

**Kansas Career and Technical Education Transition to the
Common Core State Standards:
A Descriptive Analysis of the Overlap between the States’
Career Clusters Essential Knowledge and Skills and the
Common Core State Standards**

Final Report

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Prepared for the Kansas State Department of Education

by



Table of Contents

Executive Summary	i
I. Introduction	1
II. Methodology	4
III. Findings.....	13
IV. Considerations for Next Steps Suggested by the Findings.....	31
V. References	33

Appendices

Appendix A: Phase 1 Rating Sheet; Content Area: ELA	A-1
Appendix B: Phase 1 Rating Sheet; Content Area: Mathematics	B-1
Appendix C: KS Transition: CTE/CCSS Correspondence Phase 2; Content Area: Mathematics	C-1
Appendix D: KS Transition: CTE/CCSS Correspondence Phase 2; Content Area: ELA	D-1
Appendix E: CCSS Not Matched; Content Area: Mathematics.....	E-1
Appendix F: CCSS Not Matched; Content Area: ELA.....	F-1

List of Tables

Table 1. Potential Overlap in ELA CCSS Sections Identified in Phase 1	15
Table 2. Potential Overlap in Mathematics CCSS Sections Identified in Phase 1	16
Table 3. Detailed Coverage of ESS by CCSS in Mathematics and ELA	18

Executive Summary

Overview

The State of Kansas has a history of valuing relevant and rigorous education for all students and has offered career and technical education to generations of students. In October 2010, Kansas formally adopted the Common Core State Standards (CCSS), and it has updated its education agenda to reflect this adoption. Although adoption of the CCSS signals a change in academic standards for the State, Kansas plans to continue to place great value on the career and technical education it provides to its students. Therefore, in preparation for its transition to the CCSS, the Kansas State Department of Education (KSDE) contracted WestEd to conduct a descriptive analysis examining the overlap between the States' Career Clusters Essential Knowledge and Skills and the CCSS, in order to provide the State with information that will help it best coordinate and implement the CCSS with its career and technical education standards.

More specifically, this descriptive study explored the following key questions:

1. What is the correspondence between the Essential Knowledge and Skills and the CCSS for English language arts and mathematics for grades 3–8 and high school?
2. Are any Knowledge and Skill Statements not matched to the CCSS?
3. Which section(s) of the CCSS contain(s) the greatest overlap with the Essential Knowledge and Skills?
4. Are any CCSS from identified sections not matched to the Essential Knowledge and Skills?

To describe the correspondence between the States' Career Clusters Essential Knowledge and Skills and the CCSS for ELA and mathematics for grades 3–8 and high school, WestEd systematically analyzed the documents according to a two-phase protocol.

Phase 1 involved an initial review of materials to identify high-level overlap and review and refine the analysis protocol. The purposes of Phase 1 were (1) for analysts to become oriented to the documents that were to be analyzed; (2) to determine, at a high level, areas of similarities and differences across documents; and (3) to determine how to best prioritize and focus the analysis vis-à-vis the study's key questions and the anticipated uses of its outcomes. The review of materials included an examination of how the Career Clusters as used in Kansas and the CCSS defined "career readiness." Based on the initial findings of Phase 1, the Phase 2 protocol was refined to most accurately describe the correspondence between the Essential Knowledge and Skills and the CCSS. In Phase 2, the CCSS sections that were determined in Phase 1 to have potential overlap with the Essential Knowledge and Skills were analyzed for overlap at a finer grain size, and correspondence was examined using the criteria of content match, progression, complexity, and coverage.

This study's outcomes are primarily intended to inform Kansas's transition to the CCSS, including informing the design and development of tools and professional development to support the transition. Outcomes also are intended to inform Kansas's participation in and contributions to discussions related to the revision of the Essential Knowledge and Skills.

Considerations for Next Steps Suggested by the Findings

The following are suggested next steps based on the findings of this descriptive study. It is important to note that, given the nature of this study, and given that these findings and suggestions are being presented in the early stages of the State's planning for its transition to the CCSS, these suggestions should in no way be interpreted to constrain the State's discussion and decisions. Rather, these findings and suggested considerations for next steps should encourage the State to further examine and discuss the study's descriptive data and their implications for the design and development of tools and professional development to support the transition.

1. As KSDE implements its standards (academic content and career and technical education), it should consider how to make explicit and clear the operational definition and intent of the standards. An explicit and clear definition has implications for consistent interpretation and implementation of its standards by the field.

In Phase 1 of the study's analyses, an examination of the definition of "career readiness," either as explicitly stated or as defined through the content of the State and CCSS documents reviewed, was conducted to help explain and understand possible patterns of overlap and/or areas of overlap between the Essential Knowledge and Skills and the CCSS. Generally, the State of Kansas appears to integrate its definitions of college readiness and career readiness. For example, acknowledgment within the Career Clusters that some careers within each occupational field require college or other education after high school, strengthens the idea that "college ready" is part of "career ready." Although each student is required to meet the Essential Knowledge and Skills, there are specific standards beyond the Knowledge and Skill Statements or Performance Elements (collectively referred to as "ESS") that are mapped out in the Clusters and Pathways. Preparedness expectations are differentiated for different fields and for different occupations in a field. This description appears to be qualitatively different from the description used by the CCSS. The CCSS consist of academic standards that every student is to meet (with the exception of some mathematics standards) without differentiation between students who desire different careers. The only differentiation suggested in the CCSS is the designation of some mathematics standards as being needed for advanced courses. This is the only indication that there might be different academic needs for different careers.

2. The state should consider how to define the relationship between the ESS and CCSS—that is, whether the ESS should be interpreted as inclusive of all aspects of the CCSS, and likewise whether the CCSS include all content intended by the ESS. This definition will have implications for the implementation of the standards in practice (e.g., assessment, instruction).

In mathematics, the ESS generally encompass more content than individual CCSS content standards and generally are written at a higher level of granularity than individual CCSS. The CCSS for ELA often tend to integrate more elements (such as organization, development, and style in writing) within individual standards, compared to the ESS performance elements; thus, the ESS content that matches to any one CCSS may be spread over a number of performance elements. Correspondence between the two sets of standards often depends upon the level of specificity and the nature or focus of the intended ESS.

3. KSDE should consider upfront how to best specify the application of a skill to a specific workplace context or purpose, the specific problem type associated with a standard, the context of the problem to be solved, the tools to be used, and/or the conceptual area addressed. Such specification has implications for the degree of correspondence between the ESS and the CCSS and the implementation of the standards in practice.

While there is full coverage between a number of Performance Elements and ELA and mathematics CCSS, there exists a range of content that is covered but at a different level of complexity or applied to a narrower or specific context, for example. Additionally, there are instances in the CCSS (e.g., in ELA) where certain capacities (e.g., critical thinking and problem solving) may be implicit and not referred to directly. The different grain size and organization of the two sets of standards (i.e., ESS and CCSS) and implications for the correspondence between the two sets of standards necessitate further examination and discussion.

4. With its intention of integrating as appropriate its academic and career and technical education standards, the State should further examine the data associated with this study and determine whether and how collections of related matched standards can be clustered and used, for example, to represent the endpoint of a student's learning or where the standards may fall along a progression of skills and knowledge. The outcomes of this discussion have implications for implementation of the standards in practice.

The organization and interrelatedness of the CCSS, along with consideration of what has been determined by the analysts of this study as *full*, *complete with considerations*, and *partial* coverage of the ESS and CCSS, provides the state an opportunity to use information from this study to purposefully define, organize, and integrate skills, as appropriate, for applicability in the academic and work place contexts.

5. Although this study's analysts determined that there was no correspondence found between some CCSS and Essential Topics, the State is encouraged to examine the analysts' interpretations of the standards and judgments of correspondence.

There were no matches of mathematics CCSS with Essential Topics ESS05–ESS10 at the skill or Performance Element levels. ESS05–ESS09 also had no matches to the ELA CCSS. Generally, the analysts determined that the focus of these Essential Topics on knowledge and skills specific to workplace environments or to career development did not lend themselves to correspondence with the CCSS.

I. Introduction

The State of Kansas has a history of valuing relevant and rigorous education for all students and has offered career and technical education to generations of students. Currently, Kansas draws on the national States' Career Clusters Initiative (SCCI)¹ to provide an aligned and articulated system of career education to Kansas students. Notably, it uses the SCCI Essential Knowledge and Skills, which represent the knowledge and skills considered to be “essential to success for careers in all clusters and pathways.” In October 2010, Kansas formally adopted the Common Core State Standards (CCSS), and it has updated its education agenda to reflect this adoption.

Although adoption of the CCSS signals a change in academic standards for the State, Kansas plans to continue to place great value on the career and technical education it provides to its students. Therefore, in preparation for its transition to the CCSS, the Kansas State Department of Education (KSDE) requested that WestEd conduct a descriptive analysis examining the overlap between the Essential Knowledge and Skills and the CCSS, in order to provide the State with information that will help it best coordinate and implement the CCSS with its career and technical education standards.

More specifically, this descriptive study explored the following key questions:

1. What is the correspondence between the Essential Knowledge and Skills and the CCSS for English language arts and mathematics for grades 3–8 and high school?
2. Are any Knowledge and Skill Statements not matched to the CCSS?
3. Which section(s) of the CCSS contain(s) the greatest overlap with the Essential Knowledge and Skills?
4. Are any CCSS from identified sections not matched to the Essential Knowledge and Skills?

This study's outcomes are primarily intended to inform Kansas's transition to the CCSS, including informing the design and development of tools and professional development to support the transition. Outcomes also are intended to inform Kansas's participation in and contributions to discussions related to the revision of the Essential Knowledge and Skills.

¹ The States' Career Clusters Initiative (SCCI) is an initiative established under the National Career Technical Education Foundation (NCTEF)—a supporting arm of the National Association of State Directors of Career Technical Education Consortium (NASDCTEc)—to provide Career Clusters as a tool for seamless transition from education to career in this era of changing workplace demands. SCCI helps states as they connect career and technical education to education, workforce preparation, and economic development. To this end, SCCI develops new products and promotes information sharing, techniques, and methods to aid the development and implementation of Career Clusters within states.

Unlike a traditional alignment² study, this study is a descriptive analysis of the linkage³ between the Essential Knowledge and Skills, a set of career and technical education standards intended to apply across 16 career clusters, and the CCSS, a set of academic content standards in English language arts (ELA) and mathematics. A brief description of the organization of these two sets of standards follows.

The Essential Knowledge and Skills are organized by Essential Topic, Knowledge and Skill Statement, and Performance Element (the Knowledge and Skill Statement and Performance Element are referred to collectively as “ESS”). The Essential Topic expresses the overarching category used to organize the more specific statements. The Knowledge and Skill Statement is a broad statement of expectation, and Performance Elements are specific and measurable outcomes. For example:

Essential Topic ESS08 ETHICS AND LEGAL RESPONSIBILITIES: Know and understand the importance of professional ethics and legal responsibilities.

Knowledge and Skill Statement ESS08.01 Apply ethical reasoning to a variety of workplace situations in order to make ethical decisions.

Performance Element ESS08.01.01 Evaluate alternative responses to workplace situations based on legal responsibilities and employer policies.

The ELA CCSS are divided into four strands: Reading, Writing, Speaking and Listening, and Language. As explained in the introduction of the CCSS for ELA, “each strand is headed by a strand-specific set of College and Career Readiness Anchor Standards that is identical across all grades” (p. 8). Grade-specific standards corresponding to the College and Career Readiness Anchor Standards are provided for each individual grade from grades 3–8, and for grade spans 9–10 and 11–12 in high school. For example, in Reading, the Anchor Standards and the grade-specific standards are organized as follows:

College and Career Readiness Anchor Standard R.CCR.6 Assess how point of view or purpose shapes the content and style of a text.

Grade-specific standard RI.11-12.6 Determine an author’s point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

² As commonly used, *alignment* refers to relationships that tend to be direct; alignment models typically examine correspondence between standards and assessments for a single student population (e.g., general education, English language learners, or students with disabilities) or for a single content area (e.g., English language arts or science).

³ *Linkage* includes relationships that are developmental, foundational, or proximal. Models examining linkage often lend themselves to correspondence between standards and/or assessments developed for different student populations or different content areas (Bailey, Butler, and Sato, 2007; Flowers, Wakeman, Browder, and Karvonen, 2007).

The mathematics CCSS are organized by grade level in grades K–8 and by conceptual category in high school. In grades K–8, the standards are organized into elementary and middle school (K–5 and 6–8, respectively). Each grade level is subdivided into domains; one domain, Geometry, occurs at all grades, K–8. The high school (grades 9–12) CCSS for mathematics are organized by conceptual category. Within each conceptual category are domains specific to that category, and within each domain are standards. For example:

Conceptual Category: HS – Statistics and Probability

Domain: Making Inferences and Justifying Conclusions

Standard: S-IC.6 Evaluate reports based on data.

Additionally, there are Mathematical Practice standards that are broad statements of varieties of expertise intended for all students across all grades.

The remainder of this report is organized as follows:

Section II. Methodology

Section III. Findings

Section IV. Considerations for Next Steps Suggested by the Findings

Section V. References

A series of appendices include standard-level ratings.

II. Methodology

To describe the correspondence between the States' Career Clusters Essential Knowledge and Skills and the Common Core State Standards (CCSS) for ELA and mathematics for grades 3–8 and high school, WestEd systematically analyzed the documents according to the two-phase protocol presented in this section.

Phase 1

Initial Review

The first step of the analysis included an initial review of materials to identify high-level overlap and review and refinement of the analysis protocol. The purposes of Phase 1 were (1) for analysts to become oriented to the documents that were to be analyzed; (2) to determine, at a high level, areas of similarities and differences across documents; and (3) to determine how to best prioritize and focus the analysis vis-à-vis the study's key questions and the anticipated uses of its outcomes.

Definitions of Career Readiness

An initial step in reviewing the materials was to understand how the Career Clusters as used in Kansas and the CCSS defined “career readiness.” This step was conducted by project leadership, with input from WestEd analysts, in an effort to determine the similarities and differences between the two definitions of career readiness. WestEd reviewed the CCSS (including the introductory materials), the Career Clusters, and relevant documents from the KSDE website (KS Career Fields & Clusters Model, Career Cluster Pathway Development Process, 2010 CTE Policies⁴), in order to determine each definition of career readiness, either as explicitly stated or as defined through the content of the document. A synthesis of the similarities and differences identified in this review is included in Section III of this report.

Content Overlap

WestEd analysts reviewed the CCSS and the Essential Knowledge and Skills Statements document. For each Essential Topic, analysts indicated whether any CCSS section(s) warranted review in Phase 2 based on the following questions:

- Does this section of the CCSS focus on the same broad topic as the Essential Topic?
- Does this section of the CCSS cover any of the same content or concepts as those included under the Essential Topic?
- If this section of the CCSS contains content at a sub-level, such as numbered standards, do any standards cover the same content or concepts as those included under the Essential Topic?

⁴ Retrieved January 2011 from <http://www.ksde.org/Default.aspx?tabid=249>

When any of these questions were answered “Yes,” the section was included for analysis in Phase 2. A “No” answer—lack of overlap—is also significant; lack of match and related implications are discussed later in this analysis.

Content Comparisons and Unit of Analysis

Analysts and project leadership reviewed the sections identified for further review in Phase 2, reviewed the draft coding criteria, and refined the coding criteria and protocol as appropriate for the descriptive analysis of the identified sections to be completed in Phase 2. Included in this refinement was a determination of the most relevant level of analysis for Phase 2.

Documents Used

Essential Knowledge and Skills Statements

The Essential Knowledge and Skills Statements document was included in its entirety in Phase 1. Analysts coded at the Essential Topic, Knowledge and Skill Statement, and Performance Element levels for Essential Topics ESS01 through ESS10.

Mathematics CCSS

The following sections of the CCSS for Mathematics document were included in Phase 1: Standards for Mathematical Practice, HS – Statistics and Probability, HS – Geometry, HS – Modeling, HS – Functions, HS – Algebra, HS – Number and Quantity, and Grades 3–8.

ELA CCSS

The following sections of the CCSS for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects document were included in Phase 1: Students Who Are College and Career Ready in Reading, Writing, Speaking, Listening, and Language; College and Career Readiness Anchor Standards for Reading; Reading Standards for Literature 6–12; Reading Standards for Informational 6–12; Reading Standards for Literacy in History/Social Studies 6–12; Reading Standards for Literacy in Science and Technical Subjects 6–12; Reading Standards for Literature K–5 (grades 3–5 only); Reading Standards for Informational K–5 (grades 3–5 only); Reading Standards: Foundational Skills (K–5) (grades 3–5 only); College and Career Readiness Anchor Standards for Writing; Writing Standards (6–12); Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–12; Writing Standards (K–5); College and Career Readiness Anchor Standards for Speaking and Listening; Speaking and Listening Standards 6–12; Speaking and Listening Standards K–5 (grades 3–5 only); College and Career Readiness Anchor Standards for Language; and Language Standards 6–12.

Training of Analysts

In Phase 1, training of the WestEd analysts involved a thorough review of the analysis protocol and criteria. Analysts also reviewed the Essential Knowledge and Skills and the CCSS for ELA and mathematics for grades 3–8 and high school. Analysts discussed the protocol and identified examples of sections with high-level overlap. Additionally, where necessary, analysts clarified

the criteria for potential overlap. Training ended when analysts were able to accurately and consistently apply the content overlap criteria.

Phase 2

Focused Analysis

Based on the initial findings in Phase 1 of the analysis, the Phase 2 protocol was refined to most accurately describe the correspondence between the Essential Knowledge and Skills and the CCSS.

In Phase 2, the CCSS sections that were determined in Phase 1 to have potential overlap with the Essential Knowledge and Skills were examined for overlap at a finer grain size⁵ of analysis. In order to describe the correspondence of the knowledge, skills, and concepts in the Essential Knowledge and Skills with the CCSS for ELA and mathematics, this study examined the dimension of correspondence using the criteria of content match, progression, complexity, and coverage. Descriptions of the dimension of correspondence and its associated criteria follow.

Units of Analysis

In Phase 2, analysis focused on both the Essential Knowledge and Skills Statements document and the CCSS for ELA and mathematics documents at a greater level of detail. WestEd conducted analyses at the Knowledge and Skill Statement and Performance Element levels of the Essential Knowledge and Skills and at the Mathematical Practice level (mathematics), the Anchor Standard level (ELA), and the grade-specific standard level of the CCSS.

Correspondence

For this study, *correspondence* refers to the match between a CCSS and a Knowledge and Skill Statement or Performance Element (referred to collectively as “ESS”). Using a systematic review process, each standard or statement in a CCSS section found in Phase 1 to have a potential match to an ESS was compared to the ESS, and identified matches were recorded. Because the grain sizes of the standards in different sections vary (e.g., mathematics CCSS content standards are more finely grained than Mathematical Practice statements), analysts compared each of the Essential Knowledge and Skills to the CCSS at the level of most similar granularity.

The coding of correspondence is based on the explicit wording of the ESS, especially in reference to workplace or occupational skills or applications of skills. The steps, criteria, and related questions that follow were used to determine correspondence, and analysts used the comparable columns on the rating sheet to record their findings.

⁵ *Grain size* is the level and/or degree of generality or specificity in the statement of focus.

Content Match

For this study, *content match* is defined as an overlap in concepts and skills that are central to the standard. For each standard, analysts began at the highest grade identified in Phase 1. For example, for ELA CCSS, analysts began with the Anchor Standards and moved to the grade-specific standards. When a match to an Anchor Standard (ELA) or Mathematical Practice (mathematics) was identified, analysts recorded it in the Anchor/Practice column of the rating sheet. When a grade-level content standard was identified, analysts recorded the standard in the column (Matched Standard, Matched Mathematical Practice, or Matched Anchor Standard) corresponding with their rating. If no match was identified, analysts moved to the next highest grade, and continued until a match was identified. If multiple CCSS were required to completely address the content in the ESS, every applicable standard was recorded. If only a portion of a CCSS was covered by the ESS to which it matched, information about the unmatched part of the CCSS was included in the Comments column (see the following Comments on Overlap section).

Progression

To provide information relevant to instruction and CTE standards revision, each matched standard was given a progression code. This code identifies where the target ESS content falls in the progression of content in the CCSS. For each matched standard or range of standards, the following progression codes were used.

- a. This is the end point of content that was introduced and developed in earlier grades.
- b. This is the introduction point for content developed further in later grades.
- c. This content is repeated at other grades in a grade-appropriate context or application.
- d. This content is introduced in earlier grades and developed in later grades or (for high school mathematics) conceptual categories.
- e. Other (with a description in the Comments column).

Complexity

For this study, *complexity* refers to cognitive complexity. Both content analysts have extensive training and experience in applying Webb's Depth of Knowledge (DOK) levels (Webb, 2005), and Webb's levels were used as a common language to encourage continuity of interpretation between raters across content areas. The standards were not coded for DOK, as this is a descriptive study, but the ESS and the CCSS were compared in terms of DOK in order to determine the complexity codes.

Where the content match between the ESS and the CCSS included only part of either statement, only the part of the statement that was matched was coded for complexity. Analysts noted the levels of complexity of the matched standards using the following complexity codes.

- Similar (S): The ESS and the CCSS are at similar levels of complexity.
- Different (D): The ESS and the CCSS are at different levels of complexity.

When a “D” was coded, analysts provided an explanation of this difference in the Comments column.

Coverage

For this study, *coverage* is defined as the relationship between the skills and concepts of the ESS and those of the CCSS. In rating this correspondence, it is more useful to evaluate the degree of the observed relationships among skills and concepts than to just provide a yes/no rating. Therefore, the relationship is rated using one code for the full set of corresponding CCSS according to the following definitions:

- Full (F): The central or core content of the ESS is fully covered by the CCSS at the same level of complexity.
- Complete with considerations (C): The central or core content of the ESS is covered by the CCSS, but may be at a different level of complexity or require other considerations. Considerations and/or notes are included in the Comments column.
- Partial (P): Some core or central content of the ESS is not covered by the CCSS. Elements not covered are indicated in the Comments column.
- None (N): No CCSS standard matches the ESS.

Comments on Overlap

In the Comments column, analysts provided additional descriptive information on the overlap between the ESS and the CCSS, in the form of focused, targeted comments. Comments were structured according to the following questions, as applicable:

- Explanations of progression codes (e.g., Do different standards or parts of standards appear at different places on the progression? What is the grade or grade range of skill progression for the matched CCSS?)
- Do the two standards reflect the same degree of specificity?
- Is one a subset or sub-skill of the other?
- Is one standard an application of the other?
- What other information is relevant about the overlap between these standards?
- Are there aspects of the CCSS that are not covered by the matched ESS?

Training of Analysts

For Phase 2, training involved a thorough review of the Phase 2 protocol and criteria. Analysts reviewed the documents they submitted in Phase 1 indicating the areas of high-level overlap between the ESS and their assigned CCSS, with the understanding that, should a match be found outside of the areas indicated in the Phase 1 document, it would be noted and applied to Phase 2 analysis. Each analyst completed sample analysis on several ESS standards with the involvement of the other analyst and project leadership.

Follow-up meetings were held to confirm consistent application of Phase 2 protocol, make refinements in protocol language, and capture and refine decision rules.

CCSS Checklist

When analysts coded a CCSS to an ESS, it was recorded on a CCSS checklist. This was designed to facilitate the creation of a list of the CCSS that were not identified in the ESS.

Decision Rules

Decision rules are guidelines that help ensure standardization and reliability of the coding process. Decision rules were created to address specific issues and circumstances that arose during the analyses as well as to document understanding and interpretation of constructs and content and the nuances of the standards. During the coding process, analysts proposed decision rules to the project lead to ensure consistency, as appropriate, across analysts. The following decision rules were used in this study.

Decision Rules Used for Both ELA and Mathematics

1. Essential Topic ESS01 and Knowledge and Skill Statements ESS01.02, ESS01.03, and ESS01.04 are written at a more general and broad level than the other Essential Topics or Knowledge and Skill Statements. The language used and the broad range of academic content mentioned in these ESS are too general to meaningfully code to any particular CCSS, and were addressed in a comment at the Knowledge and Skill Statement level. For example, ESS01.03 includes the comment “According to the mathematics CCSS introduction (p. 5), complete coverage of the CCSS is required for the full range of postsecondary opportunities,” and the Correspondence columns for these ESS were not coded.
2. When specific workplace content or context is central to an ESS (Knowledge and Skill Statement or Performance Element), it will not be matched to a more general CCSS that does not address that specific content. For example, ESS09.03.02, “Prepare a resume,” is not matched to a more general Writing CCSS standard because no Writing CCSS standards specifically include resume writing.

3. When an ESS describes skills also covered in the CCSS but applied in the ESS to a general workplace context, the match may be rated as “Partial.” For example, in ESS02.04, “Evaluate and use information resources to accomplish specific occupational tasks,” the skill of evaluating and using information resources to “solve a problem” is covered in several CCSS, but the application to “specific occupational tasks” is not addressed. The “Partial” rating reflects the fact that the skills described in the ESS may be applied to occupational content/context not covered in the CCSS.

