



# CTE Program Review - Instruction

Office of Career Technical Education

March 21, 2018

# Discussion Topics

3-Circle Instruction  
Model

Long and Short  
Term Planning

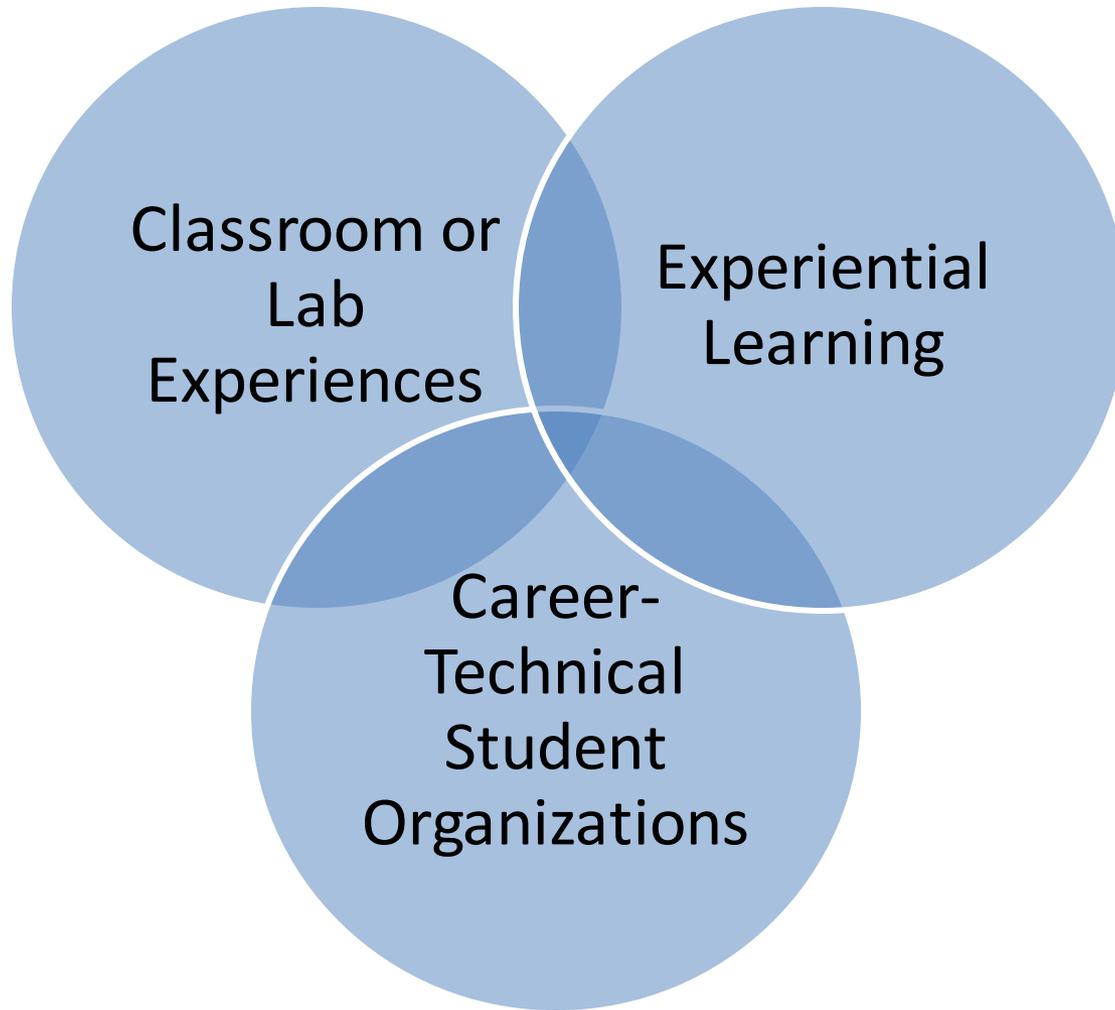
Short-Cycle  
Assessment

Interventions and  
Support Strategies

Professional  
Development

Example

# 3 Circle Model



# Long-Term Planning

- Scaffolding Skill Sets
  - Ensure that foundational knowledge and skills are identified for the Pathway.
  - Build upon foundational knowledge and skills for the end of Pathway.
  - Provides students with the foundational knowledge and skills they need to solve the problems at the end of Pathway.
- Use resources from each of the three circles when planning instruction.

