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Associations (NYSCEA)*

I'd like to introduce myself and provide you with a brief overview of my background. I am Brian Vorwald, current President of the Science Teachers Association of NY State, Inc. (STANYS). Our organization represents P-16 science educators in all school settings, including informal education. I taught Earth Science at Sayville Public Schools on Long Island from 1975 until my retirement in 2010. I served as science department chairperson for grades 6 through 12 for the last 14 years of my Sayville career and in that capacity I was responsible for the comprehensive middle school and high school science programs, development of the 6-12 budget, and supervision of staff. I've taught courses in the Department of Earth and Space Science at Suffolk County Community College since 1988 and currently hold the rank of adjunct associate professor. As a consultant to the New York State Education Department (NYSED) I've worked in all phases of Earth Science exam construction, was on the writing teams that produced the Physical Setting/Earth Science Core Curriculum [1] and the performance test that is Part D of all Regents Earth Science Exams. I've had extensive experience delivering professional development to teachers as a NYSED and Eastern Suffolk BOCES Earth Science mentor in addition to presenting at STANYS sponsored workshops and conferences.

It is from the perspective of a classroom teacher at the high school and collegiate levels, a science supervisor, a curriculum and assessment developer on the local and state levels, and a staff developer that I will discuss key issues facing science education in New York State. Many of my comments are based directly on the report of Eleventh New York State Education Summit that was held at Union Graduate College in Schenectady, NY on August 21-22, 2012. This meeting was sponsored by the New York State Science Education Consortium, which is a group of NY State science organizations and networks. The full *Report of Recommendations* which contains a list of all the constituent organizations is presented as an appendix to this document.

In his January 2011 State of the Union address, President Barack Obama spoke about the importance of science education in the pursuit to keep our nation on pace with other industrialized countries. The president stated that America's young people must have the knowledge and skills to create and fill the jobs of a new age. However, there is a shortage of students who have the science skills necessary to fill the science, technology, engineering, and mathematics (STEM) positions that businesses require in order to be competitive. Ken White, manager of Brookhaven National Lab's Office of Educational Programs at the launch of the Long Island STEM Hub on December 6, 2011 stated, "Long Island has many businesses, as well as educational and scientific institutions, that need a technical workforce, but students are not pursuing studies in STEM, and young people are leaving Long Island when good jobs are available here." [2] While the 10 programs of the Empire State STEM Learning Network are working to develop resources for school districts, teachers, local universities, parents, local and businesses to address regional STEM workforce needs, the most important place for additional support and reform is in the P-12 science classrooms throughout New York State. After all, STEM starts with science.

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Presently, science instruction in New York State is based on resource guides and core curricula for the elementary level, intermediate level, and commencement level disciplines (living environment, Earth science, chemistry, and physics). These documents are aligned with the revised 1996 edition of the New York State Learning Standards for Mathematics, Science, and Technology. [3] They have been used for more than a decade, and while they address science in terms of content, scientific inquiry, mathematical analysis, and engineering design, they are in need of revision. The National Research Council, in its *Framework for K-12 Science Education*, states that there is a weakness in addressing the need for students by the end of 12th grade to, "...have sufficient knowledge of science and engineering to engage in public discussions on related issues; are careful consumers of scientific and technical information related to their everyday lives; are able to continue to learn about science outside schools; and have the skills to enter careers of their choice, including (but not limited to) careers in science, engineering, and technology." [4] Addressing this weakness should be the focus of curriculum development and/or revision.

Based on the Framework, the Next Generation Science Standards (NGSS) are now being developed by Achieve, Inc., an independent, bipartisan, non-profit educational organization created in 1996 by the nation's governors and corporate leaders. The NGSS is being developed through a collaborative process involving 26 states, including the New York State Leadership team of which I'm a member. The NGSS focuses on learning science and engineering using an integration of knowledge of scientific content and the practices necessary to engage in scientific inquiry and engineering design. It's anticipated that a second public draft of the NGSS will be released in November 2012 and that they will be released in their final form in 2013.

The NGSS can serve as a catalyst for new efforts in New York State to develop science standards and policies and to develop or revise State science curriculum documents. We recommend that the NYSED and the Board of Regents review the NGSS and direct the development or revision of K-12 State science standards and curriculum and assessment documents using the guidelines discussed in each of the following categories.

