## Budget

**University Of Akron (092869) - Summit County - 2014 - Straight A Fund - Rev 0 - Straight A Fund - Application Number (312)**

**U.S.A.S. Fund #:**

### Plus/Minus Sheet (opens new window)

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| Adjusted Allocation | 0.00 |
| Remaining           | -3,663,999.00 |
2. Executive summary: Provide an executive summary of your project proposal and which goal(s) in question you seek to achieve. Please limit your responses to no more than three sentences.

This Racing to a Straight A Student Achievement Project can provide 5th grade teachers across Ohio with the International Soap Box Derby's "Gravity Racing Challenge (GRC)", which is designed to meet the following five project goals: (1) develop Gravity Racing Challenge resources, curriculum, and measurable assessments aligned to Ohio's New Learning Standards and State Achievement Tests, (2) use Soap Box Cars and "tool kits" to create an engaging, differential, interactive learning environment to improve students' academic achievement in science and math, (3) provide professional development and collaborative teaching opportunities for educators through workshops, webinars, resources, and support to successfully implement this Project in their classrooms, (4) connect student learning to higher education, life, and careers through collaborative efforts, teaching, and mentorship by educators and students in grades 6-12, higher education, professional organizations, and businesses and (5) provide educators with the necessary resources, support, and training to build and maintain community partnerships necessary for continued support and sustainability of this Project in their schools.

3. 25000 3. Total Students Impacted:

4. Lead applicant primary contact: - Provide the following information:
First Name, last Name of contact for lead applicant: Donald Visco
Organizational name of lead applicant: The University of Akron
Unique Identifier (RN/Fed Tax ID): 062869
Address of lead applicant: 302 Buchtel Commons, Akron, OH 44325-3901
Phone Number of lead applicant: 330-972-7930
Email Address of lead applicant: dvisco@uakron.edu

5. Secondary applicant contact: - Provide the following information, if applicable:
First Name, last Name of contact for secondary applicant: Linda Hubbell
Organizational name of secondary applicant: The International Soap Box Derby
Unique Identifier (RN/Fed Tax ID):
Address of secondary applicant: PO Box 7225, Akron, OH 44306
Phone number of secondary applicant: 330-733-8723
Email address of secondary applicant: linda@asbd.org

6. List all other participating entities by name: Provide the following information for each additional participating entity, if applicable: Mention First Name, Last Name, Organizational Name, Unique Identifier (RN/Fed Tax ID), Address, Phone Number, Email Address of Contact for All Secondary Applicants in the box below.

7. Partnership and consortia agreements and letters of support: - (Click on the link below to upload necessary documents).

8. Please provide a brief description of the team or individuals responsible for the implementation of this project including relevant experience in other innovative projects. You should also include descriptions and experiences of partnering entities.

Dr. Kristin Koskey is an Assistant Professor in the College of Education at the University of Akron. She earned her Ph.D. in Educational Research and Measurement at the University of Toledo in 2009. Dr. Koskey teaches courses in evaluation, assessment, research design, and statistics. She is also a partner at Metric's America for which she consults in psychometric analyses, evaluations, and facilitating item-writing workshops for different organizations. Her areas of expertise include psychometrics, evaluation, and mixed-methods research design. Dr. Koskey's work is published in leading journals such as Studies in Educational Evaluation, Journal of Applied Measurement, Journal of Mixed Methods Research, Journal of Experimental Education, and Educational and Psychological Measurement. She has contributed to the evaluations on grants such as the Franco-American Teachers-in-Training Institute (U.S. Department of State), Math and Science Partnership - Motivation Assessment Program (NSF), and a grant funded by the Jacobs Foundation. Further, she served on an evaluation team for the Laying the Foundation, a program implemented across multiple states. TBN: a project coordinator at UA will be hired to manage the logistics and paperwork associated with the financial management of the project. The team has already identified a few persons eligible to fulfill this role with the necessary qualifications. Thus, they will be able to act quickly if the project is funded.

