ROADMAP INTRODUCTION

The purpose of this New York State P-12 Science Learning Standards Implementation Roadmap is to serve as an at-a-glance guide for all stakeholder groups to facilitate attainment of the Statewide Strategic Plan for Science. This Roadmap is designed to assist in the transition to the new science standards as a resource that can be adapted by stakeholders at the local, regional, and state levels. Six key component areas as identified below, include a major goal supported by objectives and activities included in the Statewide Strategic Plan for Science. Effective standards implementation requires a system-wide commitment. The activities serve as a connection between the Statewide Strategic Plan for Science and this Roadmap is part of a larger comprehensive science standards systems implementation plan. Specific activities are suggested to be carried out through various actions by all stakeholder groups in a designated timeframe to create consistency across multiple levels over a multi-year, three-phase, implementation process. This roadmap is a tool that can be used to facilitate opportunities to engage every student in quality science education throughout their school career.

- **Outline of Contents**
  - Component areas

All Phases	Phase I	Phase II	Phase III
• Standards • Curriculum • Professional Development to Enhance Instruction • Assessment • Materials and Resources Support • Administrative and Community Support	• Standards • Curriculum • Professional Development to Enhance Instruction • Assessment • Materials and Resources Support • Administrative and Community Support	• Standards • Curriculum • Professional Development to Enhance Instruction • Assessment • Materials and Resources Support • Administrative and Community Support	• Standards • Curriculum • Professional Development to Enhance Instruction • Assessment • Materials and Resources Support • Administrative and Community Support

  - Stakeholder groups
    - New York State Education Department-NYSED
    - Professional Learning Networks, Organizations and Associations
      - Teacher Centers, Department of Environmental Conservation, New York State Cultural Center, Regional Information Centers, STEM Hubs, Professional Associations, Higher Education Institutions, Informal Science Institutions, Business and Industry Partners
    - Educational Systems Phase
      - Big 5/BOCES/Districts
  - Phases of implementation/PROPOSED Timeframes
    - **Phase I: Raise Awareness and Build Capacity** 07/2017-08/2019
    - **Phase II: Transition and Implementation** 09/2019-08/2023
    - **Phase III: Implementation and Sustainability** 09/2023-ongoing
- **General Organization Structure of the Roadmap**
    - Each component area is identified by a capital letter (A=Standards), with each objective identified by the component area letter and an objective number (A1=1st Standard objective). Each activity is identified by the key component area, the objective number and a lower-case letter (A1a=first activity within Standards component objective 1).
    - A checked box(es) identifies the phase(s) of implementation that an activity should be addressed by stakeholder groups. Activities may be addressed in more than one phase of implementation and may have different actions based on the stakeholder group and phase.

BACKGROUND

The **mission** of the New York State Education Department's standards work is to create a Statewide learning community to enhance science education and improve student achievement of the New York State science learning standards leading to career and college readiness and a scientifically literate population capable of addressing the needs of society, participating in a global economy, and sustaining the physical and living environment.

The **vision** of the New York State Education Department's standards work is to ensure the teaching and learning of science for all P-12 students by providing equitable access to exemplary teachers, science curriculum programming, instructional practices, and standards-based assessments that are reflective of research and best practices, along with quality resources and support from stakeholders at large.

Department staff in collaboration with various stakeholders in science education across the state have engaged in a multi-tier process over several years (2010-2016) to develop New York State P-12 Science Learning Standards (NYSP-12SLS)
The Statewide Leadership Team, Science Education Steering Committee, and Science Education Consortium have served in a formal advisory capacity to Department staff throughout the development process. The Department also gleaned valuable information from two public surveys; summer 2013 compared current state science standards to the NGSS using a set of criteria, and a public survey (opened December 8, 2015-closed February 8, 2016) on the draft NYSP-12SLS based on the same criteria. In conjunction with the three committees, Department staff worked alongside members to analyze quantitative and qualitative survey data and feedback to determine the necessary changes included in the current revised NYSP-12SLS under consideration and posted on the Department's website.

The NYSP-12SLS are based on guiding documents grounded in the most current research in science and scientific learning; and reflect the importance of every student's engagement with natural scientific phenomenon at the nexus of three dimensions of learning; Science and Engineering Practices, Disciplinary Core Ideas, and Cross-cutting concepts; A Framework for K-12 Science Education[1] and the Next Generation Science Standards[2].

In the recent 2015 report, Revisiting the STEM Workforce by the National Science Board[3], it is stated that "the STEM workforce is extensive and critical to innovation and competitiveness" and careers in these fields will only grow in the next decade making it essential for accessibility to equitable learning opportunities for all students to benefit. Over the past several decades as well as recently, streams of research studies, reports, policies, and publications also document the under participation and often limited preparedness of many students across the United States in science, limiting inclusive opportunities to enter the Science, Technology, Engineering, and Mathematics (STEM) workforce and college pathways.

It is in this context that the proposed new state learning standards in science are well positioned to strengthen P-12 science education in our classrooms for all our students. The development and adoption of these new proposed NYSP-12SLS is a significant and an essential first-step in upholding the primary goal, objectives and activities identified in the 'Standards' key component section included in the Board of Regents approved Statewide Strategic Plan for Science (January 2015).

The NYSP-12SLS were adopted by the Board of Regents in December 2016 with an initial transition beginning July 2017.

National Research Council. (2012). *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Washington, DC: The National Academies Press.
[2] National Research Council. (2013). *Next Generation Science Standards: For States, By States*. Washington, DC: The National Academies Press.
[3] National Science Board. (2015). *Revisiting the STEM Workforce*. Arlington, VA: National Science Foundation.

IMPLEMENTATION ROADMAP[1] New York State P-12 Science Learning Standards Implementation Roadmap All Phases