- **Curriculum Development/Revision:** A major strength of the science program in New York State has been the direct involvement of its teachers of science in standards setting and curriculum development. This has helped to make certain State policies, procedures, and materials in science education are appropriate to the contexts in which they are applied and also appropriate to the developmental needs of children throughout NY State. All future documents should be:
 - developed by groups composed primarily of currently practicing teachers and administrators within the K-12 grade span and additional stakeholders in science education, as appropriate. Teachers should be provided with release time to participate in committees and the NYSED should inform district office administrators;
 - be aligned to the Common Core ELA math standards as well as to technology and engineering standards; and
 - be sufficiently detailed so that districts can use them directly to deliver instruction. If this detail isn't provided a burden will be placed on local districts that may not have the resources necessary to support local curriculum development. This is essential in order to avoid another unfunded mandate and to maintain the equity issues that exist between districts and between different regions of the state.

- **Hands-on Science Instruction:** A hands-on science component should be mandated at every level of science instruction.
 - Direct hands-on experiences will provide students a context for the major practices employed by scientists as they investigate and build models about the world around us.
 - Current regulatory language governing the laboratory requirement as hands-on, manipulative lab experiences should be maintained. The regulation should have a more specific wording to protect from paper and pencil and wholly virtual computer labs.

- **Assessments:** Regulatory language that will ensure the provision of the current State assessments for science in grades 4, 8, and the four commencement level subject areas (Earth Science, Living Environment, Chemistry and Physics) should be preserved. [5] Assessments in grades 6 and 7 should be added.
 - Regulatory language that mandates that for students to qualify to take commencement-level science assessments, they must complete at least 1200 minutes of hands-on, manipulative laboratory experiences as evidenced by satisfactory laboratory reports should be preserved. [5]
 - Each State assessment should include a performance component based on science practices associated with curriculum.
 - The development of future State elementary, intermediate, and commencement-level science assessments should use a test construction model that actively engages classroom teachers in the test development process.
 - NYSED and the Regents have stated its commitment to transitioning the State's P-12 education system from paper-and-pencil testing to computer-based testing (CBT). [6] Proposals that would make State science assessments CBT should be carefully reviewed for feasibility and their effects on students, teachers, and schools. We recommend that any future CBT science assessments should retain the item formats of our current assessments: multiple choice, constructed responses, extended constructed response, and a performance component.

Development of new curricula documents or revision of existing documents, assessments, and policies are central to providing all children with a rich and meaningful science education and to develop the science skills necessary to be successful in STEM-based scientific, technical, and professional jobs. However, there are other concerns that must be addressed in order to achieve these goals.

- **Graduation Requirement in Science:** The current graduation requirement in science requires only three years of science coursework and the successful completion of one science Regents exam. [5] As a result, many students do not attain the commencement standards in chemistry and physics, disciplines that are integral to complete STEM education and are prominent in the disciplinary core ideas of *Framework*. To address this need we make the following recommendation.
 - Review current State graduation requirements in science, explore the prospect of increasing the minimum number of science credits from 3 to 4, and propose regulatory language that reflects and ensures student achievement of the State's commencement-level learning standards in science; life, physical, and Earth sciences.
- **Time for Science Instruction at the Elementary Level:** In order to strength elementary science education it's recommended that regulatory language be developed that will specify and mandate instructional time that must be devoted to science at the elementary level. This language should be included in all appropriate State science curriculum documents. Integrating the teaching of reading and math through the vehicle of science promotes students engaging in authentic real world experiences and will help address time issues created by the many demands placed upon elementary-level teachers.

- **Professional Development for Teachers:** In order to help K-12 teachers to understand and implement new or revised curricula extensive professional development opportunities must be provided. These reforms will assist teachers in improving their content knowledge, science practices, and pedagogical strategies. In the past, many science teachers who assisted the NYSED in implementing reforms have been members and leaders of state and regional professional associations and networks of science educators. These groups are prepared to assist the State in implementing science educational reforms according to but not limited to the following guidelines.
 - Professional development providers should be educators with experience teaching K-12 students.
 - Sustainable professional development models, such as the turnkey model, should be implemented.
 - Professional development should be provided that will enrich elementary-level teachers' competence and confidence with science/STEM content and practices.
 - Because it's important that administrators be engaged with teachers in professional development, opportunities should be pursued that will facilitate them joining teams of teachers involved in professional development.

