Graduation Guidelines & 21st Century Skills

Jo O’Brien
Colorado Department of Education
High School Students in Colorado

A Mastery Minded Approach
Colorado High School students

- **What** do students need to know and prove they can do?
- How can we best **measure** this for better workforce and college prep?
- How have our Colorado high school students been doing academically **before** the standards were raised?
- How might we redesign the high school graduation system so a **diploma** is more meaningful?
Colorado High School students will soon:

• Be expected to reach a higher bar of academic knowledge

• Be expected to accurately apply academic knowledge to solve new or uncertain dilemmas

• Be expected to start working online to accelerate and demonstrate their thinking
What must a student know?

1. Grades K-12th
2. New content expectations/standards:
   - Math
   - Reading
   - Writing
   - Science
   - Visual Arts
   - Social Studies
   - Drama
   - Music
   - Career/Technical
   - Health
   - PE
   - World Language
   - Drama

   (informed by MA, VA, Singapore, Finland)

3. AND for 48 states the ones in red are the same
12 Big Ideas in SCIENCE

Examples of the high school graduate threads of expectations:

• Can explain and predict, using natural phenomena, what is governed by Newton's Laws of Motion

• Can solve problems of the natural world scientifically and form rational explanations based on evidence

• Can analyze essential properties of matter and predict outcomes of chemical reactions
One thread in SCIENCE

( example: Know and Apply Newton’s Laws of Motion)

so then...

12th

Identify the limitations of Newton’s laws in an extreme setting.

11

9

Justify an evidence based analysis of forces in motion acting on an object and the acceleration produced by a net force.

8

7

6

5

4

Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical

3

2

1

K

Note motion of objects
Demonstrating proof of 21st century skills in Science (and every other subject)

- **Critical Thinking and Reasoning K-12**
  Students use logic to make a claim, correctly identify pertinent issues, solve smaller scoped problems, advance evidence to prove solutions and make informed decisions.

- **Information Literacy K-12**
  Students find, evaluate, display and use high quality information.

- **Collaboration K-12**
  Students work together, sometimes from different locations, to solve small scale problems, build large scale solutions or produce original knowledge.

- **Self-direction K-12**
  Students take personal responsibility for their learning by becoming more intellectually mature in their evaluation of work, practicing the habits of being a reliable thinker and exercising persistence toward better self performance.

- **Invention K-12**
  Students invite on-going self learning, construct new knowledge, and create innovative solutions in uncertain or new situations.
We need to measure ...

- What does she know about math, reading, science, social studies, writing?
  
  NEW TEST

- When does she apply this knowledge to get the job done?
  
  DEMONSTRATIONS

- How thoughtful in planning and exploring can a student be about her next steps?
  
  CAREER/COLLEGE Exploring PORTFOLIO
Choose each experimental condition below to determine the time required to dissolve an effervescent tablet at three temperatures.

Record the results of your experiment by plotting data points on the graph below. Click on the graph to add a point. Points can be dragged to new positions or dragged off the graph to remove them.

**Effect of Temperature on Time to Dissolve a Tablet in Water**

<table>
<thead>
<tr>
<th>Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>20</td>
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<tr>
<td>30</td>
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<td>60</td>
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<td>70</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>90</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

Temp (°C)
So what...for you?

Beginning in 2014 in Science you will have feedback regarding the Colorado student pipeline for every student:

1. “On track” or “off track” trend lines for knowledge in Science from 3rd-12th grade
2. Critical Thinking and Reasoning in Science trends
3. Using Science Information Gathering trends
4. Collaboration/Science (pending)
5. Self-direction/Science (pending)
6. Invention/Science (pending)
Colorado High School students

• **What** do students need to know and prove they can do?
• How can we best **measure** impact on workforce and college outcomes?
• How have our Colorado high school students been doing academically **before the standards were raised**?
• How might we redesign the high school graduation system so a **diploma** is more meaningful?
## Colorado’s High School Academic Student Performance

