Republic of the Philippines
Department of Education
Bureau of Learning Resources

Inspection and Test Protocol

Project Title: **Mass Production, Supply, Delivery, Installation, Training and Maintenance of Science and Mathematics Equipment Packages to Public Elementary, Junior and Senior High Schools FY2026**

A. General Inspection Protocol. This general protocol shall serve as guide in the conduct of the Evaluation
a.) verify/evaluate the parameters of the goods or product as indicated in the specifications e.g. material, dimensions,
b.) check the goods for any evidence of defects visually as follows:
 i) rust formation
 ii) cracked/broken parts
 iii) warps/dents
 iv) loose parts
 v) discoloration
c.) look into the completeness of parts/accessories;
d.) all goods powered by dry cell (AA, AAA, etc.) shall be included with corresponding batteries ready for use;
e.) the bidder shall unbox, set up (if applicable), and manipulate the goods to be evaluated and shall perform corresponding performance and/or functionality tests.
f.) Markings and Labels shall be in English, with correct spelling, permanent.
g.) For models with key card, verify and identify the structures if correct.
h.) The bidder/supplier shall provide the materials and consumables.

Detailed Test and Inspection Protocol

Item	Description	Inspection and Test Procedure
MASS PRODUCTION		
LOT 1: BLR-DEVELOPED SCIENCE AND MATHEMATICS EQUIPMENT		
1	**BLR-developed Basic Scikit: Ø 9.5mm x 250mm long Stand Rod**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the diameter and length of the rod.
		(d) Do material evaluation.
		(e) Check the straightness of the rod taking into consideration the maximum allowable linear deflection as specified in the technical specifications.
		(f) Inspect the surface finish.
		(g) Check the radius of the rounded ends of the rod.
		(h) Do functionality test to validate the level of performance and accuracy of the rod especially when used as component of the Stand Setup.
2	**BLR-developed Basic Scikit: Ø 9.5mm x 500mm long Stand Rod**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the diameter and length of the rod.
		(d) Do material evaluation.
		(e) Check the straightness of the rod taking into consideration the maximum allowable linear deflection as specified in the technical specifications.
		(f) Inspect the surface finish.
		(g) Check the radius of the rounded ends of the rod.
		(h) Do functionality test to validate the level of performance and accuracy of the rod especially when used as component of the Stand Setup.

Item	Description	Inspection and Test Procedure
3	**BLR-developed Basic Scikit: Ø 12.7mm x 1000mm long Stand Rod**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the diameter and length of the rod.
		(d) Do material evaluation.
		(e) Check the straightness of the rod taking into consideration the maximum allowable linear deflection as specified in the technical specifications.
		(f) Inspect the surface finish.
		(g) Check the radius of the rounded ends of the rod.
		(h) Do functionality test to validate the level of performance and accuracy of the rod especially when used as component of the Stand Setup.
4	**BLR-developed Basic Scikit: Rail**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure the diameters and length of the rail.
		(c) Do material evaluation.
		(d) Check the straightness of the rail.
		(e) Inspect the surface finish.
		(f) Check the radius of the rounded ends of the rail.
		(g) Do functionality test to validate the level of performance and accuracy of the rail especially when used as component in the Cart-Rail System.
5	**BLR-developed Basic Scikit: Ring with stem**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the length, rod diameter, and ring diameter of the item.
		(d) Do material evaluation.
		(e) Inspect the surface finish.
		(f) Do functionality test to validate the level of performance of the item especially when used as component of the Stand Setup.
6	**BLR-developed Basic Scikit: Test Tube Rack**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do material evaluation of the non-plastic parts.
		On the Individual Parts:
		(c) Do dimensional inspection of the individual parts. Measure lengths, widths, depths, diameters, holes, distances between holes, threads, etc.
		(d) Inspect the surface finish of individual parts. Material colors specified in the technical specifications must be followed.
		(e) There must be no breakage, chipped edges, sharp edges, cracks, scratches, warping, and other deficiencies/defects on the individual parts.
		On the Assembly:
		(f) Check the horizontality and verticality of the test tube rack when this is laid flat on a horizontally-level table surface.
		(g) Do functionality test to validate the level of performance of the Test Tube Rack.
7	**BLR-developed Basic Scikit: Wire Gauze**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure the length, width, wire diameter, and mesh per inch of the item.

Item	Description	Inspection and Test Procedure
		(c) Do material evaluation.
		(d) Inspect the jackets and their thickness.
		(e) See to it that the jackets are properly welded on the four (4) corners of the item.
		(f) Do functionality test to validate the level of performance of the item especially when used as component of the Stand Setup.
8	**BLR-developed SCIKIT BASIC 001: Stand Base**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) To determine the conformity of the plastic materials to the technical specifications, the material should be tested by DOST material testing facilities or at any DOST-accredited testing institution. Test certificate should be issued by the testing unit, the original copy should be submitted to BLR-Cebu to validate the specified material. A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to testing facility. All expenses for the said test shall be shouldered by the Supplier. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do material evaluation on non-plastic parts.
		(d) Do dimensional inspection. Measure the height, width, length, depth, hole diameters, distances between holes, and thickness. Check the parallelism and perpendicularity of the holes with respect to each other. Check the horizontality of the front holes as well as the verticality of the top hole when the item is laid flat on a horizontally-level table surface. Also, check the distance from the said table surface to the center/s of the front hole/s.
		(e) Inspect the embossed markings.
		(f) Inspect the surface finish. The color should conform to what is specified in the technical specifications. There must be no warping of material.
		(g) Inspect the setscrews and their threads as well as the threads of the inserts.
		(h) Inspect the rubber soles.
		(i) Do functionality test to validate the level of performance and accuracy of the item especially when used as component of the Stand Setup and/or as component of the Cart-Rail System. The Stand Setup assembly (stand base, stand supports, and stand rods) should be stable and level when laid on a flat surface.
9	**BLR-developed SCIKIT BASIC 001: Stand Support**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) To determine the conformity of the plastic materials to the technical specifications, the material should be tested by DOST material testing facilities or at any DOST-accredited testing institution. Test certificate should be issued by the testing unit, the original copy should be submitted to BLR-Cebu to validate the specified material. A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to testing facility. All expenses for the said test shall be shouldered by the Supplier. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do material evaluation on the non-plastic parts.
		(d) Do dimensional inspection. Measure the height, width, length, depth, hole diameter, and thickness. Check the horizontality of the hole when the item is laid flat on a horizontally-level table surface. And check the distance from the said table surface to the center of the hole.
		(e) Also, check the centricity of the hole with respect to the sides of the item.
		(f) Inspect the embossed markings.

Item	Description	Inspection and Test Procedure
		(g) Inspect the surface finish. The color should conform to what is specified in the technical specifications. There must be no warping of material.
		(h) Inspect the rubber sole.
		(i) Do functionality test to validate the level of performance and accuracy of the item especially when used as component of the Stand Setup. The Stand Setup assembly (stand base, stand supports, and stand rods) should be stable and level when laid on a flat surface.
10	**BLR-developed SCIKIT BASIC 001: SCIKIT BASIC Storage Case 001 (With Cover and Base Sheathing)**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, thicknesses, diameters, radii, depths, draft angles, etc.
		(c) Check the surface finish. The color of the material should conform to what is specified in the technical specifications. Note: There must be no warping and/or twisting of material.
		(d) Check the perpendicularity and parallelism of the sides/walls with respect to each other.
		(e) Check the printed markings.
		(f) Using a spirit level, check the horizontality of the case when this is laid flat on a horizontally-level table surface.
		(g) Check the cover. There must be no warping and/or twisting of the cover.
		(h) Check the base sheathing and its fixation on the case.
		(i) Do functionality test to validate the storage case's level of performance and accuracy by loading the specific science equipment intended for it to store.
11	**BLR-developed SCIKIT BASIC 002: Multiclamp**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) To determine the conformity of the Aluminum-Silicon-Copper Alloy material to the technical specifications, the material should be tested by DOST material testing facilities or at any DOST-accredited testing institution. Test certificate should be issued by the testing unit, the original copy should be submitted to BLR-Cebu to validate the specified material. A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to testing facility. All expenses for the said test shall be shouldered by the Supplier. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do material evaluation on the non-zinc alloy parts.
		(d) Do dimensional inspection. Measure the height, width, length, depth, hole diameters, and thickness. Check the parallelism and perpendicularity of the sides with respect to each other.
		(e) Inspect the embossed markings.
		(f) Check the holes and their threads as well as their alignment to the V-cuts situated opposite them. Also, check the perpendicularity of the said holes with respect to the surfaces on which they were drilled.
		(g) Inspect the surface finish.
		(h) Inspect the setscrews and their threads.
		(i) Do functionality test to validate the level of performance and accuracy of the item especially when used as component of the Stand Setup. (Note: Special attention shall be given to the perpendicularity and parallelism of the assembled parts of the Stand Setup.)
12	**BLR-developed SCIKIT BASIC 002: Test Tube Holder**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, cracks, scratches, and other deficiencies/defects on the item.

Item	Description	Inspection and Test Procedure
		(c) Do dimensional inspection. Measure the length, width, and wire diameter.
		(d) Do material evaluation.
		(e) Inspect the surface finish.
		(f) Do functionality test to validate the level of performance of the item. Test the item by picking up and holding a Ø16mm test tube full of sand. Check the grip if it is evenly applied on the surface of the test tube. Check and see if the test tube would not slide down when held in an upright position.
13	**BLR-developed SCIKIT BASIC 002: SCIKIT BASIC Storage Case 002 (With Cover and Base Sheathing)**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, thicknesses, diameters, radii, depths, draft angles, etc.
		(c) Check the surface finish. The color of the material should conform to what is specified in the technical specifications. Note: There must be no warping and/or twisting of material.
		(d) Check the perpendicularity and parallelism of the sides/walls with respect to each other.
		(e) Check the printed markings.
		(f) Using a spirit level, check the horizontality of the case when this is laid flat on a horizontally-level table surface.
		(g) Check the cover. There must be no warping and/or twisting of the cover.
		(h) Check the base sheathing and its fixation on the case.
		(i) Do functionality test to validate the storage case's level of performance and accuracy by loading the specific science equipment intended for it to store.
14	**BLR-developed SCIKIT BASIC 003: Universal Clamp**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) To determine the conformity of the Aluminum-Silicon-Copper Alloy material to the technical specifications, the material should be tested by DOST material testing facilities or at any DOST-accredited testing institution. Test certificate should be issued by the testing unit, the original copy should be submitted to BLR-Cebu to validate the specified material. A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to testing facility. All expenses for the said test shall be shouldered by the Supplier. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do material evaluation on the non-zinc alloy parts.
		(d) Do dimensional inspection. Measure the height, width, length, depth, diameters, and thickness.
		(e) Do dimensional inspection on Arm A, Arm B, the handle, and the adjusting screw.
		(f) Inspect the embossed markings.
		(g) Inspect the surface finish.
		(h) Inspect the cork linings.
		(i) See if the item has a clamp opening of Ø 6mm minimum and Ø 92 mm maximum as specified in the technical specifications.
		(j) Do functionality test to validate the level of performance and accuracy of the item especially when used as component of the Stand Setup.
15	**BLR-developed SCIKIT BASIC 003: Universal Bosshead**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.