Thank you for this opportunity to articulate our vision for the future of science education in New York State. We stand ready to work with the NYSED, other professional organizations, teachers, administrators, and the community at large to assist in developing and implementing the reforms in science education that are anticipated within the next few years.

Respectfully submitted,



Brian Vorwald
STANYS President, 2012-13

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3. The University of the State of New York - The State Education Department, *Learning Standards for Mathematics, Science, and Technology*, revised March 1996 edition
4. National Research Council, Committee on a Conceptual Framework for New K-12 Science Education Standards, *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*, National Academies Press, Washington, DC (2012), summary section, p. 1.
5. The Regulations of the Commissioner of Education Relating to General Education and Diploma Requirements – Part 100, <http://www.p12.nysed.gov/part100/opener.html>, [100.5(a)(5)(i)(d)(3)].
6. John B. King, Jr. Commissioner, Memo to Superintendents, Principals, and RIC Directors: *New York State's Transition to Computer-based Testing*, The New York State Education Department, May 12, 2012.

Appendix

The Eleventh New York State Science Education Summit Report of Recommendations

The Eleventh New York State Science Education Summit was sponsored by the New York State Science Education Consortium and held at Union Graduate College in Schenectady, New York in August 21-22, 2012. The following constituent organizations and networks of the Consortium were represented at Summit XI: Science Teachers Association of New York State, New York State Science Education Leadership Association, Science Council of New York City, Long Island Science Education Leadership Association, Capital Area Science Supervisors Association, and the Biology-Chemistry Professional Development Network. In addition, the two Science Curriculum Supervisors of the New York State Education Department also participated in Summit XI. A total of 16 science education leaders attended the Summit.

The format of Summit XI was as follows:

- (1) Participants broke into smaller groups and each group completed a SWOT analysis of the status of P-16 science education in New York State, identifying Strengths, Weaknesses, Opportunities and Threats;
- (2) SWOT analyses were shared among the groups to identify common areas of agreement and common concerns.
- (3) Participants then broke into five Working Groups with each group focusing on a particular facet of P-16 science education:
 - State P-16 Science Education Policies and Procedures
 - State P-16 Science Curriculum
 - State P-16 Science Assessment
 - State-guided Professional Development for Teachers of Science
 - Strategies to influence State-wide Science Education Policy Formation
- (4) Each Working Group reviewed the SWOT analysis, past documents and surveys of the Consortium, and current national and state initiatives in science education in order to develop a set of recommendations pertaining to its facet of P-16 science education.
- (5) Draft recommendations of each Working Group were shared in several plenary sessions in order to obtain broader feedback and suggestions for improvement.
- (6) Final recommendations of each Working Group were presented at the end of Summit XI and were used in developing the current report that will be disseminated to the New York State Education Department (NYSED), the memberships of the constituent organizations and networks of the Consortium, and other relevant stakeholders.

This report includes some key issues identified in the SWOT analysis and the specific recommendations developed by the five Working Groups. It is a very opportune time to provide these recommendations to the NYSED, the professional science educator associations, and others interested in P-16 science education reform. It has been clear for several years that revisions in State science standards and policies, curriculum documents, assessments, and professional development strategies are needed if we are to provide all children with a richer and more meaningful education in science in elementary and secondary school. Currently, new national

science education standards are being developed by Achieve and New York State is a Lead State Partner in such development. When these standards are disseminated in final form in 2013, the recommendations of this report should inform State policy makers in regards to possible State adoption of the national standards and the implications of such adoption for State development and/or revision of P-16 science standards, policies, curriculum documents, assessments, and professional development strategies.

Key Issues Identified in SWOT Analysis

A major strength of the State's P-16 science education program has been the direct involvement of its P-16 teachers of science in standards setting, curriculum and assessment development, and in providing professional development opportunities for their colleagues. Such involvement has helped to ensure that State policies, procedures, and materials in science education are appropriate to the contexts in which they will be applied and used and also appropriate to the developmental needs of children throughout the state. Many of the science teachers who have assisted the State in implementing its reforms over the past several decades have been leaders and members of the several viable state and regional professional associations and networks of science educators. These associations stand ready to assist the State once again in developing and implementing the reforms in science education that are anticipated in the next few years.