Decision Rules Used for ELA

4. When an RST (Reading Standards for Literacy in Science/Technical Subjects) or WHST (Writing for Literacy in History/Social Studies/Science and Technical Subjects) CCSS appears in parentheses in the “Matched Common Core Standards” column, it indicates that the standard is a match, but that it duplicates the coverage of the ESS provided by a Reading or Writing standard also listed. In other words, the RST or WHST standard does not provide any additional coverage of the ESS beyond that represented by the Reading or Writing standard. (The language of the Literacy standards is often very similar to that of the Reading and Writing standards.) When an RST or WHST standard appears without parentheses, it indicates that, in this case, the standard provides some additional coverage of the ESS. For example, in ESS02.01, “Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice,” the matched Reading standard refers to understanding vocabulary in context, including “technical meanings”; the RST standard (RST.11-12.4) focuses on understanding “domain-specific words and phrases as they are used in a specific or technical context.” In this example, both standards have corresponding content, but the RST standard is more closely related to the ESS.

Decision Rules Used for Mathematics

5. For ESS01.03.07, “Analyze data when interpreting operational documents,” the term “operational documents” was interpreted to broadly refer to technical, procedural, or other documents used in the workplace.

Analysts’ Qualifications

Essential to this analysis is the expertise of the analysts in their respective content areas. Analysts in this study collectively have experience and expertise in analysis of the CCSS for states, the CCSS content areas (i.e., English language arts and mathematics), career and technical education, standards and assessment review and development, curriculum, instruction, and assessment alignment. Additionally, analysts received training specific to the research protocol of this study. A brief professional biography of the qualifications of each analyst follows.

Karen Schaafsma Anderson, English Language Arts Analyst

Dr. Karen Schaafsma Anderson is an ELA Content Specialist with WestEd’s Assessment and Standards Development Services (ASDS) program, and has worked in K–12 and higher education, both public and private, for over 25 years, as a teacher, writer, assessment developer, and English language arts/reading content specialist. For the past four years, Dr. Schaafsma Anderson has worked with WestEd, specializing in the areas of English language arts/reading standards and assessment at national, state, and local levels. In particular, she has served as English language arts content lead and content analyst on numerous alignment studies, responsible for the overall quality of reading analyses, including the training of raters, facilitation of calibration discussions, and drafting of reports. Her alignment work has included both fixed-form and computer-adaptive assessments. Dr. Schaafsma Anderson received a BA in English, cum laude, from the California State University, Stanislaus, and an MA and a PhD in English from the University of California, Davis.

Svetlana J. Darche, Career and Technical Education Reviewer

As a Senior Research Associate in WestEd’s Health & Human Development Program, Svetlana Darche works with state and local agencies in evaluation, strategic planning, program design, and the building of cross-sectoral collaborations for system change. She has done this work in several interrelated domains, including education, workforce development, social services, and criminal/juvenile justice. In 2006/07, Ms. Darche completed a statewide assessment of career-technical education (CTE) needs in California for the state’s Department of Education. This was followed by the development of California’s State Plan for CTE, which presented a statewide vision and key elements of a comprehensive CTE system beyond the state’s mandated Carl D. Perkins application. Based on the CTE effort, Ms. Darche is now working with the California Department of Education to develop a strategic plan for its adult education system. She also recently co-led a study to assess opportunities for expanding “multiple pathways” or “linked learning” programs throughout California—programs that feature the integration of CTE with academics. In 2008, Ms. Darche completed an extensive study for the Irvine Foundation on opportunities for expanding work-based learning in California. She received a BA in anthropology from the University of California, Los Angeles (UCLA), and an MBA from UCLA’s Anderson School of Management, where she concentrated on the public/not-for-profit sector.

Ann Muench, Mathematics Analyst

Ann Muench is a Senior Research Associate and Mathematics Specialist with WestEd’s ASDS program, and has worked extensively with state mathematics content standards analyses and alignment studies in numerous states, including analyses of the CCSS. Her work includes standards and assessments for both general education and special population students. At the national level, she developed mathematics standards for Job Corps student training. In the area of assessment development, Ms. Muench works on test item development for several state tests by editing and reviewing items for mathematics content and bias, and facilitating teacher item writing and review groups. As part of the WestEd Eisenhower Regional Consortium, Ms. Muench collaborated with key state, district, and site personnel to provide technical assistance and staff development in the areas of mathematics education, assessment, and using

data to effect change. Ms. Muench has extensive experience in developing educational products; presenting at local, state, regional, and national events; and facilitating educational dialogue and discussion using tools and processes she co-developed. A veteran mathematics teacher, Ms. Muench has written and edited both student and teacher textbook materials, as well as assessment tasks in mathematics and career training. Ms. Muench completed doctoral studies in educational psychology at the University of Colorado, Boulder, and holds an MS and a BS in Mathematics from Purdue University.

III. Findings

This section presents the findings of this study. First, the findings from Phase 1 are presented in terms of the overlap of the definitions of career readiness and the sections identified as potentially overlapping. Next, the findings from Phase 2 are presented, organized by the key questions of the study.

Definitions of Career Readiness

An examination of the definition of “career readiness,” either as explicitly stated or as defined through the content of the state and CCSS documents reviewed, is important to help explain and understand possible patterns of overlap and/or areas of overlap between the Essential Knowledge and Skills and the CCSS.

Essential Knowledge and Skills Statements

The State of Kansas appears to integrate its definitions of college readiness and career readiness. In May 2010, the Kansas State Board of Education (KSBE) approved policy motions with the intent of ensuring that career and technical education’s “contributions and potential are realized” through integrating academic and career and technical education standards. Although not explicitly stated as a definition of “college and career readiness,” the document states the aim that “all students will achieve challenging academic and technical standards and be prepared for high-skill, high-wage, or high-demand occupations in current or emerging professions” (KSBE, 2010, p. 1).

The 16 Career Clusters organize academic and occupational knowledge and skills into a coherent course sequence and identify pathways from secondary schools to two- and four-year colleges, graduate schools, and the workplace. In these clusters and pathways, the integration of the definitions of college readiness and career readiness is apparent. The Cluster Knowledge and Skills and the Pathway Knowledge and Skills articulate occupation-specific performance elements and sample indicators designed to ready students for their chosen occupational fields. The acknowledgment within the Career Clusters that some careers within each occupational field require college or other education after high school strengthens the idea that “college ready” is part of “career ready.” This integrated description is qualitatively different from the description used by the CCSS.

In addition, a list of Essential Knowledge and Skills Statements communicates a set of cross-cluster academic foundations and career skills. As reflected in the Essential Knowledge and Skill Statements document, skill statements are essential to success for careers in all clusters and pathways, and students are expected to be able to demonstrate these skills in the context of their chosen cluster and pathway.

Common Core State Standards

The ELA CCSS document includes a page-long description of students who are college- and career-ready in reading, writing, speaking, listening, and language. This description helps to

illustrate the target knowledge, skills, and understandings that authors refer to as capacities of the literate. The seven capacities are:

- They demonstrate independence.
- They build strong content knowledge.
- They respond to the varying demands of audience, task, purpose, and discipline.
- They comprehend as well as critique.
- They value evidence.
- They use technology and digital media strategically and capably.
- They come to understand other perspectives and cultures.

In mathematics, the CCSS for high school intend to “specify the mathematics that all students should study in order to be college and career ready” (CCSSO and NGA, 2010, p. 57). The high school standards are organized by the following six conceptual categories:

- Number and Quantity
- Algebra
- Functions
- Modeling
- Geometry
- Statistics and Probability

A list of capacities parallel to that in English language arts is not included in mathematics. However, the Standards for Mathematical Practice communicate the expertise valued by the standards across grades. These standards “describe varieties of expertise that mathematics educators at all levels should seek to develop in their students” (CCSSO and NGA, 2010, p. 6).

The CCSS consist of academic standards that every student is to meet (with the exception of some mathematics standards) without differentiation between students who desire different careers. The only differentiation provided in the CCSS is the designation of some mathematics standards as being needed for advanced courses. This is the only indication that there might be different academic needs for different careers. As the standards, capacities of the literate, and mathematical processes and proficiencies are the same for most students, regardless of their chosen career, it appears that the CCSS definition of “college and career readiness” is applicable to most students.

Potential Overlap of Sections Identified in Phase 1

In Phase 1, analysts reviewed the CCSS documents to determine which sections would have the greatest potential overlap with the ESS. Analysts' ratings sheets with comments are included in Appendix A and B. Table 1 shows the analysts' findings for potential overlap in the ELA document sections. A "Y" indicates that analysts found potential overlap.

Table 1. Potential Overlap in ELA CCSS Sections Identified in Phase 1

Essential Topic	1. Students Who Are College and Career Ready in Reading, Writing, Speaking, Listening, and Language	2. College and Career Readiness Anchor Standards for Reading	3. Reading Standards for Literature 6–12	4. Reading Standards for Informational 6–12	5. Reading Standards for Literacy in History/Social Studies 6–12	6. Reading Standards for Literacy in Science and Technical Subjects 6–12	7. Reading Standards for Literature K–5 (grades 3–5 only)	8. Reading Standards for Informational K–5 (grades 3–5 only)	9. Reading Standards: Foundational Skills (K–5) (grades 3–5 only)	10. College and Career Readiness Anchor Standards for Writing	11. Writing Standards (6–12)	12. Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–12	13. Writing Standards (K–5)	14. College and Career Readiness Anchor Standards for Speaking and Listening	15. Speaking and Listening Standards 6–12	16. Speaking and Listening Standards K–5 (grades 3–5 only)	17. College and Career Readiness Anchor Standards for Language	18. Language Standards 6–12	19. Language Standards K–5 (grades 3–5 only)
ESS01: ACADEMIC FOUNDATIONS	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ESS02: COMMUNICATIONS	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ESS03: PROBLEM-SOLVING AND CRITICAL THINKING	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	Y	N	N	N	N
ESS04: INFORMATION TECHNOLOGY APPLICATIONS	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	N	Y	Y	N	N	N	N
ESS05: SYSTEMS	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ESS06: SAFETY, HEALTH AND ENVIRONMENTAL	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ESS07: LEADERSHIP AND TEAMWORK	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N
ESS08: ETHICS AND LEGAL RESPONSIBILITIES	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ESS09: EMPLOYABILITY AND CAREER DEVELOPMENT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ESS10: TECHNICAL SKILLS	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	Y	N	N	N	N

As shown in Table 1, the ESS were judged to have potential matches in Academic Foundations, Communications, Problem-Solving and Critical Thinking, Information Technology Applications, Leadership and Teamwork, and Technical Skills. These Essential Topics were found to have potential overlap with most sections of the CCSS in ELA, but not with the descriptions of Students Who Are College and Career Ready in Reading, Writing, Speaking, Listening, and Language; the Reading Standards for Literature (6–12 or K–5); or the Reading Standards Foundational Skills (K–5).

Table 2. Potential Overlap in Mathematics CCSS Sections Identified in Phase 1

Essential Topic	Standards for Mathematical Practice	HS-Statistics and Probability	HS-Geometry	HS-Modeling	HS-Functions	HS-Algebra	HS-Number and Quantity	Grade 8	Grade 7	Grade 6	Grade 5	Grade 4	Grade 3
ESS01: ACADEMIC FOUNDATIONS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ESS02: COMMUNICATIONS	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ESS03: PROBLEM-SOLVING AND CRITICAL THINKING	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ESS04: INFORMATION TECHNOLOGY APPLICATIONS	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	N
ESS05: SYSTEMS	N	N	N	N	N	N	N	N	N	N	N	N	N
ESS06: SAFETY, HEALTH AND ENVIRONMENTAL	N	N	N	N	N	N	N	N	N	N	N	N	N
ESS07: LEADERSHIP AND TEAMWORK	Y	Y	N	Y	N	N	N	Y	Y	N	N	N	N
ESS08: ETHICS AND LEGAL RESPONSIBILITIES	N	N	N	N	N	N	N	N	N	N	N	N	N
ESS09: EMPLOYABILITY AND CAREER DEVELOPMENT	N	N	N	N	N	N	N	N	N	N	N	N	N
ESS10: TECHNICAL SKILLS	Y	Y	N	Y	N	N	Y	Y	Y	N	N	N	N

As shown in Table 2, the ESS were judged to have potential matches in Academic Foundations, Communications, Problem-Solving and Critical Thinking, Information Technology Applications, Leadership and Teamwork, and Technical Skills. These Essential Topics were found to have potential overlap in all grades (3–8) and conceptual categories (high school) of the CCSS in mathematics.

Based on the findings described in Tables 1 and 2, analysts focused their review of the ESS and the CCSS on the sections with potential overlap, indicated with a “Y.” As described in the methodology, analysts looked for matches first at the high school grades, because the ESS are intended to represent career-ready knowledge and skills. If full coverage of the ESS was found within the high school content, the analysts recorded the match and moved to the next ESS. If coverage was not found at high school, analysts continued looking for matches at each lower grade, down to grade 3. The findings of this review follow.

What is the correspondence between the Essential Knowledge and Skills and the CCSS for ELA and mathematics for grades 3–8 and high school?

Table 3 shows the coverage of the ESS by the mathematics and ELA CCSS, including the coverage rating for each Knowledge and Skill Statement and Performance Element.

Table 3. Detailed Coverage of ESS by CCSS in Mathematics and ELA

ESS	Mathematics Coverage	ELA Coverage	ESS	Mathematics Coverage	ELA Coverage	ESS	Mathematics Coverage	ELA Coverage
ET ESS01	ACADEMIC FOUND.		ESS02.03.03	N	F	ESS03.02	N	N
ESS01.01	N	N	ESS02.04	N	P	ESS03.03	N	N
ESS01.02			ESS02.04.01	N	P	ESS03.04	P	C
ESS01.02.01	N	F	ESS02.04.02	N	F	ESS03.04.01	F	F
ESS01.02.02	N	F	ESS02.05	N	F	ESS03.04.02	F	C
ESS01.02.03	N	F	ESS02.05.01	N	F	ESS03.04.03	F	F
ESS01.02.04	N	F	ESS02.05.02	N	F	ESS03.04.04	P	F
ESS01.02.05	N	F	ESS02.05.03	N	F	ET ESS04	INFO. TECHNOLOGY APPLICATIONS	
ESS01.02.06	N	F	ESS02.06	N	F	ESS04.01	N	N
ESS01.02.07	N	F	ESS02.06.01	N	F	ESS04.02	N	N
ESS01.02.08	N	F	ESS02.06.02	N	F	ESS04.03	N	N
ESS01.02.09	N	N	ESS02.06.03	N	F	ESS04.04	N	N
ESS01.02.10	N	F	ESS02.06.04	N	F	ESS04.04.01	N	F
ESS01.03			ESS02.06.05	N	F	ESS04.04.02	N	F
ESS01.03.01	F	N	ESS02.06.06	N	F	ESS04.04.03	N	F
ESS01.03.02	F	N	ESS02.07	N	P	ESS04.05	N	N
ESS01.03.03	C	N	ESS02.07.01	N	P	ESS04.05.01	N	P
ESS01.03.04	C	N	ESS02.07.02	N	P	ESS04.05.02	N	P
ESS01.03.05	C	N	ESS02.08	N	F	ESS04.05.03	N	C
ESS01.03.06	F	N	ESS02.08.01	N	F	ESS04.06	N	P
ESS01.03.07	P	N	ESS02.08.02	N	F	ESS04.06.01	N	N
ESS01.04			ESS02.09	P	C	ESS04.06.02	N	P
ESS01.04.01	P	N	ESS02.09.01	P	C	ESS04.07	C	N
ESS01.04.02	P	N	ESS02.09.02	P	C	ESS04.07.01	F	N
ET ESS02	COMMUNICATIONS		ESS02.10	N	C	ESS04.07.02	P	N
ESS02.01	N	F	ESS02.10.01	N	N	ESS04.08	N	N
ESS02.01.01	N	N	ESS02.10.02	N	N	ESS04.09	N	N
ESS02.01.02	N	F	ESS02.11	N	N	ESS04.10	N	N
ESS02.01.03	N	N	ET ESS03	PROBLEM-SOLVING AND CRITICAL THINKING		ESS04.11	N	N
ESS02.01.04	N	C	ESS03.01	C	P	ET ESS05	SYSTEMS	
ESS02.01.05	N	N	ESS03.01.01	N	N	ET ESS06	SAFETY, HEALTH AND ENVIRONMENTAL	
ESS02.01.06	N	C	ESS03.01.02	P	P	ET ESS07	LEADERSHIP AND TEAMWORK	
ESS02.02	N	P	ESS03.01.03	N	N	ET ESS08	ETHICS AND LEGAL RESPONSIBILITIES	
ESS02.02.01	N	F	ESS03.01.04	F	P	ET ESS09	EMPLOYABILITY AND CAREER DEVELOPMENT	
ESS02.02.02	N	N	ESS03.01.05	F	P	ET ESS10	TECHNICAL SKILLS	
ESS02.02.03	N	P	ESS03.01.06	F	N	ESS10.01	N	N
ESS02.02.04	N	N	ESS03.01.07	N	N	ESS10.01.01	N	C
ESS02.02.05	N	N	ESS03.01.08	F	C	ESS10.01.02	N	N
ESS02.03	N	P	ESS03.01.09	N	N	ESS10.01.03	N	N
ESS02.03.01	N	P	ESS03.01.10	F	N	ESS10.02	N	N
ESS02.03.02	N	F	ESS03.01.11	F	N			

Key: (F) Full coverage; (C) Complete coverage with considerations; (P) Partial coverage; (N) No coverage.

Mathematics

The mathematics CCSS state that complete coverage is required in order to ensure that students are prepared for the full range of postsecondary opportunities. This same requirement is reflected in the ESS01.03 statement “Demonstrate mathematics knowledge and skills required to pursue the full range of postsecondary education and career opportunities.” Additionally, the high school CCSS include standards intended for students preparing to take advanced mathematics courses, which are designated with a (+). The CCSS Mathematical Practice standards are broad and intended for all students across the grades, whereas the CCSS content standards are grade-level-specific or, in high school, are described in detail based on conceptual category.

In the Academic Foundations Essential Topic ESS01, the CCSS most fully cover ESS.01.03, Performance Elements. Based on the number sets specified in ESS01.03.01—whole numbers, fractions, and decimals—ESS01.03.02 and ESS01.03.03 were interpreted to apply only to whole numbers, fractions, and decimals as well. Coverage of these skills (identifying numbers, performing basic operations, and comparing numbers) is accomplished in the CCSS at grades 4, 5, and 6.

Other Performance Elements of ESS01.03 are written at a more general level, overlap with several CCSS Mathematical Practice standards, and encompass CCSS content across several grades and conceptual categories. For example, in ESS01.03.04, applying data and measurements to solve problems occurs throughout the CCSS. Thus, matches with the CCSS often depend upon the specific problem type or conceptual area addressed. At the high school level, problems that address data and measurement are likely matched with the Statistics and Probability conceptual category, and address standards in the S.ID domain (Interpreting Categorical and Quantitative Data), by summarizing, representing, and interpreting data on a single count or measurement variable or on two categorical and quantitative variables, as well as in the S.IC domain (Making Inferences and Justifying Conclusions). To the extent that the problems deal with probability, including conditional probability, there can be other matches in this conceptual category for understanding independence and conditional probability, as well as computing probabilities of compound events or using probability to make decisions. To the extent that the problems involve measurements of geometric shapes and quantities, the CCSS in the Geometry domains G.GMD (Geometric Measure and Dimension) and G.MG (Modeling with Geometry) and in the Number and Quantity domain N.Q (Quantities) may match the ESS. To the extent that the problems involve relationships that can be modeled as linear functions, equations, or inequalities, there are matches in the Function domains F.IF (Interpreting Functions) and F.LE (Linear, Quadratic, and Exponential Models), as well as to CCSS in the Algebra domain A.CED (Creating Equations) that include problems involving unit rates, scale, proportional relationships, area, circumference, angle measurement, etc.

Similar to the first three ESS01.03 standards, ESS01.03.05 is explicit about the required skill—“Analyze mathematical problem statements for missing and/or irrelevant data.” Although there are no content CCSS that specify determining missing and/or irrelevant data, there are matches for ESS01.03.05 at the general level of the Mathematical Practice standards, in that determining missing and/or irrelevant data is interpreted as a necessary part of analyzing and solving problems, particularly in designing or conducting experiments or determining appropriate models or strategies to use when problem solving.

ESS01.03.06 is similar to ESS01.03.04 in that problems involving constructing charts, tables, and graphs from functions and data occur throughout the CCSS. However, at the secondary level, most CCSS go beyond representing data and functions to summarizing and interpreting the information. Matches in the Statistics and Probability domain S.ID (Interpreting Categorical and Quantitative Data) include representing data with plots on the real number line and using two-way frequency tables and scatter plots to summarize and represent categorical and quantitative variables. To the extent that the problems deal with probability, there may be a match for constructing and interpreting two-way frequency tables and using them to decide if events are independent and to approximate conditional probabilities. In the Functions conceptual category, matches depend on students evaluating functions and interpreting statements in terms of a context; sketching graphs based on interpreting and showing key features of a relationship; relating domains of functions to their graphs and the quantitative relationships described; and graphing a variety of functions, including linear, quadratic, polynomial, exponential, and logarithmic functions, and arithmetic and geometric sequences. In the Algebra conceptual category, matches depend upon students graphing and finding solutions of pairs of functions and systems of linear equations and inequalities.

ESS01.03.07 is general in that students are to analyze data, but specific with the intention of interpreting operational documents. There is overlap at the general level with the CCSS Mathematical Practice standards MP.1–6, and more specific matches in the Statistics and Probability domain S.IC (Making Inferences and Justifying Conclusions) with S.IC.6 (“Evaluate reports based on data”), and with S.IC.1, 3, 4, and 5 to the extent that the data to be analyzed involve statistics with population parameters, samples, and randomization.

The mathematics CCSS were also matched to the science-oriented ESS01.04 Performance Elements based on mathematics being a tool used by scientists. Overlap was identified for both ESS01.04.01 and ESS01.04.02 with several of the Mathematical Practice standards as well as with individual standards in the Statistics and Probability domains S.ID (Interpreting Categorical and Quantitative Data) and S.IC (Making Inferences and Justifying Conclusions). Coverage was considered partial for the two ESS in that the CCSS may not cover all aspects of the ESS, given that the focus on evaluating scientific constructs did not include an exhaustive list, and the focus on applying scientific methods may entail more than what is specified in the CCSS. Likewise, the ESS may not cover all aspects of the matched CCSS.

For the most part, the complexity of the ESS and that of the CCSS were coded as similar. This is due to determining the complexity of the overlapping parts of the ESS and the matched CCSS involved. That both the ESS and CCSS describe knowledge and skills required of all students to be prepared for the full range of postsecondary opportunities is interpreted to generally mean that the level of complexity required by one would be the level required by the other to address the overlap.

Due to the interrelatedness of the CCSS, particularly at the high school level, determining where standards are in a progression involved deciding if a collection of related matched standards represented the endpoint of a student’s learning. Because of the (+) standards, which are required for students preparing for advanced mathematics courses and are applicable for students preparing for certain careers, most progressions were coded as “d,” being somewhere between

the beginning and the end of student learning of a concept, and typically closer to the end in the high school conceptual categories.

The Performance Elements in ESS01.03 and ESS01.04 typically encompass more content than individual CCSS content standards. Matches often depend upon the nature or focus of the problems to be solved, or the data to be analyzed. The differences in specificity, with ESS usually written at a higher level of granularity than individual CCSS, will likely require the State to review whether the ESS should be interpreted as inclusive of all aspects of the CCSS, and, likewise, whether the CCSS include all content intended by the ESS.

In the Essential Topics ESS02 through ESS10, there were several matches with the Mathematical Practice standards and some matches with individual CCSS. In ESS02, Communications, there are matches between ESS.02.09 and its two Performance Elements (creating and interpreting tables, charts, and figures) and several Mathematical Practices standards (MP.1–6) as well as several content standards from the Statistics and Probability domains S.ID (Interpreting Categorical and Quantitative Data), S.IC (Making Inferences and Justifying Conclusions), and S.CP (Conditional Probability and Rules of Probability). Although several CCSS throughout the grades and conceptual categories include developing and interpreting tables, charts, and figures, these matches at the high school level depend upon how well the communication purposes intended by the ESS can be shown with data involving statistics with population parameters, samples, randomization, probability, etc. Coverage is coded as partial due to the nature of intended figures possibly not being covered by these CCSS.

With regard to the Knowledge and Skill Statements pertaining to problem solving and critical thinking (ESS03), there is significant overlap with the CCSS, but there are also differences. Several CCSS standards across the grades and conceptual categories require problem solving in real-world contexts and modeling, and they likely involve but do not specify using creativity or innovation. At the Knowledge and Skill Statement level of ESS03.01, there are several matches with Mathematical Practice standards (MP.1–6), as well as with individual CCSS from each conceptual category focused on using critical thinking skills to solve problems and make decisions. The amount of overlap between ESS03.01 and the CCSS depends upon the context of the problems to be solved and the tools to be used. Also, although working in teams or groups is not specified in the CCSS, many standards lend themselves to designing and conducting projects that could involve working with others as well as decision-making. At the Performance Element level, overlap was found with the Mathematical Practice standards, but not with individual content standards. The match for ESS03.01.02 with two of the Mathematical Practice standards is coded as partial because no CCSS specify that solutions be creative. Other matches at the Performance Element level were coded as fully covered by various Mathematical Practice standards (ESS03.01.04–06, 08, 10, 11), but not to individual content standards. The matches depend upon the inclusion of appropriate situations as intended by the particular ESS.

