Pathway2Careers Math

Implementation Guide

Selecting and Using P2C Math Lessons

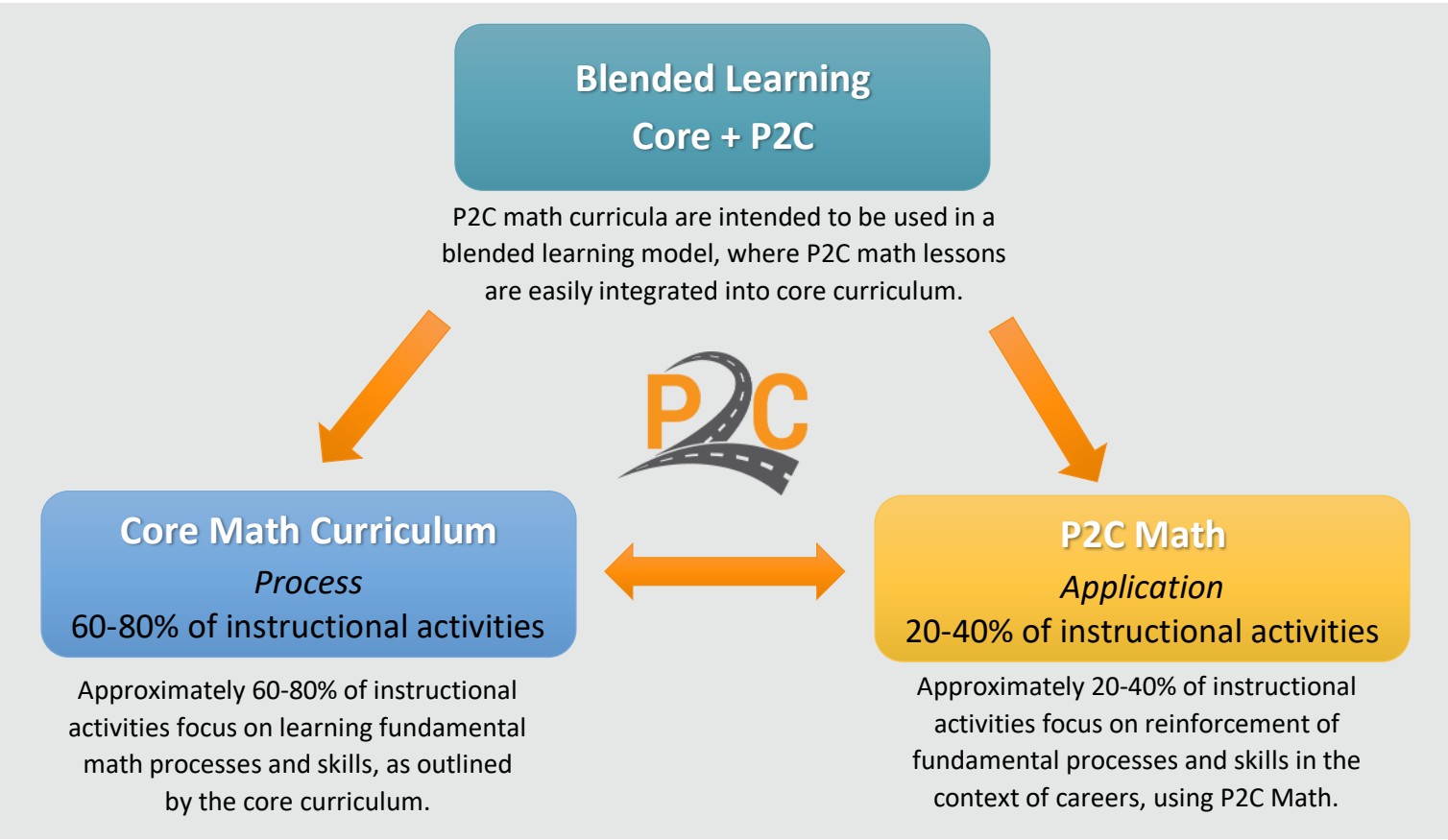
Pathway2Careers

Education with Destination

Instructional Model

Model for Implementation

The P2C math curricula are intended to be used in a blended learning model, where the P2C lessons supplement and compliment the core curriculum. Lessons within the core curriculum can follow a typical instructional plan with much of the instructional material remaining unchanged. The P2C math lessons can be integrated into the core curriculum as substitute or added content that replaces or expands upon the application and practice activities within the core curriculum. The idea is to use the P2C lessons as a learning opportunity for students that can strengthen fundamental math concepts as students apply what was learned within the core curriculum.



Practical Implementation

Selecting P2C Math Lessons

The P2C Math lessons are designed to supplement core curriculum and are intended to be integrated within current lesson plans. Each P2C lesson is best used in place of, or in addition to, practice and application activities within the core curriculum.

Step One:
Review Core Curriculum

Locate a detailed table of contents, scope and sequence, and/or pacing guide for your core curriculum. Review information presented for lessons within each unit or chapter.

Step Two:
Identify Concepts and Standards

For each lesson within your core curriculum, identify: (1) the specific math concepts and (2) the Common Core State Standards coverage (if available).

Step Three:
Align P2C Lessons with Core Curriculum

Match the math concepts and standards from your core curriculum with those provided for the P2C math lessons.

Step Four:
Integrate P2C Lessons

List P2C lesson matches alongside planned lessons from your core curriculum. Replace or add practice and application activities from your core curriculum with the P2C career-focused lessons.