This strength can be coupled to a major opportunity that looms on the near horizon. Currently, Achieve is developing "Next Generation Science Standards" (NGSS) that are aligned with the "Framework for K-12 Science Education" published by the National Research Council in 2011. A second public draft of NGSS is scheduled for dissemination in late 2012 and it is expected that the final version of NGSS will be published by Achieve in 2013. The NGSS and other national initiatives in science and STEM education could serve as catalysts for new efforts within New York State to formulate science standards and policies, develop or revise State science curriculum documents and assessments, and plan more systemic professional development initiatives for P-16 teachers of science to help them understand and implement the new reforms. In the past, the science teaching community and the science educator professional associations and networks have been intimately involved in such State efforts.

At Summit XI, several weaknesses related to the current P-16 system of science education were also identified. First, owing to the emphasis on English Language Arts and Mathematics for purposes of school accountability, less time and resources have been locally dedicated to P-16 science education, especially at the elementary level where few teachers have a substantial background in science. Second, owing to the graduation requirement requiring only three years of science coursework and the successful completion of one Regents exam in science, many students do not achieve the commencement standards in chemistry and physics since they lack coursework in these disciplines. For example, it is possible for a student to complete coursework in Regents Earth science, Regents living environment, and Forensics (or some other local course) and achieve the graduation requirement by passing the State Regents exam on the living environment. Some students pursue the Regents living environment course over two years and complete their third year of science required for graduation with a local elective that is weakly associated with physical science or with a course in occupational science. In many schools, it would seem that the effort to ensure that students graduate from high school overrides a

consistent effort to support student achievement of the standards in all four major science disciplines. As a result, perhaps only one-half of high school graduates in New York State have even had the opportunity of achieving such standards in their science coursework. A third weakness is not exclusive to science education and pertains to the effects of the current weak economy on opportunities to obtain a quality science education in the schools. Science teachers, along with others, have been laid off to balance school budgets and this has led to larger class sizes in laboratory science courses and the elimination of science electives important to the scientifically talented as well as to the general student population. One ramification of these events has been the growing reticence of students to pursue undergraduate and graduate degrees in science teaching as reflected in significantly declining enrollments in science teacher education programs within New York State's colleges and universities.

Finally, participants at Summit XI identified a few major threats to achieving meaningful reforms in P-16 science education over the next several years. First, it is likely that such reforms will require significant fiscal allocations far beyond what might be left for such work in New York State's Race to the Top grant. Also, on the national scene and within the State, there are no identified sources of such funding, either now or in the foreseeable future. Second, there is a concern that if the State does move forward with reforms in science standards, policies, curriculum, assessment, and professional development, the State may bypass the expertise found in the science teaching community and within professional associations and establish contracts with commercial educational vendors in order to complete the work at hand. Such an approach could lead to products that are less contextualized or less cognizant of the needs of students, teachers, and schools. Third, the current initiatives related to the revised Annual Professional Performance Review (APPR) may draw science teachers' time, energy, and focus away from planning and implementing the kind of high quality science instruction that cannot always be measured by the instruments of student performance and growth that the APPR mandates. For example, to the extent that such instruments focus on improvements in reading and writing in science described in the ELA Common Core Curriculum, science teachers may give greater emphasis to these laudable goals but less emphasis to other important aspects of science education that have been addressed in the NGSS. Reading and writing in science facilitate concept formation and scientific reasoning; however, they are not one and the same.

Recommendations of Summit XI Working Groups

The following pages contain the recommendations of the Summit XI Working Groups:

1. State P-16 Science Education Policies and Procedures
2. State P-16 Science Curriculum
3. State P-16 Science Assessment
4. State-directed Professional Development for Teachers of Science
5. Strategies to influence State-wide Science Education Policy Formation

State P-16 Science Education Policies and Procedures

We strongly recommend that the State undertake the following policies and procedures to strengthen P-16 science education:

Priority 1:

