PRIVATE SECONDARY EDUCATION AUTHORITY

MONITORING OF NORMS AND STANDARDS IN A FACILITY RECKONED AS:

SCIENCE JUNIOR LABORATORY – Year 2021/2022

Subject Appellation and Level:

- **SCIENCE – Up to Grade 9 & 9+(EP) – National Curriculum Framework** ☐

Name of School : _____ Date of Verification : _____

Is the Junior Lab. a separate facility? ____ If no, where is the equipment provided? _____

Number of sections and students using the Junior Lab.:

Grade	No. of Sections	No. of Students	No. of Groups
EP 7			
EP 8			
EP 9			
EP 9+			
Reg.7			
Reg.8			
Reg.9			

Educator in Charge:_____Qualifications:_____

Specialist room Attendant:_____Qualifications:_____

IMPORTANT NOTES:

The following conditions should be fulfilled to ensure a reasonable standard:

- **The room and floor area provided should be appropriate.**
- **A minimum score of 75 % should be obtained in each of the four Sections A to D.**
- **Compulsory items in Section D, highlighted in bold characters, should be provided.**
- **Record of use of the Lab. should be kept as required.**

Minimum requirements for a class of 20 students are specified. However, in case of need provision should be made to accommodate up to 4 additional students.

(A) PHYSICAL FACILITIES -

Item	Description	Quantity required	Marks Per Unit	Marks	Existing	Score (for PSEA use only)
1. Floor Area and Room ***NOTES:** i) For existing Integrated Science Labs., the previously approved Floor Area shall be accepted and rated pro-rata. ii) For new Science Junior Labs., the required area of 60 m^2 should be provided.	**Concrete Building**	An area of 60 m^2 is required* *(Re. side-note)*	75	4500		
	CONDITIONS OF ROOM:			1500 **(Marks on conditi-ons pro-rata on area)**		
	Ceiling	Plastered Crack-free	10%			
	Walls	Plastered & painted	10%			
	Flooring	Flat & tiled /painted	10%			
	Shape	Convenient	10%			
	Set Up	Conducive	10%			
	Cleanliness	Maintained	10%			
	Proper Storage and Classification	Indexing & Accessibility	10%			
	Lighting	Adequate Natural/	10%			
	Ventilation	Assisted	10%			
	Utilities	Water/Gas/ Electricity	10%			

2. Furniture & Accessories ***NOTE:** **Worktables** should be of Laboratory type and fitted with taps, sinks, bunsen burners and power supply.	i) Work tables * *(see side note)*	15 m^2	30	450		
	ii) Stools	20	20	400		
	iii) Demonstration table (min 2.00m x 1.00 m) *(Table rated only if it has ALL of the 4 facilities listed below).*	2 m^2	110	220		
	a) Tap and sink (Tap: graded type. Sink: porcelain)	1 set	100	100		
	b) Bunsen burner with gas supply	1	100	100		
	c) Power point- attached or nearby	1	100	100		
	d) 20 cms higher than work tables	-	100	100		
***NOTE :** **Conditions** Problems identified with the conditions of **Furniture and Accessories**, if any, shall be evaluated on how far they affect teaching and learning on a scale of 1 to 10 before effecting deductions on marks for conditions. The marks may be totally forfeited in case of even a single grave problem with conditions.	iv) Chair for teacher	1	150	150		
	v) White Board size (243 x 105 cm) *(below size not rated)*	1	200	200		
	vi) Taps *(graded type)* and sinks *(of appropriate material)*	5 sets	90	450		
	vii) Power Points	2	75	150		
	viii) Wall Clock	1	100	100		
	ix) Shelves and Cupboards with drawers	Sufficient for proper storage	300	300		
	***Conditions of i) to ix)** *(see side note)*			740		
			TOTAL Section A	**9560**		

(B) INSTRUCTIONAL TOOLS & RECORDS – weightage: 30%						
3. Practicals Number of sessions	**20 practical sessions per class in the academic year spread over all three school terms.** *(Records to be kept class-wise and signed by teachers)*	20	250	5000	*Average for all sections reckoned:* ----------	

GRADE	**Extd. Prg.**				**Regular**		
	7	**8**	**9**	**9+**	**Gd. 7**	**Gd. 8**	**Gd. 9**
Class/Group A							
B							
C							
D							
E							
Total							

NOTE: To be reckoned pro-rata for the current academic year - max. 20 per class or group on 8.5 months.

