League of Innovative Schools Webinar

21st Century Skills

May 3, 2017
TODAY’S PRESENTERS

From the Great Schools Partnership:

Ted Hall, Senior Associate
TODAY’S PRESENTERS

From the Montpelier, VT Schools:

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Math Teacher
@Howe2Math
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All phone lines will be muted throughout the presentation to reduce background noise. They will be unmuted for Q & A.

Conference Call Number:
1-888-850-4523, Participant code: 382946#
HOUSEKEEPING

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http://newenglandssc.org/league-members/lis-webinars/
Please type your name, school, state into the chat space

e.g. Ted Hall, GSP (ME)
<table>
<thead>
<tr>
<th>State</th>
<th>Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>Dianna Roberge-Wentzell and Melissa Hickey</td>
</tr>
<tr>
<td>ME</td>
<td>Rachelle Tome and Diana Doiron</td>
</tr>
<tr>
<td>NH</td>
<td>Paul Leather and Christopher Motika</td>
</tr>
<tr>
<td>RI</td>
<td>Mary Ann Snider and Cali Cornell</td>
</tr>
<tr>
<td>VT</td>
<td>Heather Bouchey, Jess DeCarolis, Veronica Newton, and Sigrid Olson</td>
</tr>
</tbody>
</table>
By participating in this webinar, you will:

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- Hear from a team of educators from Montpelier (VT) Public Schools about their process for developing and implementing 21st century skills across all grades and all parts of the curriculum
- Learn about Great Schools Partnership Transferable Skills Project as well as other relevant resources
What are 21st Century Skills?
What are 21st Century Skills?

The term 21st century skills refers to a broad set of knowledge, skills, work habits, and character traits that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today’s world, particularly in collegiate programs and contemporary careers and workplaces.

From edglossary.org
Generally speaking, 21st century skills can be applied in all academic subject areas, and in all educational, career, and civic settings throughout a student’s life.
If students are going to make a successful transition to college and career, schools need to do more than focus on academics. Experts say helping students develop grit, self-discipline, and critical thinking needs to be prioritized, as well.
21st Century Skills

A Stanford dean on adult skills every 18-year-old should have

Julie Lythcott-Haims, Author, NYT bestseller How to Raise an Adult; former Stanford dean; podcast host

Updated Feb 26, 2016 · Featured in The Huffington Post and 3 more
“Though public schools are currently held accountable for students' scores in math and reading proficiency alone, evidence from both psychology and economics shows that a wide range of non-academic skills play a big role in determining success later in life.”

Why 21st Century Skills?

“Real mathematics is about inquiry, communication, connections, and visual ideas. . . We need students who can ask good questions, map out pathways, reason about complex solutions, set up models and communicate in different forms.”
Why 21st Century Skills?

“Although the underlying communications and information-processing competencies have not changed, they are applied at an increasing pace to accomplish tasks across various life contexts…”

Why 21st Century Skills?

The National Research Council Report states:

The skills our graduates need most:

- complex communication competencies
- non-routine problem solving
- verbal and quantitative literacy
- self-direction & collaboration
Partnership for 21st Century Learning

Learning and Innovation Skills – 4Cs

Critical thinking, Communication, Collaboration, Creativity

How do each of the New England Secondary School Consortium states define 21st Century Skills?
CONNECTICUT

Foundational Skills and Competencies:
- Reading
- Writing
- Speaking, Listening, and Viewing
- Quantifying
- Problem Solving, Reasoning, and Creative Thinking
- Learning Resources and Information Technology
- Working Independently and Collaboratively

Aspects of Character
- Responsibility and Integrity
- Effort and Persistence
- Intellectual Curiosity
- Respect
- Citizenship and Sense of Community
MAINE

Guiding Principles

- Clear and Effective Communicator
- Self-Directed and Lifelong Learner
- Creative and Practical Problem Solver
- Responsible and Involved Citizen
- Integrative and Informed Thinker
NEW HAMPSHIRE

Competency-Based Performance Standards

- Ability to Work with Others
- Communication Skills
- Decision Making and Problem Solving
- Information Use (Technology, Research, Analysis)
- Self-Management
RHODE ISLAND

Applied Learning Standards

- Critical Thinking
- Problem Solving
- Communication
- Collaboration
- Research, Reflection and Evaluation
Transferable Skills

