Lunar Dust Baffles
Finalist List
for
NASA HUNCH
Design and Prototyping 2021

Congratulations for being chosen as a Finalist for NASA HUNCH Design and Prototype 2021. Your design was chosen as a Finalist because your team has fulfilled all or most of the requirements for your project along with quality in design and manufacturing the prototype. Your team demonstrated good testing of your prototype and knowledge of the problems and extensive understanding of the environment for your project. There was a lot of really amazing competition for these spots and all people from the semi-finalist

By being a Finalist means that you are a winner but this does not mean your idea will fly to space. This is real engineering. Although it is possible the reviewers could see one design that is exactly what they want, it is more likely NASA may choose one or a few ideas from each team to incorporate into a different design. It is also very possible that requirements or needs have changed since the beginning of the school year and they are not interested in the idea at this time. This is the nature of engineering but it does not diminish your accomplishments.

Design to Flight

The goal of HUNCH is to keep your names attached to these ideas and to have you assist with later developments of your projects when possible. Your projects and information will be provided to Mike Bennett who runs the HUNCH Design to Flight program that will coordinate the sending of your ideas to the engineers as they request it and working with your team to give engineers assistance whenever possible. This might include updating or making new CAD drawings, assembly of prototypes, choosing flight components and/or assisting with presentations. You will receive an email through your teachers in the coming days requesting specific information about your project.

Patents

In general, NASA does not seek patents on materials that are only related to space, however, if there are other potential uses for the device or ideas related to Earth bound applications, HUNCH will ask NASA Tech Transfer to assist in working through patent process. It is our goal that students and schools are included in any patents with as much credit as possible. We do not anticipate this as an income generator but more as value to your resumes.

Presentations:

General:

- Practice your presentation.
- Look sharp and professional.
- Everyone from the team should talk.
- Briefly introduce yourselves including your name and grade and school and state.

- Reviewers will already be aware of the problem and the constraints– I'll take care of that.
- Start with a demonstration of your prototype and briefly describe the testing that has been done.
- Point out details that make your design innovative, more robust, cleanable, repairable or desirable.
- Mention one or two things that didn't work initially but you were able to make changes and move forward.
- Briefly talk about how your prototype is different from the final product would be and include the materials you think will be used on the design that would fly to space.
- Answer questions quickly and concisely but completely so you can answer more questions and receive more comments. If you don't know something, say that you will have to check on it and plan to get back with them with an answer by email.
- Relax. These people are interested in what you have to say and know what its like to be on the spot.

Specific to Dust Baffles

- Show how your design will be easy for astronauts to set up on the moon—the more prep work on Earth, the easier for astronauts on the moon.
- Is there an order for how the soil is applied to your design?
- You will be giving your talk with the other Finalists on **April 29—10:00 to 11:30 CT**
  I will be sending out invites for a Microsoft Teams meeting in the next couple of days to the teams.

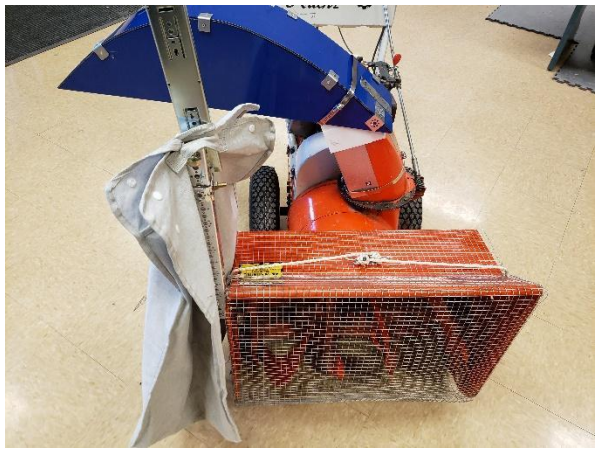
Lunar Dust Blower

School: Billings Career Center

Teacher: Eric Anderson

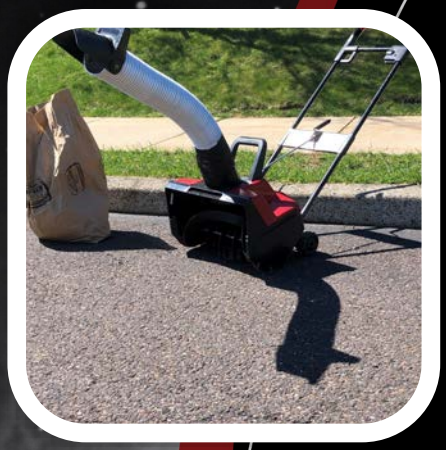
Team Members: Nolan Leonard and Jordan Dervishian

Description: Our lunar dust blower features a wire mesh on the intake chute, a hanging bag on the side for dust storage, and a directional chute that guides the dust into the bag. The mesh filters out rocks and only allows dust in while being removable. The bag can fold up and is also removable for SEV pickup. The chute guides dust into the bag without clogging or escaped dust. Our design allows distant dust to be taken back to the habitats as well as nearby.