Item	Description	Inspection and Test Procedure
		(b) To determine the conformity of the Aluminum-Silicon-Copper Alloy material to the technical specifications, the material should be tested by DOST material testing facilities or at any DOST-accredited testing institution. Test certificate should be issued by the testing unit, the original copy should be submitted to BLR-Cebu to validate the specified material. A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to testing facility. All expenses for the said test shall be shouldered by the Supplier. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do material evaluation on the non-zinc alloy parts.
		(d) Do dimensional inspection. Measure the height, width, length, depth, hole diameters, and thickness. Check the concentricity of the Ø 13.5mm hole from one end to the other end of the item.
		(e) Inspect the embossed markings.
		(f) Check the threaded holes and their alignment to the semi-circular cuts situated opposite them.
		(g) Inspect the surface finish.
		(h) Inspect the setscrews and their threads.
		(i) Do functionality test to validate the level of performance and accuracy of the item especially when used as component of the Stand Setup. (Note: Special attention shall be given to the perpendicularity and parallelism of the assembled parts of the Stand Setup.)
16	**BLR-developed SCIKIT BASIC 003: SCIKIT BASIC Storage Case 003 (With Cover and Base Sheathing)**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, thicknesses, diameters, radii, depths, draft angles, etc.
		(c) Check the surface finish. The color of the material should conform to what is specified in the technical specifications. Note: There must be no warping and/or twisting of material.
		(d) Check the perpendicularity and parallelism of the sides/walls with respect to each other.
		(e) Check the printed markings.
		(f) Using a spirit level, check the horizontality of the case when this is laid flat on a horizontally-level table surface.
		(g) Check the cover. There must be no warping and/or twisting of the cover.
		(h) Check the base sheathing and its fixation on the case.
		(i) Do functionality test to validate the storage case's level of performance and accuracy by loading the specific science equipment intended for it to store.
17	**BLR-developed Free Fall Apparatus (Mechanics 001): Ball Case (with Cover and foam)**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection of the Case and its Cover. Measure lengths, widths, thicknesses, diameters, radii, depths, draft angles, etc.
		(c) Check the surface finish. The color of the material should conform to what is specified in the technical specifications. There must be no warping of material.
		(d) Check the DepED-BLR embossed markers (on the Case and Cover).
		(e) Check the cushion (soft foam). Measure length, width, and thickness.
		(f) Do functionality test to validate its level of performance and accuracy by loading the spherical balls intended for it to store.
18	**BLR-developed Free Fall Apparatus (Mechanics 001): Digital Timer Assembly (Digital Stopwatch)**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection of the electronic digital stopwatch and the female electronic jack (RCA jack).

Item	Description	Inspection and Test Procedure
		(c) There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies on the assembly.
		(d) Open the back cover of the stopwatch and using the Schematic Wiring Diagram as reference, inspect how the wiring (inside the stopwatch) is done. Check, also, the type (or kind) of wire used.
		(e) Do functionality test to validate the level of performance and accuracy of the Digital Timer Assembly by using it as component of the Free-Fall Apparatus in conducting experiment on free fall.
19	**BLR-developed Free Fall Apparatus (Mechanics 001): Metertape with hooks and plastic pointer**	**METERTAPE**
		(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, chipped edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the lengths, widths, thicknesses, diameters, radii, etc.
		(d) Inspect the meter tape (or measuring tape). Check the printed numerals, graduations, and printed letters. Inspect the plastic case. (Note: The meter tape should be able to measure in Metric and English units.) Check the accuracy of measurements. Check the maximum measuring capacity of the meter tape.
		(e) Inspect Hook A and Hook B and their fixations on the meter tape.
		(f) Inspect the surface finish.
		(g) Do functionality test to validate the level of performance and accuracy of the Meter Tape with hooks Assembly especially when used as component of the Free-Fall Apparatus in conducting experiment on free fall.
		POINTER
		(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure the length, width, height, thicknesses, radii, angles, etc.
		(c) Inspect the surface finish. The color of the material should conform to what is specified in the technical specifications.
		(d) Do functionality test to validate the level of performance and accuracy of the Pointer especially when used as component of the Free-Fall Apparatus in conducting experiment on free fall.
20	**BLR-developed Free Fall Apparatus (Mechanics 001): Ǿ 12.7mm Steel Spherical Ball**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no cracks, scratches, dents, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the diameter of the chrome-plated steel ball.
		(d) Check the weight. The weight should conform to what is specified in the technical specifications.
		(e) Inspect the surface finish.
		(f) Test the level of performance by using it as component of the Free-Fall Apparatus in conducting experiment on free fall.
21	**BLR-developed Free Fall Apparatus (Mechanics 001): Ǿ 25mm Plastic Spherical Ball with metal screw**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no cracks, scratches, dents, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the diameter of the plastic ball as well as the diameter of the hole intended for the steel screw.
		(d) Inspect the steel screw. It must be new and rust-free.
		(e) Inspect the surface finish. The color of the plastic ball should conform to what is specified in the technical specifications.

Item	Description	Inspection and Test Procedure
		(f) Check the weight (of the plastic ball with screw). The weight should conform to what is specified in the technical specifications.
		(g) Test the level of performance by using it as component of the Free-Fall Apparatus in conducting experiment on free fall.
22	**BLR-developed Free Fall Apparatus (Mechanics 001): Ǿ 25mm Steel Spherical Ball**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no cracks, scratches, dents, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the diameter of the chrome-plated steel ball.
		(d) Check the weight. The weight should conform to what is specified in the technical specifications.
		(e) Inspect the surface finish.
		(f) Test the level of performance by using it as component of the Free-Fall Apparatus in conducting experiment on free fall.
23	**BLR-developed Free Fall Apparatus (Mechanics 001): Pad Switch Assembly**	a. In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		b. To determine the conformity of the plastic material to the technical specifications, a certificate from DOST, which would attest to the said conformity, is required for the Supplier to submit. (Note: A representative of the Procuring Entity should be present during preparation and submission of the material test specimen to DOST. All expenses for the said test shall be shouldered by the Supplier.)
		On the Individual Parts:
		(a) Do dimensional inspection of the individual parts. Measure lengths, widths, depths, diameters, holes, distances between holes, threads, etc.
		(b) Inspect the surface finish of the individual parts.
		(c) There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies on the individual parts.
		(d) Inspect the Handle Shaft and the Spindle. Check the holes, their diameters, locations, and concentricity. Check the threaded holes. Check the perpendicularity and/or parallelism of the holes with respect to each other and with respect to the shaft/spindle.
		(e) Inspect the Landing Pad. Check the width, length, and thickness. Check the rivet holes, their diameters, and locations. Check the concentricity and alignment of the holes intended for the spindle. Check the punched “DepED-BLR” marker. Check the horizontality/flatness of the pad.
		On the Assembly:
		a. Inspect the fixations of the individual parts of the assembly.
		b. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies on the assembly.
		c. Check the perpendicularity of the spindle with respect to the handle shaft.
		d. Check the magnet and its capacity to hold the landing pad in place.
		e. Do functionality test to validate the level of performance and accuracy of the Pad Switch Assembly by using it as component of the Free-Fall Apparatus in conducting experiment on free fall.
24	**BLR-developed Free Fall Apparatus (Mechanics 001): Solenoid Assembly**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		On the Individual Parts:
		(b) Do dimensional inspection of the individual parts. Measure lengths, widths, depths, diameters, holes, distances between holes, threads, etc.
		(c) Inspect the surface finish of individual parts. Material color/s specified in the technical specifications must be followed.

Item	Description	Inspection and Test Procedure
		(d) Inspect the outer frame. Check the perpendicularity and parallelism of the walls with respect to each other. Check the holes intended for the rivets, their diameters, the distances between them, and their conformance to the technical specifications/approved sample. Check the punched “DepED-BLR” marker.
		(e) Inspect the inner frame. Check the hole intended for the Core Shaft, its diameter, and its concentricity. Check the perpendicularity of the said hole with respect to the end faces. Check the holes intended for the rivets, their diameters, the distances between them, and their conformance to the technical specifications/approved sample.
		(f) There must be no breakage, chipped edges, sharp edges, cracks, scratches, warping, and other deficiencies/defects on the individual parts.
		On the Assembly:
		(g) Inspect the windings of the Solenoid. It should be # 22 AWG Magnet Wire (600 +/- 5 windings) with wax paper cover. Check the magnetic holding capacity of the Solenoid. Note: The Solenoid must have a magnetic holding capacity of 250 grams (minimum) using a zinc-plated mass as test specimen. During the test, make sure that the battery or dry cell in the Synchro Box is new.
		(h) There must be no breakage, chipped edges, sharp edges, cracks, scratches, warping, and other deficiencies/defects on the assembly.
		(i) Check the perpendicularity of the outer frame with respect to the extension rod.
		(j) Inspect the binding posts and their fixations on the outer frame.
		(k) Check the wires that connect the binding posts to the Solenoid. Check the continuity of the said wires.
		(l) Inspect the fixation of the individual parts of the assembly.
		(m) Do functionality test to validate the level of performance and accuracy of the Solenoid Assembly by using it as component of the Free-Fall Apparatus in conducting experiment on free fall.
25	**BLR-developed Free Fall Apparatus (Mechanics 001): Synchro Box Assembly**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		On the Individual Parts:
		(b) Do dimensional inspection of the individual parts. Measure lengths, widths, depths, diameters, holes, distances between holes, threads, etc.
		(c) Inspect the surface finish of individual parts. Material color/s specified in the technical specifications must be followed.
		(d) There must be no breakage, chipped edges, sharp edges, cracks, scratches, warping, and other deficiencies/defects on the individual parts.
		(e) Inspect the (Main) Body. Check for perpendicularity, parallelism, and contours of the walls. Check the embossed dry cell outline marker as well as the embossed positive (+) and negative (-) sign markers. Inspect the counterbore holes, their diameters, and locations. Check the threaded holes. Check the 0.5mm-deep holes/cuts intended for the rubber soles. Check the provision for a snap-on locking system.
		(f) Inspect Cover A. Check for perpendicularity, parallelism, and contours of the walls. Check the embossed “DepED-BLR”, “Stopwatch”, Pad Switch”, and “Solenoid” markers. Inspect the counterbore hole intended for the push button switch. Check the threaded holes.
		(g) Inspect Cover B. Check for perpendicularity, parallelism, and contours of the walls. Check the embossed “DepED-BLR” marker. Check the provision for a snap-on locking system.
		(h) Inspect the battery/dry cell holders, both positive (+) and negative (-).
		(i) Inspect the rubber soles, wire holders, terminal strip, transistor (semiconductor), resistor, push button switch, and hook-up wire.

