

Interactive Science Initiative to Support Indiana Public Schools

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Abstract:

Indiana public schools face challenges like many schools in the nation. Dwindling funding, teacher lay-offs, lack of parental involvement and federal funding initiatives that have become a catalyst for failure across the nation. Legislation that placed unfunded mandates or regulations on public school systems did not take into account the unique challenges that face schools by state and treated them as a nationwide cooperative with similar demographics and challenges. Most of the support from national mandates has caused financial hardship on schools rather than bringing aid.

The combination of these influences has impacted the education of our youth in Indianapolis. In some schools our failure includes low graduation rates, increased school violence, truancy and government take-over of individual facilities. IPS's *perceived* failures as a public system of education fuels an already exacerbated opinion of many that we have lost our international competitiveness as a nation, and our ability to support future national workforce needs as a state. The success of the Indianapolis Public Schools has direct influence on economic development, workforce development, scientific research, real estate, retail and much more.

ISIS™ is launching high altitude balloons (62) over a period of two years. As a part of a one week intensive curriculum at each school location, the project works closely with educators to provide meaningful PBL based experiments that are launched from their location. ISIS™ was adopted by IPS (Indianapolis Public Schools) in Indiana as a beta site for a national roll-out of the program. The program illustrates the benefit of a resurrection of high altitude ballooning in academics and it provides a platform for students to engage that is at no cost to the school system, student or family.

Background:

Since 2008, Spaceport Indiana has been engaging in STEM education in K-12 public, private, and home schools. This initiative was started by Brian Tanner, a long time entrepreneur and philanthropist who saw an opportunity to create a launch and research facility in Indiana that would also engage Hoosier youth in the process. The changes in America's space program have spawned a number of domestic and international efforts to improve space exploration, research and platform development. This industry growth places a new demand on future workforce development. Indiana can, and will, benefit from this growth over the next few decades.





ACADEMIC
HIGH-ALTITUDE
CONFERENCE



One significant benefit is that the Spaceport can help foster new partnerships that support educational institutions. In the case of this proposal, educators and administrators in public and private schools can engage with industry professionals within the Spaceport infrastructure and support the academic process. The advent of Science Technology Engineering & Mathematics (STEM) by NASA and the principles of Project Based Learning can be supported in a very unique way using space technology and research to excite students and encourage them to continue their

education beyond high school.

Since 2008 there have been 20 Spaceports identified and documented around the world. In 2009 the International Spaceports Council was formed by members of all the Spaceports and is located in Washington, D.C. at the Commercial Space Flight Federation organization. These facilities will need employees who understand the operations of such facilities and will require multiple disciplines such as fuel systems, airframe development, security, habitat development, geology, physics, nursing, and many more. In many cases, Spaceports will employ those who have a certificate in a specialty as well as college graduates. This has significant impact on those new to the workforce as well as others who can be re-trained in a new industry.

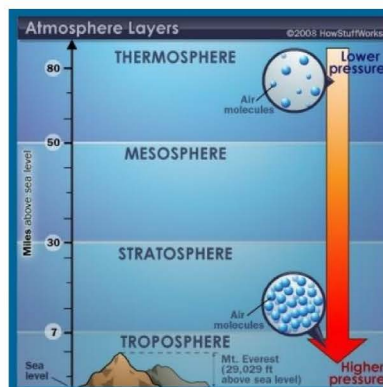
The efforts of SPI support more than just the space industry. Our technological capabilities, delivered through our student projects, support disciplines that are important to our U.S. economy. These include healthcare/medical, pharmaceutical, IT, automotive, airlines and many more. The students who participate in our programs get hands-on experience and connect classroom learning with real world operational validation, and application. They learn processes, systems and delivery.

It should be noted that since its opening, Spaceport Indiana has visited dozens of schools, held workshops for educators and students, created **INSpace Camps™** in Indiana, as well as the first annual rocket challenge in the state. These efforts have engaged thousands of students with Spaceport Mission Specialists. SPI has opened one Regional Outreach Centre and plans four more statewide. As a result, we have seen students continue their education in a STEM field when enrolled in state colleges and universities, given thousands in scholarships, and in 2011 seen the development of the National Space Corps.



Project I.S.I.S.

Project I.S.I.S. is an effort headed by Spaceport Indiana to visit each of IPS's schools (61 facilities) during the 2011/2012 and 2012/1013 academic years. 1) We will engage students in hands-on science projects that include advanced technology such as high altitude balloon launches and other near space platforms. 2) Further increase participation in the Space Corps program to engage volunteerism to support advanced education initiatives. SPI will support STEM learning and encompass subject matter that is being delivered by educators within the school system through collaboration. 3) Create an educator support system including workshops and resources to improve delivery of STEM subject matter.



Every day, teachers deliver state required curriculum that can be supported by project based learning experiments in which SPI has unique subject matter expertise. In the past few years, SPI has partnered with public and private schools to bring near space experiments into the classroom. Students have created payloads and loaded experiments that have been launched into the stratosphere. Students learn to predict flight paths, track platforms, recover payloads and validate experiments. Experiments have included projects like, chemical bonding, microgravity, design of hardened circuit boards, tissue growth, plant/seed development and many others.



In addition, SPI has created the Space Corps™ program (description attached). The program is designed to encourage volunteerism among students to support each other through peer to peer experiments, outreach and mentoring. The Space Corps uses college students as mentors for K-12 students and encourages delivery of subject matter from one student to another as a way to stimulate higher education achievements by students in K-12. There is a particular emphasis to support inner-city underrepresented and underserved students from minority backgrounds. While educators do a remarkable job delivering subject matter, there is no comparison to the experience that students get putting that subject matter to the test in a real operational environment. If students can experience these activities they take on a much different perspective about the subject, remain engaged and are encouraged to remain in school. SPI proposes to use high altitude balloon launches, and rocketry experiments to support science and math subject matter being delivered by IPS educators and staff.

While administrators, legislators, and educators continue to address current challenges facing public schools, we can bridge the gap by supporting curriculum that has been drastically cut in both academic support and necessary materials in the classroom. We can continue to support the academic experiences that will give students an edge on SATs, during the college admissions



process and when applying for scholarships. Industry often partners with school systems that address their needs early in the academic process. IPS can be a model for the space, science and technology industry and find future support from companies who need students with hands on experiences.

SPI is seeking funding in the amount of \$100,700.00 for delivery of the programming. SPI is already committing \$35,000.00 to the project as the initial partner. We will solicit community partners who have a bested interest in the public schools to support the effort for the two year period. It is clear that there is no funding within the school system to deliver such opportunities.

The benefit to partners engaged in the program will cast a wide net. There will be significant public exposure as we engage schools through TV, radio and print media. Our vehicle, used for the launches and recovery will bear the name of partners, our website (over 3 million views annually) will include partner information, and it is anticipated that there will be national coverage of the activities. All printed informational packets and project packets will contain the name of partners. This is all in addition to the obvious benefit of creating a unique learning environment for student, faculty and administration within the IPS system.

Once the program has ended, SPI will analyze collected data and measure sustainability as to whether this type of project could be done annually within this school system and other across the state. SPI will measure educator involvement, student involvement, and parental involvement in the program. The influence and collaboration of these three components will be crucial to future programming as well as future success.

**Additional information about the proposed program can be directed to Brian Tanner, Spaceport Indiana. btanner@spaceportindiana.com, www.spaceportindiana.com or by calling 765 606 1512.

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