<table>
<thead>
<tr>
<th>NAEP Achievement: 3rd grade Reading</th>
<th>% of CO students performing at or above Proficient level</th>
<th>CSAP: 10th grade Reading</th>
<th>% of CO students performing at or above Proficient level</th>
</tr>
</thead>
<tbody>
<tr>
<td>All students</td>
<td>32</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>White</td>
<td>40</td>
<td>43</td>
<td>41</td>
</tr>
<tr>
<td>Black, non Hispanic</td>
<td>18</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Economically Disad.</td>
<td>15</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Limited English Prof.</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NAEP Achievement: 3rd grade Math</th>
<th>% of CO students performing at or above Proficient level</th>
<th>CSAP: 10th grade Math</th>
<th>% of CO students performing at or above Proficient level</th>
</tr>
</thead>
<tbody>
<tr>
<td>All students</td>
<td>32</td>
<td>37</td>
<td>40</td>
</tr>
<tr>
<td>White</td>
<td>43</td>
<td>48</td>
<td>51</td>
</tr>
<tr>
<td>Black, non Hispanic</td>
<td>11</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>Hispanic</td>
<td>10</td>
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<td>19</td>
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<tr>
<td>Limited English Prof.</td>
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<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Colorado’s Graduation, College Enrollment, and Remediation Rates

<table>
<thead>
<tr>
<th>% of Colorado High School Students from the graduating class of:</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO High School Graduation Rate</td>
<td>75</td>
<td>72</td>
</tr>
<tr>
<td>College Enrollment Rate (only in CO)</td>
<td>48</td>
<td>54</td>
</tr>
<tr>
<td>College Enrollment Rate (both in &amp; out of CO)</td>
<td>65</td>
<td>-</td>
</tr>
<tr>
<td>Reading Remediation (2 year colleges)</td>
<td>35</td>
<td>33</td>
</tr>
<tr>
<td>Reading Remediation (4 year colleges)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Math Remediation (2 year colleges)</td>
<td>52</td>
<td>53</td>
</tr>
<tr>
<td>Math Remediation (4 year colleges)</td>
<td>15</td>
<td>19</td>
</tr>
</tbody>
</table>
Colorado High School students

- What do students need now to know and prove they can do?
- How can we best measure this for better workforce and college prep?
- How have our Colorado high school students been doing academically before the standards were raised?
- How might we redesign the high school graduation system so a diploma is more meaningful?
Currently...

- 178 school districts have 178 graduation requirements.

- To exit the K-12 education system a certain number of credits are required based on grade points and “seat time”.

- Schools want to see their students graduate with a diploma that has more meaning.

- State statute (section 22-2-106) requires the State Board of Education to adopt a state set of guidelines for high school graduation requirements by May 2013.
Graduation Guidelines

• Local school boards may use their own locally developed graduation requirements so long as they “meet or exceed” any minimum standards or core competencies/skills adopted by the state board.

• In fall of 2014, districts will begin implementing these graduation guidelines for 9th graders for on time graduation in 2018.
Graduation Guidelines Components

- Guiding principles
- Academic mastery level
- 21st century skill proof levels
- Sufficient illustration of career and college planning
Guiding Principles of new High School Graduation Guidelines- DRAFT

• Create a meaningful high school diploma:
  • Students should demonstrate that they have met minimum exit criteria signaling that they are prepared to: be responsible citizens, enter postsecondary education or military service without need for remediation, and be productive entry-level employees.

• Student ownership:
  • Students should have early access to information about their education, be encouraged to take rigorous coursework, and understand how the coursework and experiences in which they select to participate have implications for their career goals.

• Flexibility:
  • Students should have multiple, equally rigorous and valued pathways to postsecondary education and meaningful careers. Students should have flexibility to change their minds about postsecondary and workforce goals, as they are exposed to a variety of experiences.
Graduation Guidelines Components

- Guiding principles
- Academic mastery level
- 21st century skill proof levels
- Sufficient illustration of career and college planning
Demonstrating Academic Mastery- DRAFT

- Student must demonstrate mastery of the following academic content areas:
  - Reading, Writing and Communicating;
  - Mathematics;
  - Social Studies;
  - Science;
  - and at least one other content area from the Colorado Academic Standards or Career and Technical Education standards

- And, there are several ways in which students can demonstrate this mastery....
High School Graduation Guidelines: Ways to Demonstrate Academic Mastery – DRAFT