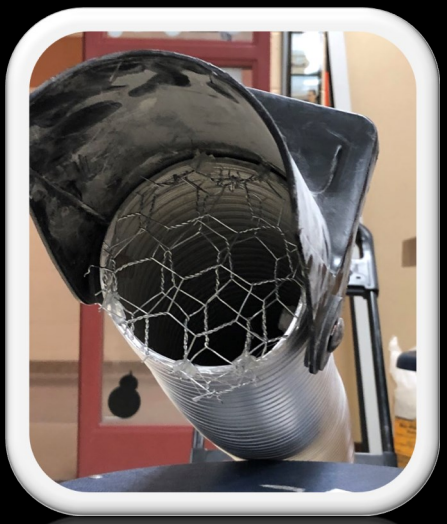


Team Members:
Dan Krauss
Sydney Mandel
Ava Paulson
Fred Bauer (Teacher)

LUNAR DUSTBLOWER

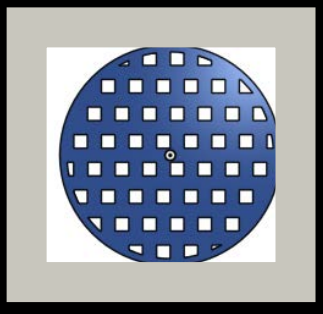


Includes
the shaft which is able to rotate to allow for directionality of filling the baffle

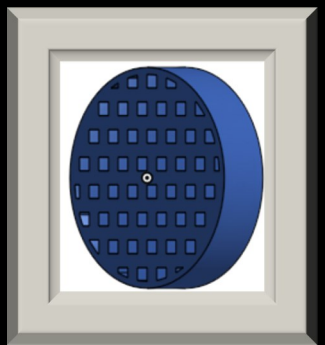


Pictured: the chicken wire used to replicate a sifter. Will not allow for pieces bigger than an

Sifter and directionality



Parts



LUNAR DUST BLOWER

James Parker, Jeremiah Johnson,
Brandon Williams

We attend Manvel High School where we are instructed by Mr. Smith.
Our project is the lunar dust blower, its goal is for it to blow the lunar dust of of the moon's surface on to the top of the lunar habitats.

NASA HUNCH
High school students United with NASA to Create Hardware

OUR PLAN BREAKDOWN

Component 1:

This is where we identified our problem and our 5 attack paths. We documented the patents and researched current and past solutions. And lastly we went over the design requirements specs, and customer requirements.

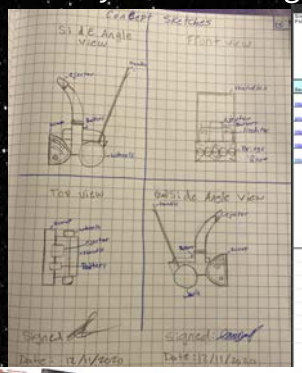
Component 2:

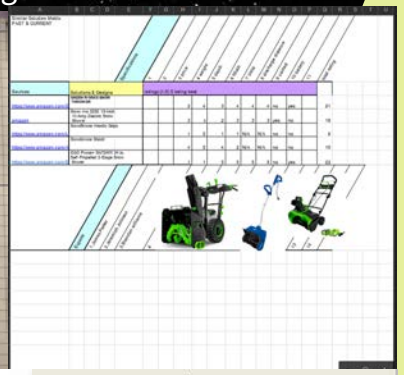
We did sketches of the lunar dust blower to help explain how the lunar dust blower will work and what it should look like. This includes isometric views and front, top and side views of our future product.

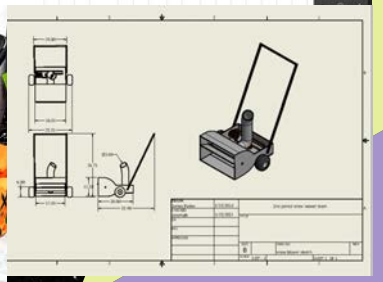
KNOWLEDGE IS POWER

Component 3

Out of the sketches we made we decided whose design was most efficient and began checking the viability of our design.







Our website: https://spark.adobe.com/page/n99ZjAEaiun8W/

Just because have to work in someplace new and unknown, doesn't mean you have to rely on something new and unknown - The lunar dust blower is built on comfort and familiarity,so you can complete tasks with ease!

Contact

VIERSTEINE

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STEM Academy of Lewisville
Lewisville, TX 75057

About the Project

What is the Lunar Dust Blower?

The lunar dust blower is a device similar to that of a snow blowing machine - the only difference being that instead of removing snow from an unwanted area, it collects lunar dust and disperses it onto a lunar bubble dome.

Whats the idea behind the Lunar Dust Blower?

Space explorer's plan to one day, establish an inflatable dome on the moon. This dome will act as a sanctuary for astronauts to reside in during their stay.

Lunar Dust Properties:

Lunar dust, also known as regolith, contains helpful qualities, such as its ability to resist meteorite attractions and reduce radiation levels .

Project Design

Materials:

- Electric snow blower (Snow Joe sj625)
- Sheet metal
- Mounting Handle bar
- Steel mesh

Modifications:

- **Handle bar** - allows versatility for thick astronautic glove usage
- **Filter** - prevents rocks bigger than an inch from going through the chute and potentially impairing the dome
- **Lunar tires** - allows for mobility on lunar terrain
- **Machine Mouth Cover** - allows the blades of the machine to focus on collecting the dust that lies close to the surface

Extensions:

- **Bendy Straw Tube** - extension to original machine chute, for attachment of crevice nozzle
- **Crevice Nozzle** - extension to bendy straw tube, for creating linear and clean flow path for exertion of dust onto particular sections of lunar dome
- **Cattle Guard** - covering of machine mouth opening - aids in collecting and shoveling piles of lunar dust toward machine blades

Prototype Visuals

Preliminary Design

CAD Model

Prototype