4. Audio Visual Lessons (*Records to be kept class-wise and in the lab.)*	10 lessons per class over a period of 12 months (video lessons, Computer Assisted Learning)	10	200	2000	*Average for all sections reckoned:* ----------	

GRADE	**Extd. Prg.**				**Regular**		
	7	**8**	**9**	**9+**	**7**	**8**	**9**
Class/Group A							
B							
C							
D							
E							
Total							

NOTE: To be reckoned pro-rata for the current academic year - max. 20 per class or group on 8.5 months.

5. Time-Table	Time-Table of practicals (with school seal and year)	1 displayed		100		
6. Stock-Book	Up to date, signed and with school seal. New acquisitions highlighted.	1		150		

7. Teaching and Learning Aids **NOTES:** **i) Charts topics** 1. Periodic Table 2. Ecosystem -e.g pond life 3. Classification of organisms – the 5 kingdoms 4. Balanced diet 5. Carbon cycle 6. Human blood composition and function 7. Alimentary canal 8. Blood circulation 9. Food chain 10. Heart structure and Function 11. Human reproduction 12. Respiratory system 13. Vitamins 14. AIDS 15. Pollution (air, sea etc.) 16. Drugs and smoking 17. Global warming **ii) Charts size** Minimum: A_3 Contents should be readable with bold drawings and characters. **iii) Microscope Slides** 1. Human cheek cell 2. Onion root trip 3. Muscle cell 4. Bacteria 5. Amoeba 6. Yeast 7. Blood smear showing i) RBC, ii)WBC 8. Dicot leaf (T.S) 9. Dicot stem (T.S) 10. Monocot leaf (T.S) 11. Monocot stem (T.S) 12. Dicot root (T.S)	**(i) Reference Books for Theory** *(Published in the past 3 years)* **(ii) Reference Books for Practical** *(Published in the past 5 years)* **(iii) Wall-charts** *(re: list of topics & size in the first column)* **(iv) Microscope Slides** *(list of slides in the first column)* **(v) Models** 1. Set of teeth 2. Human heart 3. T.S and L.S stem (Dicot) 4. T.S and L.S leaf (Dicot) **(vi) Multimedia** a) PC/Laptop b) Internet c) LCD Projector* d) Screen* ***NOTE**:* *A connectable LED TV of 55" may replace items c) and d).*	3 Min. 3 17 13 4 1 Connected 1 1	100 100 30 30 50 200 100 240 70	300 300 510 390 200 200 100 240 70		
			TOTAL Sect. B	**9560**		

(C) SAFETY ITEMS						
Item	**Description**	**Quantity**	**Weightage Per Unit**	**Marks**	**Existing**	**Score (for PSEA use only)**
1. First Aid Kit	Equipped to treat cuts, burns and eye problems	1	350	350		
2. Fire Extinguisher	Capacity: 2 L or 2Kg (serviced on time)	1	400	400		
3. Fire Blanket	0.9m x 0.9 m	1	350	350		
4. Emergency Exit (clearly indicated)	Additional door for quick exit in case of emergency	1	400	400		
5.Safety Charts (permanently affixed at appropriate places)	Clear instructions about safety precautions	5	80	400		
6. i) Main Switch /Circuit Breaker ii) ELCB/RCD	Separate for the Science Lab. and located at an accessible place inside the Lab.	1 1	350 400	350 400		
7. Gas conductors	Rubber tubing connected to Bunsen Burners should be replaced before expiry date stated thereon	6	60	360		
8. Storage of chemicals	Safe storage, organisation and accessibility of chemicals, especially hazardous ones	Safe Storage conditions Accessibility	100 76	176		
			TOTAL Sect. C	**3186**		

