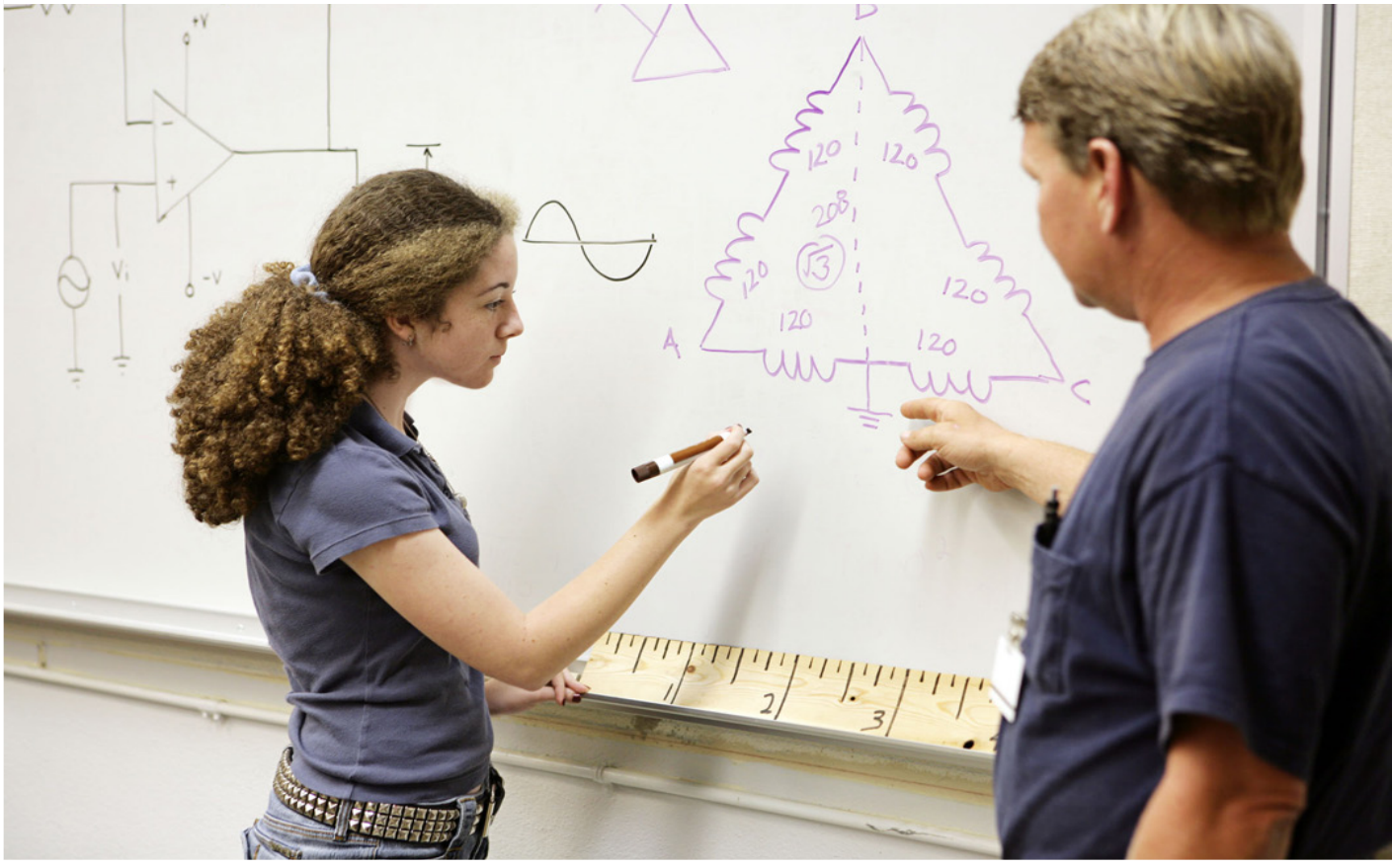
Career and Technical Education Professional Development and Formative Performance Assessments



Prepared by the Educational Policy Improvement Center

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About the Educational Policy Improvement Center (EPIC)

EPIC's mission is to improve educational policy and practice that will increase student success, particularly with students historically underserved by public schools. EPIC conducts a range of policy-related research studies and develops practical tools and techniques to support a dramatic improvement in college and career readiness for students. EPIC is distinguished by its pioneering use of state-of-the-art, criterion-based, and standards-referenced methods of course and document analysis.

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Executive Summary: Project Overview

The Career and Technical Education Professional Development and Formative Performance Assessments project (hereafter referred to as the CTE Professional Development project) is a short-term project funded by the Oregon Department of Education (ODE) that will have lasting results. The project brought together educators from around the state of Oregon for two professional development workshops over the span of five months. In the winter and spring of 2012-2013, the Educational Policy Improvement Center (EPIC) partnered with representatives from the Office of Secondary/Postsecondary Transitions at ODE and the Oregon Department of Community Colleges Workforce Development (CCWD) to guide secondary and postsecondary instructors in the development and implementation of formative performance assessments.

EPIC's goal during the project was to create a process for educators to collaboratively develop high-quality performance tasks that are aligned to the Common Core State Standards (CCSS) and are consistent with the Smarter Balanced Assessment Consortium's (SBAC) model of performance tasks. The instructors recruited for this project included both secondary and postsecondary educators from the fields of Career and Technical Education (CTE), English/language arts (ELA), and mathematics.

The first phase of this project included a professional development workshop for these educators. EPIC presented on a variety of topics related to performance assessment and CCSS over a two-day period. The workshop culminated in a collaborative work session in which instructors began designing a performance task to implement in their classroom during the spring term of the 2012-2013 academic year. After writing and implementing their performance tasks, teachers reconvened for the second phase of the project, a follow-up workshop to discuss their experience, review feedback, and refine their tasks. The third and final stage of the project involved creating a protocol to analyze performance tasks for commonalities in problem-solving skills and depth of knowledge and then conducting an analysis of the performance tasks submitted by participating teachers. The resulting set of procedures, presentation materials, and sample tasks from this project will serve to guide future collaborative initiatives.

Background

Performance assessments (also referred to as performance-based assessments or performance tasks) present students with the opportunity to demonstrate their knowledge and skills in ways that are relevant to their lives. Most performance tasks make connections to authentic situations, including content from the CTE classroom, such as using mathematics skills in a construction class or developing writing skills in a health occupations course. Exemplary CTE instruction integrates academic subjects (such as reading, writing, speaking, math, science) in ways that mirror how students encounter these subjects in career settings.

Fueling the need to introduce Oregon's students to these types of assessments, the Smarter Balanced Assessment Consortium (SBAC) will include performance tasks in the national assessments that will be implemented in Oregon during the spring of 2015. The SBAC performance tasks will assess students on mathematics and English language arts/literacy skills from the Common Core State Standards. The switch from multiple-choice tests to an assessment system that focuses on students' ability to apply knowledge of multiple standards while solving problems will be a major shift for both students and educators. Many CTE instructors need support to prepare for this new assessment, so this CTE Professional Development project aimed to make commonalities between this work and the preparation for the SBAC performance assessments more transparent.

For more information about SBAC performance tasks and assessments, please visit:

http://www.smarterbalanced.org/smarter-balanced-assessments/

Phase 1: Professional Development

Workshop Overview

From January to February 2013, EPIC worked in conjunction with ODE and CCWD staff to plan the first professional development workshop. The objectives for this first training were to:

- Develop a shared understanding of college and career readiness
- Develop a deeper understanding of how to use and create formative performance assessments
- Prepare to integrate the Common Core State Standards into the classroom
- Strengthen secondary/postsecondary partnerships

The first workshop was held in February 2013 at Lane Community College in Eugene, Oregon. The two-day workshop was designed to be an interactive session, mixing direct delivery of content with hands-on, small group interactive activities using resources and exemplars to understand, develop, and implement high-quality performance assessment tasks aligned to the CCSS. Participants spent much of the two days working collaboratively with vertical teams of inter-disciplinary faculty by geographic regions. The annotated agenda from this two-day workshop is included in Appendix A in order to assist in the replication of this project.

The first day emphasized building a deep understanding of the CCSS, performance assessment, and the role performance assessment and the CCSS play in improving college and career readiness. During the second day, facilitators gave the participating instructors the resources to create their own performance tasks. The workshop employed a task shell creating a common format to write the tasks. This format was dictated by a set of detailed Writer's Guidelines (see Appendix B) and a performance task template, which allowed participants to better understand the criteria used to evaluate high-quality tasks. In addition, using a common format results in a bank of tasks that have a similar structure, level of detail, and formatting increasing the ease of use. Facilitators also emphasized the concepts of incorporating rigor (cognitive demand) into the development of performance tasks. Participants were introduced to Norman Webb's Depth of Knowledge (DOK) model and encouraged to consult the verb chart resource while writing their tasks (see Appendix C).

As the workshop concluded, participants used a professional development website, edWeb.net, to upload their ideas for performance assessments. This shared platform allowed for easy interaction between the workshop facilitators and the instructors and served as a place to

house the tasks while under development. Instructors then had ten weeks to continue to develop and refine their performance tasks and to implement them in the classroom.

Workshop Participants

In total, 37 instructors participated in the two-day event. Table 1 summarizes the number of participants by type.

