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Northern Rhode Island Collaborative

Project SUCCESS

(Science Understanding through a Collaborative Commitment to Enduring Student Success)

Kindergarten through Eighth Grade

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Developed under the direction of ...
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Carpe Diem Science

I hear and I forget.
I see and I remember
I do and I understand.

Chinese Proverb

"Intellectual growth should commence at birth and cease only at death."

Albert Einstein

Vision and Mission Statements

A vision is a vivid idealized description
of a desired outcome that inspires, energizes
and helps create a clear picture of the overall goals.

Vision Statement

The vision of Project SUCCESS is to create a collaborative community of professionals to **nurture and inspire young scientists** in kindergarten through eighth grade. This focus lays an important foundation for these students to succeed in high school and postsecondary institutions and thereby becoming the science teachers, medical practitioners, scientists, engineers, technologists, and scientifically literate citizens of tomorrow. This will be accomplished by fostering a school climate and culture of effective, continuous improvement based upon evidence-based decision-making where all stakeholders are reflective learners.

This vision will be realized in **learning environments** where. . .

- groups of learners have scientific conversations between teacher and student, student and student, teacher and teacher, teacher and scientist, and student and scientist, creating vibrant collaborative communities of learners united for the common purpose of understanding science.

- classrooms look and feel like science laboratories, museums, or workshops, with all the necessary resources, tools, equipment, and technology appropriate for 21st century instruction and learning.

- students are exposed to a rigorous, standards-based curriculum focusing on major understandings, core concepts , scientific vocabulary, and skills, developed and articulated K through 12.

- students are immersed in a culture of inquiry where they are free to take risks and take ownership and responsibility for their own learning.

- lessons are crafted so they are authentic, innovative, learner-centered, and interdisciplinary so they are responsive to a variety of learning styles.

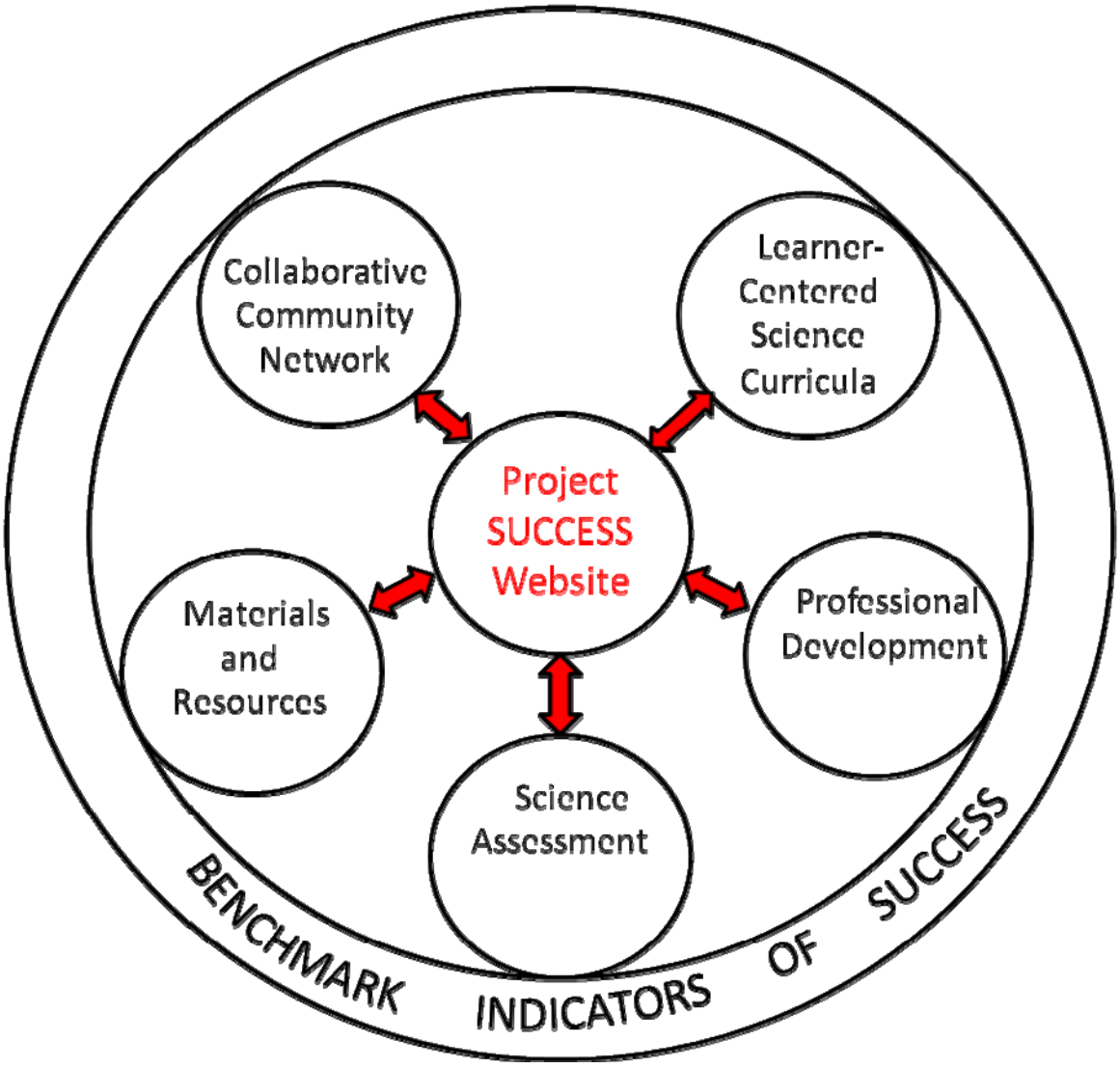
- assessment is often indistinguishable from classroom instruction as it takes place frequently and provides teachers with ongoing feedback about what students are thinking and learning and how instruction should proceed.

