

# 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.

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#### 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.

#### Equipment:

Foldable Table

National FFA Career Development Event (CDE) equipment

Printers

Stackable Chairs

Whiteboard

#### Supplies:

Calculators (graphing/scientific)

\*Computers (one per two students)

#### Facility/Equipment

Greenhouse – complete with environmental controls and timers

Benches/Tables for greenhouse

Bottom heat for propagating.

Hydroponics systems

Aquaculture system

Wheelbarrows

Fiberglass concrete forms – for benches, etc.

Hand tools – hammers, screwdrivers, socket set, wrenches, tape

Drills – cordless is always good

Skill saw

Concrete/Masonry tools – trowel, float, edger, jointer

Drill press

Band saw

Drill bits, hole saws

Aquaculture water meter (colorimeter kit is good too)

Handheld pH meters

Benchtop pH meter for Biotech/Tissue Culture

Tissue culture grow rack with lights

Tissue Culture chambers

Autoclave

Incubator

Lawn mower

Laminar Flow Hood (tissue culture)

#### Facility/Equipment(continued)

Grinders

Tiller

Fertilizer injectors

EC (electroconductivity) meter

Pipe threader

Pipe cutter – large and small

Propane torches – soldering

Pipe vises (and tables)

Metal tables

Welders

Collapseable (sp) saw horses

Lab glassware – beakers, graduated cylinders, bottles

Hot/stir plates

Computers

Drafting boards and equipment (T squares, triangles, templates, etc.)

#### Facility Supplies

Tissue culture supplies – agar, sucrose, nutrients

Ethanol

Pvc pipe

Drip pipe

Copper pipe

Solder

Flux

Block/brick

Soil – mulch, perlite, vermiculite

Plant containers – 1 gallon, 5 gallon, liners

Concrete, cement, sand, lime

Stir bars (plastic coated magnets for stir plates)

Seeds – garden, greenhouse and hydroponics

Hydroponic nutrients

Fish

Fish food

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

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Item	Item
<b>Ag Mechanization</b>	
<b><u>Wood Construction—Machinery</u></b>	<b><u>Metal Construction—Hand Tools Plumbing</u></b>
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"
<b><u>Wood Construction—Portable Electric Power Tools</u></b>	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"
<b><u>Wood Construction—Hand Tools</u></b>	Groover, Hand No. 4
Awl, Scratch 6"	Hammer, Tinnens 12 oz
Bar, Nail 10"	Handle, Tap ¼" – 1"
Bar, Pry 10"	Mallet, Tinnens 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, Tinnens (left cut) 10"
Bit, Wood ¼" – 1"	Snips, Tinnens (right cut) 10"
Brace, Box Ratchet 10"	Snips, Tinnens (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"	<b><u>Sheet Metal</u></b>
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"
<b><u>Wood Construction—Hand Tools</u></b>	<b><u>Metal Construction—Hand Tools Welding Hot Metal</u></b>
Plane, Smoothing 9"	Gauge, metal
Pliers, Fencing 10 ½"	Chipping Tool
Rasp (half round) 14"	Clamp 9"

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Item	Item
Rasp (round) 14"	Clamp, C 4"
Rasp (square) 12"	Clamp, C 6"
Rule, Tape 5M/16ft	Clamp, C 8"
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"	<b><u>Concrete &amp; Masonry—Machinery</u></b>
Square, Framing Metric	Mixer 4 cu ft
<b><u>Wood Construction—Miscellaneous</u></b>	Mortar Box 9.2 cu ft
Bench, 2 station 28 x 64"	Wheelbarrow 5.5 cu ft
Brush, Bench 8"	<b><u>Concrete &amp; Masonry— Hand Tools</u></b>
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"
<b><u>Metal Construction—Machinery</u></b>	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"
<b><u>Metal Construction—Machinery (cont.)</u></b>	<b><u>Concrete &amp; Masonry— Hand Tools (cont.)</u></b>
Welder, Electric Arc 250-300 amp	Scale, Weight 100lb
Welder, MIG 150-200amp	Sieve, Aggregate
Welder, Oxy-acetylene Equipment	Shovel (square point) 10"
<b><u>Metal Construction—Portable Power Tools</u></b>	Shovel (round point) 9"
Drill, Electric ½"	Tamper, Jitterbug 36" x 6 ½"

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Item	Item
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"
Nibbler 16ga	Trowel, Pointed 11" x 5 ½"
Saw, Band ½" blade	Trowel, Pointing 4 ½"
<b><u>Metal Construction—Hand Tools Cold Metal</u></b>	<b><u>Concrete &amp; Masonry—Miscellaneous</u></b>
Caliper, Vernier 5" cap (English meas.)	Bucket 5 gal
Caliper, Vernier 5" cap (metric meas.)	Can, Oil 1qt
Chisel, Cold ¾"	<b><u>Electrical—Hand Tools</u></b>
Cutter, Bolt 30"	Belt, Cotton Web 2 ¼" wide
Dresser, Grinder 12"	Bender ½"
Dresser, Grinder 6"	Bender ¾"
Drill, Twist Fractional (straight shank)	Bit, Auger 5/8" x 18"
Drill, Twist Number (straight shank)	Bit, Auger ¾" x 18"
Drill, Twist Letter (straight shank)	Cable Ripper 3 ¾"
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 ½ - 1 ¼
File, Hand (half round) 10"	Meter, AC Volts 4 ½
File, Hand (mill) 10"	Meter, AC Amp 4 ½
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"	<b><u>Portable Tester Equipment</u></b>
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 ¾" – 2 ½"	Hydrometer (radiator testing)
Screwdriver 4"	Lamp, Trouble 25'
Screwdriver 6"	Tachometer 50-4000rpm
<b><u>Metal Construction—Hand Tools Cold Metal (cont.)</u></b>	<b><u>Portable Tester Equipment (cont.)</u></b>
Screw plate ¼" – ¾" NC	Tester, Battery
Screw plate ¼" – ½" 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

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Item	Item
Wrench, Adjustable 8"	<b>Hand Tools (Continued)</b>
Wrench, Adjustable 10"	Puller (universal joint)
<b>Power Tools &amp; Equipment</b>	Puller 13 ton
Charger, Battery 80amp	Punch, Gasket ¼-5/8"
Cleaner, Parts 45gal	Punch 1/8-1/4"
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)
<b>Hand Tools</b>	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"	<b>Soil &amp; Water Management</b>
Extractor, Screw No 1-6	Arrows (pins) 3/16" x 14"
Gauge, Dial 1" Range	Auger, Soil 2"
<b>Hand Tools (cont.)</b>	<b>Soil &amp; Water Management (cont.)</b>
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'	<b>Drafting</b>

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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)	<b><u>Small Engine Equipment Tools</u></b>
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](http://www.azed.gov/cte/grants)