The workshop participants overwhelmingly represented high schools. Ideally, in the future, the composition of the workshop participants would be more balanced between secondary and postsecondary faculty members. This would directly improve the desired objective of strengthening secondary/postsecondary partnerships. Collaborative vertical partnerships have multiple advantages, including: deepening the understanding of the Common Core State Standards and the Smarter Balanced Assessments across K-12 and higher education systems; facilitating local partnerships to improve college and career readiness; increasing the transparency and alignment of expectations and content coverage between high school and colleges; and building a vertically aligned P-16 system.

Workshop Outcomes

At the end of the two-day workshop, EPIC collected feedback from the participants. Overall, the results of the first meeting evaluation indicate that the workshop successfully addressed all four meeting objectives identified during the planning phase. Participants reported that they learned more about performance assessment than any other topic at the workshop, and they left feeling prepared to write a performance task. The evaluation also provided valuable feedback for refinement for future iterations of the workshop. As a result of the feedback, EPIC modified the agenda and materials of the professional development session including reducing some of the introductory information, providing more examples of performance task exemplars, and streamlining the task template. For a summary of the evaluation results, please see Appendix D.

Table 1. Workshop Participants by Type*

	CTE	English/ Literacy	Math	Other	Total
Secondary Instructors	15	6	5	5	**31**
Postsecondary Instructors	1	1	3	0	**5**
School District Representative	0	1	0	0	**1**
Total	**16**	**8**	**8**	**5**	**37**

** Participants were categorized by their primary area of instruction. Seven participants indicated that they taught multiple subjects.*

Phase 2: Task Implementation & Revision

The goal of the second phase of the project was to have instructors write a complete performance task, implement that task in their classroom, and reflect on the learning process that they and their students experienced.

Performance Task Implementation

EPIC used an online survey to gather information from participants about their reactions to the implementation of their performance task with students. Overall, the implementation survey results indicated instructors had positive experiences both writing and implementing their task (see Appendix D). Instructors reported that the writing process helped them better understand how to frame a performance task, how to integrate a real life application into their task, and that working collaboratively in the workshops was helpful. Ninety-one percent of instructors reported that their students' also had positive experiences with the task. Instructors reported that students enjoyed the creativity allowed by the task, that they enjoyed and were motivated by the real world application of the task, and that they were more actively engaged during the task. The survey indicated instructors learned a great deal about their students' abilities during the task implementation. Several participants credited the task for illuminating what their students did and did not know. Instructors then used this information to guide additional instruction.

Performance Task Review and Feedback

After implementing their performance task, instructors uploaded their task, task handouts, and student work samples to edWeb.net for EPIC staff to review. Consistent with the research supporting effective performance assessment, EPIC modeled the provision of formative feedback during the process of performance task development. EPIC staff used a Performance Task Review Sheet (see Appendix E) to conduct the reviews. This review sheet establishes criteria for a high quality task, and is consistent with the expectations from the Writer's Guidelines. Reviewers provided detailed written feedback to each instructor on the task's design, authenticity, and instructions. Instructors received this feedback at the follow-up workshop where they could ask questions and were given time to make the recommended revisions. Overall, EPIC reviewers were impressed with the creativity of educators' tasks. Table 2 lists the 24 task titles and the corresponding courses in which the tasks were delivered. Please also see Appendix F for a sample of a completed task.

Follow-up Professional Development Workshop

After writing and implementing the performance tasks, participants reconvened at Lane Community College for a follow-up workshop in May 2013. The agenda for the workshop included the review of student work samples, a discussion of how to evaluate and grade student work, time to share student support strategies, and a research-based presentation on best practices for formative assessment. Instructors were given the majority of the afternoon to review and discuss the feedback EPIC provided on participants' performance tasks and to make changes to their task. See Appendix G for the agenda used by facilitators during the May workshop.

At the end of the workshop, instructors completed an online meeting evaluation that solicited feedback on a wide range of topics that extended beyond the one-day workshop. The results included suggestions related to the amount of time that they had to work on task writing. Some participants requested additional time to develop

tasks at the beginning of the process. For future iterations of this workshop, it is recommended to schedule task writing around school breaks (such as before the start of school, or winter or spring breaks). This allows more time for task writing, while still giving instructors time to pilot the task. Also, the more lead-time participants receive for deadlines, the more time they have to plan ahead to accommodate this work.

In addition to suggestions for improvement, workshop participants gave input on the overall project from beginning to end. They responded in near unanimity that they would use their performance task again. As a result of their participation in the workshop, instructors reported they were more aware of how they could add to or change their curriculum in order to incorporate performance assessment. Specifically, several participants tied this experience to an increased desire to address the CCSS in the CTE classroom. Because of the implementation of a performance assessment, many instructors found they had a much deeper understanding of their students' learning. Instructors were able to pinpoint several areas in which their students need to improve: basic research skills (such as citing sources), higher-level thinking skills, and writing skills. One instructor summed up the professional development by writing, "This experience has demystified performance assessments. I will be doing more of these in the coming years." For a summary of the evaluation results, see Appendix D.

Table 2. Performance Task Titles and Applicable Courses

Content Area	Applicable Course
Electric Go-Karts and Tires: Measuring Rolling Resistance	Applied Physics, Engineering
Singers or Athletes: Writing a Biography	Business
Champagne and Steaks, or Soda and Hot Dogs? A Personal Financial Plan for Your Future	Business
The Perfect Fit: Creating a T-shirt Design	Business, Graphic Design
No Stove Required: Creating Heat with Chemical Reactions	Engineering, Business
Cool Jobs: Job Fair Presentation	Careers
What Do You Want to Do in Life? Career Research Project	Careers
How Truss Design Activity	Construction Technology
Picture This: Designing Wooden Frames for Senior Photos	Construction Technology
Manufacturing Chocolate Bars: Mass vs. Volume	Culinary Arts
Restaurant by Me: A Comprehensive Luncheon Project	Culinary Arts
Is this Fiction for Real? Researching Social Issues in Literature	English/Language Arts
Oh Well: Choosing a Location to Drill a Water Well	Engineering
Pile of Sand Calculator	Engineering
Oops! Investigating Medical Mistakes	Health Occupations
Sexually Transmitted Infections in Your Town: Creating an Informational Brochure	Health Occupations
Put on Your Lab Coats: Becoming a Science Magazine Writer	Journalism
Put Yourself Out There! Writing for the Public	Journalism
Stepping Stones to Success: Using Geometric Methods to Solve Design Problems	Manufacturing Technology
That's Cheesy! Building a Better Box	Manufacturing
Diagnosis: Disorder	Marketing
A Student's Life: Using Population Sampling and Proportions to Make Predictions	Mathematics
It's Not My Fault! Using Math Reasoning and Argumentative Writing to Make Your Case	Mathematics: Algebra 2
Boats 'R Us: 3-D Modeling	Modeling, STEM

Phase 3: Performance Task Analysis

The third and final stage of the project involved creating a protocol to analyze performance tasks for commonalities in problem solving skills and challenge level (as measured by depth of knowledge) and then conducting an analysis of the performance tasks submitted by participating teachers. Staff members from EPIC and ODE met to collaboratively develop the protocol to conduct the task review. Eight staff members from EPIC and ODE comprised the task review team and the task analysis process took place during the summer months of 2013.

Performance Task Analysis Protocol

EPIC and ODE developed a protocol to analyze the performance tasks based on two components: 1) Dr. David T. Conley's Key Cognitive Strategies (KCS) model[1] and 2) Norman Webb's Depth of Knowledge (DOK) model[2]. These two frameworks allowed the review team to assess problem-solving skills required in the task as well as the cognitive demand of the tasks.

The KCS are intentional behaviors that allow students to learn, understand, retain, use, and apply

Table 3. Key Cognitive Strategies

Aspect	Component	Successful college students and employees do the following:
Problem Formulation	Hypothesize	Construct thoughtful hypotheses that contain a cause-and-effect or thesis statement, are sufficient to formulate a potential solution, make sense, and are complete.
	Strategize	Utilize strategies that are appropriate to the subject area and will likely be effective for solving the problem.
Research	Identify	Utilize search methods geared to the problem that identify sources related to the problem that are sufficient to address the hypothesis or thesis.
	Collect	Collect sources systematically and ensure that the sources collected are sufficient to address the hypothesis or thesis.
Interpretation	Analyze	Identify and utilize analytic methods that are appropriate to the problem, are sufficiently systematic to reveal patterns in the data or information, and generally help support or call into question the hypothesis or thesis.
	Evaluate	Select findings that are of value to completing the task, are prioritized in a way that is useful to addressing the hypothesis or thesis, and are sufficient to help support or call into question the hypothesis or thesis.
Communication	Organize	Produce final work products that use a logically consistent organizational structure and formats and conventions that are appropriate to the subject area.
	Construct	Produce work drafts that are of increasing quality, incorporate feedback, and incorporate results from Problem Formulation, Research, and Interpretation.
Precision/ Accuracy	Monitor	Generate final work products that are precise and follow the subject area's rules and conventions, and document references properly.
	Confirm	Confirm technical and grammatical accuracy and consistency with task requirements and directions.

1 Conley, D. T. (2013). Getting ready for college, careers, and the Common Core: What every educator needs to know. Eugene, OR: Jossey-Bass.

