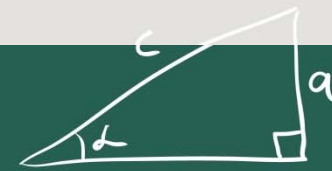# Report and Recommendations of the
Task Force on Gateway Mathematics Success

For Presentation to the Academic, Research and Student Affairs Committee

June 11, 2015
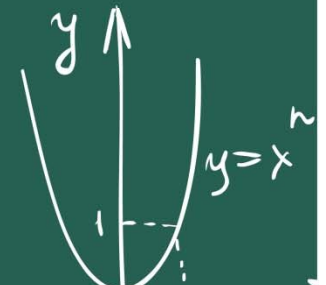
Task Force Objectives

❖ **Task Force on Gateway Mathematics Success**
- Established by the Chancellor
- Support from Complete College America and the Charles A. Dana Center

❖ **Task Force Objective**
- Increase success in gateway mathematics across the System
- Increase degree completion

❖ **Timeline for work**
- Two year project
- Year One of the project ended ahead of schedule with the completion of the Task Force report and policy recommendations
- Year Two of the project will begin in September 2015 with a reconvened and expanded Task Force charged with implementation

The Challenge

Students are . . .

🕐 **Taking too much time**

Taking too many credits

Languishing at Remedial Level

🎓 **Not graduating**

The Approach of the Task Force

❖ **Driven by Data**
- Course completion of gateway mathematics courses
- Subsequent course enrollment – are students on track to meeting requirements
- Impact of remediation on completing the gateway mathematics course within one year of enrollment
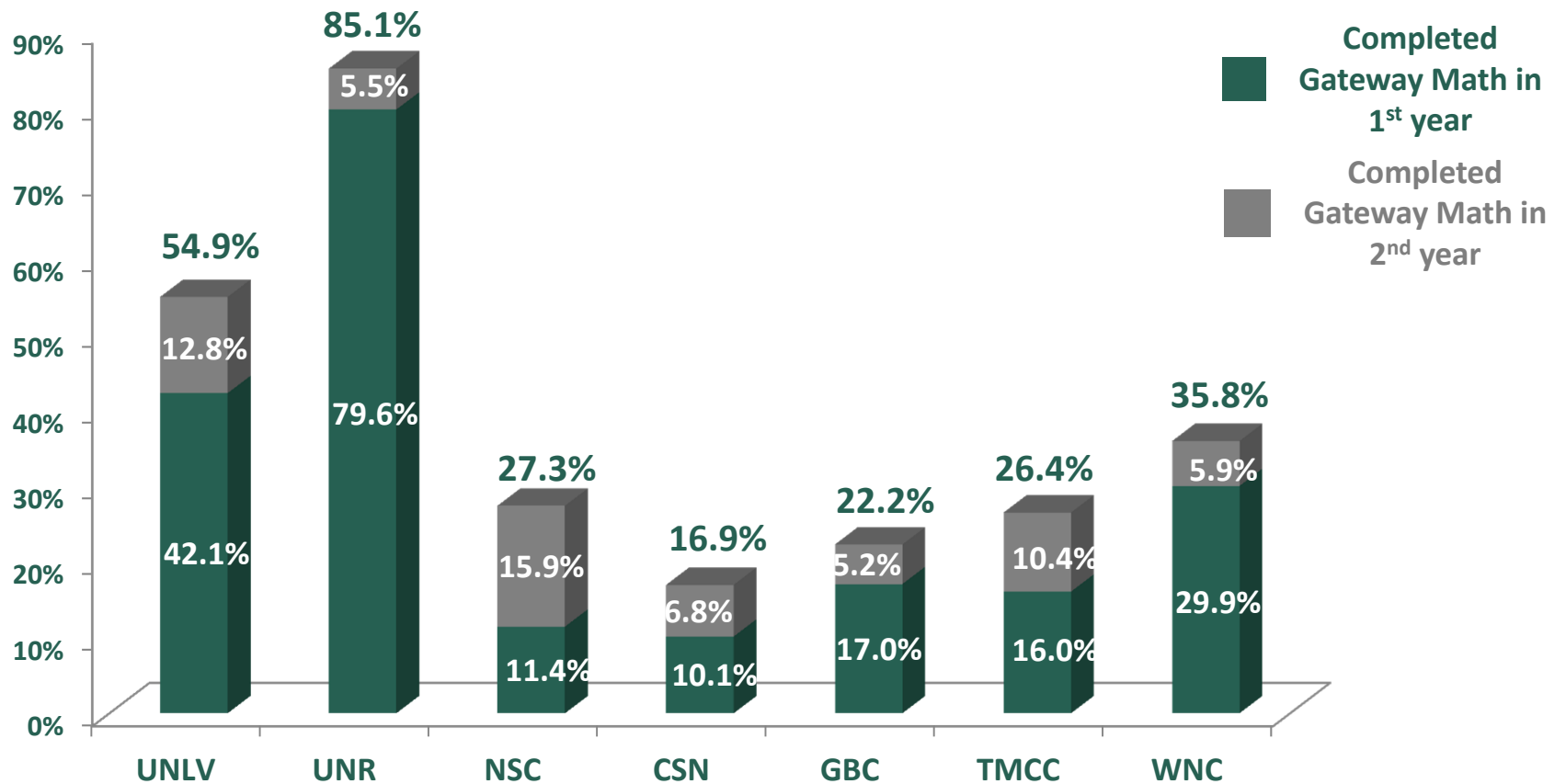
❖ **April 2014 NSHE Gateway Mathematics Summit**
- Set the stage for the work of the Task Force
- Clear objective based on data – increase the number of students that complete the gateway mathematics course within the first year of enrollment

