



EXECUTIVE SUMMARY



IN SUPPORT OF THE TENNESSEE INNOVATIVE
SCHOOLS MODEL

NS4ed, LLC

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Executive Summary

Pathway2Careers, the emerging core curricula for middle- and high-school students is successfully building students' career awareness and planning in the context of STEM math skills required for today's workforce. The curricula is transformative for today's classrooms: It engages students in math learning by making that learning relevant to careers, and by helping particularly high-need students dream and plan for work they may never have thought possible. Key objectives in Pathway2Careers include STEM learning (mathematics), exploration of relevant careers for local and regional workforces, and a pathway for next steps following graduation. With Pathway2Careers, we create a *continuum of personalized learning for all students*.

This is an exciting time in education as states, districts, and schools, with the encouragement of the US Department of Education, reimagine how all students can transition from high school through postsecondary education and into careers. Education is on the cusp of a career-connected learning revolution. Pathway2Careers is in the forefront, with partnerships focused on engaging students with powerful learning methods to improve student outcomes.

A Tennessee-Recommended Curriculum for 2023: NS4ed, LLC's Pathway2Careers

As part of its rigorous quality instructional review, the Tennessee Textbook and Instructional Materials Quality Commission and the TN Department of Education approved NS4ed's Pathway2Careers™ mathematics curriculum for use in Tennessee schools across the State.

Pathway2Careers succeeds in "making math meaningful" by highlighting more than 650 high-value careers and demonstrating to learners how math is vital in those jobs. To ensure relevance, NS4ed's math curricula use current, state-specific career data from the U.S. Bureau of Labor Statistics to connect learning to careers and prepare students for success following high-school graduation. This approach to learning supports the Tennessee Innovative School Model's commitment that Tennessee is "future-workforce ready." By integrating math learning with career exploration, NS4ed has achieved two milestones in education:

- ⇒ Helping students learn math, the most important STEM skill for the workplace.
- ⇒ Creating a platform that *listens* to student career aspirations and helps them build the pathways to move toward success.

Reflecting the vision for Tennessee Innovative School Models, these achievements are transforming school environments and creating a culture of college and career awareness and readiness.

Reimagining Schools: An Overview of Pathway2Careers

Pathway2Careers is a career-connected math program. Its basic theory is that students will be able to connect and engage with challenging mathematics concepts by learning about and thinking critically about potential careers. When students connect with a specific career path and goal through career exploration, they will be motivated to persist and continue with mathematics at progressively higher levels, as they prepare for today's increasingly digital workforce.

NS4ed developed Pathway2Careers with the belief that every student can do great things when encouraged to discover their future pathways through career exploration, and then learn academic skills vital to success in the careers they are exploring. In this way, students can, on their own, connect careers and learning.

Education's entire approach to readiness—for both the college and career-bound students—is changing as we embrace innovative school models that *redefine* what post-secondary pathways can look like. For students heading for college, the aim is to provide them with the skills they need to reach their post-secondary goals. For students entering the workforce, the aim is to ensure they have the critical skill set, required training, and necessary credentials. For all students, a firm math foundation to support their career choices is a key step toward meeting their goals.

How it Works:

The Pathway2Careers Math Curriculum—developed for Pre-Algebra, Algebra 1 and 2, and Geometry—introduces math concepts within the context of 16 different career clusters recognized by the U.S. Department of Labor. Each cluster includes lessons focused on 20 high-demand, high-wage careers, providing students with the potential to experience 320 different career options at the same time they are learning math.

This design structure clearly illustrates for students how algebra and geometry are used in everyday workplace activities. To assure the math lessons are reflective of a student's career interest, each course begins with students completing a career assessment to discover and learn more about their career interests. Based on these responses, Pathway2Careers software builds math lessons that utilize these careers students identified to drive the learning objectives. While learning math, they are simultaneously exploring in greater depth just what these careers require. This is the basis for NS4ed's career-connected learning in mathematics. At any point, students can enter a different career to explore, and the software will reformat the lessons in this context.

Each lesson begins with a career spotlight on the occupation that will illustrate that lesson.

The career spotlight provides students with the occupation description, the differing levels of education required, potential employers, and a summary of responses to the question, “Is this a good career for me?” Also in the introduction is a list of the math concepts that will be taught.

Lesson objectives are stated, along with illustrations of the math problem, again in context of the student-selected occupations. For example, if “volume of cylinders, cones, and spheres” is being taught in Geometry in the context of agricultural engineering, the lesson will show storage systems with their dimensions, followed by hints for planning how to solve the presented storage problem for agricultural products. A series of problems at the end of the lesson determine skill growth and understanding of the math concept taught.

All curricula are aligned to Tennessee state standards, and curriculum crosswalks support program alignment.

The content of Pathway2Careers is rich with careers while teaching math concepts and skills in each lesson:

Pre-Algebra:

- ⇒ 51 application lessons each give an in-depth, real-world look at how 51 different occupations use Pre-Algebra concepts.
- ⇒ 261 unique occupations throughout 61 explorations give students a short overview of how these occupations might use Pre-Algebra concepts.

Algebra 1:

- ⇒ 50 application lessons each give an in-depth, real-world look at how 50 different occupations use Algebra 1 concepts.
- ⇒ 262 unique occupations throughout 75 explorations give students a short overview of how these occupations might use Algebra 1 concepts.

Geometry:

LESSON 1.3



Use Theorems About Angles

CAREER SPOTLIGHT: Carpenter

Occupation Description
Carpenters construct, repair, and install building frameworks and structures made from wood and other materials.