2 Webb, N. L. (1997). Criteria for alignment of expectations and assessments in mathematics and science education. Council of Chief State School Officers and National Institute for Science Education Research Monograph No. 6. Madison: University of Wisconsin, Wisconsin Center for Education Research

content from various disciplines. They include five key components: problem formulation, research, interpretation, communication, and precision and accuracy. See Table 3 for a detailed description of these five cognitive strategies. To evaluate tasks for their cognitive demand, the team used the following abbreviated definitions of the four DOK levels (see Figure 1 for more detailed descriptions of the levels):

1. **Recall** – Recall of fact, information, or procedure
2. **Skill/Concept** – Use information or conceptual knowledge in two more steps
3. **Strategic Thinking** – Requires reasoning, developing plan or a sequence steps, some complexity, more than one possible answer
4. **Extended Thinking** – Requires an investigation, time to think and process multiple conditions of problem while applying higher-order thinking.

After developing this task analysis framework, the review team participated in a joint calibration exercise. Each person individually scored a task, rating its DOK level in each of the five KCS areas. The team then shared their ratings and discussed their rationale with the larger group in an endeavor to align their perceptions and come to consensus on the rating of the task.

Following the planning that established the task analysis protocol, individ- team members received assignments for a number of task reviews. Each reviewer was required to rate the DOK level of the task in each of the five KCS areas and then provide a narrative rationale as well as provide recommendations for how to strengthen the task and increase the DOK level if needed. Each task was reviewed by a minimum of two people to check for consistency in rating. If discrepancies were found, reviewers discussed their ratings until reaching consensus.

Figure 1: Webb's Depth of Knowledge (DOK)

LEVEL 1: RECALL

- **I**nvolves basic tasks that require students to recall or reproduce knowledge and/or skills.
- **C**ontent involves working with facts, terms and/or properties of objects and use of simple procedures and/or formulas.
- **L**ittle transformation or extended processing of the target knowledge required.
- **K**ey words: list, identify and define.

LEVEL 2: SKILLS/CONCEPT

- **I**ncludes engagement of some mental processing beyond recalling or reproducing a response.
- **C**ontent involves working with a set of principles, categories, and protocols.
- **S**tudents are asked to transform/process target knowledge before responding (Classify, estimate, infer, and organize.
- "Describe or explain" requires going beyond explanation, Students use context different from which it was learned

LEVEL 3: STRATEGIC THINKING

- **D**emand a short-term use of higher order thinking processes to solve real-world problems with predictable outcomes.
- **T**asks require balance of knowledge and skill to execute processes and reach a solution.
- **K**ey processes include: Analysis, explanation with supporting evidence, generalization, and creation.

LEVEL 4: EXTENDED THINKING

- **S**tandards require extended use of higher order thinking processes.
- **S**tudents employ and sustain strategic thinking processes over a longer period of time to solve a problem.
- **S**tudents conduct investigations with unpredictable outcomes.
- **K**ey processes include: Conduct, manage, reflect, and synthesize.

Performance Task Analysis

Table 4 details the results of the analysis for each of the 24 tasks completed for this project. The median DOK column in Table 4 reports a composite DOK score for the task. Tasks receiving a median DOK level of 1-Recall are shaded the lightest green, those receiving a median DOK level of 2-Skill/Concept are shaded in medium green, and those receiving a median DOK level of 3-Strategic Thinking are shaded in the darkest green. Out of the 24 total tasks, 17% received a median DOK of 1-Recall, 58% received a median DOK of 2-Skill/Concept, and 25% received a median DOK of 3-Strategic Thinking, indicating that the majority of tasks fall at a level 2. When

Table 4. Performance Task DOK Analysis

Applicable Course	Subject Area	Key Cognitive Strategies					Mean DOK	Median DOK
		PF	R	I	C	P&A		
Health Occupations	ELA	1	2	1	2	1	1.40	1.00
Business	ELA	1	2	2	1	1	1.40	1.00
Culinary Arts	Math	2	1	1	1	2	1.40	1.00
ELA	ELA	1	2	3	1	1	1.60	1.00
Careers	ELA	1	2	2	2	1	1.60	2.00
Math	Math	1	1	2	2	2	1.60	2.00
Applied Physics, Engineering	Math	1	2	2	2	1	1.60	2.00
Engineering	Math	1	1	2	2	2	1.60	2.00
Manufacturing Technology	Math	2	1	2	1	2	1.60	2.00
Business, Art	ELA	2	2	1	2	2	1.80	2.00
Careers	ELA	1	2	2	2	2	1.80	2.00
Construction Technology	Math	2	1	2	2	2	1.80	2.00
Algebra 2	Math	2	1	2	2	2	1.80	2.00
Marketing	ELA	1	2	3	2	2	2.00	2.00
Business, Engineering	Science	2	2	2	2	2	2.00	2.00
Health Occupations	ELA	2	2	3	2	2	2.20	2.00
Culinary Arts	ELA/ Math	2	2	3	2	2	2.20	2.00
Journalism	Spanish	2	2	2	3	3	2.40	2.00
Journalism	ELA	2	3	3	3	2	2.60	3.00
Business	Math	2	3	3	3	2	2.60	3.00
Construction Technology	Math	2	2	3	3	3	2.60	3.00
Cabinet Manufacturing	Math	3	2	3	2	3	2.60	3.00
STEM	Science	3	3	3	3	3	3.00	3.00
Engineering	Science	3	3	4	3	3	3.20	3.00
Average DOK by aspect		1.75	1.92	2.33	2.08	2.00		

Table 5. Mean DOK by Subject Area

Subject Area	Mean DOK Score on All Tasks
English/Language Arts	1.9
Mathematics	1.9
Science	2.7

Table 6. Mean DOK by Subject Area and KCS Component

	Problem Formulation	Research	Interpretation	Communication	Precision and Accuracy
English/Language Arts	1.4	2.1	**2.3**	1.9	1.6
Mathematics	1.8	1.5	**2.3**	2.0	2.1
Science	2.7	2.7	**3.0**	2.7	2.7

taking into account the subject area of the task, the English Language Arts and Mathematics tasks received similar DOK ratings, while the Science tasks reflected a higher mean DOK rating (see Table 5).

The mean DOK level for each of the five Key Cognitive Strategies is listed at the bottom of Table 4. The highest overall score was for Interpretation, while the lowest cognitive demand was reported on Problem Formulation. When we compare the DOK levels for each subject area across the KCS aspects (see Table 6), the high challenge level in Interpretation holds for each subject area. Slight variations from the cumulative averages show that Math tasks were rated lower in Research while Problem Formulation had the lowest overall level in English Language Arts.

Analyzing the DOK levels by the types of KCS enables a deeper understanding of the rigor of the tasks and the alignment to the CCSS beyond a content match. In a previous study EPIC conducted analyzing the relationship of the CCSS to five sets of comparison standards, EPIC determined the DOK levels of the CCSS[3] . The results of this analysis can be found in Figure 2 and Figure 3. In summary, the CCSS have a distribution of cognitive demand levels across the four DOK categories. In ELA, the majority of standards are at DOK level 3 (55 percent). For math, the standards had lower overall DOK levels, with a majority of the standards at level 2 (54 percent). For the tasks to be aligned to the CCSS, this requires not only content alignment, but also comparable cognitive challenge levels (i.e. rigor). Therefore, to be consistent with the demands of the CCSS, the DOK levels for the task requiring the demonstration of ELA standards should be in the level 3-Strategic Thinking range. Math tasks, in order to agree with the level of the CCSS standards, should be written for level 2-Skill/Concept.

3 Conley, D., Drummond, K., de Gonzalez, A., Seburn, M., Stout, O. & Rooseboom, J. (2011). Lining Up: The Relationship between the Common Core State Standards and Five Sets of Comparison Standards. Eugene, OR: Educational Policy Improvement Center.