9. Which of the stated Straight A Fund goals does the proposal aim to achieve? - (Check all that apply)
- Student achievement
- Spending reductions in the five-year fiscal forecast
- Utilization of a greater share of resources in the classroom

10. Which of the following best describes the proposed project? - (Select one:)
- New - never before implemented
- Existing and research-based - never implemented in your district or community school but proven successful in other educational environments
- Mixed Concept - incorporates new and existing elements
- Enhancing/Scale Up - elevating or expanding an effective program that is already implemented in your district, school, or consortia partnership

11. If a partnership or consortium will be established, please include the signed Straight A Description of Nature of Partnership or Description of Nature of Consortium Agreement.

Upload Grant Application Attachment.aspx

12. 8. Please provide a brief description of the team or individuals responsible for the implementation of this project including relevant experience in other innovative projects. You should also include descriptions and experiences of partnering entities.

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14. Which of the following best describes the proposed project? - (Select one:)
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- Student achievement
- Spending reductions in the five-year fiscal forecast
- Utilization of a greater share of resources in the classroom

18. Which of the following best describes the proposed project? - (Select one:)
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19. If a partnership or consortium will be established, please include the signed Straight A Description of Nature of Partnership or Description of Nature of Consortium Agreement.

Upload Grant Application Attachment.aspx
11. Describe the innovative project.
Ohio’s New Learning Standards and Model Curriculum in Science has two major expectations based in STEM: (1) Expectations for Learning Cognitive Demands and (2) Expectations for Technological and Engineering Design. Students are expected to be able to ask scientific questions, define engineering problems, and understand the difference between engineering and science practices (Bybee, 2011). However, the standard science curriculum does not address engineering clearly. Hence, there is a strong need to establish partnerships to infuse the science curriculum with engineering activities that have shown past success, especially at the middle school level, where the interest in science is known to begin to decline. The Racing to a Straight A Student Achievement Project combines the International Soap Box Derby’s (ISBD) Historically significant, educational mission, and youth gravity racing through Soap Box Derby with the academic excellence and resources of the University of Akron’s College of Engineering and College of Education to provide 5th grade educators with the resources to implement the Gravity Racing Challenge curriculum to students across Ohio (about 1000 classrooms/25,000 students). This includes curricular resources (e.g. workbooks), Mini Soap Box Derby Classroom Kits and Soap Box Cars, as well as the training and professional development required to implement the GRC curriculum. The Mini Soap Box Derby Classroom Kits are small, gravity driven cars (called “Minis”) that the students assemble, using tracks and timers provided to explore relevant physics and motion concepts. Each student will have their own car. The assemblage of the larger Soap Box Derby cars will be facilitated by videos created by UA’s student design team and will include “tech tips” on both building the car and the physics behind some design decisions the students can make. The Mini Soap Box Derby Classroom Kits will be provided for free to educators by UA, with a budget allocation to offset the cost of the materials and labor. Each Soap Box Derby car kit plus shipping will be $1000.

12. Describe how it will meet the goal(s) selected above.
If school/district receives school improvement funds/support, include a brief explanation of how this project will advance the improvement plan.

13. Financial Documentation - All applicants must enter or upload the following supporting information. Responses should refer to specific information in the financial documents when applicable:
a. Enter a project budget
b. Upload the Straight A Financial Impact Template forecasting the expected changes to the five-year forecast resulting from implementation of this project. If applying as a consortia or partnership, please include the five-year forecast of the consortium (i.e. STEM school district, community partners). The project disbursement will be directly to the STEM school team and will be spent in accordance with the approved budget.

If subsection (b) is not applicable, please explain why, in addition to how the project will demonstrate sustainability and impact.

The Straigh A Financial Template is not directly applicable as the two entities are partners in The University of Akron and the International Soap Box Derby. However, as and shown in Question #16, there is an expected savings to a school district that participates in this program. The project will demonstrate sustainability through the fact that recurring costs are small ($285 per classroom) and a pathway to obtain those dollars (from community and industry partners) is available. The project will demonstrate impact through the detailed assessment and evaluation plan provided in Questions 20 - 22.

14. What is the total cost for implementing the innovative project?
3,663,999.00 * Total project cost

* A brief narrative explanation of the overall budget. The narrative should include the source and amount of other funds that may be used to support this concept (e.g., Title I funding, RTT money, local funding, foundation support, etc.), and provide details on the cost of items included in the budget (i.e. staff counts and salary/benefits, equipment to be purchased and cost, etc).

