NS4ed

TN INNOVATIVE SCHOOL MODELS APPLICATION

IN SUPPORT OF THE TENNESSEE INNOVATIVE SCHOOL MODELS

NS4ed, LLC

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TENNESSEE INNOVATIVE SCHOOL MODELS APPLICATION

THE STRATEGY: CAREER-CONNECTED LEARNING THROUGH PATHWAY2CAREERS

The NS4ed Pathway2Careers mathematics program for middle and high schools aligns and support innovative school models. In the following sections, Section headings describing the curricula align with the application where possible.

Part 1.1: Basic Information

This section will be completed by the district or school serving as the fiscal agent.

Part 2.2: Project Components

NS4ed provides high-quality activities and services for seven or more Tennessee ISM program components, as shown in the following chart. Those components that are asterisked, while not software-based, are fully supported. Where schools have integrated these components as part of their ISM (e.g., work-based learning, early college high schools, summer recapture programs, simulated workplaces in the classroom), Pathway2Careers enhances and strengthens these opportunities through its course content, career alignment, and career connected learning in STEM math skills and concepts.

Tennessee Program Components – Innovative School Models

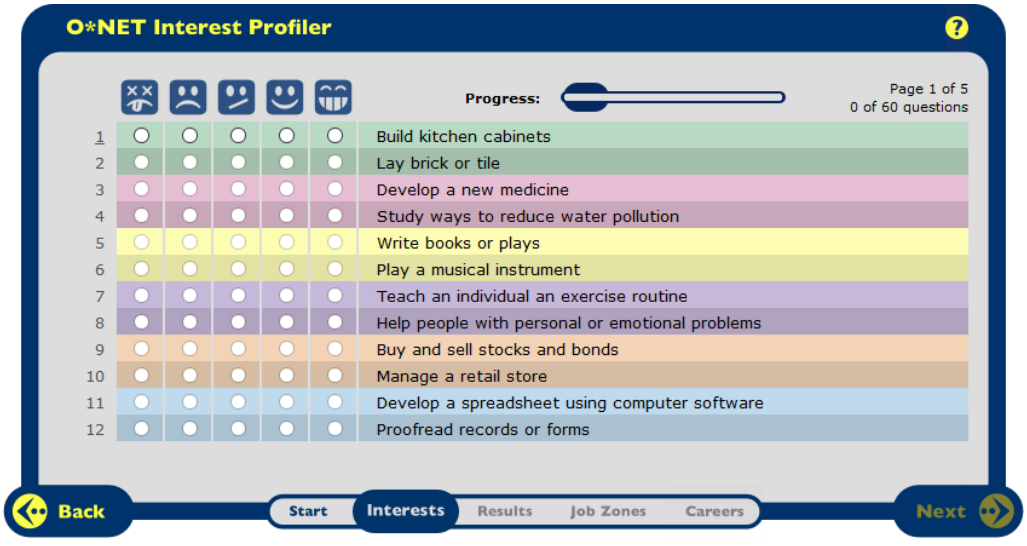
Middle School Program Components	Available
Career awareness activities	✓
Career assessments	✓
Academic advising for high school	✓
Learning loss gap programming	✓
Project-based learning opportunities	✓
On-site and/or virtual job shadowing	*
Practical learning environment development	✓
Multiple modality course development	*
Non-academic standard and competency development for employment success	✓
Course content revisions to increase knowledge of high-school CTE pathways	✓
EPSO awareness activities	*

Summer learning opportunities	*
Industry field trips	*
School-based enterprises	*
Career cluster academies	*
Mentorship opportunities with partners	*
Course content revisions to incorporate information on high-demand occupations	✓
Career pathways student portfolio development	✓
High School Program Components	**Available**
Early postsecondary opportunities	✓
Industry credential attainment	*
Intentional academic advisement	✓
Programming to address industry skill gaps	✓
Extended learning opportunities	✓
Summer learning opportunities	✓

The following information is provided in line with the proposal application. Again, NS4ed meets a minimum of seven of these program components.

Self- knowledge, learning style, personality, interest, aptitude, and career:

At the beginning of each math lesson, students take an interest survey that helps them identify personal work-related interests. Responses from the interest survey also help the Pathway2Career curricular software drive the career context of the lesson.



Profiler responses are grouped into six different interest areas. Students explore their strongest areas and learn how specific interests align with particular careers. These are the first steps of career exploration.

After completing the self-assessments and learning about how different interest areas support career interests, students are introduced to the 16 career clusters identified by the US Department of Labor. These include:

