

Understanding PLTW End-of-Course Assessment Results 2020-21

Updated June 2, 2021

PLTW End-of-Course (EoC) Assessment score reports provide meaningful information to students, parents, and educators, offering competency-based feedback on areas of student strengths. Students and parents can gain insight about the abilities and course achievements of an individual, and educators can use the aggregate score information to develop targeted instructional enhancements for the upcoming year.

Development of the PLTW EoC Assessments is guided by a Test Advisory Counsel and multiple working panels of subject matter experts (SMEs) representing leaders from industry, higher education, and experienced PLTW teachers. This overview document provides information to aid understanding of PLTW EoC Assessment score reports.

Standards-based Scores

Individual score reports show an overall scale score representing standards-based results from the assessment and how the skills the student demonstrated in solving the problems on the assessment fell within achievement levels. You may view a sample score report for each PLTW EoC Assessment in **Appendix A**.

Scale Score

The overall assessment results are reported on a scale from 100 to 600, rounded to the nearest 10, with a higher score indicating a higher level of achievement. Using a scale score allows for valid comparisons of student results within and across years as difficulty of individual items on the assessment may vary.

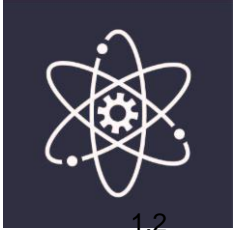
Achievement Level

The scale score identifies an achievement level: Novice, Practiced, Accomplished, or Distinguished. On the back of the score report is a description of what each achievement level means in terms of what a student knows and can do. A panel of SMEs decided the range of scores assigned to each achievement level.

Skill Cluster Subscore

The individual student report also includes subscores based on domain groups referred to as skill clusters. A panel of SMEs defined the skill cluster early in the test design process as an authentic grouping of skills. A test blueprint is established for each course to list the domains included with each skill cluster and the weight (by percentage) of each skill cluster within the assessment. Skill clusters scores are reported on a scale of 1 to 6.





Aggregate Scores to Inform Instruction

PLTW encourages educators to review aggregate and disaggregate scores across classes, and even across years of instruction, to evaluate their own individual teaching strategies. Test blueprints are available to indicate which domains are represented in each skill cluster, and what percentage of the assessment is devoted to measuring competencies in each skill cluster. You may view the test blueprint for each PLTW EoC Assessment in [Appendix B](#).

While we recognize and appreciate the individual approaches each instructor brings to their classroom, PLTW provides a linking document that identifies the many lessons and activities provided in the PLTW curriculum to support student competency across specific domains. Teachers may reference the curriculum linking document for each high school course that offers a PLTW EoC Assessment in [Appendix C](#). This linking document serves as a planning tool as teachers consider instructional alignment with the EoC Assessments for future students.

Normative Scores

PLTW provides normative information for each EoC Assessment to show how students performed in comparison to their peers who took the same assessment. For example, the score might be as high as or higher than 10 percent of the comparison group, 50 percent, 90 percent, or more.

The chart provide shows the comparison group as everyone who took the same PLTW Assessment in the 2018-19 academic year. Charts for subsequent years will be available at the end of each testing window as statistical analysis is complete on that year's student results.

Normative and standards-based scores can sometimes appear inconsistent. For example, the current skills may fall within the achievement range associated with the Novice designation; yet the student may still outperform most students if most students who participated in the assessment that year did not consistently demonstrate the complex skills required to earn the designations of Practiced, Accomplished, or Distinguished. Alternatively, the student may have demonstrated the complex skills identified with the achievement level of Accomplished and Distinguished, but so did most other students. It is not that the information is inconsistent, but that it is looking at student achievement in different ways.

The normative table provided in [Appendix D](#) lists every possible PLTW Assessment score from 100 to 600 and then lists each of the PLTW Assessments, one per column. Assessments are organized within the PLTW Computer Science, PLTW Engineering, or PLTW Biomedical Science pathway. Each cell in a column indicates what percent of students scored at or below the score for that row. For example, find the column or normative data, for the Human Body Systems assessment. The first row is for a score of 100. In this case, 1 percent of students who took the Human Body Systems assessment in 2018-19 had a score of 100. In the second row we see that 2 percent of students scored 110 or below. If we go down to the row for a score of 350, we can see that score was as good or better than 53 percent of students who took the assessment.