Item	Description	Inspection and Test Procedure
		(j) Inspect the stopwatch connector (with RCA plug), pad switch connector (with Y-terminal lugs), and solenoid connector (with needle probe terminal rods).
		On the Assembly:
		(k) With the use of the Circuit Schematic Diagram as reference, inspect the electronic circuit of the assembly.
		(l) Inspect the fixations and/or connections of the individual parts of the assembly.
		(m) There must be no breakage, chipped edges, sharp edges, cracks, scratches, warping, and other deficiencies/defects on the assembly.
		(n) Inspect the continuity of the wire connectors.
		(o) Inspect/test the snap-on locking system (for the body and Cover B)
		(p) Do functionality test to validate the level of performance and accuracy of the Synchro Box Assembly by using it as component of the Free-Fall Apparatus in conducting experiment on free fall.
26	**BLR-developed Free Fall Apparatus (Mechanics 001): SCIKIT MECHANICS Storage Case 001 (With Cover and Base Sheathing)**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, thicknesses, diameters, radii, depths, draft angles, etc.
		(c) Check the surface finish. The color of the material should conform to what is specified in the technical specifications. Note: There must be no warping and/or twisting of material.
		(d) Check the perpendicularity and parallelism of the sides/walls with respect to each other.
		(e) Check the printed markings.
		(f) Using a spirit level, check the horizontality of the case when this is laid flat on a horizontally-level table surface.
		(g) Check the cover. There must be no warping and/or twisting of the cover.
		(h) Check the base sheathing and its fixation on the case.
		(i) Do functionality test to validate the storage case's level of performance and accuracy by loading the specific science equipment intended for it to store.
27	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): Cart-spring loaded**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) To determine the conformity of the plastic materials to the technical specifications, the materials should be tested by DOST material testing facilities or at any DOST-accredited testing institution. Test certificate/s should be issued by the testing unit; the original copy should be submitted to BLR-Cebu to validate the specified materials. A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to testing facility. All expenses for the said test shall be shouldered by the Supplier. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do material evaluation of the non-plastic parts.
		On the Individual Parts:
		(d) Do dimensional inspection of the individual parts. Measure lengths, widths, depths, diameters, holes, distances between holes, threads, etc.
		(e) Inspect the surface finish of individual parts. Material colors specified in the technical specifications must be followed.
		(f) Check the verticality or uprightness of the sides, front face, and rear face of the cart body when this is laid flat on a horizontally-level table surface. Check, also, the horizontality of the holes as well as their alignment and parallelism with respect to each other.
		On the Assembly:

Item	Description	Inspection and Test Procedure
		(g) Do dimensional inspection of the assembly. Measure length, width, height, gaps between assembled parts, distances between wheels, etc.
		(h) There must be no breakage, cracks, chipped edges, sharp edges, scratches, warping, and other deficiencies/defects on the assembly.
		(i) Inspect the linear clearances between the axle shafts and the teflon bearings.
		(j) Inspect the alignment of the wheels with respect to each other as well as with respect to the rails on which they are to operate. The cart should run smoothly on the rails.
		(k) Check the verticality or uprightness of the assembly when this is laid flat on a horizontally-level table surface.
		(l) Check, also, the perpendicularity of the top surface of the assembly with respect to the front face, rear face, and sides.
		(m) Test run the cart and check the performance of the wheels.
		(n) Check the performance of the spring and the setting plate that would set or hold the spring in its compress state.
		(o) Check the weight of the cart. Note: The difference in weight between Cart A (spring-loaded) and Cart B (with counterweight) should not exceed 5 grams.
		(p) Do functionality test to validate the level of performance and accuracy of the cart especially when this is used as component in conducting laboratory experiments on the Law of Conservation of Momentum and Newton’s Second Law of Motion, among others. During the conduct of Explosion Expirement, the Dynamic Carts A and B should reach the end of the one (1) meter rails at the same time.
28	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): Cart-with counterweight**	a. In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		b. To determine the conformity of the plastic materials to the technical specifications, the materials should be tested by DOST material testing facilities or at any DOST-accredited testing institution. Test certificate/s should be issued by the testing unit, the original copy should be submitted to BLR-Cebu to validate the specified materials. A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to testing facility. All expenses for the said test shall be shouldered by the Supplier. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(a) Do material evaluation of the non-plastic parts.
		On the Individual Parts:
		(b) Do dimensional inspection of the individual parts. Measure lengths, widths, depths, diameters, holes, distances between holes, threads, etc.
		(c) Inspect the surface finish of individual parts. Material colors specified in the technical specifications must be followed.
		(d) Check the verticality or uprightness of the sides, front face, and rear face of the cart body when this is laid flat on a horizontally-level table surface. Check, also, the horizontality of the holes as well as their alignment and parallelism with respect to each other.
		On the Assembly:
		(e) Do dimensional inspection of the assembly. Measure length, width, height, gaps between assembled parts, distances between wheels, etc.
		(f) There must be no breakage, cracks, chipped edges, sharp edges, scratches, warping, and other deficiencies/defects on the assembly.
		(g) Inspect the linear clearances between the axle shafts and the teflon bearings.
		(h) Inspect the alignment of the wheels with respect to each other as well as with respect to the rails on which they are to operate. The cart should run smoothly on the rails.
		(i) Check the verticality or uprightness of the assembly when this is laid flat on a horizontally-level table surface.

Item	Description	Inspection and Test Procedure
		(j) Check, also, the perpendicularity of the top surface of the assembly with respect to the front face, rear face, and sides.
		(k) Test run the cart and check the performance of the wheels.
		(l) Check the weight of the cart. Note: The difference in weight between Cart A (spring-loaded) and Cart B (with counterweight) should not exceed 5 grams.
		(m) Do functionality test to validate the level of performance and accuracy of the cart especially when this is used as one of the components in conducting laboratory experiments on the Law of Conservation of Momentum and Newton's Second Law of Motion, among others. During the conduct of Explosion Expirement, the Dynamic Carts A and B should reach the end of the one (1) meter rails at the same time.
29	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): Cylindrical Mass, 50-gram**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the outside and inside diameters and the thickness.
		(d) Do material evaluation.
		(e) Inspect the weight to know its conformity to the technical specifications.
		(f) Test the item's level of performance and accuracy by using it as component of the Cart-Rail System in performing laboratory experiment on the Law of Conservation of Momentum and Newton's 2nd Law of Motion, among others.
30	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): Driving Mass, 3-gram**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do dimensional inspection. Measure the outside and inside diameters, the thickness, the slit, and the eccentricity of the inside diameter to the outside diameter of the item.
		(d) Do material evaluation.
		(e) Inspect the weight to know its conformity to the technical specifications.
		(f) Test the item's level of performance and accuracy by using it as component of the Cart-Rail System in performing laboratory experiment on the Law of Conservation of Momentum and Newton's 2nd Law of Motion, among others.
31	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): Leveling Pad Assembly**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do material evaluation of the non-plastic parts.
		(c) Do dimensional inspection. Measure length, width, depth, diameters, and thickness.
		(d) Check the horizontality of the pad when this is laid flat on a horizontally-level table surface.
		(e) Inspect the jack bolts and their threads as well as the threads of the inserts.
		(f) Inspect the surface finish. The color of material as specified in the technical specifications must be followed.
		(g) Do functionality test to validate the level of performance and accuracy of the pad especially when used as component of the Cart-Rail System.
32	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): Plastic Hammer**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure diameters, length, radius, etc.

Item	Description	Inspection and Test Procedure
		(c) Check the surface finish. The color of the material should conform to what is specified in the technical specifications.
		(d) Test the item's level of performance and accuracy by using it as component of the Cart-Rail System in performing laboratory experiment on the Law of Conservation of Momentum as well as in conducting experiment on Explosion.
33	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): Modelling Clay, 1 bar/set**	(a) Check compliance of the item with the technical specifications.
		(b) Do functionality test to validate the level of performance of the item especially when used as accessory to the Cart-Rail System during laboratory experimentation.
34	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): Stopper-Fork Assembly**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) To determine the conformity of the plastic materials to the technical specifications, the materials should be tested by DOST material testing facilities or at any DOST-accredited testing institution. Test certificate/s should be issued by the testing unit, the original copy should be submitted to BLR-Cebu to validate the specified materials. A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to testing facility. All expenses for the said test shall be shouldered by the Supplier. There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other deficiencies/defects on the item.
		(c) Do material evaluation of the non-plastic parts.
		On the Individual Parts:
		(d) Do dimensional inspection of the individual parts. Measure lengths, widths, depths, diameters, holes, distances between holes, threads, etc.
		(e) Inspect the surface finish of individual parts. Material colors specified in the technical specifications must be followed.
		(f) Inspect the wheel, to include the concentricity of its outside diameter to its center hole, the parallelism of its faces, and the perpendicularity of its center hole with respect to the said faces.
		(g) There must be no breakage, chipped edges, sharp edges, cracks, scratches, warping, and other deficiencies/defects on the individual parts.
		On the Assembly:
		(h) Check the horizontality and verticality of the stopper-fork when this is laid flat on a horizontally-level table surface.
		(i) Check the performance of the Wheel by having it rotate freely without load and having it rotate with load. The wheel must turn and run smoothly.
		(j) Do functionality test to validate the level of performance and accuracy of the Stopper-Fork Assembly especially when used as component of the Cart-Rail System.
35	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): String (thin), 1 ball/set**	(a) Check compliance of the item with the technical specifications.
		(b) Do functionality test to validate the level of performance of the item especially when used as accessory to the Cart-Rail System during laboratory experimentation.
37	**BLR-developed Dynamics Carts-Rail System (Mechanics 002): SCIKIT MECHANICS Storage Case 002 (With Cover and Base Sheathing)**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, thicknesses, diameters, radii, depths, draft angles, etc.
		(c) Check the surface finish. The color of the material should conform to what is specified in the technical specifications. Note: There must be no warping and/or twisting of material.
		(d) Check the perpendicularity and parallelism of the sides/walls with respect to each other.

Item	Description	Inspection and Test Procedure
		(e) Check the printed markings.
		(f) Using a spirit level, check the horizontality of the case when this is laid flat on a horizontally-level table surface.
		(g) Check the cover. There must be no warping and/or twisting of the cover.
		(h) Check the base sheathing and its fixation on the case.
		(i) Do functionality test to validate the storage case's level of performance and accuracy by loading the specific science equipment intended for it to store.
37	**BLR-developed SCIKIT MECHANICS 003: 10-Newton Spring Balance**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) To determine the conformity of the plastic materials to the technical specifications, a certificate from DOST, which would attest to the said conformity, is required for the Supplier to submit. (Note: A representative of the Procuring Entity should be present during preparation and submission of the material test specimens to DOST. All expenses for the said test shall be shouldered by the Supplier.)
		On the Individual Parts:
		(c) Do dimensional inspection of the individual parts. Measure lengths, widths, heights, depths, diameters, holes, thicknesses, threads, etc.
		(d) Inspect the surface finish of individual parts. Material color specified in the technical specifications must be followed.
		(e) There must be no breakage, chipped edges, sharp edges, cracks, scratches, warping, twisting, and other deficiencies/defects on the individual parts.
		(f) Inspect the outer tube. Check the straightness of the tube. Check the concentricity of the outside diameter and inside diameter. Inspect the printed description (marker) on the outer surface of the tube. Check the threads and their lengths.
		(g) Inspect the top cover. Check the outside thread, inside thread, and the thread lengths.
		(h) Inspect the stopper. Check the concentricity of the outside diameter and inside diameter. Check the thread and its length. The material (of the stopper) should be transparent (clear).
		(i) Inspect the inner tube. Check the concentricity of the outside diameter and inside diameter. Check the flared end (where the rim was curved outward) of the tube.
		(j) Inspect the extension spring. Check the outside diameter, wire diameter, pitch, and length. Check the material. The material should conform to what is specified in the technical specifications.
		(k) Inspect the spring and hook adaptor. Check the outside thread, inside thread, and their lengths.
		(l) Inspect the hook. Check the alignment of the center of the curved end to the stem.
		On the Assembly:
		(a) There must be no breakage, chipped edges, sharp edges, cracks, scratches, warping, twisting, and other deficiencies/defects on the assembly.
		(b) Inspect the surface finish of the assembly.
		(c) Inspect the calibration (graduation) sticker. Inspect the printed numbers, letters, and graduation lines. Check the color/s. Check the surface finish of the sticker. Check the accuracy of the graduations using a force gauge.
		(d) Check the fixations of the individual parts of the assembly.
		(e) Do functionality test to validate the level of performance and accuracy of the Spring Balance by using it in conducting experiment on force.
38	**BLR-developed SCIKIT MECHANICS 003: Leveling Hose**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure the length, outside diameter, and inside diameter.
		(c) Inspect the transparent plastic material.