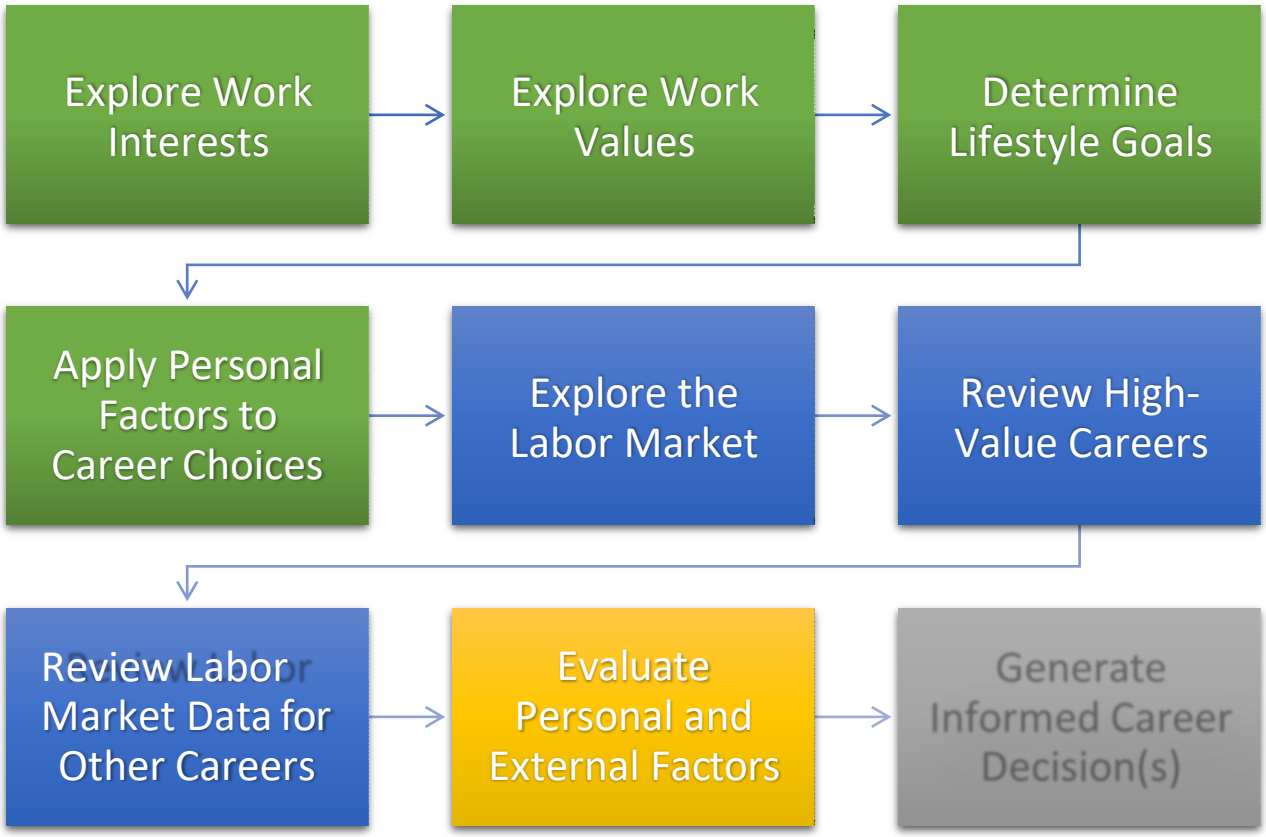
> Architecture and Construction; Agriculture, Food & Natural Resources; Business, Management & Administration; Human Services; Law, Public Safety, Corrections & Security; Science, Technology, Engineering & Mathematics; Education & Training; Government & Public Administration; Information Technology; Manufacturing; Transportation, Distribution & Logistics; Arts, Audio/video Technology & Communications; Finance; Health Science; Hospitality & Tourism; and Marketing, Sales & Service.

With knowledge of their interest areas, abilities, and values, students select a career cluster that best fits their personal needs.

As students work through the math lessons in Pathway2Careers, they continue to gain self-knowledge as they explore their learning styles, personal strengths, interests, and aptitudes. This growth is supported and encouraged through a unique career exploration curriculum developed by NS4ed and delivered in conjunction with the Pathway2Careers

math curricula for middle and high school. Teachers can structure the career exploration and math lessons as independent studies by each student, or as large or small group collaboration with other students.

Labor Market Information (LMI), which is discussed further in the proposal, includes information about high-value careers through data related to demand and wages. Pathway2Careers makes this information available to students as part of career exploration, to better understand career pathways. Most important, LMI helps students make *informed career decisions*, which include consideration of personal and external factors, as the following figure shows (green=personal factors; blue = external factors):



Goal setting and reflections:

Building upon their developing understanding of their own strengths and interests, their growing confidence in their ability to learn math, and their continuing career exploration, students can begin to set goals and reflect on college and career readiness. To this end, Pathway2Careers provides:

- Foundational knowledge and skills.
- Evidence-based learning strategies.
- Choice and purpose in learning.
- Insight into personal career interests and values.
- Exposure to economic realities through labor market information.
- Career-focused content.

With Pathway2Careers, students benefit in many ways that support their goal setting. Benefits include:

- College and career readiness.
- Motivation to learn.
- Exposure to multiple careers.
- Knowledge of career pathways.
- Informed career decisions.
- Tools for employment success.

The goal-setting and reflection continue throughout middle and high school as students re-take interest surveys; continue to explore careers; work with counselors to align careers with their course sequences; and gain greater understanding of the link between education, college and career readiness, and the workplace. Students can store outcomes from the lessons, accompanying activities, assessments, and journal entries in their personal electronic portfolio on the Pathway2Careers platform for ongoing reflection and review. In this way, students can understand the pathways they have taken to become college and career ready through to graduation.

