**Team Darwin - Spring Grove Area High School SLI 2016**

**Background**

 Many children dream at a young age of being astronauts and seeing space. But a few children instead think of what it would be like to build the rocket that will send them there. Yes that is who we are. No we aren’t astronauts nor do we build a rocket that can fly to space, but a mile seems pretty close for a group of high school students from the little town of Spring Grove, Pennsylvania.

The NASA SLI program has been around now for many years and is a prestigious program that allows high school and college students to propose and build a rocket. Spring Grove is one of only 12 high schools in the country to be a part of this program. Each year teams compete by building rockets in the Team America Rocketry Challenge (TARC) program. Teams that place in the top 20 at TARC Nationals qualify for the SLI program. Last year two Spring Grove teams placed in the top 20 allowing Spring Grove to be one of only two high schools to have two SLI teams. These students endure the process of submitting a proposal similar to those required of NASA employees. After the proposals are approved a subscale rocket is built to test the design. This is followed by two more reports and the completion of a full-scale rocket. In April these students will travel to Huntsville, Alabama with the hopes of taking home the National Altitude Award which is given to the team who flies closest to a mile.

**Adult Educators:**

Rosemary Cugliari (cugliarr@sgasd.org) - Spring Grove Area High School Principal

Brian Hastings (hastingb@sgasd.org) - Physics teacher, NASA Student Launch Mentor

Renee Bosak (bosakr@sgasd.org) - Biology teacher, NASA Student Launch Mentor

Safety Officer: Renee Bosak and Brian Hastings, Level II NAR Certified Members

**Team Members:**

* Adam Cavanaugh (Senior) - Co-Captain
* Joshua Staley (Senior) - Co-Captain
* Hannah Sheffer (Junior)
* Carson Buffalow (Sophomore)
* Trevon Colbert (Sophomore)
* Emily Edsall (Sophomore)
* Sarah Staley (Freshman)

**Our Goal:**

Our mission is to efficiently design, build, and launch a rocket to reach a height of 5,280 feet

(1 mile) or as close as possible while carrying a scientific payload. Along the way the team will write five full reports on the team's work and progress, while also working to improve interpersonal skills and enhance our educational opportunities.

**Payload Summary:**

The payload is designed to test the effects of acceleration on planaria. Planaria are small flatworms. The planaria will be cut in half and placed inside test tubes within the nosecone of the rocket. They will then be compared to a control group that will show whether or not the acceleration affected their regrowth.

**Rocket Summary:**

* Total length:88.125 in
* Diameter : 3.9 in
* Gross lift off weight : 18.4 lbs

**Subsystems of the Rocket:**

-Recovery subsystem (parachutes, shock cords, pyrotechnics, etc) -Payload

-Propulsion and motor retention subsystems -Rocket airframe

**Mission Performance Predictions:**

In order for this project to be successful the following must be met:

1. It must successfully launch and deploy both parachutes.
2. The rocket must be within 10% of our target altitude of 1 mile or 5280 feet.
3. We must be able to use that data to draw a meaningful conclusion to our experiment.
4. Lastly, no onboard systems or parts may break or malfunction during the course of the launch.

**Project Plan:**

Budget and Funding Plan

* The estimated budget for both teams is $26,000.
* This will be achieved through fundraisers, donations and grants from local companies, universities, and community members. Individuals and companies may make a donation on our team GoFundMe page at: www.gofundme.com/sgsli

**Sponsors:**

* TE Connectivity
* AquaPhoenix Scientific
* Engineering Society of York
* Spring Grove Education Fund
* Hanover Rotary
* Hanover Foods
* Hanover Elks
* Hain Pure Protein Corporation
* First Energy
* York County Community Foundation

**Timeline and Schedule:**

* November 21–22: Subscale Launch and establish a team website **springgroverocketry.weebly.com**
* January 16–17: Launch of the Full Scale Rocket
* February 20–21: Launch of Full Scale Rocket
* March 12–13: Launch of Full Scale Rocket
* April 10: Launch of Full Scale Rocket

**Educational Engagement:**

The team presented to 7th graders and will hold a rocket building workshop.