Item	Description	Inspection and Test Procedure
		(d) There must be no cracks, scratches, chipped edges, and other deficiencies/defects.
		(e) Do functionality test to validate the level of performance of the hose especially when used in determining whether the two (2) stand bases are horizontally level during experiment on momentum, acceleration, and inertia within the realm of the Cart-Rail System.
39	**BLR-developed: User's Manual (SCIKIT MECHANICS)**	(c) Check the number of pages. If needed, do proof-read.
		(d) Do dimensional inspection. Check the width, length, and thickness of the papers.
40	**BLR-developed: Experiment Module (SCIKIT MECHANICS)**	(e) Inspect the binding. See how the manuals/modules are bound.
		(f) There must be no tear/s on the covers and pages. There must be no crumpled cover/s or page/s.
41	**BLR-developed Blackboard Compass**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, heights, diameters, thicknesses, angles, radii, etc.
		(c) There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other defects on the item.
		(d) Check the surface finish. Materials specified in the technical specifications should be followed.
		(e) Inspect the pivot arm and adjustable arm. Check the screw (with wing nut and washer) that locks the two (2) arms together.
		(f) Test the unlocking, swinging, and locking of the said two (2) arms.
		(g) Inspect the pen/chalk holder and its fixation on the adjustable arm. Check the threaded insert of the pen/chalk holder. Check the pen/chalk lock and clip.
		(h) Inspect the pivot pen and its fixation on the pivot arm. Check the silicon suction cap, (Test the functionality of the said suction cap.)
		(i) Check the engraved DepED-BLR marker.
		(j) Do functionality test to validate the level of performance of the Blackboard Compass by: (1) using it in drawing circles and arcs on a blackboard or whiteboard; and (2) performing geometric constructions such as (a) Perpendicular Bisector of a Line Segment; (b) Angle Bisector; and (c) Locating the Centroid.
42	**BLR-developed Blackboard Protractor**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, heights, diameters thickness, angles, radii, etc.
		(c) There must be no chipped edges, sharp edges, cracks, scratches, warping, twisting, delamination, and other defects on the item.
		(d) Check the printed graduation lines, numbers, letters, and DepED-BLR marker. Check the accuracy of the linear and angular graduations. Check the positioning of the numbers with respect to the graduation lines
		(e) Check the surface finish. Note: The surface must be coated with protective gloss varnish. The said varnish must be on top of the printed graduation lines, numbers, letters, and DepED-BLR marker.
		(f) Inspect the steel handle and its fixation on the protractor.
		(g) Do functionality test to validate the level of performance of the Blackboard Protractor by using it in drawing and measuring angles and lines on a blackboard or whiteboard.
43	**BLR-developed Heat Conductivity Apparatus**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) There must be no sharp edges, cracks, scratches, chipped edges, breakage, and other defects on the item.

Item	Description	Inspection and Test Procedure
		(c) Do dimensional inspection. Measure lengths, widths, diameters, radii, thicknesses, etc.
		(d) Inspect the surface finish. Check the materials. The materials should conform to what is specified in the technical specifications.
		(e) Inspect the five (5) test plates and their arrangement on the assembly. Check the punched description markers (Mild Steel, Copper, Aluminum, Stainless Steel, and Brass).
		(f) Check the Heating Ring and its holes.
		(g) Check the Handle.
		(h) Do functionality test to validate the level of performance and accuracy of the Heat Conduction Apparatus by using it in conducting experiment on heat conduction of metals.
44	**BLR-developed Fresh Water Aquarium with Stand**	A. Inspection:
		1. Shall comply with the design (drawing) specifications.
		2. There must be no breakage, no chipped and sharp brim, no cracks, no scratches, and other deficiencies/defects on the item.
		B. Leak Test:
		Fill water up to half of an inch below the brim (top) of the aquarium. Pour the water carefully so as not to spill any and the surroundings to remain dry. Let the water stay for three (4) hours.
		C. Materials Needed to Perform Inspection and Test:
		1. Digital Vernier Caliper
		2. Steel tape measure
		3. Pail
		4. Tap water
45	**BLR-developed: Fraction Set**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, heights, diameters, thicknesses, angles, radii, etc.
		(c) There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other defects on the item.
		(d) Check the surface finish. Materials specified in the technical specifications should be followed.
46	**BLR-developed: Linear Pair/Angle Demonstrator**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, heights, diameters, thicknesses, angles, radii, etc.
		(c) There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other defects on the item.
		(d) Check the surface finish. Materials specified in the technical specifications should be followed.
		(e) Do functionality test to validate the level of performance of the Linear Pair/Angle Demonstrator by (1) forming three (3) different kinds of angle and verify its measurement using a standard protractor.
47	**BLR-developed: Number Blocks**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, heights, diameters, thicknesses, angles, radii, etc.
		(c) There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other defects on the item.
		(d) Check the surface finish. Materials specified in the technical specifications should be followed.
48	**BLR-developed: Place Value Chart with decimal pockets**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		(b) Do dimensional inspection. Measure lengths, widths, heights, diameters, thicknesses, angles, radii, etc.

Item	Description	Inspection and Test Procedure
		(c) There must be no breakage, chipped edges, sharp edges, cracks, scratches, and other defects on the item.
		(d) Check the surface finish. Materials specified in the technical specifications should be followed.
LOT 2: BLR-DEVELOPED STORAGE CABINETS		
1	**BLR-developed Storage Cabinet**	(a) In the evaluation of sample, the technical specifications, as part of the Contract, will be used as reference. However, in the pre-delivery inspection, it will be the approved sample that will be used as reference.
		On the individual parts (when the cabinet is at its collapse state):
		(b) Conduct visual inspection of the individual parts. The material/s must conform to what is specified in the technical specifications. There must be no deformities, breakage, sharp edges, cracks, chipped edges, scratches, dents, and other defects on the individual parts.
		(c) Do dimensional inspection of the individual parts. Measure lengths, widths, heights, thicknesses, holes, distances between holes, etc.
		(d) Check the surface finish. Surface that needs powder coating, as specified in the technical specifications, must be powder-coated.
		(e) Inspect the doors, the transparent Plexiglass (acrylic), and the rubber linings. Note: There must be no cracks, warping, bending, scratches, and other defects on the transparent Plexiglass (acrylic).
		(f) Check the door lock and its keys. Check the door handles, detachable shelf supports, and hinges.
		(g) Inspect the top cover, bottom cover, side covers, back covers, and the shelves. Check the holes for the detachable shelf supports.
		(h) Check the fittings of the lock posts of the top cover, front base, and rear base to the (square) openings of the side and back covers.
		(i) Check the bolts and nuts. Check the rivets.
		(j) Check the welds and their locations. Note: Messy or untidy welds are not acceptable.
		On the Assembly:
		(k) The assembled cabinet will be subjected to stress test by moving it sideways, forward, and backward and tilt 30 degrees both ways from the vertical position. During stress test, if the assembled cabinet is found not sturdy and defects are noted, it will be subjected to re-inspection to verify the quality of welded joints, locking rivets, bolts, nuts, and their spacing and determine whether these conform to the technical specifications.
		(l) Do dimensional inspection of the assembly. Measure the height, width, depth, length, etc.
		(m) Check the uprightness of the assembly when laid flat on a (horizontal) ground.
		(n) Check the perpendicularity and/or parallelism of the top cover, bottom cover, side covers, and back covers with respect to each other.
		(o) Check the alignment of the holes (for the detachable shelf supports) both vertically and horizontally.
		(p) Using a spirit level, check the horizontality of the shelves when these are laid to rest on their (detachable) supports in the cabinet. Check, also, the horizontality of the top and bottom covers.
		(q) There must be no deformities, breakage, sharp edges, cracks, chipped edges, cracks, scratches, dents, and other defects on the assembly.
		(r) Check for gaps between the assembled parts.
		(s) Test the opening, closing, swinging, and locking of the doors. Check the performance of the hinges including the performance of the door lock & its keys.
		(t) Inspect the rivets. Check the bolts and nuts. Check their fixations.
		(u) Do functionality test to validate the level of performance of the cabinet by placing in it the equipment intended for it to store.
MARKET ITEMS		
LOT 3: SCIENCE LABORATORY TOOLS AND EQUIPMENT		
1	**Distillation set-up: Condenser, Liebig-type**	A. (Refer to General Inspection Protocol)

Item	Description	Inspection and Test Procedure
		The item must conform to the design specifications
		B. Tests
		Visual inspection Check the visible attributes/parameters of the Liebig condenser as per technical specifications.There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein.Check the following: 1) Features two concentric straight glass tubes, the inner one being longer and protruding at both extremities, surrounded by a water jacket with sealed inner tube and outer tube of an inner straight tube surrounded by an outer jacket tube 2) With the following permanent inscriptions and numbers permanently enamelled onto the glass 3) With sealed inner tube 4) With a **drip tip** at the bottom 5) Accessories: a) One (1) pc rubber stopper that will fit upper (inlet) tube b) Rubber tube= yellow 6) Must have User's Manual in English on the installation, use and care, proper storage with repair and maintenance and Activity Sheets/Teacher's Manual 7) Must have a brand enamelled permanently onto the glass **Dimensional inspection** Measure the dimensions as per technical specificarions of the Liebig condenser
		Insert the rubber stopper to the distilling flask and to the Liebig condenser if there will be no leak or escape of the steam or rubber hose **Scratch test:** Scratch using your thumb nails the brand and inscriptions and other markings of theLiebig condenser; to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings. If it wont peel off, it passed QC inspection. If not, it is rejected **Refractive-index test** (by submerging the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, the glass can no longer be seen or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass
		Refractive-index test. Submerge the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, the glass can no longer be seen or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass
		Functionality Test Assemble the distillation setup (Liebig Condenser, distilling flask, rubber hose, rubber stopper). Perform the distillation experiment (see attached procedure) **The distillate shall be obtained** (e.g. coffee to be distilled) without any breakage.
		C. Materials needed to perform inspection and test tape rule, heat source, stand, water source, glycerine (1L), coffee solution, rag/tissue paper, wire gauze, ring with stem, stand setup assembly, universal clamp, Bunsen burner, LPG
2	**Distillation set-up: Distilling Flask, borosilicate, 250ml,**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications
		B. Tests

