General Education Assessment Report 2020-2021

Prepared by Benjamin Worth, Vice President of Academic Affairs June 2021

OVERVIEW

Given the similarities in the four Transfer program curricula, one assessment report is compiled for all DSLCC transfer programs and is called the General Education Assessment Report. This report was renamed in 2019-2020 from the "General Studies Assessment Report" to more closely align with Virginia Community College System (VCCS) Transfer Virginia and State Council of Higher Education for Virginia (SCHEV) terminology.

This assessment encompasses the following Associate of Arts and Sciences degrees:

- Business Administration
- Business Administration with a Specialization in Business Foundations
- Education
- General Studies
- General Studies with a Specialization in Administrative Justice
- Science

Per VCCS Policy 5.0.2, General Education, DSLCC has adopted six General Education competencies, and these competencies are evaluated on a cyclical basis. Typically, only two competencies are assessed each year with the goal of assessing all competencies every six years. The assessments for student learning outcomes for a competency in any given year are conducted in the Spring semester, and results of the assessment are reviewed by the Office of Institutional Effectiveness and Research and (OIER) delivered as a report to faculty at the start of the Fall semester. Faculty use the results of the report to plan assessment report for the upcoming year. This General Education Assessment report was impacted by the 2020 COVID-19 Pandemic: assessments planned for Spring 2020 were postponed until Spring 2021. General Education Faculty did review student success data and studied the impact of the move to virtual instruction. This report documents those efforts and describes ongoing assessment initiatives.

PLANNED ASSESSMENT

Assessment of General Education competencies is developed and overseen by the General Education Assessment Workgroup which includes the following membership: the Academic Vice President (Ben Worth), Office of Institutional Effectiveness (Associate Vice President Matt McGraw), and DSLCC full-time transfer faculty members Tondalaya VanLear (English and Education), Tina Dressler (Psychology), Lee Anne Bowling-Angle (Biology and Chemistry), Sandra McHenry (Biology and Chemistry), Steve Nicholson (Mathematics), and Ashley Pratt (Mathematics). The assessment follows policies and procedures outlined in the DSLCC Assessment Plan.

For the cycle described in this report, the General Education Assessment Workgroup elected to assess Quantitative Literacy and Civic Engagement competencies:

Quantitative Literacy

Definition: Quantitative Literacy is the ability to perform accurate calculations, interpret quantitative information, apply and analyze relevant numerical data, and use results to support conclusions. Degree graduates will calculate, interpret, and use numerical and quantitative information in a variety of settings.

Student Learning Outcomes: Students will be able to…

> 1. Identify the proper formulas to evaluate and quantify physical and financial properties
>
> 2. Calculate the results of the appropriate formulas correctly with consistent units
>
> 3. Interpret the results of calculations to make proper decisions that are consistent with the discipline and reflect the validity and scope of the formula
>
> 4. Represent data and numerical information using equations, graphs, diagrams, tables and words
>
> 5. Use graphical, symbolic and numerical methods to analyze, organize and interpret data
>
> 6. Use quantitative evidence to support or clarify a position using verbal or written communication
>
> 7. Apply estimation to consider the reasonableness of numerical answers

Civic Engagement

Definition: Civic Engagement is the ability to contribute to the civic life and well-being of local, national, and global communities as both a social responsibility and a life-long learning process. Degree graduates will demonstrate the knowledge and civic values necessary to become informed and contributing participants in a democratic society.

Student Learning Outcomes: Students will be able to …

> 1. describe their own as well as others' political beliefs and cultural values in order to discover the strength that diversity of opinion brings to civic life;
>
> 2. deliberate on civic, social, and political challenges and problems in a civil manner;
>
> 3. summarize fundamental principles and debates about democracy and citizenship both within the United States and in other countries;
>
> 4. consider the ethical implications of public policy decisions;
>
> 5. identify how to become an engaged and contributing member of society through volunteerism and service.

COVID-19 PANDEMIC

As noted in the 2020 General Education Assessment Report, "The impact of the Pandemic will be felt more heavily in the 2020-2021 report." Indeed, the Coronavirus Pandemic of 2020 curtailed DSLCC assessment activities. Beginning March 18, 2020, DSLCC instruction shifted to an online mode, and the

campus closed. As of this writing, DSLCC campus remains closed to most students and visitors with college employees only permitted on site for essential activities.

Significantly, the Civic Engagement and Quantitative Reasoning assessments planned for Spring 2020 were cancelled. This prevented OIER from producing an assessment report for Summer 2020.

ONGOING ASSESSMENT ACTIVITIES

In the Fall 2020, the DSLCC General Education Assessment Workgroup met to explore ways assessing critical thinking and general education competencies at a distance using remote learning tools. The committee identified two the following instruments for assessment:

1. The Community and Civic Engagement Survey (CCES)
2. The Quantitative Reasoning for College Science (QuaRCS) Assessment

CCES was developed by the Democracy Commitment (TDC), a non-partisan national organization dedicated to advancing democracy in higher education, and to make democratic skills available to all individuals who desire a voice and a seat at the table of local, state, and national discourse and action. TDC provides a platform for the development and expansion of community college programs, projects, and curricula aimed at engaging students in civic learning and democratic engagement.   The CCES is used with their permission.

The Quantitative Reasoning for College Science (QuaRCS) Assessment is a validated assessment instrument that was designed to measure changes in students' quantitative reasoning skills, attitudes toward mathematics, and ability to accurately assess their own quantitative abilities. It has been administered to more than 5,000 students at a variety of institutions at the start and end of a semester of general education college science instruction.

The instruments were designed using a Google Form that permitted distribution at a distance both to general population students and to concurrent enrollment students taking classes in local high schools.

The assessment was delivered at all program sites during the Spring 2021 semester. Data from the assessment is being analyzed by OIER Summer 2021 and the results will be shared with DSLCC Faculty Fall 2021.

USE OF DATA TO IMPROVE INSTRUCTION

The cancellation of assessment gathering in Spring 2020 did not, however, prevent DSLCC faculty from examining data to improve the quality of DSLCC general education. DSLCC faculty were provided with the DWF Report for Fall 2019 and Fall 2020 as well as enrollment data. These reports are provided in the appendix. See screenshots below:

Due to the pandemic, data from Fall 2019 to Fall 2020 is challenging to parse. Percentage of students earning D's, F's, and W's increased slightly (2%) from Fall 2019 to Fall 2020.