Figure 2: DOK Level of Common Core ELA Standards

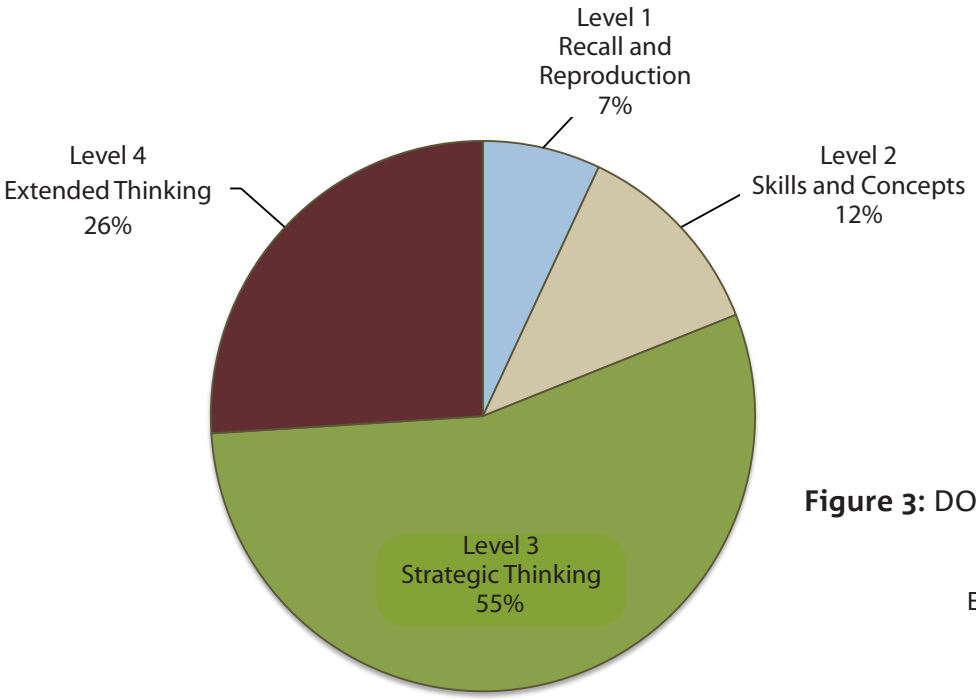
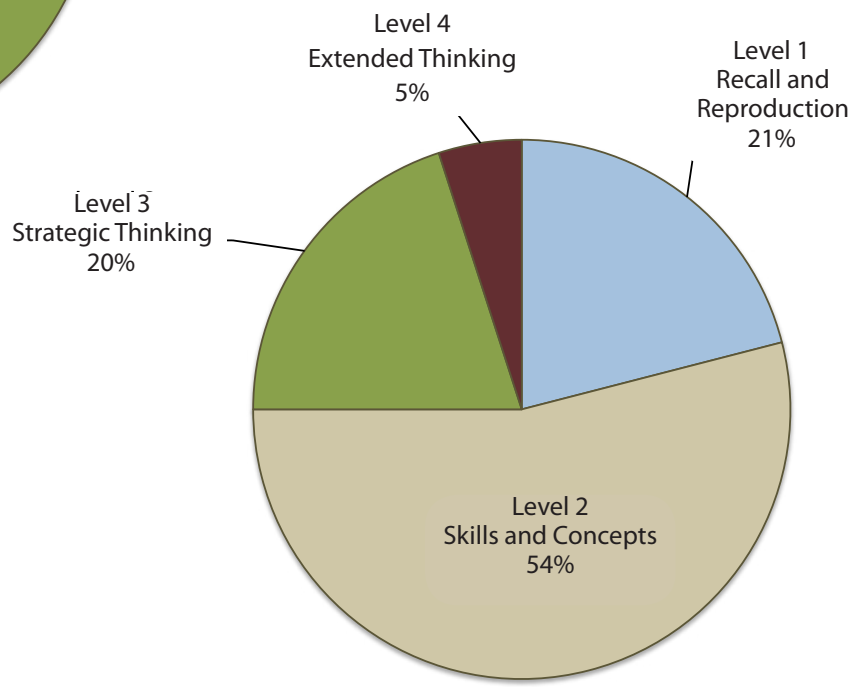


Figure 3: DOK Level of Common Core Math Standards

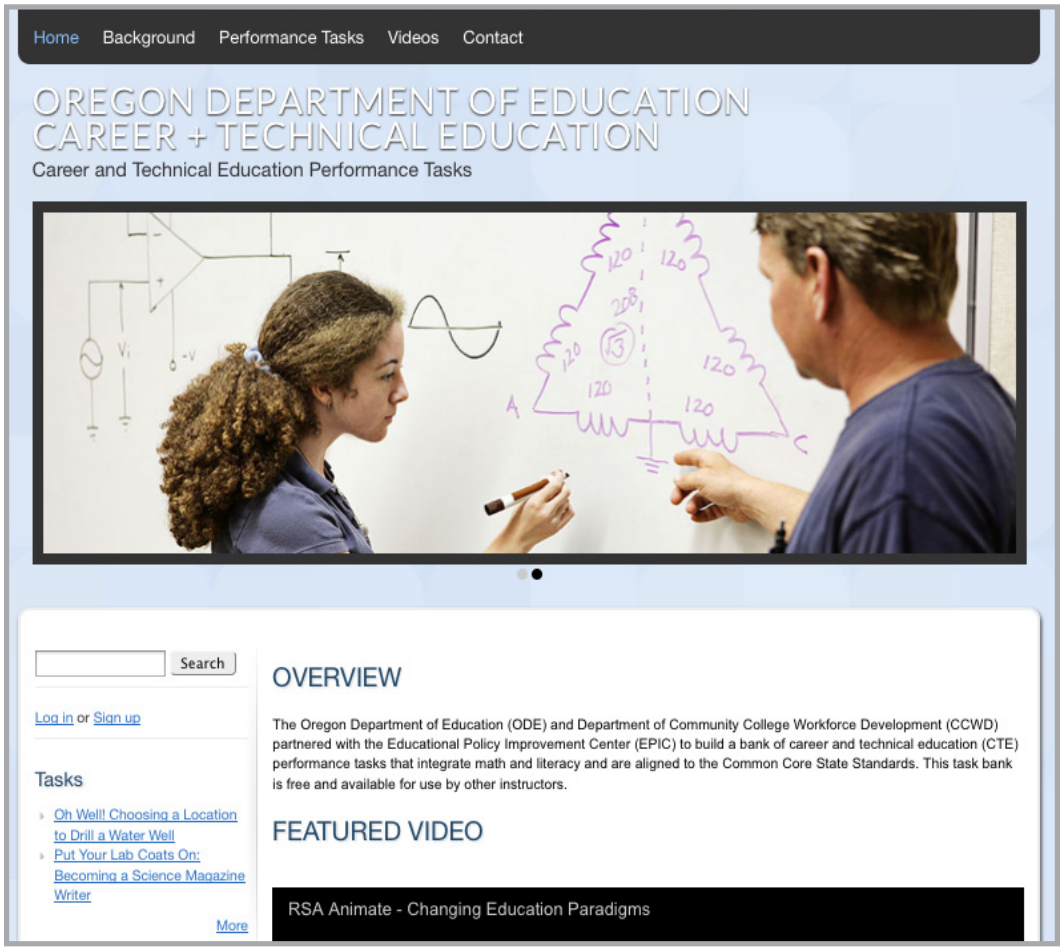


The recommendation for future task revision and development would be to further train participating teachers in reaching these desired DOK levels. For dissemination of exit-level high school tasks aligned to the CCSS, all ELA tasks rated under DOK level 3, and all math tasks under a DOK level 2 should be revised to increase the rigor to be consistent with the CCSS. In addition, ELA tasks should be strengthened to encourage more problem formulation (i.e. allow the students to come up with the research questions and hypothesis instead of being given the problem). Math tasks should incorporate more research (such as data collection). Having these baseline tasks analyzed as part of this project provides a valuable professional development activity. Future users of the tasks will have rated and annotated examples demonstrating the various DOK levels to help calibrate their expectations for the appropriate level of rigor desired for the tasks.

Online Dissemination Platform

The tasks developed for this project are intended to be shared with and used by a wide audience of educators. In an effort to aid this effort, EPIC designed a preliminary web site to host the CTE performance tasks that instructors have developed to date (see Figure 4). The site is hosted at http://odectetasks.drupalgardens.com/ and will be maintained by ODE staff on an ongoing basis. Tasks will be featured on the site in a blog-style listing of tasks and will allow for users to make notes and comments. Tasks can be tagged for a variety of keywords (including subject area, Common Core State Standards, and SBAC claims), which will help users as they search for tasks that are relevant to their classes. Another page on the site offers background information about the CTE Professional Development project. This page could also include links to articles and other types of resources and information about performance assessment in general. As teachers visit the site and become registered users, they will have the opportunity to post comments on specific tasks. Thus, there is the possibility that teachers will engage in a discussion of tasks. This type of sharing and interaction is the kind of professional learning that EPIC and ODE encourage.

Figure 4: CTE Task Dissemination Website



Recommendations for Future Work

Overall, this project demonstrated both the benefits and challenges related to changing instructional practice. Performance assessment is a powerful tool for deeper learning, for both the teachers and students. During the age of high-stakes standardized testing, the use of performance assessment in the classroom has decreased. Two factors are contributing to the resurgence of performance assessment. First, with the increased focus on creating college and career ready students, this ambitious goal requires students to obtain knowledge and skills beyond what can be measured by standardized tests. Performance assessment challenges students to demonstrate these deeper learning skills and enables teachers to measure them. Secondly, the new SBAC assessments include performance tasks. As demonstrated by the results of this project, teachers need professional development and support to understand how to create and implement high quality and rigorous performance assessment aligned to the CCSS.

One of the goals of this project was to create a replicable professional development module. The deliverables created as part of this project include agendas, presentation materials, sample activities, exemplar tasks, student work samples, and rubrics that can be accessed by interested users. All of the materials developed were revised based on the feedback and lessons learned from this pilot, resulting in a high quality and teacher-tested professional development module. The challenges now relate to dissemination and scale-up. EPIC has already had the opportunity to replicate this model with the Clackamas Education Service District during the fall of 2013. Ongoing efforts are needed to publicize the professional development module, to expand the task bank by involving teachers in similar professional development opportunities, and to replicate this interactive training in other contexts.

Another important need identified through this project relates to the additional support teachers need in providing the instruction necessary for students to be successful with performance tasks. Teachers need more opportunities to learn how to analyze student work, to provide constructive feedback to students, and to develop effective instructional interventions for struggling students. Additional training, and examples of what this looks like in terms of classroom practice, is recommended as an extension to the performance assessment professional development module. Another recommended area is in the development of professional development videos used to accompany the performance tasks. These videos would capture the techniques of expert instruction and would allow others who are using a task to see how the task is used in the classroom. The videos would supplement the written task and be hosted on the task bank web site.