Postsecondary education and/or trainings:

As students explore careers, they will also learn about the level of postsecondary education and training which a career requires. Further exploration into the education and training requirements for different jobs within a career cluster can guide counselor and student sessions as they select courses through high school and identify postsecondary programs that provide the education students require to be work-ready.

Extra- and co-curricular activity participation:

Pathway2Careers math curricula provide problem-solving skills that can be implemented in cross-curriculum and extracurricular activities, building upon career development.

Work-based learning participation:

NS4ed's program design encourages development of work-based learning through volunteer opportunities, service learning, shadowing, work experiences, and apprenticeships.

The proposed *Pathway 2 Careers* will provide employer video presentations and lessons, which are embedded in the math curricula. In these videos, local employees describe the types of jobs available in the industry in which they work, the jobs that are in high demand, what is expected on the job, and the educational and skill requirements needed for employment. In in high school, to augment the videos, webinars and zoom sessions can be developed for synchronous presentation to students to encourage interactivity. This give and take between students and employers will facilitate student mentoring, project-based learning, and one-on-one advisement.

In addition to the employer videos that will be introduced each year, employers will help personalize learning activities, build capstone projects, and establish work experiences during the school year and summer. All these encounters and activities will be journaled and stored on students' personal electronic portfolios.

Resumes and cover letters for prospective employers:

Students are taught methods to write effective cover letters and resumes in the high-school career exploration curriculum. Resumes and cover letters are stored online in the student's personal electronic portfolio for access and revision.

The following information aligns directly with the ISM application. These are components of the ISM which NS4ed addresses through Pathway2Careers and ancillary services.

2.2.1 Applicable Grade Span 9-12

- ✓ ***Skill gaps between regional industry needs and the skill level of students will be addressed.***

Labor Market Information:

Labor Market Information (LMI) provides an easy way to reveal jobs with the most openings, highest wages, and most growth. This information helps educators focus on careers and skills students need for high-demand careers. When student skill levels do not match regional industry needs, skill gaps occur. LMI is used to make informed career decisions.

NS4ed's Pathway2Careers software analyzes and processes up-to-date LMI and shares that sortable, easy-to-navigate, high-value information with educators, students, and local communities. This information is filtered through the software's Labor Market Navigator, which provides ongoing information on changing *high-value careers*; and connects partners and community leaders across education and business to collaborate on policy that can eliminate skill gaps in the local workforce.

By highlighting quality, high-demand careers as identified through the Navigator, Pathway2Careers points learners toward real jobs that are projected to grow and are considered high-wage. This opens a pathway to valuable meaningful work, and focuses on skill gaps to be addressed.

Skill Gaps:
The Pathway2Career math curricula addresses skill gaps in the local economy by building the level of skill students have in the important STEM knowledge area of *mathematics.* As students build their mastery levels in math, they are, simultaneously, learning how to apply this new knowledge in the *context of careers,* particularly those which are experiencing gaps. These skill gaps are addressed through the Pathway2Career platform by providing students with two types of lessons that intertwine math and careers.

- *Exploration lessons* demonstrate the skills. They instruct students on the structure of mathematics through notes and examples. These lessons indicate multiple examples of occupations that utilize the math skills and concepts taught in the lesson. Each lesson includes a minimum of two real-world (workplace-based) problems that ask students to demonstrate how certain occupations use the mathematical concepts of the lesson.

- *Application lessons* spotlight one high-value occupational connection to the math concepts taught in the lesson. In these lessons, students receive details about the occupation (a description, what people in that career do on the job, salary ranges, demand projections, and accompanying employer videos that "put a face" to the job and the role math plays. Students gain a deeper understanding of the connection between the occupation and the concept as they become engaged in the learning process.

Students needing remedial support in math skills can move across math curricula (e.g., reviewing problems in Pre-Algebra when enrolled in Algebra 1), which are vertically aligned across all Pathway2Career curricula. In this way, previous skills can be reinforced and learning loss or remediation can be effectively improved.

- ✓ **Early postsecondary opportunities will be expanded for students.**
- ✓ **Students will have increased access to earn a postsecondary credential while in high school.**
- ✓ **Students will have increased access to earn an industry credential while in high school.**

In districts across the country, high schools that develop early postsecondary opportunities and programs in which students can earn postsecondary and industry credentials have found Pathway2Careers invaluable as a foundation for higher-level math skills required to earn these credentials and degrees.

Students transitioning from middle school to high school early college opportunities, into college, and into future *high-value careers* will be encouraged and motivated to persist and acquire skills in algebra and geometry. Across high schools, higher-levels of real-world applications provide access to higher levels of academic achievement. The drive to accelerate in these programs (CTE) clearly underscores the importance of Pathway2Career's innovative mathematics curricula, which draws upon career-connected learning paradigms.

The journaling function in Pathway2Careers and building of online Student Portfolios across middle and high school now becomes all-important. The stored data can help students chart and compare the different postsecondary education and training options for different careers clusters and occupations. For those programs that begin postsecondary education while students are in high school (e.g., Early College High Schools, Dual Enrollment, and International Baccalaureate Degree Programs), career awareness at a progressively more in-depth level will further strengthen the bond between high schools, colleges, and the workplace.