Sample Lesson Selection

Step One:
Review Core Curriculum

Locate a detailed table of contents, scope and sequence, and/or pacing guide for your core curriculum. Review information presented for lessons within each unit or chapter.

To the right is a sample table of contents that demonstrates the type of information needed from the core curriculum. Listed within this table are specific lesson titles, as well as associated CCSS for each lesson. This will be the basic information used to start the lesson matching process.

Sample Algebra I Table of Contents	CCSS
Unit 1: Algebra Foundations	
Lesson 1.1 Variables and Expressions	A-SSE.1a, A.SSE.2
Lesson 1.2 Order of Operations	A.SSE.1b, A.SSSE.2
continued	
Unit 2: Linear Equations	
Lesson 2.1 Writing Equations	A.CED.1
Lesson 2.2 Solving One-Step Equations	A.REI.3
continued	
Unit 3: Linear Functions	
Lesson 3.1 Graphing Linear Equations	F.IF.4, F.IF.7a
Lesson 3.2 Graphing to Solve Linear Equations	A.REI.10, F.IF.7a
continued	
Unit 4: Equations and Linear Functions	
Lesson 4.1 Graphing Equations – Slope-Intercept Form	F.IF.7a, S.ID.7
Lesson 4.2 Writing Equations – Slope-Intercept Form	F.BF.1, F.LE.2
continued	
Unit 5: Linear Inequalities	
Lesson 5.1 Solving Inequalities – Addition and Subtraction	A.CED.1, A.REI.3
Lesson 5.2 Solving Inequalities – Multiplication and Division	A.CED.1, A.REI.3
continued	

Step Two:
Identify Concepts and Standards

For each lesson within your core curriculum, identify: (1) the specific math concepts and (2) the Common Core State Standards coverage (if available).

This second step can be easily accomplished by reviewing the lesson topics and standards within the table of contents. Lesson titles can provide quick information on the primary concepts presented within a lesson. Lesson topics also can assist in determining what specific elements of a standard may be addressed in the lesson.