In addition, EPIC recommends further vetting of the performance tasks before posting them to the aforementioned website. The tasks are in draft form and would benefit from incorporating the reviewers' suggestions to increase the DOK level of the tasks, as well as a general copy editing to revise tasks for consistency in language, level of detail, and formatting. Alternatively, it would be possible to post the tasks in their current format while including a disclaimer that the tasks have not been completely vetted or piloted. Finally, in an effort to build out the task bank and provide a wider range of tasks in various CTE fields, another recommendation is to replicate this professional development project and collaborate with other school districts, institutions of higher education, and organizations in Oregon to develop additional performance tasks.

Appendix A: Professional Development Workshop Agenda

Date:

Time:

Location:

AGENDA: DAY ONE

8:30 – 9:00	Registration/Check-in
9:00 – 9:15	Welcome and Overview *Welcome and provide big picture purpose and charge of the workshop.*
9:15 –9:30	Introduction Activity *"Describe the most successful project you have done with your students. Find someone in the room you do not know, introduce yourself and spend 5 minutes discussing."*
9:30 – 10:30	Understanding the Smarter Balanced Assessments *Presenters will share a brief overview of CCSS and SBAC. Interactive small group activity will explore literacy and math claims to understand what will be measured by the tasks they will develop. Small groups will then explore an SBAC grade 11 task.*
10:30 – 10:45	Break
10:45 – 12:00	Exploring Performance Assessment *Presenters share an overview of performance assessment, including activity of examining additional examples of performance assessment (teach them how to use edWeb.net and look at exemplar tasks) and the SBAC criteria for good tasks. Do the sample tasks meet the SBAC criteria?*
12:00 – 12:45	Lunch
12:45 – 1:15	Understanding Task Construction *Train participants on how to construct a task, including reviewing template and writer's guidelines.*
1:15-2:30	Group Work *Vertical teams brainstorm tasks ideas.*
2:30-2:45	Break
2:45-3:00	Creating High-Quality Performance Tasks *Facilitators guide interactive session on how to create high-quality performance tasks including understanding cognitive demand and rigor, and conduct a small group activity to revise a task to improve challenge level.*
3:00-3:45	Group Work *Begin drafting tasks.*
3:45-4:00	Adjourn *Homework: Come back with an idea to use to develop a task during Day 2.*

ODE/EPIC
CTE Task Development Meeting

AGENDA: DAY TWO

Date:

Time:

Location:

9:00 – 9:15	Overview of the day *Presenter reviews objectives and schedule for the day.*
9:15 – 9:45	Discuss Task Topics *Small group discussion of proposed topics for task development. Each member presents and receives feedback on ideas.*
9:45 – 10:00	Understanding Evaluation Criteria *Presenters share task evaluation criteria to better understand expectations.*
10:00 – 12:00	Refining and Developing Tasks *Vertical team working session with facilitators circulating for support. Reach agreement in groups for the topics they will address in each task and continue drafting task.*
12:00 – 12:45	Lunch
12:45 – 1:15	Task Writing Challenges Q&A *Participants can ask questions and share thoughts. Presenter can discuss predictable challenges for writing tasks:* • *What would responses look like (i.e. expectations for student work)?* • *Addressing problem solving* • *Selecting novel, non-routine, and real world applications of content and integrating content into real-world problems* • *Increasing cognitive demand and rigor* • *Appropriate scaffolding* • *Share lessons learned from previous task writers*
1:15 – 1:45	Wrapping Up • Upload Task Drafts *(participants upload drafts to edWeb.net)* • Evaluation Survey *(Presenters provides link to online meeting evaluation survey)*
1:45-2:00	Next Steps and Adjourn *Reference any upcoming due dates/meetings and closing thoughts.*

Appendix B: CTE Task Writer's Guidelines

Author: *First and Last Name*

Institution: *Where you are currently teaching: Institution name, city, state*

Task Title: *Create a student-friendly task title, maximum of 60 characters. Task titles are composed of two parts: 1) the first half should be creative and designed to generate interest among students; and 2) the second half gives the teacher an indication of the instructional content of the lesson. Example: Next Stop, Space: Designing a Space Elevator.*

Task Overview: *Summarize the task in a short paragraph of three to four sentences. Address the summary to instructors and be sure to explain what the final product(s) of the task will be – a research paper, a multimedia presentation, a letter, etc. Be sure to consider the following questions:*

- *How can you reflect a real-world task and/or scenario-based problem?*
- *Does the task require production of more extended responses (e.g., oral presentations, exhibitions, product development), in addition to more extended written responses, which might be revised and edited?*

Applicable CTE Course(s): *List the course(s) for which this task is designed. Include all high school courses and entry-level college courses to which this task pertains. Examples: High School Business, Entry-level Nursing.*

Primary Claim (including subject area and claim number): *From the English or Mathematics SBAC claims, choose one main claim that this performance task assesses.*

STUDENT DIRECTIONS

Note: Address the student directly, in the 2nd person.

A. Student Prompt

Lay out the context in which this task takes place. For example: Imagine that you have decided to enter a design competition intended to gather suggestions and ideas for building a space elevator on Earth. You will need to develop a general understanding of the forces involved and the materials needed for the elevator. Then, you should explore a smaller section of the problem and develop a recommendation for the project to submit to the competition. © *EPIC*

Be sure to consider the following questions:

- *Does the task allow for multiple points of view & interpretations?*
- *Does the task represent content that is relevant & meaningful to students?*
- *Does the task allow for demonstration of important knowledge & skills, including those that address 21st century skills such as critically analyzing, synthesizing media texts?*

B. Handouts/Resources

Provide any specialized additional materials that students will need for the task. (Generally, the Student Prompt should be sufficient for most tasks and students should be able to generate their own data, research, and organizational materials.)

TEACHER PROCEDURES

Note: Use the imperative or “command” voice to address the teacher directly. For example, write: "Prepare one packet per student," instead of writing "The teacher should prepare one packet per student" or writing “The teacher will prepare one packet per student.”

C. Pre-work/Prior Knowledge

List any skills and/or curriculum content that students need to know and be able to do prior to being assigned this task. Also, include any tools and technologies students will be expected to use.

D. Procedures During Administration

Provide step-by-step procedures on how the task should be implemented including in-class and out-of-class activities. Divide procedures into DAY 1, DAY 2, etc. and be sure to include explicit suggestions for how to present the task and how to activate students’ prior learning. Consider including specific student prompts and introductory activities.

Consider the following questions: How prescriptive is the task versus requiring student-initiated planning and organization? How much of the assessment would be completed in the classroom or as homework?

E. College and Career Connections

Include a short description that connects the concepts and skills that students will practice in the task to college and career readiness. This is important to make these connections explicit to enable students to see the relevance and meaning.

TASK DETAILS

F. Subject Area(s)

List the Common Core subject area(s) that are addressed in this task (English Language Arts and/or Mathematics).

G. Primary Common Core Content Domain

List the main focus of this lesson. Example: Algebra, Writing.

H. Secondary Common Core Content Domain(s)

Include any related domains (e.g. Reading Informational Texts, Geometry) that are strongly addressed in the task. Note: These secondary domains should be more than tangentially related to the core purpose of the task.

I. Secondary Claim(s)

List any additional claims that relate to this task. These claims are addressed in the task, but not the central focus as represented by the primary claim. Please include the subject area(s) and claim number(s).

J. Standards

List applicable standards from the Common Core State Standard web site:

- *English/Language Arts*: http://www.corestandards.org/ELA-Literacy
- *Mathematics:* http://www.corestandards.org/Math

Be sure to consider the following question: How can you integrate knowledge and skills across multiple standards or strands?

K. Stimulus/Source

Include any documents, texts, and/or websites that students will need to complete this task.

L. Teacher Preparation/Resource Requirements

State anything the teacher must do before implementing the task (gathering materials, setting up workstations, grouping students, etc.). Also include the resources students will need to complete this task (in addition to the digital resources listed above) For example: course-specific items, graphing calculators, architectural design software, etc.

Be sure to consider the following question: Is the task feasible for the typical classroom environment?

M. Scaffolding Techniques

Include strategies to help students at different levels successfully complete the task. What accommodations are permissible/necessary for students who have accessibility issues? What recommendations do you have for students who won't be able to complete the task independently?

N. Time Requirements

Give an estimate of time required to complete the task. How many days will teachers and students need for this task? Specify the length of classes and include both in-class and out-of-class time.

O. Vocabulary

Provide an alphabetized list of words from the Student Directions that students need to understand the task. Does this list help build the vocabulary necessary for success in this career and content area?

P. Curricular Extensions

After the task has been administered, how could the teacher continue to expand upon the themes and deepen understanding of the content addressed by the task?

Q. Solutions and/or Strategies

Provide one or more strategies students may use to successfully solve the task. When a problem is open-ended, suggest multiple strategies or answers. Describe the level of performance teachers could expect from students at the college and career level. What should the final product look like? How will the teacher know if students have succeeded?

Be sure to consider the following question: How can you measure capacities such as depth of understanding, research skills and/or complex analysis with relevant evidence?