SCIENCE				
NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS IMPLEMENTATION ROADMAP		**Phases**		
Goals/Objectives	**Key Implementation Activities**	**I** **Raise Awareness and Build Capacity**	**II** **Transition and Implementation**	**III** **Implementation and Sustainability**
A. Standards Goal: Adopt new P-12 NYS science learning standards and 5-year strategic plan.				
A1. Objective: Direct the review, revision, and adoption process for identifying new P-12 NYS science learning standards	A1a.Develop a 5-year statewide strategic in science for adoption by the Board of Regents.	Complete		
	A1b.Develop and post a to gather stakeholder feedback on comparing 1996 NYS science learning standards and nationally developed Next Generation Science Standards (NGSS) to research-based standards evaluation criteria.	Complete		
	A1c.Engage science education stakeholders to analyze feedback from the public survey.	Complete		
A2. Objective: Determine the core science content, conceptual understandings, and practices for all students P-12 that develops scientifically literate citizens who are better prepared to pursue college and/or career pathways.	A2a.Convene committees of stakeholders to review feedback from the public survey, other pertinent data, and current research in science and science education, as well as other international, national, and state standards documents.	Complete		
	A2b.Develop a recommendation to the Board of Regents regarding the adoption of a revised set of the current NYS science learning standards, the adoption of a new set of P-12 NYS science learning standards incorporating the tenets of the Framework for K-12 Science Education, the adoption of a new set of P-12 NYS science learning standards influenced by the NGSS, or the adoption of the NGSS.	Complete		
	A2c.Develop cross-content area benchmarks for use both within and across P-12 grade levels to support horizontal and vertical articulation between the science disciplines and other content areas.	✓		
	A2d.Identify convergences with engineering, technology, New York State Next Generation Mathematics Learning Standards (2017), and New York State Next Generation English Language Arts Learning Standards (Revised 2017).	✓		
A3. Objective: Implement and sustain the 5-year strategic plan for transitioning to the new P-12 NYS science learning standards	A3a.Develop a reasonable timeline for the adoption of and transition to implementation of the new P-12 NYS science learning standards.	✓		
	A3b.Secure funding to support and sustain the implementation process at the State, regional, and local levels.	✓	✓	
	A3c.Ensure that the six critical components - Standards, Curriculum, Professional Development to Enhance Instruction, Assessment, Materials and Resource Support, and Administrative and Community Support - of the 5-year strategic plan are addressed concurrently during the implementation process.	✓	✓	✓

[1] Adapted from the Center on Standards and Assessment Implementation's Standards Implementation Framework, Version 1.0

SCIENCE				
NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS IMPLEMENTATION ROADMAP		**Phases**		
Goals/Objectives	**Key Implementation Activities**	**I** **Raise Awareness and Build Capacity**	**II** **Transition and Implementation**	**III** **Implementation and Sustainability**
B. Curriculum Goal: Provide opportunities that are reflective of research and best practices for P-12 students to engage with scientific phenomena through implementation of innovative science curriculum programming that fosters learning, deep understanding, and application of core science content, conceptual understandings, and practices.				
B1. Objective: Survey current research pertaining to teaching and learning in science, science education, and cognitive science to develop relevant curriculum guidance and resources.	B1a.Explore, identify, and provide access to pertinent research.	✓		
	B1b.Align and incorporate relevant connections to engineering, technology, New York State Next Generation Mathematics Learning Standards (2017), and New York State Next Generation English Language Arts Learning Standards (Revised 2017).	✓		
	B1c.Provide funding opportunities for equitable development and/or adoption of exemplary science curriculum programming.	✓	✓	
	B1d.Develop articulated P-12 guidance to support curriculum development and implementation aligned to the new P-12 NYS science learning standards.	✓	✓	
	B1e.Provide funding opportunities for equitable implementation and evaluation of exemplary science curriculum programming at the regional and local levels.			✓
	B1f.Review and update curriculum guidance and resources to be reflective of changes in instructional technology, content, and best educational practices, emphasizing active engagement in STEM.			✓
B2. Objective: Build the capacity of regional centers and local school districts to implement curriculum and instructional programs that are based on the new P-12 NYS science learning standards.	B2a.Engage education stakeholders with expertise in various disciplines to support local and regional development, dissemination, and implementation of curriculum based on the new P-12 NYS science learning standards	✓	✓	
	B2b.Leverage funding opportunities for partnerships and collaborations of science education stakeholders for the development, dissemination, and implementation of local and regional curriculum programming.	✓	✓	
	B2c.Support the implementation of exemplary, data-informed science curriculum programming and instructional materials, using cross-curricular connections from engineering, technology New York State Next Generation Mathematics Learning Standards (2017), and New York State Next Generation English Language Arts Learning Standards (Revised 2017) that strengthen, support, and reinforce the development of scientific literacy.		✓	
	B2d.Create opportunities that bring students into contact with working scientists, mathematicians, and engineers through innovative curriculum design, internships, and mentorships with institutes of higher education and/or business and industry partners.			✓
B3. Objective: Incorporate the use of technology to expand the development, dissemination, and implementation of curriculum	B3a.Leverage existing and seek new funding sources to support the use of technology to develop, disseminate, and implement science curriculum and instructional resources through various delivery platforms.			✓
	B3b.Utilize multiple platforms to access exemplary curriculum and instructional resources.			✓
	B3c.Build student resources by establishing community-based programs that provide relevant STEM applications in science curriculum and instructional programs.			✓

SCIENCE				
NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS IMPLEMENTATION ROADMAP		**Phases**		
Goals/Objectives	**Key Implementation Activities**	**I** **Raise Awareness and Build Capacity**	**II** **Transition and Implementation**	**III** **Implementation and Sustainability**
and instructional resources to broaden accessibility.				
C. <u>Professional Development to Enhance Instruction</u> Goal: Initiate, build, and sustain collaborations and partnerships to provide specific and focused professional development to support the teaching and learning of core science content, conceptual understandings, and practices P-12.				
C1. Objective: Provide opportunities for local educational agencies to collaborate and partner with STEM education stakeholders to develop and implement effective professional development models that are based upon the new P-12 NYS science learning standards	C1a.Establish networks of stakeholders in STEM education to provide professional development that enhances the development, dissemination, and implementation of curriculum, instructional and assessment materials, and other resources.	✓		
	C1b.Create access to new and/or existing, online, on-demand venues for specific and focused professional development.	✓		
	C1c.Build the capacity of interested business and industry experts to effectively partner with local educational agencies by promoting pertinent professional learning opportunities and resources.	✓	✓	
	C1d.Engage local, state, and national professional and science education associations to lead and sustain STEM-related professional development opportunities for face-to-face and online collaboration.		✓	
	C1e.Target funding opportunities that support partnerships between business and industry, institutes of higher education, professional and science education associations, local education agencies, and other stakeholders to sustain professional development for teachers and leaders in science.			✓
	C1f.Promote institutes, courses, and/or workshops that enhance the teaching and learning of the individual disciplines associated with science, technology, engineering, and mathematics and the connections between these disciplines.			✓
C2. Objective: Increase teacher and leader participation and engagement in professional development opportunities that are based upon the new P-12 NYS science learning standards to build subject knowledge and pedagogical-content knowledge in the sciences by leveraging the expertise of science education stakeholders.	C2a.Design opportunities to coordinate professional development that articulates collaborations and partnerships across P-16.	✓	✓	✓
	C2b.Target annual professional development in science that builds specific subject knowledge and pedagogical-content knowledge toward fulfilling the 100 hours required for maintenance of certification.	✓	✓	✓
	C2c.Provide funding opportunities for teachers and leaders to participate in sustained, online or on-site professional development institutes, professional learning communities, courses, and/or workshops during the school year.	✓	✓	✓
	C2d.Identify or develop and implement a needs assessment to determine the focus of future professional development opportunities.	✓		
	C2e.Create professional development opportunities that bring teachers and leaders into contact with working scientists, mathematicians, and engineers through internships and mentorships with peer teachers, institutes of higher education, and/or business and industry partners.	✓	✓	✓