Carpenters have many different tasks. Some carpenters insulate office buildings; others install drywall or kitchen cabinets in homes. Still others focus on production or commercial work to help construct tall buildings or bridges. These carpenters also erect shoring and scaffolding for buildings.

Education
Carpenters typically need a high school diploma and learn on the job or through apprenticeships. Certain high school courses, such as mathematics and mechanical drawing, may be useful. Some vocational-technical schools offer associate’s degrees in carpentry. The programs vary in length and teach basics and specialties in carpentry.

Potential Employers
Carpenters held about 1.0 million jobs in 2018. The largest employers of carpenters were as follows:

Self-employed workers	27%
Residential building construction	22%
Nonresidential building construction	13%
Building finishing contractors	12%
Foundation, structure, and building exterior contractors	10%

Watch a video about carpenters:
<https://www.bls.gov/ooh/construction-and-extraction/carpenters.htm#>

Career Cluster
Architecture & Construction

Career Pathway
Construction

Career Outlook

- Salary Projections:
Low-End Salary, \$30,170
Median Salary, \$48,330
High-End Salary, \$84,690
- Jobs in 2018: 1,006,500
- Job Projections for 2028:
1,086,600 (increase of 8%)

Geometry Concept

- Apply theorems about angles.

Is this a good career for me?
Carpenters:

- Follow blueprints and building plans to meet the needs of clients
- Measure, cut, and shape wood, plastic, and other materials
- Construct and install building frameworks, including walls, floors, and doorframes
- Instruct and direct laborers and other construction helpers

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- ⇒ 50 application lessons each give an in-depth, real-world look at how 50 different occupations use Geometry concepts.
- ⇒ 283 unique occupations throughout 75 explorations give students a short overview of how these occupations might use Geometry concepts.

Algebra 2:

- ⇒ 47 application lessons each give an in-depth, real-world look at how 47 different occupations use Algebra 2 concepts.
- ⇒ 349 unique occupations throughout 110 explorations gives students a short overview of how these occupations might use Algebra 2 concepts.

What Pathway2Careers Means for Your Students:

- ⇒ When students find purpose in their learning, they perform better in school.
- ⇒ By analyzing and processing labor market data and sharing that sortable, easy-to-navigate, high-value information with students through the software's built-in Labor Market Navigator, Pathway2Careers teaches students about *high-value careers*; connects educational programs to careers (*thus providing relevancy*); and connects education, industry, and community leaders on behalf of career and college readiness.
- ⇒ Students learn important math skills through multiple examples of occupations that utilize the skills taught in the lesson. Each lesson includes at least two real-world problems which ask students to demonstrate how certain occupations use the math concepts of the lesson.
- ⇒ Students gain a deeper understanding of the connection between the occupation and the math concept. Lessons spotlight one high-value occupational connection to the mathematical concepts taught.

Responsiveness to the Tennessee Innovative School Models Application Components

The Tennessee Department of Education Innovative School Models application has identified middle-school and high-school priorities for creating a college and career ready environment in schools. NS4ed's Pathway2Careers curricula are responsive to these priorities.

- ⇒ With Pathway2Careers' career exploration, students *make connections* with employers through videos in which employers describe the workplace. These videos can be customized to include opportunities for mentoring and shadowing.
- ⇒ The curricula *provide opportunities* for students to recognize and build upon their own strengths and career interests.

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- ⇒ Pathway2Careers is *learning with purpose*, where students improve their knowledge of careers and math. Learning math in a relevant format encourages *intentional decision-making*.
 - ⇒ As students learn more about the careers in which they are interested, explore these careers further in depth, and begin to understand what academic courses they need to succeed in these careers, they are *persevering* in their goals.
 - ⇒ As students move toward career and technical education (CTE) programs in high school, they do so with a foundation of career-connected learning.
 - ⇒ The pandemic's impact on both academic learning and social and emotional learning (SEL) has, through disastrous consequences, changed the direction of many educational programs. Pathway2Careers responds to these impacts in several ways—by engaging students in learning, in applying their interests to real job opportunities, in helping them rebuild their math skills, and in letting them dream again of what the future can hold.

A full description of Pathway2Careers aligned with Tennessee's priorities is included in the attached application responses. For those program design areas not linked directly to the software, (e.g., introducing early college high schools), Pathway2Careers enhances and strengthens these programs through its course content and career alignment.

About NS4ed, LLC

NS4ed is a Tennessee-based educational research and solution development company dedicated to building effective equity-based collaborations across education and the workplace. NS4ed's mission is to help *all* students attain successful futures through career exploration and math. We achieve this goal through sole source solutions in **customized labor market data and navigation, career exploration tools, and mathematics and career-connected learning curricula**. NS4ed invests in quality measures to ensure its innovative solutions provide exceptional student experiences and support best practices in teaching.

To support effective teaching and learning, NS4ed provides educators with a wide menu of professional learning opportunities. Workshops are available both in-person or virtually to best meet teachers' schedules and learning objectives. Topics focus on career-connected learning and engaging students in relevant math programs where, as one student said, *"I finally get why I'm learning this.... I'm gonna need it."*

A 2022 independent study of the effectiveness of NS4ed's Pathway2Careers, conducted by the University of Louisville Center for Research in Mathematics and Science Teacher Development (CRIMSTED), reported notable strengths in the curricula including breadth of career integration, rich array of career connections of high interest, incorporation of comprehensive mathematical ideas, and systemic integration of mathematical representations for engaging students.