For ESS03.04 and its four Performance Elements involving conducting technical research and gathering information for decision-making, coverage was coded as partial or full with several Mathematical Practice standards, but the ESS were not matched with individual content standards. As with other ESS, the matches depend upon the inclusion of appropriate situations as intended by the particular ESS.

For the Information Technology Applications skills and Performance Elements in ESS04, matches with ESS04.07 and its two Performance Elements were with Mathematical Practice standards MP.4 and MP.5 for organizing and manipulating data with spreadsheet applications. A match with a Statistics and Probability standard (S.ID.4) is coded as partial due to the specificity of the CCSS limiting the use to estimating areas under a normal curve and estimating population percentages, whereas the more general ESS likely involves a variety of applications. Matches depend upon situations involving certain mathematics concepts such as modeling and using appropriate tools strategically.

There are no matches of mathematics CCSS with Essential Topics ESS05–10 at the skill or Performance Element levels. As with Essential Topic ESS01, Academic Foundations, the Knowledge and Skill Statements and the Performance Elements encompass more content than individual CCSS content standards. Matches often depend upon the nature or focus of the intended ESS. The differences in specificity, with ESS written at a broader level of granularity than individual CCSS, may require the State to review whether the ESS should be interpreted as inclusive of all aspects of the CCSS, and likewise whether the CCSS include all content intended by the ESS.

ELA

For Essential Topic ESS01, Academic Foundations, one out of the four related skill statements had matches in the ELA CCSS. All of the ELA CCSS could be matched to ESS01.02 (“Demonstrate language arts knowledge and skills required to pursue the full range of postsecondary and career opportunities”). Because the skill statement was articulated at a much higher level of generality than any one CCSS, it was not assigned specific CCSS matches. Nearly all of the Performance Elements under this skill statement had full coverage matches to one or more CCSS for reading, writing, and speaking and listening; nearly all of the matched Performance Elements were found to be at the same level of complexity as the corresponding content in the CCSS. With one exception, all of the matched CCSS represented the end point of the progression for the identified skills within the CCSS. For this Essential Topic, the overlapping content in both sets of standards represents core skills in reading, writing, and speaking and listening at the secondary (college- and career-ready) level as applied to information and informational or technical texts.

Differences in grain size and organization between the two sets of standards are reflected in the comments on the rating sheet; in general, the ESS Performance Elements for skill statements tend to be stated in more general terms than the corresponding CCSS. For example, Performance Element ESS01.02.03 requires students to “organize oral and written information.” The corresponding CCSS address the organization of oral and written information in separate standards (in the strands of Writing and Speaking and Listening) and include more detailed criteria for the effective organization of information in writing or speech (e.g., “conveying a clear and distinct perspective, such that listeners can follow the line of reasoning” in SL.11-12.4). The matched CCSS also include other elements, such as “development” or “style” in writing, not addressed in the ESS Performance Elements. In fact, while individual ESS Performance Elements tend to be stated in more general terms, with less detail than the CCSS, they often describe subsets of the skills described in the matched CCSS. For example, one Performance Element (ESS01.02.06) calls for the comprehension of “oral and written

information,” and another (ESS01.02.07) calls for the evaluation of oral and written information. The CCSS matched to these two Performance Elements integrate comprehension, analysis, and evaluation of information in each standard (but address written and oral information in different strands). The two ESS Performance Elements more closely correspond to the content in the matched CCSS when taken together than either does on its own.

As seen in the previous example, differences between the two sets of standards in organization and grain size do not necessarily reflect differences in overall content or coverage. Because the CCSS tend to integrate more elements (such as organization, development, and style in writing) within individual standards than the ESS Performance Elements, the ESS content that matches to any one CCSS may be spread over a number of Performance Elements. For example, W.11-12.4 matches content in ESS01.02.03 (organizing writing) and in ESS01.02.02 (adapting language to purpose, including “diction/structure/style”).

Three of the four skill statements for ESS01, Academic Foundations, describe skills and knowledge in other content areas, outside of the language arts; these include mathematics, science, and career-related training specific to “a particular career.” There were no matches of ELA CCSS to these skill statements or their related Performance Elements.

Essential Topic ESS02, Communications, had the most ELA CCSS matches to its skill statements and Performance Elements of any Essential Topic. Like the previous Essential Topic, ESS02 is stated in more general terms than any single CCSS and could be matched to nearly all of the ELA CCSS, with the exception of those for Literature and Reading Foundational Skills. Because of this difference in grain size, no CCSS matches were assigned to this Essential Topic. Of the eleven skill statements for Communications, ten had matches; six of those matches were to CCSS that represented “full coverage” or “complete coverage with considerations” of the skill statement and four were to CCSS that represented “partial coverage” of the skill statements. One skill statement, ESS02.11, addressing “public relation skills,” did not have matches to any CCSS. The matched content in the CCSS and the skill statements and Performance Elements for this Essential Topic address the skills needed to effectively locate, interpret, evaluate, and communicate information and to apply it to “actual practice.” All of the CCSS matched to skill statements and Performance Elements in Communications represented the end point of the progression of those skills and that knowledge within the CCSS. In addition, the majority of skill statements and Performance Elements that had matches were found to have the same level of complexity as the overlapping content in the CCSS.

The ESS with full-coverage matches to CCSS describe key communication skills—such as organizing information to present orally or in writing, or evaluating the reliability of information to be presented orally or in writing—that are equally applicable in either an academic context or a workplace context. Two skill statements (ESS02.09 and ESS02.10) had matches that were rated as “complete with considerations.” In each case, the matched content in the CCSS overlaps with the core skills in the skill statements, but there is some variation in the emphasis or context of the standards. For example, skill statement ESS02.10 calls for students to “listen to and speak with diverse individuals to enhance communication skills.” The matched CCSS, SL.11-12.1, calls for participating in “collaborative discussions” with “diverse partners.” Although both standards call for skill in oral communication with others, the CCSS emphasizes collaborative discussion while the ESS emphasizes listening to and speaking with “diverse individuals” (a

phrase that could represent a broader range of diversity than that in a classroom context). The “complete with considerations” rating indicates overlapping skills in both standards but with at least a potential difference in the way those skills are applied.

Four skill statements had “partial” coverage matches to CCSS. In each case, there was some overlap between the skills described in the ESS and the related CCSS, but the application of the skill to a specific workplace context or purpose in the ESS was not covered by the CCSS. For example, ESS02.03 calls for locating and organizing information “to communicate with co-workers and clients.” The matched CCSS address the central skills of locating and organizing information and integrating it into written texts or oral presentations but do not address the central purpose in the ESS of communicating information to co-workers and clients. The rating for “partial” coverage indicates that some content of the ESS that was determined to be part of its central skill is not addressed by the related CCSS. In practical terms, the “partial” rating signals that, while the skills in the matched CCSS may overlap with the skills in the ESS, the application of the skill to a workplace context or purpose may require additional knowledge and training not covered in the CCSS.

In many but not all cases, the coverage for Performance Elements was consistent with those for the related skill statements. In some cases, however, a particular Performance Element, such as selecting “the most appropriate reading strategy” (ESS02.01.01), had no match in the CCSS even though the related skill statement had matches with complete coverage. In other cases, a Performance Element might have a full-coverage match to one or more CCSS even though the related skill statement had a partial coverage match. In the case of ESS.02.03.02, for example, the Performance Element calls for organizing information but does not include the purpose specified in the skill statement, “to communicate with co-workers and clients.” Because the language of the Performance Element is more general than that of the skill statement (not linking the skill to a specific purpose), it had “full coverage” matches to content in the related CCSS while the skill statement had matches with partial coverage.

Although the majority of skill statements and Performance Elements that had matches were found to have the same level of complexity as the overlapping content in the CCSS, there were some exceptions. Skill statements ESS02.07–ESS02.09 and their related Performance Elements were found to have different levels of complexity than those of the matched content in the CCSS. For example, ESS02.09, “Develop and interpret tables, charts, and figures to support written and oral communications,” has matching content in three CCSS in Reading, Writing, and Speaking and Listening. The CCSS Writing standard W.11-12.8 describes a complex, multi-step research process that includes gathering, evaluating, and integrating information from “multiple authoritative print and digital sources” in a written text. The Speaking and Listening standard SL.11-12.2 also calls for integrating information “presented in diverse formats and media (e.g., visually, quantitatively, orally)” to solve a problem. Both CCSS standards would encompass the skill in the ESS, but both describe more complex skills, requiring students to draw on multiple sources of information (in different formats) as part of a research or problem-solving process.

Throughout the ratings in Essential Topic ESS02, differences in the grain size and organization of the two sets of standards are evident in the frequent comments that a given ESS Performance Element describes a “subset” of the skills in the related CCSS. A good example can be seen in the skill statement for oral presentations (ESS02.06) and its six Performance Elements,

ESS02.06.01–06; the skill statement provides a more general overview of the process of developing and delivering oral presentations, and each Performance Element focuses on the skill needed for one aspect of the process, from identifying support materials to implementing multimedia strategies. The individual skills identified in the six Performance Elements are integrated in the two matched CCSS, particularly in SL.11-12.4, which encompasses all aspects of the process except for the use of multimedia, addressed in SL.11-12.5. In effect, the skill statement and the six related Performance Elements for oral presentations, taken together, more closely correspond to the matched CCSS in grain size and level of detail and more clearly represent the overlap between the two sets of standards than the one-on-one matches of CCSS to ESS.

For the third Essential Topic, Problem-Solving and Critical Thinking (ESS03), fewer skill statements and Performance Elements had CCSS matches. Of the four skill statements for this topic, two had no matches in the CCSS, one had a partial match, and one had a match representing “complete coverage with considerations.” The two skill statements with no matches addressed the use of critical thinking to “resolve conflicts” in the workplace (ESS03.02) and the creation and monitoring of “performance goals” in the workplace (ESS03.03). No CCSS cover these skills. The greatest degree of overlap (“complete with considerations”) with the CCSS was found for skill statement ESS03.04, which focuses on “technical research” used for making decisions.

For this topic, all of the ESS with matches to content in the CCSS were found to have the same level of complexity as the matched CCSS. In addition, all of the matched CCSS represented the endpoint in the progression of these skills within the CCSS.

One key difference between the two sets of standards in relation to this topic is that no CCSS standard explicitly identifies critical thinking or problem solving as its central focus; the CCSS describe skills in reading, writing, and speaking and listening in which capacities for critical thinking and problem solving may be implicit, but are rarely referred to directly. Only a small number of CCSS explicitly refer to solving problems or making decisions; for example, in the context of language arts activities such as “collaborative discussions” or written research projects. The skill statements and Performance Elements are also more general than the related CCSS in describing skills with a broad range of application beyond the language arts, in content areas such as mathematics and science as well as workplace contexts. For example, skill statement ESS03.01 focuses on using critical thinking “independently and in teams” to “solve problems and make decisions,” a skill with a broad range of applications across content areas. It had partial coverage matches to a number of CCSS in Reading, Writing, and Speaking and Listening. The rating of partial coverage reflects the fact that, unlike the ESS, the matched CCSS only address problem solving in the context of specific language arts skills, such as integrating “multiple sources of information presented in different media or formats” (RI.11-12.7, SL.11-12.2) or conducting “short as well as more sustained research projects” (W.11-12.7). None of the matched CCSS explicitly refer to critical thinking; only one (SL.11-12.1) makes any reference to teamwork or collaboration. The ESS skill statement and its related Performance Elements, by contrast, emphasize the broader cognitive capacities, to think critically and to solve problems, not only in the context of conducting research or integrating information from diverse sources. Many of the Performance Elements for this skill statement, ESS03.01.01–ESS03.01.11, had no matches to any CCSS, either because they describe problem-solving skills specifically applied to

workplace tasks or because they describe the use of problem-solving methods (not addressed in the CCSS). Other Performance Elements, such as “Evaluate ideas, proposals, and solutions to problems” (ESS03.01.05), had partial matches to CCSS that were more specifically focused on writing (research) or reading (information) skills. Only one Performance Element, focused on analyzing information, had a match to CCSS, with coverage rated as “complete with considerations.” Although the performance element still has broader applications than the corresponding content in the CCSS, the core skill of analyzing information “to determine value to the problem-solving task” overlaps with that in the CCSS.

The greatest degree of overlap with CCSS in this Essential Topic was found in skill statement ESS03.04, “Conduct technical research to gather information necessary for decision-making,” and its related Performance Elements. The skill statement had matches to CCSS with coverage rated as “complete with considerations,” recognizing that “decision-making” in the ESS might include workplace applications not covered in the matched CCSS. All of the performance elements for this skill statement had matches to CCSS in Writing and Speaking and Listening, with “full” or “complete” coverage of the ESS content. The overlapping content in both sets of standards focuses on research skills; that is, on gathering, evaluating, integrating, and using information and data to make decisions. As in other examples previously discussed, the ESS skill statement summarizes the skill in more general terms (“Conduct research . . . for decision-making”), and the related Performance Elements focus on subsets of skills required for steps in the larger process. The Performance Elements also describe subsets of skills that are integrated in the matched CCSS. These differences in grain size and organization suggest that the combined skill statements and Performance Elements most closely approximate the grain size of the matched CCSS standards.

For the Information Technology Applications Essential Topic (ESS04), there were relatively few matches to CCSS; of the eleven skill statements for this topic, only three had matches to CCSS, and most of the matches found were rated as representing “partial” coverage of the ESS or “complete coverage with considerations.” With a few exceptions (discussed below), the ESS with matching content in the CCSS were found to have the same level of complexity as the CCSS. The majority of the matched CCSS represent the end point in the progression of the skills within the CCSS.

This Essential Topic covers the skills needed to use “information technology tools” in a workplace context. Many of the skill statements and related Performance Elements have no matches in the CCSS because the central skills they describe are context-specific, linked to occupational tools and functions that have no counterpart in the CCSS. For example, “Use Personal Information Management (PIM) applications to increase workplace efficiency” (ESS04.01) and “Employ technological tools to expedite workflow” (ESS04.02) have no matches in the CCSS to the workplace-specific knowledge and skills they describe.

Three skill statements for this topic, ESS04.04–06, did have matches to CCSS in either Writing or Speaking and Listening. All three address the use of the Internet or Internet applications for purposes including locating information (04), preparing written documents (05), or preparing oral presentations (06), all skills that are covered in the CCSS. In all three skill statements and in most of their related Performance Elements, however, the skills described are applied to business tasks or purposes, such as preparing “business documents” or presentations for “training, sales,

and information-sharing.” With a few exceptions, the matches found to CCSS are rated as representing “partial” coverage of the ESS or “complete coverage with considerations.” The few matches rated as representing “full coverage” are to performance elements that describe a skill in more general terms, without specifying the application to a business context. For example, ESS04.04.03, “Evaluate Internet resources reliability and validity,” has a full-coverage match to several CCSS because it does not explicitly limit the skill described to a business purpose. In contrast, ESS04.06.01, “Prepare presentations for training, sales, and information sharing,” has no matches in the CCSS because of the business-oriented purposes it specifies.

Knowledge and Skill Statement ESS04.04, addressing the use of Internet applications to “perform workplace tasks,” had no matches in the CCSS; some of its Performance Elements, again describing skills in more general terms, did have matches, although some were rated as having a different level of complexity than the matched CCSS. For example, Performance Element ESS04.04.01, “Access and navigate Internet (e.g., use a web browser),” was matched to a CCSS standard that calls for students to use Internet technology to “produce and publish writing,” a more complex skill than accessing the Internet. Under the same skill statement, the content of Performance Element ESS04.04.03, “Evaluate Internet resources for reliability and validity,” was found to have the same level of complexity as the matched CCSS. The “different” rating for the complexity of several of the Performance Elements for this skill statement most likely reflects the organizational structure in the ESS, in which more complex skills described in skill statements are broken into subsets of individual skills in Performance Elements. The Performance Element describing the skill of accessing and navigating the Internet is likely intended to represent one component of the skill statement and would be expected to be applied to the more complex activities implied in that statement.

The remaining Essential Topics in the Essential Knowledge and Skills Statements, ESS05–ESS09, had no matches to the CCSS. These Essential Topics, including Systems; Safety, Health, and Environmental; Leadership and Teamwork; Ethics and Legal Responsibilities; and Employability and Career Development, focus on knowledge and skills that are specific to workplace environments or to career development.

Are any Knowledge and Skill Statements not matched to the CCSS?

As seen in Table 3, for Essential Topic ESS01, Academic Foundations, ESS01.01 and its related Performance Elements were not matched to any CCSS. Under ESS01.02, only ESS01.02.09 was not matched to any CCSS. Decision Rule 1 provides an explanation for why there were no matches for ESS01.02 (i.e., ESS01.02.09), ESS01.03, and ESS01.04. Most of the Knowledge and Skill Statements and Performance Elements under Essential Topic ESS02, Communications, were matched to CCSS, with the exception of a few Performance Elements under ESS02.01, ESS02.02, ESS02.10, and ESS02.11. In ESS03, Problem-Solving and Critical Thinking, some Performance Elements under ESS03.01 were not matched to CCSS, and none of the Knowledge and Skill Statements and Performance Elements under ESS03.02 and ESS03.03 were matched to CCSS. In ESS04, Information Technology Applications, ESS04.01, ESS04.02, ESS04.03, ESS04.08, ESS04.09, ESS04.10, and ESS04.11 were not matched to CCSS at the Knowledge and Skill Statement or Performance Element levels. ESS04.04 and ESS04.05 were not matched at the Knowledge and Skill Statement level, but all of the Performance Elements were matched. ESS04.06 had one unmatched Performance Element.

Five Essential Topics—ESS05, Systems; ESS06, Safety, Health and Environmental; ESS07, Leadership and Teamwork; ESS08, Ethics and Legal Responsibilities; and ESS09, Employability and Career Development—were not matched to CCSS at the Knowledge and Skill Statement or Performance Element levels. Essential Topic ESS10, Technical Skills, had CCSS matched to one Performance Element, leaving two Knowledge and Skill Statements and six Performance Elements not matched to CCSS.

What section(s) of the CCSS contain(s) the greatest overlap with the Essential Knowledge and Skills?

Mathematics

The more general Mathematical Practice standards apply across grade levels as well as conceptual categories. Most of these match with several ESS and are well represented, with the exception of MP.7, which was matched to one ESS, and MP.8, matched to two ESS.

Most CCSS involving data use and representation overlap with the ESS, as do many of the CCSS that specify problem solving. At the high school level, most standards in the Statistics and Probability conceptual category are matched with several ESS at the skill statement and Performance Element levels. A few are matched with one ESS, and five of the 31 standards are not directly matched to any ESS. The non-matched CCSS focus on probability and focus less on application than on procedural fluency.

Other conceptual categories that involve content related to measurement and data are also matched to the ESS with the consideration that the nature of the intended ESS includes specifics of the CCSS. For example, only four of 43 Geometry standards were matched to a single ESS at the Performance Element level, and these were for concepts involving shapes or measurements and modeling with geometry. Nine of the 28 standards in the Functions conceptual category, six of the 27 Algebra standards, and five of the 27 Number and Quantity standards matched one of two ESS at the Performance Element level (ESS01.03.04, involving applying data or measurements, and/or ESS01.03.06, involving creating tables, graphs, etc.) and/or matched one ESS at the skill level (ESS03.01, involving use of critical thinking skills).

Although there were no direct matches with the 24 grade 7 standards or with the 28 grade 8 standards, the material is addressed more fully in the high school conceptual categories and, when appropriate, matched at that level. The 10 direct matches identified in grades 3–6 (two of 29 grade 6 standards, four of 26 grade 5 standards, three of 28 grade 4 standards, and one of 28 grade 3 standards) address identification, computation, and comparison of whole numbers, fractions, and decimals.

ELA

Overall, the majority of the ELA CCSS were found to have matches in the ESS, with the exception of three CCSS sections. As would be expected, the four CCSS for Reading: Foundational Skills (K-5 only) had no matches in the ESS; these CCSS describe knowledge and skills (such as phonics) students are expected to have mastered by the end of grade 5. In addition, none of the 10 CCSS for Reading literature (0%) and only one of the 10 CCSS for Reading/Literacy in History/Social Studies (10%) had matches to the ESS. This result reflects the emphasis in the ESS on informational, technical, or business texts but not on literature or historical texts/documents. All other sections of the CCSS had matches to ESS, with the greatest overlap found in the CCSS sections for Reading Informational Text (90% of the 10 standards matched), Speaking and Listening (100% of 10 standards matched), and Reading/Literacy in Science and technical Subjects (100% of 10 standards matched). A smaller majority of the standards for Writing (70% of 10 standards) and Language (67% of the 6 standards) had matches in the ESS.

In effect, compared to the ESS, the ELA CCSS include a broader range of academic content as “essential” for college and career-readiness; more specifically, the CCSS include knowledge of literary texts and literacy in history/social studies as essential content while these areas are not represented in the ESS. In Writing, the CCSS include skills in three broad types of writing: arguments, informative/explanatory texts, and narratives. The ESS focus on skills in producing informational or explanatory writing but do not address argument or narrative. Both the CCSS and the ESS include knowledge and skills required for control of grammar and conventions in writing or speaking. The CCSS for Language, however, also include knowledge of other aspects of language, such as the use of figurative language, word relationships, nuances in meaning, etc.

The sections of the CCSS with matches to ESS can be described as addressing core academic skills in reading, writing, speaking and listening at the secondary (college and career ready) level as applied to information and informational or technical texts. The sections of the CCSS with few or no matches can be described as addressing core skills in reading as applied to literary or historical texts and in writing as applied to narrative or argumentative texts.

Are any CCSS from these sections not matched to the Essential Knowledge and Skills?

Mathematics

In most of the mathematics sections identified in Phase 1, there are individual standards not matched to ESS. (See Appendix B.) The Mathematical Practice standards were all matched to ESS. When looking at these results, it is important to remember Phase 2 protocol. Analysts found the best content match at the highest-grade-level CCSS. If an ESS was matched with a high school standard, the lower-grade-level standards would not be matched. Therefore, lack of matches in grades 3–8 could indicate that matches were made at the high school level.

As mentioned previously, almost all domains in the Statistics and Probability conceptual category were well represented, with the exception being limited matching with standards dealing with conditional probability. Most of the Geometry conceptual category was not matched, including standards dealing with congruence, similarity, right triangles and

trigonometry, circles, geometric properties, and relationships between two- and three-dimensional objects. For Functions, there was little match in building functions; in constructing linear, quadratic, and exponential models; or in using and applying trigonometric functions. In the Algebra conceptual category, content dealing with structures of expressions, operations on polynomials, and reasoning with equations and inequalities had few if any matches. Mathematics content in the Numbers and Quantity conceptual category that was not matched with ESS includes the real number system and the complex number system, as well as properties and operations with complex numbers and vectors and matrices.

In some cases, CCSS that are not matched to an ESS are nonetheless important for meeting CCSS that are matched. For example, in the Functions conceptual category, standard F.IF.8 (in which students write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function, and which includes using properties of exponents and exponential functions) and standard F.IF.9 (which involves comparing properties of two functions) are not directly matched to an ESS. However, each may be a key element in accomplishing standards that are matched to an ESS, such as standard F.BF.1 (in which students write a function that describes a relationship between two quantities, determining an explicit expression or a recursive process, or steps for calculating from a context, as well as combining standard function types using arithmetic operations) and standard F.LE.1 (which involves distinguishing between situations that can be modeled with linear functions and with exponential functions, and recognizing the type of growth involved).

ELA

Because of the consistent structure of the ELA CCSS, the analysis is framed around the College and Career Readiness Anchor Standards. Although reading has one set of Anchor Standards, there are four areas of Reading Standards. Most of the Reading Standards for Literature and Reading Standards for Literacy in History/Social Studies 6–12 were not matched, while only one of the Reading Standards for Informational Text was not matched to ESS. Writing also has one set of Anchor Standards but two areas of Writing Standards. Two Writing Standards and four Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–12 were not matched. Lastly, two Language Standards were not matched to ESS.

IV. Considerations for Next Steps Suggested by the Findings

The intention of this study was to provide the Kansas State Department of Education (KSDE) with information about the correspondence between the Essential Knowledge and Skills and the CCSS for English language arts and mathematics for grades 3–8 and high school; which Knowledge and Skill Statements, if any, do not match to the CCSS; and which section(s) of the CCSS contain(s) the greatest overlap with the Essential Knowledge and Skills. The following are suggested next steps based on the findings of this descriptive study. It is important to note that, given the nature of this study, and given that these findings and suggestions are being presented in the early stages of the State’s planning for its transition to the CCSS, these suggestions should in no way be interpreted to constrain the State’s discussion and decisions. Rather, these findings and suggested considerations for next steps should encourage the State to further examine and discuss the study’s descriptive data and their implications for the design and development of tools and professional development to support the transition.

1. As KSDE implements its standards (academic content and career and technical education), it should consider how to make explicit and clear the operational definition and intent of the standards. An explicit and clear definition has implications for consistent interpretation and implementation of its standards by the field.