Sample Algebra I Table of Contents	CCSS
Unit 1: Algebra Foundations	
Lesson 1.1 Variables and Expressions	A-SSE.1a, A.SSE.2
Lesson 1.2 Order of Operations	A.SSE.1b, A.SSSE.2
continued	
Unit 2: Linear Equations	
Lesson 2.1 Writing Equations	A.CED.1
Lesson 2.2 Solving One-Step Equations	A.REI.3
continued	
Unit 3: Linear Functions	
Lesson 3.1 Graphing Linear Equations	F.IF.4, F.IF.7a
Lesson 3.2 Graphing to Solve Linear Equations	A.REI.10, F.IF.7a
continued	
Unit 4: Equations and Linear Functions	
Lesson 4.1 Graphing Equations – Slope-Intercept Form	F.IF.7a, S.ID.7
Lesson 4.2 Writing Equations – Slope-Intercept Form	F.BF.1, F.LE.2
continued	
Unit 5: Linear Inequalities	
Lesson 5.1 Solving Inequalities – Addition and Subtraction	A.CED.1, A.REI.3
Lesson 5.2 Solving Inequalities – Multiplication and Division	A.CED.1, A.REI.3
continued	

Step Three:
Align P2C Lessons with Core Curriculum

Match the math concepts and standards from your core curriculum with those provided for the P2C math lessons.

In this step, lessons are most easily matched by looking for similarities in lesson titles. Lessons from the core curriculum can be matched to lessons with similar titles within the P2C table of contents. Once a topic match has been found, further confirmation of a match can be achieved by evaluating standards. If both lesson titles and CCSS align, a suitable lesson match has been made. **Important Note:** Because the P2C math lessons are supplementary, there may not be a lesson match for every core lesson.

Sample Algebra I Table of Contents	CCSS
Unit 1: Algebra Foundations	
Lesson 1.1 Variables and Expressions	A-SSE.1a, A.SSE.2
Lesson 1.2 Order of Operations	A.SSE.1b, A.SSSE.2
continued	
Unit 2: Linear Equations	
Lesson 2.1 Writing Equations	A.CED.1
Lesson 2.2 Solving One-Step Equations	A.REI.3
continued	

Pathway2Careers Algebra I Table of Contents

1. Algebra Foundations

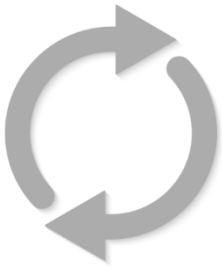
	Lesson Topic	CCSS	Occupation
Lesson 1.1	Unit Analysis	N.Q.1	Dental Laboratory Technicians
Lesson 1.2	Modeling with Quantities	N.Q.2	Terrazzo Workers and Finishers
Lesson 1.3	Precision and Accuracy	N.Q.3	Environmental Science and Protection Technicians
Lesson 1.4	Structure of Expressions	A.SSE.1a	Economics Teachers, Postsecondary

2. Solving Equations

	Lesson Topic	CCSS	Occupation
Lesson 2.1	Writing Linear Equations	A-CED.1	Credit Counselors
Lesson 2.2	Solving Linear Equations with a Variable on One Side	A-REI.3, A-CED.1, A-REI.1	Veterinarians
Lesson 2.3	Solving Linear Equations with a Variable on Both Sides	A-REI.3, A-CED.1, A-REI.1	Bookkeeping, Accounting, and Auditing Clerks
Lesson 2.4	Literal Equations and Formulas	A-CED.4, N-Q.1	Electricians

Step Four:
Integrate P2C Lessons

List P2C lesson matches alongside planned lessons from your core curriculum. Replace or add practice and application activities from your core curriculum with the P2C career-focused lessons.



Sample Algebra I Table of Contents	CCSS	P2C Lesson Match
Unit 1: Algebra Foundations		
Lesson 1.1 Variables and Expressions	A-SSE.1a, A.SSE.2	No match
Lesson 1.2 Order of Operations	A.SSE.1b, A.SSSE.2	No match
continued		
Unit 2: Linear Equations		
Lesson 2.1 Writing Equations	A.CED.1	Lesson 2.1
Lesson 2.2 Solving One-Step Equations	A.REI.3	Lesson 2.2
continued		

This last step involves listing P2C lesson matches within the core curriculum. This can be done prior to the start of the course or as a continuous process while teaching the course. For each lesson match, the most effective approach will be to present the core lesson using standard practices and materials. This will provide a firm foundation of basic skills and concepts. When opportunities arise within the core lesson to apply or practice concepts, use the P2C math lesson to replace or supplement these activities. The use of the P2C math lessons will strengthen student learning of core concepts through the application of these fundamental skills to authentic work activities.