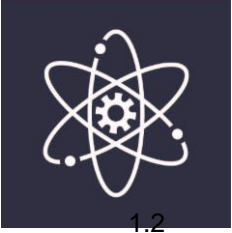




In addition to the normative information, we have shaded each cell for each assessment to indicate the achievement level - Novice, Practiced, Accomplished, or Distinguished - associated with each score.

For frequently asked questions, refer to [Appendix E](#) or contact our friendly Solution Center at 877.335.7589 or solutioncenter@pltw.org.





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Appendix A: Sample Score Reports

Engineering	Biomedical Science	Computer Science
Engineering Essentials (Coming Soon)	Principals of Biomedical Science	Computer Science Essentials
Introduction to Engineering Design	Human Body Systems	Computer Science Principles
Principals of Engineering	Medical Interventions	Computer Science A
Aerospace Engineering		Cybersecurity
Civil Engineering and Architecture		
Computer Integrated Manufacturing		
Digital Electronics		
Environmental Sustainability		





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Appendix B: Test Blueprints

Engineering	Biomedical Science	Computer Science
Engineering Essentials	Principals of Biomedical Science	Computer Science Essentials
Introduction to Engineering Design	Human Body Systems	Computer Science Principles
Principals of Engineering	Medical Interventions	Computer Science A
Aerospace Engineering		Cybersecurity
Civil Engineering and Architecture		
Computer Integrated Manufacturing		
Digital Electronics		
Environmental Sustainability		



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Appendix C: Mapping between test blueprints and course curriculum for each course

Preparing Students for a Successful End-of-Course Assessment

The global COVID-19 pandemic has forced schools to re-think how and where students can safely meet and has introduced both opportunity and challenge in facilitation of effective learning. Helping students prepare for the PLTW End-of-Course (EoC) Assessment requires a continued focus on objectives outlined in the test blueprint for each course. Students and teachers understand that a PLTW assessment measures much more than recited information memorized from a text, thus most domains listed in the test blueprints will be discussed across multiple lessons in the curriculum. The attached outlines are intended to offer a roadmap of alignment between the skill clusters represented in the EoC Assessment, the Domains they reflect, and the APBs for each course.

Considering Future Changes to Instruction

EoC Assessment scores will be available within 24 hours of completion. By examining performance of all students, educators can determine how to modify their instruction to better prepare students in future instruction. If, for example, all students did relatively well in three skill clusters and relatively poorly in a fourth, that would imply that three of the four skill clusters are being well taught, but the teacher may need to make some changes to the instruction of the fourth cluster. Also, comparing the performance of students who did well to those who did not can be enlightening. Did the students who scored well perform better across all the domains, or were there one or two domains that stood out as distinguishing high scorers from low scorers?

Analyzing both aggregate scale scores and the sub-scores which are grouped by skill cluster, comparing areas of strength to the blueprints for more information, and then returning to the frameworks for information on what knowledge and skills the student may be lacking, will help teachers, instructional coaches and administrators plan for continued improvement in instructional approach.





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Aerospace Engineering

Skill Cluster	Domain	Framework
Professional Practice and Communication	Career Awareness	Lesson 1.1, 3.1, 4.1, 4.3
	Professionalism and Ethics	Lesson 1.1, 3.1, 4.1
	Collaboration	Lesson 1.1, 2.1, 2.3, 3.1, 4.1, 4.2
	Communication	Lesson 1.1, 1.2, 2.3, 3.1, 3.2, 4.2, 4.3
Design and Mindset	Engineering Mindset	Lesson 1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2, 4.3
	Design Process	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2, 4.3
	Engineering Tools and Technology	Lesson 1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2
Aerospace Fundamentals	Aerospace Accomplishments	Lesson 1.1, 4.3
	Fundamentals of Flight	Lesson 1.2, 2.1, 2.2, 2.3, 4.1, 4.2
	Materials and Structures	Lesson 2.1
Flight Operations	Flight Operations	Lesson 1.2, 1.3, 4.1
Space Flight	Space Flight	Lesson 3.1, 3.2
Remote Systems	Remote Systems	Lesson 4.2





