

Arizona Department of Education

Career and Technical Education

Recommended Equipment List

Program: AgriScience
CIP#: 01.0000.00

NOTE: The following items and descriptions are the recommended equipment guidelines for each **CTE AgriScience** program. Please note that this list of recommended items does not necessarily need to be supported financially by Federal Perkins or State Priority funding sources. In many cases, local school district funds are used to purchase items on a regular basis (i.e. furniture, consumables, etc.) Further, please understand that this is not an exhaustive list. Local program and business needs may necessitate the purchase of additional equipment and software resources, as may the rapidly-changing nature of the industry-specific technologies used in the program.

Please contact ADE-CTE Program Specialist for **Agriculture and Welding** if you have questions regarding the appropriateness of any item you are considering for addition to your **CTE AgriScience** program.

Recommended Equipment and Software

| Item | Item |
|--------------------|------|
| AgriScience | |

Agriscience classroom should reflect the environment, equipment, supplies and instructional materials students would expect to find in industry.

| <u>Equipment:</u> | <u>Facility/Equipment(continued)</u> |
|--|---|
| Foldable Table | Grinders |
| National FFA Career Development Event (CDE) equipment | Tiller |
| Printers | Fertilizer injectors |
| Stackable Chairs | EC (electroconductivity) meter |
| Whiteboard | Pipe threader |
| Supplies: | Pipe cutter – large and small |
| Calculators (graphing/scientific) | Propane torches – soldering |
| *Computers (one per two students) | Pipe vises (and tables) |
| Facility/Equipment | Metal tables |
| Greenhouse – complete with environmental controls and timers | Welders |
| Benches/Tables for greenhouse | Collapseable (sp) saw horses |
| Bottom heat for propagating. | Lab glassware – beakers, graduated cylinders, bottles |
| Hydroponics systems | Hot/stir plates |
| Aquaculture system | Computers |
| Wheelbarrows | Drafting boards and equipment (T squares, triangles, templates, etc.) |
| Fiberglass concrete forms – for benches, etc. | Facility Supplies |
| Hand tools – hammers, screwdrivers, socket set, wrenches, tape | Tissue culture supplies – agar, sucrose, nutrients |
| Drills – cordless is always good | Ethanol |
| Skill saw | Pvc pipe |
| Concrete/Masonry tools – trowel, float, edger, jointer | Drip pipe |
| Drill press | Copper pipe |
| Band saw | Solder |
| Drill bits, hole saws | Flux |
| Aquaculture water meter (colorimeter kit is good too) | Block/brick |
| Handheld pH meters | Soil – mulch, perlite, vermiculite |
| Benchtop pH meter for Biotech/Tissue Culture | Plant containers – 1 gallon, 5 gallon, liners |
| Tissue culture grow rack with lights | Concrete, cement, sand, lime |
| Tissue Culture chambers | Stir bars (plastic coated magnets for stir plates) |
| Autoclave | Seeds – garden, greenhouse and hydroponics |
| Incubator | Hydroponic nutrients |
| Lawn mower | Fish |
| Laminar Flow Hood (tissue culture) | Fish food |

The following tools and equipment have been assembled to provide guidance to satisfy the core curriculum in Agricultural Mechanics Instruction.