# Long-Term Planning Resources

- Career-Field Technical Content Standards
  - Career Field Course Outlines
- Webb's Depth of Knowledge (DOK)
  - Hess Cognitive Rigor Matrix
- WebXam Blue Prints
- CTAG Alignment Documents
- CTSO Competitions
- Industry Credentials

# Career Field Content Standards

## Topics

### Career-Technical Programs

- » [Agricultural and Environmental Systems](#)
- » [Arts and Communication](#)
- » [Business and Administrative Services](#)
- » [Career-Based Intervention](#)
- » [Construction Technologies](#)
- » [Education and Training](#)
- » [Engineering and Science Technologies](#)
- » [Family and Consumer Sciences](#)
- » [Finance](#)
- » [Government and Public Administration](#)
- » [Health Science](#)
- » [Hospitality and Tourism](#)
- » [Human Services](#)
- » [Information Technology](#)
- » [Law and Public Safety](#)
- » [Manufacturing](#)
- » [Marketing](#)
- » [Transportation Systems](#)

## Transportation Systems

Technical and professional level careers in planning, management and movement of people, materials and goods by road, pipeline, air, rail and water and related services such as infrastructure planning and management, logistics services and mobile equipment and facility maintenance.

### Courses

#### Middle School

- » [Middle School Air Transportation Course Titles and Descriptions](#) 

#### High School

- » [Transportation Systems Career Field Course Titles and Descriptions](#) 
- » [Ground Transportation Courses](#) 
- » [Air Transportation Sample Courses](#) 

### Standards

#### 2013

- » [Transportation Systems Career Field Technical Content Standards](#) 

### Assessment

- » [Assessment Matrix](#)
  - » [Ohio Recognized Industry Credentials](#)
  - » [WebXam](#)
-

# Webb's Depth of Knowledge

- First resource for planning within the pathway
- Use to identify foundational knowledge and skills to build upon
- Hess Cognitive Rigor Matrix applied to Career and Technology Education
  - Guide for implementing Process
- Example:
  - Transportation Competency 2.2.4
    - Describe the Characteristics of engine fuels and fuel additives
    - Foundation for...
  - Transportation Competency 3.4.3
    - Check fuel for contaminants and quality.

