -iron dust -different types of magnet (U-shaped, horse, shoe shaped, circular, cylindrical)	Board- 5 Bar mgnet-5 Magnetic compass-5, Iron dust-1 Different types of magnet-1 set each	4500/- 1875/- 450/- 1875/-
33.	Electric bell	1	1275/-
34.	A model of solar heater	1	4500/-
35.	Prisms of different size	5	1375/-
35.	-Magnifying glass	5 sets each	1375/-

	-concave mirror		
36.	-Newton's colour Disc	4	4700/-
37.	-Torch light	4 set	3000/-
38.	- A dip circle	1 set	750/-
	Total		**186,890/-**

Chemistry

SN	Equipment's	Required Quantity	Estimated Price
1	A porcelain basin, a wire gauze, a tripod stand, burner	Porcelain basin-4 Wire gauze-12	1800/- 3900/-
2.	Porcelain basin, burner, tripod stand, funnel, wire gauze, test tube, cotton, camphor	Camphor-5pkt Cotton-1pkt	1250/-
3.	Magnesium ribbon, burner, tongs/forceps	3 sets each	2925/-
4.	Blue litmus paper, red litmus paper, methylorange, phenolphthalein, PH paper, PH meter, PH scale	Litmus paper 3 pkt each, Methylorange-1 Phenolphthalein-1, Ph paper-4 pkt, Ph meter-1, Ph scale-3sets	375/- 2300/-
5.	A chart of periodic table	3	2500/-
6.	Stand, funnel, beakers, glass rod, filter paper	5sets each	7875/-
7.	Glass tube, triangular file, rubber cork, cork borer, Gas jar, beehive shelf, watch glass, wash bottle, wire gauze, tripod stand, clamp and stand, test tube brush, test tube holder, spirit lamp, Bunsen burner, woulfe's bottle, conical flask, hard glass test tube, thistle funnel, glass rod, asbestos sheet, water trough, lime tower **Chemical required** Calcium chloride, Granulated zinc, sulphuric acid, Hydrochloric acid, Hydrogen peroxide, potassium chlorate, Ammonium chloride, sodium nitrite, calcium Hydroxide, sodium hyudroxide, potassium hydroxide, sodium, manganese dioxide	5sets each Chemical 1 set each	 7652/- 840/-
8.	Distillation set		2575/-
9.	Porcelain basin, tripod stand and wire guaze, funnel and filter papers, Beakers, Test tubes, Burner, Asbestos sheet, conical	3 sets each	2050/-

	flask, water trough, glass retort		
10.	Zinc power, copper fillings, aluminium powder, iron fillings	1 pkt each	3570/-
11.	Test tubes, clean iron nails, corks, anhydrous calcium chloride, vascelin, distilled water	Test tubes- 1doz, anhydrous calcium chloride-1, vascelin-1, distilled water-1	1825/-
12.	Adsorbent chromatogram	1 set	1250/-
	Total		**42,687/-**

Biology

SN	Equipments	Required Quantity	Estimated Price
1.	A compound microscope, cover slip, glass slides, glycerine/formaline, draw tube, Dissection set(brushes, dropper, needles), Blotting paper, petri dish, Permanent slides: amoeba, paramecium, animal cell, spirogyra etc, plant tissues	Cover slip-3pkt, Glass slikes-1set, Glycerine/ Formaline- 1, Draw tube-4, dissection set-5sets, Blotting paper-2sets, petri dish-4, permanent slides-6sets, plant tissues; 6sets	7500/-
2.	Biological specimens (octopus, starfish pila, seahorse etc)	Each 5sets	5875/-
3.	A hand lens, glass slides, cover slip, compound microscope, glycireine	Hand lens-5 Slides-1set Compound microscope-6	3500/- 45000/-
4.	Model of human skeleton and chart of human skeleton	2sets	950/-
5.	Model of human body having all body organs	1 set	5875/-
6.	Globe, torch light, tennis ball	Each 2	3150/-
7.	Chart of solar system, galaxy, constellation	Each 2	3100/-
8.	Hygrometer, barometer, Anemometer, Maximum and minimum thermometer	Each 2	8150/-
9.	Plaster of paris, petroleum jelly spoon, plastic cups, soap case, leaf	Each 2 sets	2500/-
10.	A model chart of flower	2	2500/-
11.	Model chart of vegetative propagation in plants	2	1500/-
12.	A model chart of phases of the moon	2	1500/-
	Total		**91,100/-**

Some science equipment for Primary Level

SN	Equipments	Required Quantity	Estimated Price
1.	A model of traffic light	2	2500/-
2.	A set of first aid box	2	2500/-
3.	A clock	2	1500/-
4.	Chart of food and nutrition	2	1500/-
5.	Chart classifying vertebrates and invertebrates	2	1500/-
6.	Beaker, stirring rods	2 sets each	1500/-
7.	Beaker, burner, tripod stand, wire gauze	2 sets each	400/-
8.	Measuring can, Measuring cylinder	2 sets each	2550/-
9.	-model of solar system, Model of phases of the moon Modal of water cycle	2 sets each	4500/-
10.	Measuring tape, scale and height		750/-
11	Wooden rack(5^{11} x 6^{11})	2sets	40000/-
		Total	**59,200/-**

Total Budget

SN	Faculty	Amount	TGUP Share	School Share
1	Physics	186,890/-	186,890/-	-
2	Chemistry	42,687/-	-	42,687/-
3	Biology	91,100/-	-	91,100/-
4	Equipment for Primary Level	59,200/-	59,200/-	-
	Total		**246,090/-**	**133,787**

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

Monitoring/Evaluation

The teachers will keep a close eye on all of our activities and resources. Every teacher is required to report on their experiments and activities to their coordinators, and all of this information is then forwarded to the principal.

Committee Members:

a. Ranjita Mahat (CM) – Leader
b. Raj Kumar Silwal(Coordinator)- Member
c. Lalit Kumar Tamang(Secondary Level science teacher)-Member
d. Sabina Silwal(Lower secondary science teacher) – Member
e. Ashika Mahat (9) (LSF/E4E girl) – Member
f. Aayushma K.C. (8) (LSF/E4E girl) – Member

g. Pramita Sijapati (6) (LSF/E4E girl) – Member
h. Swospal Dangol (7) (LSF/E4E girl) – Member
i. Dinisha Sunar (5) (LSF/E4E girl) – Member