

**SHS REQUIREMENTS:
Facilities, Materials and Equipment
STEM**

STEM STRAND (CORE SUBJECTS)

Essential program will not run/not be implemented without these			Supplemental will enhance/ enrich implementation
Track	Facilities	Materials and Equipment	
Core Science Subjects 40 students	<ul style="list-style-type: none"> ✓ 1 Life Science Laboratory (including sink, storage, shower) ✓ 1 Chemistry Laboratory (including sink, storage, shower) ✓ 1 Physical Science Laboratory (including sink, storage, shower) ✓ 1 Computer Laboratory ✓ 1 Storage Room (chemical and toxic substances) 	<ul style="list-style-type: none"> ✓ NSTIC-developed Basic Science Equipment (1 package per 5 students): <ul style="list-style-type: none"> ○ Stand Base Assembly ○ Stand Support ○ Ring with stem ○ Ø9.5mm x 250mm long Stand Rod ○ Ø9.5mm x 500mm long Stand Rod ○ Ø12.7mm x 1000mm long Stand Rod ○ Multiclamp Assembly ○ Universal Bosshead Assembly ○ Universal Clamp Assembly ○ Test Tube Holder ○ Test Tube Rack ○ Case 001 (with Cover and Base Sheathing) ○ Case 002 (with Cover and Base Sheathing) ○ Case 003 (with Cover and Base Sheathing) ✓ NSTIC-developed Mechanics Science Equipment (1 package per 5 students) <ul style="list-style-type: none"> ○ Cart-Rail System (includes Dynamic Carts, Motorized Cart, Rails, etc.) ○ Free-Fall Apparatus (includes Solenoid, Pad Switch, Synchro Box, Timer, etc.) ○ Hooke's Law Apparatus ○ Friction Apparatus ○ Lever Assembly 	<ul style="list-style-type: none"> ✓ Shelves and Cabinets for Earth and Space equipment

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		<ul style="list-style-type: none"> ○ Pulley set: <ul style="list-style-type: none"> • Double Pulley Assembly • Single Pulley Assembly ○ Spring Balances: <ul style="list-style-type: none"> • 10-Newton Spring Balance Assembly • 5-Newton Spring Balance Assembly • 2-Newton Spring Balance Assembly ○ C-Clamp with hook ○ Hooked Masses: <ul style="list-style-type: none"> • 500-gram Hooked Mass • 250-gram Hooked Mass • 20-gram Hooked Mass ○ Case 001 (with Cover and Base Sheathing) ○ Case 002 (with Cover and Base Sheathing) ○ Case 003 (with Cover and Base Sheathing) ○ Spare Parts: <ul style="list-style-type: none"> • Worm with Axle Assembly • Worm Gear A • Spur Gear B • Spur Gear C ✓ NSTIC-developed Thermocline Apparatus (1 package per 5 students) ✓ NSTIC-developed Heat Conductivity Apparatus ((1 package per 5 students) ✓ Aneroid Barometer Set (demonstration type) ✓ Aneroid Barometer Set (wall type)

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		<ul style="list-style-type: none"> ✓ Hand Lens, at least 10x magnification ✓ Rain Gauge ✓ Protractor, plastic, 180°, semi-circular, 15cm diameter (minimum) ✓ Stopwatch, digital ✓ Balance, Triple-Beam ✓ Relief Globe, Ø 12 inches ✓ Bulb, flashlight size, 2.5 V, screw-type ✓ Bulb Socket, flashlight size, screw-type ✓ Penlight, 3 V, plastic case ✓ Anemometer with Wind Vane, handheld, digital direct reading ✓ Magnetic Compass ✓ AWG # 22 Wire, red, 250mm long with alligator clips at both ends ✓ AWG # 22 Wire, black, 250mm long with alligator clips at both ends ✓ AWG # 22 Wire, red, 500mm long with alligator clips at both ends ✓ AWG # 22 Wire, black, 500mm long with alligator clips at both ends ✓ Bar Magnet, 6" x 3/4" x 1/4" ✓ U-shaped Magnet, 3" L x 3" W x 3/4" thick ✓ Graduated Cup, 200 ml. Capacity, plastic, transparent ✓ Meterstick, plastic ✓ Ring and Ball Apparatus