# Webb's Depth of Knowledge

Hess Cognitive Rigor Matrix applied to Career & Technology Education (CTE CRM)				
Hess' Interpretation Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions				
Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall & Reproduction	Webb's DOK Level 2 Skills & Concepts	Webb's DOK Level 3 Strategic Thinking/ Reasoning	Webb's DOK Level 4 Extended Thinking
<b>Remember</b> Memorize, recognize, recall, locate, identify	<ul style="list-style-type: none"> <li>Recall or locate key facts, terms, details, procedures (e.g., explicit in text)</li> </ul>	Use these Hess CRM curricular examples with most assignments, assessments, or inquiry activities for Career & Technology Education		
<b>Understand</b> Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, summarize, generalize, infer a logical conclusion), predict, observe, match like ideas, explain, construct models	<ul style="list-style-type: none"> <li>Select correct terms/ graphics for intended meaning</li> <li>Describe/explain who, what, where, when, or how</li> <li>Define terms, principles, concepts</li> <li>Represent relationships with words, diagrams, symbols</li> <li>Solve routine problems</li> </ul>	<ul style="list-style-type: none"> <li>Specify and explain relationships (e.g., non-examples/examples; cause-effect; if-then)</li> <li>Summarize procedures, results, concepts, key ideas (paragraph)</li> <li>Make and explain estimates, basic inferences, or predictions</li> <li>Use models to explain concepts</li> <li>Make and record observations</li> </ul>	<ul style="list-style-type: none"> <li>Explain, generalize, or connect ideas using supporting evidence (quote, example, text reference, data);</li> <li>Justify your interpretation when more than one is plausible</li> <li>Explain how a concept can be used to solve a non-routine problem</li> <li>Develop a multi-paragraph manual or infographic for specific purpose/focus</li> </ul>	<ul style="list-style-type: none"> <li>Use multiple sources to outline varying perspectives on a problem or issue</li> <li>Explain how a concept relates across content domains or to 'big Ideas' (e.g., patterns in the human or designed world; structure-function)</li> <li>Apply generalizations from one investigation to new problem-based situations, using evidence or data</li> </ul>
<b>Apply</b> Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (transfer) to an unfamiliar or non-routine task	<ul style="list-style-type: none"> <li>Apply basic formulas, algorithms, conversion rules</li> <li>Calculate; measure</li> <li>Use reference materials and tools to gather information</li> <li>Demo safe procedures</li> </ul>	<ul style="list-style-type: none"> <li>Select and use appropriate tool or procedure for specified task</li> <li>Use context to identify the meaning of terms/phrases</li> <li>Interpret information using diagrams, data tables, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Build or revise a plan for investigation using (new) evidence/data</li> <li>Use and show reasoning, planning, and evidence to support conclusions or to identify design flaws</li> <li>Conduct a designed investigation</li> </ul>	<ul style="list-style-type: none"> <li>Draw from source materials with intent to develop a complex or multimedia product with personal viewpoint</li> <li>Conduct a project that specifies a problem, identifies solution paths, tests the solution, and reports results</li> </ul>
<b>Analyze</b> Break into constituent parts, determine how parts relate, compare-contrast, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for potential bias, point of view, technique /strategy used)	<ul style="list-style-type: none"> <li>Identify trend, pattern, possible cause, or effect</li> <li>Describe processes or tools used to research ideas</li> <li>Identify ways symbols or metaphors are used to represent universal ideas</li> <li>Retrieve data to answer a question (e.g., diagram, graph)</li> </ul>	<ul style="list-style-type: none"> <li>Compare similarities/ differences or draw inferences about ____ due to influences of ____</li> <li>Distinguish relevant-irrelevant information; fact/opinion; primary from a secondary source</li> <li>Extend a pattern</li> <li>Organize and represent data</li> <li>Categorize materials, data, etc. based on characteristics</li> </ul>	<ul style="list-style-type: none"> <li>Interpret information from a complex graph/model (e.g., interrelationships among variables, concepts)</li> <li>Use reasoning, planning, and evidence to support or refute inferences or results stated</li> <li>Use reasoning and evidence to generate criteria for making and supporting an argument</li> <li>Generalize &amp; support a pattern/trend</li> </ul>	<ul style="list-style-type: none"> <li>Analyze multiple sources of evidence (e.g., compare-contrast various plans, solution methods)</li> <li>Analyze and compare diverse/complex/ abstract perspectives, models, etc.</li> <li>Gather, organize, and analyze information from multiple sources to answer a research question</li> </ul>
<b>Evaluate</b> Make judgments based on specified criteria, detect inconsistencies, flaws, or fallacies, judge, critique	"UG" – unsubstantiated generalizations = stating an opinion or claim without providing any support for it!			<ul style="list-style-type: none"> <li>Evaluate relevancy, accuracy, &amp; completeness of sources used</li> <li>Apply understanding in a novel way, provide argument/ justification for the application</li> <li>Critique the historical impact of __on__</li> </ul>
<b>Create</b> Reorganize into new patterns/schemas, design, plan, produce	<ul style="list-style-type: none"> <li>Brainstorm ideas, concepts, problems, or perspectives related to a given scenario, observation, question posed</li> </ul>	<ul style="list-style-type: none"> <li>Generate testable conjectures/ hypotheses based on observations, prior knowledge, and/or artifacts</li> </ul>	<ul style="list-style-type: none"> <li>Develop a complex model for given concept and justify reasoning</li> <li>Develop an alternative solution and justify reasoning</li> </ul>	<ul style="list-style-type: none"> <li>Synthesize information across multiple models, sources, or texts</li> <li>Articulate new knowledge or new perspective</li> </ul>