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Civil Engineering and Architecture

Skill Cluster	Domain	Framework
Professional Practice	Career Awareness	Lesson 1.1, 1.2, 2.3, 3.1, 3.3, 4.1
	Professionalism and Ethics	Lesson 2.3, 4.1
Communication and Collaboration	Collaboration	Lesson 1.2, 2.3, 3.2, 3.3, 4.1, 4.2
	Communication	Lesson 1.1, 1.2, 2.1, 2.3, 3.1, 3.3, 3.4, 4.1, 4.2
Design and Mindset	Engineering Mindset	Lesson 1.1, 1.2, 2.3, 3.1, 4.1, 4.2
	Design Process	Lesson 1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 4.1
	Engineering Tools and Technology	Lesson 1.1, 2.1, 2.2, 2.3, 3.1, 3.2, 3.4, 4.1
Building Design	Building Design and Analysis	Lesson 1.1, 2.1, 2.2, 2.3, 3.1, 3.3, 4.1
	Design and Construction Documentation	Lesson 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 4.1
Site Design	Site Design	Lesson 2.3, 3.4, 4.1
Structural Design	Structural Design	Lesson 3.1, 3.2, 4.1
Utilities and Services	Utilities and Services	Lesson 2.3, 3.3, 4.1





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Computer-Integrated Manufacturing

Skill Cluster	Domain	Framework
Professional Practice and Communication	Career Awareness	Lesson 2.1
	Professionalism and Ethics	Lesson 2.1
	Collaboration	Lesson 1.2, 1.3, 3.2, 3.3, 4.2
	Communication	Lesson 1.1, 3.1, 4.1, 4.2
Design and Mindset	Engineering Mindset	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2
	Design Process	Lesson 1.1, 1.2, 1.3, 2.2, 2.3, 3.2, 4.1, 4.2
	Engineering Tools and Technology	Lesson 1.1, 1.2, 1.3, 2.1, 2.3, 3.1, 3.2, 3.3, 4.2
Manufacturing Processes and Systems	Role of Manufacturing	Lesson 1.1
	Manufacturing Processes	Lesson 1.1, 1.3, 2.1, 2.2, 2.3, 4.2
	Manufacturing Systems	Lesson 1.1, 1.3, 2.1, 2.2, 3.1, 4.2
Product Design	Product Design for Manufacturability	Lesson 1.3, 2.1, 2.3, 4.1
Automation and Control	Automation and Control	Lesson 1.2, 1.3, 3.1, 3.2, 3.3, 4.2





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Digital Electronics

Skill Cluster	Domain	Framework
Professional Practice, Design, and Mindset	Engineering Mindset	Lesson 2.2, 2.4, 3.2, 3.3, 4.2
	Design Process	Lesson 1.1, 2.1, 2.2, 2.4, 3.2, 3.3, 4.2
	Engineering Tools and Technology	Lesson 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2
	Career Awareness	Lesson 2.2, 2.4, 3.2, 3.3, 4.2
	Communication	Lesson 2.2, 2.4, 3.2, 3.3, 4.1, 4.2
Math/Science Foundations	Foundations in Mathematics and Science	Lesson 1.1, 1.2, 2.1, 2.2, 2.3, 2.4
	State Machines	Lesson 4.1
Electronic Foundations	Foundations in Electronics	Lesson 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2
Logic	Combinational Logic	Lesson 1.1, 1.2, 2.1, 2.2, 2.3, 2.4
	Sequential Logic	Lesson 1.1, 1.2, 3.1, 3.2
	Programming Logic	Lesson 2.2, 4.1, 4.2