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		<ul style="list-style-type: none"> ✓ Glass Rod, solid, Ø 6mm (minimum) x 300mm long (Insulator) ✓ Plastic Rod, solid, Ø 6mm (minimum) x 300mm long (Insulator) ✓ Wood Rod, solid, Ø 6mm (minimum) x 300mm long (Insulator) ✓ Copper Rod, solid, Ø 6mm (minimum) x 300mm long (Conductor) ✓ Aluminum Rod, solid, Ø 6mm (minimum) x 300mm long (Conductor) ✓ Steel Rod, solid, Ø 6mm (minimum) x 300mm long (Conductor) ✓ Celestial Globe ✓ Rock Samples Box, 24 compartments ✓ Telescope, astronomical ✓ Bunsen Burner, gas-type ✓ Tweezer, 6 1/2" long, stainless steel, self-closing, with wood handle & serrated jaws ✓ Laboratory Tong, stainless steel, 8 3/4" long ✓ Test Tube Brush ✓ Hand Gloves, acid/solvent-resistant, super nitrile ✓ Safety Goggles ✓ Storage Cabinet, 1800 mm x 2000 mm x 500 mm ✓ Beaker, 250 ml., borosilicate ✓ Erlenmeyer Flask, 250 ml., borosilicate ✓ Stirring Rod, Ø 6mm x 250mm long

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		<ul style="list-style-type: none"> ✓ Test Tube, Ø 16mm x 150.8mm long ✓ Glass Tubing, Ø 4mm x 1220mm long ✓ Vial, Ø 12mm x 75mm long ✓ Graduated Cylinder, 100 ml. capacity ✓ Graduated Cylinder, 10 ml. Capacity ✓ Glass Funnel, Ø 50mm (Top Inside Diameter), 100mm long Stem ✓ Petri Dish, Ø 100mm (minimum) ✓ Watch Glass, Ø 100mm (minimum) ✓ Reagent Bottle, 250 ml. capacity ✓ Glass Tubes, Hematocrite, 100's/pack (for experiments in capillarity) ✓ Glass Tube, 3mm OD x 1200mm long (for experiments in capillarity) ✓ Glass Tube, 6mm OD x 1200mm long (for experiments in capillarity) ✓ Hydrometer, Specific Gravity: 0.700 - 2.000, 15" long ✓ Alcohol Thermometer, -20°C to 110°C ✓ Evaporating Dish, 75 ml. capacity ✓ Alcohol Burner, glass, 120 ml. Capacity ✓ Mortar and Pestle, 300 ml. Capacity ✓ Syringe, 10 ml. Capacity, without needle ✓ Medicine Dropper, 2 ml. capacity ✓ Triangular File, 6" long, with handle

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STEM STRAND (BIOLOGY)

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Biology STEM	✓	<ul style="list-style-type: none"> ✓ Digital Microscope or better ✓ Hand Lens, at least 5x magnification ✓ Balance, Triple-Beam ✓ Cork Borers, 4mm to 20mm OD, 12 borers/set ✓ Tripod, Height: 6" ✓ Cork Stopper for Ø 16mm test tube ✓ Rubber Stopper for Ø 16mm test tube ✓ Rubber Stopper # 6 with 2 holes ✓ Filter Paper, ordinary, 24" x 24" sheet ✓ Litmus Paper Strips, blue, 100's/vial ✓ Litmus Paper Strips, red, 100's/vial ✓ Hand Gloves, acid/solvent-resistant, super nitrile (1:1) ✓ Safety Goggles (1:1) ✓ Storage Cabinet, 1200mm x 600mm x 2000mm ✓ Test Tube, Ø 16mm x 150mm long ✓ Evaporating Dish, 75 ml. capacity ✓ Glass Funnel, Ø 50mm (Top Inside Diameter), 75mm long Stem ✓ Petri Dish ✓ Beaker, 250 ml., borosilicate ✓ Alcohol Thermometer, -20°C to 110°C ✓ Glass Slides, 100's/box ✓ Glass Cover Slips, 100's/box ✓ Graduated Cylinder, 100 ml., borosilicate ✓ Erlenmeyer Flask, 250 ml., borosilicate 	<ul style="list-style-type: none"> ✓ Digitized Science Equipment: <ul style="list-style-type: none"> ○ pH Sensor with computer interface/software ○ Sensor Extension Cable ○ Barometer Pressure Sensor with computer interface/software ○ Electronic Balance ○ Carbon Dioxide Sensor with computer interface/software ○ Oxygen Gas Sensor with computer interface/software ○ Quick Release Connector ○ Skin/Surface Temperature Probe ○ Introduction & use of dichotomous keys Kit ○ Microscope, halogen illumination (4x, 10x, 40xR, and 100xR) ○ Dissecting Microscope ○ Examining Bacteria through infusion laboratory investigation Kit ○ Bio Laminar Flow Hood (equipped for growth and