Hess, K., Ed.D. (2014). Cognitive Rigor and Depth of Knowledge. Retrieved March 19, 2018, from <http://www.karin-hess.com/cognitive-rigor-and-dok>

# WebXam Blueprints

- Indicate the percentage of test items a student will be assessed on by outcome covered in a course.
  - Available for many career fields
    - Scroll to your career field, look for the Blueprints link
- [www.webxam.org/legacy/AboutTheTests](http://www.webxam.org/legacy/AboutTheTests)

# WebXam Blueprints

## Hydraulics and Pneumatics

Subject Code: 010225

Outcome #	Outcome Name	% Items Approved by SMEs
<b>Strand 1. Business Operations/21st Century Skills</b>		
1.1	Employability Skills	5.3
1.2	Leadership and Communications	4.2
1.3	Business Ethics and Law	3.2
1.4	Knowledge Management and Information Technology	3.2
1.6	Business Literacy	2.1
1.8	Operations Management	2.1
1.10	Sales and Marketing	2.1
1.12	Site and Personal Safety Procedures	17.9
<b>Strand 4. Power Systems</b>		
4.1	Tool, Stationary and Mobile Equipment Maintenance	9.5
4.2	Equipment Operations	5.3
4.11	Hydraulic Systems	36.8
4.12	Brakes	4.2
<b>Strand 6. Environmental Science</b>		
6.8	Contaminants and Pollution Control	2.1
6.9	Hazardous Materials and Waste Management	2.1

# WebXam Test Dates

- Always be aware of the vendor testing calendar.
  - <https://news.webxam.org/calendar/>
- Evaluated your district testing calendar to ensure CTE-End of Course (WebXam) are accounted for.
  - Set your pacing based on your district's decided upon test date

# CTAG

- What outcomes and competencies are identified for the CTAG?
  - Emphasize those outcomes and competencies and make sure they are given a larger focus in the course.
  - [CTAG Alignment Document](#)
    - Post-Secondary Essential Learning Outcomes are aligned to the Secondary Course Competencies.

# CTSO Competition Schedules

- If students are competing in CTSO Competitions, check the schedule to make sure that
  1. They are competing in events that are relevant to the skills they will be developing in your classroom.
  2. The competencies necessary for proficiency in competition will be covered in time for them to compete.

# CTSO Competition Schedules



Search keywords:  
Student Organizations

- Go to the CTSO website identified in the Program Matrix from Webinar 2 for your pathway to learn more.

# Industry Credential

- Are there industry credentials you want your students to earn upon completion of the pathway?
- Do the competencies of the credential align with the courses you're offering?
- Cross reference competencies in WebXam with the competencies emphasized for the industry credentials to ensure that all necessary competencies are covered
  - Fill in the gaps.

# Day to Day Classroom Instruction

- Student outcome focused
  - Strategies
  - Structures/Activities
- Ensure differentiation of learning styles for all students in a pathway
- Ensure engaging and relevant context of delivery

# Day to Day Classroom Instruction

- Planning starts with the content standards identified in the long term plan - backwards
  - Start with the intended outcomes and work on activities to ensure students get there
    - Includes consideration of all previously mentioned resources
    - Scaffold within units and lessons
    - What are the steps to mastering a competency?

# Day to Day Classroom Instruction

# Why are you assessing?

## *of learning....*

- Take place after learning has occurred to evaluate the results
- Make statements of learning status at a point in time to those outside the classroom
- Can also be done in the classroom to determine a student's report card grade
- E.g., WebXam standardized assessments

## *for learning....*

- Take place while learning is still underway throughout teaching and learning
- Diagnose student needs, plan next steps in instruction, provide student feedback for improvement
- Help students see and feel in control of their journey to success

Stiggins, R.J., Arter, J.A., Chappuis, J., and Chappuis, S. (2006). Classroom Assessment for Student Learning. Produced by Educational Testing Services.