15. What are the new/recurring costs of your innovative project that will continue once the grant has expired?
0.00 * Specific amount of new/recurring cost after project is implemented

* Narrative explanation/rationale: Provide details on the cost of items included in the budget (i.e. staff counts and salary/benefits, equipment to be purchased and cost, etc.) If there are no new/recurring costs, please explain why.

The Soap Box Derby car can be taken apart and used again, so this is a one-time cost. Additionally, the DVDs and training materials are also one-time costs. However, there may be parts that break with repeated use. Thus, we would estimate $45 per classroom for replacement parts for a Soap Box Derby car (per year). For the Minis, the replacement parts include student consumable items in the classroom.

16. Are there expected savings that may result from the implementation of the innovative project?
0.00 * Specific amount of expected savings (annual)

* Narrative explanation/rationale: Provide details on the anticipated savings (i.e. staff counts and salary/benefits, equipment to be purchased and cost, etc.). If there are no new/recurring costs, please explain why.

This Project designed to impact students’ achievement in math and science has potential savings of the District's General Fund by decreasing expenditures for student remediation, intervention, and/or retention (specifically for students who are identified for special services), institution of a district-wide professional development curriculum, and ensuring that all students are given the tools they need to succeed. In addition, the project will likely result in a reduction of the District's General Fund expenditures for special education services, as the project will be designed to address the root causes of special education referrals. Additionally, the project will result in a reduction of transportation costs, as students will be able to participate in the project through the use of their own transportation, thereby reducing the need for district-provided transportation.

17. Provide a brief explanation of how the project is self-sustaining. If there are ongoing costs associated with the project after the term of the grant, this explanation should provide details on the costs that reduction that...
will be made that are at least equal to the amount of new/recurring costs detailed above. If there are no new/recurring costs, explain in detail how this project will sustain itself beyond the life of the grant.

The Gravity Racing Challenge started a few years ago with only a few schools in Ohio. Those school districts secured the necessary financial, technical, and program support to continue to use the GRC curriculum with the partner entities (UA and ISBD) to continue to support the project in its second year. UA and ISBD have been working with the partners and districts interested in implementing the GRC curriculum. The team already has contacts for the Soap Box Derby in various regions, in-person and virtually, to facilitate the grant in the time frame required. The Gravity Racing Challenge has experienced strong growth in Ohio and other states, with over 60 schools participating in the GRC curriculum in the 2020-21 school year. The team has also engaged in partnerships with local community organizations and businesses, which has resulted in securing the necessary funding for schools to be able to participate in GRC. In addition to financial support, educators have built strong technical and curriculum support networks and collaborations with colleagues, professional organizations, and other higher education. This networking, sponsorship, partnerships, and collaborations have resulted in the retention of students participating in the GRC program, as well as the substantial growth shown by increased school involvement across Ohio. We believe that the success of this project is due to the collaborative and inclusive approach that has been taken, building partnerships with local community organizations and businesses, and students' engagement in the GRC curriculum for financial stability. Both of these currently exist in the schools that participate in the GRC, which creates models for other schools to follow. Level 1: Educators commitment and support of this Project. As previously mentioned, the GRC program is slowly growing in Ohio and those schools who have used it recently are continuing to use the program. One major reason for this is because the Gravity Racing Challenge is a large-scale, all-encompassing curriculum for their curricular activities, including being standard-based, experiential, measurable, STEM applicable, team building, inclusive, hands-on and motivating. Two quotes follow, which support the impact of the GRC program. "The team experience in the Soap Box Derby is like none I have ever experienced before. Soap box derby requires strong collaboration and team values. Teamwork is vital to building a successful car because almost everything requires a partner or a group. The ingenuity of designing the car and the problem solving skills required to troubleshoot by teachers are all key skill we will use in life regardless of the career paths we have chosen in the future." Karthik S. (student) Westlake HS.

Students are7. Describe the expected changes to the instructional and/or organizational practices in your institution.

E) SUBSTANTIAL IMPACT AND LASTING VALUE - Impact, evaluation and replication

20. Describe the rationale, research or past success that supports the innovative project and its impact on student achievement, spending reduction in the five-year fiscal forecast or utilization of a greater share of resources in the institution.