	DFW-All	DFW-OnGround
Fall 2020	23%	20%
Fall 2019	21%	19%
Fall 2018	21%	21%

DSLCC FTE Comparison Report						
75th Day of Term - Reading Day						
12/10/2020						
		Fall 20		**Fall 19**		**Fall 18**
Headcount		1,075.00		1,032.00		981.00
Total Credits		9,406.00		8,844.00		9,076.00
FTES		627.07		589.60		605.07
Credits per Student		8.75		8.57		9.25

Additionally, general education transfer faculty were asked to provide a qualitative assessment of the impact of the shift to virtual learning that occurred due to the Pandemic: "How has the shift to virtual learning impacted critical thinking teaching and learning in your academic discipline?"

Responses are provided in the Appendix.

Key lessons learned include:

- High stress and anxiety brought on by illness, loss of jobs, lack of time management (Humanities, Social Sciences)
- Increase of non-academic impediments such as distraction of in-home settings, changing job demands, changing family demands (Humanities, Social Sciences)
- Diminished Opportunity for Interaction/Engagement (English & Education)
- Increase in DWFs (Social Sciences)
- Educational software solutions such as Socrative, Poll Everywhere, Pear Deck, and Canvas Breakout Rooms, can improve the virtual classroom environment (Mathematics); by allowing for anonymity, reluctant and shy students were more likely to participate in classroom activities.

APPENDIX

Appendix A – English & Education Report

Appendix B – Social Sciences Report

Appendix C – Natural Sciences Report

Appendix D – Mathematics Report

Appendix E – The Community and Civic Engagement Survey (CCES)

Appendix F - The Quantitative Reasoning for College Science (QuaRCS) Assessment

Appendix G – DFW Report

Appendix H – FTE Comparison Report

General Ed. Assessment: English and Education

How has the shift to virtual learning impacted critical thinking teaching and learning in your academic discipline?

In order to determine the impacts the virtual shift demanded of students and faculty as a result of the pandemic, I would need a very keen crystal ball. I do not have one. I can report, though, that this sudden and challenging change required us to "pull out the stops" as we, both instructors and students, grappled with the comparison of in-person and forced "on screen" only--often adaptation was in the moment. Not all changes were bad—innovation and "ah-ha" moments were shared, but there was also the frustration of multiple influences and demands from outside non-academic elements (distraction of in-home settings, changing job demands, changing family demands), which increased stress and anxiety in class sessions as we navigated class interactions and content learning time.

To meet those needs in my English classes, I and other instructors in the department gave more time at the beginning of the session for students to share concerns, as they felt comfortable doing so. This time provided an outlet for them and a chance for instructors to adjust what was planned for the session "on the fly" if need be. While I have no documented evidence this decision improved learning, this time did improve interaction and brought a greater willingness from students in private conferences to acknowledge struggles and seek ways to keep on pace.

To also adjust and help, I and other instructors suspended late penalties and gave multiple opportunities for revision work, with resource help, and continued to do so through this academic year. Multiple emails and alerts also helped, and other instructors have reported similar actions in trying to help student handle the stress of the shift. Unfortunately, some students could not keep pace, and I have seen more students than in previous semesters who were unable to handle the challenges. Obviously, critical thinking and learning have been impacted, evidenced by an increase in the number of failing grades and students reporting high anxiety, frustration, and depression.

A large impact for Education students has been the restriction of in-person observations for their courses. While I secured professional classroom videos students could use as part of that required experience, students have struggled to observe in-person with limited opportunity as a result of multiple area school closings. This challenge to foundational experience has increased student stress because of the contrast of a passive focus (watching a video of a classroom) rather than the active one (physically in a classroom). Some students felt a loss of experience and struggled with completing observation hours and responses. Those observations also inform in-class discussions/interactions, so that opportunity for critical thinking exchange was affected.

High stress and anxiety have been part of asynchronous online classes as well because of family concerns (illness, loss of jobs, lack of time management, etc…), and some students had difficulty balancing their independent study and preparation time needed for working on class assignments/requirements. For both synchronous and asynchronous classes, students have faced hurdles with the basics of both internet and personal equipment reliability, creating lapses in interaction that builds critical thinking and learning.

This challenging and forced shift affected critical thinking and learning more than I can outline here. Certainly, it has spurred creative approaches to learning that we can continue to develop, but it has exacted a high price from everyone in the stress and concerns we could not eliminate.

NATURAL SICENCES
ASSESSMENT REPORT
2020-2021

Prepared by Lee Anne Bowling-Angle and Sandra McHenry

Critical thinking skills develop when students can listen and see how their peers arrive at ideas, thoughts, and conclusions. The development of these skills are fostered when the instructor has real time access to the ideas and thoughts as students become curious about content. Shifting to virtual learning created challenges for both the students and instructors. In order to foster critical thinking in the virtual learning environment, collaboration using higher order thinking skills is necessary. Fostering collaboration and critical thinking occurred in discussion boards, breakout rooms, clinical case study assignments, peer reviews, virtual labs, as well as, group projects. Each type of collaboration also presented barriers to fostering the type of discussion in person learning facilitates. Group discussion boards can be time consuming and cause the development of ideas to take longer than they would if the discussion was occurring in real time, such as in a classroom. Breakout rooms prevent the instructor from guiding and facilitating the discussion in each room. Virtual labs in science courses inhibit curiosity and thought development many times due to the lack of lab partners sharing ideas across the table while investigating content. While virtual learning may be more flexible for our students, creating critical thinking teaching is best done when the classroom is a learning community where ideas are shared in real time.