# Assessment of Learning

- 4/4/2018 Webinar on Assessment
  - WebXam
    - Best Practices
    - Resources

# Pre-Assessment

- Pre-assess before planning the unit
- Use results to determine where to focus instructional time
- Lessons and Units offer layers of scaffolding
  - Provide more flexibility for students who have already developed an understanding
  - Tiered options and opportunities for students with different needs

# Assessment for Learning

- Short-cycle and Formative assessments are a key part of instruction.
- Can inform teaching and keep you aware of your students' progress on a daily basis
- Continual growth of the classroom comes from continual evaluation of the results the instruction produces
- Cycle → Never stops

# Formative Assessment

- Try to match the assessment styles to the End of Course assessment style
  - WebXam
    - Multiple Choice
    - 4 Possible Answers
    - No True/False
    - Computer Based
  - WebXam Blueprints (if available)

# Formative Assessment

- Example:
  - Transportation 2.2.4
    - Describe characteristics of engine fuels and fuel additives.
  - Three question multiple choice online quiz (quizizz.com) that gives immediate results
    - Plickers

# Formative Assessment

- Example Cont'd
  - Data shows that only 20% of students mastered competency
    - What happened?
    - What can I do differently next time?
    - How can I address this quickly to ensure mastery?

# Strategies and Supports

- React to data in the classroom to adapt instruction to students needs
- Individualized attention to students or groups that need additional or modified instruction
- Varying learning styles
  - Provide different teaching and learning methods to provide access to all students

# Strategies and Supports

- Example:
  - Transportation 2.2.4
    - Describe characteristics of engine fuels and fuel additives.
  - Gather data from formative assessment
  - 4 students continue to struggle
    - Assessment data reveals they are missing one key part of the competency

# Strategies and Supports

- Example Cont'd
  - Pull this group together and provide small group instruction in a common lesson
  - Answer questions in smaller setting
  - New mode of instruction
  - Continue to assess

# Professional Learning Impacts Student Learning

High-Quality  
Professional  
Development

Improved  
Knowledge,  
Skills and  
Practices

Gains in  
Student  
Learning

# Professional Development

- Set aside time for teachers to grow and build their skill set
- Growth does not occur without targeted time and effort
- Explore and identify options that are best for individuals or teams that meet their needs

# Professional Development Resources

- Ohio Department of Education CTE Program Specialists
- Educational Service Centers (ESC)
- State Support Teams (SST)
- STARS
- Industry Provided Professional Development

# Professional Organizations

OACTE

OAAE

OATFACS

ITEEA

CTEP

# Example

District: Anywhere Local Schools

Pathway: T9- Ground Transportation

Pathway Non-Compliant in FY2016 and FY2017

Pathway Data FY18:

- Technical Skill: 57%
- Participation: 100%
- Post-Program Placement: 84%

Quality Program Standards Rated  $\leq$  Minimal

# Example

- Instructor overly emphasizes laboratory instruction
- Students participate in work-release programs. However, instructor does not assess student learning while on work-release.
- Instructor has limited support from administrators to have students participate in CTSO during instructional time.

QUALITY INDICATOR	EXEMPLARY	EFFECTIVE	MINIMAL	UNSATISFACTORY
1. Instruction balances between inquiry-based classroom and laboratory instruction, experiential learning, and engagement in the Career Technical Student Organization.	A documented balance exists between inquiry-based classroom and laboratory instruction, experiential learning and engagement in the student organization.	There is an attempt to balance inquiry-based classroom and laboratory instruction, experiential learning, and engagement in the student organization, but two of the three components dominate the instruction.	One component of the curriculum clearly is dominating the instruction. The instructor(s) has a plan to bring deficient areas into balance.	None of these components are apparent in the instruction.

# Example

- Instructor builds a loose pacing plan for the year, but does not analyze for Webb's Depth of Knowledge as it applies to skills building on each other.
- Instructor does not reference career-technical learning standards when creating lesson plans or assessments.
- Instructor provides hands-on learning opportunities, but they are focused around different competencies than the course and WebXam focus.

