Mathematics Alignment Ranking System

This document was created by the Michigan Academic Career Tech Education Consultants (MACTEC.) and is intended to guide as to how to rank any given CTE skill during a mathematics alignment.

In an effort to create a more descriptive and flexible process for aligning Career and Technical Education (CTE) curriculum standards with Common Core mathematics standards we have devised system to rank the correlation between the two. The rankings are used to indicate the strength of the correlation between the CTE concept(s) and the mathematics concept(s). The rational for the ranking is to provide a communication tool to those who are charged with the alignment process so that they can communicate the relevance of the mathematics used for any given skill within a CTE curriculum.

While the levels described below are necessarily qualitative in nature, we have tried to create a system that is both user-friendly and specific. These should not be construed as mandated levels during either the alignment or the implementation phase. They are simply a guide and a way of providing the input of the alignment team.

Please note the "or" between each of the three criteria at each level. This indicates that a mathematics standard need not conform to all three criteria to be placed within a given level. However, we do recommend that any standard only appear in one level, not multiple levels.

Continuum Rating System (see example on the next page)

Level 1 – Strongly present within a CTE Standard

-or-

Most, if not all, CTE instructors (greater than 90%) would teach this mathematics in standard delivery.

-or-

Necessary mathematics to be taught with this CTE standard.

Level 2 – Moderately present within a CTE Standard

-or-

The majority of CTE instructors (more than 50%) would teach this mathematics in standard delivery.

-or-

Recommended mathematics to be taught with this CTE Standard.

Level 3 – Minimally present within a CTE Standard

-or-

Few CTE instructors (less than 50%) would teach this mathematics in standard delivery.

-or-

This mathematics can be used to teach or enrich a CTE Standard.

Note: The CTE concept and the math concepts are filled in by the group.

The standards are aligned by a contract service

Segment	CTE Segments/Performance Elements	CTE Concepts	Math Concepts	Common Core Math Standards Middle School	Common Core Math Standards High School
	8. Identify common quality control methods 9. Discuss quality and continuous improvement methods used in engineering	Limits Min Max	Min and Max and statistics (I), Logic (III)	6.EE.8; 6.EE.9; 7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4; 8.EE.7; 8.EE.8; 8.F.4	A.CED.2; A.CED.3; A.CED.4; A.REI.3; A.REI.4; A.REI.10; F.LE.1; F.LE.2; F.LE.5; F.IF.5; A.SSE.1; F.BF.1; S.CP.1
	XI. ENGINEERING & TECHNOLOGY PATHWAY **A .Know the elements of the processes and concepts for understanding the design process.** 2. Explain the elements and steps of the design process and tools or techniques that can be used for each step. 3. Describe design constraints, criteria, and trade-offs in regard to variety of conditions (e.g. technology, cost, safety, society, the environment, time, human resources, manufacturability). **B. Develop processes and concepts to apply the design process.** 1. Apply the design process, including understanding customer needs, interpreting and producing design constraints and criteria, planning and requirements analysis, brainstorming and idea generation, using appropriate modeling and prototyping, testing, verification, and implementation. 2. Demonstrate the ability to evaluate a design or product and improve the design using testing, modeling, and research. 3. Demonstrate the ability to record and organize information and test data during design evaluation.	A.1;A.2;A.3; Explaining Plans B.1-B.3 Reading charts and graphs, measurement and conversion, spread sheets, Develop and solve equations, Problem solving, Using Limits Min Max	A.1; A.2;A.3 Angles, Geometric shape applications, relations ships/comparison between 3D and 2D(I), Limits Min Max (II) B.1-B.3 Angles, Geometric Shapes applications (I), Reading Charts and Graphs (I), measurement and conversion (I), operations with Reals (I), Problem solving (I), Creating and solving equations (II), Min and Max and statistics (I), Logic (III)	7.G.5; 6.G.3; 7.G.1; 7.G.6; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 6.NS.2; 6.NS.3; 7.NS.1; 6.EE.6; 6.EE.7; 6.EE.8; 6.EE.9; 7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4; 8.EE.7; 8.EE.8; 8.F.4; 7.SP.2; 7.SP.3; 7.SP.4; 7.SP.5; 8.SP.1; 8.SP.3; 8.SP.4	G.CO.9; G.CO.12; G.CO.13; G.GPE.7; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; A.APR.1; A.APR.7; N.RN.3; N.Q.1; A.CED.1; A.CED.2; A.CED.3; A.CED.4; A.REI.3; A.REI.4; A.REI.10; F.LE.1; F.LE.2; F.LE.5; F.IF.5; A.SSE.1; F.BF.1; S.ID.1; S.ID.2; S.ID.3; S.ID.5; S.ID.6; S.MD.1; S.CP.1; N.Q.1; N.Q.2; N.Q.3

First: The CTE standard(s) that contain some level of mathematics are identified. For exampleA.1; A.2; A.3 are noted here.

There is also a short note about what it is in the skill that requires mathematics skills/thinking.

Second: The specific CTE skill is again noted and then the mathematics concepts are discussed. There is no discussion of the common core standards at this point.

While the concepts are discussed the correlating level is also determined. The basic question here is how much the mathematics is relied on to complete the skill.

Please Note: Notice that the mathematics in this example is parceled into two groups, Level 1 indicated by (I), the other is given a Level 2 (II) designation. Also the levels in this document are indicated by roman numerals.

The Level 1-3 rating system allows for a discussion about how often a CTE skill needs the mathematics in order to be taught, or how in-depth the concept is covered. So a skill that could require a great deal of math when taught at a college level may not have some much relevance in high school (**Level 2 or 3** would probably be appropriate for a skill of that nature.) On the other hand a certain skill may demand a great deal of math no matter what level it is taught at (**Level I** would be appropriate at that point. During the discussion the instructors can talk about what they do, what they have seen others do, and what is possible. Levels allow instructor and consultants to develop a more accurate document about what **does** happen daily in CTE programs versus what **can** happen.