- ✓ **Work-based learning (WBL) opportunities will be expanded for students.**

Through Pathway2Careers, schools can expand work-based learning. As noted above, this occurs at a basic level through student work in the curricula and their growing understanding of the connection between what they learn and what they will do. As noted, work-based learning is built in several ways:

- ⇨ Maintaining the focus on careers and why math is so important.

- ⇨ Including employer videos—including videos from local employers—in the platform, accessible through Pathway2Careers, to help students connect with real work representatives.

- ⇨ By focusing on how math is used in the workplace and providing students with extensive information about careers, Pathway2Careers shifts students' attention to work-based learning.

- ⇨ In every Pathway2Careers lesson, practice problems allow students to demonstrate their proficiency in the skills taught throughout the lesson.

- ⇨ Problems such as Error Analysis, Writing, Technology, and Challenge, also included on the platform, develop students' critical thinking skills and require deeper levels of understanding essential in the workplace.

- ⇨ "On the Job" sections in the curricula present at least four problems directly related to skills and situations that could be found in a particular career. Students must consider the occupation and the application of the mathematical concepts presented in the lesson to solve the problems. These problems often revisit the original question posed at the beginning of the lesson.

All these activities and lessons in Pathway2Careers expand the ability of students to be ready to participate in work-based learning opportunities schools have developed with local employers. NS4ed will also contribute to expanding these opportunities through its partnerships with employers who are interviewed for the videos.

To further expand student opportunities for work-based learning, NS4ed can build a *linked-in live and online* platform for Student Career Profiles. Each student will create an online profile page that "journals" their STEM activities. Students will be able to add to the profiles across middle and high school with their exploration highlights, courses, work experiences, workshops, business tours, and college visits. *For many disadvantaged students; i.e., minorities, low-income, special needs, and others), these profiles may represent the first time they envision themselves as successful and included in STEM careers.* As Student Profile Pages post online and are updated, prospective employers can follow students' progress toward career readiness. Businesses will be encouraged to provide hands-on virtual and onsite work experiences for students whose interests match their business workplaces (e.g., apprenticeships, internships, and summer jobs).

- ✓ **Advisement and mentorship opportunities will be expanded and improved for students.**

As students make connections with prospective employers and participate in career-related activities beyond the classroom, their access to advisement and mentorship expands to provide support and encouragement toward career goals.

- ✓ **Career awareness and exploration activities will be expanded and improved for students.**

Pathways to Careers curriculum motivates students and connects them directly to occupations that use the skills being taught. *Career Spotlight* sections, found on the first page of every application lesson, describe careers and requirements. These spotlights are enhanced by short videos, where potential employers introduce students to all aspects of the career. These application lessons build on prior learning and emphasize prerequisite skills needed. To ensure content is relevant and meaningful to students, NS4ed developers continuously expand and improve career awareness and exploration activities that augment the curricula. These include research assignments, interactive problem-solving, career storytelling, worksite simulations, and games.

With funding from the Department of Education, NS4ed expanded its career awareness and exploration activities through development of a *career exploration core course* that progressively becomes more in-depth from 6th through 12th grade. Pathway2Careers is the software and platform driver for this "first-of-its-kind" commitment to make career exploration part of every school's core subject area.

NS4ed's introduction of a career exploration course was built upon the belief that educational models for career and college readiness too often begin "mid-stream," introducing students to career exploration at the same time career pathways are being written, generally in high school. As a result, high-need students are often playing catch-up to prepare for college, establish a career focus, and prepare for academic requirements different careers may require. The career exploration core course NS4ed developed begins in middle school so that all students have the tools needed to build career pathways and academic programs early on.

The following table shows the activities and contents for the *Pathway2Careers* exploration system, and the grades in which they are introduced.

	Grades						
Learning Objectives/Activities	**6th**	**7th**	**8th**	**9th**	**10th**	**11th**	**12th**
Complete career interest inventory							
Establish connection to career interest/update							
Re-evaluate career interest inventory							
Complete work values inventory							

Complete work skills inventory							
Learning Objectives/Activities	**6th**	**7th**	**8th**	**9th**	**10th**	**11th**	**12th**
Re-evaluate career interest, work values, and skills inventories							
Explore careers							
Identify top ten careers							
Attend video introduction to careers (local/regional businesses)							
Attend video review of careers and introduction to business opportunities (local/regional businesses)							
Attend video review of careers, with open discussions (local/regional businesses)							
Engage in/continue comparison of careers							
Learn about/review career clusters and identify top career in each career cluster							
Investigate available jobs in interested career clusters							
Learn about Labor Market Information (LMI)							
Learn about alignment of high-value careers among 3 leading indicators							
Review current LMI and current high-value careers							
Engage in career connected learning – supplemental STEM math program (school)							
Begin financial literacy skills development							
Begin soft skills training							
Learn setting goals, writing resumes, and interviewing techniques							
Build academic awareness of fundamental job skills and learning requirements							
Develop degree skill requirements							
Evaluate education and training requirements							
Engage in postsecondary coursework aligned to career interests toward certification and college credit (per school, per program)							
Attend virtual employer visits and/or onsite events							
Explore available summer business opportunities (internship, work study) as introduced by employers in video presentations							

Explore summer and school-year work-based opportunities (internship, apprenticeship, work study)							
Work with school counselor to map out program of study, aligned to a five-year IGP including postsecondary education/training.							
Create/Update/Save Portfolio							

2.2.1 Applicable Grade Span 6-8

- ✓ **There will be activities implemented to increase awareness among rising 8th and 9th graders of ISM opportunities.**

Pathway2Careers provides teachers flexible delivery options, such as shared PDF lessons, digital platform annotated over Smart Boards, traditional classroom presentations, or access through students' laptops. The math curricula can be used in schools as a core curriculum or as supplemental materials to the math curriculum already in place.