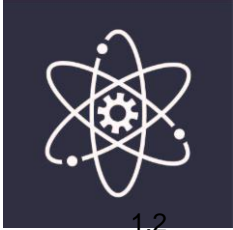


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Engineering Essentials

Skill Cluster	Domain	Framework
Professional Practice	Career Awareness	Lesson 1.1, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 4.1, 4.2, 4.3
	Professionalism and Ethics	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
	Project Management	Lesson 1.1, 1.4, 2.1, 2.2, 2.3, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
Communication and Collaboration	Collaboration	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4.
	Communication	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
Design and Mindset	Engineering Mindset	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
	Design Process	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
	Systems Thinking	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
	Computational Thinking	Lesson 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
	Experimental Design	Lesson 1.3, 2.1, 2.2, 2.3, 3.1, 3.3, 4.1
Design Properties	Physical Properties	Lesson 1.3, 2.1, 3.1, 3.2, 3.3, 4.1, 4.3, 4.4
	Modeling	Lesson 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3,





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Critical and Computational Thinking	D5: Computational Thinking	Lesson 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
	D7: Systems Thinking	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4





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Environmental Sustainability

Skill Cluster	Domain	Framework
Professional Practice	Career Awareness	Lesson 1.1, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4
	Professionalism and Ethics	Lesson 1.1, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4
Communication and Collaboration	Collaboration	Lesson 1.1, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.4, 4.2, 4.3, 4.4
	Communication	Lesson 1.1, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4
Design and Mindset	Engineering Mindset	Lesson 1.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.2, 4.4
	Design Process	Lesson 1.1, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4
	Engineering Tools and Technology	Lesson 1.1, 2.1, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4
Water Supply	Safe and Abundant Water Supply	Lesson 2.1, 2.2, 2.3, 2.4
Food Security	Food Security	Lesson 3.1, 3.2, 3.3, 3.4
Renewable Fuels	Renewable Fuels	Lesson 4.1, 4.2, 4.3, 4.4





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Introduction to Engineering Design

Skill Cluster	Domain	Framework
Professional Practice	Career Awareness	Lesson 1.1, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.2, 4.4
	Professionalism and Ethics	Lesson 1.1, 2.2, 2.3, 3.1, 3.2, 3.3
Collaboration and Communication	Collaboration	Lesson 1.1, 1.2, 1.3, 1.4, 2.2, 3.1, 3.2, 3.3, 4.1, 4.2, 4.4
	Communication	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
Design and Mindset	Engineering Mindset	Lesson 1.1, 1.2, 1.3, 1.4, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
	Design Process	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.4
	Systems Thinking	Lesson 2.2, 3.1, 3.2, 3.3, 4.1, 4.3, 4.4
	Computational Thinking	Lesson 1.1, 1.2, 1.4, 2.2, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3
Design Properties	Engineering Design	Lesson 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1
	Engineering Science	Lesson 1.1, 1.3, 2.1, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4
Modeling	Modeling	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4





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Principles of Engineering

Skill Cluster	Domain	Framework
Professional Practice and Communication	Career Awareness	Lesson 1.1, 1.2, 2.1, 3.1, 4.1
	Professionalism and Ethics	Lesson 1.2, 1.4, 2.1, 3.1, 4.1
	Collaboration	Lesson 1.1, 1.4, 3.3
	Communication	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2
Design and Mindset	Engineering Mindset	Lesson 3.1, 3.3, 4.2
	Design Process	Lesson 1.1, 1.2, 1.3, 1.4, 2.2, 2.4, 3.1, 3.3, 4.2
	Engineering Tools and Technology	Lesson 1.2, 2.1, 2.2, 2.4, 3.2, 3.3, 4.1, 4.2
Energy and Power	Energy and Power	Lesson 1.1, 1.2, 1.3, 1.4
Materials and Structures	Materials and Structures	Lesson 2.1, 2.2, 2.3, 2.4
Control Systems	Control Systems	Lesson 3.1, 3.2, 3.3
Statistics and Kinematics	Statistics and Kinematics	Lesson 4.1, 4.2

