Agenda
Goal: Introduce NASA OPSPARC and NASA/NIA Design Challenges

ITEEA – NIA Partnership

NASA OPSPARC
• Ways to integrate challenges into curriculum

Additional Design Challenges
• LiveBinder
• NASA Spotlites
The National Institute of Aerospace Center for Integrative STEM Education

- Georgia Tech
- Hampton University
- North Carolina A&T State University
- North Carolina State University
- University of Maryland
- University of Virginia
- Virginia Tech
- The College of William & Mary
- Old Dominion University
OPTIMUS PRIME WANTS YOU!

Your Mission:
Search for NASA Spinoffs in our environment AND create your OWN Spinoff innovation!

BE THE SPARK
Why use design challenges with students?

Who “runs” these challenges?

What challenges have you used in the past?
2018 NASA OPSPARC
(OPTIMUS PRIME Spinoff Promotion and Research Challenge)

OPTIMUS PRIME WANTS YOU!

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BE THE SPARK
NASA SPINOFF

MEMORY FOAM

WAS ORIGINALLY DEVELOPED BY NASA IN 1966 TO IMPROVE THE SAFETY OF AIRCRAFT CUSHIONS.
Track 1 – Grades 3 – 12

Glog Track

Have you developed Glogs with students?

Hydro Electric House
Thermawning Greenhouse (Thermabed)
Microshutter Array Fiber Optics

Grades 3-6
Grades 7-8
Grades 9-12
Track 1 – Glogs Due March 5

Glog Track (Grades 3-12)

- **October**: Challenge Kick-off
- **February 20**: Glog Deadline
- **February 27**: 20 Teams Selected for InWorld
- **March 5**: Glog Deadline
- **April**: Top 10 Finalists Selected
- **April 23-30**: Public Choice Voting
- **May 1**: Winners Announced
- **June 13-14**: Winners Workshops & Celebration at NASA Goddard

Glog + InWorld Presentation Track

(Grades 7-12)

- **October**: Challenge Kick-off
- **April 12**: Top 6 Teams Selected
- **April 23-30**: Public Choice Voting
- **April 24-25**: Design Reviews
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NASA
OPSPARC
Track 1
Teams work with college mentors in a virtual world to develop 3D models and a marketing plan.
BIG questions need a BIG telescope!
What do you know about JWST?
Identify first bright objects
Changes in Galaxies

... to determine how galaxies and dark matter evolved to the present day
Birth of Stars

... to unravel the birth and early development of stars and the formation of planets.
Track 2 -- Teams

College Mentors:
Engineering/Computer Science + Business
Build InWorld

Brainstorm Possible Solutions

Because it is a layered dome it minimizes the amount of light it reflects back into the telescope and it regulates heat in the equipment.

Because of its dome shape, the shield protects the telescope from light emitted by the Sun, Earth, and Moon well.

As the shield will be a dome shape, it is also quite sturdy and will be able to withstand the tension of the space environment better than Design 2.

Although this design is heavier than the other one, we chose it because it will protect the telescope better.

It will also shield the telescope from any meteorites and will maximize the pointing angle of the telescope better.

For all of these reasons, we chose Design 1.
Past Finalists and Winning Team Designs
Past InWorld Finalists

New to ActiveWorlds??? Click this sign to learn how to get around!

Congratulations To Our Six Finalists!

Our Six Finalists Completed The JWST Design Challenge

Please Visit Our Finalists' Worlds By Clicking On Their Team Patches
Do you teach CAD? Modeling and simulations?

Models:
- Autodesk
- PTC Creo
- Sketch Up
Guest Speakers InWorld
Hello! My name is Makaela and I will be representing the all girls team here at Landstown High School for the NASA's OPSPARC challenge for creating a spin-off.

For this video I will go over:
- The original technology from the James Webb Space Telescope that we chose to create our spin-off.
- Adapting our spin-off to the real world.
- And the need for the technology and its capabilities.