As described throughout this proposal, student awareness of ISM opportunities increased with the use of Pathway2Careers, a model of career-connected learning. NS4ed works closely with schools as they personalize their innovation models, with opportunities for enhancements to the math curricula in order to meet the requirements of the proposed ISM.

- ✓ **Students will have increased access to career assessments and advising.**
- ✓ **Middle-school students will develop targeted plans for EPSO participation.**
- ✓ **Middle-school students will have increased access to academic advising for high-school course selection.**
- ✓ **Early CTE courses will be offered to middle-school students that result in a seamless career pathway**

With Pathway2Careers, students are encouraged to make *intentional decisions* about their careers. These decisions will help establish the foundation for counselors to advise students as they explore careers, and identify high-school courses they need for their career choices. For those schools that have EPSO programs and CTE courses in middle school, Pathway2Careers will be an important gateway for success in these early college programs.

Intentional decisions help students improve knowledge of careers that excite them. There are two criteria in helping students make intentional decisions, which will be used in advisement: (1) introduce Pathway2Careers Pre-Algebra in early middle school to help

students begin to build their knowledge of careers; and (2) build student math skills, which are a requirement in every job. Greater knowledge about careers and learning math in a relevant format encourages intentional decision-making.

- ✓ **Advanced courses will be offered to middle-school students to enhance their innovative school model experience.**

Middle-school students progressing through Pathway2Careers math, beginning with Pre-Algebra, can seamlessly move to Algebra 1 prior to high school.

Part 2.3: Project Description

Answer the following, ensuring appropriate information is provided for ISM project(s) to be implemented: (36000 characters). From student needs POV, PBL, seamless alignment, impact on students

How have student, school, and/or partner needs informed your district's ISM (e.g., labor market needs, student performance data, postsecondary enrollment trends, etc).

Each school applicant will provide an individual needs assessment – e.g., student proficiency scores in math, student graduation rates, intent to enroll in college, persistence, etc. Based on location of school district, NS4ed will conduct labor market analysis.

The *Pathway2Careers* program and platform includes individual student portfolios where career and academically aligned data and information are stored and edited. With this portfolio, students can maintain a "history" of their self-explorations and reflections, career explorations, career interests, goal setting, and career planning.

Each student's Personal Electronic Portfolio includes a listing of the academic coursework they have taken and how it aligns with and is driven by career interests. These data are part of each student's IGP. The Portfolio includes both current and previous (historical) IGPs so students, counselors, and teachers can determine the progression students take toward college and career readiness upon graduation.

High-school graduation requirements are tracked and monitored, and any credentials, certifications, badges, and awards students earned are entered into the Portfolio

Describe the project-based learning experience(s) that will be developed in conjunction with community partners. Specify real-world and problem-solving opportunities that will be embedded.

Pathway2Careers is fully embedded with project-based learning experiences. NS4ed works closely with community partners to develop relevant projects in both middle-school and high-school lessons. These projects, in the form of summative assessments and aligned with the math lessons, provide an authentic scenario through the lens of various occupations. Then, students use their developed math skills and understanding to solve the problem. Projects are continually developed for each course and include broad industry PBL experiences or rather an in-depth look at a specific career pathway within a specific industry (For example, the *Logistics/Transportation* industry could include variations in *aviation, trucking, and shipping.*)

Explain how seamless alignment will be promoted in middle to high school CTE programs of study.

NS4ed's Pathway2Careers math curricula—Pre-Algebra, Algebra 1 and 2, and Geometry courses—are vertically aligned lessons appropriate for students in middle through high school. All curricula are grade-level specific, and all include teacher resources such as lesson plans and pacing guides. In this way, adults working with students can support student goal setting, career exploration, and career planning from grade-to-grade. The full learning process represents a digitalized middle- to high-school math curriculum, with meaningful learning and in-depth career application. Continuity is maintained as students progress through the curriculum and develop student personalized college/career pathways.

The visual below illustrates the seamless development of student competencies from 6th through 12th grade, and how this seamless pathway can incorporate CTE programming.