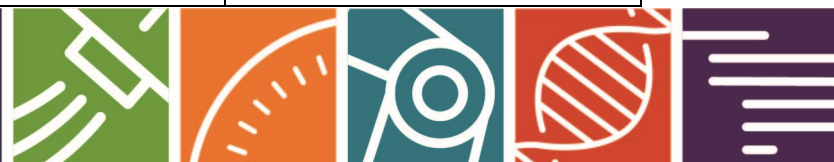


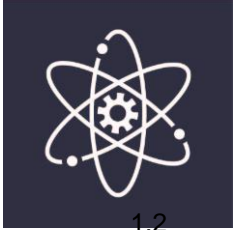


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Human Body Systems

Skill Cluster	Domain	Framework
Professional Practice and Communication	Career Awareness	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 5.2, 5.3, 6.1
	Professionalism and Ethics	Lesson 1.3, 2.1, 2.2, 2.3, 2.4, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 6.1
	Communication	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 5.2, 5.3, 6.1
	Collaboration	Lesson 1.3, 2.2, 2.4, 3.1, 3.2, 3.4, 4.2, 4.4, 6.1
Critical and Process Thinking	Experimental Design	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.4, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 5.2, 5.3,
	Critical and Process Thinking	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.2, 3.3, 4.2, 4.3, 4.4, 5.3, 6.1
Biological Foundations	Structure and Function	Lesson 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 5.2, 5.3, 6.1
	Molecular Biology	Lesson 1.3, 5.3,
Biomedical Tools and Analysis	Biomedical Tools and Technology	Lesson 1.2, 1.3, 2.2, 3.3, 4.1, 4.2, 4.3, 4.4, 5.2,
	Analysis of Medical Evidence	Lesson 1.1, 1.2, 2.2, 2.3, 3.2, 3.3, 4.1, 4.3, 4.4, 5.2, 6.1
	Analysis of Disease	Lesson 2.2, 2.3, 2.4, 3.2, 3.3, 3.4, 4.3, 4.4, 5.2, 6.1





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	Clinical Testing	Lesson 2.2, 2.4, 3.3, 3.4, 4.1, 4.3, 4.4, 5.2, 5.3, 6.1
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Medical Interventions

Skill Cluster	Domain	Framework
Professional Practice	Career Awareness	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.3, 4.4
	Professionalism and Ethics	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.3, 4.4
Communication and Collaboration	Communication	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4
	Collaboration	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 3.2, 3.3, 3.4, 4.2, 4.3, 4.4
Critical and Process Thinking	Experimental Design	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 3.1, 3.2, 3.3, 3.4, 4.1, 4.3
	Critical and Process Thinking	Lesson 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4
Biological Foundations	Microbiology	Lesson 1.2, 4.1
	Molecular Biology	Lesson 1.1, 1.4, 2.1, 3.4, 4.1
Medical Foundations	Disease Physiology	Lesson 1.3, 3.1, 3.2, 4.2
	Disease Prevention and Treatment	Lesson 1.4, 2.2, 3.3, 3.4, 4.2
Biomedical Tools and Analysis	Biomedical Tools and Technology	Lesson 1.2, 1.3, 1.4, 2.1, 3.1, 3.3, 4.1, 4.2, 4.3
	Analysis of Medical Evidence	Lesson 1.1, 1.3, 1.4, 2.1, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
	Diagnostic Testing	Lesson 1.1, 1.3, 3.1





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Principles of Biomedical Science

Skill Cluster	Domain	Framework
Professional Practice	Career Awareness	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3
	Professionalism and Ethics	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3
Communication and Collaboration	Communication	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3
	Collaboration	Lesson 1.1, 1.3, 2.1, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3
Critical and Process Thinking	Experimental Design	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2, 4.3
	Critical and Process Thinking	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3
Biological Foundations	Microbiology	Lesson 1.1, 1.3, 3.1, 3.2, 4.1
	Cell Biology	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2
	Anatomy and Physiology	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 3.2, 4.1, 4.2
Molecular Biology and Genetics	Molecular Biology and Genetics	Lesson 1.1, 1.2, 1.3, 2.2, 2.3
Laboratory and Clinical Practices and Analysis	General Laboratory Practices	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2
	Clinical Medicine	Lesson 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2