<table>
<thead>
<tr>
<th></th>
<th>Mathematics</th>
<th>English Language Arts</th>
<th>Science</th>
<th>Social Studies</th>
<th>1 other content area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Successful completion of military entrance exams</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td>Achieving necessary cut-scores on statewide assessments (TCAP, PARCC)</td>
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<tr>
<td>3.</td>
<td>Successfully completing a journeyman apprenticeship</td>
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<tr>
<td>4.</td>
<td>GED</td>
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<tr>
<td>5.</td>
<td>Achieving cut-scores on national college/career ready exams (ACT, SAT)</td>
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<tr>
<td>6.</td>
<td>Successful completion of college credit bearing courses</td>
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<tr>
<td>7.</td>
<td>Achieving necessary cut-scores on college credit bearing exams such as AP, IB</td>
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<tr>
<td>8.</td>
<td>Achieving necessary cut-score on course placement exams</td>
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<tr>
<td>9.</td>
<td>Achieving necessary GPA</td>
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<tr>
<td>10.</td>
<td>Successful completion of career ready exams/experiences</td>
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<tr>
<td>11.</td>
<td>Successful completion of an industry certification or licensure</td>
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<tr>
<td>12.</td>
<td>Demonstration of mastery through student work or performances</td>
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<tr>
<td>13.</td>
<td>Successful completion of academic units/ credits of coursework</td>
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<tr>
<td>14.</td>
<td>Successful completion of local end-of-course exams</td>
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<tr>
<td>Scenario</td>
<td>CCHE</td>
<td>Endorsed diploma</td>
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<tr>
<td>A ~15th percentile</td>
<td>no need for remediation</td>
<td>~60th percentile</td>
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<td>B ~30th percentile</td>
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<td>~69th percentile</td>
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<td>C ~ 45th percentile</td>
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<tr>
<td>D ~60th percentile</td>
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</tbody>
</table>

1. Successful completion of military entrance exams
   - ASVAB 15 30 45

2. Achieving cut-scores on statewide assessments (TCAP, PARCC)
   - TCAP Math (N=54662) 512 scale score (8257) 553 scale score (16160) 584 scale score (24399) 611 scale score (32599) 627 scale score (37559)

3. Successfully completing journeyman apprenticeship
   - GED (N=3152) 430 460 490 510 530

4. Achieving cut-scores on national college/career ready exams (ACT, SAT)
   - ACT Math (N=49303) 15 (4648) 16 (10615) 18 (21608) 19 (24500) 21 (27844) 22 (31515)
   - SAT 370 410 450 470 500 600

5. Successfully completing college credit bearing courses
   - Concurrent Enrollment N/A N/A N/A Math 120 (C- or higher) Cor better in gT Pathways courses C or better in gT Pathways courses

6. Achieving cut-scores on college credit bearing exams such as AP, IB
   - AP N/A N/A N/A 3+ AP exam score 3+ AP exam score
   - IB N/A N/A N/A 4+ IB exam score 4+ IB exam score

7. Achieving necessary cut-score on course placement exams
   - Accuplacer N/A N/A N/A 85+ Accuplacer Intermediate Algebra

8. Achieving necessary GPA
   - GPA (16846*3=50592) 2.64 (2495*3=7485) 3.00 (4883*3=14649) 3.28 (7538*3=22614) 3.51 (10103*3=30309) 3.81 (13179*3=39537)

9. Successful completion of career ready exams/experiences
   - CTE N/A N/A N/A

10. Successfully completing industry certification/licensure
    - CTE N/A N/A N/A

11. Demonstrate mastery via collection of student work or performances
    - CTE N/A N/A N/A

12. Successful completion of academic units/credits of coursework
    - Credit hours 4 High School credits or 090 MAT = 3 yrs 106 MAT= 4 yrs 4 credits

13. Successful completion of local end-of-course exams
    - N/A N/A N/A N/A

* (number, percent) of graduated students who would not have been able to graduate if this cut score had been used in 2009.
<table>
<thead>
<tr>
<th>Scenario</th>
<th>15th Percentile</th>
<th>30th Percentile</th>
<th>CCHE No Need for Remediation</th>
<th>45th Percentile</th>
<th>60th Percentile</th>
<th>Endorsed Diploma ~78th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario A</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Scenario B</td>
<td>632 (8171)</td>
<td>665 (16366)</td>
<td>685 (24244)</td>
<td>703 (32486)</td>
<td>725 (42397)</td>
<td></td>
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<tr>
<td>Scenario C</td>
<td>460</td>
<td>490</td>
<td>540</td>
<td>570</td>
<td>640</td>
<td></td>
</tr>
<tr>
<td>Scenario D</td>
<td>370</td>
<td>410</td>
<td>440 Writing 430 Reading</td>
<td>450</td>
<td>500</td>
<td>597 (600)</td>
</tr>
</tbody>
</table>

