

**Math-in-CTE Curriculum Map:
Transportation, Distribution, and Logistics (Automotive)**

| CTE Course/Unit | CTE Concepts | Math Concepts | Common Core Math Standards Middle School | Common Core Math Standards High School |
|------------------------|---|---|--|---|
| Site specific | Policies and procedures; Pretests for tools and parts; Auto terms; Math review and pretest for math | Basic math | 6.NS.2; 6.NS.3; 7.NS.1; 7.EE.3 | A.APR.1; A.APR.7; N.RN.3; N.Q.1 |
| Safety | Behavior; Tool usage; Equipment usage; Emergency procedures; Air pressure; Chemicals (MSDS); PPE; Housekeeping | | | |
| Tools | Basic tool skills | Conversion of fractions to decimals to metric | 6.NS.1; 6.EE.2; 7.NS.1; 7.NS.2; 7.NS.3; 7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5 | |
| Thread restore | Make bolt, nut, pop rivet repair | Measurement; Tolerance | 6.NS.2; 6.NS.3; 7.NS.1; 7.EE.3 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; N.Q.3 |
| Nomenclature | Automotive terms, including basic engine and vehicle configurations | | | |
| Basic electrical | Electrical theory; Meters; Basic circuits; Circuit | Ohm's law; Watt's law; Volt drop | 6.EE.2; 7.EE.1; 7.EE.2 | A.REI.1; A.REI.2 |

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| | protection; Test light | | | |
| Wire repair | Wire repair procedures; Solder styles (crimp, heatshrink); Solder types | | | |
| Batteries | Battery construction and types; Safety, ratings, measurement and testing; Charging | Conversion of ratings; Tolerance | | N.Q.3 |
| Start/charge | Foundations of starting and charging system and operation; Testing procedures and determining outcome | Tolerance; Ranges | | N.Q.3 |
| Tire | Foundations of tire and rim construction; Tire sizes and designations; Age of tires; Safety working on rims; Dismount/mount and repair procedures | Aspect ratio; Pressure vs. force; Percent; Diameter; Unit conversions; Formulas | 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 7.EE.3 | G.MG.3 |
| Steer/ Suspension | Foundations of steering and suspension systems and alignment | Slip angle of toe | | |

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| Brakes | Foundations of brake system (hydraulic vs. friction); Fluid concerns; Pascal's Law | Pressure vs. force vs. leverage; Boiling point degradation | 6.EE.2; 7.EE.1; 7.EE.2 | A.REI.1; A.REI.2 |
| Brakes/Drum | Drum-specific applications | | | |
| Brakes/Disc | Disc-specific applications | | | |
| Cooling system | Foundations of cooling system, including components, theory | Boiling point/pressure; Freeze protection vs antifreeze strength | | |
| Basic engines | Foundations of basic engines, components | Engine displacement and compression ratio | 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 7.EE.3 | G.MG.3 |