- Preserve current regulatory language governing laboratory requirement as hands-on, manipulative, lab experience. The regulation needs to have more detailed wording to protect from paper and pencil and wholly virtual computer labs. The language needs to be very clear: this is what it is and this is what it is not. The regulatory language should be included in all State science curriculum guides/documents.
- Develop regulatory language that will specify and mandate instructional time that must be devoted to science at the elementary level and include this language in appropriate State science curriculum guides/documents.
- Preserve regulatory language that will continue to ensure the provision of the current State assessments for science in grades 4, 8, (adding in grades 6 and 7 assessments) and the four subject areas of science at commencement level: Earth Science, Living Environment, Chemistry, and Physics.
- Remove certification restrictions that are conflicting (*e.g. holding a Physics 7-12 certificate does not qualify one to teach grade 8 Physical Science that is an integrated chemistry/physics class; holding an Earth Science 7-12 certificate does not qualify one to teach grade 6 Earth Science classes*), and provide guidelines in science that clarify certifications needed for various scenarios.
- Include policy wording that mandates that a certain number of PD hours must be subject specific (*e.g. Chemistry teacher should obtain a certain number of PD hours devoted to content and pedagogy in chemical science/overall science practices such as chemistry, chemical hygiene, lab safety, inquiry science, green science lab development, etc. 50% of the PD requirement should be devoted to subject specific topics –approx. 90 hours of the 175 total hours*).
- Include a minimum of 25 hours devoted to science content/science pedagogy in elementary teachers' PD hours.

Priority 2:

- Review and revise those policies that are outdated with regard to science in relation to other subjects (e.g. assessments and use of graphing calculators)
- Provide leadership and support to allow for the use of State textbook monies for science materials and supplies (possibly include as a budget amendment).
- Review current State graduation requirements in science, explore the prospect of increasing the minimum number of science credits from 3 to 4, and propose regulatory language that reflects and ensures student achievement of the State's commencement-level learning standards in science; life, physical, and Earth sciences.
- Provide regulatory wording that includes mandatory phase-in for future facilities projects that require science instructional facilities to meet specific guidelines. In order to get the full state reimbursement for a facilities project there must be specific upgrades/structures in place for science labs. These requirements should be designed to ensure minimum elements that must be in place for the safe and effective instruction of all sciences (e.g. Chemistry—hot and cold running water, eyewash stations, fire blanket, chemical stations, prep and storage rooms, lab stations for student work, gas, etc.). Future facilities projects should also ensure that all science classrooms have the facilities needed for students to conduct laboratory activity on an ongoing basis. If a graduation requirement were to include 4 units of study, this would necessitate having upgraded facilities for science instruction.

State P-16 Science Curriculum

We recommend that the NYSED Board of Regents review the Next Generation Science Standards and direct the development or revision of K-12 State science standards and curriculum guidance documents in accordance with the following guidelines:

- These documents should include carefully articulated K-8 science curriculum guidance, with specific recommendations as to what content needs to be taught at each grade level.
- Curriculum documents for all levels should provide examples of real world applications of science principles and concepts that contain specific performance expectations.
- A hands-on laboratory component should be mandated at every level of science instruction. Computer-based laboratories can enhance, but cannot supplant hands-on, manipulative experiences.
- Models of high-quality laboratory experiences should be provided for every level of science.
- Explicit connections should be made to Common Core ELA and math standards, as well as to technology and engineering standards.
- An instruction manual should be provided on how to conduct inquiry-based science experiments and classroom activities that reveal the nature of science.
- At the secondary level, the core concepts in every content area should be identified. Essential questions should be used as a guide for teachers and students to see the connections of each lesson to the overarching unit.
- Examples of engineering activities should be provided for every grade level.
- The State curriculum documents should mandate the minimum number of minutes of science instruction that must take place each week at each grade band, particularly at the elementary level.
- The curriculum document development should be overseen by a team that establishes a uniform format and checks for consistency across the grade spans and content levels.

- The groups that are involved in developing the curriculum documents must be composed primarily of currently practicing teachers and administrators within the K-12 grade span and additional stakeholders in science education, as appropriate. The State Education Department needs to inform district office administrators about the formation of these committees so that they will provide teachers with the release time to participate. The State should provide the fiscal resources for this curriculum development.
- The curriculum documents that are developed must be sufficiently detailed so that districts can use them directly to drive instruction. Without this detail, this burden will be placed on local districts that may not have the resources available to support local curriculum development. This creates or maintains the equity issues that exist between districts and between different parts of the state.