6th Grade

Personal Discovery Activities

- Exploration of work interests, including work interests inventories
- Exploration of work values, including work values inventories
- Exploration of personal aptitudes, including aptitude inventories
- Synthesis of personal interests, values, and aptitudes into cohesive self model

Career Evaluation Activities

- Use of cost-benefit analysis tools in evaluating ROI on education
- Use of labor market information in evaluating high-value occupations
- Develop awareness of low- and high-demand occupations
- Evaluate best-fit occupations with regard to personal interests and needs

Student

Career Exposure Activities

- Engage in virtual, real-time career exposure experiences with employers
- Observe on-the-job videos that demonstrate typical job activities
- Attend employer visits and onsite events that introduce occupations
- Set up personal/virtual meetings with individuals to explore job activities

Education & Training Activities

- Exposure to career clusters and education pathways
- Analysis of education and training requirements for occupations
- Evaluation of regional education and training locations
- Awareness of fundamental job skills (e.g., soft skills, technology skills, etc.)

12th Grade

Industry leaders, students, and educators interact to develop meaningful career exposure activities.

Student Career Portfolio

Student virtual career portfolios contain progress measures within each of the four activity groups to be used by students and employers to evaluate career preparedness.

Industry Points of Contact

Industry points of contact include personal and virtual, real-time experiences that are initiated both by students and employers at regional, state, and national levels.

Industry leaders, students, and educators interact to develop meaningful education and training activities.

Career Exposure Activities

- Develop virtual, real-time career exposure experiences for students
- Collaborate with education leaders to establish campus and business visits
- Record on-the-job interviews of individuals in high-demand occupations
- Establish job shadowing programs for interested potential employees
- Develop effective marketing campaigns for high-demand occupations

Industry Leaders

Education & Training Activities

- Develop degree and skill requirements for high-demand occupations
- Inform education leaders of skill needs
- Offer training programs for potential employees (e.g., work-based learning)
- Develop industry pathways outlining entry and exit points for occupations
- Provide education coaches to direct and guide interested potential employees

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As the figure shows, students seamlessly move toward a progressively more immersive career-focused experience as they transition from middle to high schools. This fully augments and integrates with any high schools CTE program.

How will the ISM Grant impact and change students' school experiences?

NS4ed's *Pathway2Careers* 6th through 12th grade math curricula and career exploration platform accelerates educational inclusion and accessibility by *preparing all students*—including those traditionally underrepresented in college and high-value careers—for learning, leadership, and life. The curricula and platform are based on two fundamental approaches to help build student competencies. The first approach is grounded in giving students **purpose and choice** in their learning process. The second approach gives students **interest and motivation** to pursue high-value careers by increasing their familiarity and awareness of these careers. As students gain skills and confidence, they begin to envision careers that in the past may have seemed unreachable to them. Operating with these approaches, NS4ed's curricula and platform provide students with choice, purpose, and exposure to careers in order to build their competencies.

- ⇨ **To provide *purpose* to the learning experience, within the innovation for this project, individual math lessons have been developed in the context of local high-value careers. Through these career-specific applications, students have the opportunity to see real value and purpose in what may otherwise seem like arbitrary math concepts.**

- ⇨ ***Choice* comes about through the ability of students to select the career context for their lessons. Math lessons will be designed around and aligned to state standards in one of the most extensive choice-based math learning systems created to date.**

- ⇨ ***Exposure* comes about through each lesson's career spotlights, which include a summary of job responsibilities, educational requirements, and potential employers, median income, projected job demand, and apprenticeships.**

As schools form partnerships with the colleges and employers to introduce career information into middle and high schools, learning experiences become motivating, engaging, and, above all, relevant to students' lives. With pathways leading to promising careers, students have a beacon to follow. With "careers matter" at the center of learning, students begin to develop a career mindset—*curiosity* about careers, *clarity* on possible career interests based on self-awareness, and *confidence* in decisions. When students develop goals that will lead to meaningful lives, they make *connections* between academic knowledge and learning, careers, educational planning, and achievement of career aspirations. These connections support education with purpose and choice.

This career-connected learning approach is a major change for students' school experiences and better ensures no student is disenfranchised from their educational journey workforce opportunities in their areas of interest.

Part 2.4: Project Partners

This section requires the applicant to outline partner information if applicable.

Part 2.5: Reimaging Time, Space, and Modes of Learning

Reimaging Time, Space and Modes of Learning – Applicable Grade Span 9-12

NS4ed supports innovations in the application and use of time, space, and modes of learning to move education firmly into a lasting partnership with business and the economy. As educators, our goal is to prepare our students for the next steps following high-school graduation. Within the Tennessee ISM, and other paradigms of innovation in education, career-connected learning will best support changes in time and space, and represents a new mode of learning.

Time

- Utilizing equipment outside the traditional school day to extend and accelerate learning opportunities.
- Utilizing staff outside the traditional school day to extend and accelerate learning opportunities.
- Offering schedule flexibility within the school day and/or school week to maximize opportunities for students.
- Expanding summer programming and learning opportunities.
- Revising district academic requirements for postsecondary courses or enrollment.
- Revising district graduation requirements to better align with employment standards.
- Sharing instructional staff across partnering organizations and educational institutions.
- Other – specify.