Challenges faced include:

- Not all students are able or willing to have cameras on during class. There's a general reluctance for others to speak when there is no nonverbal feedback. Psychological barriers for those that have difficulty with public speaking are made worse when nonverbal feedback is not present. This leads to a limited number of voices in discussion. Discussion boards can overcome some of this by providing an alternative learning community space, but the ideas and solutions develop more slowly, and the method is more time consuming for some. While these boards may be adequate for some disciplines, science is dynamic, and it is difficult to introduce different and evolving scenarios that would require quick pivot of solutions.
- Anatomy and Physiology is a visual discipline. Clinical case studies are presented to bring relevance to the basic science and to foster and encourage critical thinking and problem solving. Often the ideas are best expressed using 3-D models and demonstrations.
- Virtual science labs are not an effective substitute for most A&P or Biology labs. Labs are a time for students to interact and discuss ideas in a learning environment that is not hindered by the usual classroom dynamics. Critical reflective thinking may occur most often within this environment.

How has the shift to virtual learning impacted critical thinking teaching and learning in your academic discipline?

Most of the social science courses this semester have been either hybrid or totally online, which has been helpful for many, but I do not think this format has improved learning or enhanced critical thinking. I have had many students tell me they have struggled staying motivated in this type of learning environment, and I have felt the same way. I also have received many communications from students about increased anxiety and depression. I believe I have had more F's in my courses, due to students just giving up. The hybrid format may promote improved critical thinking because the students do have to complete activities such as homework and discussion to digest the material outside of class. I also have many students who have children at home, and many other factors, which increase distraction, and I feel that has affected the learning process. It has been a challenge to provide regular and substantive interaction, but I feel this is best done with at least weekly contact so you can create relationships and engaging activities such as role-play, group projects, polls, discussions, and writing activities that support learning objectives. Learning must be bi-directional, not one-way!

I have been more flexible this semester and have contacted students more to try to encourage retention. I feel our students are more at risk due to their academic ability and super busy schedules, and I'm excited to be heading back to our classrooms soon! I do think this will greatly improve critical thinking, engagement, and student learning!

MATHEMATICS
ASSESSMENT REPORT
2020-2021

Prepared by Ashley Pratt

How has the shift to virtual learning impacted critical thinking teaching and learning in your academic discipline?

Learning mathematics in any modality involves the development of critical thinking skills due to the nature of the subject. Students regularly face new problems in which they are required to analyze, apply prior knowledge, and develop a solution to a previously unanswered question (at least to them). However, an important step in critical thinking is to be able to communicate and justify results. During the remote teaching semester, this did become more challenging.

In order to encourage students to share ideas and grapple with challenging problems in remote classes, instructors used supplemental technology such as Socrative, Poll Everywhere, and Pear Deck so that students would be able to share their ideas and thoughts with each other. One of the benefits of using these tools was that students were able to remain anonymous to each other, but the instructor was able to view individual students' responses. In the remote environment, students seemed more reluctant to respond to questions and be present in the interactive space, but these tools provided a level of peer anonymity that encouraged students to be active participants. The responses also provided insight into their thinking to each other and their instructor. These tools also provided formative assessment that was easily obtained and analyzed. Instructors could assess student understanding and areas in need of reinforcement or additional instruction. In the physical classroom, obtaining digital feedback that can be easily analyzed is much harder to do. Instructors found this immediate feedback from students provided useful insight into the students' understanding of the material.

Another tool utilized by instructors to encourage critical thinking and communication was the use of breakout rooms. Although students were reluctant to speak up in the large group, students felt more comfortable communicating with two or three other students and working together to complete a task. The types of tasks that worked best in these environments were those with open-ended solutions, those with multiple entry-points, and those that required collaboration and cooperation in order to complete. When students were given an unspecific task (such as discuss your solution to the problem), the breakout rooms were not as effective. However, if there was more guidance and a well-defined task to complete, students were able to utilize this environment to develop stronger critical thinking skills through their communication. The biggest challenge with breakout rooms for many students was learning how to use the digital whiteboard tools without a stylus. If students had all had access to a digital pen, students would have been able to communicate some of their mathematical thinking easily.

Ultimately, the biggest hinderance to learning was in the lack of personal connection that supported motivation. Not being able to make true eye contact with each other and being in a shared physical space made the social aspects of learning much more challenging. Instructors often opened class time with an interesting question to spark conversation or found opportunities for students to share personal experiences as they related to the course. Some students were less reluctant to engage in the digital socialization, but overall, most students hid behind their computer screens for as much of class as they could. It was easier for students to be passive learners and harder for instructors to maintain an active learning space. When in the same physical space, the instructor can identify students who are disengaged and can give subtle cues to help them reengage. Interactions are more natural in the physical space, and group communication and collaboration are easier to facilitate.   Without these interactions, many students had less motivation to participate in the class and learning suffered.

Community and Civic Engagement Survey

NOTE: The survey is a web-based survey and therefore this document does not reflect the web-based formatting.

This survey will be used for research purposes only; your responses will remain anonymous and any data that is reported will be at the aggregate level (no individual data will be shared). You may choose not to answer any question. Thank you for your time and feedback.

1. <u>**Prior to entering this college,**</u> **how frequently did you participate in the following activities?**
   (Never, Annually, Semi-Annually, Monthly, Weekly, Daily)
   a. Participate in a group or organization
   b. Perform a leadership role in an organization or club
   c. Make a speech or presentation
   d. Obtain news (through the Internet, television, newspaper, radio, etc.)
   e. Discuss politics, social, or community issues
   f. Volunteer in your community
   g. Engage in service learning as part of a class
   h. Express your opinions on issues or policies via social media or the Internet
   i. Recruit others to participate in a community or civic activity
   j. Sign an online or paper petition
   k. Raise awareness about an issue, campaign, party, or group
   l. Raise money for an issue, campaign, party, or group
   m. Participate in a local, state, or national campaign
   n. Persuade others to vote for a particular issue, candidate, or party

2. <u>**Prior to entering this college,**</u> **had you participated in any of the following activities?** (*No, Yes*)
   a. Registered to vote
   b. Voted in a student election
   c. Voted in a local, state or federal election