SCIENCE				
NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS IMPLEMENTATION ROADMAP		**Phases**		
Goals/Objectives	**Key Implementation Activities**	**I** **Raise Awareness and Build Capacity**	**II** **Transition and Implementation**	**III** **Implementation and Sustainability**
	C2f.Incorporate career-ladder incentives for teachers and leaders to provide professional development sessions and engage in professional development opportunities that are related to STEM education.		✓	
C3. Objective: Include components of science and engineering practices for pre-service STEM teacher and leader preparation programs and in continuing professional development opportunities that are based upon the new P-12 NYS science learning standards for in-service teachers and leaders.	C3a.Build teacher resources by establishing community-based programs that provide relevant STEM applications in science curriculum and instructional programs.		✓	
	C3b.Create or access professional development opportunities that focus on the integration of science and engineering practices in STEM courses.		✓	
	C3c.Articulate collaborations and partnerships between STEM stakeholders that support curriculum programming and instructional practices that are better aligned to college and career expectations.		✓	
	C3d.Establish partnership programs between local education agencies and institutes of higher education to foster innovative comprehensive approaches that enhance pre-service and in-service teaching and learning of science and engineering practices.		✓	
D. Assessment Goal: Support the development of assessments at the state, regional, and local levels that measure student achievement of all new P-12 NYS science learning standards, and use the data resulting from these assessments to enhance teaching and learning.				
D1. Objective: Explore established and contemporary science assessment models at the international, national, state, regional, and local levels to implement changes in the P-12 science assessment system that are reflective of the new P-12 NYS science learning standards.	D1a.Propose a P-12 science assessment system that reflects the core science content, conceptual understandings, and practices that are included in the new P-12 NYS science learning standards.	✓	✓	
	D1b.Convene science education stakeholders to review and evaluate New York State's current assessment system for the sciences P-12.	✓		
	D1c.Collaborate between states to discuss and/or develop science assessments that have common blueprints.	✓		
	D1d.Develop and recommend an implementation timeline that is based on the Board of Regents' decision regarding the new P-12 NYS science learning standards and assessment system.	✓		
D2. Objective: Understand and use relevant student achievement data from State science assessments to initiate data-driven professional development, curriculum, instruction, and assessment.	D2a.Collaborate with science education stakeholders statewide, regionally, and locally to provide professional development for teachers and leaders that is focused on understanding and analyzing student achievement data for improving science teaching and learning.	✓	✓	✓
	D2b.Provide professional development opportunities for teachers and leaders to better understand the intent and design of an assessment system that is aligned to the new P-12 NYS science learning standards.	✓	✓	✓
	D2c.Provide professional development on the use of student achievement data to foster the development of formative assessments at the local and regional levels.	✓	✓	✓
	D2d.Continue to develop and administer valid and reliable State science assessments to drive professional development to improve teaching and student achievement.	✓	✓	✓

SCIENCE				
NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS IMPLEMENTATION ROADMAP		**Phases**		
Goals/Objectives	**Key Implementation Activities**	**I** Raise Awareness and Build Capacity	**II** Transition and Implementation	**III** Implementation and Sustainability
E. <u>Materials and Resources Support</u> Goal: Support regular and substantive teaching and learning of core science content, conceptual understandings, and practices through scientific inquiry and authentic engagement with natural phenomena by providing models of effective systems management and dissemination of science materials.				
E1. Objective: Build the capacity of local educational agencies, higher education institutions, business and industry partners, and other profit and nonprofit organizations to connect teachers and students to relevant, real-world science applications that are aligned to the new P-12 NYS science learning standards.	E1a.Investigate opportunities to expand access to science content through online resources.	✓		
	E1b.Develop partnerships between STEM stakeholders and school districts that collaborate to provide education outreach for science materials and other logistical support.		✓	
	E1c.Capitalize on the regional and local capacity to offer distance learning and online courses through partnerships and grants.		✓	
	E1d.Provide incentives for outreach opportunities and technical support for laboratory experiences and rentals of high-tech research equipment.			✓
	E1e.Provide mentorships and research opportunities for teachers and students through incentives to build partnerships between business and industry, higher education institutions, and/or other STEM stakeholders (i.e., museums, nature centers, community organizations, etc.).			✓
E2. Objective: Create new and identify existing science material centers (regional, district, school-based) and related resources to support the equitable access and implementation of exemplary, cost-effective curriculum programming and instructional materials that are aligned to the new P-12 NYS science learning standards.	E2a.Develop collaborations and partnerships to promote and support comprehensive systems for the development, implementation, and sustainability of science materials and resources.	✓		
	E2b.Identify new or use existing funding streams to support facilities planning to provide physical space that is conducive to teaching and learning in state-of-the-art classrooms and laboratories.		✓	
	E2c.Seek funding opportunities for instructional technologies that support core science and engineering content, conceptual understandings, and practices.		✓	
	E2d.Seek funding opportunities to acquire equipment, materials, and supplies to support the development, implementation, and sustainability of P-12 science curriculum and instructional programming at the local and regional levels.		✓	
F. <u>Administrative and Community Support</u> Goal: Build the capacity to enhance science education and ensure career readiness by involving STEM stakeholder partnerships and alliances between school districts, institutions of higher education, science education professional organizations, business and industry, informal education organizations, government agencies, and the larger learning communities: local, regional, state, national, and international arenas.				
F1. Objective: Identify science education stakeholders to lead the development and	F1a.Engage key STEM stakeholders to serve as catalysts in the advancement and implementation process pertaining to NYS science education to build and sustain a STEM talent pipeline.		✓	