Item	Description	Inspection and Test Procedure
		Visual inspection Check the visible attributes of the distilling flask, borosilicate, 250 mL, as per technical specifications. There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein.Check for the following: 1.Features a long neck, a side arm that facilitates condensation, and a round bottom for uniform heating . 2) With the permanent inscriptions and numbers permanently enamelled onto the glass 3) Supplied with an accessories a) rubber stopper that fits the mouth of the 250 mL distilling flask b) rubber stopper that fits the mouth of the Liebig condenser 4) Must be able to produce a distillate during an experiment on Distillation 5) Must have a brand enamelled permanently onto the glass **Dimensional inspection** Measure the dimensions as per technical specificarions of the distilling flask, borosilicate, 250 mL **Scratch test:** Scratch using your thumb nails the brand and white graduations and inscriptions and other markings of thedistilling flask; to test for the peel and adhesion properties of embossed brand and permanency of graduations, and other markings. If it wont peel off, it passed QC inspection. If not, it is rejected
		Refractive-index test. Submerge the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index, the glass can no longer be seen or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass
		Volumetric Test Fill the 250 mL distilling flask with 250 mL water using a standard 100 mL graduated cylinder, to check if its volumetric capacity is met.
		Functionality Test . Assemble the distillation setup to perform distillation experiment (Liebig Condenser, distilling flask, rubber hose, rubber stopper). (See attached procedure). **Distillate shall be obtained** (e.g. coffee to be distilled) without any breakage .
		C. Materials needed to perform test and inspection
		tape rule, heat source, stand, water source, glycerine (1L), coffee solution, rag/tissue paper, wire gauze, ring with stem, stand setup assembly, universal clamp, Bunsen burner, LPG
3	**Electrolysis Apparatus, student-type (Brownlee)**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications
		B. Tests

Item	Description	Inspection and Test Procedure
		a) **Visual inspection** Check the visible attributes of the electrolysis apparatus, borosilicate, 1000 mL, as per technical specifications. There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein. Account for all the accessories like: 1)jar/beaker = 100 mL cap 2) Comes with two (2) electrodes 3)Comes with an acid-proof insulating support to hold the two binding posts (one red, one black) 4) the graduated test tubes, 0-25 mL, 18 x 150 5) Certification from the manufacturer that the test tubes are reusable and not disposable 6)Comes with power source: 220 V -240 V AC input)/ (0-12 V) DC output, and with switch selector 7) Comes with 9 V battery with one (1) battery snap 8) Comes with two (2) connecting wires (1 red, 1 black) 9)Comes with with alligator clip soldered on one end of the wires with banana plugs soldered on the other end of each wire (1 red, 1 black) 10)Comes with two (2) replacement graduated test tubes 11) Comes with two (2) solid rubber stoppers to fit perfectly the two (18 x 150 mL) test tubes 12) With a well written Operations Manual and Assembly Guide and sample Activity Sheets/Teacher's Manual in English 13) Comes with a training video that shows the actual equipment submitted and approved during the sample evaluation in a USB 14) Comes with a brand etched/enamelled permanently onto glass **Dimensional inspection** Measure the dimensions as per technical specificarions of the jar/beaker
		a) Do the **refractive-index test** for the four graduated 25 mL glass test tubes and beaker/glass jar (by submerging the glass into vegetable oil or glycerine) to determine whether the glass material is borosilicate. Borosilicate glass is identified by its refractive index, 1.474. Immersing the glass in a container of liquid of similar refractive index makes the glass not visible or will disappear. (Vegetable oil, 1.47 and glycerine, 1.473 are some liquids with similar refractive index as to borosilicate glass.
		b) Do **volumetric test:**
		i) Fill each of the two (2) graduated test tube samples up to their 25 mL mark, using a standard 10 mL graduated cylinder to check the accuracy and preciseness of the printed graduations b) Measure 27 mL water and fill the two graduated test tube samples. It wont overflow , it passed QC inspection. If not, it is rejected
		ii) Measure 1000 mL of water using a standard 100 mL graduated cylinder and pour into glass jar sample, to test and verify its volumetric capacity and to check the accuracy and preciseness of the printed graduations and verify whether the required minimum/maximum volumetric capacity of the glass jar (1000 mL): as stipulated in the technical specifications, is met.
		c) Do the **scratch test**: scratch using your thumb nails the **white graduations** and large white enamel marking spot of the 27 mL graduated test tubes and 1000 mL beaker to test for the peel and adhesion properties of embossed/enamelled brand and permanency of graduations, If they are peeled off, the item is rejected.

Item	Description	Inspection and Test Procedure
		e) Do the **function test** by performing the Electrolysis of Water experiment, to separate water into its elements to produce two part hydrogen and one part oxygen gases. (See attached sheets), to check the accuracy and preciseness of the printed graduations and verify whether the required minimum/maximum volumetric capacity of the glass, as stipulated in the technical specifications, is met. Once the unit is turned on, see to it that there must be **no leakage** from the 2 electrodes. If it has no leak, the item is accepted. It must separate water into its elements producing two gases (hydrogen and oxygen) with a 2:1 ratio, be sure to observe the following ratios: a) **2 mL** hydrogen: **1 mL** oxygen; b) **4 mL** hydrogen: **2 mL** oxygen, c) **6 mL** hydrogen: **3 mL** oxygen, d) **8 mL** hydrogen: **4 mL** oxygen, e) **10 mL** hydrogen: **5 mL** oxygen, and so on **until 10 mL to 5 mL of the gases** has been collected for the gases, and then test for the gases. **If a leak from the two electrodes occurs, the item is rejected**
		f) Test for the hydrogen gas collected i) Get the test tube and collect the gas sample and close the test tube using your thumb. ii) Invert the test tube and light a wooden splint or matchstick iii) Take your thumb off the test tube iv) Immediately/quickly, bring the lit splint near the mouth of the test tube containing the gas. v) Observe the sound. A distinctive "squeaky popping" sound is produced, it indicates the presence of hydrogen gas, due to its rapid combustion. 2) Test for oxygen gas collected i) Get another test tube and collect the gas sample and close the test tube using your thumb. ii) Light a wooden splint or matchstick and blow out the flame so that the splint glows, and an ember forms iii) Take your thumb off the test tube iv) Immediately/quickly, bring the ember near the mouth of the test tube containing the gas. v) Observe the light/ember The ember tends to die, but upon bringing it inside the mouth of the test tube, causes it to re light, which it indicates the presence of oxygen gas. If the gas tested supports combustion, making the ember glow more
		C. Materials needed to perform inspection and test
		Tape rule
		9 V battery
		Connecting wires
		Beaker, 250 mL
		Power supply with switch selector
		Stirring rod Sodium hydroxide solution Glycerine (1L)
4	**Osmosis Apparatus**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications
		B. Tests

Item	Description	Inspection and Test Procedure
		Visual inspection Check the visible attributes/parameters of the Osmosis apparatus, as per technical specificationsThere must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein. Check the following: 1)Features a a long shaft of tube with a reservoir and a funnel like/flared rim section at the top and at the bottom. The shaft is designed to allow insertion through a small hole present in a Y-shaped support stand giving way for the tube to be inserted into a container. 2) Comes as a complete set, which is composed of the following items: a) With one (1) pc battery jar = 600-605 mL cap b) With one (1) pc double thistle tube with brand name etched onto the glass c) With one (1) pc stable Y-shaped metal support stand, safe to use, and absence/free of all sharp edges, all surface imperfections/irregularities and all other defects not stated herein d) Comes with ten (10) pc semi-permeable membrane e) Each item is individually placed in a snap fit organizer shaped into each item and packed as a complete set in a padded sturdy polystyrene box f) With Instruction Manual and Activity Sheets, well written User's Manual (Assembly guides) and Activity Sheets in American English g)Comes with a brand permanently etched onto the double thistle tube and in the box **Dimensional inspection** Measure the dimensions as per technical specifications of the Osmosis apparatus
		Functionality Test
		Set up the Osmosis apparatus and conduct experiment (See attached procedure on Osmosis experiment) Procedure: 1 Soak the animal membrane in water for at least 30 seconds and cover the thistle tube with it, and tie it with rubber band. Make sure that the membrane is smooth and tight against the lip of the thistle tube to prevent leakage 2. Fill the thistle tube funnel up to a its neck with the 50 % sugar and remove trapped air using a barbecue stick 3. Invert and mount the thistle funnel in an upright position using the alumnum stand . Make sure that it does not touch the bottom of the jar. 4. Fill the jar with water up to the neck of the thistle funnel. Use the barbecue stick when there is a gap on the glass tube 5. Mark the initial level of the sugar solution with a marking pen 6. Mark the next level of the sugar solution in the thistle tube after 5 minutes 7. Monitor the change of the level of the sugar solution in the thistle tube every after 5 minutes for 20 minutes **Expected Result**: There is a **continuous rise of the level** of sugar solution in the thistle tube until rising of the level stops when equilibrium is reached.
		C. Materials
		Sugar solution, 50%
		Sugar, 10 g
		Tape rule Balance. digital Ruler Vernier caliper Stopwatch Beaker, 250 mL Barbecue stick Water Rubber band
5	**Balance, Toploading, Electronic**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications

Item	Description	Inspection and Test Procedure
		B. Tests
		Visual inspection Check the visible attributes/parameters of the Balance, Toploading, Electronic, as per technical specifications. There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein. Check for the following: 1. 500 g span calibration mass 2. power cord 3. four AA batteries 4. draft shield 5. With Statement of Accuracy/ Certification of Accuracy 6. training video that shows the actual equipment submitted and approved during the sample evaluation in a USB **Dimensional inspection** Measure the dimensions as per technical specifications of the Balance, Toploading, Electronic
		Functionality test
		a) Set up and operate the unit using the User's Manual . b) Place the balance on a sturdy, level surface. c) Get the bubble centered to ensure the balance is correctly level on the bench top d) First, before weighing , it needs to be "tared," or recalibrated to read 0.01 g. e) Press the button and turn it on f) Press the Tare button and release to effect this recalibration to check **its** accuracy . g) Place the 500 g calibration mass to be weighed at the center of the pan h) Take the reading i) Take **three or** more trials to verify the precision and functionality
		C. Materials needed to perform inspection and test
		Tape rule, Vernier caliper
6	**Balance, Triple Beam, with tare, 2610-gram**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications
		B. Tests
		Visual inspection Check the visible attributes/parameters of the Balance, Triple Beam, with tare, 2610-gram, as per technical specifications. There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein Check for the following 1.spring, loaded zero-adjust compensator, 2. iron stand assembly (stand rod and C clamp) 3. With Statement of Accuracy (Certificate of Traceability) 4. training video that shows the actual equipment submitted and approved during the sample evaluation in a USB **Dimensional inspection** Measure the dimensions as per technical specifications of the Balance, Triple Beam, with tare, 2610-gram
		Functionality Test