Setting the Stage
Gateway Course Completions

Percent Completed Gateway Math within First 2 Years
Fall 2012 First-Time, Degree-Seeking Freshmen Cohort

Legend:
- **Completed Gateway Math in 1st year** (green)
- **Completed Gateway Math in 2nd year** (gray)

Chart data:

Institution	Completed in 1st year	Completed in 2nd year	Total
UNLV	42.1%	12.8%	54.9%
UNR	79.6%	5.5%	85.1%
NSC	11.4%	15.9%	27.3%
CSN	10.1%	6.8%	16.9%
GBC	17.0%	5.2%	22.2%
TMCC	16.0%	10.4%	26.4%
WNC	29.9%	5.9%	35.8%

The Importance of Timely Gateway Mathematics Success

Impacts on Graduating Students

Fall 2007 cohort	% Completed Gateway Math in first 2 years	150% Graduation Rate	% not Completed Gateway Math in first 2 years	150% Graduation rate
UNLV	59.5%	48.8%	40.5%	22.6%
UNR	79.2%	52.0%	20.8%	12.7%
NSC	37.0%	25.0%	63.0%	3.9%
CSN	16.9%	23.2%	83.1%	3.9%
GBC	17.5%	26.8%	82.5%	1.8%
TMCC	18.8%	31.8%	81.2%	1.5%
WNC	35.1%	30.9%	64.9%	0.3%

Task Force Finding: Timely completion of gateway mathematics courses correlates with students persistence and degree completion.

$$k = tg\alpha$$
$$(a \cdot b)^m = a^m \cdot b^m \quad \sin(\alpha \pm \beta) = \sin\alpha \cdot \cos\beta \pm \cos\alpha \cdot \sin\beta$$

No Math in the First Year

Too many students do <u>not</u> enroll in any math course in their first year

	Percent of first-time, degree-seeking students that did <u>not</u> enroll in math in the first year of enrollment (Fall 2012 cohort)
UNLV	18.9%
UNR	4.6%
NSC	32.6%
CSN	67.7%
GBC	38.7%
TMCC	31.2%
WNC	30.1%

What is the "right math"?