- teachers are comfortable and confident teaching science since they know their students and how they learn best, they understand the science content, and they know the best ways to deliver instruction.

- benchmark measures are taken from the outset to project, track, and report progress over time to monitor the attainment of the vision.

A mission statement provides a sense of direction
by guiding all actions and decisions necessary to attain the vision.

The mission of the Northern Rhode Island Collaborative (NRIC) is to embrace those strategies that will make the vision of Project SUCCESS a reality and assist member districts in creating the ideal science learning environments just described. The basic strategies for accomplishing this can be divided into six major areas of focus: the development of a collaborative community network; development of learner-centered science curricula; delivery of professional development; development of science assessments; management of materials and resources; and finally the design of a website for Project SUCCESS.



1. Collaborative Community Network

In order for Project SUCCESS to realize its vision it is imperative that a collaborative community network be developed and maintained through NRIC. It will include teachers, administrators, local college and university faculty and staff as well as partners from industry, research centers and local organizations who actively support student engagement and achievement in science. Collaboration efforts will include…

- effective, evidence-based decision making, professional development, coaching, and common planning.
- offering applied, authentic learning opportunities for both students and teachers.
- horizontal, grade level planning and development within a district and among regional districts.
- vertical, kindergarten through twelfth grade, planning and development among teachers and administrators within district and among regional districts.
- streamlining the transitions from elementary grades to middles school, from middle school to high school and from high school beyond.

2. Learner-Centered Science Curricula

The NRIC is committed to working with the collaborative network of professionals to develop local and/or regional rigorous, learner-centered curricula that . . .

- articulate major understandings, core content, scientific vocabulary, and skills from kindergarten through twelfth grade, enabling students to apply and transfer new, fundamental knowledge each year.
- are age-appropriate and learner-paced and reflect research-based learning progressions.
- incorporate the development of 21st century skills right along with the content.
- ensure that student understanding is achieved through evidence-based best practices with an emphasis on inquiry-based instruction where students learn to articulate and answer scientific questions.
- ensure that students learn to select and use measurement tools, scientific equipment, and state-of-the art technology properly and safely.
- ensure that science is integrated with language arts, physical education, health, social studies, mathematics, art, and music where and when appropriate.
- promote common language, procedures, classroom routines, such as laboratory notebooks and lab report formats, that increase in sophistication from kindergarten through twelfth grade.

3. Professional Development

Meaningful reform efforts require a major investment of time and energy in the form of professional development for teachers, staff, and administrators. Therefore the NRIC is committed to ...

- providing local and regional professional development that is sufficient to transform both the spirit and practice of science instruction and achieve the desired, data-verified student success.

- providing opportunities for teachers, both inter- and intra-district, to work collaboratively in a variety of ways including: team teaching; modeling; focused, grade-level science workshops; and visits to exemplar science classrooms and laboratories.

- building capacity within districts by training and supporting local and/or regional science specialists, science coaches or teacher leaders to provide ongoing, sustained professional development and support in districts.

- providing a variety of PD opportunities that are ongoing and designed so teachers can "learn by doing" including the following topics:
    - Effective Use of New Technologies in the Science Classroom
    - The Interdisciplinary Science Classroom
    - Science Content Training
    - Linking Assessment, Instruction and Learning
    - Instructional Strategies That Work (Inquiry-based instruction, problem-based learning etc.)
    - Effective Leadership of the Science Reform Effort
    - Building Capacity within Schools and/or Districts
    - Learning Progressions and the Design of Curriculum
    - Curriculum Development for the 21st Century Science Classroom (Understanding By Design?)
    - Designing Shared Common Assessments
    - Effective Use of Science Journals/Notebooks
    - Teaching New Science Units or Modules (by theme)
    - Creating a Culture of Continuous Change: Reflecting, Revising and Reviewing Classroom Practice to Promote Student Success

4. Science Assessments

NRIC is committed to facilitating the development and implementation of common, high-quality assessments aligned with the standards and newly developed curricula. These assessments will …

- consist of common tasks developed collaboratively at all levels.