Ag Mechanization

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| <u>Wood Construction—Machinery</u> | <u>Metal Construction—Hand Tools Plumbing</u> |
| Drill Press 15in. | Bender, Tubing ¼" – 5/8" |
| Saw, Radial Arm 14in. blade | Brace, Hand 10" |
| Saw, Table 10in blade | Cutter, Pipe 1/8" – 2" |
| <u>Wood Construction—Portable Electric Power Tools</u> | Cutter, Tubing 3/16" – 5/8" |
| Cleaner, Vacuum 2HP | Cutter, Plastic pipe ¼" – 2 5/8" |
| Drill, Electric (HI-LO gear) 3/8" | Die, Pipe threading 3/8" – ¾" |
| Drill, Electric (Reversible) 3/8" | Die, Pipe Threading ½" – 2" |
| Router 1 ½ HP | Flaring Tool 3/16" – 5/8" |
| <u>Wood Construction—Hand Tools</u> | Groover, Hand No. 4 |
| Awl, Scratch 6" | Hammer, Tinnors 12 oz |
| Bar, Nail 10" | Handle, Tap ¼" – 1" |
| Bar, Pry 10" | Mallet, Tinnors 20 oz |
| Bar, Ripping 24" | Pliers, Forming 8" |
| Bevel, Sliding 8" | Riveter, Pop 1/8" – 3/16" |
| Bit, Auger No. 4 – 16 | Rule, Steel 1" x 36" |
| Bit, Expansive 7/8" – 3" | Snips, Tinnors (left cut) 10" |
| Bit, Wood ¼" – 1" | Snips, Tinnors (right cut) 10" |
| Brace, Box Ratchet 10" | Snips, Tinnors (straight combo) 10" |
| Chalk line 50ft | Square, Combination 12" |
| Chisel, Wood ¼" - 1 ½" | Oiler, Bench 1/3 pint |
| Clamp, Fixture ¾" pipe | Reamer, Pipe 1/8" – 1" |
| Clamp, Hand Screw 12" | Reamer, Pipe ¼" – 2" |
| Clamp, Hand Screw 10" | Saw, Hack 12" |
| Clamp, Hand Screw 8" | Swaging Tool ¼" – 5/8" OD |
| Clamp, Hand Screw 6" | Tap, Pipe 1-8" ¾" |
| Countersink ½" | Torch, Propane |
| Divider, Wing 7" | Vise, Pipe 1/8" – 2 ½" |
| Drill, Screw setting No. 6-12 | Wrench, Pipe 8" |
| Hammer, Nail (curved claw) 13oz | Wrench, Pipe 10" |
| Hammer, Nail (curved claw) 16oz | Wrench, Pipe 12" |
| Hammer, Nail (ripping claw) 16oz | Wrench, Pipe 14" |
| Knife, Putty 1 ¼" | Wrench, Pipe 18" |
| Knife, Utility 6" | Wrench, Pipe 24" |
| Level, Carpenter's 24" | <u>Sheet Metal</u> |
| Mallet 16oz | Awl, Scratch 6" |
| Nail Set 4" | Copper, Soldering 3 lb |
| Plane, Block 6" | Copper, Soldering 2 lb |
| Plane, Jack 14" | Divider, Wing 12" |
| <u>Wood Construction—Hand Tools</u> | <u>Metal Construction—Hand Tools Welding Hot Metal</u> |
| Plane, Smoothing 9" | Gauge, metal |
| Pliers, Fencing 10 ½" | Chipping Tool |
| Rasp (half round) 14" | Clamp 9" |
| Rasp (round) 14" | Clamp, C 4" |
| Rasp (square) 12" | Clamp, C 6" |
| Rule, Tape 5M/16ft | Clamp, C 8" |

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|--|---|
| Rule, Tape 30M/100ft | Clamp, C 11" |
| Saw, Hand 26" x 11pt | Cleaner, Tip |
| Saw, Hand 26" x 9pt | Glove, Leather Large |
| Saw, Hand 26" x 5 ½ pt | Hammer (ball pein) 24oz |
| Screwdriver, Clutch 3" | Hammer (ball pein) 32oz |
| Screwdriver, Clutch 4" | Hammer (blacksmith) 32oz |
| Screwdriver, Phillips 3" | Hammer 8 lb |
| Screwdriver, Phillips 4" | Lighter |
| Screwdriver, Ratchet 25" | Pliers 10" |
| Screwdriver, Regular 4" | Saw, Hack 10" – 12" |
| Screwdriver, Regular 6" | Tongs 3/8" x 20" |
| Screwdriver, Regular 8" | Tongs 24" |
| Square, Combination 12" | Vise 5" |
| Square, Framing 16" x 24" | Concrete & Masonry—Machinery |
| Square, Framing Metric | Mixer 4 cu ft |
| Wood Construction—Miscellaneous | Mortar Box 9.2 cu ft |
| Bench, 2 station 28 x 64" | Wheelbarrow 5.5 cu ft |
| Brush, Bench 8" | Concrete & Masonry— Hand Tools |
| Brush, Paint 2" | Corner Box |
| Brush, Paint 3" | Drill, Masonry |
| Sharpening Stone 8 x 2 x 1" | Edger 6" x 2 ½" x ¼" |
| Staple Gun ½" | Edger 6" x 3 ½ x 3/8" |
| Vise, Woodworking 4" x 10" | Edger 6" x 4" x ½" |
| Metal Construction—Machinery | Float, Bull 42" x 8" |
| Anvil 140# | Float, Magnesium 16" x 3 ½" |
| Bender, Iron | Float, Sponge 8" x 4" |
| Brake, Metal 48" | Float, Wood 18" x 3 ½" |
| Compressor, Air 7.5 CFM | Float, Wood 12" x 4 ½" |
| Drill Press 20" | Groover 6" x 2" x 1/8" |
| Drill Press Vise No. 3 | Groover 5 ½" x 3" x 3/8" |
| Forge, Gas Fired 400,000 BTU | Hammer, Electric ½" |
| Grinder, Bench 6" x ¾" x ½" | Hoe, Mortar 10" width |
| Grinder, Floor Stand 12" x 2" x 1 ¼" | Hose, Water 5/8" x 50' |
| Saw, Abrasive cut off 14" blade | Jointer, Brick ½" 5/8" |
| Saw, metal Cutting ½" x .024" blade | Level, Masons 48" |
| Shear, metal 3/16" | Line, Masons 250' |
| Sheer, metal ½" | Pads, Knee |
| Welder, Electric Arc 225 amp | Rubbing Brick 6" x 3" |
| Metal Construction—Machinery (cont.) | Concrete & Masonry— Hand Tools (cont.) |
| Welder, Electric Arc 250-300 amp | Scale, Weight 100lb |
| Welder, MIG 150-200amp | Sieve, Aggregate |
| Welder, Oxy-acetylene Equipment | Shovel (square point) 10" |
| Metal Construction—Portable Power Tools | Shovel (round point) 9" |
| Drill, Electric ½" | Tamper, Jitterbug 36" x 6 ½" |
| Furnace, Soldering 3 burner | Trowel, Brick 11 ½" x 5" |
| Grinder, Right Angle 7" | Trowel, Finishing 12" x 4" |
| Grinder, Straight 5" | Trowel, Finishing 16" x 4" |
| Impact Tool, Electric 5" | Trowel, Margin 5" x 2" |