SCIENCE				
NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS IMPLEMENTATION ROADMAP		**Phases**		
Goals/Objectives	**Key Implementation Activities**	**I** **Raise Awareness and Build Capacity**	**II** **Transition and Implementation**	**III** **Implementation and Sustainability**
continued growth of partnerships focused on comprehensive revitalization of science education.	F1b.Support collaborations with regional STEM hubs that provide access to various higher education faculty and business and industry experts and their facilities to raise awareness of real-world applications and opportunities in STEM college and career pathways.		✓	
	F1c.Utilize informal (i.e., museums, nature centers, community organizations, etc.) and formal (i.e., P-12 schools, institutes of higher education, business and industry, research centers) STEM education stakeholders and their resources to promote and support new and existing innovative science education initiatives (i.e., fellowships, internships, mentorships, research opportunities).		✓	
	F1d.Identify models of effective collaborations between departments of science, technology, engineering, and mathematics and teacher education programs of institutes of higher education.		✓	
	F1e.Provide incentives for institutes of higher education to facilitate collaborations between departments of science, technology, engineering, and mathematics and teacher education programs of institutes of higher education.		✓	
	F1f.Develop and implement career ladder incentives for teachers and administrators that build the leadership capacity and talent pool of STEM departments of school districts and in institutes of higher education.		✓	
F2. Objective: Review, revise, and propose regulations that reflect engagement in innovative teaching and learning through authentic experiences with natural phenomena that lead to the achievement of the new P-12 NYS science learning standards by all students.	F2a.Solicit input from STEM education stakeholders, ensuring the involvement of experts from P-12 education, institutes of higher education, and business and industry in the advisement and recommendations for regulations addressing qualifications to teach science P-12.	✓		
	F2b.Convene science education stakeholders to re-examine the alignment of teacher certification P-12 to the structure of the new P-12 NYS science learning standards and the Next Generation Science Standards.	✓		
	F2c.Re-examine pre-service program requirements to include multiple paths to acquire endorsements of specialization in science education P-12.		✓	
	F2d.Re-examine the current in-service professional development requirement (100 hours over 5 years) to recommend a minimum allocation of time toward teacher participation in science pedagogical content knowledge-based PD and the distribution of these hours over time.		✓	
	F2e.Review commissioner's regulations pertaining to science program and diploma requirements P-12 and consider amendments to reflect the knowledge and skills as consumers of scientific and technological information related to their everyday lives and enabling them to enter the colleges and/or careers of their choice.	✓	✓	✓
	F2g.Ensure internal collaboration and consultation between various program offices within the NYSED to propose the requisite changes in regulations.	✓	✓	✓

SCIENCE				
NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS IMPLEMENTATION ROADMAP		**Phases**		
		I	**II**	**III**
Goals/Objectives	**Key Implementation Activities**	**Raise Awareness and Build Capacity**	**Transition and Implementation**	**Implementation and Sustainability**
F3. Objective: Enhance public relations to heighten the importance and strengthen the presence of P-12 science education in New York State.	F3a.Develop a statewide plan for improving communication with science stakeholders and the community at large about the benefits of STEM education.	✓		
	F3b.Develop a plan to build awareness regarding the importance of science education for citizenry and readiness for college and/or careers.	✓		
	F3c.Build support and enhance the knowledge of public and private sectors to promote effective implementation of science curriculum programming, instructional practices, and standards-based assessments that are aligned to the new P-12 NYS science learning standards.		✓	
F4. Objective: Leverage fiscal and human resources, through STEM education stakeholder partnerships to catalyze and sustain the revitalization of science education statewide, regionally, and locally.	F4a.Explore funding opportunities offered by both public and private sectors to establish STEM stakeholder partnerships that are focused on enhancing programs in STEM education by embracing models that are similar to those used in the National Board Certification process.	✓		
	F4b.Re-evaluate the coordination, allocation, and distribution of state and federal funding streams to better support science education.	✓		
	F4c.Identify available grants to sustain the implementation of the new P-12 NYS science learning standards through partnerships within the State's established infrastructure, such as BOCES, museums, STEM Hubs, etc.	✓		

New York State P-12 Science Learning Standards Implementation Roadmap Phase I

SCIENCE			
PHASE I NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions**	**Phase I 07/2017-08/2019**
Goals/Objectives	**Key Implementation Activities**	**Stakeholder Groups, Networks, and Partnerships** NYSED, Professional Learning Networks, Big 5 School Districts, BOCES, School Districts, Institutes of Higher Education Partners, Business and Industry Partners…	**Raise Awareness Build Capacity**
A. Standards Goal: Adopt new P-12 NYS science learning standards and 5-year strategic plan.			
A1. Objective: Direct the review, revision, and adoption process for identifying new P-12 NYS science learning standards.	A1a.Develop a 5-year statewide strategic plan in science for adoption by the Board of Regents.		Complete
	A1b.Develop and post a public survey to gather stakeholder feedback on comparing 1996 NYS science learning standards and nationally developed Next Generation Science Standards (NGSS) to research-based standards evaluation criteria.		Complete
	A1c.Engage science education stakeholders to analyze feedback from the public survey.		Complete
A2. Objective: Determine the core science content, conceptual understandings, and practices for all students P-12 that develops scientifically literate citizens who are better prepared to pursue college and/or career pathways.	A2a.Convene committees of stakeholders to review feedback from the public survey, other pertinent data, and current research in science and science education, as well as other international, national, and state standards documents.		Complete
	A2b.Develop a recommendation to the Board of Regents regarding the adoption of a revised set of the current NYS science learning standards, the adoption of a new st of P12 science learning standards incorporating the tenets of the Framework for K-12 Science Education, the adoption of a new set of P-12 NYS science learning standards influenced by the NGSS, or the adoption of the NGSS.		Complete
	A2c.Develop cross-content area benchmarks for use both within and across P-12 grade levels to support horizontal and vertical articulation between the science disciplines and other content areas.		Phase I
	A2d.Identify convergences with engineering, technology, New York State Next Generation Mathematics Learning Standards (2017), and New York State Next Generation English Language Arts Learning Standards (Revised 2017).		Phase I

SCIENCE			
PHASE I NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase I** **07/2017-08/2019** **Raise Awareness** **Build Capacity**
Goals/Objectives	**Key Implementation Activities**		
A3. Objective: Implement and sustain the 5-year strategic plan for transitioning to the new P-12 NYS science learning standards	A3a.Develop a reasonable timeline for the adoption of and transition to implementation of the new P-12 NYS science learning standards		Phase I
	A3b.Secure funding to support and sustain the implementation process at the State, regional, and local levels.		Also Phase II
	A3c.Ensure that the six critical components - Standards, Curriculum, Professional Development to Enhance Instruction, Assessment, Materials and Resource Support, and Administrative and Community Support - of the 5-year strategic plan are addressed concurrently during the implementation process.		Also Phase II and Phase III
B. Curriculum Goal: Provide opportunities that are reflective of research and best practices for P-12 students to engage with scientific phenomena through implementation of innovative science curriculum programming that fosters learning, deep understanding, and application of core science content, conceptual understandings, and practices.			
B1. Objective: Survey current research pertaining to teaching and learning in science, science education, and cognitive science to develop relevant curriculum guidance and resources.	B1a.Explore, identify, and provide access to pertinent research.		Phase I
	B1b.Align and incorporate relevant connections to engineering, technology New York State Next Generation Mathematics Learning Standards (2017), and New York State Next Generation English Language Arts Learning Standards (Revised 2017).		Phase I
	B1c.Provide funding opportunities for equitable development and/or adoption of exemplary science curriculum programming.		Also Phase II
	B1d.Develop articulated P-12 guidance to support curriculum development and implementation aligned to the new P-12 NYS science learning standards.		Also Phase II
B2. Objective: Build the capacity of regional centers and local school districts to implement curriculum and instructional programs that are based on the new P-12 NYS science learning standards	B2a.Engage education stakeholders with expertise in various disciplines to support local and regional development, dissemination, and implementation of curriculum based on the new P-12 NYS science learning standards.		Also Phase II
	B2b.Leverage funding opportunities for partnerships and collaborations of science education stakeholders for the development, dissemination, and implementation of local and regional curriculum programming.		Also Phase II