- Clear and Effective Communication
- Creative and Practical Problem-Solving
- Informed and Integrative Thinking
- Responsible and Involved Citizenship
- Self-Direction
“Effective schools identify core values and beliefs about learning that function as explicit foundational commitments to students and the community. Decision-making remains focused on and aligned with these critical commitments. Core values and beliefs manifest themselves in research-based, school-wide 21st century learning expectations.
Every component of the school is driven by the core values and beliefs about learning and supports all students' achievement of the school's learning expectations.”
Standard 1/Indicator 2 on Core Values, Beliefs, and Learning Expectations:

The school has challenging and measurable 21st century learning expectations for all students which address academic, social and civic competencies.
Proficiency-Based Learning Simplified
A Great Schools Partnership Learning Model

Graduation Requirement | Reporting Method | Cross-Curricular Graduation Standards 5–8 standards taught in all content areas | Assessment Method |
--- | --- | --- | --- |
YES | Transcripts and Report Cards | | Body of Evidence |
YES | Transcripts and Report Cards | Content-Area Graduation Standards 5–8 standards for each content area | Verification of Proficiency Students demonstrate achievement of content-area graduation standards through their aggregate performance on summative assessments over time |
NO | Progress Reports | Performance Indicators 5–10 indicators for each cross-curricular and content-area standard that move students toward proficiency and the achievement of graduation standards | Summative Assessment Graded summative assessments are used to evaluate the achievement of performance indicators |
NO | Teacher Feedback | Learning Objectives Learning objectives guide the design of curriculum units that move students toward proficiency and the achievement of performance indicators | Formative Assessment Ungraded formative assessments are used to evaluate student learning progress |

Body of Evidence Students demonstrate achievement of standards through a body of evidence evaluated using common rubrics

Verification of Proficiency Students demonstrate achievement of content-area graduation standards through their aggregate performance on summative assessments over time

Summative Assessment Graded summative assessments are used to evaluate the achievement of performance indicators

Formative Assessment Ungraded formative assessments are used to evaluate student learning progress

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Cross-Curricular Graduation Standards

5-8 standards taught in all content areas

Learning Objectives

Learning objectives guide the design of curriculum units that move students toward proficiency and the achievement of performance indicators.

Performance Indicators

5-10 indicators for each cross-curricular and content area standard that move students toward proficiency and the achievement of graduation standards.
When 21st Century Skills Shape our Assessments

Rich and authentic student tasks = Engagement

Explicit teaching of these skills along with content-area skills and knowledge = Equity
How are 21st Century Skills Taught + Assessed?

These skills should be taught and assessed across all content areas and across all grades so that students have many experiences with these important skills.
How are 21st Century Skills Taught + Assessed?

- Has your school or district designed a formal system for assessing the 21st Century Skills?
- Does your system utilize a portfolio, student-led conferences, or other forms of student reflection and collection of evidence?
- Does your system utilize separate assessments for the 21st Century Skills?
What Steps Can You Take?

- Decide on your school’s 21st century skills.
- Develop performance indicators for each of the skills.
- Develop scoring criteria for each of the performance indicators.
- Use the standards, performance indicators, and scoring criteria to teach and assess these skills.
Who are we?

321 Students

88% White

28% Free and Reduced Lunch
Emphasizing Transferable Skills

**HABITS OF LEARNING**
- Persistence
- Questioning
- Self-Awareness
- Collaboration
- Growth Mindset
- Precision
- Preparedness

**CITIZENSHIP**
- Participation & Engagement
- Contribution & Service
- Responsibility
- Sustainability
- Respect
- Diversity

**PROBLEM SOLVING**
- Understanding the Problem
- Brainstorming Possible Approaches
- Choosing & Implementing an Approach
- Analysis
- Reflection

**CREATIVITY**
- Brainstorming
- Risk Taking
- Flexibility
- Connections
- Creative Expression

**READING**
- Habits and Dispositions
- Vocabulary Acquisition and Use
- Initial Understanding
- Analysis and Interpretation

**WRITING**
- Purpose
- Organization
- Evidence
- Analysis
- Voice & Tone
- Conventions

**COMMUNICATION**
- Collaborative Discussion
- Poise
- Presentation
- Interpersonal Communication

**MPS** Learning Expectations
Flexible Pathways and Personalized Learning

Writing:
- Poetry Slam
- Op-Eds
- Thank You Letters
- Reflections & Goal-Setting
- Lab Reports
- Creative Writing
- Literary Analysis
- French Fairy Tales
- College Essays
- Young Writer’s Project

Reading:
- News Feeds & Social Media
- International Newspapers
- Current Events
- Schoolwide Reading
- Literary Short Stories
- Primary Sources in History
- Scientific Articles
- VT Reads List
- Novels
- Technical Guides & Manuals