The International Soap Box Derby is an organization with a historic track record spanning seventy-seven years of providing over one million youth with educational opportunities and experiences through gravity racing. Currently, the program is running with schools in twenty-four Ohio School Districts using the GRC curriculum. The ISBD staff are equipped to scale the project to 1000 classrooms in Ohio. The team already has contacts for the Soap Box Derby in various regions, in-person and virtually, to facilitate the grant in the time frame required. The Gravity Racing Challenge has experienced strong growth in Ohio and other states, with over 60 schools participating in the GRC curriculum in the 2020-21 school year. The team has also engaged in partnerships with local community organizations and businesses, which has resulted in securing the necessary funding for schools to be able to participate in GRC. In addition to financial support, educators have built strong technical and GRC program support networks and collaborations with colleagues, professional organizations, and other higher education. This networking, sponsorship, partnerships, and collaborations have resulted in the retention of students participating in the GRC program, as well as the substantial growth shown by increased school involvement across Ohio. We believe that the success of this project is due to the collaborative and inclusive approach that has been taken, building partnerships with local community organizations and businesses, and students' engagement in the GRC curriculum for financial stability. Both of these currently exist in the schools that participate in the GRC, which creates models for other schools to follow. Level 1: Educators commitment and support of this Project. As previously mentioned, the GRC program is slowly growing in Ohio and those schools who have used it recently are continuing to use the program. One major reason for this is because the Gravity Racing Challenge is a large-scale, all-encompassing curriculum for their curricular activities, including being standard-based, experiential, measurable, STEM applicable, team building, inclusive, hands-on and motivating. Two quotes follow, which support the impact of the GRC program. "The team experience in the Soap Box Derby is like none I have ever experienced before. Soap box derby requires strong collaboration and team values. Teamwork is vital to building a successful car because almost everything requires a partner or a group. The ingenuity of designing the car and the problem solving skills required to troubleshoot by teachers are all key skill we will use in life regardless of the career paths we have chosen in the future." Karthik S. (student) Westlake HS.

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20. Describe the rationale, research or past success that supports the innovative project and its impact on student achievement, spending reduction in the five-year fiscal forecast or utilization of a greater share of resources in the institution.
21. Is this project able to be replicated in other districts in Ohio?

| YES | NO |

22. If so, how?

The project can be replicated in other districts after the initial implementation. The proposed expansion to 1000 classrooms will create an infrastructure of trained teachers who can support further dissemination. The project goals will help create training materials for teachers, and curricular materials to be used in the classroom. These materials will be readily available for other districts/teachers who are interested in implementing engineering in their middle schools. While there is a cost associated with purchasing classroom kits, this cost can be funded through business partners, or can come from districts allocated funds for implementing science and engineering activities. Teachers have been very successful in the past in securing funds from business partners to participate in GRC race activities.

23. Describe the substantial value and lasting impact that the project hopes to achieve.

This Project's overall design, format, and delivery invokes high levels of student interest and engagement resulting in students taking an active role in their learning. This engagement and interest are essential to keep students in the STEM pipeline. Furthermore, this project targets 21st learning skills. As active learners in this Project, students will be able to develop high level critical thinking problem solving skills, improve their communication and team building skills, and apply what they learn in novel situations. Students will also acquire organizational skills necessary to complete the project, which will be transferred to other learning situations.

24. What are the specific benchmarks related to the fund goals identified in question 9 that the project aims to achieve in five years? Include any other anticipated outcomes of the project that you hope to achieve that may not be easily benchmarked.