Item	Description	Inspection and Test Procedure
		1. Set up and operate the unit using the User's Manual . 2.Zero the balance first before weighing by sliding back all the weight poises (that slide along the beams) so that the pointer is right at the zero line. Adjust and turn the zero adjustment knob a little bit to get it right at the zero line. 3. Place the 500 g mass at the left pan , the pointer immediately goes up and is no longer zeroed. 4. Slide the weight poises until the pointer is at zero again to find the weight of the object. Start with the two heavier weight poises and then use the lightest one (the rider) to do the fine tuning. 5. Add up all the number that each weight poise is at when the pointer is zeroed. 6. Take two or more trials to verify its accuracyConduct weighing using a known mass , 500 g, to check accuracy. Take three or more trials to verify its reliability and functionality. 7. Conduct determination of specific gravity of an object experiment to check accessories (clamp, rods) are compatible and functional.
		C. Materials needed to perform inspection and test
		Vernier caliper, tape rule, 500 g mass
7	**Calorimeter**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications
		B. Tests **Visual inspection** Check the visible attributes/parameters of the calorimeter, as per technical specifications . There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein Check for the following: 1. 2 Two polished spun aluminum vessels 2. A plastic insulator ring or fiber washer for insulating and supporting one vessel within the other, protects the polystyrene insulation against damage and liquid spill 3. Insulated Stirrer 4. A clear transparent molded cover or plastic lid with a filler cap, with two holes (one hole is for the rubber stopper that holds the thermometer and the other hole for the stirrer 5. Rubber stopper with one hole 6. With polystyrene/a fiber separator to insulate the inner vessel 7. Original copy of the Test certificate/s issued by the testing unit, like DOST material testing facilities or at any DOST-accredited testing institution attesting that the material of the insulation of the calorimeter, is polystyrene **Dimensional inspection** Measure the dimensions as per technical specifications of the calorimeter **Functionality Test**
		Perform Heat of Fusion experiment
		1. Weigh an empty calorimeter using a triple beam balance.
		2. Record the mass in Table 1.
		3. Heat 500 mL of water in a beaker using a Bunsen/alcohol burner until the temperature is 60 ^{0}C. Observe what happens.
		4. Pour the warm water into the calorimeter and measure the weight using the triple beam balance. Stir well using the stirrer provided.’
		5. Record the temperature reading when it stabilizes as the initial temperature. Note: Do not use the thermometer to stir the mixture.
		6. Weigh 50 g crushed ice and add it to the calorimeter making sure that the stirrer is covered with the ice.
		7. Stir until the ice melts and record the final temperature.
		C. Materials Needed to Perform Inspection and Tests:

Item	Description	Inspection and Test Procedure
		1. Tape rule, vernier caliper 2. Hot water, 60 deg 3. Ice (shall be brought by the supplier), 50 g 4. Thermometer -20 to 110 deg C 5. Beaker, 500 mL 6. Triple beam/toploading electronic balance
8	**Centrifuge**	A. (Refer to General Inspection Protocol) The item must conform to the design specifications **B. Tests** **Visual inspection** Check the visible attributes/parameters of the centrifuge, as per technical specifications . There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein Check for the following: 1. Fixed speed, suction cupped feet 2. With Angled rotor, 8-Place Centrifuge with Timer 3. With power cord 4. Eight 13 x 75 mm tube sleeve inserts 5. Eight pc 15 mL round bottom plastic centrifuge tubes with screw cap with white or black print graduations sleeves 6. Eight 13 x 75mm round bottom plastic centrifuge tubes with screw cap 7. With Operations Manual and Assembly Guide in English 8. With sample activity sheets in English 9. Comes with a training video that shows the actual equipment submitted and approved during the sample evaluation in a USB **Dimensional inspection** Measure the dimensions as per technical specifications of the centrifuge **Functionality Test** Install, set up and operate the unit using the User's Manual. a) Remove the centrifuge from the box and inspect for any possible shipping damage. If the centrifuge appears to be damaged from shipping, it is rejected. b) Place the centrifuge on a sturdy, level surface. c) Turn the lid latch to the UNLOCK position (“U”). Open to verify that
		d) Verify that the power switch on the front of the unit is in the OFF position. e) Connect the 3-prong wall power cord to the AC power adapter, and then connect the AC power adapter to the back of the centrifuge. f)Plug the power cord into an approved and properly grounded outlet. Do not insert specimen test tubes prior to initial test run. g) Close the lid, turn the lid latch to the LOCKED position (“L”) and turn power switch ON. For fixed unit, turn the timer to 10 minutes. h) Press RUN. If there is a smooth whirring sound and the unit accelerates with little or no vibration, your E8 centrifuge is ready to operate. The unit PASSED If there are loud, unusual sounds or if you experience excessive vibration, immediately turn the unit off. DO NOT OPERATE. The sample is rejected
		Measure the speed of the centrifuge using the tachometer
9	**Electrical Conductivity (Conductivity of Solutions) Apparatus**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications
		B. Tests

Item	Description	Inspection and Test Procedure
		Visual inspection Check the visible attributes/parameters of the Electrical Conductivity (Conductivity of Solutions) Apparatus, as per technical specifications.There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein Check for the following: 1. With 2 AA batteries 2. With 1 pc battery holder 3. With second power source: 220 V -240 V AC input)/ (0-12 V) DC output, comes with switch selector 4.With Operations Manual and Assembly Guide in English 5. With sample activity guide/sheets/Teacher's Manual in English **Dimensional inspection** Measure the dimensions as per technical specifications of the Electrical Conductivity (Conductivity of Solutions) Apparatus **Functionality test** by performing the Electrical Conductivity of Substances, wherein conductors/electrolytes cause the bulbs to light while non-conductors/non-electrolyte will not cause the bulbs to light
		Procedure:
		1. Prepare 10% salt solution,(10 g salt, 90 g water)
		2. Clean the electrode using sand paper
		3. Fill the jar with the salt solution
		4. Connect the ECA to the power source
		Expected Result: The bulb will light up if (salt solution) electrolyte. If non-electrolyte, it will not light up(sugar)
		C. Materials needed to perform test and inspection
		Measuring tape/ ruler
		2 Battery, AA
		Power supply (0-12 V) with switch selector Beaker, 250 mL
		Alligator clips Connecting wires Stirring rod 10% salt solution Sugar solution
10	**Laboratory Hot Plate with magnetic stirrer**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications
		B. Tests
		Visual inspection/parameters Check the visible attributes/parameters of the Laboratory Hot Plate with magnetic stirrer, as per technical specifications There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein . Check the following: 1. Ceramic coated aluminum plate 2. With temperature probe, probe holder, support rod, and stir bar 3. Heating power consumption : 600 W minimum 4. With built-in support rod mount, thumbscrew, accommodates rods up to 13 mm in dia. 5. With English User's Manual which consists of the Operating Manual 6. Comes with a **training video** that shows the actual equipment submitted and approved during the sample evaluation in a USB 7. Comes with a brand marked permanently on the body **Dimensional inspection** Measure the dimensions as per technical specifications of the Laboratory Hot Plate with magnetic stirrer
		Functionality test
		a)Place half full water in a beaker. Use boiling stones or boiling sticks in liquids to facilitate even heating and boiling

Item	Description	Inspection and Test Procedure
		b)Heat the water up to its boiling point and let it continue boiling for three more minutes to check functionality
		Monitor the motor temperature based on NEMA Standards MG 1-2011, 12.43, defines temperature rise for motors in a maximum ambient of 40°C. *Its vibration is within the tolerance of the given motor rating without irregular noise in motor bearing and in other moving mechanical parts;
		Endurance Test for a series of five Test Runs with one minute each to determine how the machine behaves under sustained use. Turn On and Off method is applied.
		Powder coating test
		Rub a ball of cotton with alcohol into the surface of the plate. If the color of the paint sticks to the cotton, it is not powder coated. Reject the item. If not, accept the item as it is powder coated.
		C. Materials needed to perform inspection and test
		Steel / ruler
		Digital vernier caliper
		Stand setup assembly
		Beaker
		Wire gauze
		Boiling stones
		Ring with stem
		Alcohol burner
		Lighter
		Denatured alcohol
11	**pH meter, hand-held, digital**	A. (Refer to General Inspection Protocol)
		The item must conform to the design specifications
		B Tests
		Visual inspection/parameters Check the visible attributes/parameters of the Laboratory Hot Plate with magnetic stirrer, as per technical specifications There must be no breakage, cracks, scratches, chipped rims, sharp edges, striae, surface irregularities including all other defects not stated herein. Check the following: 1. Portable hand held digital pen type 2. With retractable electrode 3. Electrodes extend up to 3.15” (80.01 mm) (min) 4. One (1) bottle pH 7.0 buffer solution Capacity of pH 7.0 buffer solution : 50 mL 5. With one (1) pc calibration screwdriver 6. One (1) pc 9V battery 7. Packed in hard plastic carry case 8. With User's Manual and Student Worksheets/Teacher's Manual in English 9. Comes with a brand marked permanently on the body **Dimensional inspection** Measure the dimensions as per technical specifications of the p meter, had held, digital
		Function test
		Standardize the pH meter first.
		1. Place the 9V battery in the battery holder at the back of the pH
		meter.
		2.Turn it on. Do not place the pH probe into the stock buffer solutions.
		3. Always pour the stock solution into a smaller beaker.
		4. Immerse the tip of the electrode in the pH 7 buffer solution.
		5. Adjust the pH reading in the LCD display using the calibration
		screw driver/ trimmer to pH 7.0.
		6. Rinse in distilled water before proceeding to measure the pH
		of the sample solutions.
		After every test, rinse the electrode in between the tests. Standardize again, using the pH 7 buffer solution, only after twenty samples had been taken.
		7. Immerse in an acid, base and then distilled water, one at a time
		If the sample is :

Item	Description	Inspection and Test Procedure
		A) an acid, the pH meter reading is from pH 0-6.9;
		B) a base, the pH meter reading is pH 7.1- pH14.0.
		C) distilled water, pH 7.0
12	**Microscope, Digital**	A. Inspection:
		1. Shall comply with the design specifications.
		2. Move the stage clips left to right, to and fro to check if not defective
		3. Check the completeness of the parts and accessories
		4. Check for defects.
		5. Shall comply in the submission of Training video as stated in the specifications.
		B. PerformanceTest:
		Bidder's representative must do the demonstration on its operation during the sample evaluation.
		a. Set-up the unit
		b. Perform sample snapshots
		c. Conduct short videos
		C. Material Needed to Perform Inspection:
		1. Steel tape measure
		2. Prepared slides
13	**Microscope, Compound with 4 Objectives**	A. Inspection:
		1. Shall comply with the design specifications.
		2. Inclined the arm to check if it is not loose.
		3. Check the mechanical stage if it is stable and properly aligned.
		4. Move the stage clips left to right, to and fro to check if it is not defective
		5. The coarse and fine focus adjustments must bring the specimen into sharp focus
		6. Move the body tube up and down to check that it must not slide down on its own
		7. Check that the mirror assembly is not defective.
		8. Shall comply in the submission of Training video as stated in the specifications.
		B. Glass LensTest:
		1. Gently tap with a small rounded metal object (like a penny or wedding ring), the sound must be clear and high-pitched "tink" (plastics will render a soft "thud").
		2. Temperature can also be a method of distinguishing between glass and plastic. When exposed to a cold surroundings, glass lenses will be noticeably cold to the touch while plastic will seem like a neutral temperature.
		3. As to weight, glass is heavier than plastic
		C. Materials Needed to Perform Inspection and Test:
		1. Steel tape measure
		2. Prepared glass slide
		3. Coin/Ring
14	**Prepared Slide Set, Microscope, 25 pieces**	A. Inspection:
		1. Shall comply with the design specifications.
		2. There shall be no broken cover slip/glass cover protecting the specimen
		3. Check each slide under the microscope for examination and familiarity of specimen. Each specimen must be clear and distinct.
		B. Materials Needed to Perform Inspection:
		1. Digital Vernier Caliper
		2. Compound Microscope
15	**Prepared Slide Set, Mitosis and Meiosis**	A. Inspection:
		1. Shall comply with the design specifications.
		2. There shall be no broken cover slip/glass cover protecting the specimen
		3. Check each slide under the microscope for examination and familiarity of specimen. Each specimen must be clear and distinct.
		B. Materials Needed to Perform Inspection:
		1. Digital Vernier Caliper
		2. Compound Microscope