College Algebra → Calculus →

S
T
E
M

Task Force Finding: A comprehensive examination of the mathematics requirements of NSHE programs found no programs requiring college algebra as a default, without any particular curricular reason for the requirement.
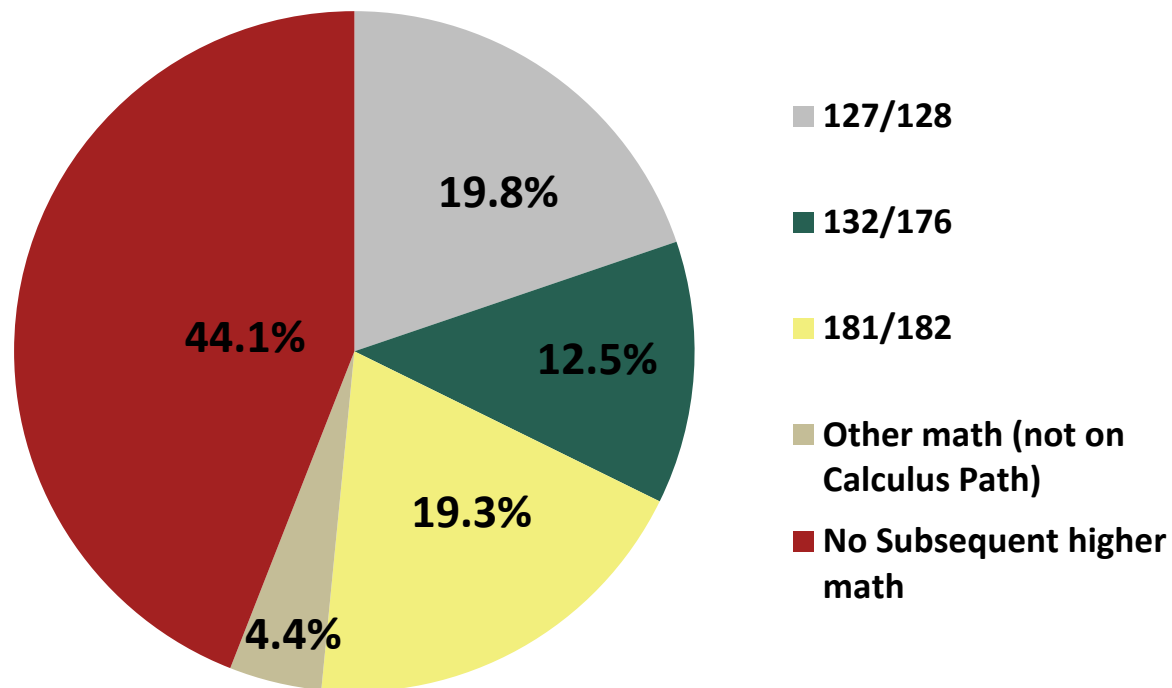
$$k = tg\alpha \quad (a \cdot b)^m = a^m \cdot b^m \quad \sin(\alpha \pm \beta) = \sin\alpha \cdot \cos\beta \pm \cos\alpha \cdot \sin\beta$$

Math Enrollment Patterns Subsequent to Math 126

Highest Subsequent Math Enrolled within Two Years (All Institutions)
For Students who Started in Math 126 in Fall 2012

Pie chart:

- 127/128 — 19.8%
- 132/176 — 12.5%
- 181/182 — 19.3%
- Other math (not on Calculus Path) — 4.4%
- No Subsequent higher math — 44.1%

NOTE: No reported enrollments in Math 126 in Fall 2012 for NSC.