Present core lesson to students using standard practices and materials.

Identify application and practice opportunities within the core lesson.

Replace or supplement application and practice opportuntiies with a P2C math lesson.

Using P2C Math Lessons

There are two suggested modes of implementation for lessons within the P2C math curricula. Lessons can be used in classroom instruction, where teachers lead or guide students through each lesson, as well as independent learning opportunities, where students engage in more autonomous, student-led experiences. The P2C lessons have been explicitly designed to support both modes of implementation. Classroom instruction is recommended as the primary mode, as this mode offers the ability to enhance student interest and engagement in the learning experience through the application of fundamental math concepts to meaningful career opportunities.

Suggested Modes of Lesson Implementation

Classroom Instruction
Teacher-Led

Learning Environment: virtual or in-person classroom

Technology: computers, projector, tablets, calculators

Digital Tools: P2C Learning Management System (LMS)

Instructional Materials: P2C Math Lessons

Process: Begin with a review of the spotlighted career in the P2C math lesson, followed with a walk-through of lesson examples. Provide opportunities for students to complete exercises and checks in the classroom environment with teacher monitoring and feedback.

Independent Learning
Student-Led

Learning Environment: independent learning space (classroom, home, school, or alternate study space)

Technology: computers, tablets, calculators

Digital Tools: P2C Learning Management System (LMS)

Instructional Materials: P2C Math lessons

Process: Assign the appropriate P2C math lesson to students as an independent learning activity (e.g., homework). Instruct students to work through the lesson, starting with the career overview. Encourage students to complete *all* or *specific* practice and check items. Evaluate student performance using the P2C LMS or alternate classroom methods.

Process for Lesson Implementation

Classroom Instruction
Teacher-Led

Step One: Identify P2C Lesson Match
Refer to the core curriculum and identify the P2C lesson match for the planned lesson (see *Selecting P2C Lessons* above). The P2C lessons are indented for use in place of practice and application activities in the core curriculum.

Step Two: Prepare P2C Lesson Materials
Log into the P2C LMS and locate the student and teacher editions for the P2C lesson match. Prepare to share lesson content using a computer, projector, tablets, laptops printed materials, etc.

Step Three: Present Lesson to Students
Using the delivery mode prepared in the previous step, present the lesson to students. Review the lesson occupation and walk students through the lesson examples. Provide opportunities for students to complete the practice and check items in class.

Step Four: Evaluate Student Learning
Observe student performance on practice problems, as well as the check at the end of the lesson. Provide feedback to students regarding their learning.

Independent Learning
Student-Led

Step One: Identify P2C Lesson Match
Refer to the core curriculum and identify the P2C lesson match for the planned lesson (see *Selecting P2C Lessons* above). The P2C lessons are indented for use in place of practice and application activities in the core curriculum.

Step Two: Locate and Assign P2C Lesson
Log into the P2C LMS and locate the student editions for the P2C lesson match. Assign the P2C lesson to students within the P2C LMS or through alternate assignment methods currently used with students.

Step Three: Provide Student Access
Ensure students can access the assigned lesson using the assignment method identified in the previous step. Provide additional instruction regarding items students will need to complete.

Step Four: Evaluate Student Learning
Assess student performance on assigned practice and check items. Provide feedback to students within the P2C LMS or alternate assignment communication methods currently used with students.