3. **Since entering this college, how frequently have you participated in the following activities?** *(Never, Annually, Semi-Annually, Monthly, Weekly, Daily)*
   a. Participated in a group or organization
   b. Performed a leadership role in an organization or club
   c. Made a speech or presentation
   d. Obtained news (through the Internet, television, newspaper, radio, etc.)
   e. Discussed politics, social, or community issues
   f. Volunteered in your community
   g. Engaged in service learning as part of a class
   h. Expressed your opinions on issues or policies via social media or the Internet
   i. Recruited others to participate in a community or civic activity
   j. Signed an online or paper petition
   k. Raised awareness about an issue, campaign, party, or group
   l. Raised money for an issue, campaign, party, or group
   m. Participated in a local, state, or national campaign
   n. Persuaded others to vote for a particular issue, candidate, or party
   o. Acted as a tutor, mentor, or coach for other students
   p. Interacted with a professor outside of class
   q. Studied or prepared for class
   r. Attended a religious service
   s. Participated in a racial/ethnic organization

4. **Since entering this college, have you participated in any of the following activities?** (*No, Yes*)
   a. Registered to vote
   b. Voted in a student election
   c. Voted in a local, state or federal election
   d. Taken a political science or government course
   e. Taken a course that deals with social, political, or economic inequality

5. **My experiences at this college have contributed to my ability to:** *(Not at All, Very Little, Somewhat, To a Great Extent)*
   a. Have a civil conversation about controversial issues with someone whose background or views are different than my own.
   b. Have my views challenged by others.
   c. Understand people from other cultures, races, or ethnicities.
   d. Work with others to make a difference on campus or in the community.
   e. Voice my opinions on campus, at work, or in my community.

6. **Please indicate your level of agreement with the following statements:** *(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)*
   a. Involvement in community or campus causes is important to me.
   b. I have the tools to seek out information in order to develop an informed position on a social or political issue.
   c. I have the tools necessary to communicate with someone whose views are different than my own.
   d. I can be a part of something bigger than myself to effect change.

7. **I see myself:** *(Responses: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)*
   a. As part of the campus community.
   b. As part of a community outside this college.
   c. As an individual who can have an impact on what happens in this country.
   d. As someone who has something to offer the world.
   e. As someone who can speak out for themselves and others.

8. **After leaving this college, how frequently do you plan to do the following?** *(Hardly Ever, Occasionally, Frequently, Almost Always)*
   a. Work with others to promote social or political change.
   b. Demonstrate leadership in my community or workplace.
   c. Help others who may not be as well off as myself.

9. **To what extent have your experiences at this college increased your knowledge of:** *(Not at All, Very Little, Somewhat, To a Great Extent)*
   a. Global issues
   b. National issues
   c. Issues facing my community

For questions 10 and 11, please provide your best answer.

10. **What individual or group of individuals has the responsibility to make the final decision on whether a law is constitutional or not?** *(Select one)*
    a. The President of the United States
    b. The Supreme Court
    c. Congress
    d. I don't know
.
11. **How much of a majority is required in the U.S. Senate and House of Representatives to override a presidential veto?** *(Select one)*
    a. 4/5 or 80 percent
    b. 2/3 or 67 percent
    c. 3/5 or 60 percent
    d. 1/2 or 50 percent
    e. I don't know

For questions 12-20 please provide information about your background.

12. What is your current enrollment status?
    a. Part-time (Less than 12 units)
    b. Full-time (12 units or more)

13. Approximately how many credits have you completed at this college?
    a. 0-12
    b. 13-24
    c. 25-59
    d. 60-89
    e. 90 units or more

14. What is your ethnicity?
    a. American Indian or Alaska Native
    b. Asian
    c. Black or African American
    d. Hispanic/Latino(a)
    e. Native Hawaiian or Other Pacific Islander
    f. White
    g. Two or more races
    h. Race/ethnicity unknown
    i. Nonresident alien

15. What is your gender?
    a. Male
    b. Female

16. What is your age?
    a. 19 or younger
    b. 20-24
    c. 25-29
    d. 30-34
    e. 35-49
    f. 50 or older

17. Please provide an estimate of what you perceive to be the income of your parents/guardians while you were in high school.
    a. Less than $19,999 (Low Income)
    b. $20,000 - $59,999 (Lower Middle Income)
    c. $60,000 - $99,999 (Middle Income)
    d. $100,000 - 149,000 (Upper Middle Income)
    e. $150,000 or more (High Income)
    f. I don't know

18. How many hours per week do you work for pay? *(Responses: None, 1-10 hours, 11-20 hours, 21-30 hours, 31-40 hours, More than 40 hours)*
   a. On-campus
   b. Off-campus

19. Is English the primary language you speak at home?
   a. No
   b. Yes

20. What is the highest education level of ANY of your primary parents/guardians?
   a. Grade 9 or less
   b. Some high school, did not graduate
   c. High school graduate (diploma, GED, or equivalent)
   d. Some college, no degree
   e. Associate degree (AA, AS)
   f. Bachelor's degree (BA, BS)
   g. Graduate degree (master's, PhD, or professional degree beyond bachelor's)
   h. Unknown

Please provide your campus-wide ID. (Providing your ID allows the research office to link survey results to institutional data for more in-depth analysis. Your ID and responses will remain confidential and we will only report results in the aggregate.)

Thank you for completing this survey!

The Quantitative Reasoning for College Science (QuaRCS) Assessment

------------------------------ INSTRUCTIONS FOR INSTRUCTORS ------------------------------

This document contains the text of the Quantiative Reasoning for College Science (QuaRCS) Assessment. The QuaRCS is designed to be administered online, however is available here for instructors wishing to examine it, implement it through their own online assessment platforms, or administer it in paper form.

The QuaRCS seeks to measure student skills in the following ten areas of quantitative reasoning: graph reading, table reading, arithmetic, proportional reasoning, estimation, percentages, statistics/probability, area/volume, error, and unit conversions/dimensional analysis. It also probes students' attitudes toward mathematics and the role of quantitative information in science. The assessment includes a short series of demographic and academic background questions. Details about the development and validation of the QuaRCS can be found in the following article:

Follette, Katherine B.; McCarthy, Donald W.; Dokter, Erin; Buxner, Sanlyn; and Prather, Edward (2015) "The Quantitative Reasoning for College Science (QuaRCS) Assessment, 1: Development and Validation," Numeracy: Vol. 8: Iss. 2, Article 2.
available at: http://scholarcommons.usf.edu/numeracy/vol8/iss2/art2

The QuaRCS is non-proprietary, however we strongly encourage your participation in our national study should you choose to administer it in your course(s). Instructors taking part in the national study will receive:
   a) Access to our online assessment interface. We will administer the instrument for you. You simply assign the link.
   b) Customized participant lists and score/attitude reports after each assessment. We will do all of the grading for you and conglomerate the results into a report.
   c) Reports on improvements in student attitudes and skills from pre to post semester. We can help you quantify whether you course is helping improve your students' quantitative skills and attitudes toward mathematics.