SCIENCE			
PHASE I NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks, Big 5 School Districts, BOCES, School Districts, Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase I 07/2017-08/2019** **Raise Awareness Build Capacity**
Goals/Objectives	**Key Implementation Activities**		
C. Professional Development to Enhance Instruction Goal: Initiate, build, and sustain collaborations and partnerships to provide specific and focused professional development to support the teaching and learning of core science content, conceptual understandings, and practices P-12.			
C1. Objective: Provide opportunities for local educational agencies to collaborate and partner with STEM education stakeholders to develop and implement effective professional development models that are based upon the new P-12 NYS science learning standards.	C1a.Establish networks of stakeholders in STEM education to provide professional development that enhances the development, dissemination, and implementation of curriculum, instructional and assessment materials, and other resources.		Phase I
	C1b.Create access to new and/or existing, online, on-demand venues for specific and focused professional development.		Phase I
	C1c.Build the capacity of interested business and industry experts to effectively partner with local educational agencies by promoting pertinent professional learning opportunities and resources.		Also Phase II
	C1d.Engage local, state, and national professional and science education associations to lead and sustain STEM-related professional development opportunities for face-to-face and online collaboration.		Phase 1
C2. Objective: Increase teacher and leader participation and engagement in professional development opportunities that are based upon the new P-12 NYS science learning standards to build subject knowledge and pedagogical-content knowledge in the sciences by leveraging the expertise of science education stakeholders.	C2a.Design opportunities to coordinate professional development that articulates collaborations and partnerships across P-16.		Also Phase II and Phase III
	C2b.Target annual professional development in science that builds specific subject knowledge and pedagogical-content knowledge toward fulfilling the 100 hours required for maintenance of certification.		Also Phase II and Phase III
	C2c.Provide funding opportunities for teachers and leaders to participate in sustained, online or on-site professional development institutes, professional learning communities, courses, and/or workshops during the school year.		Also Phase II and Phase III
	C2d.Identify or develop and implement a needs assessment to determine the focus of future professional development opportunities.		Phase 1
	C2e.Create professional development opportunities that bring teachers and leaders into contact with working scientists, mathematicians, and engineers through		Also Phase II and Phase III

SCIENCE			
PHASE I NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase I** **07/2017-08/2019** **Raise Awareness** **Build Capacity**
Goals/Objectives	**Key Implementation Activities**		
	internships and mentorships with peer teachers, institutes of higher education, and/or business and industry partners.		
D. Assessment Goal: Support the development of assessments at the state, regional, and local levels that measure student achievement of all new P-12 NYS science learning standards, and use the data resulting from these assessments to enhance teaching and learning.			
D1. Objective: Explore established and contemporary science assessment models at the international, national, state, regional, and local levels to implement changes in the P-12 science assessment system that are reflective of the new P-12 NYS science learning standards.	D1a.Propose a P-12 science assessment system that reflects the core science content, conceptual understandings, and practices that are included in the new P-12 NYS science learning standards.		Also Phase II
	D1b.Convene science education stakeholders to review and evaluate New York State's current assessment system for the sciences P-12.		Phase I
	D1c.Collaborate between states to discuss and/or develop science assessments that have common blueprints.		Phase I
	D1d.Develop and recommend an implementation timeline that is based on the Board of Regents' decision regarding the new P-12 NYS science learning standards and assessment system.		Phase I
D2. Objective: Understand and use relevant student achievement data from State science assessments to initiate data-driven professional development, curriculum, instruction, and assessment.	D2a.Collaborate with science education stakeholders statewide, regionally, and locally to provide professional development for teachers and leaders that is focused on understanding and analyzing student achievement data for improving science teaching and learning.		Also Phase II and Phase III
	D2b.Provide professional development opportunities for teachers and leaders to better understand the intent and design of an assessment system that is aligned to the new P-12 NYS science learning standards.		Also Phase II and Phase III
	D2c.Provide professional development on the use of student achievement data to foster the development of formative assessments at the local and regional levels.		Also Phase II and Phase III
	D2d.Continue to develop and administer valid and reliable State science assessments to drive professional development to improve teaching and student achievement.		Also Phase II and Phase III

SCIENCE			
PHASE I NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase I** **07/2017-08/2019** **Raise Awareness** **Build Capacity**
Goals/Objectives	**Key Implementation Activities**		
E. Materials and Resources Support Goal: Support regular and substantive teaching and learning of core science content, conceptual understandings, and practices through scientific inquiry and authentic engagement with natural phenomena by providing models of effective systems management and dissemination of science materials.			
E1. Objective: Build the capacity of local educational agencies, higher education institutions, business and industry partners, and other profit and nonprofit organizations to connect teachers and students to relevant, real-world science applications that are aligned to the new NYSP-12SLS.	E1a.Investigate opportunities to expand access to science content through online resources.		Phase I
E2. Objective: Create new and identify existing science material centers (regional, district, school-based) and related resources to support the equitable access and implementation of exemplary, cost-effective curriculum programming and instructional materials that are aligned to the new P-12 NYS science learning standards.	E2a.Develop collaborations and partnerships to promote and support comprehensive systems for the development, implementation, and sustainability of science materials and resources.		Phase I
F. Administrative and Community Support Goal: Build the capacity to enhance science education and ensure career readiness by involving STEM stakeholder partnerships and alliances between school districts, institutions of higher education, science education professional organizations, business and industry, informal education organizations, government agencies, and the larger learning communities: local, regional, state, national, and international arenas.			
F2. Objective: Review, revise, and propose regulations that reflect engagement in innovative teaching and learning through authentic experiences with natural phenomena that lead to the achievement of the	F2a.Solicit input from STEM education stakeholders, ensuring the involvement of experts from P-12 education, institutes of higher education, and business and industry in the advisement and recommendations for regulations addressing qualifications to teach science P-12.		Phase I
	F2b.Convene science education stakeholders to re-examine the alignment of teacher certification P-12 to the structure		Phase I