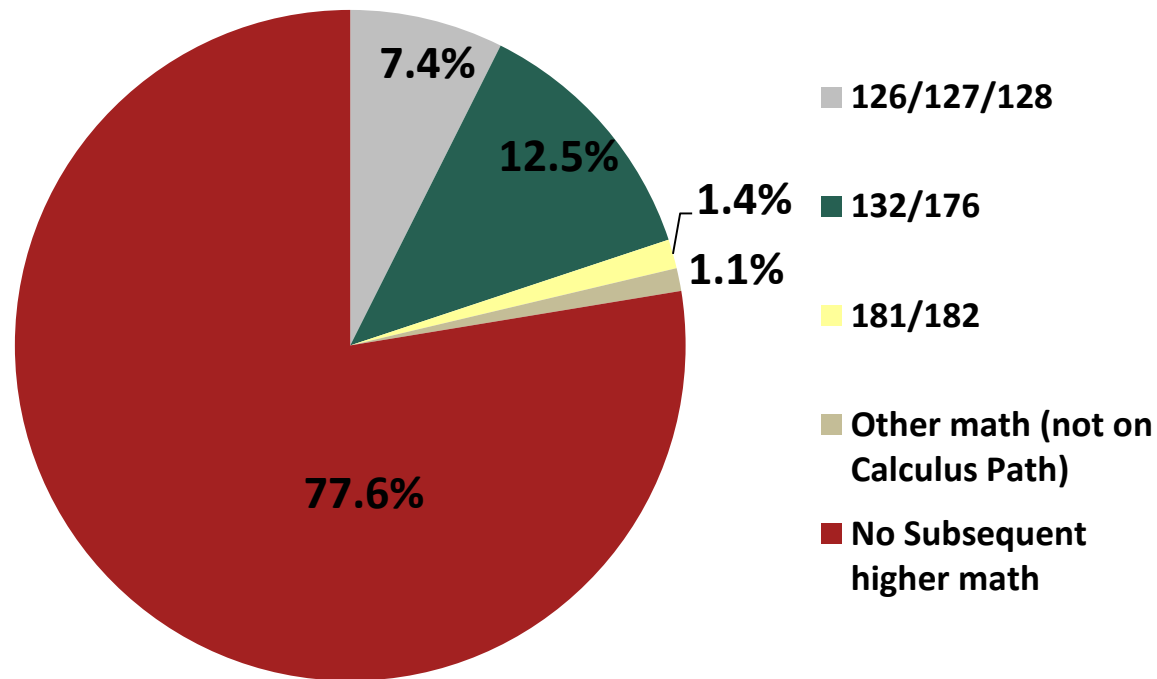# Further Analysis of Subsequent Enrollment Patterns

Math 126

- 44.1 percent students who took Math 126 in Fall 2012 (or 1,577 students) did not enroll in a higher mathematics course.

- 31.3 percent of these 1,577 students were not enrolled in the 2013-14 academic year.

- Of the 1,062 still enrolled in 2013-14, 390 who failed Math 126, and 198 who passed Math 126 failed to enroll in the subsequent mathematics course required for their program of study.

Task Force Finding: Too many students are not completing the required mathematics course for their major in a timely fashion.

Math Enrollment Patterns Subsequent to Math 124

Highest Subsequent Math Enrolled within Two Years
For Students who Started in Math 124 in Fall 2012

7.4%

12.5%

1.4%

1.1%

77.6%

- 126/127/128
- 132/176
- 181/182
- Other math (not on Calculus Path)
- No Subsequent higher math

NOTE: Only CSN, UNLV and NSC reported enrollments in Math 124 in Fall 2012.

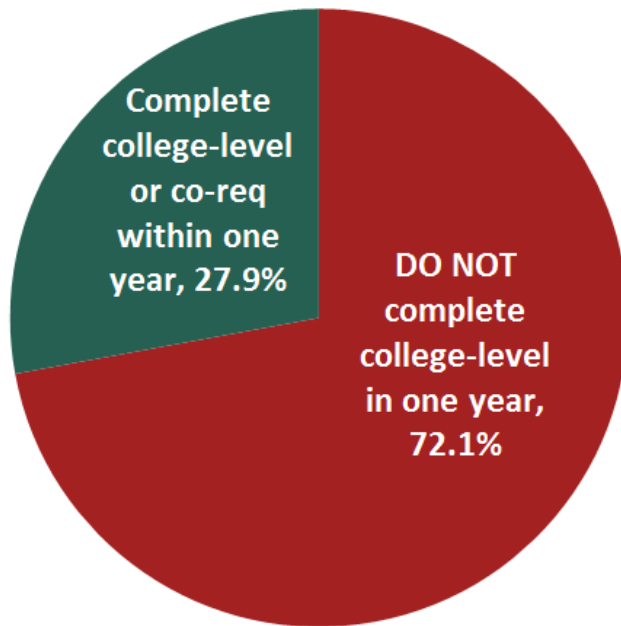# Further Analysis of Subsequent Enrollment Patterns

Math 124

- 77.6 percent students who took Math 124 in Fall 2012 (or 1,470 students) did not enroll in a higher mathematics course.