1. Successful completion of military entrance exams
   - ASVAB

2. Achieving cut-scores on statewide assessments (TCAP, PARCC)
   - TCAP Reading (N=54662)
   - SAT Reading

3. Successfully completing journeyman apprenticeship
   - GED (N=3152)

4. Achieving cut-scores on national college/career ready exams (ACT, SAT)
   - ACT Read. (N=49303)
   - SAT

5. Successful completion of college credit bearing courses
   - Concurrent Enrollment

6. Achieving cut-scores on college credit bearing exams such as AP, IB
   - AP
   - IB

7. Achieving necessary cut-score on course placement exams
   - Accuplacer

8. Achieving necessary GPA
   - GPA

9. Successful completion of career ready exams/experiences
   - CTE

10. Successfully completing industry certification/licensure

11. Demonstrate mastery via collection of student work or performances

12. Successful completion of academic units/credits of coursework
    - Credit hours

13. Successful completion of local end-of-course exams

14. * (number, percent) of graduated students who would not have been able to graduate if this cut score had been used in 2009.
Graduation Guidelines Components

- Guiding principles
- Academic mastery level
- 21st century skill proof levels
- Sufficient illustration of career and college planning
Demonstrating proof of 21st century skills

- **Critical Thinking and Reasoning**
  Students use critical thinking skills to conduct research, use reason to make a claim, solve problems, advance evidence to prove solutions and make informed decisions.

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  Students demonstrate new approaches to learning, construct new knowledge, and create innovative solutions in uncertain or new situations.
Graduation Guidelines Components

- Guiding principles
- Academic mastery level
- 21\textsuperscript{st} century skill proof levels
- Sufficient illustration of career and college planning
Providing sufficient illustration of planning

- Career Planning  9-12th
- Work Exploration  9-12th
- Academic Progress  9-12th
- College Exploration  9-12th
- Financial Literacy  9-12th
We need your thinking on two things...

- Would a diploma that illustrates mastery benefit you?
- Do these components seem appropriate?
Thank you...

Jo O’Brien
Assistant Commissioner
Strategic Priorities and Research
Colorado Department of Education

obrien_j@cde.state.co.us

303-866-6852
Student Performance

- **Career & Tech Education**
  - CSAP: 680/581
  - ACT: 19 / 18
  - GPA: 3.05

- **All students**
  - CSAP: 683/586
  - ACT: 20 / 19
  - GPA: 3.28

- **High School Graduates**
  - CSAP: 697/605
  - ACT: 21 / 21
  - GPA: 3.21

- **Concurrent Enrollment**
  - CSAP: 708/617
  - ACT: 22 / 22
  - GPA: 3.45

- **Advanced Placement**
  - CSAP: 723/641
  - ACT: 24 / 24
  - GPA: 3.48

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**High School College**

- **060 Reading Remediation**
  - CSAP: 647/532
  - ACT: 14 / 15
  - GPA: 2.6

- **060 Math Remediation**
  - CSAP: 683/566
  - ACT: 19 / 16
  - GPA: 2.55

- **090 Reading Remediation**
  - CSAP: 663/556
  - ACT: 15 / 16
  - GPA: 2.63

- **090 Math Remediation**
  - CSAP: 692/580
  - ACT: 19 / 17
  - GPA: 2.75

- **2 year didn’t persist**
  - CSAP: 674/568
  - ACT: 18 / 17
  - GPA: 2.62

- **Successful 2 year college student**
  - CSAP: 710/628
  - ACT: 22 / 22
  - GPA: 3.09

- **Successful 4 year college student**
  - CSAP: 723/643
  - ACT: 24 / 24
  - GPA: 3.47

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**Continuum of Academic Performance**

To score Proficient/Advanced on CSAP: ≥ 663 in Reading and 627 in Math
Higher Education Admissions Requirements ACT: ≥ 17 in Reading and ≥ 19 in Math