SCIENCE			
PHASE I NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks, Big 5 School Districts, BOCES, School Districts, Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase I 07/2017-08/2019** **Raise Awareness Build Capacity**
Goals/Objectives	**Key Implementation Activities**		
new P-12 NYS science learning standards by all students.	of the new P-12 NYS science learning standards, the Framework for K-12 Science Education, and the Next Generation Science Standards.		
	F2e.Review commissioner's regulations pertaining to science program and diploma requirements P-12 and consider amendments to reflect the knowledge and skills as consumers of scientific and technological information related to their everyday lives and enabling them to enter the colleges and/or careers of their choice.		Also Phase II and Phase III
	F2g.Ensure internal collaboration and consultation between various program offices within the NYSED to propose the requisite changes in regulations.		Also Phase II and Phase III
F3. Objective: Enhance public relations to heighten the importance and strengthen the presence of P-12 science education in New York State.	F3a.Develop a statewide plan for improving communication with science stakeholders and the community at large about the benefits of STEM education.		Phase I
	F3b.Develop a plan to build awareness regarding the importance of science education for citizenry and readiness for college and/or careers.		Phase I
F4. Objective: Leverage fiscal and human resources, through STEM education stakeholder partnerships to catalyze and sustain the revitalization of science education statewide, regionally, and locally.	F4a.Explore funding opportunities offered by both public and private sectors to establish STEM stakeholder partnerships that are focused on enhancing programs in STEM education by embracing models that are similar to those used in the National Board Certification process.		Phase I
	F4b.Re-evaluate the coordination, allocation, and distribution of state and federal funding streams to better support science education.		Phase I
	F4c.Identify available grants to sustain the implementation of the new P-12 NYS science learning standards through partnerships within the State's established infrastructure, such as BOCES, museums, STEM Hubs, etc.		Phase I

New York State P-12 Science Learning Standards Implementation Roadmap Phase II

SCIENCE			
PHASE II NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase II** **09/2019-08/2023**
Goals/Objectives	**Key Implementation Activities**		**Transition and Implementation**
A. Standards Goal: Adopt new P-12 NYS science learning standards and 5-year strategic plan.			
A3. Objective: Implement and sustain the 5-year strategic plan for transitioning to the new P-12 NYS science learning standards.	A3b.Secure funding to support and sustain the implementation process at the State, regional, and local levels.		Also Phase I
	A3c.Ensure that the six critical components - Standards, Curriculum, Professional Development to Enhance Instruction, Assessment, Materials and Resource Support, and Administrative and Community Support - of the 5-year strategic plan are addressed concurrently during the implementation process.		Also Phase I and Phase III
B. Curriculum Goal: Provide opportunities that are reflective of research and best practices for P-12 students to engage with scientific phenomena through implementation of innovative science curriculum programming that fosters learning, deep understanding, and application of core science content, conceptual understandings, and practices.			
B1. Objective: Survey current research pertaining to teaching and learning in science, science education, and cognitive science to develop relevant curriculum guidance and resources.	B1c.Provide funding opportunities for equitable development and/or adoption of exemplary science curriculum programming.		Also Phase I
	B1d. Develop articulated P-12 guidance to support curriculum development and implementation aligned to the new P-12 NYS science learning standards.		Also Phase I
B2. Objective: Build the capacity of regional centers and local school districts to implement curriculum and instructional programs that are based on the new P-12 NYS science learning standards.	B2a.Engage education stakeholders with expertise in various disciplines to support local and regional development, dissemination, and implementation of curriculum based on the new P-12 NYS science learning standards.		Also Phase I
	B2b.Leverage funding opportunities for partnerships and collaborations of science education stakeholders for the development, dissemination, and implementation of local and regional curriculum programming.		Also Phase I
	B2c.Support the implementation of exemplary, data-informed science curriculum programming and instructional materials, using cross-curricular connections from engineering, technology B2c.Support the implementation of exemplary, data-informed science curriculum programming and instructional materials, using cross-curricular connections from engineering, technology New York State		Phase II

SCIENCE			
PHASE II NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase II** **09/2019-08/2023**
Goals/Objectives	**Key Implementation Activities**		**Transition and Implementation**
	Next Generation Mathematics Learning Standards (2017), and New York State Next Generation English Language Arts Learning Standards (Revised 2017) that strengthen, support, and reinforce the development of scientific literacy.		
C. Professional Development to Enhance Instruction Goal: Initiate, build, and sustain collaborations and partnerships to provide specific and focused professional development to support the teaching and learning of core science content, conceptual understandings, and practices P-12.			
C1. Objective: Provide opportunities for local educational agencies to collaborate and partner with STEM education stakeholders to develop and implement effective professional development models that are based upon the new P-12 NYS science learning standards.	C1c.Build the capacity of interested business and industry experts to effectively partner with local educational agencies by promoting pertinent professional learning opportunities and resources.		Also Phase I
	C1d.Engage local, state, and national professional and science education associations to lead and sustain STEM-related professional development opportunities for face-to-face and online collaboration.		Phase II
C2. Objective: Increase teacher and leader participation and engagement in professional development opportunities that are based upon the new P-12 NYS science learning standards to build subject knowledge and pedagogical-content knowledge in the sciences by leveraging the expertise of science education stakeholders.	C2a.Design opportunities to coordinate professional development that articulates collaborations and partnerships across P-16.		Also Phase I and Phase III
	C2b.Target annual professional development in science that builds specific subject knowledge and pedagogical-content knowledge toward fulfilling the 100 hours required for maintenance of certification.		Also Phase I and Phase III
	C2c.Provide funding opportunities for teachers and leaders to participate in sustained, online or on-site professional development institutes, professional learning communities, courses, and/or workshops during the school year.		Also Phase I and Phase III
	C2e.Create professional development opportunities that bring teachers and leaders into contact with working scientists, mathematicians, and engineers through internships and mentorships with peer teachers, institutes of higher education, and/or business and industry partners.		Also Phase I and Phase III
	C2f.Incorporate career-ladder incentives for teachers and leaders to provide professional development sessions and		Phase II