- 22.1 percent of these 1,470 students were not enrolled in the 2013-14 academic year.

- Of the 1,052 still enrolled in 2013-14, 417 who passed Math 124 failed to enroll in the subsequent mathematics course required for their program of study.

Task Force Finding: Too many students are not completing the required mathematics course for their major in a timely fashion.

Bottleneck from Remedial to College Level
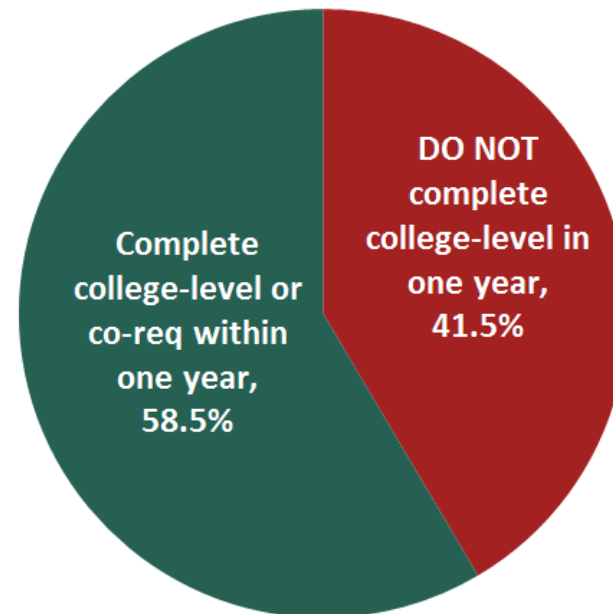
How well is Math096 working in getting students into a college level math course within one year?

2-year NSHE Institutions

Complete college-level or co-req within one year, 27.9%

DO NOT complete college-level in one year, 72.1%

4-year NSHE Institutions

DO NOT complete college-level in one year, 41.5%

Complete college-level or co-req within one year, 58.5%

Remedial to College Level Challenges

Students Enrolled in Math 095 or Math 096 in Fall 2013
Percent that Complete a College-level Course within One Year

	Math 095 Enrollment	% Completed College-Level Course w/in one year	Math 096 Enrollment	% Completed College-Level Course w/in one year
UNLV	702	4.7%	274	24.8%
UNR	260	24.6%	435*	80.5%
NSC	22	27.3%	17	41.2%
4-year Total	984	10.5%	726	58.5%
CSN	334	13.2%	210	19.0%
GBC	14	7.1%	17	41.2%
TMCC	134	7.5%	225*	30.2%
WNC	169	13.6%	86	40.7%
2-year Total	651	12.0%	538	27.9%

NOTE: Cohort includes first-time, degree-seeking students only
*co-requisite course enrollments included

Task Force Finding: Traditional remedial pathways do not result in timely completion of gateway mathematics courses. Co-requisite courses appear to result in much higher rates of successful completion of gateway mathematics in the first year of enrollment.

$$k = tg\,\alpha$$
$$(a \cdot b)^m = a^m \cdot b^m \qquad \sin(\alpha \pm \beta) = \sin\alpha \cdot \cos\beta \pm \cos\alpha \cdot \sin\beta$$

(ACADEMIC, RESEARCH AND STUDENT AFFAIRS COMMITTEE 06/11/15) Ref. ARSA-10b, Page 14 of 23

Task Force Recommendations

The Task Force Recommendations focus primarily on:

1. Revisions to Board of Regents' policy concerning the placement of degree-seeking students;

2. Future reporting and monitoring of adopted policy changes; and

3. Implementation and scaling up.

Revisions to Board Policy
(Title 4, Chapter 16, Section 1)