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Computer Science A

Skill Cluster	Domain	Framework
Professional Practice and Communication	Career Awareness	Problems 1, 2, 3, 4
	Professionalism and Ethics	Units 1.3, 2.4, 2.5, 3.6, 3.7, 3.8, 4.10 Problems 2, 4
	Collaboration	Units 2.4, 2.5, 3.6, 4.10 Problems 1, 2, 3, 4
	Communication	Units 1.3, 4.9 Problem 2
Creativity and Problem Solving	Creativity	Unit 1.1, 1.3, 2.4, 2.5, 3.6, 3.8, 4.9 Problem 1, 2, 3, 4
	Problem-Solving Mindset	Unit 1.1, 1.3, 2.4, 2.5, 3.6 Problem 1, 2, 3, 4
	Problem Solving and Computation Process	Unit 1.2, 1.3, 2.4, 2.5, 3.6, 3.7, 3.8, 4.9, 4.10 Problem 1, 3, 4
	Computational Techniques	Unit 1.1, 2.5, 3.6, 4.9, 4.10 Problem 4
Variables, Algorithms, and Modularity	Modularity	Unit 1.1, 1.2, 2.4, 2.5, 4.9 Problem 1
	Variables	Unit 1.1, 1.2, 1.3, 2.4, 2.5
	Algorithms	Unit 1.1, 1.2, 1.3, 2.4, 3.6, 3.7, 4.10 Problem 1, 2, 3





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Programming	Computational Thinking Process	Unit 1.1, 1.2, 1.3, 2.4, 2.5, 3.6, 3.7 3.8, 4.9, 4.10 Problem 1, 2, 3, 4
	Programming Design and Implementation	Unit 1.1, 1.2, 1.3, 2.4, 2.5, 3.6, 3.7 3.8, 4.9, 4.10 Problem 1, 2, 3, 4



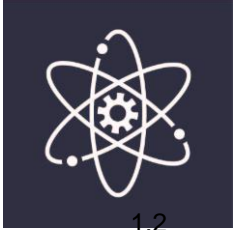


1.2

Computer Science Essentials

Skill Cluster	Domain	Lessons
Professional Practice	Career Awareness	Lesson 1.2, 2.2
	Professionalism and Ethics	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.3, 4.1
	Social Impact of Computing	Lesson 1.2
Collaboration and Communication	Collaboration	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1
	Communication	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 4.1
Problem Solving	Creativity	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1
	Problem Solving Mindset	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1
	Problem Solving Process	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1
Data, Algorithms, and Abstraction	Data	Lesson 1.2
	Algorithms	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1
	Abstractions	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1
Programming	Programming	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1
Computational Tools and	Computational Tools and	Lesson 1.1, 1.2, 1.3, 2.1, 2.2,





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Techniques	Techniques	2.3, 3.1, 3.2, 3.3, 4.1
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1.2

Computer Science Principles

Skill Cluster	Domain	Framework
Professional Practice	Career Awareness	Lesson 1.1, 1.3, 2.2, 4.2
	Professionalism and Ethics	Lesson 1.1, 1.2, 1.3, 3.2, 3.3, 4.1, 4.2, 4.3
	Social Impact of Computing	Lesson 2.1, 2.2, 2.3, 3.1, 4.2
Collaboration and Communication	Collaboration	Lesson 1.1, 1.2, 1.3, 2.3, 3.1, 3.2, 4.1, 4.2
	Communication	Lesson 1.2, 1.3, 3.3
Problem Solving	Creativity	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.3, 4.2, 4.3
	Problem-Solving Mindset	Lesson 1.1, 1.2, 1.3, 2.2, 3.1, 3.2, 3.3, 4.1, 4.3
Data, Algorithms, and Development	Creative Development	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.3
	Data	Lesson 1.1, 1.2, 2.2, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3
	Algorithms and Programming	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3
The Internet	Computer Systems and Network	Lesson 2.2, 2.3, 3.1, 4.2