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		<ul style="list-style-type: none"> ✓ Stirring Rod, Ø 6mm x 250mm long ✓ Alcohol Burner, glass, 120 ml. capacity ✓ Graduated Cylinder, 10 ml., borosilicate ✓ Watch Glass, Ø 90mm ✓ Mortar and Pestle, 300 ml. capacity ✓ dissecting set or scalpel & forceps ✓ Wash Bottle, plastic, 250 ml. ✓ Medicine Dropper, 2 ml. capacity 	<ul style="list-style-type: none"> preparation of cultures) ○ Nutrient Agar Culture Media ○ Incubator ○ Laboratory Oven ○ Accessories
Chemistry	✓	<ul style="list-style-type: none"> ✓ Alcohol Thermometer, -20°C to 110°C ✓ Graduated cylinder, 10 ml cap, borosilicate ✓ Graduated Cylinder, 100 ml., borosilicate* ✓ Test Tube, Ø16mm x 150mm long ✓ Wire Gauze, 140mm x 140mm (minimum) ✓ Stirring Rod, Ø 6mm x 250mm long ✓ Evaporating Dish, 75 ml. capacity ✓ Electrolysis Apparatus, Hoffman-type ✓ Alcohol Burner, glass, 60 ml. capacity ✓ Watch Glass, Ø 90mm ✓ Distilling Flask, 250 ml. ✓ Volumetric Flask, 250 ml. ✓ Erlenmeyer Flask, 250 ml., borosilicate ✓ Beaker, 500 ml, borosilicate ✓ Beaker, 250 ml, borosilicate ✓ Beaker, 100 ml, borosilicate ✓ Beaker, 50 ml, borosilicate ✓ Reagent Bottle, narrow mouth amber color (250 ml. capacity) 	<ul style="list-style-type: none"> ✓ Digitized Science Equipment: <ul style="list-style-type: none"> ○ SPARK Science Learning System ○ Fast Response Temperature Sensor (3 packs) with computer interface/software ○ Skin/Surface Temperature Probe ○ Sensor Extension Cable ○ Hot Plate ○ Absolute Pressure Sensor with computer interface/software ○ Water Quality Sensor with computer interface/software ○ Turbidity Sensor with computer interface/software ○ Barometer Sensor with computer interface/software

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		<ul style="list-style-type: none"> ✓ Reagent Bottle, wide mouth colorless (250 ml. capacity) ✓ Glass Funnel, Ø 50mm (Top Inside Diameter), length of stem: 75mm ✓ Cork Borers, 4mm to 20mm OD, 12's/set ✓ Burette, 25 ml. Capacity (acid) ✓ Burette, 25 ml. Capacity (base) ✓ Glass Tubing, Ø 6mm x Ø 4mm x 1220mm long ✓ Vial, Ø 6mm x 50mm long ✓ Hydrometer for light liquids ✓ Hydrometer for heavy liquids ✓ Condenser, Liebig-type ✓ Graduated Pipette, 10 ml. Capacity ✓ Balance, Double-Beam, 2610-gram capacity ✓ Spatula , porcelain ✓ Mortar and Pestle, 150 ml. capacity ✓ Calorimeter ✓ Osmosis Apparatus ✓ Electrical Conductivity Apparatus ✓ pH Meter, range: 0 to 14 pH ✓ Open U-tube Manometer (and Accessories) ✓ Phenolphthalein Indicator, 100 grams/bottle ✓ Litmus Paper Strips, blue, 100's/vial ✓ Litmus Paper Strips, red, 100's/vial ✓ Universal pH Paper, ph 0-14, 100 strips/pack ✓ Filter Paper, ordinary, 24" x 24" sheet ✓ Rubber stopper for Ø 16mm test tube
		<ul style="list-style-type: none"> ○ Electronic Balance – top loading ○ Quick Release Connector ○ Accessories and various chemical solutions ○ Magnetic stirrer