NASA OPSPARC Spin-off Video: The Kapton Suit

Makaela Vidal

YouTube Subscribe 2

119 views
Example of Review and Feedback to Students by SMEs

Hey everyone! My name is Helena Zhu and I'm currently an Economics major at Cornell University. I've been involved with the business side of tech for a while now - working in biotech, e-commerce, and aerospace during my past couple years in college. I think your Kapton suit is a great idea to help improve healthcare. I would definitely think about how to reduce costs for the suit - looking at the link you provided about kapton tape, it seems like $10 for the thinnest roll is pretty pricey. How thick does the kapton have to be to block out the x-rays? Is a full body suit necessary to make the procedure safer? Could you analyze where the x-rays hit people in the greatest concentration and focus on covering those parts (Kapton vest, Kapton chainmail lol)? To implement this idea, you'll have to find a Kapton producer who will give the materials to you for a great price in order to charge hospitals a reasonable price for the suit. I definitely think this is possible to create though - it's for a great cause and is definitely a novel way of utilizing existing technologies! Good luck!

Show less

Reply •  

Mason Peck 3 months ago

I teach aerospace engineering at Cornell University. A couple of years ago I served as NASA's Chief Technologist in Washington DC. I have also worked at Boeing and other aerospace companies. My research interests these days are primarily in spacecraft systems architecture and technology for attitude control, guidance, and navigation of spacecraft.

I just have to say--wow! What a professional, well-designed video! You should be proud of the great organization, attention to detail, and clarity of this presentation. Communicating your ideas is an essential step in being successful at changing the world through science and technology. You seem to be well on your way.

"Radiation" can mean many things, and it's often used broadly to refer to any electromagnetic energy (infrared, visible light, ultraviolet light, X rays, gamma rays, and so
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Track 2 – Glogs Due February 20
OPSPARC website
https://nasaopsparc.com/

Project Checklist & Timeline

Coach Project Checklist

1. Assist students with registration. All students need parent/guardian consent.
   *Upon registration, a Coach Handbook and a Student Design Packet will be provided.

REGISTRATION OPTIONS:

- Students sign up individually online. They will need to know their parent/guardian email or have their parent/guardian present.
- Parents register their students. Coach sends home “Letter to Parent.”
- Coach initiates registration. Parent consent still required. See Forms & Materials.
- For those not able to register and/or give permission online, use the Offline Registration form. See Forms & Materials.
What criteria do you use to select Design Challenges?

Track 2 – Glog + InWorld
**NIA-NASA Design Challenges**

**ITEA and NIA Webinar -- January 10, 2018**

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National Aeronautics and Space Administration

**NASA eClips™**

**NASA’S OUR WORLD**

**DESIGNING A SHOWER CLOCK**
Other Design Challenges?
Previews of Coming Attractions
NASA eClips™ Suite

**Featured Video | Our World: Sun's Position**

**Playlists**

**Our World**
- Grades K-5
  - 4 hours = 1 Day

**Real World**
- Grades 6-8
  - These video segments connect classroom mathematics to 21st century science careers and innovations and are designed for students to develop an appreciation for.

**Launchpad**
- Grades 9-12
  - These video segments support project-based and problem-based learning experiences in science, mathematics, and career and technical education classrooms.

**Spotlites**
- Student Productions
  - Student-produced videos addressing common science misconceptions paired with interactive lessons and subject matter expert interviews to offer.

**Educator Guides**
NASA eClips™ Educator Guides provide examples of ways teachers may effectively use video segments as an instructional tool. Each guide includes instructional objectives, background information, links to video clips, instructions for implementing inquiry-based lessons, additional resources related to the topic and suggestions for extending or modifying lessons. All lessons are presented in the 5-E delivery model and are aligned to national standards for science, math, and technology.

**Guide Lites**
Guide Lites are individual activities from approved NASA eClips™ Educator Guides that are well-suited for informal settings. Each Guide Lite includes the lesson objectives and a list of materials, which are inexpensive and readily available. Lessons are organized using an Engage, Explain and Extend section. NASA eClips™ video segments that support each activity are identified in the lesson.
NASA and NIA have hired your video production class to produce a video for their website. The goal of the video is to clear up a science misconception.
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Questions?