QUALITY INDICATOR	EXEMPLARY	EFFECTIVE	MINIMAL	UNSATISFACTORY
3. Instruction reinforces the application of relevant and rigorous career-technical learning standards.  Evidence: (e.g., lesson plans)	Instruction consistently incorporates related career-technical learning standards.	Instruction focuses on academic skills and connects with career-technical learning standards.	Instruction focuses on academic skills.	Instruction does not address academic skills.

# Example

- Instructor is using industry credential based assessments to evaluate student learning at the end of the year.
- Project based assessment for completion, not mastery, is used by the instructor most frequently.
- Local assessment policy is not uniform across pathways.

QUALITY INDICATOR	EXEMPLARY	EFFECTIVE	MINIMAL	UNSATISFACTORY
<p>2. Assessments measure technical and academic performance through locally developed assessments based on identified competencies.</p> <p>Evidence: (e.g., assessments)</p>	<p>Assessments measure complex application of technical knowledge and skills, solving authentic industry problems related to the career field technical content standards.</p>	<p>Assessments measure technical knowledge and skills specified in the career field technical content standards.</p>	<p>Assessments measure technical knowledge.</p>	<p>Assessments are not locally developed.</p>

# Example

## Quality Program Standards Continuous Growth Plan (Minimal and Unsatisfactory Ratings Only)

Standard # Indicator #	Deficiency discovered during program review	Action Plan	Target Date(s)	√
S.6 I.1	A documented balance <b><u>does not</u></b> exist between inquiry-based classroom and laboratory instruction, experiential learning and engagement in the student organization.			
S.6 I.3	Instruction rarely incorporates career-technical content standards. Students often have hands on instruction but it is not related to the competencies most necessary for the courses.			
S.7 I.2	Assessments of learning are vendor based. Local assessments for learning have not been developed.			

# Example

## Quality Program Standards Continuous Growth Plan (Minimal and Unsatisfactory Ratings Only)

Standard # Indicator #	###	Action Plan	Target Date(s)	√
S.6 I.1		Administrators will assist instructors in identifying student learning opportunities of specific career-technical learning standards from their pathway courses. Students may encounter these opportunities during work based learning opportunities and CTSO competitions.		
S.6 I.3		Administrators and instructors will develop an instructional plan that incorporates Career-Technical learning standards. Reference all of the following resources: WebXam Blueprints, CTAG Alignments, and Industry Credential Outcomes.		
S.7 I.2		Instructors will be provided targeted professional development on how to select and design quality assessments.  Instructors will implement short cycle assessments into their instructional plan.		

# Example

## Career-Technical Education Annual Program Review Corrective Action Plan

<b>OPPORTUNITIES FOR IMPROVEMENT</b> As identified in the Self-Evaluation Assessment.	<b>CORRECTIVE ACTION PLAN</b> Established by the district after Summary Report review with CTPD (when applicable) and ODE staff)	<b>DOCUMENTATION TIMELINE</b> List the specific documentation to be sent to ODE supporting Corrective Action Plan implementation	<b>SET SPECIFIC TARGET DATES</b> Month/Day/Year
Instruction balances between inquiry-based classroom and laboratory instruction, experiential learning, and engagement in the Career Technical Student Organization.	Administrators will assist instructors in identifying student learning opportunities of specific career-technical learning standards from their pathway courses. Students may encounter these opportunities during work based learning opportunities and CTSO competitions.	Completed Work-Based Learning Agreements for all Students ( <a href="#">Example</a> )  Course Syllabus or Program Sheet that identifies all CTSO opportunities (i.e. competitions) that align with the pathway.	

# Example

## Career-Technical Education Annual Program Review Corrective Action Plan

<b>OPPORTUNITIES FOR IMPROVEMENT</b> As identified in the Self-Evaluation Assessment.	<b>CORRECTIVE ACTION PLAN</b> Established by the district after Summary Report review with CTPD (when applicable) and ODE staff)	<b>DOCUMENTATION TIMELINE</b> List the specific documentation to be sent to ODE supporting Corrective Action Plan implementation	<b>SET SPECIFIC TARGET DATES</b> Month/Day/Year
Instruction reinforces the application of relevant and rigorous career-technical learning standards (outcomes and competencies).  Evidence: (e.g., lesson plans)	Administrators and instructors will develop an instructional plan that incorporates Career-Technical learning standards and reference all of the following resources: WebXam Blueprints, CTAG Alignments, Industry Credentials Outcomes.  Administrator will facilitate instructor professional development to gain personal, hands-on career field experience to build ideas for relevant application of standards of the specific course.	Long Term Instructional Plan (i.e. Syllabus, Curriculum Map, Pacing Guide, Units of Instruction) that includes Ohio's Career-Technical Learning Standards.	