Suggest Revisions to the Board's Remedial Placement Policy

- Maintain the ACT "guarantee" for recent high school graduates with 12th grade conditions – adopted by the Board in December 2014

- Degree-seeking students that place below college level, but are at least high school ready, must be placed on a pathway for gateway course completion (English and mathematics) within the first year of enrollment

  - ✓ Exception for students in a STEM program – placement into a three-semester sequence culminating in the gateway college algebra course

- Pathways are not applicable to students who place below the high school level

- The Chancellor will work with the state superintendent to publicize requirements to all school districts

(ACADEMIC, RESEARCH AND STUDENT AFFAIRS COMMITTEE 06/11/15) Ref. ARSA-10b, Page 16 of 23

Section 1. NSHE Placement Policy

The placement policies of the Nevada System of Higher Education (NSHE) are intended to ensure a foundation of knowledge and competencies that will assist students in successfully pursuing and attaining an academic degree. Students are strongly encouraged to prepare for the rigors of higher education prior to entering the NSHE.

1. Pursuant to federal regulations, institutions may make ability-to-benefit determinations using federally approved tests and passing scores to receive federal student aid. The NSHE reserves the right to cancel the admission or registration of any individual whose attendance at a university or college, in the opinion of the appropriate administrative officer and the President, would not be mutually beneficial, as determined by the ability-to-benefit test, to that individual and the university or college.

2. [Effective Fall 2016, entering students from Nevada high schools will have participated in a statewide administration of the ACT exam in their junior year of high school, and some students may elect to take the ACT exam more than one time. Any student]

2. ***Initial Placement of Students into English and Mathematics Courses.***

    a. ***Exemption from Remedial Instruction. Degree-seeking students*** who meet[s] or exceed[s] the ***minimum*** English or mathematics scores ***on*** [for the ACT] ***any one of the college readiness assessments listed below*** [under subsection 4] must be placed into a college-level course in that subject [based on the student's highest ACT test score] ***and are exempt from being placed into any form of remedial instruction in that subject provided that the student:***

        i. ***Was continuously enrolled in an English course and a mathematics course in his or her senior year of high school unless an exception is approved on a case by case basis by an NSHE institution; and***
        ii. ***Enrolls in an NSHE institution after high school in any term (summer/fall/winter/spring) during the academic year following high school graduation***.

Institutions may use other factors including high school transcript, grade point average, or additional testing to determine the appropriate first college-level course***.*** [, or to place a student who did not meet the placement scores under subsection 4 into a college-level course. ***Institutions are not required to honor initial placement decisions pursuant to this subsection for students who fail to remain continuously enrolled in required mathematics and English courses until the core mathematics and English requirements are completed.***

[This subsection applies only to students who:

a. ~~Were continuously enrolled in an English and mathematics course in their senior year of high school unless an exception is approved on a case-by-case basis by an NSHE institution; and~~
b. ~~Enroll in an NSHE institution after high school in any term (summer/fall/winter/spring) during the academic year following high school graduation.]~~

College Readiness Assessments - English	
Test Score	*Minimum Score*
ACT English	*18*
SAT Critical Reading	*500*
Smarter Balanced	*2583 (Achievement Level 3)*
PARCC	*Level 4 Score*

College Readiness Assessment - Mathematics	
Test Score	*Minimum Score*
ACT Mathematics	*22*
SAT Mathematics	*500*
Smarter Balanced	*2628 (Achievement Level 3)*
PARCC	*Level 4 Score*

b. ***Placement of Students without an Exemption from Remedial Instruction. For degree-seeking students who have not met the English or mathematics college readiness assessment score on one of the tests in subsection a or who have not taken any of the tests in subsection a, institutions must develop an assessment and placement policy that ensures students who place at high school or above levels have an opportunity to enroll in and complete gateway college courses in mathematics and English within one academic year. The assessment and placement policy may use multiple measures, including, but not limited to placement exams; high school GPA; course selection and performance in the senior year of high school; and intended postsecondary program of study to determine appropriate placement into one the following options:***