Cybersecurity

Skill Cluster	Domain	Framework
Professional Practice	Career Awareness	Lesson 1.1, 2.1, 3.2, 3.4,
	Professionalism and Ethics	Lesson 1.1, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
	Social Impacts of Computing	Lesson 1.1, 2.2, 2.3, 3.4,
Collaboration and Communication	Collaboration	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
	Communication	Lesson 1.1, 1.2, 1.3, 2.1, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
Problem Solving	Creativity	Lesson 1.1, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
	Problem Solving Mindset	Lesson 1.1, 1.3, 2.1, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.2, 4.3
	Computational Problem-Solving Process	Lesson 1.1, 1.2, 1.3, 2.1, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
	Computational Tools and Techniques	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
Data, Security Algorithms, and Abstraction	Data	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
	Security Algorithms	Lesson 3.1, 4.1, 4.2, 4.3
	Abstraction	Lesson 1.2, 2.1, 2.3, 2.4, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3





Systems and Networks	Computer Systems	Lesson 1.1, 1.2, 1.3, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
	The Network	Lesson 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3
Threat Investigation, Analysis, Response, and Protection	Threat Investigation, Analysis, Response, and Protection	Lesson 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3





Appendix D: Normative Score Table 2018-19

Scale Score	PLTW Computer Science				PLTW Engineering							PLTW Biomedical Science		
	Computer Science A	Computer Science Essentials	Computer Science Principles	Cybersecurity	Aerospace Engineering	Civil Engineering and Architecture	Computer Integrated Manufacturing	Digital Electronics	Environmental Sustainability	Introduction to Engineering Design	Principles of Engineering	Human Body Systems	Medical Interventions	Principles of Biomedical Science
100	1	2	2	2	3	2	2	1	3	3	2	1	2	1
110	1	2	2	3	3	2	3	1	4	3	2	2	2	2
120	1	3	3	3	3	2	3	1	4	4	3	2	2	2
130	2	3	3	3	4	3	4	2	4	4	3	2	2	2
140	2	4	4	4	4	3	4	2	5	5	4	3	3	3
150	3	5	5	5	5	4	5	3	6	6	4	3	3	4
160	4	6	6	5	6	4	6	3	6	7	5	4	4	4
170	5	7	6	6	6	5	6	4	8	8	6	5	5	5
180	6	8	8	7	7	6	7	5	8	9	7	6	6	6
190	7	9	9	9	8	7	8	6	10	11	8	7	7	7
200	8	11	10	10	9	8	10	8	11	13	10	8	8	8
210	10	12	12	11	11	10	11	10	13	14	12	9	9	9
220	12	14	13	13	12	12	13	12	14	16	13	11	11	11
230	14	16	15	15	14	14	15	15	16	19	15	13	13	13
240	16	19	17	16	16	16	17	17	17	21	17	15	14	15
250	19	21	20	18	18	18	19	20	19	23	20	18	17	17
260	22	23	22	19	20	21	21	23	21	26	22	20	19	20
270	24	26	25	21	22	24	23	27	24	28	25	23	23	23
280	27	28	27	24	25	27	26	30	26	31	28	26	25	26
290	31	31	30	27	28	30	29	34	29	33	31	30	28	30
300	34	34	33	30	30	35	32	37	32	36	34	33	32	33
310	38	37	36	34	34	38	35	41	34	39	38	37	35	37
320	42	40	39	38	37	42	38	45	37	42	41	41	39	41
330	46	44	44	42	42	46	42	48	41	45	45	45	44	44
340	49	47	47	45	45	50	46	52	44	48	48	49	47	48
350	53	51	51	50	49	54	50	55	47	51	52	53	52	52
360	57	55	55	54	53	58	54	59	52	55	56	57	54	57
370	60	59	58	59	57	61	58	62	56	59	60	61	60	60
380	64	63	62	63	61	65	62	65	59	62	63	65	64	64
390	67	67	66	68	65	69	66	69	63	66	67	69	67	68
400	71	70	70	71	69	72	70	72	68	70	71	72	71	71
410	74	74	73	75	73	75	73	75	72	74	74	76	73	75
420	76	78	77	77	78	78	77	77	76	78	77	78	77	77
430	79	81	80	81	81	80	80	80	80	82	80	81	81	80
440	82	84	83	83	84	83	84	83	83	86	83	84	83	82
450	84	87	85	86	87	85	86	85	87	89	86	86	86	85
460	86	89	88	89	90	87	89	87	90	91	88	88	89	87
470	88	91	91	90	92	90	91	89	92	94	90	91	90	90
480	90	93	92	92	94	91	93	90	94	96	92	92	93	91
490	92	94	94	94	95	93	94	92	96	97	94	93	94	94
500	93	95	95	95	96	94	95	93	97	98	95	94	95	94
510	95	96	97	96	97	95	97	95	98	99	96	95	96	94
520	96	97	98	97	98	96	97	95	98	99	97	96	96	97
530	97	98	98	98	99	97	98	96	99	99	98	97	97	97
540	98	98	99	98	99	98	99	97	99	99	98	97	98	97
550	99	99	99	99	99	98	99	98	99	99	99	98	98	99
560	99	99	99	99	99	98	99	98	99	99	99	98	99	99
570	99	99	99	99	99	99	99	99	99	99	99	99	99	99
580	99	99	99	99	99	99	99	99	99	99	99	99	99	99
590	99	99	99	99	99	99	99	99	99	99	99	99	99	99
600	99	99	99	99	99	99	99	99	99	99	99	99	99	99