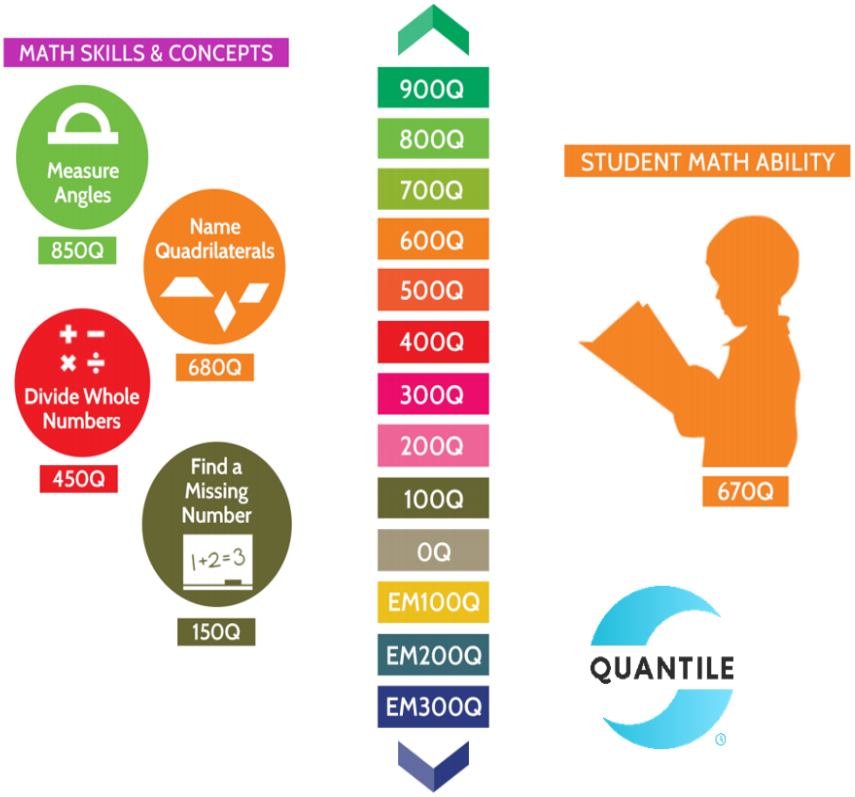
P2C Math Assessments

About the Assessments

The Pathway2Careers (P2C) math assessments provide students with a Quantile measure that represents students' mathematical achievement level and indicates the skills and concepts they are ready to learn. This information allows educators to more easily align instruction and educational materials with a student's current skill level. The P2C assessments also provide the ability to track students' mathematics growth with multiple assessments throughout the year – beginning, middle, and end. A student's increasing Quantile measure is an indication of his or her readiness to learn progressively more complex mathematical concepts. The rate of growth that students demonstrate can also indicate their likelihood for accessing more advanced math skills.

In addition to monitoring growth, student Quantile measures provided by the P2C assessments can be compared to the math demands of different careers in the Quantile Career Database. This database, created by MetaMetrics® (developer of the Quantile Framework for Mathematics), lists hundreds of careers and their Quantile measures representing the math demand for entry into the career. By Comparing their Quantile measure from the P2C math assessments to the math demand of careers they aspire to, students are motivated to be mathematically ready for these careers with continued study. The purpose of the database is to provide a critical point of connection for students, allowing them to see how their learning applies to their current and future employment potential. With this awareness, students can better prepare for the realities of today, as well gain inspiration to acquire skills for the future.

- The Quantile scale ranges from Emerging Mathematician (below 0Q) to above 1600Q. Each numeric value within the scale, referred to as a Quantile measure, is representative of a student's overall mathematical ability.
- A student's Quantile measure indicates the progress made in learning math content and what new math content the student may be ready to learn.
- Increases in a student's Quantile measure points to his or her readiness to learn progressively more complex mathematical concepts.



QUANTILE CAREER DATABASE

- The Quantile Career Database relies on extensive research to examine the mathematical demands of hundreds of Quantile-measured careers.
- Each student's Quantile measure can be compared to careers within the database to understand careers they are prepared to access and the math demands of careers they aspire to achieve.