State P-16 Science Assessment

We recommend that the NYSED Board of Regents review the Next Generation Science Standards and direct the development or revision of K-12 State science assessments in accordance with the following guidelines:

- State science assessments should be administered to students each year, beginning at the fourth grade level.
- The four separate State commencement-level science assessments in Earth Science, Living Environment, Chemistry and Physics should be maintained.
- In the new or revised State commencement-level science assessments, the emphasis of disciplinary content, the applications in science/engineering/mathematics, and the cross-cutting content should be driven by the focus and design of the relevant State curriculum documents.
- In order for students to qualify to take each State commencement-level science assessment, they must complete at least 1200 minutes of hands-on, manipulative laboratory experiences and submit written laboratory reports of these experiences that are judged satisfactory by their teacher. Solely paper and pencil and virtual computer labs should not be included in the above time and report requirement.
- All State elementary, intermediate, and commencement-level science assessments should include a combination of multiple-choice, constructed response, and extended constructed response test items. Each State assessment should also include a performance and/or practical component.
- The performance and/or practical component of each State elementary, intermediate, and commencement-level science assessment should be modeled after the current fourth grade, eighth grade, and Regents Earth Science performance assessments. Each performance and/or practical component should focus on skills that are identified as “keys to success” in the specific course. Such skills may be associated with laboratory safety, experimental design, manipulation and proper use of equipment, and the interpretation of experimental data.
- The development of future State elementary, intermediate, and commencement-level science assessments should use a “Test Construction” model that actively engages classroom teachers in the test development process.
- All proposals that would make State science assessments computer-based should be carefully reviewed for feasibility and their effects on students, teachers, and schools. If

computer-based State science assessments are implemented, they should retain the item formats recommended above: multiple choice, constructed response, extended constructed response, and a performance and/or practical component.

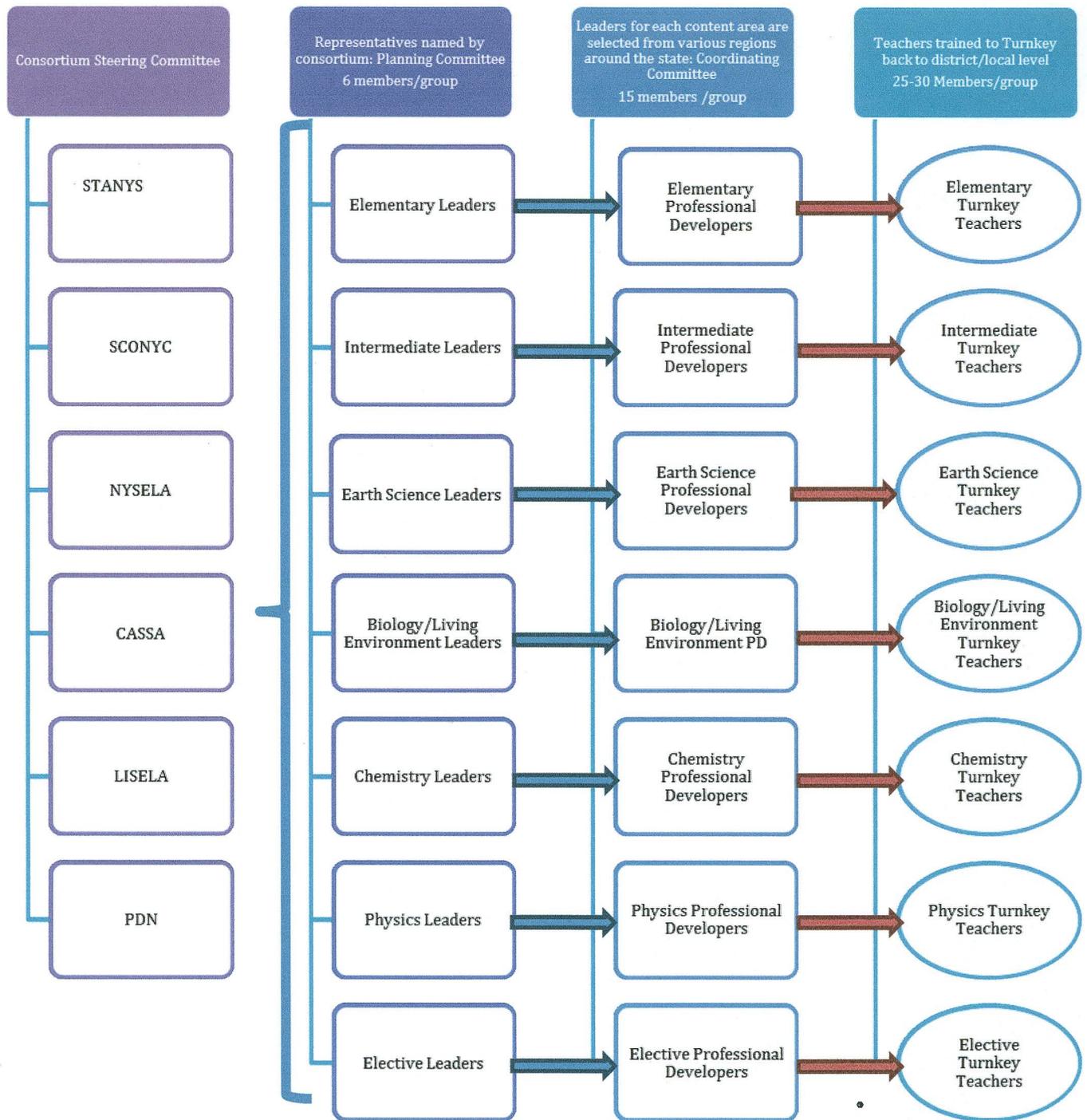
State-directed Professional Development for Teachers of Science