Below you'll find copies of all of the questions that appear in the online assessment. Solid horizontal lines indicate breaks between question blocks, each of which is shown on a separate page in the online assessment. The order of all quantitative question blocks except the first is randomized by our survey software. If you are administering the assessment in paper format, or implementing it online yourself, we advise similar randomization to avoid the effects of test fatigue on results from any one question.

More information about the study and curricular resources can be found at www.katefollette.com/QL. Please also feel free to contact Principal Investigator Kate Follette (kfollette@stanford.edu) with any questions or concerns about the QuaRCS or its implementation.

The Quantitative Reasoning for College Science (QuaRCS) Assessment
Pre Semester Survey

You are being asked today to participate in a research study designed to investigate whether introductory science courses for non-majors like the one you are currently taking can improve students' quantitative and numerical skills. The designers of the study hope that this will give us some insight into how to improve the usefulness of courses like this for students like yourselves.

By completing this survey, which should take you 20-30 minutes, and clicking "submit" at the end, you are consenting to participate and to share your responses with its creators unless you e-mail the Principal Investigator and ask that your data be removed from consideration. Your participation is entirely voluntary, and you may withdraw at any time. There are no risks to you associated with your participation in this study.

If your instructor has assigned this instrument as part of your participation grade, he or she will be provided only with your name and told whether or not you completed the survey. Your instructor will not receive your individual results. The general results of the survey for your entire class will also be provided to your instructor at the end of the semester, but your name will be replaced with an anonymous tag. Therefore, your instructor will not be able to match results with individual students.

Your name will be used by us only to match the surveys that you complete at the beginning, middle and end of the semester, and will not be published.

If you have any questions or concerns about this study, would like to receive a copy of the results or to withdraw your data, please don't hesitate to contact Principal Investigator Kate Follette at kfollette@stanford.edu or at (763)213-7110. Thank you!

An Institutional Review Board responsible for human subjects research at The University of Arizona reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

P1. Please select your school below
P2. Please select the name of your instructor from the list below.
P3. In the field below, please give your name in the form Firstname Lastname, without middle names, initials or prefix/suffixes. If your last name includes a space, please omit it. For example, Oscar de la Hoya would be Oscar delaHoya.
Note: If your instructor has assigned this instrument for participation credit, you must provide your real name in order to receive it. Your name will NOT be published nor will your instructor receive your individual results.

These questions were designed to be answerable without a calculator, but you are welcome to use one if you choose. Choose the best answer for the following 25 quantitative questions, each of which is followed by a question asking you to rate your confidence in your answer. The quantitative questions are followed by a series of short questions about you and your feelings about math. The results of this survey will be used to try to improve courses like yours, so please try your best on all of the questions.

_____

1. a. You have a rectangular fish tank that's 10 inches tall, 20 inches wide, and 15 inches deep. If the volume of one gallon of water is 231 cubic inches, then how many gallons are required to fill the tank?
   a) 1 gallon
   b) 9 gallons
   c) 13 gallons
   d) 231 gallons
   e) 3000 gallons

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

2. a. Your grocery store has a 20 ounce jar of peanut butter for $4.00, and a 45 ounce jar for $9.00. Which purchase will get you the best price per ounce?
   a) the 20 ounce jar
   b) the 45 ounce jar
   c) the two jars are both the same price per ounce

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

3. a. A college that typically has 50,000 students experiences an increase in enrollment to 55,000 students. By what percentage did enrollment increase?
   a) 1%
   b) 5%
   c) 9%
   d) 10%

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

For the next three questions, consider the graph shown below.

Population of City X
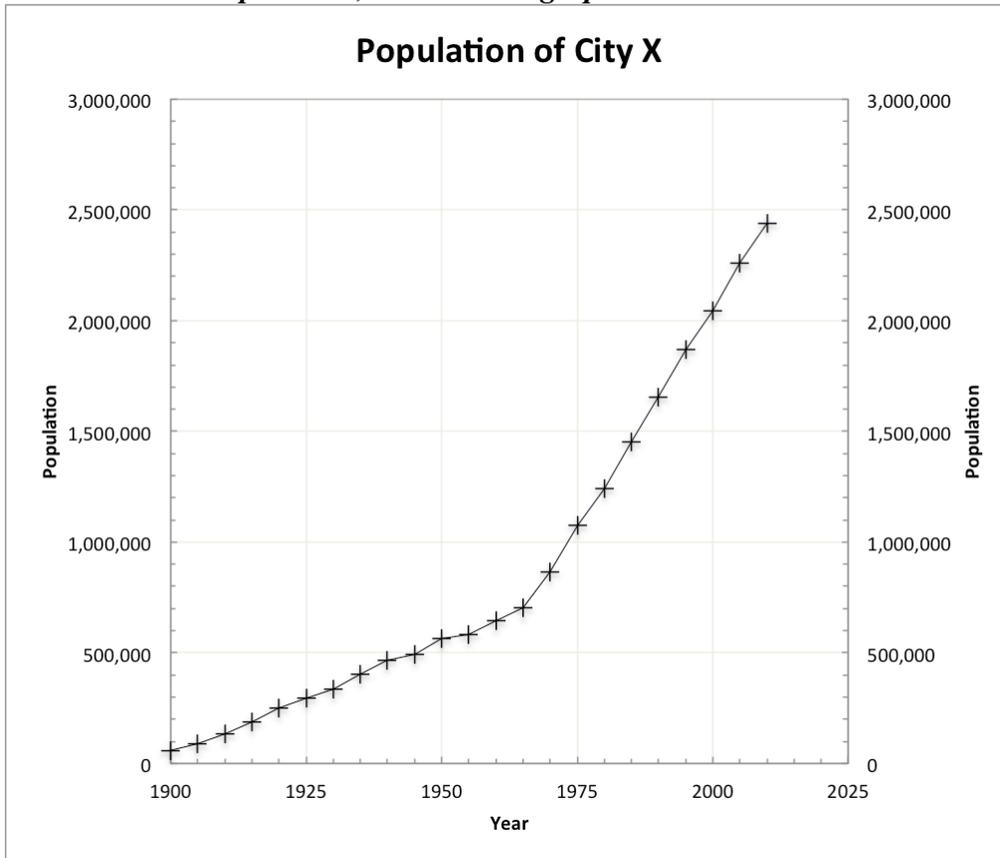
4. a. According to the graph, what was the approximate population of City X in 1980?
    a) 750,000
    b) 1 million
    c) 1.25 million
    d) 1.5 million
    e) 1.75 million

    b. How confident are you in the answer you just chose?
    a) very confident
    b) confident
    c) not very confident
    d) I guessed