Please Note: PLTW will release a normative table for the 2020-21 school year in late summer 2021. This document will be updated and available [here](#).

Appendix E: Frequently Asked Questions

How do Scale Scores and Skill Cluster Scores relate to each other?

Though the scale score and skill clusters scores both gather information from the assessment, they use that information in different ways. Because of the number of items contributing to each score, the scale score is a more precise measurement (51 points) and the skill cluster score is a less precise measurement (5 points). As a result, the lower scale scoring student could have been a "low 4" and the higher scale scoring student could have been a "high 4", contributing to the difference in scale scores. Also, the PLTW EoC Assessments contain both unidimensional and multidimensional items. In other words, there are both items that measure just one skill cluster and items that measure multiple skill clusters. If an item is multidimensional, it may contribute to the score of multiple skill clusters, but it would only contribute once to the scale score and achievement level descriptor.

Example:

Student 1: Practiced, 340 score (with a 4, 4, 4, 5 in the clusters)

Student 2: Accomplished, 350 score (with a 3, 4, 4, 4 in the clusters)

The scale score and the corresponding Achievement Level Descriptor will provide the best indication of a student performance across the entire course. The skill cluster scores will help teachers understand if there is a targeted area of the practice in which the student does especially well. If the teacher wants to align their teaching more directly to the skills measured on the assessment next year, they should consider domains included in skill clusters where students are not performing as well and consider ways to increase their attention to that area as they make plans for next year.

Scale scores offer an indicator of student competency in the entire course and skill cluster scores provide targeted information that may be more helpful as teachers consider modifications to their instructional plan for future classes.

How does the scale score this year relate to the 1 to 9 scale from previous years?

PLTW EoC Assessments changed significantly in 2018 to align more closely to the PLTW approach and support a shift to assessment of both subject matter and transportable skills. Score reporting has moved from a 1 to 9 scale used as a comparison between all students in the course, to a criterion-based score reported for each student on a scale of 100-600. A panel of SMEs have established achievement level ranges of Novice, Practiced, Accomplished, and Distinguished for each course with cut scores adjusted for difficulty across multiple test forms.

For those institutions using a score to define proficiency in a standards-based setting, PLTW provides descriptions of each achievement level band on the back of each student score report. If an institution you work with would like additional guidance using the PLTW EoC Assessment scores, please encourage them to reach out to our team at pltwassessments@pltw.org.

