

INTEGRATIVE SCIENCE TECHNOLOGY ENGINEERING ARTS MATHEMATICS: (I-STEAM) EDUCATION

The board of education recognizes that integrative approach to Science, Technology, Engineering, Arts and Mathematics (\*STEAM) education throughout academic and extracurricular programs improves and enhances student achievement. The district shall be an active participant in our nation's efforts to expand the capacity and diversity of the \*STEM/STEAM workforce pipeline to prepare more students for the best jobs of the future that will keep the U.S. innovative, secure and competitive. The district shall offer an educational program that promoted effective and innovative teaching and student achievement in science, technology, engineering, arts and mathematics providing the skills essential for success in the 21<sup>st</sup> century job market. The district shall also be an active participant in the nations efforts to create a culture of sustainability

Recognizing that everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment, moving in a direction of Sustainability creates and maintains the conditions under which people and nature can co-exist in harmony. In NJ, a three-pillar approach is commonly used... people, planet and prosperity or the triple bottom line. . It indicates the requirements to sustain the needs of present and future generations. STEAM, when delivered in an integrative method, creates, for students, opportunities to solve environmental situations using STEAM content areas combined with new and innovative ways of thinking. It fosters systems thinking and takes into account, the social systems that could place people, and the systems they live in at risk when sustainability is not considered. In addition, economic systems that value money over people and ecosystems are also not sustainable. Last but not least, the environment can be damaged due to unsustainable technological inventions, transportation systems, food sources and other systems as well. STEAM is not only about the content areas, it is an integrative process that considers sustainable solutions and long-term thinking, instead of short-term solutions that impact all people, their quality of life, other species that live on this planet and the ecosystems in which we all live.

In addition to curriculum and programs offered during the school year, the board shall support within the confines of the district budget, I-STEAM initiatives, programs and activities in out-of-school-time settings such as before-school, afterschool and summer learning programs to further engage children and youth and spark their interest in I-STEAM.

The board will include goals and objectives for the district's I-STEAM/Sustainability programs in the strategic plan. These goals and objectives shall be reviewed and adjusted as part of the regular strategic planning process. The district goals shall include general areas that aligns and provides...

1. Workplace Readiness/Employability Skills relevant to the STEAM fields to all students.
2. An environment that promotes an I-STEAM Professional Learning Community.
3. Core \*I-STEAM Teaching and Learning Characteristics throughout multiple classroom settings.
4. Ongoing Professional Learning in I-STEAM for all district staff, administration and board members

The chief school administrator or his or her designee(s) may develop and integrate I-STEAM initiatives in the district's educational programs, extracurricular programs and/or other activities sponsored by the district. Wherever possible, I-STEAM programing should be articulated across subjects and grades. The chief school administrator or his or her designee may develop and implement, with board approval, programing initiatives including but not limited to the following Target Areas:

I-STEAM EDUCATION (continued)

- A. Research based curriculum aligned to NJ Student Learning Standards and programs that ensure that student performance in STEAM blended with other content areas is effectively implemented, evaluated and measured;
- B. Hands-on, inquiry and project-based learning activities, such as learning about the engineering design process and through real-world problem solving, working directly with I-STEAM professionals through internships, and participating in field experiences and I-STEAM-related problem solving competitions;
- C. Hands-on, inquiry project-based learning activities that incorporate STEAM in all district programs involving district sustainability, school improvement initiatives, community outreach and other areas that involve students in STEAM educational opportunities.
- D. Programs that integrate and align K-12 education with higher-education programs and initiatives that prepare students with workforce needs and provides essential employability skills;
- E. Cooperative programing with community colleges to supplement district opportunities in STEAM education and prepare students for continuing STEAM education and for the STEAM related workforce;

Adopted: July 25, 2019

**Key Words:**

Science, Technology, Engineering, Mathematics, Arts, STEM, iSTEM, STEAM, I-STEAM, 21<sup>st</sup> Century Classroom, Innovation, Problem Solving, Critical Thinking, Entrepreneurial STEM/STEAM, Workplace Readiness, Employability Skills, Design based pedagogy, Project/Problem Based Learning, Engineering Design Process,

**Definitions:****\*STEM**

Design-based learning approaches that *intentionally* integrate the concepts and practices of science and/or mathematics education with the concepts and practices of technology and engineering education.

It is enhanced through further integration with other school subjects such as:

- Language arts
- Social studies
- Art, etc.

**\*I-STEAM**

Integrative STEAM education incorporates the “A” for the arts – recognizing that to be successful in technical fields, individuals must also be creative and use design, critical thinking and problem solving skills while incorporating innovative thinking which are best developed through exposure to the arts. An Integrative approach to STEAM removes the silo approach for learning and focuses on issues instead of specific content areas

Integrative education bases its practices on the characteristics of the human learner and on the interdependent nature of reality. Instead of artificially dividing the world into "subjects" and using textbooks and seat work, integrative education immerses students in an enriched environment that reflects the complexities of life. This provides a holistic context for learning that leads to a greater ability to make and remember connections and to solve problems (Susan Kovalik and Karen Olsen 1994).

I-STEAM EDUCATION (continued)**Possible**

<b><u>Cross References:</u></b>	*1100	Communicating with the public
	*1200	Participation by the public
	*1220	Ad Hoc committee
	*1230	School connected organizations
	*1330	Use of facilities
	*3500.1	Conservation and sustainability
	*4131/4131.1	Staff development
	*4213/4213.1	Staff development
	*6140	Curriculum adoption
	*6141	Curriculum design and development
	*6142.10	Internet safety and technology
	*6142.11	Career and technical education
	*6145	Extracurricular activities

\*Indicates the policy is included in the Critical Policy Reference Manual.