5. a. If the current population growth rate continues, which is the best estimate for the population of City X in the year 2050?
    a) 3 million
    b) 4 million
    c) 5 million
    d) more than 5 million

b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

6. a. Based on this graph, compare the population growth rates (i.e. increase in number of people per year) before and after 1970
   a) After 1970, the population grew at one-quarter of the pre-1970 rate
   b) After 1970, the population grew at one-half of the pre-1970 rate
   c) After 1970, the population grew at two times the pre-1970 rate
   d) After 1970, the population grew at four times the pre-1970 rate
   e) The population growth rates were the same before and after 1970

b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

For the next three questions, consider the peanut butter cookie ingredient list shown below

3/4 cup peanut butter
1/2 cup shortening
1 cup white sugar
1 and 1/2 cups flour
3/4 cup brown sugar
4 Tablespoons butter
1 and 1/4 teaspoons baking soda
1/4 teaspoon salt

7. a. Imagine you have already filled a measuring cup (like the one shown above) with the amount of peanut butter in the recipe and you want to add the correct amount of shortening **on top of** it. Which line on the measuring cup should you fill to with shortening?
   a) the 1 cup line
   b) the 1 and 1/4 cup line
   c) the 1 and 1/2 cup line
   d) the 1 and 3/4 cup line

b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident

      d) I guessed

8. a. If your measuring cup has ounces on the side instead of cups, which line should you fill
    to when measuring the flour? There are 8 ounces in 1 cup.
      a) 6 ounces
      b) 8 ounces
      c) 12 ounces
      d) 14 ounces

    b. How confident are you in the answer you just chose?
      a) very confident
      b) confident
      c) not very confident
      d) I guessed

9. a. You have only a **½ Tablespoon** measuring spoon. How much should you fill it to get
    the correct amount of baking soda? There are 3 teaspoons in 1 tablespoon.
      a) half full
      b) two-thirds full
      c) three-quarters full
      d) five-sixths full
      e) full once and then another one-quarter full

    b. How confident are you in the answer you just chose?
      a) very confident
      b) confident
      c) not very confident
      d) I guessed

For the next three questions, consider the following table.

Number of Injuries by Ability Level for Skiers at Resort Y in the Years 2000-2010

Level of Expertise	Total Visitors	Number of Minor Injuries	Number of Severe Injuries	Number of Deaths
Novice	12,152	384	122	1
Intermediate	9,498	96	65	0
Expert	802	11	16	5
Totals	**22,452**	**491**	**203**	**6**

10. a. How many total injuries (including deaths) were sustained at Resort Y during this time
    period?
      a) 694
      b) 700
      c) 22,452
      d) 23,152

b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

11. a. What were the chances of a randomly-selected skier sustaining an injury of any kind (minor, severe or death) while at Resort Y during this time period?
   a) less than 1%
   b) about 2%
   c) about 3%
   d) more than 4%

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

12. a. What proportion of **severely** **injured** skiers at Resort Y during this time period were **intermediate** skiers?
   a)   fewer than 1 in 100
   b)   about 1 in 10
   c)   about 1 in 6
   d)   about 1 in 3

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

For the next two questions, consider the graph shown below.
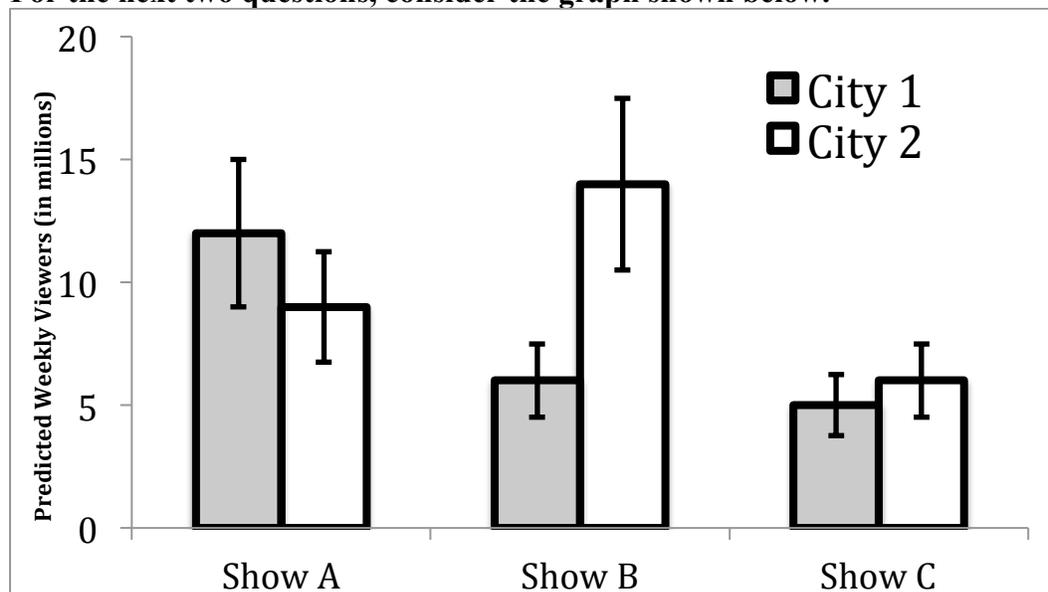
13. a. The graph above shows the **predicted** viewership of three television shows in two cities based on a poll of a small number of residents in each city. The poll has a reported error of 25%, shown as vertical error bars. Which of the following statements about the predicted viewers of Show A is most accurate?
   a) More people will watch Show A in City 1
   b) More people will watch Show A in City 2
   c) Either (a) or (b) could be true