Creativity:
- T-Shirt Design
- Songwriting
- Product Development
- Coding
- Body Extensions
- My Strange Object
- Arduino Boards
- Photography
- Film Contest
- Repurposed Art

Habits of Learning:
- Green Up Day
- Dismantling Rape Culture
- Senior Center
- SAGE
- LGBTQ
- AP U.S. History
- Planting Hope
- Sustainability Course
- UES Mentoring
- Student Leadership

Citizenship:
- Team-Building
- Adirondack Chairs
- Chicken Coop
- 3D Printing
- Financial Literacy
- Online Research
- Lab Experiments
- Literary Analysis
- Modeling
- Computer Troubleshooting

Problem Solving:
- Blogging
- Public Service Announcements
- Graduation Speech
- School Board Presentations
- CBL Correspondence
- Class Discussions
- Visual Media
- Soliloquies
- Camp Counseling
- Performing

Communication:
- Blogging
- Public Service Announcements
- Graduation Speech
- School Board Presentations
- CBL Correspondence
- Class Discussions
- Visual Media
- Soliloquies
- Camp Counseling
- Performing
Flexible Pathways

internships, early college, dual enrollment, online learning, work-based learning, independent studies, service learning, extended learning opportunities
ESSENTIAL QUESTIONS:
Students will utilize their CBL experience to work towards answering the following questions:

- What can I learn about myself and others through actively involving myself in real world professional/community settings and experiences?
- What can I learn about my interests, skills, and aspirations through actively involving myself in real world professional/community settings and experiences?

SKILL DEVELOPMENT:
Students will work towards proficiency within three MHS Learning Expectations:

Habits of Learning -“Self-Awareness”:

Citizenship - “Responsibility”:

Habits of Learning - “Preparedness”:

CBL TEAM:

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Laidlaw</td>
<td><a href="mailto:bill.laidlaw@mpsvt.org">bill.laidlaw@mpsvt.org</a></td>
<td>225-8154</td>
</tr>
<tr>
<td>Sarah Loveless</td>
<td><a href="mailto:sarahl@mpsvt.org">sarahl@mpsvt.org</a></td>
<td>522-2785</td>
</tr>
<tr>
<td>Matt McLane</td>
<td><a href="mailto:matt@mpsvt.org">matt@mpsvt.org</a></td>
<td>522-2758</td>
</tr>
<tr>
<td>Katrina Phillips</td>
<td><a href="mailto:katrina@mpsvt.org">katrina@mpsvt.org</a></td>
<td>225-8078</td>
</tr>
<tr>
<td>Marking Period</td>
<td>Units</td>
<td>Content Proficiency Indicator</td>
</tr>
<tr>
<td>----------------</td>
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</tr>
<tr>
<td>1 (September 29)</td>
<td>Fitting Functions to Tables</td>
<td><strong>Functions</strong> d: Build a function that models a relationship between quantities.</td>
</tr>
<tr>
<td>2 (November 2)</td>
<td>Function Notation</td>
<td><strong>Functions</strong> a: Understand the concept of a function and use function notation.</td>
</tr>
<tr>
<td>3 (December 7)</td>
<td>Factors, Roots &amp; Zeros</td>
<td><strong>Algebra</strong> d: Understand the relationship between zeros and factors of polynomials.</td>
</tr>
<tr>
<td>4 (January 13)</td>
<td>Linear Algebra</td>
<td><strong>Algebra</strong> j: Solve systems of equations.</td>
</tr>
<tr>
<td>5 (February 23)</td>
<td>Exponential Functions</td>
<td><strong>Functions</strong> f: Construct exponential models.</td>
</tr>
<tr>
<td>6 (April 5)</td>
<td>Logarithmic Functions</td>
<td><strong>Algebra</strong> b: Write expressions in equivalent forms to solve problems.</td>
</tr>
<tr>
<td>7 (May 12)</td>
<td>Transformations</td>
<td><strong>Geometry</strong> a: Experiment with transformations in the plane.</td>
</tr>
<tr>
<td>8 (June 14)</td>
<td>Trigonometry</td>
<td><strong>Geometry</strong> c: Solve real-life and mathematical problems involving angle measures, side lengths, &amp; area.</td>
</tr>
</tbody>
</table>
### Fitting Functions to Tables Unit 1:

#### Enduring Understanding:

**Transferable Skill**

4.3 **Problem Solving:** Choosing and Implementing an Approach

#### Essential Questions:

- How can understanding functions help us predict the future?
- What is the process for taking information and creating a useful tool for prediction?