Item	Description	Inspection and Test Procedure
LOT 4: SCIENCE DEVICES, INSTRUMENTS, AND MEASURING TOOLS		
1	**Calculator, Graphing, non-projectable**	A. (Refer to General Inspection Protocol)
		B. Tests:
		1. Conduct Calculator Precision (see attached)
		2. Operate or run the calculator and validate the given functions and other functions included in the system through/by executing the instructions in the user's/operation manual and as indicated in the technical specifications (2, 7). (see attach file on what to input to calculator Annex F.2)
		3) Connect accessories from Graphing Calculator to PC/laptop and test if its functioning (get connected to the PC).
		C. Materials needed to perform Inspection and Test Procedures:
		1. Tape rule.
		2. Laptop or PC for connecting the accessories.
2	**Globe, Celestial**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. By means of the provided knob turn the sun at full
		circle to simulate its apparent annual track and its
		relative locations at different months of the year as
		viewed from the earth; the knob should not stuck up.
		2. Turn the knob for the earth globe inside the celestial
		globe to simulate earth's rotation, the knob should not
		stuck up.
		3. Let the Bidders demonstrate the accuracy of information using Encyclopedia
		Britannica or Wikipedia as reference
		a) search keywords celestial globe, astronomical
		map, celestial sphere
		b) navigate page/s until you see a diagrams of
		constellations on the 'Northern sky/Northern celestial
		hemisphere' and 'Southern sky/southern celestial
		hemisphere'
		c) compare the names and relative locations of
		constellations in the Britannica/Wikipedia diagrams
		to that of the celestial globe evaluated. 'Northern sky'
		in the Britannica diagram corresponds to the
		'northern hemisphere' in the celestial globe and the
		'Southern sky' corresponds to southern hemisphere;
		you should be able to see similar representations of
		constellations and their relative locations in the
		Encyclopedia Britannica/Wikipedia diagram and the
		celestial globe evaluated
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
		3. phone or PC with reliable internet connection (for Encyclopedia search)
3	**Globe, Terrestrial**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Using Encyclopedia Britannica or Wikipedia as
		reference check accuracy of entries like:
		a) continents
		b) bodies of water
		c) mountains/ranges
		d) names of countries updated and their coordinate
		system location
		e) prime meridian
		f) latitude
		g) longitude
		2. Check the meridian ring. It shall have a graduation and the stand post shall fall in between 65° to 70° marks on the meridian ring, approximately illustrating a tilt of 23°.
		3. Spin the globe in both clockwise and counter clockwise
		directions. The spin should be smooth and unimpeded.
		4. The latitude and longitude lines should be correctly numbered.
		5. Pick at least 5 random cities (with 1 in the Philippines).

Item	Description	Inspection and Test Procedure
		6. Determine their latitude and longitude coordinates using the globe.
		7. Get a standard reference (Encyclopedia Britannica or
		Wikipedia) for the correct coordinates of the cities you
		selected. Your manually plotted coordinates should be
		within 5° of the referenced value.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
		3. phone or PC with reliable internet connection
		B. Functionality Test:
		1. The foam shall demonstrate the following:
		a. Mountain Formation
		b. Hogback Formation
		2. The fault structures shall demonstrate the following:
		a. Normal;
		b. Reverse; and
		c. Slide slip faults.
		3. Render leak test for the tray. Fill the tray with 3/4 full of water. Water shall not leak for at least 1 hour.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		B. Functionality Test:
		1. Check the accuracy of the labels. Preferably using Encyclopedia as reference.
		C. Materials Needed to Perform Inspection and Tests:
		1. steel rule/meter tape
		2. phone or PC with reliable internet connection
4	**Landform Demonstration Kit**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. The foam shall demonstrate the following:
		a. Mountain Formation
		b. Hogback Formation
		2. The fault structures shall demonstrate the following:
		a. Normal;
		b. Reverse; and
		c. Slide slip faults.
		3. Render leak test for the tray. Fill the tray with 3/4 full of water. Water shall not leak for at least 1 hour.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
5	**Model, Earth Internal Structure, 1/4 part detachable**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Check the accuracy of the labels. Preferably using Encyclopedia as reference.
		C. Materials Needed to Perform Inspection and Tests:
		1. steel rule/meter tape
		2. phone or PC with reliable internet connection
6	**Model, Tectonics Demonstrator**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. The item shall demonstrate the different simulation indicated in the technical specification.
		2. Verify the simulation preferrably using an Encylcopedia as reference.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
7	**Model, Volcano, cross section**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1) Verify the parts of the volcano as specified in the technical specification, preferrably using an Encyclopedia as a reference.
		2) Simulate Volcanic Eruption.
		C. Materials Needed to Perform Inspection and Tests:
		1. steel rule/meter tape
		2. phone or PC with reliable internet connection
		3. Materials for Volcanic Eruption (shall be brought by the supplier).

Item	Description	Inspection and Test Procedure
8	**Rock Samples, 24 pcs/set, (minerals of 3 rock types)**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Preferably, use encyclopedia as reference. Check if the appearance of each rock sample resembles the appearance in the reference picture.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
		3. phone or PC with reliable internet connection
		4. Overflow can
		5. Graduated cylinder (100mL)
9	**Telescope, Astronomical (Reflecting) - ES**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Measure the focal length-the effective physical length
		of the telescope:
		a) using a meter tape measure the distance from the rear of the telescope where the primary mirror (objective) is fixed to the secondary mirror is fixed. The secondary mirror is directly below the eyepiece. The measured distance is the focal length of the telescope. (To get the actual measure, get the length between the primary mirror and below the eyepiece.)
		2. Manipulate the controls of the telescope as presented
		in the accompanying manual, these includes the cradles,
		latitude, leveling and balancing, alignment, azimuth lock,
		declination etc.
		3.The telescope unit should respond accordingly as discussed in the manual.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
10	**Telescope, Astronomical (Reflecting) - JHS**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Measure the focal length-the effective physical length
		of the telescope:
		a) using a meter tape measure the distance from the rear of the telescope where the primary mirror (objective) is fixed to the secondary mirror is fixed. The secondary mirror is directly below the eyepiece. The measured distance is the focal length of the telescope. (To get the actual measure, get the length between the primary mirror and below the eyepiece.)
		2. Manipulate the controls of the telescope as presented
		in the accompanying manual, these includes the cradles,
		latitude, leveling and balancing, alignment, azimuth lock,
		declination etc.
		3.The telescope unit should respond accordingly as discussed in the manual.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
11	**Archimedes Principle Set**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Dynamometer:
		a) Check the dynamometer accuracy:
		i) one at a time suspend the BLR standard masses
		into the hook of the dynamometer;
		ii) dynamometer reading should be within ±2.5% of the
		value of each BLR standard mass
		2. Bucket and Plummet (with color bands)
		a) insert the plummet into the bucket
		b) the plummet should slide into the bucket unimpeded
		c) when the plummet is fully embedded inside the
		bucket, the color bands of the bucket and plummet
		should align without sign of offset
		3. Overflow Can and Catch Bucket

Item	Description	Inspection and Test Procedure
		a) place the catch bucket directly below the spout of the
		overflow can
		b) fill the overflow can with water past the spout; wait
		until the overflow stops
		c) pour into the sink the collected water in the catch
		bucket
		d) put back the empty catch bucket below the spout of
		the overflow can
		4. Whole Setup Testing
		a) pull out the imbedded plummet from the bucket
		b) suspend the bucket onto the hook of the
		dynamometer
		c) suspend the plummet onto the lower hook of the
		suspended bucket
		d) the combined weight of the bucket and plummet
		should not go beyond the graduation scale of the
		dynamometer
		e) record the dynamometer reading
		f) slowly immerse the suspended plummet into the
		overflow can with water; water overflows trough the
		spout then goes into the catch bucket; do this until
		the plummet (only) is completely immersed in the
		water
		g) the plummet shall be made to stay in the water
		steadily until no more water comes out of the spout of
		the overflow can
		h) record the new dynamometer reading
		i) now slowly transfer the water from the catch bucket
		into the bucket suspended on the dynamometer;
		note that as the suspended bucket is filled with water
		it goes down pushing down the suspended plummet
		deeper into the water;
		j) compensate by slowly pulling up the dynamometer to
		prevent the plummet from touching the bottom of the
		overflow can
		k) continue pouring the water from the catch bucket
		unto the suspended bucket until there is no more
		water left in the catch bucket
		l) check the reading on the dynamometer; the reading
		should go back to the previous reading in step e)
		above
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 Vernier caliper
		3. tap water
12	**Basic Lens Set, acrylic**	A. (Refer to General Inspection Protocol)
		B. Acrylic Test:
		OPTION 1:
		1. The lens will be tested for density using displacement
		method to verify the kind of material the lens is made of:
		a) using weighing scale measure the mass of each
		lens and record; note there are 7 types of lenses
		convex lens, concave lens etc.
		b) put the catch bucket directly below the spout of the
		overflow can
		c) fill the overflow can with water past the spout
		d) collect the overflowing water into the catch bucket
		until overflowing stops
		e) pour the collected water into the sink; place back the
		catch bucket below the spout of the overflow can
		f) carefully submerge the 50 mm double convex lens,
		into the water inside the overflow can
		g) measure the volume of the collected water using the
		100 mL graduated cylinder
		h) divide mass by volume; this is your calculated density
		of the lens sample; standard density for acrylic is
		1.18 grams/cm3; your calculated value should be