R. Sample Top-Score Responses

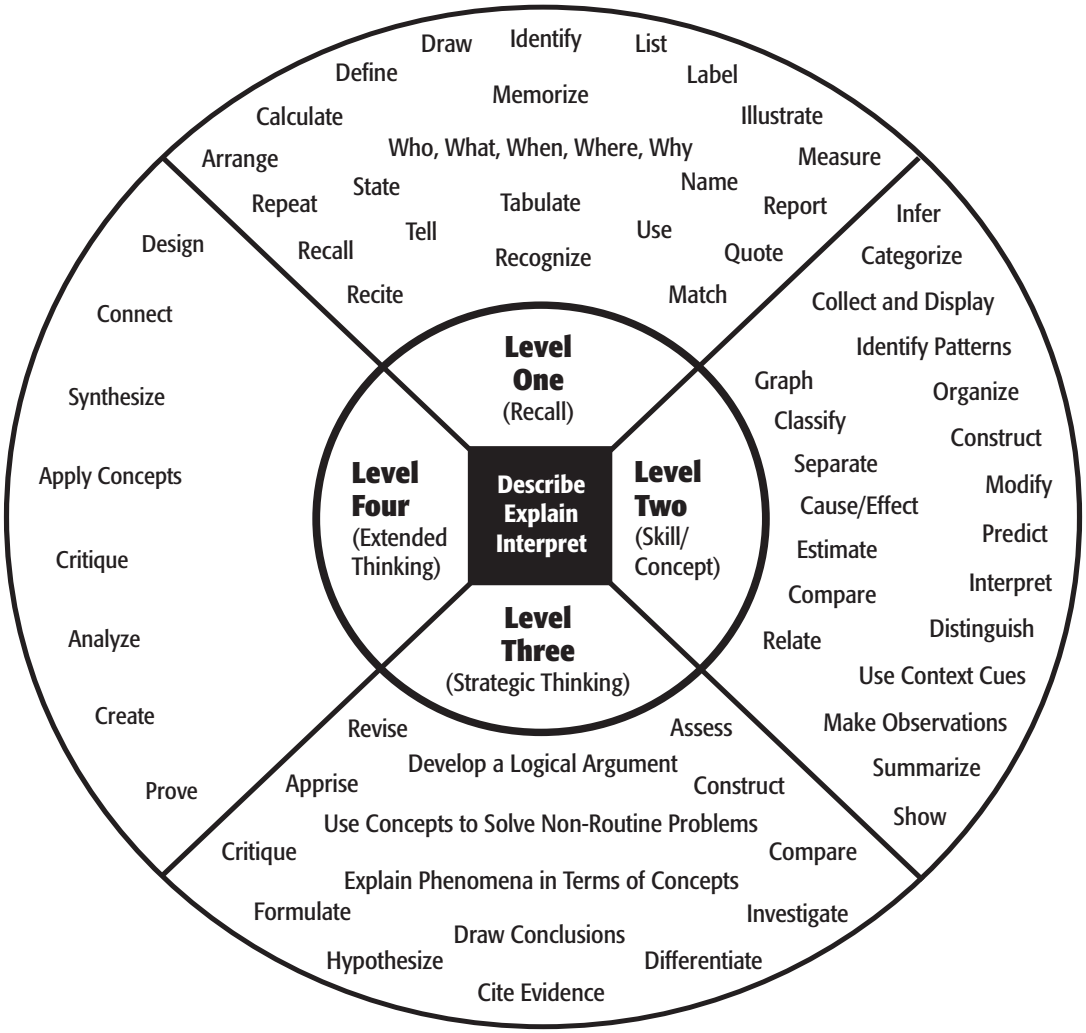
Collect exemplars during the pilot administration of the task.

S. Notes (optional)

Include any additional comments to assist potential users in their implementation of the task if needed. Examples might include a description of the course context and/or the sequence of the task in the course curriculum. Any brief factors that teachers should know before implementing this task would be appropriate, such as: "Multi-part task" or "Multiple sessions."

Appendix C: Depth of Knowledge (DOK) Chart

Depth of Knowledge (DOK) Levels



Level One Activities	Level Two Activities	Level Three Activities	Level Four Activities
Recall elements and details of story structure, such as sequence of events, character, plot and setting.	Identify and summarize the major events in a narrative.	Support ideas with details and examples.	Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/ solutions.
Conduct basic mathematical calculations.	Use context cues to identify the meaning of unfamiliar words.	Use voice appropriate to the purpose and audience.	Apply mathematical model to illuminate a problem or situation.
Label locations on a map.	Solve routine multiple-step problems.	Identify research questions and design investigations for a scientific problem.	Analyze and synthesize information from multiple sources.
Represent in words or diagrams a scientific concept or relationship.	Describe the cause/effect of a particular event.	Develop a scientific model for a complex situation.	Describe and illustrate how common themes are found across texts from different cultures.
Perform routine procedures like measuring length or using punctuation marks correctly.	Identify patterns in events or behavior.	Determine the author's purpose and describe how it affects the interpretation of a reading selection.	Design a mathematical model to inform and solve a practical or abstract situation.
Describe the features of a place or people.	Formulate a routine problem given data and conditions.	Apply a concept in other contexts.	
	Organize, represent and interpret data.		

Webb, Norman L. and others. "Web Alignment Tool" 24 July 2005. Wisconsin Center of Educational Research. University of Wisconsin-Madison. 2 Feb. 2006. <http://www.wcer.wisc.edu/WAT/index.aspx>.

Appendix D: Evaluation Results Summary

February Professional Development Workshop Evaluation Summary

What type of institution do you represent?

a.	High School	Total: 27
b.	Community College:	Total: 4
c.	4-year Postsecondary Institution	Total: 0
d.	School District	Total: 1
e.	Other (please specify)	Total: 0

Please rate your understanding of the following concepts as a result of this workshop. (5 being I understand it very well and 1 being I do not understand it at all)

1.	4 Keys to College and Career Readiness	Mean: 3.91
2.	Common Core State Standards	Mean: 3.66
3.	Smarter Balanced Performance Assessment Tasks	Mean: 3.75
4.	Performance Assessment	Mean: 3.94

If you rated any of the above less than a 2, please explain:

- "The lower numbers are simply because I was already aware of these things."
- "I can't remember what you mean by the 4 Keys to College and Career."

Please rate the usefulness of the following information/activities you engaged in. (5 being very useful and 1 being not useful at all.)

1.	SBAC Analysis Activity	Mean: 3.72
2.	Cognitive Demand/Rigor Exercise	Mean: 3.66
3.	Group Task Brainstorming and Writing	Mean: 4.38

How prepared are you to write a performance task? (5 being very prepared and 1 being not prepared at all)

Mean: 4.03
Max: 5
Min: 3

What are your top two takeaways from today's workshop? (Most common responses/themes: 1 is most common response)

1. The value of networking and brainstorming with others (including with others in different disciplines). (n=10)
2. How to create a performance task and the importance of using performance assessment in the classroom to engage students in learning and engage higher-order thinking. (n=8)
3. The importance of creating tasks that use scenario-based approaches and relevant real world context. (n=7)
4. Understanding and becoming familiar with the SBAC assessments and claims. (n=5)

5. Greater insight into Common Core State Standards and the importance of implementing the standards. (n=5)
6. Hearing from ODE about state testing, 40/40/20 initiative etc. (n=4)

For the May 17 meeting would you prefer to work with your same group? If not, do you have any suggestions for how to structure the work groups?

Same Group: 24 responses
Example response: "I would greatly prefer to work with the same group…I appreciate the hardworking folks I am with, and would like to know in detail how their lessons worked for them."

Different Group: 3 responses
Example response: "I would prefer to work in different groups. In fact, I would benefit from maybe mixing the groups once during the day to have more conversations."

Don't Care: 2 responses
Example response: "I think it would be cool to mix it up a little bit and talk with some different people. Maybe we could meet with our original group for a bit them scramble to new groups?

What additional suggestions or feedback to you have for future workshops? (Common themes and quotes from participants)

Suggestions for altering the format of the day:

- Less of the pedagogical, background introduction and start to the work session sooner.
- Start with inspiring examples, or give groups a challenge or task to the participants to have them work on and discuss.
- More time to write performance tasks in the meeting and work with others.

Other topics/information that would have been helpful to learn about:

- Common Core Standards
- Proficiency based grading
- More examples of effective performance based activities

Positive feedback:

- "…did a great job of giving a good overview of PBA's and their importance, and then having us look at some case studies and apply it immediate. I'm really excited about our project!"
- "I appreciate allowing plenty of time to actually DO the task writing during the workshop, as opposed to sending us home to complete it our own"
- "I liked the spirit of the workshop and got a lot out of it. It makes me feel hopeful that testing won't crush my love of teaching. Thanks for all the hard work."

Implementation Suvey Results Summary

(n=23 instructors)

Question 1: ***Describe your experience writing the performance task.***

Positive	Challenges
▪ Enjoyed the experience (n=2) ▪ Nice to have a structure for writing a task ▪ Helped me to better understand how to frame a performance task ▪ Helped me focus on working towards a real life application ▪ The examples provided were an excellent resource tool to write the task ▪ Liked working in teams	▪ Challenge to integrate the CCSS (n=2) ▪ Process was cumbersome (n=2) ▪ Time consuming (n=2) ▪ Only have 10 weeks to teach entire course, so it was hard to reach the depth ODE was seeking

Question 2: ***Were the Writer's Guidelines useful? (5 being very useful and 1 being not useful at all).***

Mean: 4.01

Suggestions for improvement:

- Provide examples of actual performance task filled out like the template. (n=3)
- Give better definitions and examples of items requested.
- Shorten, too long to be practical or realistic.