SCIENCE			
PHASE II NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase II** **09/2019-08/2023**
Goals/Objectives	**Key Implementation Activities**		**Transition and Implementation**
	engage in professional development opportunities that are related to STEM education.		
C3. Objective: Include components of science and engineering practices for pre-service STEM teacher and leader preparation programs and in continuing professional development opportunities that are based upon the new P-12 NYS science learning standards for in-service teachers and leaders.	C3a.Build teacher resources by establishing community-based programs that provide relevant STEM applications in science curriculum and instructional programs.		Phase II
	C3b.Create or access professional development opportunities that focus on the integration of science and engineering practices in STEM courses.		Phase II
	C3c.Articulate collaborations and partnerships between STEM stakeholders that support curriculum programming and instructional practices that are better aligned to college and career expectations.		Phase II
	C3d.Establish partnership programs between local education agencies and institutes of higher education to foster innovative comprehensive approaches that enhance pre-service and in-service teaching and learning of science and engineering practices.		Phase II
D. Assessment Goal: Support the development of assessments at the state, regional, and local levels that measure student achievement of all new P-12 NYS science learning standards, and use the data resulting from these assessments to enhance teaching and learning.			
D1. Objective: Explore established and contemporary science assessment models at the international, national, state, regional, and local levels to implement changes in the P-12 science assessment system that are reflective of the new P-12 NYS science learning standards.	D1a.Propose a P-12 science assessment system that reflects the core science content, conceptual understandings, and practices that are included in the new P-12 NYS science learning standards.		Also Phase I

SCIENCE			
PHASE II NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase II** **09/2019-08/2023**
Goals/Objectives	**Key Implementation Activities**		**Transition and Implementation**
D2. Objective: Understand and use relevant student achievement data from State science assessments to initiate data-driven professional development, curriculum, instruction, and assessment.	D2a.Collaborate with science education stakeholders statewide, regionally, and locally to provide professional development for teachers and leaders that is focused on understanding and analyzing student achievement data for improving science teaching and learning.		Also Phase I and III
	D2b.Provide professional development opportunities for teachers and leaders to better understand the intent and design of an assessment system that is aligned to the new P-12 NYS science learning standards.		Also Phase I and III
	D2c.Provide professional development on the use of student achievement data to foster the development of formative assessments at the local and regional levels.		Also Phase I and III
	D2d.Continue to develop and administer valid and reliable State science assessments to drive professional development to improve teaching and student achievement.		Also Phase I and III
E. Materials and Resources Support Goal: Support regular and substantive teaching and learning of core science content, conceptual understandings, and practices through scientific inquiry and authentic engagement with natural phenomena by providing models of effective systems management and dissemination of science materials.			
E1. Objective: Build the capacity of local educational agencies, higher education institutions, business and industry partners, and other profit and nonprofit organizations to connect teachers and students to relevant, real-world science applications that are aligned to the new NYSP-12SLS.	E1b.Develop partnerships between STEM stakeholders and school districts that collaborate to provide education outreach for science materials and other logistical support.		Phase II
	E1c.Capitalize on the regional and local capacity to offer distance learning and online courses through partnerships and grants.		Phase II
E2. Objective: Create new and identify existing science material centers (regional, district, school-based) and related resources to support	E2b.Identify new or use existing funding streams to support facilities planning to provide physical space that is conducive to teaching and learning in state-of-the-art classrooms and laboratories.		Phase II

SCIENCE			
PHASE II NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase II** **09/2019-08/2023**
Goals/Objectives	**Key Implementation Activities**		**Transition and Implementation**
the equitable access and implementation of exemplary, cost-effective curriculum programming and instructional materials that are aligned to the new P-12 NYS science learning standards.	E2c.Seek funding opportunities for instructional technologies that support core science and engineering content, conceptual understandings, and practices.		Phase II
	E2d.Seek funding opportunities to acquire equipment, materials, and supplies to support the development, implementation, and sustainability of P-12 science curriculum and instructional programming at the local and regional levels.		Phase II
F. Administrative and Community Support Goal: Build the capacity to enhance science education and ensure career readiness by involving STEM stakeholder partnerships and alliances between school districts, institutions of higher education, science education professional organizations, business and industry, informal education organizations, government agencies, and the larger learning communities: local, regional, state, national, and international arenas.			
F1. Objective: Identify science education stakeholders to lead the development and continued growth of partnerships focused on comprehensive revitalization of science education.	F1a.Engage key STEM stakeholders to serve as catalysts in the advancement and implementation process pertaining to NYS science education to build and sustain a STEM talent pipeline.		Phase II
	F1b.Support collaborations with regional STEM hubs that provide access to various higher education faculty and business and industry experts and their facilities to raise awareness of real-world applications and opportunities in STEM college and career pathways.		Phase II
	F1c.Utilize informal (i.e., museums, nature centers, community organizations, etc.) and formal (i.e., P-12 schools, institutes of higher education, business and industry, research centers) STEM education stakeholders and their resources to promote and support new and existing innovative science education initiatives (i.e., fellowships, internships, mentorships, research opportunities).		Phase II
	F1d.Identify models of effective collaborations between departments of science, technology, engineering, and mathematics and teacher education programs of institutes of higher education.		Phase II
	F1e.Provide incentives for institutes of higher education to facilitate collaborations between departments of science,		Phase II

SCIENCE			
PHASE II NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase II** **09/2019-08/2023**
Goals/Objectives	**Key Implementation Activities**		**Transition and Implementation**
	technology, engineering, and mathematics and teacher education programs of institutes of higher education.		
	F1f.Develop and implement career ladder incentives for teachers and administrators that build the leadership capacity and talent pool of STEM departments of school districts and in institutes of higher education.		Phase II
F2. Objective: Review, revise, and propose regulations that reflect engagement in innovative teaching and learning through authentic experiences with natural phenomena that lead to the achievement of the new P-12 NYS science learning standards by all students.	F2c.Re-examine pre-service program requirements to include multiple paths to acquire endorsements of specialization in science education P-12.		Phase II
	F2d.Re-examine the current in-service professional development requirement (100 hours over 5 years) to recommend a minimum allocation of time toward teacher participation in science pedagogical content knowledge-based PD and the distribution of these hours over time.		Phase II
	F2e.Review commissioner's regulations pertaining to science program and diploma requirements P-12 and consider amendments to reflect the knowledge and skills as consumers of scientific and technological information related to their everyday lives and enabling them to enter the colleges and/or careers of their choice.		Also Phase I and Phase III
	F2g.Ensure internal collaboration and consultation between various program offices within the NYSED to propose the requisite changes in regulations.		Also Phase I and Phase III
F3. Objective: Enhance public relations to heighten the importance and strengthen the presence of P-12 science education in New York State.	F3c.Build support and enhance the knowledge of public and private sectors to promote effective implementation of science curriculum programming, instructional practices, and standards-based assessments that are aligned to the new P-12 NYS science learning standards**.**		Phase II