The following outcomes will be used to measure the success of the program: 1. Enhance students' understanding of the engineering design process 2. Develop students' understanding of physical science concepts 3. Enhance students' understanding of the application of mathematics and science in everyday life 4. Increase students' motivation to learn STEM content 5. Connect physical science concepts to other areas of the curriculum, to achieve a deeper understanding 6. Increase students' opportunities to be involved in STEM competitions Curricular materials will be piloted in 2-3 classrooms in February 2014 during development to gain an understanding of the impact of the program. Assessments on students understanding of science and math content, student motivation to learn STEM, and students understanding of the engineering design process will be administered. A survey will be given to teachers to learn about the successful aspects of the program, and areas for improvements. Results from the analysis of the pilot data will be used to make necessary modifications to the curricular materials and website content. The improved program will be rolled out to teachers in time for implementation on a larger scale. This program builds on prior success with Gravity Racing Challenges in over 24 districts in Ohio. The newly developed curricular materials will enhance prior successes. For Outcome 1, teachers’ will rate students' products using a standardized Engineering Design Rubric. Teachers will also complete a survey including a component asking them to rate their perception of whether students' understanding of the engineering design process was enhanced as a result of engaging in the GRC activities. Two open-ended items will be included on this portion of the survey. The first open-ended question will ask if they felt students' understanding was enhanced and, if so, in what ways. The second question will ask what improvements they feel could be made to the GRC activities to meet this goal. The Outcomes 2,3, 4, and 5 will be assessed by collecting pre and post-data. Content assessments will be used to assess the impact on students' understandings of physical concepts. Their understanding of the application of mathematics and science, interest in engineering, and motivation to learn STEM content will be measured using a survey asking students to rate a series of statements using a Likert scale. Items will be adapted from the Test of Science Related Attitudes (TOSRA; Fraser, 1978). Teachers will also rate their perceptions as to whether the program increased these student outcomes. Teachers will also respond to open-ended items asking for specific examples from the classroom illustrating how the program increased these student outcomes (if they felt it did) and in what ways they feel the program could be improved to meet these goals, if any. Outcome 6 will be evaluated by the count of students participating in the Soap Box Derby competition and a survey completed by teachers indicating any additional competitions students participated.

25. Describe the plan to evaluate the impact of the concept, strategy or approaches used.

* Include the method by which progress toward short- and long-term objectives will be measured. (This section should include the types of data to be collected, the formative outputs and outcomes and the systems in place to track the program's progress).

* Include the method, process and/or procedure by which the program will modify or change the program plan if measured progress is insufficient to meet program objectives.

The purpose of this evaluation is to measure the effectiveness of the program, identify the aspects of the program that were successful, as well as areas that can be improved. Evaluation questions: 1. How successful was the program at enhancing students understanding of the engineering design process? 2. How successful was the program at having students develop science concepts that are integrated into the engineering design process? 3. How successful was the program at increasing students' interest in engineering, and motivation to learn science? 4. What is the success rate in expanding the number of competition teams that participate in the GRC race? Data collection: data collection will be at the local level by teachers and teacher mentors. A sample of students projects will be assessed by project personnel. Data analysis will be performed by the evaluator with assistance from one of the project personnel (Makki). Program goals Program Activity Timeline Data Collection Responsible Person(s) 1. Enhance students' understanding of the engineering design process Teachers are trained on the activities face to face or online Teachers implement GRC in the classroom on a regular basis. 2. Develop students understanding of physical science concepts Teachers use the developed curriculum in the GRC activities. April-May 14 Content Assessment (developed by Makki and Koskey) Administer Tests (teachers) Manage data (program coordinator) Analysis of Test Results (Evaluator) 3. Increase students motivation to learn STEM content Teachers use the developed curriculum April-May 14 Science Attitudes Survey (TOSRA) Teacher Survey Administer Tests (teachers) Analysis of Test Results (Evaluator) 4. Increase students' opportunities to be involved in STEM competitions After school program Spring 2014 Participation in competition Teacher Survey Data monitoring (Program coordinator) Analysis of Test Results (Evaluator) In addition, a survey will be administered to teachers in the program to determine the aspects of the program that were successful and aspects that need improvement.

By virtue of applying for the Straight A Fund, all applicants agree to participate in the overall evaluation of the Straight A Fund for the duration of the evaluation timeframe. The Governing Board of the Straight A Fund reserves the right to conduct evaluation of the plan and request additional information in the form of data, surveys, interviews, focus groups, and any other related data to the legislature, governor, and other interested parties for an overall evaluation of the Straight A Fund.

PROGRAM ASSURANCES: I agree, on behalf of this applicant agency and/or all identified partners to abide by all assurances outlined in the Assurance section of the CCIP. In the box below, enter “I Accept” and indicate your name, title, agency/organization and today’s date.

ACCEPT: Sharon McWhorter, Pre-Award Research Administration Office of Research Administration The University of Akron October 25 2013