Question 3: ***What suggestions do you have that might help other teachers as they develop tasks?***

1. Work collaboratively and partner with others (including colleagues familiar with the Common Core State Standards, instructors outside your discipline area, and instructional coaches). (n=4)
2. Create a real-world, authentic context for your task. (n=3)
3. Dedicate enough time – the process takes time and should not be rushed. (n=3)
4. Be flexible – Teaching the ask is an organic process and may change midstream; be flexible and open to change throughout the process. (n=2)

Question 4: ***Describe your experience in administering the task. (sample responses)***

- 73% of instructors reported an overall positive experience administering the task.
- Only 2 instructors distinctly reported challenges and struggles administering the task.

Successes:

- "The real-world nature of the task kept everyone focused on solving the problem, obtaining accurate data and answering the questions posed."
- "Students were engaged and active learners. Students had 'ah ha' moments in seeing the potential they have to save and invest."

- "I found that the more prepared I was in administering the task, lent itself to my ability to foresee possible student disengagement and reactions…. having all materials and activities planned ahead allowed for me to have confidence in what we were doing as a class and the students trusted the process because of this."

Challenges:

- "As we went through the task prep, it became evident that students needed more support in some areas."
- "Awful– My Personal Finance students attempted the task. They didn't have a lot of 'buy in' and acted like they had no idea how to predict, hypothesize, etc."

Question 5: ***In which class did you pilot the task?***

- CTE: 8 responses
- Math: 6 responses
- English/Language Arts: 4 responses
- Other: 5 responses (including Science, Spanish, and Social Studies).

Question 6: ***Approximately how long did it take students to complete the task?***

- 1-3 hours: 7 responses
- 4-6 hours: 8 responses
- 7-9 hours: 1 response
- 9+ hours: 6 responses

Question 7: ***How many students completed the task?***

For the respondents who gave a numerical answer (n=19), the total number of students participating in performance tasks was 671. The average student group size was thus 35 students per teacher, but responses ranged from 8 to 118 students.

Other respondents (n=4) interpreted the question as asking for a percentage of students who completed the assigned task. Responses ranged from 50% to 100%.

Question 8: ***How did you grade student work from the performance task?***

1. Graded using a rubric/scoring guide: 10 responses*
2. Graded for completion: 7 responses*
3. Graded for accuracy and correctness of content: 6 responses*
4. Graded on understanding and/or communication: 5 responses*
5. Graded on participation: 2 responses*

*Some instructors indicated that they graded on multiple aspects.

Question 9: ***Did the task count as part of the overall course grade?***

Yes: 19
No: 4

Question 10: ***How did you integrate your task into your curriculum?***

1. Integrated the task into an existing unit: 11 responses
2. Used task as a final project/test/assessment of proficiency: 8 responses
3. Used task as an add-on/follow up to existing curriculum: 4 responses

Question 11: ***Did you collaborate with others to write or administer your task?***

Yes: 10
No: 13

If yes, how many others did you collaborate with?

	Inside your school	Outside your school
1-2 others	6 responses	4 responses
3-4 others	3 responses	1 response
5+ others	0 responses	1 response

Question 12: ***Describe your student's experience completing the task.***

- 91% of instructors reported that their students had positive experiences with the task.
- 43% of instructors reported that their students' found the task challenging/frustrating at times.

Positive	Challenges
▪ Enjoyed the creative aspects ▪ Enjoyed researching and reading different cases ▪ Task generated excitement and good discussions ▪ Students seemed more motivated with the real-world application ▪ Students truly had "ah ha" moments ▪ Students were engaged in class during the project ▪ Students got a lot out of learning how to use Excel ▪ Students were highly motivated and looked forward to the task	▪ Students were frustrated they had to do an individual project ▪ Students were nervous about presenting their project ▪ Students didn't want to get out of their comfort zone to interview someone ▪ Students were frustrated by amount of research required ▪ Many students had to re-do several steps because they didn't have an understanding of evaluating research ▪ Some students struggled with the math

Question 13: ***How much support did students need to successfully complete the task? (Most common responses)***

1. Students primarily needed support up front at the beginning of the task (e.g., overview of expectations, introduction of new ideas, refreshers, background information, and instructions on using technology). (n=15)
2. Students needed reinforcement and help support throughout the task. (n=3)
3. Students needed minimal support. (n=3)

Question 14: ***What did you learn about the students' abilities in math, literacy, and/or CTE content as a result of the task? (Common themes)***

Strengths:

1. Realized students' strengths in specific areas. * (n=6)
2. Students understand and are often more engaged in work that has a real life context and/or hands-on work. (n=5)
3. Students enjoy a challenge and will challenges themselves. (n=2)

*Instructors reported students' strengths in a number of areas including writing, editing, connecting ideas between various written works, researching, presenting, and math skills.

Weaknesses:

1. Realized students' deficits in specific areas, and the task illuminated what students did not learn. ** (n=5)
2. Learned that students struggle with critical thinking and high-order thinking skills. (n=5)

**Instructors reported students struggling in a number of areas including reading, persuasive writing skills, making a meaningful PowerPoint, and the use of technology.

Follow-up Professional Development Workshop Evaluation Summary

(n=21 instructors)

***Question 1:* Will you use the performance task with your students the next time you teach the course? Please explain.**

Yes: 20
No: 1*

Comments:

- "I felt that giving an actual real life problem for kids to solve was much more valuable for them than holding a class discussion."
- "Felt it was a good indication of student learning from the chapter we had just covered."

*The instructor who responded "no" does not have a classroom or students at this time.

***Question 2:* How did you revise your task from our first meeting until now? (Most common themes)**

1. Added additional scaffolding and resources for students (n=8)
2. Refined written task and added more details to sections in order to make the task more understandable to all (n=4)
3. Incorporated the feedback and suggestions from EPIC (n=3)

***Question 3:* How has this workshop experience changed your instruction? (Most common themes)**

1. Reminded me to incorporate more real world application into the classroom, and that students find value in the real life context (n=4)
2. Made me more willing to implement more performance-based tasks in the future (n=4)
3. Provided me with ideas about how to assess standards and incorporate the CCSS in my classroom (n=3)
4. Helped me see how I can change some of my current tasks/assessments for the future (n=3)

***Question 4:* What did you learn about your students' college and career readiness during the implementation of the task? (Common themes)**

1. Many students are unprepared. Some students lack the basic skills that are important in college, including taking responsibility, perseverance, and the ability to follow directions. (n=3)
2. Many students struggle with higher-level thinking, problem solving, and open-ended problems. (n=3)
3. Students need to improve their writing skills. (n=2)

Question 5: ***How does the information gained from administering this task compare to your typical assessments? (Common themes)***

1. Much deeper, more detailed information than typical assessments; tasks provide a more holistic view of student performance. (n=7)
2. The task allowed me to see holes in students' knowledge and see what they have really learned, unlike other assessments. (n=3)
3. Fairly similar to my typical assessments (n=3)

Question 6: ***What recommendations do you have to improve this professional development experience?***

Positive:

- "It was great! I appreciate having the time to work on our tasks during the workshop with immediate feedback."
- "I thought that this experience was valuable. I appreciated all the thought put into its organization."

Suggestions for improvement (common themes):

- More examples in the Writer's Guidelines and samples of tasks written in the template format (n=4)
- More work time at the beginning, during the first two days of training (n=3)
- "I think the workshops need to be closer together date-wise, and more often to encourage implementation due to our busy schedules."

Performance Task Review Sheet

Task Title:
Author:
Institution:
Applicable CTE Course(s):
Reviewer:
Date:

Performance Task Components	Complete	Requires Revision	No Evidence	Comments
Task Title and Task Overview *Reflects a real-world scenario and requires students to create extended work products*				
Primary Claim(s) *Lists applicable claims that are the main target of this task*				
STUDENT DIRECTIONS				
Student Prompt *Provides an authentic, engaging context for students; allows for multiple perspectives and solution strategies; targets skills that will be necessary for college and career success*				
Handouts/Resources *Provides additional materials needed for the task, if necessary*				
TEACHER PROCEDURES				
Pre-Work/Prior Knowledge *Lists knowledge and skills required for students to successfully complete task*				

Performance Task Components	Complete	Requires Revision	No Evidence	Comments
Procedures During Administration *Provides step-by-step procedures for task implementation*				
College and Career Connections *Connects the concepts and skills students will practice in the task to college and career readiness*				
TASK DETAILS				
Subject Area(s) and Primary/Secondary Content Domain(s) *Contains appropriate subject areas and domains*				
Secondary Claim(s) *Lists applicable claims that are also addressed in this task (less central to the task than the primary claim)*				
Standards *Addresses applicable Common Core standards*				
Stimulus/Source *Identifies meaningful sources required for completion of the task*				
Teacher Preparation/Resource Requirements *Provides a complete list of necessary resources; is feasible in most classroom situations*				
Scaffolding Techniques *Provides strategies that will facilitate learning for all students*				

Performance Task Components	Complete	Requires Revision	No Evidence	Comments
Time Requirements *Reflects adequate in- and out-of-class time for task completion*				
Vocabulary *Lists sufficient, alphabetized terms to understand the task and content area*				
Curricular Extensions *Suggests meaningful continuations of instruction using the task content*				
Solutions and/or Strategies *Defines successful solutions and final products; includes criteria for measuring complex thinking skills*				
Sample Top-Score Response *Includes sample exemplar student work product*				

Appendix F: Sample Performance Task

Oregon Department of Education Career and Technical Education Task

Author:

Institution:

Applicable CTE Course(s): Engineering – Environmental Engineering, Civil Engineering

Primary Claim: English/Language Arts – Claim 4: Research & Inquiry

Task Title: Oh Well: Choosing a Location to Drill a Water Well

Task Overview: Drilling water wells on private property is a common practice in rural areas. In this project, students will write a report making their recommendations for the placement of a water well on a piece of property they just purchased. The placement of the well must take into account regional well data, local stratigraphy, and adjacent land uses. The written report must also include several figures including maps and regional stratigraphy.