In Phase 1 of the study’s analyses, an examination of the definition of “career readiness,” either as explicitly stated or as defined through the content of the State and CCSS documents reviewed, was conducted to help explain and understand possible patterns of overlap and/or areas of overlap between the Essential Knowledge and Skills and the CCSS. Generally, the State of Kansas appears to integrate its definitions of college readiness and career readiness. For example, acknowledgment within the Career Clusters that some careers within each occupational field require college or other education after high school, strengthens the idea that “college ready” is part of “career ready.” Although each student is required to meet the Essential Knowledge and Skills, there are specific standards beyond the Knowledge and Skill Statements or Performance Elements (collectively referred to as “ESS”) that are mapped out in the Clusters and Pathways. Preparedness expectations are differentiated for different fields and for different occupations in a field. This description appears to be qualitatively different from the description used by the CCSS. The CCSS consist of academic standards that every student is to meet (with the exception of some mathematics standards) without differentiation between students who desire different careers. The only differentiation suggested in the CCSS is the designation of some mathematics standards as being needed for advanced courses. This is the only indication that there might be different academic needs for different careers.

2. The state should consider how to define the relationship between the ESS and CCSS—that is, whether the ESS should be interpreted as inclusive of all aspects of the CCSS, and likewise whether the CCSS include all content intended by the ESS. This definition will have implications for the implementation of the standards in practice (e.g., assessment, instruction).

In mathematics, the ESS generally encompass more content than individual CCSS content standards and generally are written at a higher level of granularity than individual CCSS. The CCSS for ELA often tend to integrate more elements (such as organization, development, and style in writing) within individual standards, compared to the ESS performance elements; thus, the ESS content that matches to any one CCSS may be spread over a number of performance elements. Correspondence between the two sets of standards often depends upon the level of specificity and the nature or focus of the intended ESS.

3. KSDE should consider upfront how to best specify the application of a skill to a specific workplace context or purpose, the specific problem type associated with a standard, the context of the problem to be solved, the tools to be used, and/or the conceptual area addressed. Such specification has implications for the degree of correspondence between the ESS and the CCSS and the implementation of the standards in practice.

While there is full coverage between a number of Performance Elements and ELA and mathematics CCSS, there exists a range of content that is covered but at a different level of complexity or applied to a narrower or specific context, for example. Additionally, there are instances in the CCSS (e.g., in ELA) where certain capacities (e.g., critical thinking and problem solving) may be implicit and not referred to directly. The different grain size and organization of the two sets of standards (i.e., ESS and CCSS) and implications for the correspondence between the two sets of standards necessitate further examination and discussion.

4. With its intention of integrating as appropriate its academic and career and technical education standards, the State should further examine the data associated with this study and determine whether and how collections of related matched standards can be clustered and used, for example, to represent the endpoint of a student's learning or where the standards may fall along a progression of skills and knowledge. The outcomes of this discussion have implications for implementation of the standards in practice.

The organization and interrelatedness of the CCSS, along with consideration of what has been determined by the analysts of this study as *full*, *complete with considerations*, and *partial* coverage of the ESS and CCSS, provides the state an opportunity to use information from this study to purposefully define, organize, and integrate skills, as appropriate, for applicability in the academic and work place contexts.

5. Although this study's analysts determined that there was no correspondence found between some CCSS and Essential Topics, the State is encouraged to examine the analysts' interpretations of the standards and judgments of correspondence.

There were no matches of mathematics CCSS with Essential Topics ESS05–ESS10 at the skill or Performance Element levels. ESS05–ESS09 also had no matches to the ELA CCSS. Generally, the analysts determined that the focus of these Essential Topics on knowledge and skills specific to workplace environments or to career development did not lend themselves to correspondence with the CCSS.

V. References

- Bailey, A., Butler, F., & Sato, E. (2007). Standards-to-standards linkage under Title III: Exploring common language demands in ELD and science standards. *Applied Measurement of Education*, 20 (1).
- Council of Chief State School Officers (CCSSO) & National Governors Association (NGA). (2010a). *Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects*. Author.
- Council of Chief State School Officers (CCSSO) & National Governors Association (NGA). (2010b). *Common Core State Standards for Mathematics*. Author.
- Flowers, C., Wakeman, S. Y., Browder, D. M., & Karvonen, M.(2007). *Links for academic learning: An alignment protocol for alternate assessments based on alternate achievement standards*. Charlotte, NC: National Alternate Assessment Center, University of North Carolina at Charlotte.
- Kansas State Board of Education (2010, December). *Kansas Education Committee: Final Report*. Topeka, KS: Author.
- National Association of State Directors of Career Technical Education Consortium (2009, June). *Using Career Clusters Knowledge and Skill Statements to Shape Programs of Study*. Presentation at the 2009 Career Clusters Institute, Fort Worth, TX.
- States' Career Cluster Initiative (2008). Essential Knowledge and Skill Statements. Retrieved January 2011 from <http://www.careerclusters.org/resources/web/ks.php>.
- Webb, N. (July, 2005). *Web Alignment Tool (WAT) Training Manual, Draft Version 1.1*, pages 45-46 and 70-75. Available from: <http://wat.wceruw.org/index.aspx>.

Phase 1. Initial Review of Documents	1. Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, and Language	2. College and Career Readiness Anchor Standards for Reading	3. Reading Standards for Literature 6-12	4. Reading Standards for Informational 6-12	5. Reading Standards for Literacy in History/Social Studies 6-12	6. Reading Standards for Literacy in Science and Technical Subjects 6-12	7. Reading Standards for Literature K-5 (grades 3-5 only)	8. Reading Standards for Informational K-5 (grades 3-5 only)	9. Reading Standards: Foundational Skills (K-5) (grades 3-5 only)	10. College and Career Readiness Anchor Standards for Writing	11. Writing Standards (6-12)	12. Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6-12	13. Writing Standards (K-5)	14. College and Career Readiness Anchor Standards for Speaking and Listening	15. Speaking and Listening Standards 6-12	16. Speaking and Listening Standards K-5 (grades 3-5 only)	17. College and Career Readiness Anchor Standards for Language	18. Language Standards 6-12	19. Language Standards K-5 (grades 3-5 only)	Comments
Essential Topic ESS01: ACADEMIC FOUNDATIONS	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All sections except for Reading Literature 6-12 and Reading Literature K-5. However, in some sections, the overlap will be limited to one sub-level standard in the CCSS.
Essential Topic ESS02: COMMUNICATIONS	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Same sections as above: All sections except for Reading Literature 6-12 and Reading Literature K-5.

Phase 1. Initial Review of Documents	1. Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, and Language 2. College and Career Readiness Anchor Standards for Reading 3. Reading Standards for Literature 6-12 4. Reading Standards for Informational 6-12 5. Reading Standards for Literacy in History/Social Studies 6-12 6. Reading Standards for Literacy in Science and Technical Subjects 6-12 7. Reading Standards for Literature K-5 (grades 3-5 only) 8. Reading Standards for Informational K-5 (grades 3-5 only) 9. Reading Standards: Foundational Skills (K-5) (grades 3-5 only) 10. College and Career Readiness Anchor Standards for Writing 11. Writing Standards (6-12) 12. Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6-12 13. Writing Standards (K-5) 14. College and Career Readiness Anchor Standards for Speaking and Listening 15. Speaking and Listening Standards 6-12 16. Speaking and Listening Standards K-5 (grades 3-5 only) 17. College and Career Readiness Anchor Standards for Language 18. Language Standards 6-12 19. Language Standards K-5 (grades 3-5 only)																			Comments
Essential Topic ESS03: PROBLEM-SOLVING AND CRITICAL THINKING	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	Y	N	N	N	N	Overlap is limited to some content at the sub-level in sections listed. Problem-solving per se is not a <i>central</i> /focus in any of the CCSS sections. However, the critical thinking skills referred to in the Essential Topic (analyze, synthesize, and evaluate) are covered in many sections the CCSS, w/o a specific application to problem-solving.
Essential Topic ESS04: INFORMATION TECHNOLOGY APPLICATIONS	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	N	Y	Y	N	N	N	N	Limited overlap at the sub-level in most of these sections. Note that the Essential Topic refers to the use of tools "specific to the career cluster." The related content in the CCSS describes closely related skills but without the context of specific careers. Some of the CCSS sections for K-5, such as Writing Standards K-5 and Speaking and Listening K-5, could be considered foundational to the Essential Topic.

Phase 1. Initial Review of Documents	1. Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, and Language	2. College and Career Readiness Anchor Standards for Reading	3. Reading Standards for Literature 6-12	4. Reading Standards for Informational 6-12	5. Reading Standards for Literacy in History/Social Studies 6-12	6. Reading Standards for Literacy in Science and Technical Subjects 6-12	7. Reading Standards for Literature K-5 (grades 3-5 only)	8. Reading Standards for Informational K-5 (grades 3-5 only)	9. Reading Standards: Foundational Skills (K-5) (grades 3-5 only)	10. College and Career Readiness Anchor Standards for Writing	11. Writing Standards (6-12)	12. Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6-12	13. Writing Standards (K-5)	14. College and Career Readiness Anchor Standards for Speaking and Listening	15. Speaking and Listening Standards 6-12	16. Speaking and Listening Standards K-5 (grades 3-5 only)	17. College and Career Readiness Anchor Standards for Language	18. Language Standards 6-12	19. Language Standards K-5 (grades 3-5 only)	Comments
Essential Topic ESS05: SYSTEMS	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Essential Topic ESS06: SAFETY, HEALTH AND ENVIRONMENTAL	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Essential Topic ESS07: LEADERSHIP AND TEAMWORK	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	Limited overlap at the sub-level. Leadership is not a central focus of any CCSS standards.
Essential Topic ESS08: ETHICS AND LEGAL RESPONSIBILITIES	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Essential Topic ESS09: EMPLOYABILITY AND CAREER DEVELOPMENT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Most of the sub-level content of this Essential Topic describes skills and knowledge specific to a workplace/career context. These specific skills are not covered in the CCSS.

Essential Topic ESS10: TECHNICAL SKILLS	Phase 1. Initial Review of Documents	1. Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, and Language	2. College and Career Readiness Anchor Standards for Reading	3. Reading Standards for Literature 6-12	4. Reading Standards for Informational 6-12	5. Reading Standards for Literacy in History/Social Studies 6-12	6. Reading Standards for Literacy in Science and Technical Subjects 6-12	7. Reading Standards for Literature K-5 (grades 3-5 only)	8. Reading Standards for Informational K-5 (grades 3-5 only)	9. Reading Standards: Foundational Skills (K-5) (grades 3-5 only)	10. College and Career Readiness Anchor Standards for Writing	11. Writing Standards (6-12)	12. Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6-12	13. Writing Standards (K-5)	14. College and Career Readiness Anchor Standards for Speaking and Listening	15. Speaking and Listening Standards 6-12	16. Speaking and Listening Standards K-5 (grades 3-5 only)	17. College and Career Readiness Anchor Standards for Language	18. Language Standards 6-12	19. Language Standards K-5 (grades 3-5 only)	Comments
	N		Y	N	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	Y	N	N	N	N	<p>Speaking and Listening K-5 could be considered foundational to the skills in the Essential Topic.</p> <p>All of the overlap is between one sub-level under the Essential Topic and some sub-level content in the listed CCSS sections. In sum, the overlap is found in many sections but is narrow in each.</p>

Step 1. Initial Review of Documents	Standards for Mathematical Practice	HS – Statistics and Probability	HS – Geometry	HS – Modeling	HS – Functions	HS – Algebra	HS – Number and Quantity	Grade 8	Grade 7	Grade 6	Grade 5	Grade 4	Grade 3	Comments
Essential Topic ESS01: ACADEMIC FOUNDATIONS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Overlap focuses on ESS01.03 and sub-parts of ESS01.02 and ESS01.04. Because the entire set of math CCSS are intended to prepare students for post-secondary education and career opportunities, specific overlap with ESS01 in the lower grades will address particular sub-parts of ESS01.03, and across the grades there is a focus on data, measurement, charts and tables in the context of solving problems. Overlap with ESS02 comes in the form of using tables, graphs, etc. to evaluate trends, determine cause and effect, predict, interpret and persuade, particularly in the upper grades.
Essential Topic ESS02: COMMUNICATIONS	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Overlap is limited and focuses at least indirectly on sub-parts of ESS02.01 and ESS02.09. Observations regarding information, data and analysis appear across grades, but specific reading and communication strategies are not the focus. Overlap in the lower grades comes with representing and interpreting data. In the middle grades, overlap may involve analyzing relationships between dependent and independent variables, understanding statistical variability and describing distributions, drawing inferences about one or more populations, and investigating bivariate data. For advanced studies, students may model with vectors and matrices, reason with equations and inequalities, model and interpret relationships that may be linear or more complex, and make inferences and justify conclusions, including using probability to make decisions.
Essential Topic ESS03: PROBLEM-SOLVING AND CRITICAL THINKING	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Across the HS categories and grades, math CCSS involve problem solving in real-world settings. Typically, these involve individual work, not specifying team or group work, though aspects of some standards may lend themselves to designing and conducting projects that would be with others. Also, many CCSS involve solving problems but do not specify using creativity or innovation. Overlap may be limited to when the context involves specific workplace problems or concerns, such as in high school Geometry. Overlap focuses on sub-parts of ESS03.01 and ESS03.04.
Essential Topic ESS04: INFORMATION TECHNOLOGY APPLICATIONS	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	Typically math CCSS involve technology with tools, and are not focused on information technology. Based on limited overlap, as described by the sub-topics, math content in the lower grades is unlikely to provide useful links between the ESS and CCSS. Possible overlap occurs in sub-parts of ESS04.04, ESS04.07 and ESS04.08, to the extent that students use the Internet to research problems, use spreadsheets for analysis and calculations, manage data with database applications.

Step 1. Initial Review of Documents	Standards for Mathematical Practice	HS – Statistics and Probability	HS – Geometry	HS – Modeling	HS – Functions	HS – Algebra	HS – Number and Quantity	Grade 8	Grade 7	Grade 6	Grade 5	Grade 4	Grade 3	Comments
Essential Topic ESS05: SYSTEMS	N	N	N	N	N	N	N	N	N	N	N	N	N	Based on ESS05 knowledge and skill statements, there is no direct overlap with the math CCSS, although a systems topic may provide context for which problem-solving, data analysis, etc. standards could apply.
Essential Topic ESS06: SAFETY, HEALTH AND ENVIRONMENTAL	N	N	N	N	N	N	N	N	N	N	N	N	N	Based on ESS06 knowledge and skill statements, there is no direct overlap with the math CCSS; and it seems unlikely that a safety, health or environmental topic would provide context for which specific CCSS could apply.
Essential Topic ESS07: LEADERSHIP AND TEAMWORK	Y	Y	N	Y	N	N	N	Y	Y	N	N	N	N	There is limited, indirect overlap with sub-parts of ESS07.01 and ESS07.04. Possible overlap in Standards for Mathematical Practice would involve making sense of problems and persevering in solving them, or constructing viable arguments and critiquing the reasoning of others. However, leadership or teamwork seems unlikely to provide a context for specific CCSS standards without purposeful linkage with the context.
Essential Topic ESS08: ETHICS AND LEGAL RESPONSIBILITIES	N	N	N	N	N	N	N	N	N	N	N	N	N	Based on ESS08 knowledge and skill statements, there is no direct overlap with the math CCSS; and it seems unlikely that a ethics or legal responsibility topic would provide context for which specific CCSS could apply.
Essential Topic ESS09: EMPLOYABILITY AND CAREER DEVELOPMENT	N	N	N	N	N	N	N	N	N	N	N	N	N	Based on ESS09 knowledge and skill statements, there is no direct overlap with the math CCSS; and it seems unlikely that a employability or career development topic would provide context for which specific CCSS could apply.
Essential Topic ESS10: TECHNICAL SKILLS	Y	Y	N	Y	N	N	Y	Y	Y	N	N	N	N	There is limited, indirect overlap with sub-parts of ESS10.01 and ESS10.02. Possible overlap in Standards for Mathematical Practice would involve making sense of problems and persevering in solving them, or constructing viable arguments and critiquing the reasoning of others. However, technical skills seems unlikely to provide a context for specific CCSS standards without purposeful linkage with the context.

	The following knowledge and skill statements are essential to success for careers in all clusters and pathways. Persons preparing for careers at any level should be able to demonstrate these skills in the context of their chosen cluster and pathway.	Matched Mathematical Practice Standard	Matched Standard	Progression (a-e)	Complexity (S/D)	Coverage (F/C/P/N)	Comments Regarding Correspondence
Essential Topic ESS01	ACADEMIC FOUNDATIONS: <i>Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.</i>						The entire mathematics CCSS is a subset of this ESS Topic.
ESS01.01	Complete required training, education, and certification to prepare for employment in a particular career field.	N	N			N	No mathematics CCSS directly relate to training, education, or certification specific to particular careers.
ESS01.01.01	Identify training, education and certification requirements for occupational choice.	N	N			N	
ESS01.01.02	Participate in career-related training and/or degree programs.	N	N			N	
ESS01.01.03	Pass certification tests to qualify for licensure and/or certification in chosen occupational area.	N	N			N	
ESS01.02	Demonstrate language arts knowledge and skills required to pursue the full range of post-secondary education and career opportunities.	N	N			N	No mathematics CCSS directly relate to the language arts knowledge and skills required for post-secondary opportunities.
ESS01.02.01	Model behaviors that demonstrate active listening.	N	N			N	
ESS01.02.02	Adapt language for audience, purpose, situation. (i.e. diction/structure, style).	N	N			N	
ESS01.02.03	Organize oral and written information.	N	N			N	

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ESS01.02.04	Compose focused copy for a variety of written documents such as: agendas, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.	N	N			N	
ESS01.02.05	Edit copy to create focused written documents such as: agendas, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.	N	N			N	
ESS01.02.06	Comprehend key elements of oral and written information such as: cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, and technical subject matter.	N	N			N	
ESS01.02.07	Evaluate oral and written information for: accuracy, adequacy/sufficiency, appropriateness, clarity, conclusions/solutions, fact/opinion, propaganda, relevancy, validity, and relationship of ideas.	N	N			N	
ESS01.02.08	Identify assumptions, purpose, outcomes/solutions, and propaganda techniques.	N	N			N	

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ESS01.02.09	Predict potential outcomes and/or solutions based on oral and written information regarding trends.	N	N			N	
ESS01.02.10	Present formal and informal speeches including: discussion, information requests, interpretation, and persuasive arguments.	N	N			N	
ESS01.03	Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities.						According to the mathematics CCSS introduction (p. 5), complete coverage of the CCSS is required for the full range of post-secondary opportunities.
ESS01.03.01	Identify whole numbers, decimals, and fractions.		5.NBT.3; 4.NBT.2; 4.NF.6; 3.NF.1	a; a; b; b	S; S; S; S	F	Coverage of this indicator is accomplished with a collection of mathematics CCSS across grades 5 and below, which address the number systems specified. Identifying whole numbers, decimals, and fractions is foundational to understanding other number systems, and is presumed learned by the time negative numbers are introduced in grade 6. The CCSS provide detail as to how number systems are related, focusing on understanding how one system builds on another. CCSS 5.NBT.3 and 4.NBT.2 combine comparing decimals and fractions with reading and writing them.
ESS01.03.02	Demonstrate knowledge of basic arithmetic operations such as: addition, subtraction, multiplication, and division.	MP.6; MP.7; MP.8	6.NS.1; 6.NS.3; 5.NF.1; 5.NF.4; 5.NF.7	a; a; a; a; b	S; S; S; S; S	F	Coverage of this indicator is accomplished with a collection of mathematics CCSS across grades 6 and below, which address basic operations in the number systems specified in ESS01.03.01 (whole numbers, decimals, and fractions). Many CCSS provide detail as to how student understanding is developed, how operations are related, and application to real-world situations.

	The following knowledge and skill statements are essential to success for careers in all clusters and pathways. Persons preparing for careers at any level should be able to demonstrate these skills in the context of their chosen cluster and pathway.	Matched Mathematical Practice Standard	Matched Standard	Progression (a-e)	Complexity (S/D)	Coverage (F/C/P/N)	Comments Regarding Correspondence
ESS01.03.03	Demonstrate use of relational expressions such as: equal to, not equal, greater than, less than, etc.	MP.6	5.NBT.3; 4.NBT.2; 4.NF.2	d; a; a	S; S; S	F	Coverage of this indicator is accomplished with a collection of mathematics CCSS across grades 5 and below, which address finding equivalent numbers and comparing numbers in the number systems specified in ESS01.03.01. Although the CCSS do not specify “not equal,” coverage is inferred from the use of greater than and less than.
ESS01.03.04	Apply data and measurements to solve a problem.	MP.1; MP.2; MP.4; MP.6	S.ID.1–9; S.IC.1–6; S.CP.4, 5; G.GMD.3; G.MG.1–3; F.IF.2, 4–6; F.LE.1, 5; A.CED.1–3; N.Q.1–3	d; d; a; d; d; d; d; d; d; d	D; S; S; S; S; S; D; S; S	F	<p>Across grades 8 and below, and in each of the five high school conceptual categories, there is problem solving that involves data and/or measurement. Grades 5 and below have a domain named Measurement and Data. In grades 6–8 data is addressed in the Statistics and Probability domain, and measurement is addressed in the context of fractions, ratios, and proportions, as well as in the Geometry and the Statistics and Probability domains.</p> <p>In the high school Statistics and Probability conceptual category, the CCSS in the S.ID and S.IC domains provide more specificity and detail, and may match the data problem types targeted by the ESS. The matches with standards in the other domains depend upon the inclusion of data and measurement problems involving conditional probability; measurements of geometric shapes and quantities; relationships that can be modeled as linear functions, equations, or inequalities; as well as problems involving unit rates, scale, proportional relationships, area, circumference, angle measurement, etc. Although not coded here, some of the CCSS designated with a (+) and intended for students preparing to take advanced mathematics courses also address the ESS. In particular, N.VM.3 and 6 (Vector and Matrix Quantities), S.CP.9 (Conditional Probability and the Rules of Probability), and S.MD.1–7 (Using Probability to Make Decisions) involve applying data in problem-solving situations.</p> <p>Differences in complexity are due primarily to differences in specificity. The ESS is written at a broader level of granularity than the CCSS. The State may wish to review whether the ESS should be interpreted as inclusive of all aspects of the CCSS.</p>

	The following knowledge and skill statements are essential to success for careers in all clusters and pathways. Persons preparing for careers at any level should be able to demonstrate these skills in the context of their chosen cluster and pathway.	Matched Mathematical Practice Standard	Matched Standard	Progression (a-e)	Complexity (S/D)	Coverage (F/C/P/N)	Comments Regarding Correspondence
ESS01.03.05	Analyze Mathematical problem statements for missing and/or irrelevant data.	MP.1; MP.2; MP.3				F	The ESS focus on determining missing and/or irrelevant data is not directly specified in the mathematics CCSS content standards, but is a necessary part of problem solving, especially in situations in which students design/conduct experiments, determine appropriate models or strategies to use, etc.
ESS01.03.06	Construct charts/tables/graphs from functions and data.	MP.1; MP.2; MP.4; MP.5; MP.6	S.ID.1, 5, 6; S.CP.4; F.IF.2, 4, 5, 7; F.LE.2; A.REI.11, 12	d; a; d; d; d	S; S; S; S; S	F	Across the grades and high school conceptual categories, mathematics CCSS include problems involving charts, tables, and graphs representing functions and data. CCSS in the grades 5 and below Measurement and Data domains involve representing data with tables and a variety of graphs. In grades 6–8, students construct tables, charts, and graphs to represent quantitative relationships between dependent and independent variables, to represent data distributions, to represent proportional relationships, to find probabilities, and to investigate patterns of association in bivariate data; and they use functions to model relationships. At the secondary level, most CCSS include representing data and functions, and go beyond to summarizing and interpreting the information, and may specify a variety of types of functions (e.g., logarithms, polynomials), systems of equations, inequalities, etc.
ESS01.03.07	Analyze data when interpreting operational documents.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6	S.IC.1–6	d	S	P	Matches with S.IC.1, 3, 4, and 5 depend upon the interpretation that operational documents could include data involving statistics with population parameters, samples, randomization, etc. The match with MP.5 is based on use of a spreadsheet and other technological documents. The ESS and CCSS differ in specificity. The ESS is written at a broader level of granularity than the CCSS. The State may wish to review whether the ESS should be interpreted as inclusive of all aspects of the CCSS. Likewise, the CCSS may be interpreted as not including data analysis of the operational documents intended by the ESS.
ESS01.04	Demonstrate science knowledge and skills required to pursue the full range of post-secondary and career education opportunities.						To the extent that mathematics is considered a tool used by scientists, several mathematics CCSS relate to the specifics included in these ESS indicators.