Space

- Offering high school course requirements on-site at an employer.
- Offering high school course requirements on-site at a postsecondary education institution.
- Offering expanded on-site work-based learning opportunities.
- Expanding the number of high school teachers approved to serve as postsecondary adjunct faculty for EPSOs.
- Other - specify

Modes of Learning

- Offering students multiple types of EPSOs (dual enrollment, dual credit, AP, etc.)
- Offering students EPSOs in multiple modalities (online, hybrid, on ground).
- Offering work-based learning experiences in virtual and hybrid formats.
- Offering EPSOs in a variety of content areas (general core and career and technical education).
- Expanding advisement and supportive services to address high school to college and career transitions.
- Developing academic standards and competencies for employment success in collaboration with partners.
- Developing non-academic standards and competencies for employment success in collaboration with partners.
- Expanding mentorship opportunities for students in collaboration with partners.
- Other – specify.

Reimaging Time, Space and Modes of Learning – Applicable Grade Span 9-12

Time

- Utilizing equipment outside the traditional school day to extend and accelerate learning opportunities.
- Utilizing staff outside the traditional school day to extend and accelerate learning opportunities.
- Offering schedule flexibility within the school day and/or school week to maximize opportunities for students.
- Expanding summer programming and learning opportunities.
- Revising district academic requirements for postsecondary courses or enrollment.
- Revising district graduation requirements to better align with employment standards.
- Sharing instructional staff across partnering organizations and educational institutions.
- Other – specify.

Space

- Offering expanded project-based learning opportunities
- Offering field trip opportunities embedded into project-based learning opportunities.
- Offering shadowing opportunities at an employer (on-site and virtual).
- Developing a school-based enterprise.
- Creating a practical learning environment.
- Developing a middle school academy focusing curricula on a specific career cluster.
- Other – specify.

Modes of learning

- Offering students EPSOs in multiple modalities (online, hybrid, on ground).

- Offering work-based learning and project-based learning experiences in virtual and hybrid formats.
- Expanding career awareness efforts to increase student exposure to non-traditional fields.
- Expanding career exploration efforts to increase student knowledge of different career pathways.
- Expanding career advising services to address middle school to high school transitions.
- Leveraging career assessments to address career interest and exploration.
- Developing non-academic standards and competencies for employment success in collaboration with partners.
- Expanding mentorship opportunities for students in collaboration with partners.
- Revising course content to enhance knowledge of high-demand occupations and aligning high school CTE pathways.
- Integrating student portfolio development to demonstrate knowledge of career pathways.
- Other – specify.

Part 2.6: Theory of Action

Career Connected Learning

For years, educators have struggled to improve math scores throughout the country. In many cases, educators are struggling to overcome students' negative attitudes toward mathematics that generally begins in early middle school. This is partly because math has traditionally been taught in a linear, abstract format, making it difficult for students to relate the subject matter to their daily lives. Pathway2Careers Curriculum modernizes math by bringing comprehension to the forefront. When students find purpose in their learning, they perform better in school.

The NS4ed *Pathway* curricula and platform is an *education with distinction* model of career-focused learning. NS4ed encourages the use of informed career readiness practices in educational settings so learning is not taught in "silos" apart from real-world applications. The platform merges up-to-date career guidance into academic learning. Unique to NS4ed, the curriculum can add, modify, or enhance lessons to reflect changing demands of the state's economy; i.e., real-time labor market information. This makes *Pathway2Careers* lessons able to teach math concepts and skills in the context of current high-demand, high-wage jobs.

Pathway2Careers proffers an innovative solution to a persistent problem in education—how struggles with math appear to "close the doors" to STEM opportunities. The solution is to teach math through a career lens where lessons content and objectives are presented in

the context of a specific cluster-related occupation, and personalized to students' career interests. Lessons illustrate how math skills and concepts are used in everyday workplace activities and, by being relevant, encourage students to learn.

The Pathway2Careers makes a difference with its first-of-its kind career-connected curricula by bringing *high-value careers* into the classroom. The scaffolded lessons lead to positive outcomes by creating meaningful, real-world situations and demonstrating how math is used in hundreds of careers—helping students understand the "why" behind the "what" As students explore and clarify career searches from 6th to 12th grade, they can revisit career choices through their online portfolio and determine which majors they will pursue in postsecondary programs.

According to the U.S. Department of Education, math skills, particularly algebra, are the foundation for future success in STEM careers. In addition, STEM careers are growing in demand and provide valuable, high-paying jobs. Most STEM careers require a 4-year college degree, and there are high correlations between the study of math with college and career success. Thus, persistence with mathematics is essential. NS4ED's career-focused math builds confidence and proficiency, which go hand-in-hand in building math skills and preparing for STEM college majors and careers.

Part 2.7: Action Steps, Outcomes, and Evaluation Strategies

Current efforts to define action steps, outcomes, and evaluation strategies often focus primarily on short-term, tangible outcomes, such as grades, test scores, graduation rates, diplomas, and certificates. Students are deemed successful if they achieve a specific grade, score, or certificate. While these achievement-based outcomes are useful in tracking some degree of progress, they can be limited in their ability to predict success beyond the classroom. For this reason, we must also continue in our action steps and outcomes to establish benchmarks for career readiness. Monitoring student progress toward acquiring career-relevant skills that promote success in multiple career pathways will be essential. Instead of the diploma being the epitome ofstudent success, a fulfilling career that sustains quality-of-life goals will become the new marker of success.