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| Nibbler 16ga | Trowel, Pointed 11" x 5 1/2" |
| Saw, Band 1/2" blade | Trowel, Pointing 4 1/2" |
| Metal Construction—Hand Tools Cold Metal | Concrete & Masonry—Miscellaneous |
| Caliper, Vernier 5" cap (English meas.) | Bucket 5 gal |
| Caliper, Vernier 5" cap (metric meas.) | Can, Oil 1qt |
| Chisel, Cold 3/4" | Electrical—Hand Tools |
| Cutter, Bolt 30" | Belt, Cotton Web 2 1/4" wide |
| Dresser, Grinder 12" | Bender 1/2" |
| Dresser, Grinder 6" | Bender 3/4" |
| Drill, Twist Fractional (straight shank) | Bit, Auger 5/8" x 18" |
| Drill, Twist Number (straight shank) | Bit, Auger 3/4" x 18" |
| Drill, Twist Letter (straight shank) | Cable Ripper 3 3/4" |
| Drill, Twist Fractional (taper shank) | GFCI, Portable 15 amp |
| File, Hand (half round) 14" | Hammer, Nail 16oz |
| File, Hand (flat) 12" | Knife 1 blade |
| File, Hand (mill) 12" | Knockout 1/2 - 1 1/4 |
| File, Hand (half round) 10" | Meter, AC Volts 4 1/2 |
| File, Hand (mill) 10" | Meter, AC Amp 4 1/2 |
| File, Hand (round) 12" | Pliers, Diagonal 8" |
| File, Hand (round) 10" | Pliers, Long Nose 7" |
| File, Hand (square) 12" | Pliers, Pump 10" |
| File, Hand (square) 10" | Pliers, Side Cutting 9" |
| File, Card N | Screwdriver 3/16" x 4" |
| File, Hand (3-square) 8" | Screwdriver 3/16" x 6" |
| File, Hand (taper) 6" | Screwdriver #2 x 4" |
| Gauge, Drill point 6" | Soldering Gun 325 watt |
| Gauge, Drill size fractional | Terminal |
| Hammer, Ball Pein 3/0 | Tester 0-300amp & 0-600 volt |
| Hammer, Ball Pein 1 | Tool Pouch 5" |
| Marking Stamps (figure) 3/16" | Portable Tester Equipment |
| Marking Stamps (letter) 3/16" | Analyzer, Exhaust Gas |
| Oiler, Bench 1/3 pint | Extension Cord 50' |
| Saw, Hack 10-12" | Hydrometer (battery testing) |
| Saw, Hole 3/4" - 2 1/2" | Hydrometer (radiator testing) |
| Screwdriver 4" | Lamp, Trouble 25' |
| Screwdriver 6" | Tachometer 50-4000rpm |
| Metal Construction—Hand Tools Cold Metal (cont.) | Portable Tester Equipment (cont.) |
| Screw plate 1/4" - 3/4" NC | Tester, Battery |
| Screw plate 1/4" - 1/2" NC | Tester, Engine |
| Screw plate machine screw | Tester, Generator |
| Square, Combination 12" | Tester, Ignition |
| Square, Combination (blade square head) 12" | Tester Pressure Cap |
| Vise, Machinist's 4" | Tester, RPM |
| Wrench, Adjustable 8" | Hand Tools (Continued) |
| Wrench, Adjustable 10" | Puller (universal joint) |
| Power Tools & Equipment | Puller 13 ton |
| Charger, Battery 80amp | Punch, Gasket 1/4-5/8" |
| Cleaner, Parts 45gal | Punch 1/8-1/4" |