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ESS01.04.01	Evaluate scientific constructs including: conclusions, conflicting data, controls, data, inferences, limitations, questions, sources of errors, and variables.	MP.1; MP.2; MP.3; MP.4; MP.6	S.ID.2, 3, 7–9; S.IC.1–3, 5, 6	d; d	S; S	P	The ESS is written at a broader level of granularity than the CCSS. Due to the ESS focus on science constructs, it is likely that not all of the ESS is covered by the CCSS, especially because this is not an exhaustive list of scientific constructs. Likewise, the ESS may not include all aspects of the CCSS.
ESS01.04.02	Apply scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6; MP.8	S.ID.1, 2, 4–6; S.IC.1–5; S.CP.1, 4, 5	d; d; a	S; S; S	P	The ESS is written at a broader level of granularity than the CCSS. Due to the ESS focus on science, it is likely that not all of the ESS is covered by the CCSS, and the ESS may not include all aspects of the CCSS. The matches in the S.CP domain depend upon the inclusion of scientific methods involving probability.
Essential Topic ESS02	COMMUNICATIONS: Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.						
ESS02.01	Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.	N	N			N	No mathematics CCSS directly relate to reading or the communication strategies specified by the ESS indicators, although the use of data in ESS.02.01.04 may involve mathematical thinking.
ESS02.01.01	Determine the most appropriate reading strategy for identifying the overarching purpose of a text (i.e. skimming, reading for detail, reading for meaning or critical analysis).	N	N			N	
ESS02.01.02	Demonstrate use of content, technical concepts and vocabulary when analyzing information and following directions.	N	N			N	

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ESS02.01.03	Select the reading strategy or strategies needed to fully comprehend the content within a written document (i.e., skimming, reading for detail, reading for meaning or critical analysis).	N	N			N	
ESS02.01.04	Interpret information, data, and observations to apply information learned from reading to actual practice.	N	N			N	
ESS02.01.05	Transcribe information, data, and observations to apply information learned from reading to actual practice.	N	N			N	
ESS02.01.06	Communicate information, data, and observations to apply information learned from reading to actual practice.	N	N			N	
ESS02.02	Demonstrate use of the concepts, strategies, and systems for obtaining and conveying ideas and information to enhance communication in the workplace.	N	N			N	No mathematics CCSS directly relate to the concepts, strategies, and systems specified by the ESS.
ESS02.02.01	Employ verbal skills when obtaining and conveying information.	N	N			N	
ESS02.02.02	Record information needed to present a report on a given topic or problem.	N	N			N	
ESS02.02.03	Write internal and external business correspondence that conveys and/or obtains information effectively.	N	N			N	

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ESS02.02.04	Communicate with other employees to clarify workplace objectives.	N	N			N	
ESS02.02.05	Communicate effectively with customers and employees to foster positive relationships.	N	N			N	
ESS02.03	Locate, organize and reference written information from various sources to communicate with co-workers and clients/participants.	N	N			N	No mathematics CCSS directly relate to the information and communication with co-workers and clients/participants.
ESS02.03.01	Locate written information used to communicate with co-workers and customers.	N	N			N	
ESS02.03.02	Organize information to use in written and oral communications.	N	N			N	
ESS02.03.03	Reference the sources of information.	N	N			N	
ESS02.04	Evaluate and use information resources to accomplish specific occupational tasks.	N	N			N	No mathematics CCSS directly relate to using information to accomplish occupational tasks.
ESS02.04.01	Use informational texts, Internet web sites, and/or technical materials to review and apply information sources for occupational tasks.	N	N			N	
ESS02.04.02	Evaluate the reliability of information from informational texts, Internet Web sites, and/or technical materials and resources.	N	N			N	
ESS02.05	Use correct grammar, punctuation and terminology to write and edit documents.	N	N			N	No mathematics CCSS directly relate to the language use as specified by the ESS.
ESS02.05.01	Compose multi-paragraph documents clearly, succinctly, and accurately.	N	N			N	

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ESS02.05.02	Use descriptions of audience and purpose when preparing and editing written documents.	N	N			N	
ESS02.05.03	Use correct grammar, spelling, punctuation, and capitalization when preparing written documents.	N	N			N	
ESS02.06	Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.	N	N			N	No mathematics CCSS directly relate to the language use as specified by the ESS.
ESS02.06.01	Prepare oral presentations to provide information for specific purposes and audiences.	N	N			N	
ESS02.06.02	Identify support materials that will enhance an oral presentation.	N	N			N	
ESS02.06.03	Prepare support materials that will enhance an oral presentation.	N	N			N	
ESS02.06.04	Deliver an oral presentation that sustains listeners' attention and interest.	N	N			N	
ESS02.06.05	Align presentation strategies to the intended audience.	N	N			N	
ESS02.06.06	Implement multi-media strategies for presentations.	N	N			N	
ESS02.07	Interpret verbal and nonverbal cues/behaviors to enhance communication with co-workers and clients/participants.	N	N			N	No mathematics CCSS directly relate to communication as specified by the ESS.
ESS02.07.01	Interpret verbal behaviors when communicating with clients and co-workers.	N	N			N	
ESS02.07.02	Interpret nonverbal behaviors when communicating with clients and co-workers.	N	N			N	

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ESS02.08	Apply active listening skills to obtain and clarify information.	N	N			N	No mathematics CCSS directly relate to active listening as specified by the ESS.
ESS02.08.01	Interpret a given verbal message/information.	N	N			N	
ESS02.08.02	Respond with restatement and clarification techniques to clarify information.	N	N			N	
ESS02.09	Develop and interpret tables, charts, and figures to support written and oral communications.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6	S.ID.1–6; S.IC.1, 6; S.CP.4	d; d; a	S; S; S	P	Several mathematics CCSS involve developing and interpreting tables, charts, and figures (ESS01.03.06), but not necessarily to support communication skills. Matches depend upon appropriateness of tables or plots for the purpose intended by the ESS and depend upon data involving statistics with population parameters, samples, randomization, etc. There are differences in specificity. The ESS is written at a broader level of granularity than the CCSS and may not include all aspects of the mathematics CCSS.
ESS02.09.01	Create tables, charts, and figures to support written and oral communications.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6	S.ID.1, 5, 6; S.CP.4	d; a	S; S	P	Matches depend upon the appropriateness of tables or plots for the purpose intended by the ESS and depend upon data involving statistics with population parameters, samples, randomization, probability, etc. There are differences in specificity. The ESS is written at a broader level of granularity than the CCSS and may not include all aspects of the mathematics CCSS.
ESS02.09.02	Interpret tables, charts, and figures used to support written and oral communication.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6	S.ID.2–6; S.IC.1, 6	d; d	S; S	P	Matches depend upon data involving statistics with population parameters, samples, randomization, etc. There are differences in specificity. The ESS is written at a broader level of granularity than the CCSS and may not include all aspects of the mathematics CCSS.
ESS02.10	Listen to and speak with diverse individuals to enhance communication skills.	N	N			N	No mathematics CCSS directly relate to communication with diverse individuals.
ESS02.10.01	Apply factors and strategies for communicating with a diverse workforce.	N	N			N	

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ESS02.10.02	Demonstrate ability to communicate and resolve conflicts within a diverse workforce.	N	N			N	
ESS02.11	Exhibit public relations skills to increase internal and external customer/client satisfaction.	N				N	No mathematics CCSS directly relate to public relations skills.
ESS02.11.01	Communicate effectively when developing positive customer/client relationships.	N	N			N	
Essential Topic ESS03	PROBLEM-SOLVING AND CRITICAL THINKING: <i>Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.</i>						The mathematics CCSS require problem solving in real-world settings in all grades and high school content. Also, many CCSS likely involve but do not specify solving problems using creativity or innovation.
ESS03.01	Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g., analyze, synthesize and evaluate).	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6	S.ID.1–7; S.IC.2, 4–6; S.CP.4 G.GMD.3; G.MG.2, 3; F.IF.4–6; F.BF.1; F.LE.1; F.TF.5; A.SSE.4; A.CED.1–3; N.Q.1, 2	d; d; a; d; d; d; d; d; d; d; d; d	S; S; S; S; S; S; S; S; S; S; S; S	P	Although the mathematics CCSS do not specify team or group work, many standards lend themselves to designing and conducting projects that could involve working with others as well as decision-making. Standards having to do with modeling require critical thinking, including creativity and innovation. The matched CCSS are particularly relevant to the ESS and represent each of the conceptual categories. The amount of overlap between the ESS and CCSS depends upon the mathematical concepts and the context of the problems to be solved and the tools to be used. Although not coded here, some of the CCSS designated with a (+) and intended for students preparing to take advanced mathematics courses also address the ESS. In particular, N.VM.3 and 6 (Vector and Matrix Quantities) and S.MD.1–7 (Using Probability to Make Decisions) involve critical thinking and decision making.
ESS03.01.01	Identify common tasks that require employees to use problem-solving skills.	N	N			N	No mathematics CCSS directly relate to identifying tasks requiring problem-solving skills.

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ESS03.01.02	Analyze elements of a problem to develop creative solutions.	MP.1; MP.2				P	The matches depend upon the inclusion of problems that involve mathematical concepts and require making sense of the problems and reasoning abstractly and quantitatively. The CCSS, however, do not specify solutions be creative.
ESS03.01.03	Describe the value of using problem-solving and critical thinking skills to improve a situation or process.	N	N			N	No mathematics CCSS directly relate to describing the value of problem-solving and critical thinking skills.
ESS03.01.04	Create ideas, proposals, and solutions to problems.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6				P	The matches depend upon the inclusion of problems that involve mathematical concepts and require making sense of the problems, persevering in solving the problems, reasoning abstractly and quantitatively, constructing viable arguments, and critiquing the reasoning of others. Depending upon the nature of the problems, modeling with mathematics, using appropriate tools strategically, and/or attending to precision also would be involved.
ESS03.01.05	Evaluate ideas, proposals, and solutions to problems.	MP.3				P	The match depends upon the inclusion of problems that involve mathematical concepts and that require constructing viable arguments and critiquing the reasoning of others.
ESS03.01.06	Use structured problem-solving methods when developing proposals and solutions.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6				P	Although the mathematics CCSS do not specify using structured problem-solving methods, they match the ESS to the extent that the problems involve mathematical concepts and require making sense of the problems, persevering in solving the problems, reasoning abstractly and quantitatively. Depending upon the nature of the problems, constructing viable arguments and critiquing the reasoning of others, modeling with mathematics, using appropriate tools strategically, and/or attending to precision also would be involved.
ESS03.01.07	Generate new and creative ideas to solve problems by brainstorming possible solutions.	N	N			N	No mathematics CCSS directly relate to generating ideas and specifying brainstorming, although these may occur during the problem-solving process.

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ESS03.01.08	Critically analyze information to determine value to the problem-solving task.	MP.1; MP.2; MP.3				P	The matches depend upon the inclusion of problem-solving tasks that involve mathematical concepts and require making sense of the problems, persevering in solving the problems, reasoning abstractly and quantitatively, constructing viable arguments, and critiquing the reasoning of others.
ESS03.01.09	Guide individuals through the process of recognizing concerns and making informed decisions.	N	N			N	No mathematics CCSS directly relate to guiding others in decision-making.
ESS03.01.10	Identify alternatives using a variety of problem-solving and critical thinking skills.	MP.1; MP.3; MP.4				P	The matches depend upon the inclusion of situations that involve mathematical concepts and in which identifying alternatives requires making sense of the problems, persevering in solving the problems, constructing viable arguments, critiquing the reasoning of others, and modeling with mathematics.
ESS03.01.11	Evaluate alternatives using a variety of problem-solving and critical thinking skills.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6				P	The matches depend upon the inclusion of situations that involve mathematical concepts and in which evaluating alternatives requires making sense of the problems, persevering in solving the problems, reasoning abstractly and quantitatively, constructing viable arguments, and critiquing the reasoning of others. Depending upon the nature of the problems, modeling with mathematics, using appropriate tools strategically, and/or attending to precision also would be involved.
ESS03.02	Employ critical thinking and interpersonal skills to resolve conflicts with staff and/or customers.	N	N			N	No mathematics CCSS directly relate to using critical thinking skills to resolve conflicts.
ESS03.02.01	Analyze situations and behaviors that affect conflict management.	N	N			N	
ESS03.02.02	Determine best options/outcomes for conflict resolution using critical thinking skills.	N	N			N	

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ESS03.02.03	Identify with others' feelings, needs, and concerns.	N	N			N	
ESS03.02.04	Implement stress management techniques.	N	N			N	
ESS03.02.05	Resolve conflicts with/for customers using conflict resolution skills.	N	N			N	
ESS03.02.06	Implement conflict resolution skills to address staff issues/problems.	N	N			N	
ESS03.03	Identify, write and monitor workplace performance goals to guide progress in assigned areas of responsibility and accountability.	N	N			N	No mathematics CCSS directly relate to workplace performance goals.
ESS03.03.01	Write realistic performance goals, objectives and action plans.	N	N			N	
ESS03.03.02	Monitor performance goals and adjust as necessary.	N	N			N	
ESS03.03.03	Recognize goal achievement using appropriate rewards in the workplace.	N	N			N	
ESS03.03.04	Communicate goal achievement with managers and co-workers.	N	N			N	

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ESS03.04	Conduct technical research to gather information necessary for decision-making.	MP.1; MP.2; MP.3; MP.4; MP.5; MP.6				P	Although many mathematics CCSS involve research, gathering information, and decision-making, the focus is on mathematics and may relate to the ESS only indirectly, and not cover it fully. The matches depend upon the inclusion of technical research that involves mathematical concepts and requires making sense of the problems, persevering in solving the problems, reasoning abstractly and quantitatively, constructing viable arguments, and critiquing the reasoning of others. Depending upon the nature of the research, modeling with mathematics, using appropriate tools strategically, and/or attending to precision also would be involved.
ESS03.04.01	Align the information gathered to the needs of the audience.	MP.3; MP.4				P	The matches depend upon the inclusion of situations that involve mathematical concepts and in which aligning the information requires constructing viable arguments, critiquing the reasoning of others, and, depending upon the nature of the research, modeling with mathematics.
ESS03.04.02	Gather technical information and data using a variety of resources.	MP.1; MP.4; MP.5				P	The matches depend upon the inclusion of situations that involve mathematical concepts and in which gathering the information and data requires constructing viable arguments, critiquing the reasoning of others, and, depending upon the nature of the research, modeling with mathematics.
ESS03.04.03	Analyze information and data for value to the research objectives.	MP.1; MP.2; MP.3; MP.4				P	The matches depend upon the inclusion of situations that involve mathematical concepts and in which analyzing information and data requires making sense of the problems, persevering in solving the problems, reasoning abstractly and quantitatively, constructing viable arguments, critiquing the reasoning of others, and, depending upon the nature of the research, modeling with mathematics.
ESS03.04.04	Evaluate information and data to determine value to research objectives.	MP.1; MP.2; MP.3; MP.4				P	The matches depend upon the inclusion of situations that involve mathematical concepts and in which evaluating information and data requires making sense of the problems, persevering in solving the problems, reasoning abstractly and quantitatively, constructing viable arguments, critiquing the reasoning of others, and, depending upon the nature of the research, modeling with mathematics.

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Essential Topic ESS04	INFORMATION TECHNOLOGY APPLICATIONS: <i>Use information technology tools specific to the career cluster to access, manage, integrate, and create information.</i>						Although many mathematics CCSS involve using tools and technology, the focus is on mathematics and not specific to information technology specific to career clusters.
ESS04.01	Use Personal Information Management (PIM) applications to increase workplace efficiency.	N	N			N	No mathematics CCSS directly relate to PIM or workplace efficiency.
ESS04.01.01	Manage personal schedules and contact information.	N	N			N	
ESS04.01.02	Create memos and notes.	N	N			N	
ESS04.02	Employ technological tools to expedite workflow.	N	N			N	No mathematics CCSS directly relate to using tools for expediting workflow.
ESS04.02.01	Use information technology tools to manage and perform work responsibilities.	N	N			N	
ESS04.03	Operate electronic mail applications to communicate within a workplace.	N	N			N	No mathematics CCSS directly relate to communicating with email.
ESS04.03.01	Use email to share files and documents.	N	N			N	
ESS04.03.02	Identify the functions and purpose of email systems.	N	N			N	
ESS04.03.03	Use email to communicate within and across organizations.	N	N			N	
ESS04.04	Operate Internet applications to perform workplace tasks.	N	N			N	No mathematics CCSS directly relate to using the Internet for workplace tasks, although it may be used for research purposes.
ESS04.04.01	Access and navigate Internet (e.g., use a web browser).	N	N			N	
ESS04.04.02	Search for information and resources.	N	N			N	

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ESS04.04.03	Evaluate Internet resources for reliability and validity.	N	N			N	
ESS04.05	Operate writing and publishing applications to prepare business communications.	N	N			N	No mathematics CCSS directly relate to communications as specified in the ESS.
ESS04.05.01	Prepare simple documents and other business communications.	N	N			N	
ESS04.05.02	Prepare reports and other business communications by integrating graphics and other non-text elements.	N	N			N	
ESS04.05.03	Prepare complex multi-media publications.	N	N			N	
ESS04.06	Operate presentation applications to prepare presentations.	N	N			N	No mathematics CCSS directly relate to presentations as specified in the ESS.
ESS04.06.01	Prepare presentations for training, sales and information sharing.	N	N			N	
ESS04.06.02	Deliver presentations with supporting materials.	N	N			N	
ESS04.07	Employ spreadsheet applications to organize and manipulate data.	MP.4; MP.5				P	The matches depend upon the inclusion of situations in which organizing and manipulating data with a spreadsheet application involves modeling with mathematics and using appropriate tools strategically. The CCSS may relate to the ESS only indirectly, depending on the context and purpose of the application.
ESS04.07.01	Create a spreadsheet.	MP.4; MP.5				P	The matches depend upon the inclusion of situations in which creating a spreadsheet involves modeling with mathematics and using appropriate tools strategically.
ESS04.07.02	Perform calculations and analyses on data using a spreadsheet.	MP.4; MP.5	S.ID.4	d	S	P	The matched Statistics and Probability standard specifies using a spreadsheet to estimate areas under a normal curve to estimate population percentages. The ESS is more general and would likely involve a variety of applications.

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ESS04.08	Employ database applications to manage data.	N	N			N	No mathematics CCSS directly relate to using database applications to manage data.
ESS04.08.01	Manipulate data elements.	N	N			N	
ESS04.08.02	Manage interrelated data elements.	N	N			N	
ESS04.08.03	Analyze interrelated data elements.	N	N			N	
ESS04.08.04	Generate reports showing interrelated data elements.	N	N			N	
ESS04.09	Employ collaborative/groupware applications to facilitate group work.	N	N			N	No mathematics CCSS directly relate to using applications to facilitate group work.
ESS04.09.01	Facilitate group work through management of shared schedule and contact information.	N	N			N	
ESS04.09.02	Facilitate group work through management of shared files and online information.	N	N			N	
ESS04.09.03	Facilitate group work through instant messaging or virtual meetings.	N	N			N	
ESS04.10	Employ computer operations applications to manage work tasks.	N	N			N	No mathematics CCSS directly relate to using applications to manage work tasks.
ESS04.10.01	Manage computer operations.	N	N			N	
ESS04.10.02	Manage file storage.	N	N			N	
ESS04.10.03	Compress or alter files.	N	N			N	
ESS04.11	Use computer-based equipment (containing embedded computers or processors) to control devices.	N	N			N	No mathematics CCSS directly relate to using equipment to control devices.
ESS04.11.01	Operate computer driven equipment and machines.	N	N			N	
ESS04.11.02	Use installation and operation manuals.	N	N			N	

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ESS04.11.03	Troubleshoot computer driven equipment and machines.	N	N			N	
ESS04.11.04	Access support as needed to maintain operation of computer driven equipment and machines.	N	N			N	
Essential Topic ESS05	SYSTEMS: Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. Identify how key organizational systems affect organizational performance and the quality of products and services. Understand global context of industries and careers.						Although the topic may lend itself to a context for which CCSS problem-solving, data analysis, etc., standards may be applied, there is no direct overlap with mathematics CCSS.
ESS05.01	Describe the nature and types of business organizations to build an understanding of the scope of organizations.	N	N			N	No mathematics CCSS directly relate to understanding business organizations.
ESS05.01.01	List the types and functions of businesses.	N	N			N	
ESS05.01.02	Describe the types and functions of businesses.	N	N			N	
ESS05.01.03	Explain the functions and interactions of common departments within a business.	N	N			N	
ESS05.02	Implement quality control systems and practices to ensure quality products and services.	N	N			N	No mathematics CCSS directly relate to implementing quality control systems and practices.
ESS05.02.01	Describe quality control standards and practices common to the workplace.	N	N			N	

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Essential Topic ESS06	SAFETY, HEALTH AND ENVIRONMENTAL: <i>Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.</i>						Although the topic may lend itself to a context for which CCSS problem-solving, data analysis, etc., standards may be applied, there is no direct overlap with mathematics CCSS.
ESS06.01	Implement personal and jobsite safety rules and regulations to maintain safe and healthful working conditions and environments.	N	N			N	No mathematics CCSS directly relate to safety rules and regulations.
ESS06.01.01	Assess workplace conditions with regard to safety and health.	N	N			N	
ESS06.01.02	Align safety issues with appropriate safety standards to ensure a safe workplace/jobsite.	N	N			N	
ESS06.01.03	Identify safety hazards common to workplaces.	N	N			N	
ESS06.01.04	Identify safety precautions to maintain a safe worksite.	N	N			N	
ESS06.01.05	Select appropriate personal protective equipment as needed for a safe workplace/jobsite.	N	N			N	
ESS06.01.06	Inspect personal protective equipment commonly used for selected career pathway.	N	N			N	
ESS06.01.07	Use personal protective equipment according to manufacturer rules and regulations.	N	N			N	

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ESS06.01.08	Employ a safety hierarchy and communication system within the workplace/jobsite.	N	N			N	
ESS06.01.09	Implement safety precautions to maintain a safe worksite.	N	N			N	
ESS06.02	Complete work tasks in accordance with employee rights and responsibilities and employers obligations to maintain workplace safety and health.	N	N			N	No mathematics CCSS directly relate to employee rights and responsibilities nor to employer obligations.
ESS06.02.01	Identify rules and laws designed to promote safety and health in the workplace.	N	N			N	
ESS06.02.02	State the rationale of rules and laws designed to promote safety and health.	N	N			N	
ESS06.03	Employ emergency procedures as necessary to provide aid in workplace accidents.	N	N			N	No mathematics CCSS directly relate to employee rights and responsibilities nor to employer obligations.
ESS06.03.01	Use knowledge of First Aid procedures as necessary.	N	N			N	
ESS06.03.02	Use knowledge of CPR procedures as necessary.	N	N			N	
ESS06.03.03	Use safety equipment as necessary.	N	N			N	
ESS06.04	Employ knowledge of response techniques to create a disaster and/or emergency response plan.	N	N			N	No mathematics CCSS directly relate to emergency response techniques or plans.
ESS06.04.01	Complete an assessment of an emergency and/or disaster situation.	N	N			N	
ESS06.04.02	Create an emergency and/or disaster plan.	N	N			N	

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Essential Topic ESS07	LEADERSHIP AND TEAMWORK: <i>Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.</i>						Typically the mathematics CCSS do not specify leadership or teamwork, though aspects of some standards may lend themselves to projects that would require these skills. Some ESS may provide context for CCSS standards involving problem solving, critiquing reasoning, etc.
ESS07.01	Employ leadership skills to accomplish organizational goals and objectives.	N	N			N	No mathematics CCSS directly relate to using leadership skills for accomplishing organizational goals.
ESS07.01.01	Analyze the various roles of leaders within organizations (e.g. contribute ideas; share in building an organization; act as role models to employees by adhering to company policies, procedures, and standards; promote the organization's vision; and mentor others).	N	N			N	
ESS07.01.02	Exhibit traits such as empowerment, risk, communication, focusing on results, decision-making, problem solution, and investment in individuals when leading a group in solving a problem.	N	N			N	
ESS07.01.03	Exhibit traits such as compassion, service, listening, coaching, developing others, team development, and understanding and appreciating others when acting as a manager of others in the workplace.	N	N			N	

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ESS07.01.04	Exhibit traits such as enthusiasm, creativity, conviction, mission, courage, concept, focus, principle-centered living, and change when interacting with others in general.	N	N			N	
ESS07.01.05	Consider issues related to self, team, community, diversity, environment, and global awareness when leading others.	N	N			N	
ESS07.01.06	Exhibit traits such as innovation, intuition, adaptation, life-long learning and coachability to develop leadership potential over time.	N	N			N	
ESS07.01.07	Analyze leadership in relation to trust, positive attitude, integrity, and willingness to accept key responsibilities in a work situation.	N	N			N	
ESS07.01.08	Describe observations of outstanding leaders using effective management styles.	N	N			N	
ESS07.01.09	Participate in civic and community leadership and teamwork opportunities to enhance skills.	N	N			N	
ESS07.02	Employ organizational and staff development skills to foster positive working relationships and accomplish organizational goals.	N	N			N	No mathematics CCSS directly relate to using organizational and staff development skills for accomplishing organizational goals.
ESS07.02.01	Implement organizational skills when facilitating others' work efforts.	N	N			N	