STUDENT DIRECTIONS

Student Prompt: Water issues are a controversial topic in the Klamath Basin. Most of the excitement in the Basin centers on the allocation of surface water to different stakeholders but just as many people (or more) relay on a clean supply of groundwater for municipal purposes. Groundwater is extracted from its reservoirs, called aquifers, through drilling and pumping. Like surface water, groundwater can become contaminated and cause the people who drink it to get sick. The causes of ground water contamination are varied and widespread and can come from many potential sources. As a landowner who is interested in having clean drinking water, your job is to choose a suitable location for drilling a water well that minimizes the risks of contamination.

Congratulations, you just purchased a large plot of land in the Klamath Basin! You are interested in developing the land by building a house and a large garden. To supply your house with drinking water and your crops with water you will need to drill a well. As you learned last week from our guest lecturer (geologist), there are good spots and bad spots to drill a well. Your job is to prepare a written report for your geologist with your recommendation on where to drill your well.

The placement of your well must meet the following criteria

- It must be located on your property
- It must be more than 500 feet from any other well
- It must be located 200 feet from any surface water
- The risk contamination must be very low

The tools you will use to prepare your report are all free government publications including USGS topographic maps, the City of Klamath Falls property use maps, and ODWR regional well log data with completed stratigraphic columns.

Your completed written report must contain the following elements:

- Proposed location of your new house and garden with justification. The location description and justification should be part of your written report.

- Proposed location of well including justification. Justification should be part of your written report. In addition to a written account of your proposed location, a map with the plotted location should also be included. Your justification should discuss the following lines of evidence:
    - Proximity to other wells
    - Proximity to surface water
    - Risk of contamination
    - Aquifer characteristics
    - Regional well characteristics

  Note: the location of your well need not be right next to your house or garden.

- Written discussion of the risk of contamination including:
    - Potential uphill point sources of contamination
    - Neighboring land uses and their associated risk of contamination. List each bordering neighbor, their land use, potential sources of contamination (there may be more than one), and an evaluation of the likelihood of contamination.
    - Non-point sources of contamination in the region

- Interpreted stratigraphy of your property. You should include a written description of the stratigraphy and a graphical representation of stratigraphic correlations. Your written description should take into account the known stratigraphy of the region as interpreted from neighboring well logs.
- Written explanation of your specific aquifer characteristics (depth to aquifer, flow rates (well discharges), water table and surface topography descriptions, any interaction with surface water, rock unit most likely containing water)
- Written account of regional well characteristics including estimated depth of well, mean static water level, rock unit likely to contain water, discharge.
- In addition to our written report, you should include several figures including:
    - Aquifer topographic map including flow direction
    - Location of regional wells with total depth, static water level, and discharge values
    - Proposed location of well on your property map
    - Interpreted regional stratigraphy from well log correlations
    - Interpreted regional stratigraphy with static water level

Handouts/Resources: Topographic maps, regional well logs with complete stratigraphic columns, property maps, land use maps,

TEACHER PROCEDURES

Pre-Work/Prior Knowledge:

- Map reading skills
- Stratigraphic correlation
- Aquifer characteristics including flow rates, direction of flow, and permeability and porosity
- Pumping characteristics including static water level and discharge
- Surface water–ground water interactions
- Point and non-point sources of pollution

Procedures During Administration:

1. Aquifer characteristics – Water movement, topography, flow direction, flow rates
   Practice drawing aquifer topography (isoclines)
2. Extracting ground water – Drilling wells, intro to well logs, static water level, discharge, drawdown
   Interpreting aquifer characteristics from well logs

3. Groundwater contamination – how groundwater gets contaminated, how contamination moves underground
4. Geologist guest lecturer – Talk about the process of drilling water wells
5. Present task – talk expectations and requirements
6. Analyze property – Topography, surface water, adjacent land uses (students take notes on each element using a prefab t-chart note sheet with elements for consideration on the left and notes on the right)
7. Analyze regional ground water – Look at regional well logs, build regional stratigraphy, contour water table, draw flow lines
8. Contamination evaluation – Based on students' analysis of steps 5 and 6, students track potential contamination through their property
9. Choosing a location – Students choose a location for their water wells
10. Report writing – Students write a document reporting the location of their water well with justifications

College and Career Connections:

Making claims and supporting them using many lines of evidence, communication using writing, critical thinking and problem solving skills are all used during this task.

TASK DETAILS

Subject Area(s): English/Language Arts

Primary Content Domain: Reasoning, evaluating

Secondary Content Domain(s): Writing, problem solving

Secondary Claim(s): ELA Claim #2 – Writing, Math Claim #3 – Communicating Reasoning

Standards:

CCSS.ELA-Literacy.W.11-12.1
CCSS.ELA-Literacy.W.11-12.7

Stimulus/Source:

All materials that students need to complete this task will be provided in class and include practice stratigraphic columns, well logs, well maps, topographic maps, and property maps. These materials are available in other documents that can be found in the associated folder.

Teacher Preparation/Resource Requirements:

- Lead up activities require handouts
- Task requires packets with task explanation, maps, and data tables
- Document camera set up to show examples

Scaffolding Techniques:

- Provide step by step instructions
- Create portfolios of lead in activities for reference
- Examples of good and bad reports
- Group collaboration during the problem solving portion of the task

Time Requirements:

This task requires roughly two weeks of class time. This timeline includes sufficient time to introduce novel concepts and allows students to complete several lead in activities that teach skills students will need to

complete the task. Once the introductory activities are completed the actual task will take roughly one week (250 minutes). This time includes one class period of writing at a computer lab.

Vocabulary:

- Aquifer
- Contamination
- Correlation
- Discharge
- Drilling
- Geologist
- Ground water
- Non-point source
- Permeability
- Point source
- Porosity
- Static water level
- Stratigraphy
- Surface water
- Well
- Well log

Curricular Extensions:

- Broader discussion of point and non-point sources of pollution
- Importance of natural resources and conservation
- Effects of water quality on human health, plant health (crops), and animal health

Solutions and/or Strategies:

- Student can place their well anywhere on their property as long as three basic parameters are met: 200 feet from surface water, 500 feet from another well, and it must be on their property.
- An evaluation of the risk of contamination provides a complicated challenge to this task. Students will be successful at this portion by taking into account the potential sources of contamination, making an evaluation of the risk of contamination at their chosen location, and providing a sound justification.
- There is one place on the map that is better than other places for a water well. Students can show their depth of knowledge by making an informed judgment about the stream that runs through their property. By labeling this stream a gaining stream, students can completely ignore any contamination potential because any pollutants will go into the stream and be carried off their property. Therefore, placing their well on the south side of the stream is by far the best solution.

Sample Top-Score Responses:

See uploaded examples

Appendix G: Follow-up Professional Development Workshop Agenda

AGENDA

9:00 – 9:15……...Overview of the Day

9:15 – 10:15…….How to Understand Student Learning

Presenter provides guiding questions and an annotated work sample that will help instructors to know how to analyze and discuss their student work. Goal: What does the evidence from the student work suggest about student performance on the claims that were being assessed? What did we learn about students from the work samples?

10:15 – 10:30..... Break

10:30 – 11:00 ..... How to Use Formative Assessment

Presenter will provide researched-based overview on best practices for formative assessment.

11:00 – 11:30 .....How Scoring Impacts Curriculum and Instruction

Instructors will share how they evaluated student work in small groups. In large group, any instructors from proficiency-based systems will share with the whole group. Group question: How can the evaluation of student work inform instruction? Instructors will add key points to poster paper.

11:30 – 12:00 ..... How to Support Student Learning

Instructors will discuss and share in small groups different student support strategies and techniques used during task implementation.

12:00 – 12:45 .....Lunch

12:45 – 2:45 ..... Final Task Revision

Presenter hands back individualized task feedback and gives time for task revisions based on the morning conversations. Goal: Do the student work, scoring, and student supports suggest task revisions?

2:45 – 3:00 ..... Break

3:00 – 3:30 ..... What Instructors Need to Know about Performance Assessment

Gather advice from instructors. Goal: Develop a list of what their colleagues need to be successful with performance assessment. Instructors will add key points to poster paper.

3:30 – 4:30 .....Upload Tasks and Final Survey