#### (U) Desired Understandings:

**Content area proficiency**

**Functions d:** Build a function that models a relationship between two quantities.

#### (K) Students will know...

- Know that a table can be represented by a linear function
- Know that differences can be used to identify a specific function
- Know that a linear equation can be found that describes a set of data
- Know that there are multiple ways to compute the error of a data set

#### (D) Students will be able to...

- Write rules for both linear and quadratic functions based on input/output values.
- Identify slope and y-intercept of linear functions
- Compute balance point for a table of values
- Compute the line of best fit given a data set
- Understand various measures of error

#### Summative Assessments:

What evidence will show that students understand?

Unit 1 [Summative Assessment](#)

#### Formative Assessments:

What other evidence needs to be collected to assess ongoing student learning?

This formative will focus solely on approach. This riddle requires an understanding of how to interpret a problem and organize information to determine the answer to a question. Students will need to document their thought process and show evidence to support a conclusion. The approach rubric will be used to assess and provide students with feedback. [The Acrobat, the Grandmas, and Ivan the Dog](#)

Content focused practice on determining patterns and writing functions to describe patterns. [Deeper Differences](#)
Enduring Understanding: (Transferable Skill)

4.3 Problem Solving: Choosing and Implementing an Approach

Essential Questions:
How can understanding functions help us predict the future?
What is the process for taking information and creating a useful tool for prediction?

(U) Desired Understandings: (Content area proficiency)
Functions d: Build a function that models a relationship between two quantities.

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- Compute balance point for a table of values
- Compute the line of best fit given a data set
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Summative Assessments:
What evidence will show that students understand?
Unit 1 Summative Assessment

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Content focused practice on determining patterns and writing functions to describe patterns. Deeper Differences
Fitting Functions to Tables Unit 1:

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Essential Questions:
How can understanding functions help us predict the future?
What is the process for taking information and creating a useful tool for prediction?

(U) Desired Understandings: (Content area proficiency)
Functions d: Build a function that models a relationship between two quantities.

(K) Students will know...
- Know that a table can be represented by a linear function
- Know that differences can be used to identify patterns of data
- Know how linear equations can be found to model a specific function

(D) Students will be able to...
- Write rules for both linear and non-linear functions
- Determine the pattern in a set of data
- Use differences to determine the relationship between variables

Summative Assessments:
What evidence will show that students understand?
Unit 1 Summative Assessment

Formative Assessments:
What other evidence needs to be collected to assess ongoing student learning?

This formative will focus solely on approach. This riddle requires an understanding of how to interpret a problem and organize information to determine the answer to a question. Students will need to document their thought process and show evidence to support a conclusion. The approach rubric will be used to assess and provide students with feedback. The Acrobat, the Grandmas, and Ivan the Dog

Content focused practice on determining patterns and writing functions to describe patterns. Deeper Differences

The Acrobat, the Grandmas, and Ivan the Dog

Deeper Differences
Algebra II  
Term One  

Functions (d): Build functions that model a relationship between quantities. 

<table>
<thead>
<tr>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understands what needs to be done to build functions that model relationships but needs guidance</td>
<td>Understands how to build functions that model relationships between quantities but makes multiple of the following mistakes: incorrect sign for coefficient, incorrect coefficient, incorrect y intercept, or written function is not clear.</td>
<td>Builds functions that model relationships between quantities with only one of the following mistakes: incorrect sign for coefficient, incorrect coefficient, incorrect y intercept, or written function is not clear.</td>
<td>Builds functions that model relationships between quantities using multiple techniques. Every part of the written function is correct.</td>
</tr>
</tbody>
</table>

4.3 Problem Solving: Choosing and Implementing an Approach 

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Chooses and implements an approach</td>
<td>Chooses and implements an approach to solve the problem</td>
<td>Analyzes factors to choose a reasonable approach. Implements the approach with precision</td>
<td>Analyzes factors to choose an effective approach that fits the constraints of the problem. Implements the approach with precision</td>
</tr>
</tbody>
</table>
Unit 1 Summative

Welcome to your unit 1 summative! Remember that you are being assessed on the following standards:

*Functions (d): Build functions that model a relationship between quantities.

*4.3 Problem Solving: Choosing and Implementing an Approach

Make sure to be clear and organized in showing your work for the following problems. Read and answer the questions carefully. You may use graph paper, scrap paper, a ruler, and a calculator. Please make sure to staple any extra sheets to your test at the end. You're ready! You got this!

The following data table was created by the Earth & Science communications team at NASA’s jet propulsion laboratory at the California Institute of technology (http://climate.nasa.gov). This data shows the average temperature anomaly every two years since 1982. A temperature anomaly indicates the observed temperature was warmer than the long-term average, while a negative anomaly indicates that the observed temperature was cooler than the long-term average. You will be using this data to answer the questions on the attached sheet.