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| Cleaner, Washer 4 GPH | Retrieving Tool 26' |
| Creeper, Mechanics | Screwdriver 12" (standard blade) |
| Hoist, Wheel 2 ton | Screwdriver 10" (standard blade) |
| Jack, Axle 4 ton | Screwdriver 8" (standard blade) |
| Jack, Service 1 ½ ton | Screwdriver 6" (standard blade) |
| Paint Spray 1qt | Screwdriver 4" (standard blade) |
| Press, Hydraulic 25ton | Screwdriver #3 (Phillips head) |
| Stands, Safety 2 ton | Screwdriver #2 (Phillips head) |
| Hand Tools | Screwdriver #1 (Phillips head) |
| Air Hose ¼" 25" | Screwdriver 3/16 (clutch head) |
| Bar, Drag Link 16" | Screwdriver ¼ (clutch head) |
| Bar, Pry ¾" x 24" | Screwdriver 5/16 (clutch head) |
| Bar, Pry ¾" x 18" | Wrench, Adjustable 8" |
| Battery Carrier 17" | Wrench, Adjustable 10" |
| Battery Cleaner | Wrench, Adjustable 12" |
| Battery Filler 1qt | Wrench, Adjustable 18" |
| Brush, Parts 12" | Wrench, Allen .028-3/8" |
| Bushing Driver | Wrench, Flat ¼"-1 5/16" |
| Caliper, Inside 8" | Wrench, Flat 3/8" – 1 ¼" |
| Caliper, Outside 8" | Wrench, Ignition 7/32 – 7/16 |
| Caliper, Micrometer 0-1" | Wrench, Oil Filter |
| Caliper, Micrometer 1-2" | Wrench, Socket ¾" Drive (square) |
| Caliper, Micrometer 2-3" | Wrench, Socket ½" Drive (square) |
| Caliper, Micrometer 3-4" | Wrench, Socket 3/8" Drive (square) |
| Caliper, Micrometer 4-5" | Wrench, Socket ½" Drive (deep socket) |
| Caliper 6" | Wrench, Socket 3/8" Drive (deep socket) |
| Can Fuel 5gal | Wrench, Socket 3/8" Drive (spark plug) |
| Can, Spout 1 & 5 qt | Wrench, Stud Remover ¼-3/4" |
| Can, Waste 10 gal | Wrench, Tappet 7/16-11/16 |
| Chain, Binder 3/8" | Wrench, Torque 3/8" |
| Chain, Log 3/8" x 14' | Wrench, Torque ½" |
| Chisel, Cold and Punch ¾" x 12" | Soil & Water Management |
| Extractor, Screw No 1-6 | Arrows (pins) 3/16" x 14" |
| Gauge, Dial 1" Range | Auger, Soil 2" |
| Hand Tools (cont.) | Soil & Water Management (cont.) |
| Gauge, Feeler .004-.027 | Level, Farm 20 Power |
| Gauge, Feeler .04mm-.89mm | Level, Hand 2 ½ Power |
| Gauge, Point | Level, Universal 26 Power |
| Gauge, Small Hole 1/8-1/2 | Pole, Range 8 ½" |
| Gauge, Telescoping ½-6" | Sampler, Soil 1" x 21" |
| Grease Gun 1lb | Tape 100ft |
| Hammer (ball pein) 16oz' | Drafting |
| Hammer (ball pein) 24oz | Drawing Board 16" x 21" |
| Hammer (plastic faced) 16oz | Scale 12" |
| Hose, Water 5/8" x 50' | Tee Square 21" |
| Oil Measure 2qt | Triangle 8" (30 – 60 degree) |
| Pliers 10" (combo slip joint) | Triangle 8" (45 – 90 degree) |
| Pliers 10" (water pump type) | Small Engine Equipment Tools |

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| Pliers 16" (water pump type) | Cutter, Valve Seat |
| Pliers 7 1/2" (diagonal cutter) | Engine, 4 cycle (1 cylinder-3HP) |
| Pliers 8" (end cutting nippers) | Hone, Cylinder 1 1/2 - 3 1/2 |
| Pliers 8" (snap ring) | Hone, Cylinder 2.0" – 2.6" |
| Pliers 8" (lock ring) | Tester, Coil |
| Pliers 6" (convertible) | Tools, Basic |
| Pliers 8" (hose clamp) | Tools, Special |
| Pliers 10" (lever wrench) | Tools, Special (starter clutch) |
| Pliers 7" (parrot nose) | Wrench, Torque 3/8" |

*Must meet the guidelines for specialized computing equipment as outlined on the "CTE Equipment Guidelines" at www.azed.gov/cte/grants