(D) EQUIPMENT & CONSUMABLES

	Chemicals	Quantity Required	Marks per 100 g/cm^3 /unit	Marks	Existing	Score (for PSEA use only)
1.	Ammonium Chloride	400 g	5	20		
2.	Ammonia Solution	500 cm^3	8	40		
3.	Ammonium Sulfate	400 g	5	20		
4.	Benedict ‘s Reagent	200 cm^3	20	40		
5.	Calcium Granules	400 g	10	40		
6.	Calcium Oxide	400 g	10	40		
7.	Calcium Carbonate	400 g	10	40		
8.	Calcium Chloride anhy.	400 g	5	20		
9.	Calcium Hydroxide	400 g	15	60		
10.	Charcoal Powder	400 g	5	20		
11.	Copper Carbonate	400 g	10	40		
			Sub-Total 1 (1 to 11)	**380**		

Contd. on the next page

12.	Copper Oxide	400 g	10	40		
13.	Copper Sulfate	400 g	15	60		
14.	Copper Sulfate (anhydrous)	400g	15	60		
15.	Eosine	25 g	160	40		
16.	Ethanol	500 cm^3	12	60		
17.	Ethanoic Acid	500 cm^3	8	40		
18.	Glucose (Analar)	500 g	12	60		
19.	Hydrochloric Acid	1 dm^3	6	60		
20.	Hydrogen Peroxide	1 dm^3	4	40		
21.	Iodine	50g	120	60		
22.	Iron Filings	400 g	15	60		
23.	Iron Oxide	400 g	10	40		
24.	Iron (II)Sulphate	500g	4	20		
25.	Lime Water	500 cm^3	12	60		
26.	Magnesium Ribbon	25 g	240	60		
27.	Magnesium Oxide	200g	20	40		
28.	Magnesium Carbonate	400 g	10	40		
29.	Manganese (IV)Oxide	400 g	10	40		
30.	Nitric Acid	1 dm^3	4	40		
31.	Potassium Dichromate	100 g	40	40		
32.	Potassium Hydroxide	400 g	10	40		
33.	Potassium Nitrate	400 g	10	40		
34.	Potassium Permanganate	400 g	15	60		
35.	Sodium Carbonate	400 g	10	40		
36.	Sodium Chloride (Not table salt)	400 g	15	60		
37.	Sodium Hydrogen Carbonate	400g	15	60		
			Sub Total 2 (12 to 37)	**1260**		

	Chemicals	Quantity Required	Marks per 100 g/cm3/unit	Marks	Existing	Score (for PSEA use only)
38.	Sodium Hydroxide	400 g	10	40		
39.	Sodium Sulfate	400 g	5	20		
40.	Starch Soluble	200 g	20	40		
41.	Sulfur Powder	200 g	20	40		
42.	Sulfuric Acid	1 dm^3	6	60		
43.	Tin	200 g	10	20		
44.	Zinc Granules	400 g	15	60		
45.	Zinc Carbonate	400 g	5	20		
46.	Zinc Sulfate	400 g	5	20		

	Indicators					
47.	Litmus / Paper blue	2 pks of 10	3/unit	60		
48.	Litmus / Paper red	2 pks of 10	3/unit	60		
49.	Methyl Orange	25 g	240	60		
50.	Phenolphthalein	25 g	240	60		
51.	Cobalt chloride paper	1 pk of 10	6/unit	60		
52.	Universal pH paper indicator	1 pk of 10	4/unit	40		
			Sub Total 3 38 to 52	**660**		

	Equipment	Quantity Required	Marks per Unit	Marks item-wise	Existing	Score (for PSEA use only)
1.	**Ammeter (O-2A, O-5A)**	**2**	**30**	**60**		
2.	**Aquarium* + Pump** **(* see note below)**	**1**	**60**	**60**		
3.	Ball and Ring	1	40	40		
4.	Ball (small e.g. ping pong)	2	30	60		
5.	Balloon (rubber)	10	4	40		
6.	Bar Magnet	2 pairs	30	60		
7.	Basin Evaporating	2	30	60		
8.	Bench Lamp	5	8	40		
9.	Beaker – 100 cm3	5	12	60		
10.	Beaker - 250 cm3	5	12	60		
11.	Beaker - 500 cm3	5	12	60		
12.	Beaker - 1000 cm3	2	30	60		
13.	Beehive Shelf	1	40	40		
14.	Bell Jar	1	40	40		
15.	Bimetallic Strip	1	40	40		
16.	Boiling tube	5	12	60		
17.	Blu- tack	2 packs	30	60		
18.	Boiling chips/porcelain pieces	1 pk	60	60		
19.	Bulb Holder (diff.size)	5	12	60		
20.	**Bunsen Burner (with gas supply)****	**5**	**12**	**60**		
21.	Burette 50 cm3	2	30	60		
22.	Candle	5	8	40		
23.	Cellotape	1 reel	40	40		
24.	Cell holder	5	12	60		
25.	Chromatography Paper	1 Reel	40	40		
			Sub-Total 4	**1320**		