- be developed concurrently with the development of the curricula.

- be used to monitor students' thinking and progress as well as inform instruction.

- include both formative and summative assessments.

- be as authentic as possible, representing real-world tasks and situations requiring creative and critical thinking skills.

- represent all levels of DOK Wheel.

- provide multiple ways for students to demonstrate their skills and understandings.

- enable teachers to assess the effectiveness of the science program, as well as student achievement in a cumulative, longitudinal fashion using many kinds of evidence.

5. Materials and Resources

In order to realize the shared vision and to create the ideal learning environment it is important to recognize the important role that resources, tools, equipment and technology play in this effort. Therefore the NRIC is committed to …

- assessing the condition of existing district science facilities, resources, tools, equipment and technology to determine specific needs.

- developing an ongoing local and/or regional program for science materials management (selection, original purchase, refurbishment, repair) that meets the specific needs of districts.

- supporting the infusion of state-of-the art technology and infrastructure in the science classroom including (wireless?) internet access, computers, computer probes, Flex-cams(Elmos), Smart Boards, video microscopes, measuring tools including electronic balances, and multi-media resources for presentation.

- coordinating the acquisition of ancillary materials such as textbooks, trade books (both fiction and non-fiction), magazines, web sites, computer software, multimedia products, and field studies that *compliment* the science curriculum.

- directing and supporting the establishment of a science lab/room in schools with available space and resources.

6. Project SUCCESS Website

Central to all the efforts of Project SUCCESS is the creation of a vehicle to engage, inform and disseminate information, data, and materials to all stakeholders in the project. Therefore NRIC is committed to designing and maintaining a website/data base to…

- facilitate effective and meaningful communication among all stakeholders.

- post and disseminate all the materials produced through Project SUCCESS (i.e. curricula, common assessments, vision and mission document, etc.)

- share all data regarding student progress and achievement as well as data about the overall effectiveness of Project SUCCESS (see next section)

Benchmark Indicators of Success

Accountability of Project SUCCESS

It is imperative to plan, from the outset of Project SUCCESS, how the efficacy of this program will be measured. Therefore, progress will be monitored on four major fronts: First, the fidelity of implementation efforts throughout the district; Second, student achievement and interest in science; Third, faculty and staff comfort and confidence in teaching science; and Fourth, sustained student achievement and interest in science after graduation from eighth grade and beyond.

Potential Indicators of Efficacy of Project SUCCESS Implementation

- Survey instrument and to track amount of time spent teaching science per week
- Interview/survey teachers (anonymously) regarding fidelity of implementation of science reform efforts
- Survey instrument measuring the commitment and support of district leadership and their perception of the fidelity of implementation of the project.
- Electronic counters indicating teacher use of NRIC Project SUCCESS website (to be developed)
- Survey instruments to measure consistency in the use of uniform science notebook format, laboratory report format, use of best practices instructional strategies, and common core science/mathematics vocabulary
- Survey instrument to track initial/ongoing teacher, staff, and administrator initial level of science education and participation in science professional development opportunities (NRIC and other state approved PD)

Potential Indicators of Enduring Student Achievement and Interest in Science:

- Science NECAP scores
- NAEP Science test scores
- Evaluation instrument to measure time-on-task in science classes
- Common performance-based tasks and tests by grade level (or unit/module)
- Voluntary participation in science fair and science Olympiad programs
- Student science portfolios (student work)
- Survey instrument to track student overall engagement and interest in science
- Rate of disciplinary referrals during science class
- Student participation in extra-curricular science activities or programs

Potential Indicators of Faculty and Staff Comfort and Confidence in Teaching Science

- Survey instrument to track the amount of time spent teaching science per week
- Survey Instrument for measuring teacher comfort/confidence in teaching science
- Survey Instrument to measure the use of best practices, i.e. inquiry vs chalk talk
- Financial commitment of each district to their science program (money for materials, support, resources)
- Survey instrument tracking intra-district collaborative efforts on the part of science teachers and their colleagues both horizontally and vertically
- Parent/community support for science
- Survey instrument of administrative leadership

Potential Indicators of Success in Science after Graduation from Eighth Grade

- Number of students choosing to take additional science courses in high school
- Number of students choosing science majors in higher education

- Number of science internships
- SAT/ACT achievement scores