We make the following recommendations:

- Professional organizations that are members of the NYS Science Education Consortium should form a network to create opportunities for collaboration with the goal of providing quality professional development for K-12 science teachers in New York State.
- Professional Development provided by the Consortium should have the goal of preparing teachers who are highly effective.
- Professional Development providers should be educators with experience teaching K-12 students.
- Professional Development models that are implemented should be sustainable and effective, e.g., the Turnkey model.
- Professional organizations should collaboratively provide leadership to inform the field about changes and initiatives that arise in science/STEM education within New York State.
- Professional organizations should create professional development opportunities to enrich elementary school teachers' competence and confidence with science/STEM content and processes.
- Professional organizations should investigate opportunities for administrators to join teams of teachers involved in professional development experiences, acknowledging the importance of administrators' engagement with teachers' professional development.
- Professional organizations should investigate sources for funding to support professional development through the Consortium network.

We recommend the following actions for implementation:

- Establish a group of Consortium members who will serve as a Steering Committee for Professional Development. This group will meet with content representatives named by Consortium member groups to plan and organize a meeting for content area coordinators.
- The suggested infrastructure should be in place to support NYSED and regional BOCES groups to provide Professional Development to the field once the decision has been made regarding adoption of new State science standards, curriculum guides, and assessments.



Strategies to influence State-wide Science Education Policy Formation

Publications

- The Eleventh State Science Education Summit Report of Recommendations will be forwarded to the following individuals and groups:
 - Members of the New York State Board of Regents
 - Pertinent Officials of the New York State Education Department
 - Chair and Members of the New York State Assembly Education Committee
 - Chair and Members of the New York State Senate Education Committee
 - Chair of the New York State Governor's Commission on Education
 - New York State United Federation of Teachers
 - New York State Council of School Superintendents
 - New York State School Boards Association
 - New York State Parent Teacher Association

- The Eleventh State Science Education Summit Report of Recommendations will be forwarded to P-16 Science Educators through the various publications and electronic networks existing within the professional associations of the New York State Science Education Consortium.

- The Summit XI Report of Recommendations will be used to craft press releases and articles for potential publication in newspapers, magazines, and journals.

Meetings

- Science Education Leaders of professional associations within the Consortium will attempt to establish meetings with the following policy makers to highlight the Summit XI recommendations and advocate for P-16 science education reform:
 - NYSED Associate Commissioner for Curriculum and Assessment
 - NYSED Director of Curriculum and Assessment
 - NYS Board of Regents Chancellor, Vice Chancellor, and Regional and At Large Members
 - Members of the NYS Assembly and NYS Senate Education Committees

- Science Education Leaders of professional associations within the Consortium will attempt to establish a series of progressive, face-to-face dialogues with the two NYSED Associates in Science Education in school year 2012-2013 to review the status of national and state initiatives in science education reform and make recommendations for developing and/or revising NYS science standards and policies, curriculum documents, assessments, and professional development strategies.

Next Generation Science Standards Review

- Science Education Leaders of professional associations within the Consortium will attempt to establish a group of science content experts to review and provide formal, organized feedback on the Second Public Draft of the Next Generation Science Standards to the New York State Education Department and other stakeholders.