<table>
<thead>
<tr>
<th>Years</th>
<th>Average Temperature Anomaly</th>
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<tbody>
<tr>
<td>0</td>
<td>0.13</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>4</td>
<td>0.19</td>
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<td>20</td>
<td>0.63</td>
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<td>22</td>
<td>0.54</td>
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<td>24</td>
<td>0.63</td>
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<tr>
<td>26</td>
<td>0.53</td>
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<tr>
<td>28</td>
<td>0.72</td>
</tr>
<tr>
<td>30</td>
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</tr>
</tbody>
</table>

1. Make a scatter plot of your data.

2. Would it be reasonable to use a linear equation to describe the data? Explain.

3. Explain in words how you plan to find an equation for a line of best fit. Be specific in detailing your approach and implementation!

4. Use your plan to find and write an equation for a line of best fit that you think best describes the data. Please make sure you have a line sketched on your graph that matches your equation.
Unit 1 Summative

Welcome to your unit 1 summative! Remember that you are being assessed on the following standards:
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2. 

3. Be specific in defining your approach and implementation.

4. Use your plan to find and write an equation for a line of best fit that you think best describes the data. Please make sure you have a line sketched on your graph that matches your equation.
Unit 1 Summative

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</tbody>
</table>

2. Would it be reasonable to use a linear equation to describe the data?

Explain.

3. **Explain** in words how you plan to find an equation for a line of best fit.

*Be specific in detailing your approach and implementation!*

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4. Use your plan to find and write an equation for a line of best fit that you think best describes the data. Please make sure you have a line sketched on your graph that matches your equation.
QUESTIONS
What is the Transferable Skills Assessment Project?
Great Schools Partnership, in collaboration with Google’s EdTechTeam, Inc. is working to build an online system to support the design, implementation and scoring of performance assessment tasks that measure the Transferable Skills. We are working to build an online system that will bring transferable skills to the center of teaching & learning.
Project Goals

To provide resources to support explicit instruction of Communication, Problem Solving, Self-Direction, Collaboration, and Informed Thinking in all subject areas.
Project Goals

To train teachers to identify evidence of proficiency in all transferable skills, using shared and rigorous scoring criteria.
Project Goals

To certify teachers as aligned scorers of student work that demonstrates Communication, Problem Solving and Informed Thinking.
Project Goals

To create ways for students to compile teacher-approved evidence of proficiency in all the Transferable Skills.
How Can You Get Involved?

We are searching for student work to use in the scoring calibration system.

Any high school teacher who will have students complete a task that is aligned with any of the task models can submit student work samples.
How Can You Get Involved?

If you are interested in submitting student work, sign up using the link on this page: www.greatschoolspartnership.org/transferableskills

On this page, you will also find:

• resources for teaching and assessing the Transferable Skills
• information about recognition for your work should you choose to participate
Sample Performance Indicators + Scoring Criteria
Sample Performance Indicators

Creative + Practical Problem Solver

1. Observes and evaluates situations to define problems
2. Frames questions, makes predictions and designs data/information collection and analysis strategies
3. Identifies patterns, trends and relationships that apply to solutions
4. Generates a variety of solutions, builds a case for a best response and critically evaluates the effectiveness of the response
5. Sees opportunities, finds resources and seeks results
6. Uses information and technology to solve problems
7. Perseveres in challenging situations
## Sample Scoring Criteria

### Creative + Practical Problem Solver

<table>
<thead>
<tr>
<th>Performance Indicator</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td><strong>A. Observe and evaluate situations in order to define problems.</strong></td>
<td>I can make observations about situations.</td>
<td>I can make observations about situations <strong>identify relationships</strong> to make inferences about a problem. propose possibilities to define a problem.</td>
<td>I can categorize observations and information from <strong>multiple sources</strong> identify situational constraints and <strong>articulate</strong> the problem.</td>
<td>I can analyze situations to define complex problems and <strong>explain</strong> their relevance within the world.</td>
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Functions of Scoring Criteria

For the student

• To provide clarification for the student about what the target is and what they need to do to demonstrate proficiency

• To provide clarification for the student about what they need to work on.
Functions of Scoring Criteria

For the teacher

• To guide instruction by defining the steps that a student will move through on the way to proficiency

• To guide the scoring of assessments
PLEASE Keep Your Phones Muted
We will keep a speakers’ list and call on folks individually. Feel free to type your questions in the chat space, too.

Conference Call Number:
1-888-450-5996, Participant code: 706042#
Thank You