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

14. a. Which of the following predictions can be made based on the information (including errors) shown in the graph?
   Prediction 1: In City 2, more people will watch Show B than Show C
   Prediction 2: In City 1, Show C will have the smallest viewership
   Prediction 3: None of the three shows (A, B or C) will be equally popular in Cities 1 and 2
   a) Only Prediction 1 is supported by the graph
   b) Predictions 1 and 2 are both supported by the graph
   c) Predictions 1 and 3 are both supported by the graph
   d) All three predictions are supported by the graph
   e) None of the predictions are supported by the graph

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

15. a. You purchased 100 square feet of solar panels for your roof. However, your local Homeowner's Association requires that solar panels not be visible from the road. You decide to put solar panels on the roof of a shed in your backyard instead. The shed has a flat 5 foot by 5 foot roof. Complete the following sentence:
"To produce the same amount of power as your original design, you need to buy panels that produce _____ more power per unit area than your original panels."
   a) two times
   b) four times
   c) five times
   d) twenty times
   e) none of the above

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

16. a. If you cover the shed with your original panels, how many **more** of the same size sheds would you have to put up in your backyard in order to fit the rest of the panels?
   a) Three
   b) Five
   c) Nine
   d) Nineteen

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

17. a. Your cable bill is $36 per month from January 1 through September 30 and then doubles to $72 per month starting October 1. What is your average monthly bill over the course of the entire calendar year (January-December)?
   a) $42 per month
   b) $45 per month
   c) $48 per month
   d) $54 per month

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

18. a. If you place $10 under your mattress every day for the next 40 years, approximately how much money will you have?
   a) $15,000
   b) $150,000
   c) $1,500,000
   d) $15,000,000

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

A newspaper conducts a survey and predicts that in the local election between Candidates A and B, Candidate A will receive 60 % of the votes. The newspaper estimates the error in this prediction to be 5%.

19. a. If the newspaper repeats the survey with 400 participants, how many people can report that they will vote for Candidate A for the result to be consistent with the original prediction (that Candidate A will receive 60% of the votes with 5% error)?
   a) 228 to 252 people
   b) 220 to 240 people
   c) 240 to 260 people
   d) 220 to 260 people

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

20. a. Several days later, the newspaper conducts another survey with 300 new participants. What is the **minimum** number of votes that Candidate A can receive in this new survey in order to be consistent with the original prediction (that Candidate A will receive 60% of the votes with 5% error)?
   a) 165
   b) 171
   c) 175
   d) 180
   e) 195

   b. How confident are you in the answer you just chose?
   a) very confident
   b) confident
   c) not very confident
   d) I guessed

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21. a. You want to carpet a 15 foot by 20 foot room. You have two carpet options to choose from. One is $1.50 per square foot and the other is $3.00 per square foot. How much more will your total bill be if you choose the more expensive carpet rather than the cheaper one?
    a) $52.50 more
    b) $105 more
    c) $450 more
    d) more than $500 more

    b. How confident are you in the answer you just chose?
    a) very confident
    b) confident
    c) not very confident
    d) I guessed

22. a. To carpet your 15 foot by 20 foot room and a hallway that is 4 feet by 12 feet, about how much total carpet do you need?
    a) about 100 square feet
    b) about 150 square feet
    c) about 250 square feet
    d) about 350 square feet
    e) about 750 square feet

    b. How confident are you in the answer you just chose?
    a) very confident
    b) confident
    c) not very confident
    d) I guessed

23. a. If one scoop of lemonade powder is needed for every 12 ounces of water, then how many scoops should you add to **three gallons** of water to make it into lemonade?
    16 ounces = 1 Pint
    2 Pints = 1 Quart
    4 Quarts = 1 Gallon
    a) 11
    b) 16
    c) 32
    d) 64
    e) 128

    b. How confident are you in the answer you just chose?
    a) very confident
    b) confident
    c) not very confident
    d) I guessed

24. a. A sweater that was originally $100 is on sale for 30% off. Which of the following coupons should you use to get the lowest final price?
    a) A coupon for 25% off the sale price
    b) A coupon for $25 off the sale price
    c) Both coupons will result in the same final price.

    b. How confident are you in the answer you just chose?
    a) very confident
    b) confident
    c) not very confident
    d) I guessed

25. a. You drove 200 miles on 11 gallons of gas. Which of these is closest to the number of miles per gallon that you got?
    a) 16
    b) 18
    c) 22
    d) 24

    b. How confident are you in the answer you just chose?
    a) very confident
    b) confident
    c) not very confident
    d) I guessed

You are done with the quantitative/math questions in the survey!

26. Overall, how difficult were the questions in this survey?
    a) very easy
    b) easy
    c) moderate
    d) difficult
    e) very difficult

27. In your everyday life, how frequently do you encounter situations similar to problems in this survey?
    a) almost never
    b) about once per year
    c) about once per month
    d) about once per week
    e) daily

28. Which of the following best describes your calculator usage while taking this survey?
   a) I used a calculator to answer all or almost all of the questions
   b) I used a calculator to answer about 75% of the questions
   c) I used a calculator to answer about 50% of the questions
   d) I used a calculator to answer about 25% of the questions
   e) I didn't use a calculator at all, or used it on only one or two questions

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29. How frequently do you do calculations in your everyday life?
   a) Never
   b) Infrequently
   c) Sometimes
   d) Frequently

30. How frequently do you encounter graphs and tables in your daily life?
   a) Never
   b) Infrequently
   c) Sometimes
   d) Frequently

31. Where would you put mathematics (including: doing calculations, reading graphs and tables, reasoning with numbers, etc.) on the following scales between two opposite adjectives.