New York State P-12 Science Learning Standards Implementation Roadmap Phase III

SCIENCE			
PHASE III NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase III 09/2023-ongoing** **Implementation and Sustainability**
Goals/Objectives	**Key Implementation Activities**		
A. Standards Goal: Adopt new P-12 NYS science learning standards and 5-year strategic plan.			
A3. Objective: Implement and sustain the 5-year strategic plan for transitioning to the new P-12 NYS science learning standards.	A3c.Ensure that the six critical components - Standards, Curriculum, Professional Development to Enhance Instruction, Assessment, Materials and Resource Support, and Administrative and Community Support - of the 5-year strategic plan are addressed concurrently during the implementation process.		Also Phase I and II
B. Curriculum Goal: Provide opportunities that are reflective of research and best practices for P-12 students to engage with scientific phenomena through implementation of innovative science curriculum programming that fosters learning, deep understanding, and application of core science content, conceptual understandings, and practices.			
B1. Objective: Survey current research pertaining to teaching and learning in science, science education, and cognitive science to develop relevant curriculum guidance and resources.	B1e.Provide funding opportunities for equitable implementation and evaluation of exemplary science curriculum programming at the regional and local levels.		Phase III
	B1f.Review and update curriculum guidance and resources to be reflective of changes in instructional technology, content, and best educational practices, emphasizing active engagement in STEM.		Phase III
B2. Objective: Build the capacity of regional centers and local school districts to implement curriculum and instructional programs that are based on the new P-12 NYS science learning standards.	B2d.Create opportunities that bring students into contact with working scientists, mathematicians, and engineers through innovative curriculum design, internships, and mentorships with institutes of higher education and/or business and industry partners.		Phase III
B3. Objective: Incorporate the use of technology to expand the development, dissemination, and implementation of curriculum	B3a.Leverage existing and seek new funding sources to support the use of technology to develop, disseminate, and implement science curriculum and instructional resources through various delivery platforms.		Phase III
	B3b.Utilize multiple platforms to access exemplary curriculum and instructional resources.		Phase III

SCIENCE			
PHASE III NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase III** **09/2023-ongoing** **Implementation and Sustainability**
Goals/Objectives	**Key Implementation Activities**		
and instructional resources to broaden accessibility.	B3c.Build student resources by establishing community-based programs that provide relevant STEM applications in science curriculum and instructional programs.		Phase III
C. Professional Development to Enhance Instruction Goal: Initiate, build, and sustain collaborations and partnerships to provide specific and focused professional development to support the teaching and learning of core science content, conceptual understandings, and practices P-12.			
C1. Objective: Provide opportunities for local educational agencies to collaborate and partner with STEM education stakeholders to develop and implement effective professional development models that are based upon the new P-12 NYS science learning standards.	C1e.Target funding opportunities that support partnerships between business and industry, institutes of higher education, professional and science education associations, local education agencies, and other stakeholders to sustain professional development for teachers and leaders in science.		Phase III
	C1f.Promote institutes, courses, and/or workshops that enhance the teaching and learning of the individual disciplines associated with science, technology, engineering, and mathematics and the connections between these disciplines.		Phase III
C2. Objective: Increase teacher and leader participation and engagement in professional development opportunities that are based upon the new P-12 NYS science learning standards to build subject knowledge and pedagogical-content knowledge in the sciences by leveraging the expertise of science education stakeholders.	C2a.Design opportunities to coordinate professional development that articulates collaborations and partnerships across P-16.		Also Phase I and II
	C2b.Target annual professional development in science that builds specific subject knowledge and pedagogical-content knowledge toward fulfilling the 100 hours required for maintenance of certification.		Also Phase I and II
	C2c.Provide funding opportunities for teachers and leaders to participate in sustained, online or on-site professional development institutes, professional learning communities, courses, and/or workshops during the school year.		Also Phase I and II

SCIENCE			
PHASE III NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase III** **09/2023-ongoing** **Implementation and Sustainability**
Goals/Objectives	**Key Implementation Activities**		
	C2e.Create professional development opportunities that bring teachers and leaders into contact with working scientists, mathematicians, and engineers through internships and mentorships with peer teachers, institutes of higher education, and/or business and industry partners.		Phase III
D. Assessment Goal: Support the development of assessments at the state, regional, and local levels that measure student achievement of all new P-12 NYS science learning standards, and use the data resulting from these assessments to enhance teaching and learning.			
D2. Objective: Understand and use relevant student achievement data from State science assessments to initiate data-driven professional development, curriculum, instruction, and assessment.	D2a.Collaborate with science education stakeholders statewide, regionally, and locally to provide professional development for teachers and leaders that is focused on understanding and analyzing student achievement data for improving science teaching and learning.		Phase III
	D2b.Provide professional development opportunities for teachers and leaders to better understand the intent and design of an assessment system that is aligned to the new P-12 NYS science learning standards.		Phase III
	D2c.Provide professional development on the use of student achievement data to foster the development of formative assessments at the local and regional levels.		Phase III
	D2d.Continue to develop and administer valid and reliable State science assessments to drive professional development to improve teaching and student achievement.		Phase III

SCIENCE			
PHASE III NEW YORK STATE P-12 SCIENCE LEARNING STANDARDS ROADMAP		**Actions** **Stakeholder Groups, Networks, and Partnerships** **NYSED, Professional Learning Networks,** **Big 5 School Districts, BOCES, School Districts,** **Institutes of Higher Education Partners, Business and Industry Partners…**	**Phase III** **09/2023-ongoing**
Goals/Objectives	**Key Implementation Activities**		**Implementation and Sustainability**
E. Materials and Resources Support Goal: Support regular and substantive teaching and learning of core science content, conceptual understandings, and practices through scientific inquiry and authentic engagement with natural phenomena by providing models of effective systems management and dissemination of science materials.			
E1. Objective: Build the capacity of local educational agencies, higher education institutions, business and industry partners, and other profit and nonprofit organizations to connect teachers and students to relevant, real-world science applications that are aligned to the new P-12 NYS science learning standards.	E1d.Provide incentives for outreach opportunities and technical support for laboratory experiences and rentals of high-tech research equipment.		Phase III
	E1e.Provide mentorships and research opportunities for teachers and students through incentives to build partnerships between business and industry, higher education institutions, and/or other STEM stakeholders (i.e., museums, nature centers, community organizations, etc.).		Phase III
F. Administrative and Community Support Goal: Build the capacity to enhance science education and ensure career readiness by involving STEM stakeholder partnerships and alliances between school districts, institutions of higher education, science education professional organizations, business and industry, informal education organizations, government agencies, and the larger learning communities: local, regional, state, national, and international arenas.			
F2. Objective: Review, revise, and propose regulations that reflect engagement in innovative teaching and learning through authentic experiences with natural phenomena that lead to the achievement of the new P-12 NYS science learning standards by all students.	F2e.Review commissioner's regulations pertaining to science program and diploma requirements P-12 and consider amendments to reflect the knowledge and skills as consumers of scientific and technological information related to their everyday lives and enabling them to enter the colleges and/or careers of their choice.		Phase I and II
	F2g.Ensure internal collaboration and consultation between various program offices within the NYSED to propose the requisite changes in regulations.		Phase I and II