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ESS07.02.02	Explain how to manage a staff that satisfies work demands while adhering to budget constraints.	N	N			N	
ESS07.02.03	Describe how staff growth and development to increase productivity and employee satisfaction.	N	N			N	
ESS07.02.04	Organize team involvement within a group environment.	N	N			N	
ESS07.02.05	Work with others to develop and gain commitment to team goals.	N	N			N	
ESS07.02.06	Distribute responsibility and work load fairly.	N	N			N	
ESS07.02.07	Model leadership and teamwork qualities to aid in employee morale.	N	N			N	
ESS07.02.08	Identify best practices for successful team functioning.	N	N			N	
ESS07.02.09	Explain best practices for successful team functioning.	N	N			N	
ESS07.03	Employ teamwork skills to achieve collective goals and use team members' talents effectively.	N	N			N	No mathematics CCSS directly relate to achieving collective goals and using talents effectively.
ESS07.03.01	Work with others to achieve objectives in a timely manner.	N	N			N	
ESS07.03.02	Promote the full involvement and use of team members' individual talents and skills.	N	N			N	
ESS07.03.03	Employ conflict management skills to facilitate solutions.	N	N			N	

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ESS07.03.04	Demonstrate teamwork skills though working cooperatively with co-workers, supervisory staff, and others, both in and out of the organization, to achieve particular tasks.	N	N			N	
ESS07.03.05	Demonstrate teamwork processes that provide team building, consensus, continuous improvement, respect for the opinions of others, cooperation, adaptability, and conflict resolution.	N	N			N	
ESS07.03.06	Develop plans to improve team performance.	N	N			N	
ESS07.03.07	Demonstrate commitment to and a positive attitude toward team goals.	N	N			N	
ESS07.03.08	Take responsibility for shared group and individual work tasks.	N	N			N	
ESS07.03.09	Assist team members in completing their work.	N	N			N	
ESS07.03.10	Adapt effectively to changes in projects and work activities.	N	N			N	
ESS07.03.11	Negotiate effectively to arrive at decisions.	N	N			N	
ESS07.04	Establish and maintain effective working relationships with all levels of personnel and other departments in order to accomplish objectives and tasks.	N	N			N	No mathematics CCSS directly relate to maintaining effective working relationships to accomplish objectives and tasks.
ESS07.04.01	Build effective working relationships using interpersonal skills.	N	N			N	

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ESS07.04.02	Use positive interpersonal skills to work cooperatively with co-workers representing different cultures, genders and backgrounds.	N	N			N	
ESS07.04.03	Manage personal skills to accomplish assignments.	N	N			N	
ESS07.04.04	Treat people with respect.	N	N			N	
ESS07.04.05	Provide constructive praise and criticism.	N	N			N	
ESS07.04.06	Demonstrate sensitivity to and value for diversity.	N	N			N	
ESS07.04.07	Manage stress and control emotions.	N	N			N	
ESS07.05	Conduct and participate in meetings to accomplish work tasks.	N	N			N	No mathematics CCSS directly relate to conducting or participating meetings to accomplish tasks.
ESS07.05.01	Develop meeting goals, objectives and agenda.	N	N			N	
ESS07.05.02	Assign responsibilities for preparing materials and leading discussions.	N	N			N	
ESS07.05.03	Prepare materials for leading discussion.	N	N			N	
ESS07.05.04	Assemble and distribute meeting materials.	N	N			N	
ESS07.05.05	Conduct meeting to achieve objectives within scheduled time.	N	N			N	
ESS07.05.06	Demonstrate effective communication skills in meetings.	N	N			N	
ESS07.05.07	Produce meeting minutes including decisions and next steps.	N	N			N	
ESS07.05.08	Use parliamentary procedure, as needed, to conduct meetings.	N	N			N	

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ESS07.06	Employ mentoring skills to inspire and teach others.	N	N			N	No mathematics CCSS directly relate to mentoring, inspiring, or teaching others.
ESS07.06.01	Use motivational techniques to enhance performance in others.	N	N			N	
ESS07.06.02	Provide guidance to enhance performance in others.	N	N			N	
Essential Topic ESS08	ETHICS AND LEGAL RESPONSIBILITIES: <i>Know and understand the importance of professional ethics and legal responsibilities.</i>						Although the topic may lend itself to a context for which CCSS problem-solving, data analysis, critiquing, justifying, etc., standards may be applied, there is no direct overlap with mathematics CCSS.
ESS08.01	Apply ethical reasoning to a variety of workplace situations in order to make ethical decisions.	N	N			N	No mathematics CCSS directly relate to applying ethical reasoning or making ethical decisions.
ESS08.01.01	Evaluate alternative responses to workplace situations based on legal responsibilities and employer policies.	N	N			N	
ESS08.01.02	Evaluate alternative responses to workplace situations based on personal or professional ethical responsibilities.	N	N			N	
ESS08.01.03	Identify personal and long-term workplace consequences of unethical or illegal behaviors.	N	N			N	
ESS08.01.04	Explain personal and long-term workplace consequences of unethical or illegal behaviors.	N	N			N	
ESS08.01.05	Determine the most appropriate response to workplace situations based on legal and ethical considerations.	N	N			N	

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ESS08.01.06	Explain the most appropriate response to workplace situations based on legal and ethical considerations.	N	N			N	
ESS08.02	Interpret and explain written organizational policies and procedures to help employees perform their jobs according to employer rules and expectations.	N	N			N	No mathematics CCSS directly relate to interpreting organizational policies or procedures according to rules and expectation.
ESS08.02.01	Locate information on organizational policies in handbooks and manuals.	N	N			N	
ESS08.02.02	Discuss how specific organizational policies and procedures influence a specific work situation.	N	N			N	
Essential Topic ESS09	EMPLOYABILITY AND CAREER DEVELOPMENT: <i>Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.</i>						Although the topic may lend itself to a context for which CCSS problem-solving, data analysis, justifying, critiquing, etc., standards may be applied, there is no direct overlap with mathematics CCSS.
ESS09.01	Identify and demonstrate positive work behaviors and personal qualities needed to be employable.	N	N			N	No mathematics CCSS directly relate to demonstrating positive work behaviors and qualities.
ESS09.01.01	Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.	N	N			N	
ESS09.01.02	Demonstrate flexibility and willingness to learn new knowledge and skills.	N	N			N	
ESS09.01.03	Exhibit commitment to the organization.	N	N			N	

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ESS09.01.04	Identify how work varies with regard to site, from indoor confined spaces to outdoor areas, including aerial space and a variety of climatic and physical conditions.	N	N			N	
ESS09.01.05	Apply communication strategies when adapting to a culturally diverse environment.	N	N			N	
ESS09.01.06	Manage resources in relation to the position (i.e. budget, supplies, computer, etc).	N	N			N	
ESS09.01.07	Identify positive work-qualities typically desired in each of the career cluster's pathways.	N	N			N	
ESS09.01.08	Manage work roles and responsibilities to balance them with other life roles and responsibilities.	N	N			N	
ESS09.02	Develop a personal career plan to meet career goals and objectives.	N	N			N	No mathematics CCSS directly relate to developing career plans or meeting goals.
ESS09.02.01	Develop career goals and objectives as part of a plan for future career direction.	N	N			N	
ESS09.02.02	Develop strategies to reach career objectives.	N	N			N	
ESS09.03	Demonstrate skills related to seeking and applying for employment to find and obtain a desired job.	N	N			N	No mathematics CCSS directly relate to obtaining desirable employment.
ESS09.03.01	Use multiple resources to locate job opportunities.	N	N			N	
ESS09.03.02	Prepare a résumé.	N	N			N	
ESS09.03.03	Prepare a letter of application.	N	N			N	
ESS09.03.04	Complete an employment application.	N	N			N	

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ESS09.03.05	Interview for employment.	N	N			N	
ESS09.03.06	List the standards and qualifications that must be met in order to enter a given industry.	N	N			N	
ESS09.03.07	Employ critical thinking and decision-making skills to exhibit qualifications to a potential employer.	N	N			N	
ESS09.04	Maintain a career portfolio to document knowledge, skills and experience in a career field.	N	N			N	No mathematics CCSS directly relate to maintaining a career portfolio or documenting career qualifications.
ESS09.04.01	Select educational and work history highlights to include in a career portfolio.	N	N			N	
ESS09.04.02	Produce a record of work experiences, licenses, certifications and products.	N	N			N	
ESS09.04.03	Organize electronic or physical portfolio for use in demonstrating knowledge, skills and experiences.	N	N			N	
ESS09.05	Demonstrate skills in evaluating and comparing employment opportunities in order to accept employment positions that match career goals.	N	N			N	No mathematics CCSS directly relate to evaluating employment opportunities to find employment that matches career goals.
ESS09.05.01	Compare employment opportunities to individual needs and career plan objectives.	N	N			N	
ESS09.05.02	Evaluate employment opportunities based upon individual needs and career plan objectives.	N	N			N	
ESS09.05.03	Demonstrate appropriate methods for accepting or rejecting employment offers.	N	N			N	

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ESS09.06	Identify and exhibit traits for retaining employment to maintain employment once secured.	N	N			N	No mathematics CCSS directly relate to exhibiting traits for retaining employment.
ESS09.06.01	Model behaviors that demonstrate reliability and dependability.	N	N			N	
ESS09.06.02	Maintain appropriate dress and behavior for the job to contribute to a safe and effective workplace/jobsite.	N	N			N	
ESS09.06.03	Complete required employment forms and documentation such as I-9 form, work visa, W-4 and licensures to meet employment requirements.	N	N			N	
ESS09.06.04	Summarize key activities necessary to retain a job in the industry.	N	N			N	
ESS09.06.05	Identify positive work behaviors and personal qualities necessary to retain employment.	N	N			N	
ESS09.07	Identify and explore career opportunities in one or more career pathways to build an understanding of the opportunities available in the cluster.	N	N			N	No mathematics CCSS directly relate to exploring career opportunities.
ESS09.07.01	Locate and identify career opportunities that appeal to personal career goals.	N	N			N	
ESS09.07.02	Match personal interest and aptitudes to selected careers.	N	N			N	

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ESS09.08	Recognize and act upon requirements for career advancement to plan for continuing education and training.	N	N			N	No mathematics CCSS directly relate to career advancement and continuing education.
ESS09.08.01	Identify opportunities for career advancement.	N	N			N	
ESS09.08.02	Pursue education and training opportunities to acquire skills necessary for career advancement.	N	N			N	
ESS09.08.03	Examine the organization and structure of various segments of the industry to prepare for career advancement.	N	N			N	
ESS09.08.04	Research local and regional labor (workforce) market and job growth information to project potential for advancement.	N	N			N	
ESS09.08.05	Manage employment relations to make career advancements.	N	N			N	
ESS09.09	Continue professional development to keep current on relevant trends and information within the industry.	N	N			N	No mathematics CCSS directly relate to continuing professional development and keeping current on trends and information.
ESS09.09.01	Use self assessment, organizational priorities, journals, Internet sites, professional associations, peers and other resources to develop goals that address training, education and self-improvement issues.	N	N			N	

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ESS09.09.02	Read trade magazines and journals, manufacturers' catalogues, industry publications and Internet sites to keep current on industry trends.	N	N			N	
ESS09.09.03	Participate in relevant conferences, workshops, mentoring activities and in-service training to stay current with recent changes in the field.	N	N			N	
ESS09.10	Examine licensing, certification and credentialing requirements at the national, state and local levels to maintain compliance with industry requirements.	N	N			N	No mathematics CCSS directly relate to licensing, certification, or credential requirements.
ESS09.10.01	Examine continuing education requirements related to licensing, certification, and credentialing requirements at the local, state and national levels for chosen occupation.	N	N			N	
ESS09.10.02	Examine the procedures and paperwork involved in maintaining and updating licensure, certification and credentials for chosen occupation.	N	N			N	
ESS09.10.03	Align ongoing licensing, certification and credentialing requirements to career plans and goals.	N	N			N	

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ESS09.11	Examine employment opportunities in entrepreneurship to consider entrepreneurship as an option for career planning.	N	N			N	No mathematics CCSS directly relate to entrepreneurship.
ESS09.11.01	Describe the opportunities for entrepreneurship in a given industry.	N	N			N	
Essential Topic ESS10	TECHNICAL SKILLS: Use of technical knowledge and skills required to pursue careers in all career clusters, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.						The mathematics CCSS require use of technical knowledge and skills in certain situations; however, the focus is on mathematics content. To the extent that there is overlap in content, this topic may provide opportunities to demonstrate mathematics proficiencies, such as managing data with spreadsheets, problem solving, decision-making, etc.
ESS10.01	Employ information management techniques and strategies in the workplace to assist in decision-making.	N	N			N	The mathematics CCSS do not specify information management techniques and strategies, though aspects of some standards may lend themselves to decision-making.
ESS10.01.01	Use information literacy skills when accessing, evaluating and disseminating information.	N	N			N	The mathematics CCSS apply to the extent that the data overlaps with mathematical proficiencies.
ESS10.01.02	Describe the nature and scope of information management.	N	N			N	
ESS10.01.03	Maintain records to facilitate ongoing business operations.	N	N			N	
ESS10.02	Employ planning and time management skills and tools to enhance results and complete work tasks.	N	N			N	The mathematics CCSS do not specify using time management skills and tools, though aspects of some standards may lend themselves to optimization problem solving.
ESS10.02.01	Develop goals and objectives.	N	N			N	
ESS10.02.02	Prioritize tasks to be completed.	N	N			N	
ESS10.02.03	Develop timelines using time management knowledge and skills.	N	N			N	

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ESS10.02.04	Use project-management skills to improve workflow and minimize costs.	N	N			N	

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Essential Topic ESS01	ACADEMIC FOUNDATIONS; <i>Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.</i>						All the ELA CCSS Anchor Standards can be matched to this very general standard, which would also include knowledge and skills in mathematics.
ESS01.01	Complete required training, education, and certification to prepare for employment in a particular career field.	N				N	No ELA CCSS covers education, training, or certification specific to particular careers.
ESS01.01.01	Identify training, education and certification requirements for occupational choice.					N	
ESS01.01.02	Participate in career-related training and/or degree programs.					N	
ESS01.01.03	Pass certification tests to qualify for licensure and/or certification in chosen occupational area.					N	
ESS01.02	Demonstrate language arts knowledge and skills required to pursue the full range of post-secondary education and career opportunities.						All the ELA CCSS Anchor Standards can be matched to this very general standard.
ESS01.02.01	Model behaviors that demonstrate active listening.	SL.CCR.1	SL.11–12.1	a	S	F	The ESS is articulated at a higher level of generality than SL.11–12.1; the match to the grade level standard assumes the ESS is intended to refer to similarly complex, grade-level-appropriate applications of the broader skill of “active listening.” The ESS standard also addresses a subset of the skills included in the ELA CCSS; that is, the ESS focuses on listening while the CCSS integrates both listening and speaking.

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ESS01.02.02	Adapt language for audience, purpose, situation (i.e. diction/structure, style).	SL.CCR.6; W.CCR.4; W.CCR.10	SL.11–12.6; W.11–12.4; W.11–12.10	a; a; a	S; S; S	F	The ESS standard applies to both oral and written communication while the ELA CCSS address oral and written communication separately. Taken together, the three matched CCSS provide coverage of the ESS. The ESS represents a subset of the skills included in the more detailed CCSS. W.11–12.10 includes goals related to time (writing over extended periods), as well as for a variety of purposes and audiences.
ESS01.02.03	Organize oral and written information.	W.CCR.4; SL.CCR.4	W.11–12.4; SL.11–12.4; (WHST.11–12.4)	a; a; (a)	S; S; (S)	F	The ESS performance element addresses the organization of both oral and written information; the ELA CCSS address the organization of oral and written information in separate standards. The matched ELA CCSS also include some elements not covered in this ESS. W.11–12.4 includes the appropriate use of “development and style.” Taken together, the two CCSS provide coverage of the ESS standard while also including some content not included in the ESS.
ESS01.02.04	Compose focused copy for a variety of written documents such as; agendas, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.	W.CCR.2; W.CCR.10	W.11–12.2; W.11–12.10; (WHST.11–12.2)	a; a; (a)	S; S; (S)	F	The ESS standard is less specific than the CCSS in the criteria it articulates for the quality of the composition, referring only to “focused” documents. The CCSS include additional criteria such as effective organization, development, etc., of the written texts. The ESS corresponds well to W.11–12.10 and W.11–12.2 in terms of the breadth and range of writing covered. However, the CCSS also include some content not covered by the ESS.
ESS01.02.05	Edit copy to create focused written documents such as; agendas, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.	W.CCR.5	W.11–12.5; (WHST.11–12.5)	a; (a)	S; (S)	F	The ESS is covered by, but represents a subset of, the skills in W.11–12.5 and WHST.11–12.5. The ESS does not specify what steps might be included to “edit” written documents; however, the phrase “edit to create focused written documents” suggests the editing would encompass clarity and coherence and not just correctness. The CCSS is more specific and detailed in its language, referring to “planning, revising, editing, or trying a new approach,” as needed to strengthen writing.

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ESS01.02.06	Comprehend key elements of oral and written information such as; cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, and technical subject matter.	R.CCR.1–7 and 10	RI.11–12.1–7, 10; (RST.11–12.1–7 and 10); (RH.11–12.7)	a; (a); (a)	S; (S); (S)	F	The skills described in the ESS represent a subset of those described in RI.11–12.1–7, 10. The ESS focuses on the ability to “comprehend” key elements of texts. Most of the matched ELA CCSS incorporate, but go beyond, comprehension to include analysis and evaluation of these elements. The ESS address evaluation of texts in a different performance element, ESS01.02.07. (The two performance elements combined would be more comparable to the CCSS). The range of content (“cause/effect,” etc.) covered in the ESS corresponds to that covered in RI.11–12.1–7, 10.
ESS01.02.07	Evaluate oral and written information for; accuracy, adequacy/sufficiency, appropriateness, clarity, conclusions/solutions, fact/opinion, propaganda, relevancy, validity, and relationship of ideas.	R.CCR.1–3, 5–6, 8; SL.CCR.2–3	RI.11–12.1–8; (RST.11–12.1–8); (RH.11–12.7); SL.11–12.2–3	a; (a); (a); a	S; (S); S	F	The ESS is less specific than RI.11–12.1–8 and SL.11–12.2–3 in terms of the types or methods of evaluation to be applied but describes a comparable range of text elements to be assessed. Some of the ELA CCSS include a few elements not covered in the ESS, such as the analysis of “style” or the “beauty” of a text. RI.11–12.8 also specifies reading content (“seminal U.S. texts”) while the ESS does not specify reading content.
ESS01.02.08	Identify assumptions, purpose, outcomes/solutions, and propaganda techniques.	R.CCR.6, 8	RI.6.6; RI.9–10.8; RST.6–8.6; RST.9–10.8	d; d; d; d	S; S; S; S	F	The use of the word “Identify” in relation to “purpose” in the ESS is most closely matched by language of the grade 6 ELA CCSS, which requires students to “determine” an author’s purpose (RI.6.6); at higher grades, the related CCSS requires students to analyze methods by which authors achieve their purpose. However, the identification of propaganda in the ESS is most closely matched by RI.9–10.8, which requires students to “identify false statements and fallacious reasoning.” The reference to “outcomes/solutions” in the ESS is most closely matched by RST.9–10.8, which includes assessing the support authors provide for a recommended solution to a problem.
ESS01.02.09	Predict potential outcomes and/or solutions based on oral and written information regarding trends.	N				N	No ELA CCSS address outcomes/solutions regarding trends.

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ESS01.02.10	Present formal and informal speeches including; discussion, information requests, interpretation, and persuasive arguments.	SL.CCR.1, 3–4	SL.11–12.1; SL.11–12.3; SL.11–12.4	a; a; a	S; S; S	F	The three matched ELA CCSS include language describing criteria for student speaking, such as expressing ideas “clearly and persuasively.” The ESS is a more general summary of the types of speaking skills required; this was coded with the understanding that performance would be comparable to that of the CCSS for grades 11–12.
ESS01.03	Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities.	N				N	No ELA CCSS address demonstrating mathematical knowledge and skills.
ESS01.03.01	Identify whole numbers, decimals, and fractions.	N				N	
ESS01.03.02	Demonstrate knowledge of basic arithmetic operations such as; addition, subtraction, multiplication, and division.	N				N	
ESS01.03.03	Demonstrate use of relational expressions such as; equal to, not equal, greater than, less than, etc.	N				N	
ESS01.03.04	Apply data and measurements to solve a problem.	N				N	
ESS01.03.05	Analyze Mathematical problem statements for missing and/or irrelevant data.	N				N	
ESS01.03.06	Construct charts/tables/graphs from functions and data.	N				N	
ESS01.03.07	Analyze data when interpreting operational documents.	N				N	
ESS01.04	Demonstrate science knowledge and skills required to pursue the full range of post-secondary and career education opportunities.	N				N	No ELA CCSS address demonstrating science knowledge and skills.

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ESS01.04.01	Evaluate scientific constructs including; conclusions, conflicting data, controls, data, inferences, limitations, questions, sources of errors, and variables.	N				N	
ESS01.04.02	Apply scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.	N				N	
Essential Topic ESS02	COMMUNICATIONS; Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.						At a high level of generality, the Essential Topic corresponds to all the ELA CCSS, with the possible exception of those addressing Literature (RL.CCR). The reference to “information and ideas” in the ESS suggests the Topic refers to the creation and interpretation of informational texts.
ESS02.01	Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.	R.CCR.4; L.CCR.4; L.CCR.6	RI.11–12.4; RST.11–12.4; L.11–12.4; L.11–12.6	a; a; a; a	S; S; S; S	F	The ESS is more specific than the matched ELA CCSS in referring to “technical concepts and vocabulary.” RST.11–12.4 is the closest match, in referring to words and phrases “used in a specific scientific or technical context.” L.11–12.6 also includes using “domain-specific words.”
ESS02.01.01	Determine the most appropriate reading strategy for identifying the overarching purpose of a text (i.e. skimming, reading for detail, reading for meaning or critical analysis).					N	No ELA CCSS address the selection of particular reading strategies for identifying text purpose.
ESS02.01.02	Demonstrate use of content, technical concepts and vocabulary when analyzing information and following directions.	R.CCR.4; L.CCR.6	RI.11–12.4; RST.11–12.2–4; L.11–12.6	a; a; a	S; S; S	F	The ESS performance element represents a subset of the skills in the latter two CCSS. RST.11–12.4 and L.11–12.6 are the closest matches to the use of “technical concepts and vocabulary” in the ESS. RST.11–12.2 and RST.11–12.3 both have areas of overlap, with RST.11–12.2 including summarizing information using “accurate terms” and RST.11–12.3 including following a “multi-step procedure” and analyzing “scientific results.”

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ESS02.01.03	Select the reading strategy or strategies needed to fully comprehend the content within a written document (i.e., skimming, reading for detail, reading for meaning or critical analysis).					N	No ELA CCSS address the selection of particular reading strategies for a purpose.
ESS02.01.04	Interpret information, data, and observations to apply information learned from reading to actual practice.	R.CCR.1; R.CCR.7	RI.11–12.7; RH.11–12.7; RST.11–12.7; RST.11–12.8; RST.11–12.9	a; a; a; a; a	S; S; S; S; S	C	The language of the ESS is more general than that of the matched ELA CCSS, each of which includes some content not covered in the ESS. The CCSS, for example, include the evaluation or synthesis of information and data, skills that go beyond the interpretation of information called for in the ESS. The ESS also calls for students to apply information to “actual practice.” This element of the ESS is best matched by RST.11–12.7, which includes using information to “address a question or solve a problem.” However, “actual practice” in the ESS could include other career-related applications not covered in the CCSS.
ESS02.01.05	Transcribe information, data, and observations to apply information learned from reading to actual practice.					N	No CCSS address the skill of transcribing information, etc.
ESS02.01.06	Communicate information, data, and observations to apply information learned from reading to actual practice.	W.CCR.2; SL.CCR.4	W.11–12.2; SL.11–12.4; WHST.11–12.7–8	a; a; a	S; S; S	C	The ESS calls for communicating information, etc., in order to <i>apply</i> that information to “actual practice.” SL.11–12.4 covers the effective communication of information but without any specific reference to applying that information. Only WHST.11–12.7 includes conducting research to “solve a problem” although it focuses primarily on research skills rather than communication. Each of the matched CCSS also covers elements not included in the ESS; WHST.11–12.7–8 describe extended research tasks. The ESS represents a subset of the skills described in those standards.
ESS02.02	Demonstrate use of the concepts, strategies, and systems for obtaining and conveying ideas and information to enhance communication in the workplace.	SL.CCR.1				P	No ELA CCSS specifically refers to the use of “strategies” or “systems” for communication “in the workplace.” This ESS was coded with the understanding that some of the content of SL.CCR.1 (“participate effectively “in “conversations and collaborations”) transfers to this workplace context.