    i. *Placement into college-level courses without any additional academic support or remediation;*
    ii. *Placement into a co-requisite course where academic support is provided to students while enrolled in college-level gateway courses;*
    iii. *Placement into a single semester of remedial education that is followed by either a gateway college-level course or co-requisite gateway course option; or*
    iv. *For students who are seeking a STEM (science, technology, engineering or mathematics) degree or program of study that requires college algebra or pre-calculus and who place at the high school Algebra 1 level (e.g. Math095), placement into a three-semester sequence culminating in the gateway college algebra course. The sequence may include co-requisite coursework.*

c. *Institutions may establish alternative pathways to those described in subsection b for those degree-seeking students whose mathematics or English skills are below the high school level as established by the institution's assessment and placement policy set forth in subsection b.*

3. ~~[All degree-seeking students must complete the appropriate entry-level English and mathematics course work within the first 30 college-level credits year of enrollment unless otherwise authorized by the institution. Institutions should support enrollment in the appropriate entry-level, credit bearing college course immediately upon completion of any required remedial work. In addition]~~ *Unless an institutional exception is made*, all degree-seeking students [~~should~~] *must* be continuously enrolled in [~~the~~] appropriate mathematics and English courses until the institutional core curriculum mathematics and English requirements are completed.

~~[4. Except as otherwise provided in subsection 2, a student's English and mathematics placement test scores will serve as the foundation for decisions about the appropriate first college-level course. However, in addition to these scores, institutions may rely on other factors such as high school courses and grade point average, demonstrable competencies, and work experience to determine a student's college-content readiness and recommend placement.~~

~~a) English Placement. The following scores are minimum scores on tests a student may take or an institution may administer for placement into an entry-level, credit bearing college English course. Other appropriate placement tools may be used for English placement including reading tests, departmental diagnostic tests or other proprietary tests if supported by institutional research.~~

~~Test Score~~	~~Minimum Score~~
~~ACT English~~	~~18~~
~~SAT Critical Reading~~	~~440~~
~~Compass Writing Skills~~	~~69~~
~~Accuplacer Sentence Skills~~	~~80-86~~

~~b) Mathematics Placement. The following scores are minimum scores on tests a student may take or an institution may administer for placement into an entry-level, credit bearing college mathematics course. Other appropriate placement tools may be used for mathematics placement including reading tests, departmental diagnostic tests or other proprietary tests if supported by institutional research.~~

~~Test Score~~	~~Minimum Score~~
~~ACT Math~~	~~22~~
~~SAT Math~~	~~500~~
~~Compass Mathematics~~	~~65~~
~~Accuplacer College Level Math~~	~~50-63~~

~~5. Remedial education at NSHE institutions shall utilize instructional methods, including but not limited to co-requisite models in mathematics and English, and course designs that are most effective in ensuring that students are ready for and successful in completing an entry-level college course in English and mathematics.]~~

6]*4*. Requirements for college readiness and college-level course enrollment shall be publicized by each institution to the appropriate Nevada school districts. ***In addition, the Chancellor will work with the State Superintendent of Public Instruction to publicize these requirements to all Nevada school districts and to establish educational strategies to encourage high school standards, graduation requirements, and assessments that are aligned with college and workforce readiness expectations.***

5. *For purposes of this section, "college-level" means courses that are numbered 100-level and above.*

Follow-up Data Collection and Reporting

❖ Continue the collection of data to measure ongoing institutional progress and the impacts of the suggested revisions to the Board's placement policy

❖ Utilize statewide ACT data to validate the current NSHE ACT college readiness benchmarks, which are based on national data in the absence of statewide data

❖ Validate SBAC and PARCC scores when sufficient data is available for a study

Implementation and Scaling Up

❖ Full implementation of the policy revisions will not happen overnight, but will require substantial work on the part of the institutions and support from the System Office

❖ The Task Force will be expanded to include additional representatives from academic advising, admissions and institutional leadership to begin the work necessary for a Fall 2016 implementation target

QUESTIONS?