Item	Description	Inspection and Test Procedure
		within 10% of the standard value
		i) do steps c) to h) above for the rest of the remaining
		lenses
		OPTION 2: Combine the lenses altogether instead of single lens and do steps 1a) to 1h) above
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 Vernier caliper
		3. 1 over flow can and catch bucket in Archimedes
		Principle Apparatus
		4. 1 weighing scale
		5. tap water
13	**Coefficient of Linear Expansion**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Assemble the setup as per instruction in the accompanying user manual
		2. The Linear Expansion Apparatus comes with 3 different metal tubes: aluminum, brass, steel. Refer to the manual for identification of the metals.
		3. Select any of the metal rod samples either aluminum or brass or steel tubing; and measure its length. Record this as L.
		4. Insert the metal rod into the expansion jacket (see manual how to do this).
		5. Fix the expansion jacket onto the frame of the base of the linear expansion apparatus.
		6. Insert the thermometer into the rubber stopper.
		7. Insert the rubber stopper with thermometer into the built-in chamber of the expansion jacket (see manual).
		8. See to it that the metal tubing specimen you selected in step 4 above is align with the push rod of the dial gauge and the screw bolt of the lock mechanism of the base (see manual).
		9. Pour water (about 1/3) into the Erlenmeyer flask.
		10. Insert the 5 cm glass tubing into the rubber stopper.
		11. Insert the rubber stopper with glass tubing into the mouth of the Erlenmeyer flask.
		12. Assemble the stand set.
		13. Fix the Erlenmeyer flask onto the universal clamp of the stand set.
		14. Insert the glass tubing that is mounted on the mouth of the Erlenmeyer flask into one end of the rubber tubing
		15. Into the other end of the rubber tubing, insert the steam inlet of the expansion jacket of the linear expansion apparatus.
		16. Bring the hot plate in close proximity of stand set with the mounted Erlenmeyer flask.
		17. Sit the Erlenmeyer flask on the center of the platform of the hot plate.
		18. Set the scale of the dial gauge to"0" (refer to accompanying user manual how to do this).
		19. Record thermometer reading in oC as T1=the initial temperature of the metal tube.
		20. Turn ON the hot plate.
		21. Place the utility saucer underneath the condensed steam outlet of the expansion jacket.
		22. As the water boils, steam goes into the expansion jacket; you will see thermometer reading goes up and needle of dial gauge scale moves clockwise.
		23. When the thermometer reading becomes steady and so is the dial scale reading.
		24. At this instance the thermometer reading is your T2 in and dial scale reading is your ΔL (refer to manual how to interpret dial scale reading; convert reading to meter unit); record these values
		25. Calculate coefficient of linear expansion of the metal sample using the equation:
		$\alpha = \Delta L / L\Delta T$
		where: α=coefficient of linear expansion
		ΔL=change in length of the metal (dial scale reading)

Item	Description	Inspection and Test Procedure
		ΔT=change in temperature T2-T1
		The following are the accepted values of coefficient of linear expansion of the following metals:
		Aluminum: 25 × 10-6 °C
		Brass: 19 × 10-6 °C
		Steel: 12 × 10-6 °C
		27. Your calculated coefficient of linear expansion should be within ±10% of the accepted value.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 Vernier caliper
		3. 1 BLR stand set (1 stand base, 2 stand supports, 1-9.5 x 250 mm rod, 1-9.5 x 500 mm stand rod, 1 multi clamp, 1 universal clamp)
		3. 1 hot plate
		4. 1 thermometer
		5. 1 glass tubing 4 mm dia. X 5 cm long
		6. 1 rubber stopper with one hole
		7. 1 utility saucer
		8. 1 Erlenmeyer Flask (250 mL)
14	**DC Ammeter**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Insert the banana plug of the black connecting wire
		into the negative terminal of the DC ammeter and the
		banana plug of the red connecting wire into the
		positive terminal labeled “0.6A” of the DC Ammeter
		2. Fasten the alligator clip of the black wire used in 2
		above to the negative terminal of the dry cell
		3. Fasten the positive terminal of the dry cell using the
		alligator clip of the yellow connecting wire.
		4. Use the banana plug of the yellow wire in step 3 above
		to connect to one terminal of the bulb holder assembly
		5. Now use the alligator clip of the red connecting wire
		that is connected to the positive terminal “0.6A” of the
		DC of ammeter, to fasten the other terminal of the bulb
		holder assembly; this completes a closed circuit
		6. Record the reading of the DC ammeter
		7. do steps 1) to 6) above using the BLR reference
		digital multi meter; replace the DC ammeter by the BLR
		reference digital multimeter:
		a) turn selector knob of the BLR reference digital
		multimeter to 20A range
		b) pull out the banana plug of the black connecting wire
		from the DC ammeter and insert it into the ‘COM’
		terminal of the BLR reference digital multimeter
		c) pull out the banana plug of the red connecting wire
		from the DC ammeter and insert it into the ‘20A’
		terminal of the BLR reference digital multimeter
		b) switch ON the BLR reference digital multimeter
		e) record the reading on the BLR reference digital multi
		meter.
		8. Compare the DC ammeter reading you obtained in step
		6 above to that of the BLR reference multi meter
		obtained in step 7e) above; DC ammeter reading should
		be within ±5% of the BLR reference digital multi meter
		reading
		9. do steps 1 to 8 above using 2 dry cells connected in
		series to replace the single dry cell
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 Vernier caliper
		3. 1 miniature light bulb mounted on bulb holder
		4. 2-1.5 volt dry cell size D
		5. 2-dry cell holder
		6. 1 black connecting wire
		7. 1 red connecting wire
		8. 1 yellow connecting wire
		9. 1 BLR reference digital multimeter

Item	Description	Inspection and Test Procedure
15	**DC Voltmeter**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Insert the banana plug of the black connecting wire
		into the negative terminal of the DC voltmeter and
		the banana plug of the red connecting wire into the
		positive terminal labeled “3V”of the DC voltmeter
		2. Clip the alligator end of the black connecting wire to
		the negative terminal of the dry cell holder
		3. Clip the alligator end the red wire connecting wire to the
		positive terminal of the dry cell holder
		4. Record the DC voltmeter reading
		5. Transfer the banana plug of the red connecting wire
		from positive terminal labeled “3V” of the DC voltmeter
		to positive terminal labeled “15V”
		6. Record the DC voltmeter reading
		7. Compare the reading at “3V” setting on the DC
		voltmeter with the reading at “15V” setting; difference
		should not exceed ±5%
		8. Replace the DC voltmeter with the BLR reference
		digital multimeter.
		a) turn the selector knob of the BLR reference digital
		multimeter to select “20 VDC” range
		b) pull out the banana plug of the black connecting
		wire from the DC voltmeter and insert it into the into
		the “COM” terminal of the BLR reference digital
		multimeter
		c) pull out the banana plug of the red connecting wire
		from the DC voltmeter and insert it into the terminal
		labeled “VΩHz” of the BLR reference digital
		multimeter
		d) switch ON the BLR reference digital multimeter
		e) record the reading of the reference digital multimeter
		9. Compare the reading of the DC voltmeter in step 4
		above to the reading of the BLR reference digital
		multimeter in 8e above.
		10. DC voltmeter reading should be within ±5% of the
		BLR reference digital multimeter reading
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
		3. BLR reference digital multimeter
		4. 1-black connecting wire
		5. 1-red connecting wire
		6. 1-1.5 volt dry cell size D
		7. 1-dry cell holder for size D dry cell
16	**Manometer, Open U-tube with Nakamura-type Water Pressure Apparatus**	A. (Refer to General Inspection Protocol)
		B. Test
		1. Fill the U-tube manometer with water following
		instructions in the accompanying user manual.
		2. Insert the rifted tip of the U-tube manometer into one
		end of the supplied rubber tubing.
		3. Insert the L-shaped bent tubing mounted on the
		pressure sensor into the other end of the rubber tubing.
		4. Fasten the supplied diaphragm into each mouth of the
		pressure sensor following the instructions in the
		accompanying user manual.
		5. Apply slight pressure onto the diaphragm. The water
		inside the U-tube manometer should move up and
		down.
		6. Gradually dip the pressure sensor into the pitcher with
		water.
		7. The water inside the U-tube manometer shall
		respond.
		Pressure assembly leak test:

Item	Description	Inspection and Test Procedure
		1. Immerse the pressure assembly on water without connecting with the manometer for at least a minute. There shall be no water leaking in.
		2. Immerse the pressure assembly on water. Gently blow air through the tube. There shall be no bubbles coming out from the pressure sensor.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 Vernier caliper
		3. 1 small plastic pail or wide-mouth container
		4. tap water
17	**Mirror Set, acrylic**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. The mirror will be tested for density using displacement
		method to verify the kind of material the mirror is made
		of.
		2. Using triple beam balance measure the mass of each
		mirror and record. There are 3 types of mirrors:
		plane mirror, convex mirror, concave mirror.
		3. Put the catch bucket directly below the spout of the
		overflow can
		4. Fill the overflow can with water past the spout.
		5. Collect the overflowing water into the catch bucket
		until the last drop.
		6. Pour the collected water into the utility vessel. Place
		the catch bucket back below the spout of the overflow
		can.
		7. Carefully submerge the 50 mm plane mirror into the
		water inside the overflow can.
		8. Measure the volume of the collected water using the
		100 mL graduated cylinder.
		9. Divide mass of the plane mirror divided by the volume
		of collected water from the overflow can. This is your
		calculated density of the mirror sample.
		10. The standard accepted value for density of acrylic is
		1.18 grams/cm3; your calculated value should be
		within 10% of the standard value
		11. Do steps 4 to 10 above for the rest of the mirrors
		short cut method: combine the mirrors altogether and do steps 2 to 10 above
		C. Materials Needed to Perform Inspection and Tests:
		1. 1Vernier caliper
		2. 1 overflow can and catch bucket in the Archimedes
		Principle Apparatus
		3. 1-100 mL graduated cylinder
		4. 1 triple beam balance
		5. 1 utility water vessel
18	**Optical Bench Set**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Mount the meter stick on the stand; meter stick should
		be stable without sign of tipping off.
		2. Mount the different holders on the meter stick (see
		accompanying user manual); mounted holders should
		be stable without sign of tipping off.
		3. One at a time slide each holder along the meter stick
		back and forth.
		4. Each holder should slide smoothly without getting stuck
		5. Get 1-50 mm mirror from the plane mirror set and 1-50
		mm lens from the basic lens set.
		6. Mount the mirror and lens into the smaller holder; the
		holder should have firm grip on the lens and mirror.
		7. Get the 75 mm lens from the basic lens set and mount it
		into the larger lens holder; the holder should have firm
		grip on the lens.
		8. Mount the screen into the screen holder; grip should be
		firm.
		9. Mount the candle into the candle holder; grip should be

Item	Description	Inspection and Test Procedure
		firm.
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
		3. 1 mirror set
		4. 1 basic lens set
19	**Prism Set**	A. (Refer to General Inspection Protocol)
		B. Functionality Test:
		1. Look for a beam of sunlight that is passing thru
		openings and place the prism on the path of the sunlight
		beam.
		2. Adjust the angle of the prism relative to the path of the
		sunlight beam' you should see red, blue, green colors
		projected.
		3. The prism will be tested for density by dividing its mass
		by its volume
		a) using triple beam balance measure the mass of
		prism; record the measured mass
		b) calculate the volume of the prism by using the
		formula ½ base x height x thickness
		c) divide mass by volume; this is your calculated density
		of the prism sample
		d) standard density for acrylic is1.18 grams/cm3
		your calculated value should be within 10% of the
		standard value
		C. Materials Needed to Perform Inspection and Tests:
		1. 1 steel rule/meter tape
		2. 1 vernier caliper
		3. 1 triple beam balance
		4. sunlight