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ESS02.02.01	Employ verbal skills when obtaining and conveying information.	SL.CCR.1	SL.11–12.1	a	S	F	The ESS is more specific in focusing on “obtaining and conveying information” and represents a subset of the skills in the ELA CCSS. SL.11–12.1 covers the use of communication skills in “collaborative discussions.”
ESS02.02.02	Record information needed to present a report on a given topic or problem.					N	No ELA CCSS address the skill of recording information.
ESS02.02.03	Write internal and external business correspondence that conveys and/or obtains information effectively.	W.CCR.2	W.11–12.2	a	S	P	No ELA CCSS specifically address business correspondence. W.CCR.2 covers clearly conveying “ideas, concepts, and information” through writing. The skills described in the CCSS would likely overlap substantially with the more specific skill in the ESS. However, this ESS was coded with the understanding that some additional knowledge and skills specific to the context of business correspondence are required.
ESS02.02.04	Communicate with other employees to clarify workplace objectives.					N	No ELA CCSS address communication with “other employees” in a workplace environment or clarifying “workplace objectives.” These are interpreted as the central context and content of the ESS.
ESS02.02.05	Communicate effectively with customers and employees to foster positive relationships.					N	No ELA CCSS address communication with “customers and employees.” This is interpreted as the central content of the ESS.
ESS02.03	Locate, organize and reference written information from various sources to communicate with co-workers and clients/participants.	SL.CCR.4; W.CCR.2; W.CCR.8	SL.11–12.4; W.11–12.2; W.11–12.8; (WHST.11–12.2, 8)	a; a; a; (a)	S; S; S; (S)	P	W.CCR.2 overlaps with the ESS in requiring students to “convey complex ideas and information” through written texts. SL.CCR.4 overlaps in requiring the clear oral presentation of information to an audience. The closest match is to W.CCR.8, which specifically addresses the skill of gathering information from “multiple sources.” The ELA CCSS do not directly address the use of these skills to communicate with “co-workers and clients.” This ESS was coded with the understanding that communication with co-workers and clients likely requires some additional knowledge or skills specific to that context. The ELA CCSS also include some content not covered in the ESS. W.11–12.2 focuses on the production of informational texts.

	The following knowledge and skill statements are essential to success for careers in all clusters and pathways. Persons preparing for careers at any level should be able to demonstrate these skills in the context of their chosen cluster and pathway.	Matched Anchor Standard	Matched Grade Level Standard	Progression (a-e)	Difference in Complexity (S/D)	Coverage (F/C/P/N)	Comments Regarding Correspondence
ESS02.03.01	Locate written information used to communicate with co-workers and customers.	W.CCR.8	W.11–12.8	a	S	P	This ESS represents a subset of the skills in the ELA CCSS; W.11–12.8 also includes evaluating and integrating information. This ESS performance element is also a subset of the skills included in ESS02.03.
ESS02.03.02	Organize information to use in written and oral communications.	SL.CCR.4; W.CCR.4	SL.11–12.4; W.11–12.4; (WHST.11–12.4)	a; a; (a)	S; S; (S)	F	The skill of organizing information in the ESS is covered in the matched ELA CCSS. This ESS performance element represents a subset of the skills covered in the CCSS and in ESS02.03.
ESS02.03.03	Reference the sources of information.	W.CCR.8	W.11–12.8; (WHST.11–12.8)	a; (a)	S; (S)	F	The skill described in the ESS represents a subset of the skills described in the ELA CCSS, which include gathering, assessing, and integrating information. This ESS performance element also represents a subset of the skills described in ESS02.03.
ESS02.04	Evaluate and use information resources to accomplish specific occupational tasks.	R.CCR.7; W.CCR.8; SL.CCR.2	RI.11–12.7; (RH.11–12.7); (RST.11–12.7); W.11–12.8; (WHT.11–12.8); SL.11–12.2	a; (a); (a); a; (a); a	S; (S); (S); S; (S); S	P	The matched ELA CCSS address the skills of evaluating and using information resources but do not address the application of these skills to specific occupational tasks. RI.11–12.7 does include conducting research to solve a problem or answer a question. W.11–12.8 includes evaluating resources for their relevance to “the specific task, purpose, and audience.” The partial rating allows for the possibility that some additional knowledge and skills might be needed to apply these skills to “specific occupational tasks.” Aside from that application of occupational tasks, the ESS is covered by the CCSS.

	The following knowledge and skill statements are essential to success for careers in all clusters and pathways. Persons preparing for careers at any level should be able to demonstrate these skills in the context of their chosen cluster and pathway.	Matched Anchor Standard	Matched Grade Level Standard	Progression (a-e)	Difference in Complexity (S/D)	Coverage (F/C/P/N)	Comments Regarding Correspondence
ESS02.04.01	Use informational texts, Internet web sites, and/or technical materials to review and apply information sources for occupational tasks.	R.CCR.7; W.CCR.8; SL.CCR.2	RI.11–12.7; (RH.11–12.7); (RST.11–12.7); W.11–12.6; WHST.11–12.6; WHST.11–12.8; WHST.11–12.9; SL.11–12.2	a; (a); (a); a; a; a; a; a	S; (S); (S); S; S; S; S; S	P	The ESS is a subset of the CCSS and of the skills in ESS02.04. The ESS describes the application of information from various sources, including the Internet, to “occupational tasks.” None of the matched CCSS address the context of occupations. The closest matches are to RI.11–12.7, RST.11–12.7, and SL.11–12.2. RI.11–12.7 and RST.11–12.7 include using information from various sources, including the Internet, to “address a question or solve a problem.” SL.11–12.2 calls for integrating multiple sources of information to “make informed decisions and solve problems.” RI.11–12.7, RST.11–12.7, and SL.11–12.2 share with the ESS an emphasis on the application of information. The matches are rated “partial” with the understanding that the specific workplace context in the ESS may require additional knowledge and skills not addressed by the CCSS. All of the matched CCSS include some content not covered by the ESS. Most include evaluation of information for its reliability; for example, a skill addressed in a separate ESS (ESS02.04.02).
ESS02.04.02	Evaluate the reliability of information from informational texts, Internet Web sites, and/or technical materials and resources.	R.CCR.7; W.CCR.6; W.CCR.8; W.CCR.9; SL.CCR.2	RI.11–12.7; (RH.11–12.7); (RST.11–12.7); W.11–12.8; (WHST.11–12.8); SL.11–12.2	a; (a); (a); a; (a); a	S; (S); (S); S; (S); S	F	The skill described in the ESS is a subset of those described in the matched ELA CCSS—that is, the matched CCSS incorporate the evaluation of information into larger tasks, such as writing a research paper. The ESS is also a subset of ESS02.04, which also applies the evaluation of information to “occupational tasks.”
ESS02.05	Use correct grammar, punctuation and terminology to write and edit documents.	L.CCR.1; L.CCR.2	L.11–12.1; L.11–12.2	a; a;	S S	F	The content is similar in both the ESS and matched CCSS, but there is a difference in organization of content; the ESS performance elements address audience and purpose in a separate performance element while the CCSS combine consideration of audience and purpose with clarity and coherence (in effect, ESS02.05.01 and ESS05.02 combined).
ESS02.05.01	Compose multi-paragraph documents clearly, succinctly, and accurately.	W.CCR.2; W.CCR.4	W.11–12.2; W.11–12.4; (WHST.11–12.2, 4)	a; a; (a)	S; S; (S)	F	There is overlap between the ESS and both ELA Writing standards. W.11–12.2 focuses on conveying ideas and information “clearly and accurately” in informative texts; W.11–12.4 describes criteria for the production of writing, including “development, organization, and style.”

	The following knowledge and skill statements are essential to success for careers in all clusters and pathways. Persons preparing for careers at any level should be able to demonstrate these skills in the context of their chosen cluster and pathway.	Matched Anchor Standard	Matched Grade Level Standard	Progression (a-e)	Difference in Complexity (S/D)	Coverage (F/C/P/N)	Comments Regarding Correspondence
ESS02.05.02	Use descriptions of audience and purpose when preparing and editing written documents.	W.CCR.4	W.11–12.4; (WHST.11–12.4)	a; (a)	S; (S)	F	W.11–12.4 is the closest match to this ESS; the CCSS specifically refers to producing writing appropriate to “task, purpose, and audience.”
ESS02.05.03	Use correct grammar, spelling, punctuation, and capitalization when preparing written documents.	L.CCR.1; L.CCR.2	L.11–12.1; L.11–12.2.2	a; a	S	F	The ESS and ELA CCSS cover similar content; taken together, the two matched CCSS cover all elements in the ESS.
ESS02.06	Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.	SL.CCR.4; SL.CCR.5	SL.11–12.4; SL.11–12.5	a; a	S; S	F	This ESS and those in the related performance elements below are covered by the matched ELA CCSS. There is a difference in the organization of content in the two sets of standards. Many of the specific ESS performance elements below describe skills that are a subset of the more general ESS skill statement and the two CCSS.
ESS02.06.01	Prepare oral presentations to provide information for specific purposes and audiences.	SL.CCR.4	SL.11–12.4	a	S	F	The skill in the ESS performance element represents a subset of those in the ELA CCSS and in ESS02.06.
ESS02.06.02	Identify support materials that will enhance an oral presentation.	SL.CCR.4–5	SL.11–12.4–5	a	S	F	The skill in the ESS performance element represents a subset of those in the ELA CCSS and in ESS02.06.
ESS02.06.03	Prepare support materials that will enhance an oral presentation.	SL.CCR.4–5	SL.11–12.4–5	a	S	F	The skill in the ESS performance element represents a subset of those in the ELA CCSS and in ESS02.06.
ESS02.06.04	Deliver an oral presentation that sustains listeners' attention and interest.	SL.CCR.4; SL.CCR.5	SL.11–12.4; SL.11–12.5	a; a	S; S	F	The CCSS incorporates additional content not described in the ESS but some of that content is probably implicit in the core skill of the ESS—that is, a presentation that sustains listeners' interest must be clear and coherent and appropriate to the audience. SL.11–12.5 specifically addresses the use of “digital media” in presentations. It is not entirely clear if this ESS performance element includes the use of media, which is more directly addressed in ESS02.06.06 below.
ESS02.06.05	Align presentation strategies to the intended audience.	SL.CCR.4	SL.11–12.4	a	C	F	The ESS represents a subset of the skills in SL.11–12.4.
ESS02.06.06	Implement multi-media strategies for presentations.	SL.CCR.5	SL.11–12.5	a	S	F	SL.11–12.5 is more specific and detailed in its language but the core content is similar in both the ELA CCSS and the ESS.

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ESS02.07	Interpret verbal and nonverbal cues/behaviors to enhance communication with co-workers and clients/participants.	SL.CCR.1	SL.11–12.1	a	D	P	No ELA CCSS specifically address communication with co-workers and clients/participants. Although SL.CCR.1 is clearly related, it addresses communication in a classroom setting. It is likely that many of the specific skills described in the grade 11–12 standard (SL.11–12.1) would transfer to this context. However, communication in the workplace context may require additional knowledge and skills specific to that environment. The difference in complexity reflects the fact that SL.CCR.1 focuses primarily on collaborative discussions, a more cognitively complex activity.
ESS02.07.01	Interpret verbal behaviors when communicating with clients and co-workers.	SL.CCR.1	SL.11–12.1	a	D	P	No ELA CCSS specifically address communication with co-workers and clients/participants. Although SL.CCR.1 is related, it addresses communication in a classroom setting. It is likely that many of the specific skills described in the grade 11–12 standard (SL.11–12.1) would transfer to this context. However, communication in the workplace context may require additional knowledge and skills specific to that environment. The difference in complexity reflects the fact that SL.CCR.1 focuses primarily on collaborative discussions, a more cognitively complex activity.
ESS02.07.02	Interpret nonverbal behaviors when communicating with clients and co-workers.	SL.CCR.1	SL.11–12.1	a	D	P	No ELA CCSS specifically address communication with co-workers and clients/participants. Although SL.CCR.1 is related, it addresses communication in a classroom setting. It is likely that many of the specific skills described in the grade 11–12 standard (SL.11–12.1) would transfer to this context. However, communication in the workplace context may require additional knowledge and skills specific to that environment. The difference in complexity reflects the fact that SL.CCR.1 focuses primarily on collaborative discussions, a more cognitively complex activity.
ESS02.08	Apply active listening skills to obtain and clarify information.	SL.CCR.1	SL.11–12.1	a	S	F	SL.11–12.1 covers a broader range of skills, integrating speaking and listening in “a range of collaborative discussions.”

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ESS02.08.01	Interpret a given verbal message/information.	SL.CCR.1	SL.11–12.1	a	D	F	The ESS represents a subset of the skills covered in SL.11–12.1. It is covered by the CCSS but represents a less complex activity than the collaborative discussion described in the CCSS.
ESS02.08.02	Respond with restatement and clarification techniques to clarify information.	SL.CCR.1	SL.11–12.1	a	D	F	The ESS represents a subset of the skills covered in SL.11–12.1. It is covered by the CCSS but represents a less complex activity than the collaborative discussion described in the CCSS.
ESS02.09	Develop and interpret tables, charts, and figures to support written and oral communications.	SL.CCR.2; R.CCR.7; W.CCR.8	SL.11–12.2; RI.11–12.7; RH.11–12.7; RST.11–12.7; W.11–12.8; (WHST.11–12.8)	a; a; a; a; a; (a)	D; D; D; D; D; (D)	C	The ESS represents a subset of all the related ELA CCSS. No CCSS specifically addresses “tables, charts, and figures.” RST.11–12.7 describes a complex research process, which includes integrating and evaluating information from “diverse formats and media (e.g., quantitative data, video, multimedia).”
ESS02.09.01	Create tables, charts, and figures to support written and oral communications.	SL.CCR.2; W.CCR.2	SL.11–12.2; W.11–12.2; (WHST.11–12.2)	a; a; (a)	D; D; (D)	C	The ESS represents a subset of the skills integrated in the related ELA CCSS. No ELA CCSS specifically address the creation of charts and tables but incorporates these (and other) skills into the integration and evaluation of information in oral or written texts.
ESS02.09.02	Interpret tables, charts, and figures used to support written and oral communication.	R.CCR.7	RI.11–12.7; RH.11–12.7; RST.11–12.7	a; a; a	D; D; D	C	The ESS is covered by the related ELA CCSS but represents a subset of the skills integrated in the CCSS. The CCSS includes integrating and evaluating multiple sources of information presented in diverse formats (including quantitative).
ESS02.10	Listen to and speak with diverse individuals to enhance communication skills.	SL.CCR.1	SL.11–12.1	a	S	C	SL.11–12.1 includes participating in “a range of collaborative discussions” with “diverse partners” (fellow students). The emphasis in the CCSS is somewhat different; the ESS focuses on communication with diverse individuals while the primary focus of the CCSS is on the skills required for effective participation in “collaborative discussions.”
ESS02.10.01	Apply factors and strategies for communicating with a diverse workforce.	N				N	Although many of the skills covered in SL.11–12.1 may transfer into a workplace setting, “communicating with a diverse workforce” is not addressed in the ELA CCSS.
ESS02.10.02	Demonstrate ability to communicate and resolve conflicts within a diverse workforce.	N				N	Although many of the skills covered in SL.11–12.1 may transfer into a workplace setting, communication within a “diverse workforce” is not addressed in the ELA CCSS. The CCSS do not address conflict resolution.

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ESS02.11	Exhibit public relations skills to increase internal and external customer/client satisfaction.	N				N	No ELA CCSS address public relation skills.
ESS02.11.01	Communicate effectively when developing positive customer/client relationships.	N				N	
Essential Topic ESS03	PROBLEM-SOLVING AND CRITICAL THINKING; <i>Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.</i>						The Essential Topic is at a higher level of generality than the related ELA CCSS. The language in the Essential Topic is most closely matched by the description of “Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, and Language” in the introduction to the CCSS for ELA.
ESS03.01	Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g., analyze, synthesize and evaluate).	W.CCR.7; SL.CCR.1	RI.11–12.7; W.11–12.7; (WHST.11–12.7); SL.11–12.1; SL.11–12.2	a; a; (a); a; a	S; S; (S); S; S	P	The ESS is articulated at a higher level of generality than the related ELA CCSS. As written, it would encompass critical thinking in other content areas (math, science, etc.) beyond ELA. The CCSS cited incorporate problem-solving and the critical thinking skills in the application of specific language arts skills (reading, writing, etc.); problem-solving is not their central focus. In addition, only SL.11–12.2 emphasizes collaboration.
ESS03.01.01	Identify common tasks that require employees to use problem-solving skills.	N				N	No ELA CCSS address problem-solving in the workplace.
ESS03.01.02	Analyze elements of a problem to develop creative solutions.	W.CCR.7	W.11–12.7; (WHST.11–12.7)	a; (a)	S; (S)	P	The ESS focuses on the core skill of problem-solving. The CCSS is a partial match; it focuses on the use of research skills, using multiple sources of information, to solve a problem. As noted above, no CCSS focuses on problem-solving, per se, as a core skill. Both the ESS and the CCSS require in-depth, critical thinking.
ESS03.01.03	Describe the value of using problem-solving and critical thinking skills to improve a situation or process.	N				N	No ELA CCSS address describing the value of using problem-solving and critical thinking skills to improve a situation or process.

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ESS03.01.04	Create ideas, proposals, and solutions to problems.	N	W.11–12.7; (WHST.11–12.7); SL.11–12.1	a; (a); a	S; (S); S	P	No CCR Anchor standard addresses problem-solving. The ESS focuses on creating solutions to problems (a skill that crosses content areas), a process that likely includes research. The related ELA CCSS is focused on research skills used to “solve a problem.” There is overlap with SL.11–12.1 for “collaborative discussions.”
ESS03.01.05	Evaluate ideas, proposals, and solutions to problems.	N	W.11–12.7; (WHST.11–12.7); SL.11–12.1	a; (a); a	S; (S); S	P	No CCR Anchor standard addresses problem-solving. The ESS is more general in its focus on problem-solving (a skill that crosses content areas) than the matched ELA CCSS. The matched CCSS focus on research skills used to solve a problem. SL.11–12.1 is coded with the understanding that collaborative discussions “building on others’ ideas and expressing their own” could be applied to the skill in the ESS.
ESS03.01.06	Use structured problem-solving methods when developing proposals and solutions.	N				N	No ELA CCSS address problem-solving methods.
ESS03.01.07	Generate new and creative ideas to solve problems by brainstorming possible solutions.	N				N	No ELA CCSS address generating new and creative ideas to solve problems by brainstorming possible solutions.
ESS03.01.08	Critically analyze information to determine value to the problem-solving task.	N	W.11–12.7; W.11–12.8; (WHST.11–12.7–8)	a; a; (a)	S; S; (S)	C	No CCR Anchor standard addresses problem-solving. The ELA CCSS focus on research skills; however, there is some overlap. W.11–12.8, for example, includes assessing information gathered for its “strengths and limitations” in relation to “the specific task.” W.11–12.7 includes using research to “answer a question (including a self-generated question) or solve a problem” and narrowing or broadening the inquiry as needed. The main focus of the CCSS, however, is on research skills. The ESS could have applications outside of research activities.
ESS03.01.09	Guide individuals through the process of recognizing concerns and making informed decisions.	N				N	No ELA CCSS address guiding individuals through the process of recognizing concerns and making informed decisions.
ESS03.01.10	Identify alternatives using a variety of problem-solving and critical thinking skills.	N				N	

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ESS03.01.11	Evaluate alternatives using a variety of problem-solving and critical thinking skills.	N				N	
ESS03.02	Employ critical thinking and interpersonal skills to resolve conflicts with staff and/or customers.	N				N	No ELA CCSS address the skill of conflict resolution or the context of conflicts in the workplace.
ESS03.02.01	Analyze situations and behaviors that affect conflict management.	N				N	
ESS03.02.02	Determine best options/outcomes for conflict resolution using critical thinking skills.	N				N	
ESS03.02.03	Identify with others' feelings, needs, and concerns.	N				N	
ESS03.02.04	Implement stress management techniques.	N				N	
ESS03.02.05	Resolve conflicts with/for customers using conflict resolution skills.	N				N	
ESS03.02.06	Implement conflict resolution skills to address staff issues/problems.	N				N	
ESS03.03	Identify, write and monitor workplace performance goals to guide progress in assigned areas of responsibility and accountability.	N				N	No ELA CCSS address the creation or monitoring of goals in the workplace.
ESS03.03.01	Write realistic performance goals, objectives and action plans.	N				N	
ESS03.03.02	Monitor performance goals and adjust as necessary.	N				N	
ESS03.03.03	Recognize goal achievement using appropriate rewards in the workplace.	N				N	

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ESS03.03.04	Communicate goal achievement with managers and co-workers.	N				N	
ESS03.04	Conduct technical research to gather information necessary for decision-making.	W.CCR.7; W.CCR.8	W.11–12.7; (WHST.11–12.7); W.11–12.8; (WHST.11–12.8); SL.11–12.2	a; (a); a; (a); a	S; (S); S; (S); S	C	Research skills are covered in the ELA CCSS. The ESS also focuses on “technical research.” This represents a subset of the skills referred to in the CCSS. SL.11–12.2 includes integrating “multiple sources of information” to “make informed decisions” and W.11–12.7 includes using research to “answer a question or solve a problem.” The “technical research” and “decision-making” in the ESS may include some contexts specific to the workplace.
ESS03.04.01	Align the information gathered to the needs of the audience.	W.CCR.8; SL.CCR.4	W.11–12.8; (WHST.11–12.8); SL.11–12.4	a; (a); a	S; (S); S	F	The skill in the ESS is a subset of those included in the ELA CCSS; the CCSS integrate this skill with the larger task of making a presentation or conducting a multi-step research project.
ESS03.04.02	Gather technical information and data using a variety of resources.	W.CCR.7; W.CCR.8	W.11–12.7; W.11–12.8; WHST.11–12.7–8; SL.11–12.2	a; a; a; a	S; S; S; S	C	The content of the ESS overlaps with some elements of the three ELA CCSS; W.11–12.8, for example, includes the use of “print and digital sources” and “advanced searches.” The skill in the ESS could be described as a subset of the ELA CCSS, which are more comparable in grain size to the skills statement (ESS.03.04) above. The ESS focus on “technical information and data” makes WHST.11–12.7–8 the closest match.
ESS03.04.03	Analyze information and data for value to the research objectives.	W.CCR.8	W.11–12.8; WHST.11–12.8	a; a	S; S	F	This ESS represents a subset of the skills required for the multi-step research processes described in ELA CCSS.
ESS03.04.04	Evaluate information and data to determine value to research objectives.	W.CCR.8	W.11–12.7; W.11–12.8; (WHST.11–12.7–8)	a; a; (a)	S; S; (S)	F	This ESS represents a subset of the skills required for the multi-step research processes described in ELA CCSS.

	The following knowledge and skill statements are essential to success for careers in all clusters and pathways. Persons preparing for careers at any level should be able to demonstrate these skills in the context of their chosen cluster and pathway.	Matched Anchor Standard	Matched Grade Level Standard	Progression (a-e)	Difference in Complexity (S/D)	Coverage (F/C/P/N)	Comments Regarding Correspondence
Essential Topic ESS04	INFORMATION TECHNOLOGY APPLICATIONS; Use information technology tools specific to the career cluster to access, manage, integrate, and create information.						No ELA CCSS address the use of technology tools specific to a career (PIM, for example); however, some of the specific skills identified in the related performance elements below are covered in the CCSS.
ESS04.01	Use Personal Information Management (PIM) applications to increase workplace efficiency.	N				N	
ESS04.01.01	Manage personal schedules and contact information.	N				N	
ESS04.01.02	Create memos and notes.	N				N	
ESS04.02	Employ technological tools to expedite workflow.	N				N	
ESS04.02.01	Use information technology tools to manage and perform work responsibilities.	N				N	
ESS04.03	Operate electronic mail applications to communicate within a workplace.	N				N	
ESS04.03.01	Use email to share files and documents.	N				N	
ESS04.03.02	Identify the functions and purpose of email systems.	N				N	
ESS04.03.03	Use email to communicate within and across organizations.	N				N	
ESS04.04	Operate Internet applications to perform workplace tasks.	N				N	No ELA CCSS address the use of Internet applications applied to workplace tasks. However, the CCSS do cover the use of Internet resources for research, and “to interact and collaborate with others.”

	The following knowledge and skill statements are essential to success for careers in all clusters and pathways. Persons preparing for careers at any level should be able to demonstrate these skills in the context of their chosen cluster and pathway.	Matched Anchor Standard	Matched Grade Level Standard	Progression (a-e)	Difference in Complexity (S/D)	Coverage (F/C/P/N)	Comments Regarding Correspondence
ESS04.04.01	Access and navigate Internet (e.g., use a web browser).	W.CCR.6	W.6.6	d	D	F	Regarding progression, the ELA Writing CCSS addressing the use of technology in writing for K–5, (W.K.6–W.5.6) calls for students to use computer technology, including the Internet, with “adult guidance and support;” from grade 6 on, the standards address the use of technology and the Internet independently to produce writing (W.6.6–W.11–12.6). The ESS is matched to the grade 6 standard because it is the first point in the progression to require independent use of the Internet; new skills and knowledge are added to W.6.6–W.11–12.6 at each grade level, with the grade 11–12 standard representing the endpoint within the CCSS. The ESS represents a subset of the CCSS, which integrates the use of the Internet into the process of producing, publishing, and (at grades 11–12) updating written projects.
ESS04.04.02	Search for information and resources.	W.CCR.8	W.7.8	d	D	F	The ELA CCSS first calls for students to gather information from “digital sources” in grade 3 (W.3.8). At grade 7, W.7.8 calls for “using search terms effectively.” This is the first time in the progression that the standard refers specifically to searching for information. New skills are added to the progression every year, through grades 11–12, which represent the endpoint for this skill within the CCSS.
ESS04.04.03	Evaluate Internet resources for reliability and validity.	W.CCR.8	W.11–12.8; (WHST.11–12.8); SL.11–12.2	a; (a); a	S; (S); S	F	The ESS is fully covered by the matched ELA CCSS but represents a subset of the larger writing or research tasks described in the CCSS.
ESS04.05	Operate writing and publishing applications to prepare business communications.	N				N	The ELA CCSS do not directly cover the use of applications specific to a business context; however, some of the specific skills in the performance elements below are covered in the CCSS.
ESS04.05.01	Prepare simple documents and other business communications.	W.CCR.6	W.11–12.6; (WHST.11–12.6)	a; (a)	S; (S)	P	The ELA CCSS cover the use of computer technology to produce and publish writing, but do not specifically address business communications.
ESS04.05.02	Prepare reports and other business communications by integrating graphics and other non-text elements.	W.CCR.6	W.11–12.6; (WHST.11–12.6)	a; (a)	S; (S)	P	The ELA CCSS cover the use of computer technology to produce and publish writing, but do not specifically address business communications.