Interesting	1	2	3	4	Boring
Useful	1	2	3	4	Useless
Easy	1	2	3	4	Hard
Fun	1	2	3	4	Scary

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32. Rate the degree to which you agree with the following statement:
   "I feel confident using numbers in my non-math courses"
   a) Strongly Agree
   b) Agree
   c) Disagree
   d) Strongly Disagree

33. Rate the degree to which you agree with the following statement:
   "I feel confident using numbers in my everyday life"
   a) Strongly Agree
   b) Agree
   c) Disagree
   d) Strongly Disagree

34. Rate the degree to which you agree with the following statement:
"Numerical skills are important to the understanding of science"
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree

35. Rate the degree to which you agree with the following statement:
"Numerical skills are important to my everyday life"
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree

36. Rate the degree to which you agree with the following statement:
"I am satisfied with my current level of numerical/mathematical skill"
    a) Strongly Agree
    b) Agree
    c) Disagree
       Strongly Disagree

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37. How long ago was your last math course?
    a) I am taking a math course now
    b) Within the last year
    c) Within the last two years
    d) Within the last three years
    e) More than three years ago

38. How many mathematics courses do you plan to take in college (including any you've already taken and are taking now)
    a) none
    b) one
    c) two
    d) three or more

39. How many science courses do you plan to take in college (including any you've already taken and are taking now)
    a) none
    b) one
    c) two
    d) three or more

40. Why did you choose to take this course? Check all that apply.
    a) It is a prerequisite for courses in my major
    b) To fulfill a university general education requirement
    c) It sounded interesting
    d) It sounded easy
    e) I heard the class was good
    f) I heard the instructor was good
    g) Other _____

_____

41. I am a college _____
    a) freshman
    b) sophomore
    c) junior
    d) senior
    e) other _____

42. Please select your major or majors from the list below.
    a) Humanities (e.g. English, Literature, Philosophy, Religion, Foreign Language)
    b) Arts (e.g. Art, Music, Dance, Film, Theater, Creative Writing)
    c) Social Sciences (e.g. Economics, History, Political Science, Psychology, Sociology, Anthropology, International Relations, Geography, Linguistics, etc.)
    d) Education
    e) Science (e.g. Physics, Chemistry, Biology, Geology and sub-disciplines)
    f) Engineering, Mathematics or Computer Science
    g) Business-related (e.g. Business, Marketing, Management)
    h) Health-related (Nursing, Pharmacy, Nutritional Science, Public Health, Exercise Science, etc.)
    i) Trade-specific (e.g. Architecture, Agriculture, Law, Justice, Library Science, Retail, Family and Consumer Sciences, Construction Trades, etc.)
    j) Journalism
    k) General Studies
    l) Undecided
    m) Other   _____

43. I chose (or will choose) my major because: Check all that apply.
    a) I like the subject
    b) I feel that it will help me get a job I will enjoy after graduation
    c) I feel that it will help me get a well-paying job after graduation
    d) I am good at it
    e) I chose a major that would avoid math as much as possible
    f) I chose a major that would avoid writing as much as possible
    g) I'm not sure yet
    h) Other   _____

_____

44. My age is _____
    a) under 18
    b) 18-25
    c) 26-35
    d) 36-45
    e) 46-55
    f) 56+

45. My gender is _____.
    a) Male
    b) Female
    c) Other

46. With which racial or ethnic group(s) do you most identify? Choose all that apply.
    a) African American
    b) Asian/Pacific Islander
    c) Caucasian (non-Hispanic)
    d) Hispanic or Latino
    e) Native American
    f) Other _____
    g) I prefer not to specify

47. Have you ever been diagnosed with any of the following? Please select all that apply.
    a) A physical disability (please specify if you wish) _____
    b) A cognitive disability (please specify if you wish) _____
    c) A learning disability (please specify if you wish) _____
    d) I prefer not to specify

48. Did you attend elementary, middle and high school entirely in the United States.
    a) Yes
    b) No
        If no:
        In what country did you attend elementary school? _____
        In what country did you attend middle school? _____
        In what country did you attend high school? _____

49. Knowing that this survey is being used for research to try to improve courses like yours and
    that your answer to this question will not be shared with your instructor, please honestly
    describe the amount of effort that you put into this survey.
    a) I just clicked through and chose randomly to get the participation credit
    b) I didn't try very hard
    c) I tried for a while and then got bored
    d) I tried pretty hard
    e) I tried my best on most of the questions

DFW Report

PROGRAM

Average of DFW Percentage	
Acad Org	Total
CAGRNATRE	18%
CBUSINESS	38%
CENGINDT	27%
CHEALTH	12%
CHUMANIT	20%
CNATSCMTH	23%
CPUBSERV	20%
CSOCSCI	14%
Grand Total	23%

College Average   16%

LOCATION

	Data	
Location	Average of DFW Percentage	Sum of Tot Enrl
MAIN	20%	195
OFF 1	14%	235
VIRTUAL	29%	541
VIRTUAL-RT	22%	1035
(blank)	16%	2006
Grand Total	23%	4012

DSLCC Daily FTE Report

Fall 2020

12/10/2020

Headcount	1,075.00
FTE's	627.07
Credits	9,406.00
Credits per Student	8.75

DSLCC FTE Comparison Report

75th Day of Term - Reading Day

12/10/2020

	Fall 20		**Fall 19**		**Fall 18**
Headcount	1,075.00		1,032.00		981.00
Total Credits	9,406.00		8,844.00		9,076.00
FTES	627.07		589.60		605.07
Credits per Student	8.75		8.57		9.25

Dual Enroll					
	Fall 20		**Fall 19**		**Fall 18**
Headcount	476.00		417.00		321.00
FTES	178.90		139.20		104.90

Governor's School					
	Fall 20		**Fall 19**		**Fall 18**
Headcount	20.00		15.00		35.00
FTES	14.13		8.27		23.13

Degree Seeking Dual Enroll					
	Fall 20		**Fall 19**		**Fall 18**
Headcount	22.00		32.00		40.00
FTES	21.00		25.00		33.00

End Term Headcount & FTE Count					
	Fall 20		**Fall 19**		**Fall 18**
Headcount			1,032.00		981.00
Total Credits			8,844.00		9,076.00
FTES			589.60		605.07
Credits per Student			8.57		9.25

End Term Dual Enroll						
	Fall 20		**Fall 19**		**Fall 18**	
Headcount			417.00		322.00	
FTES			139.20		105.10	

End Term Governor's School						
	Fall 20				**Fall 18**	
Headcount			15.00		35.00	
FTES			8.27		23.13	