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		<ul style="list-style-type: none"> ✓ Rubber stopper for 250 ml Erlenmeyer flask , with 1 hole ✓ Rubber stopper for 250 ml Erlenmeyer flask , with 2 holes ✓ Cork stopper for 250 ml Erlenmeyer flask , with 1 hole ✓ Cork stopper for 250 ml Erlenmeyer flask , with 2 holes ✓ Cork stopper for Ø 16mm test tube ✓ Chart on Periodic Table of Elements, tarpaulin, 36" x 72" ✓ Poster on Laboratory Safety Rules, 30" x 40", tarpaulin, wall mount ✓ Poster on Basic Laboratory Apparatuses, 30" x 40", tarpaulin ✓ Laser Pointer, dual-function, eith dry cells ✓ Hand Gloves, acid/solvent-resistant, super nitrile ✓ Safety Goggles (1:1) ✓ Test Tube Brush ✓ Rubber Tube, Ø 10mm x Ø 8mm x 2000 mm long, Latex ✓ Syringe, 5 ml. Capacity, plastic ✓ Storage Cabinet for corrosive materials ✓ Storage Cabinet for non-corrosive materials ✓ Triangular File, 6" long, with handle ✓ stainless steel screw #6

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		<ul style="list-style-type: none"> ✓ connecting wires red and blue ✓ copperwires ✓ stripping knife ✓ bulldog type clips ✓ measuring cup ✓ iron stand and burette clamp
Physics	✓	<ul style="list-style-type: none"> ✓ Open U-tube Manometer (and Accessories) ✓ Air Blower, variable speed control ✓ Set of Connectors: <ul style="list-style-type: none"> ○ AWG # 22, black, 300mm long with alligator clip and banana plug on ends ○ AWG # 22, red, 300mm long with alligator clip and banana plug on ends ○ AWG # 22, white, 300mm long with banana plugs on both ends ○ AWG # 22, blue, 300mm long with banana plugs on both ends ✓ Resistance Box ✓ Switch, knife-type ✓ Multitester/Multimeter ✓ Galvanometer ✓ Set of Coils ✓ Motor-Generator Model Experiment Set ✓ Advanced Electromagnetism Kit ✓ Basic Electronics Kit ✓ Fuse Holder with Fuse ✓ Variable Power Supply, AC-DC
		<ul style="list-style-type: none"> ○ Archimedes Principle Apparatus ○ Digitized Science Equipment: ○ Voltage/Current Sensor with computer interface/software ○ Oscilloscope ○ Complete Robotics Kit (to include hardware, software, and accessories) ○ Force Table ○ Motion Sensor (free-fall adapter for CAE experiments) with interface/software ○ Force Sensor with computer interface/software

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		<ul style="list-style-type: none"> ✓ Tuning Fork Set (set of 8 tuning forks) ✓ Loudspeaker, > 1 watt, all frequency or low range, 4-8 Ohms ✓ Slinky Coil, metal, Ø3" x 4" long ✓ DC String Vibrator with String ✓ Basic Lens Set (set of 7 lenses) ✓ Mirror Set (set of 3 mirrors) ✓ Prism , right-angle, acrylic, 28 x 38 x 75mm ✓ Refraction Blocks (1 set is composed of 1 pc Glass & 1 pc Acrylic) ✓ Refraction Tank ✓ Student Optical Bench Set with Meterstick ✓ Multitester/Multimeter ✓ Beaker, 500 ml., polypropylene plastic ✓ Florence Flask, 250 ml., polymethylpentene ✓ Dry Cell. 1.5 V, size D , ISO Certified ✓ Dry Cell, 9 V, ISO Certified ✓ Logic Gates Trainer Kit ✓ Balance, Triple-Beam ✓ Basic Radioactivity Kit
		<ul style="list-style-type: none"> ○ Moment Apparatus ○ Pressure Sensor (for fluid mechanics) with computer interface/software ○ Tesla (magnetic field) Sensor with computer interface/software ○ Engine Model ○ Refrigeration Model ○ Electrophysiology Sensor with computer interface/software ○ Transmitter Receiver for radio based communication (computer-based) ○ Ticker timer w/ ticker tapes (rolls) ○ Transformers ○ Robotics Set ○ Set of Tools ○ Screwdriver, flat, 6" ○ Screwdriver, phillips, 6" ○ Long Nose Pliers, 6" ○ Mechanical Pliers, 6" ○ Soldering Iron, 60 watts

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			<ul style="list-style-type: none"> ○ Ball Peen Hammer, length including handle is 11", 300-350 grams ○ Precision Screwdrivers Set, 6 pcs, with plastic casing ○ Tweezers, stainless steel, with curved tips, 6 1/2" long ○ Diagonal Cutters, 6" ○ Soldering Wire, Ø1mm, Grade 60/40, Wt.: 1 lb/spool ○ Soldering Paste, 50 grams/can <p>Resonance Tube Set, open-ended Sound Signal Generator Kit</p>