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ESS04.05.03	Prepare complex multi-media publications.	W.CCR.6	W.11–12.6; W.11–12.8; (WHST.11–12.6, 8)	a; a; (a)	S; S; (S)	C	The ELA CCSS cover the use of computer technology and “digital sources” to publish writing but do not refer to any career or business contexts.
ESS04.06	Operate presentation applications to prepare presentations.	W.CCR.6; SL.CCR.5	W.11–12.6; (WHST.11–12.6); SL.11–12.5	a; (a); a	S; (S); S	P	The ESS focuses on the use of “presentation applications.” No ELA CCSS specifically includes the use of presentation applications. These specific skills could be included in the more general “use technology” of W.6 or use “digital media and visual displays of data” in SL.5. They are not directly named in the CCSS.
ESS04.06.01	Prepare presentations for training, sales and information sharing.	N				N	This ESS is very specific in applying the skills described to workplace contexts.
ESS04.06.02	Deliver presentations with supporting materials.	SL.CCR.5	SL.11–12.5	a	S	C	The ELA CCSS refers to the use of a broad array of “digital media” in presentations. The language of the CCSS is broad enough to encompass the “supporting materials” referred to in the ESS.
ESS04.07	Employ spreadsheet applications to organize and manipulate data.	N				N	No ELA CCSS specifically address the use of spreadsheets.
ESS04.07.01	Create a spreadsheet.	N				N	
ESS04.07.02	Perform calculations and analyses on data using a spreadsheet.	N				N	
ESS04.08	Employ database applications to manage data.	N				N	No ELA CCSS specifically address the use of database applications.
ESS04.08.01	Manipulate data elements.	N				N	
ESS04.08.02	Manage interrelated data elements.	N				N	
ESS04.08.03	Analyze interrelated data elements.	N				N	
ESS04.08.04	Generate reports showing interrelated data elements.	N				N	
ESS04.09	Employ collaborative/groupware applications to facilitate group work.	N				N	No ELA CCSS specifically address the use of collaborative applications.

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ESS04.09.01	Facilitate group work through management of shared schedule and contact information.	N				N	
ESS04.09.02	Facilitate group work through management of shared files and online information.	N				N	
ESS04.09.03	Facilitate group work through instant messaging or virtual meetings.	N				N	
ESS04.10	Employ computer operations applications to manage work tasks.	N				N	No ELA CCSS specifically address the use of these applications.
ESS04.10.01	Manage computer operations.	N				N	
ESS04.10.02	Manage file storage.	N				N	
ESS04.10.03	Compress or alter files.	N				N	
ESS04.11	Use computer-based equipment (containing embedded computers or processors) to control devices.	N				N	No ELA CCSS specifically address using computer-based equipment to control devices.
ESS04.11.01	Operate computer driven equipment and machines.	N				N	
ESS04.11.02	Use installation and operation manuals.	N				N	
ESS04.11.03	Troubleshoot computer driven equipment and machines.	N				N	
ESS04.11.04	Access support as needed to maintain operation of computer driven equipment and machines.	N				N	

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Essential Topic ESS05	SYSTEMS; <i>Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. Identify how key organizational systems affect organizational performance and the quality of products and services. Understand global context of industries and careers.</i>						No ELA CCSS address systems.
ESS05.01	Describe the nature and types of business organizations to build an understanding of the scope of organizations.	N				N	
ESS05.01.01	List the types and functions of businesses.	N				N	
ESS05.01.02	Describe the types and functions of businesses.	N				N	
ESS05.01.03	Explain the functions and interactions of common departments within a business.	N				N	
ESS05.02	Implement quality control systems and practices to ensure quality products and services.	N				N	
ESS05.02.01	Describe quality control standards and practices common to the workplace.	N				N	

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Essential Topic ESS06	SAFETY, HEALTH AND ENVIRONMENTAL; <i>Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.</i>						No ELA CCSS address safety, health, and environmental systems.
ESS06.01	Implement personal and jobsite safety rules and regulations to maintain safe and healthful working conditions and environments.	N				N	
ESS06.01.01	Assess workplace conditions with regard to safety and health.	N				N	
ESS06.01.02	Align safety issues with appropriate safety standards to ensure a safe workplace/jobsite.	N				N	
ESS06.01.03	Identify safety hazards common to workplaces.	N				N	
ESS06.01.04	Identify safety precautions to maintain a safe worksite.	N				N	
ESS06.01.05	Select appropriate personal protective equipment as needed for a safe workplace/jobsite.	N				N	
ESS06.01.06	Inspect personal protective equipment commonly used for selected career pathway.	N				N	
ESS06.01.07	Use personal protective equipment according to manufacturer rules and regulations.	N				N	

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ESS06.01.08	Employ a safety hierarchy and communication system within the workplace/jobsite.	N				N	
ESS06.01.09	Implement safety precautions to maintain a safe worksite.	N				N	
ESS06.02	Complete work tasks in accordance with employee rights and responsibilities and employers obligations to maintain workplace safety and health.	N				N	
ESS06.02.01	Identify rules and laws designed to promote safety and health in the workplace.	N				N	
ESS06.02.02	State the rationale of rules and laws designed to promote safety and health.	N				N	
ESS06.03	Employ emergency procedures as necessary to provide aid in workplace accidents.	N				N	
ESS06.03.01	Use knowledge of First Aid procedures as necessary.	N				N	
ESS06.03.02	Use knowledge of CPR procedures as necessary.	N				N	
ESS06.03.03	Use safety equipment as necessary.	N				N	
ESS06.04	Employ knowledge of response techniques to create a disaster and/or emergency response plan.	N				N	
ESS06.04.01	Complete an assessment of an emergency and/or disaster situation.	N				N	
ESS06.04.02	Create an emergency and/or disaster plan.	N				N	

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Essential Topic ESS07	LEADERSHIP AND TEAMWORK; Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.						No ELA CCSS address leadership/teamwork skills in the context of organizational goals. There is overlap with the collaborative skills described in SL.CCR.1 but the CCSS does not address this context.
ESS07.01	Employ leadership skills to accomplish organizational goals and objectives.	N				N	
ESS07.01.01	Analyze the various roles of leaders within organizations (e.g. contribute ideas; share in building an organization; act as role models to employees by adhering to company policies, procedures, and standards; promote the organization's vision; and mentor others).	N				N	
ESS07.01.02	Exhibit traits such as empowerment, risk, communication, focusing on results, decision-making, problem solution, and investment in individuals when leading a group in solving a problem.	N				N	
ESS07.01.03	Exhibit traits such as compassion, service, listening, coaching, developing others, team development, and understanding and appreciating others when acting as a manager of others in the workplace.	N				N	

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ESS07.01.04	Exhibit traits such as enthusiasm, creativity, conviction, mission, courage, concept, focus, principle-centered living, and change when interacting with others in general.	N				N	
ESS07.01.05	Consider issues related to self, team, community, diversity, environment, and global awareness when leading others.	N				N	
ESS07.01.06	Exhibit traits such as innovation, intuition, adaptation, life-long learning and coachability to develop leadership potential over time.	N				N	
ESS07.01.07	Analyze leadership in relation to trust, positive attitude, integrity, and willingness to accept key responsibilities in a work situation.	N				N	
ESS07.01.08	Describe observations of outstanding leaders using effective management styles.	N				N	
ESS07.01.09	Participate in civic and community leadership and teamwork opportunities to enhance skills.	N				N	
ESS07.02	Employ organizational and staff development skills to foster positive working relationships and accomplish organizational goals.	N				N	
ESS07.02.01	Implement organizational skills when facilitating others' work efforts.	N				N	

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ESS07.02.02	Explain how to manage a staff that satisfies work demands while adhering to budget constraints.	N				N	
ESS07.02.03	Describe how staff growth and development to increase productivity and employee satisfaction.	N				N	
ESS07.02.04	Organize team involvement within a group environment.	N				N	
ESS07.02.05	Work with others to develop and gain commitment to team goals.	N				N	
ESS07.02.06	Distribute responsibility and work load fairly.	N				N	
ESS07.02.07	Model leadership and teamwork qualities to aid in employee morale.	N				N	
ESS07.02.08	Identify best practices for successful team functioning.	N				N	
ESS07.02.09	Explain best practices for successful team functioning.	N				N	
ESS07.03	Employ teamwork skills to achieve collective goals and use team members' talents effectively.	N				N	
ESS07.03.01	Work with others to achieve objectives in a timely manner.	N				N	
ESS07.03.02	Promote the full involvement and use of team members' individual talents and skills.	N				N	
ESS07.03.03	Employ conflict management skills to facilitate solutions.	N				N	
ESS07.03.04	Demonstrate teamwork skills though working cooperatively with co-workers, supervisory staff, and others, both in and out of the organization, to achieve particular tasks.	N				N	

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ESS07.03.05	Demonstrate teamwork processes that provide team building, consensus, continuous improvement, respect for the opinions of others, cooperation, adaptability, and conflict resolution.	N				N	
ESS07.03.06	Develop plans to improve team performance.	N				N	
ESS07.03.07	Demonstrate commitment to and a positive attitude toward team goals.	N				N	
ESS07.03.08	Take responsibility for shared group and individual work tasks.	N				N	
ESS07.03.09	Assist team members in completing their work.	N				N	
ESS07.03.10	Adapt effectively to changes in projects and work activities.	N				N	
ESS07.03.11	Negotiate effectively to arrive at decisions.	N				N	
ESS07.04	Establish and maintain effective working relationships with all levels of personnel and other departments in order to accomplish objectives and tasks.	N				N	
ESS07.04.01	Build effective working relationships using interpersonal skills.	N				N	
ESS07.04.02	Use positive interpersonal skills to work cooperatively with co-workers representing different cultures, genders and backgrounds.	N				N	
ESS07.04.03	Manage personal skills to accomplish assignments.	N				N	
ESS07.04.04	Treat people with respect.	N				N	
ESS07.04.05	Provide constructive praise and criticism.	N				N	

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ESS07.04.06	Demonstrate sensitivity to and value for diversity.	N				N	
ESS07.04.07	Manage stress and control emotions.	N				N	
ESS07.05	Conduct and participate in meetings to accomplish work tasks.	N				N	
ESS07.05.01	Develop meeting goals, objectives and agenda.	N				N	
ESS07.05.02	Assign responsibilities for preparing materials and leading discussions.	N				N	
ESS07.05.03	Prepare materials for leading discussion.	N				N	
ESS07.05.04	Assemble and distribute meeting materials.	N				N	
ESS07.05.05	Conduct meeting to achieve objectives within scheduled time.	N				N	
ESS07.05.06	Demonstrate effective communication skills in meetings.	N				N	
ESS07.05.07	Produce meeting minutes including decisions and next steps.	N				N	
ESS07.05.08	Use parliamentary procedure, as needed, to conduct meetings.	N				N	
ESS07.06	Employ mentoring skills to inspire and teach others.	N				N	
ESS07.06.01	Use motivational techniques to enhance performance in others.	N				N	
ESS07.06.02	Provide guidance to enhance performance in others.	N				N	

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Essential Topic ESS08	ETHICS AND LEGAL RESPONSIBILITIES; <i>Know and understand the importance of professional ethics and legal responsibilities.</i>						No ELA CCSS address ethics and legal responsibilities.
ESS08.01	Apply ethical reasoning to a variety of workplace situations in order to make ethical decisions.	N				N	
ESS08.01.01	Evaluate alternative responses to workplace situations based on legal responsibilities and employer policies.	N				N	
ESS08.01.02	Evaluate alternative responses to workplace situations based on personal or professional ethical responsibilities.	N				N	
ESS08.01.03	Identify personal and long-term workplace consequences of unethical or illegal behaviors.	N				N	
ESS08.01.04	Explain personal and long-term workplace consequences of unethical or illegal behaviors.	N				N	
ESS08.01.05	Determine the most appropriate response to workplace situations based on legal and ethical considerations.	N				N	
ESS08.01.06	Explain the most appropriate response to workplace situations based on legal and ethical considerations.	N				N	
ESS08.02	Interpret and explain written organizational policies and procedures to help employees perform their jobs according to employer rules and expectations.	N				N	

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ESS08.02.01	Locate information on organizational policies in handbooks and manuals.	N				N	
ESS08.02.02	Discuss how specific organizational policies and procedures influence a specific work situation.	N				N	
Essential Topic ESS09	EMPLOYABILITY AND CAREER DEVELOPMENT; <i>Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.</i>						No ELA CCSS covers employability and career development.
ESS09.01	Identify and demonstrate positive work behaviors and personal qualities needed to be employable.	N				N	
ESS09.01.01	Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.	N				N	
ESS09.01.02	Demonstrate flexibility and willingness to learn new knowledge and skills.	N				N	
ESS09.01.03	Exhibit commitment to the organization.	N				N	
ESS09.01.04	Identify how work varies with regard to site, from indoor confined spaces to outdoor areas, including aerial space and a variety of climatic and physical conditions.	N				N	
ESS09.01.05	Apply communication strategies when adapting to a culturally diverse environment.	N				N	

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ESS09.01.06	Manage resources in relation to the position (i.e., budget, supplies, computer, etc.).	N				N	
ESS09.01.07	Identify positive work-qualities typically desired in each of the career cluster's pathways.	N				N	
ESS09.01.08	Manage work roles and responsibilities to balance them with other life roles and responsibilities.	N				N	
ESS09.02	Develop a personal career plan to meet career goals and objectives.	N				N	
ESS09.02.01	Develop career goals and objectives as part of a plan for future career direction.	N				N	
ESS09.02.02	Develop strategies to reach career objectives.	N				N	
ESS09.03	Demonstrate skills related to seeking and applying for employment to find and obtain a desired job.	N				N	
ESS09.03.01	Use multiple resources to locate job opportunities.	N				N	
ESS09.03.02	Prepare a résumé.	N				N	
ESS09.03.03	Prepare a letter of application.	N				N	
ESS09.03.04	Complete an employment application.	N				N	
ESS09.03.05	Interview for employment.	N				N	
ESS09.03.06	List the standards and qualifications that must be met in order to enter a given industry.	N				N	
ESS09.03.07	Employ critical thinking and decision-making skills to exhibit qualifications to a potential employer.	N				N	

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ESS09.04	Maintain a career portfolio to document knowledge, skills and experience in a career field.	N				N	
ESS09.04.01	Select educational and work history highlights to include in a career portfolio.	N				N	
ESS09.04.02	Produce a record of work experiences, licenses, certifications and products.	N				N	
ESS09.04.03	Organize electronic or physical portfolio for use in demonstrating knowledge, skills and experiences.	N				N	
ESS09.05	Demonstrate skills in evaluating and comparing employment opportunities in order to accept employment positions that match career goals.	N				N	
ESS09.05.01	Compare employment opportunities to individual needs and career plan objectives.	N				N	
ESS09.05.02	Evaluate employment opportunities based upon individual needs and career plan objectives.	N				N	
ESS09.05.03	Demonstrate appropriate methods for accepting or rejecting employment offers.	N				N	
ESS09.06	Identify and exhibit traits for retaining employment to maintain employment once secured.	N				N	
ESS09.06.01	Model behaviors that demonstrate reliability and dependability.	N				N	
ESS09.06.02	Maintain appropriate dress and behavior for the job to contribute to a safe and effective workplace/jobsite.	N				N	

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ESS09.06.03	Complete required employment forms and documentation such as I-9 form, work visa, W-4 and licensures to meet employment requirements.	N				N	
ESS09.06.04	Summarize key activities necessary to retain a job in the industry.	N				N	
ESS09.06.05	Identify positive work behaviors and personal qualities necessary to retain employment.	N				N	
ESS09.07	Identify and explore career opportunities in one or more career pathways to build an understanding of the opportunities available in the cluster.	N				N	
ESS09.07.01	Locate and identify career opportunities that appeal to personal career goals.	N				N	
ESS09.07.02	Match personal interest and aptitudes to selected careers.	N				N	
ESS09.08	Recognize and act upon requirements for career advancement to plan for continuing education and training.	N				N	
ESS09.08.01	Identify opportunities for career advancement.	N				N	
ESS09.08.02	Pursue education and training opportunities to acquire skills necessary for career advancement.	N				N	
ESS09.08.03	Examine the organization and structure of various segments of the industry to prepare for career advancement.	N				N	

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ESS09.08.04	Research local and regional labor (workforce) market and job growth information to project potential for advancement.	N				N	
ESS09.08.05	Manage employment relations to make career advancements.	N				N	
ESS09.09	Continue professional development to keep current on relevant trends and information within the industry.	N				N	
ESS09.09.01	Use self assessment, organizational priorities, journals, Internet sites, professional associations, peers and other resources to develop goals that address training, education and self-improvement issues.	N				N	
ESS09.09.02	Read trade magazines and journals, manufacturers' catalogues, industry publications and Internet sites to keep current on industry trends.	N				N	
ESS09.09.03	Participate in relevant conferences, workshops, mentoring activities and in-service training to stay current with recent changes in the field.	N				N	

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ESS09.10	Examine licensing, certification and credentialing requirements at the national, state and local levels to maintain compliance with industry requirements.	N				N	
ESS09.10.01	Examine continuing education requirements related to licensing, certification, and credentialing requirements at the local, state and national levels for chosen occupation.	N				N	
ESS09.10.02	Examine the procedures and paperwork involved in maintaining and updating licensure, certification and credentials for chosen occupation.	N				N	
ESS09.10.03	Align ongoing licensing, certification and credentialing requirements to career plans and goals.	N				N	
ESS09.11	Examine employment opportunities in entrepreneurship to consider entrepreneurship as an option for career planning.	N				N	
ESS09.11.01	Describe the opportunities for entrepreneurship in a given industry.	N				N	

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Essential Topic ESS10	TECHNICAL SKILLS; Use of technical knowledge and skills required to pursue careers in all career clusters, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.						The ELA CCSS do not address technical knowledge and skills in the context of careers. W.CCR.6, W.CCR.8, and SL.CCR.5 do address the use of technology to gather, evaluate, and apply information.
ESS10.01	Employ information management techniques and strategies in the workplace to assist in decision-making.	N				N	
ESS10.01.01	Use information literacy skills when accessing, evaluating and disseminating information.	W.CCR.6; W.CCR.8; SL.CCR.5	W.CCR.11–12.6, 8; (WHST.11–12.6, 8); SL.11–12.5	a; (a); a	S; (S); S	C	The ELA CCSS do not address technical knowledge and skills in the context of careers. W.CCR.6, W.CCR.8, and SL.CCR.5 do address the use of technology to gather, evaluate, and apply information.
ESS10.01.02	Describe the nature and scope of information management.	N				N	
ESS10.01.03	Maintain records to facilitate ongoing business operations.	N				N	
ESS10.02	Employ planning and time management skills and tools to enhance results and complete work tasks.	N				N	
ESS10.02.01	Develop goals and objectives.	N				N	
ESS10.02.02	Prioritize tasks to be completed.	N				N	
ESS10.02.03	Develop timelines using time management knowledge and skills.	N				N	
ESS10.02.04	Use project-management skills to improve workflow and minimize costs.	N				N	

Statistics	S.CP.2	S.CP.6	S.CP.8
	S.CP.3	S.CP.7	S.CP.9
Geometry	G.CO.1	G.SRT.1	G.C.3
	G.CO.2	G.SRT.2	G.C.4
	G.CO.3	G.SRT.3	G.C.5
	G.CO.4	G.SRT.4	G.GPE.1
	G.CO.5	G.SRT.5	G.GPE.2
	G.CO.6	G.SRT.6	G.GPE.3
	G.CO.7	G.SRT.7	G.GPE.4
	G.CO.8	G.SRT.8	G.GPE.5
	G.CO.9	G.SRT.9	G.GPE.6
	G.CO.10	G.SRT.10	G.GPE.7
	G.CO.11	G.SRT.11	G.GMD.1
	G.CO.12	G.C.1	G.GMD.2
	G.CO.13	G.C.2	G.GMD.4
Functions	F.IF.1	F.BF.5	F.TF.4
	F.IF.3	F.LE.2	F.TF.6
	F.IF.8	F.LE.3	F.TF.7
	F.IF.9	F.LE.4	F.TF.8
	F.BF.2	F.TF.1	F.TF.9
	F.BF.3	F.TF.2	
	F.BF.4	F.TF.3	
Algebra	A.SSE.1	A.APR.5	A.REI.4
	A.SSE.2	A.APR.6	A.REI.5
	A.SSE.3	A.APR.7	A.REI.6
	A.APR.1	A.CED.4	A.REI.7
	A.APR.2	A.REI.1	A.REI.8
	A.APR.3	A.REI.2	A.REI.9
	A.APR.4	A.REI.3	A.REI.10
Numbers	N.RN.1	N.CN.6	N.VM.7
	N.RN.2	N.CN.7	N.VM.8
	N.RN.3	N.CN.8	N.VM.9
	N.CN.1	N.CN.9	N.VM.10
	N.CN.2	N.VM.1	N.VM.11
	N.CN.3	N.VM.2	N.VM.12
	N.CN.4	N.VM.4	
	N.CN.5	N.VM.5	
Grade 8	8.NS.1	8.F.1	8.G.6
	8.NS.2	8.F.2	8.G.7
	8.EE.1	8.F.3	8.G.8
	8.EE.2	8.F.4	8.G.9
	8.EE.3	8.F.5	8.SP.1
	8.EE.4	8.G.1	8.SP.2
	8.EE.5	8.G.2	8.SP.3
	8.EE.6	8.G.3	8.SP.4
	8.EE.7	8.G.4	
	8.EE.8	8.G.5	

Grade 7	7.RP.1	7.EE.3	7.SP.1
	7.RP.2	7.EE.4	7.SP.2
	7.RP.3	7.G.1	7.SP.3
	7.NS.1	7.G.2	7.SP.4
	7.NS.2	7.G.3	7.SP.5
	7.NS.3	7.G.4	7.SP.6
	7.EE.1	7.G.5	7.SP.7
	7.EE.2	7.G.6	7.SP.8
Grade 6	6.RP.1	6.EE.1	6.G.1
	6.RP.2	6.EE.2	6.G.2
	6.RP.3	6.EE.3	6.G.3
	6.NS.2	6.EE.4	6.G.4
	6.NS.4	6.EE.5	6.SP.1
	6.NS.5	6.EE.6	6.SP.2
	6.NS.6	6.EE.7	6.SP.3
	6.NS.7	6.EE.8	6.SP.4
Grade 5	5.OA.1	5.NBT.6 5.NBT.7	5.MD.3
	5.OA.2	5.NF.2	5.MD.4
	5.OA.3	5.NF.3	5.MD.5
	5.NBT.1	5.NF.5	5.G.1
	5.NBT.2	5.NF.6	5.G.2
	5.NBT.4	5.MD.1	5.G.3
	5.NBT.5	5.MD.2	5.G.4
Grade 4	4.OA.1	4.NBT.6	4.MD.4
	4.OA.2	4.NF.1	4.MD.5
	4.OA.3	4.NF.3	4.MD.6
	4.OA.4	4.NF.4	4.MD.7
	4.OA.5	4.NF.5	4.G.1
	4.NBT.1	4.NF.7	4.G.2
	4.NBT.3	4.MD.1	4.G.3
	4.NBT.4	4.MD.2	
Grade 3	3.OA.1	3.OA.9	3.MD.3
	3.OA.2	3.NBT.1	3.MD.4
	3.OA.3	3.NBT.2	3.MD.5
	3.OA.4	3.NBT.3	3.MD.6
	3.OA.5	3.NF.2	3.MD.7
	3.OA.6	3.NF.3	3.MD.8
	3.OA.7	3.MD.1	3.G.1
	3.OA.8	3.MD.2	3.G.2

ELA – Not matched at any grade level or (where applicable) Anchor standard	RL.11-12.1	RI.11-12.9	RH.11-12.10
	RL.11-12.2	RH.11-12.1	RST.11-12.9
	RL.11-12.3	RH.11-12.2	W.11-12.1
	RL.11-12.4	RH.11-12.3	W.11-12.3
	RL.11-12.5	RH.11-12.4	WHST.11-12.1
	RL.11-12.7	RH.11-12.5	WHST.11-12.3
	RL.11-12.8	RH.11-12.6	L.11-12.3
	RL.11-12.9	RH.11-12.8	L.11-12.5
	RL.11-12.10	RH.11-12.9	
ELA – matched at grade level but not Anchor standard	RL.6.6		