NOTES:

* An AQUARIUM to be rated must be fully functional with air pump, weeds, aquatic organisms. An empty aquarium or with water only will not be rated.

****** Bunsen burner will not be rated if gas conductor(s) do not bear clearly the expiry date or expired.

	Equipment	Quantity Required	Marks per 100 g/cm3/unit	Marks Item-wise	Existing	Score for PSEA use only
26.	Conduction app. 4 rods/6 rods	1	60	60		
27.	Condenser	1	60	60		
28.	Copper foil	2 sheets	30	60		
29.	Copper turnings	400 g	15	60		
30.	Copper wire – insulated (2 colours)	5 m each (10 m total)	6/m	60		
31.	Cotton	1 pk	60	60		
32.	Cover slip	1 box of 200	60	60		
33.	Crucible + lid	5	12	60		
34.	Cylinder ,measuring 500 cm3	5	12	60		
35.	Cylinder,measuring 100 cm3	5	12	60		
36.	Delivery tube	5	12	60		
37.	Deflagrating Spoon	1	40	40		
38.	**Digital Balance**	**1**	**60**	**60**		
39.	Displacement vessel	1	60	60		
40.	Drawing board	5	4	20		
41.	Dropper with teat	5	12	60		
42.	Dry cells (1.5 v)	10	6	60		
43.	Elastic bands	1pk of 40	1/unit	40		
44.	Electric bulbs (different capacities)	5	12	60		
45.	Filter paper	1pk of 100	0.6/unit	60		
46.	Flask conical 250 cm3	5	12	60		
47.	Flask conical 500 cm3	2	30	60		
48.	Flask distillation 500 cm3	2	20	40		
49.	Flask flat bottom 250 cm3	5	12	60		
50.	Forceps	2	30	60		
51.	Funnel	5	12	60		
52.	Funnel thistle	5	8	40		
53.	Fuse wire (different ratings)	1 pk	60	60		
			Sub-Total 5	**1560**		

	Equipment	Quantity Required	Marks per Unit	Marks Item-wise	Existing	Score for PSEA use only
54.	Fuse holder porcelain	2	30	60		
55.	G – clamp	2	30	60		
56.	Gas jar with cover	5	12	60		
57.	Glass block – rectangular	5	8	40		
58.	Glass rods	5	12	60		
59.	Glass slides (microscope)	60	1	60		
60.	Glass tubing	1 m	60	60		
61.	Hand lens – magnifying glass	5	12	60		
62.	Ink (black)	I pot	40	40		
63.	Iron nails (small)	Adequate quantity	40	40		
64.	Lamina – regular	5	8	40		
65.	Lamina – irregular	5	8	40		
66.	Lens holder (metal)	5	12	60		
67.	Linear expansion app – demonstration	1	40	40		
68.	**Microscope (monocular)**	**2**	**30**	**60**		
69.	Metal tray	1	40	40		
70.	Metal foil (Al, Cu, etc.)	4	15	60		
71.	Molecular model	1	20	20		
72.	Mirror holder	5	8	40		
73.	Metre rule	5	12	60		
74.	**Ohmmeter**	**5**	**8**	**40**		
75.	Pendulum bob	5	8	40		
76.	Petri Dish	5	12	60		
77.	Pins	1 box	40	40		
78.	Pivot	5	8	40		
79.	Pipette – bulb 25 cm3	5	12	60		
80.	Plain mirror	5	12	60		
81.	Plastic pail	1	40	40		
82.	Plasticine	2 pks	20	40		
83.	Plotting compasses	10	2	20		
84.	Potted plants	5 asstd.	8	40		
85.	Power Supply(12V dc supply,2Vsteps)	1	40 **Sub-total 6**	40 **1520**		