Action Step: Implementation of Pathway2Careers math curricula in middle and high school.

Outcome: Student proficiencies in mathematics increase.
Outcome: Non-academic student outcomes including attendance and graduation rates increase.
Outcome: Student social-emotional learning demonstrates positivity, as measured through engagement, healthy choices, and a focus on goals.

Action Step: Alignment of math lessons with careers and occupations:

All lessons are aligned with occupations drawn from the 16 career clusters within the National Career Clusters Framework developed by the U.S. Department of Labor. Each lesson will focus on one cluster, and content will be presented in the context of a specific cluster-related occupation. Occupations will not be repeated. Thus, students will constantly be presented unique occupations within their desired career cluster.

Outcome: Every student graduating from high school has engaged in a college and career pathway that reflects their career interest and understands how math supports that interest.
Outcome: Math learning is taken out of the abstract and into the concrete with examples of how math skills are used in the real world

Action Step: Align career-based learning with workforce demand:
The occupations selected to represent each of the clusters will be carefully researched by a labor market analyst to ensure they portray viable career opportunities for students. Occupations will be selected that are expected to be in high demand and provide high wages within the state of Tennessee. Low-demand or low-wage occupations will not be included, unless no other viable occupations are available within the cluster. Labor market data for selected occupations will be displayed to students at the beginning of each lesson.

Outcome: Learning is relevant to the real world.
Outcome: Students will learn skills leading to greater career opportunities.

Evaluation

Pathway2Careers includes an advanced measure called the Quantile® Career Database that shows students how to apply their current math aptitude and set pathway goals. This invaluable information increases students' awareness of the skills and concepts needed to reach their career goals. The tool also supports educators as the Quantile framework allows them to measure where students are at and to view and measure growth over time.

The Quantile Framework is a scientific approach to measuring mathematical achievement and concept/application solvability. Quantile Measures from the MetaMetrics Career Database are helpful for linking with the Quantile scores that students earn, and with the Quantile scores associated with lessons. The career information from O*NET sets these assessment results in the context of careers—e.g., what preparation is needed.

To further help students become aware of career choices which are relevant to them, three unique Quantile assessments are gathered per subject. The three Quantile assessments are spaced out evenly so that the student takes one assessment at the beginning of year, one in the middle of the year, and one at the end of the year. In this way, students can see their own growth through benchmark results.

With the assessment results data, students are presented with a graph that shows their Quantile scores as administered with each lesson. The student graph also has the option to either preview 15 occupations that have associated Quantile scores near the student's score, or preview occupations that they have saved within the Career center. This allows students to quickly decide if they are on track for their desired career, or allows them to easily browse other career paths they may not have considered.

Every assessment taken after the first assessment at the beginning of the year also utilizes a Bayesian scoring algorithm to take previous assessment results into account. This ensures that the student's score becomes more accurate over time. To protect the student in the case of extenuating circumstances, the LMS was also built with the ability for teachers or administrators to flag results as invalid and allow students to re-attempt a particular assessment.

The Quantile framework also connects to the career database, which aids math students in exploring potential quality careers. Pursuing a high-value career can empower students, inspiring them to stick with math content, no matter how rigorous the labor and practice problems are. Finding purpose in learning can take a student from mere knowledge acquisition to completing more challenging problem-solving. They can practice math and gain degrees of assimilation, application, and adaptation. When students persist with rigorous math in the classroom, they will succeed in the workplace when they apply it to more complex problems.

Additional measures that determine positive impacts of career exploration and career development pathways include: (1) development of an individual career pathway that identifies coursework and CTE programs to support those careers; (2) early postsecondary achievements (where schools provide this program) including earning credits toward a postsecondary degree, earning a full Associate's Degree, and earning an industry-credential certification—all while in high school. A more long-term evaluation will be: (1) postsecondary persistence into sophomore year and completion of a degree; and (2) the impact of preparing students for the workforce considering the underrepresentation of minorities and women in STEM occupations.

Part 2.8: Sustainability Strategy

The Pathway2Career math platform is online and intended for use in a blended learning model, where its lessons can serve as the core math curriculum from middle through high school; *be* supplement and complement the core curriculum. Where math lessons are integrated into the curriculum as substitute or added content that replaces or expands

upon applications and practice activities, sustainability is supported through the math model currently in use.

The Pathway2Careers math curricula are, by their nature, a collaboration involving students, their teachers, and employers whose occupations are highlighted in each lesson. By presenting math lesson objectives as on-the-job problems to solve, the learning asks students to think critically, reason, and be creative. From every angle, this is an exceptional transformation of career-connected learning, and one that has been continuously sustained through state and district funding as well as the business community.

As part of its efforts to sustain the project, NS4ed will develop a *Program Operations Manual* to document, improve and disseminate best practices. Content will include a review of information pertaining to career-infused STEM learning from a local, state, and national perspective. An examination of past practices will be outlined with their clear progression into current approaches to college and career readiness. Sustainability will also be supported by an Online Toolkit with resources to support teaching and learning.

Budget

To complete the detailed budget for your application. Please contact Dr. Joseph Goins, CEO of NS4ed to receive a detailed budget plan for your application.

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