# Example

## Career-Technical Education Annual Program Review Corrective Action Plan

<b>OPPORTUNITIES FOR IMPROVEMENT</b> As identified in the Self-Evaluation Assessment.	<b>CORRECTIVE ACTION PLAN</b> Established by the district after Summary Report review with CTPD (when applicable) and ODE staff)	<b>DOCUMENTATION TIMELINE</b> List the specific documentation to be sent to ODE supporting Corrective Action Plan implementation	<b>SET SPECIFIC TARGET DATES</b> Month/Day/Year
Assessments measure technical and academic performance through locally developed assessments based on identified competencies.  Evidence: (e.g., assessments	Instructors will be provided targeted professional development on how to select and design quality assessments.  Instructors will implement short cycle assessments into their instructional plan.	Instructor contact hour documentation covering the specific topic of how to select and design quality assessments.  Copies of formative assessments (i.e. Short Cycle) designed and implemented after professional development.	

# Webinar Series Schedule

## 1. Overview

([Recording available on the CTE homepage](#))

## 2. Alignment

([Recording available on the CTE homepage](#))

## 2. Instruction (Today)

## 3. Assessment (04/04/2018)

## 4. Reporting (04/18/2018)

[education.ohio.gov](http://education.ohio.gov)

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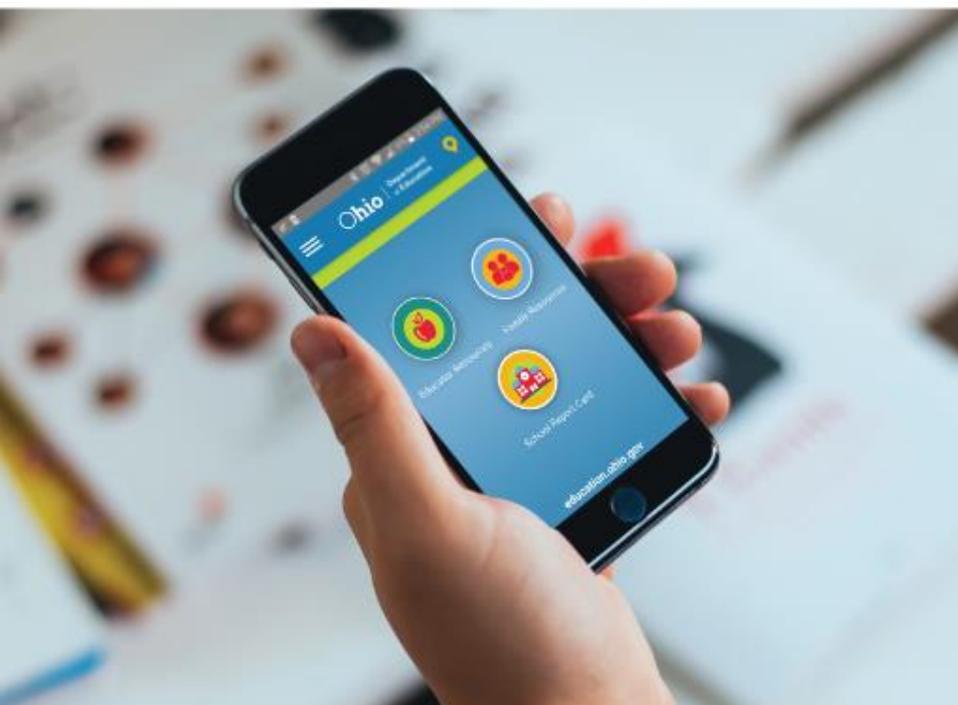


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