	Equipment	Quantity Required	Marks per Unit	Marks Item-wise	Existing	Score for PSEA use only
86.	Protractor	5	8	40		
87.	Prism – 60^0 equilateral	2	20	40		
88.	Prism – 45 –90 –45	2	20	40		
89.	Pressure increases with depth (jar)	1	40	40		
90.	Quadrat (1mx1m)	1	40	40		
91.	**Rheostat -wire type,11ohms**	**1**	**40**	**40**		
92.	Resistance unit 10 ohms	2	20	40		
93.	Rubber bung	10	6	60		
94.	Rubber tubing	5 m	12/m	60		
95.	Ruler (plastic) – 30 cm	10	6	60		
96.	Scissors (small)	5	12	60		
97.	Scalpel/sharp knife	2	30	60		
98.	Solids – regular shapes	10	4	40		
99.	Spatula	10	6	60		
100.	Splint	20	3	60		
101.	Spoon – plastic (small)	10	6	60		
102.	Springs – different sizes	5	12	60		
103.	Spring balance – 250 g	2	30	60		
104.	Stand + clamp + boss head	5	12	60		
105.	Steel wool	200 g	20	40		
106.	Stop watch	10	6	60		
107.	Steam generator/ Kettle	1	40	40		
108.	Switch (plug type –one way)	5	8	40		
109.	Tape (measuring)	1	60	60		
110.	Test tube – borosilicate 24 x 150 mm	50	1.2	60		
111.	Test tube racks	10	6	60		
112.	Test tube holder	10	6	60		
113.	Thermometer (-10 to 110 ^oC x 0.5 ^oC)	5	12	60		
114.	Thermometer- alcohol	1	40	40		
115.	Thermometer- digital	1	40	40		
			Sub-Total 7	**1540**		

	Equipment	Quantity Required	Marks per Unit	Marks Item-wise	Existing	Score for PSEA use only
116.	Thermometer - clinical	1	40	40		
117.	Three-pin-plug	2	20	40		
118.	Tile – white	5	12	60		
119.	Tongs	2	30	60		
120.	Torch (local)	1	60	60		
121.	Torch bulb	5	12	60		
122.	Triangle pipe clay	5	8	40		
123.	Tripod (local)	5	12	60		
124.	Trough (glass or metal)	2	20	40		
125.	Trowel (local)	2	10	20		
126.	**Vernier calipers**	**2**	**20**	**40**		
127.	**Voltmeter (O – 2 V and O – 5 V)**	**1 each**	**20**	**40**		
128.	Visking tubing 14mm	1 reel	40	40		
129.	Watch glass	5	12	60		
130.	Wire – resistance (nichrome, manganin, constantan) 1 reel each	3 reels	20	60		
131.	Wire gauze – Ceramic Centre	5	12	60		
132.	Y – tube	2	20	40		
			Sub-Total 8	**820**		
			TOTAL Section D (excluding conditions)	**9060**		

CRITERIA FOR MARKING CONDITIONS & QUALITY OF EQUIPMENT AND CONSUMABLES

	CRITERIA	MAX. MARKS	Rating on a Scale 1 - 10	SCORE
1.	Conditions and quality of equipment and consumables	400		
2.	All electrical equipment provided with good electrical cords & fittings	100		
	TOTAL	**500**		

MARK SCHEME AND SCORE

SECTION	WEIGHTAGE	TOTAL MARKS	MARKS SCORED	% SCORE Section-wise
A. Physical Facilities	30%	**9 560**		
B. Records and Instructional Tools	30%	**9 560**		
C. Safety	10%	**3 186**		
D. Equipment and Consumables	30%	**9 060 + 500** (conditions) = **9 560**		
OVERALL	100%	**31 866**		

REMARKS AND SHORTCOMINGS

(With particular reference to conditions at page 1 and score obtained)

Signature of PSEA Supervisor / Senior Supervisor (s)

Signature of Manager

Date:----------

Date:----------

Norms and Standards developed by the Supervision Section (2018)
NAB/PP - updated June 2021