

IMPLEMENTACIJA ASTRONOMIJE U NASTAVI – PRIMJERI DOBRE PRAKSE

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Međuzupanijski stručni skup iz Astronomije
Zagreb, 27.06.2016.

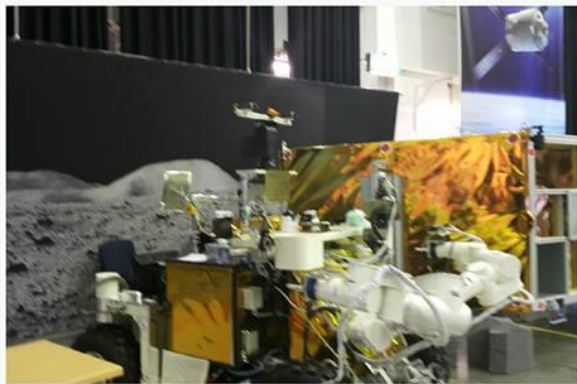
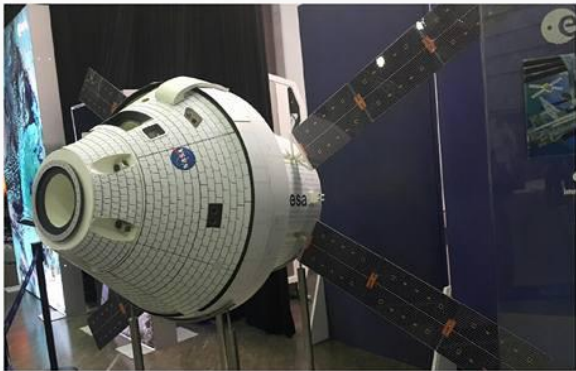
UNIVERSE AWARENESS, LEIDEN UNIVERSITY


- **VIZIJA I CILJEVI**

- UNAWE projekt želi ljepotom i veličanstvenošću našeg svemira inspirirati i motivirati djecu te povećati njihov interes za znanost i tehnologiju.


<http://www.unawe.org/>







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ACTIVITY

Keywords


Physics, Astronomy, Earth, Space, Art, Languages, Eclipse, Sun, Moon, Earth, Motion

Connection to National Curriculum


CREATING ECLIPSES IN THE CLASSROOM

Brief Description

During an eclipse, the Sun or the Moon seems called solar or lunar eclipses, respectively. They have been shrouded in myth and legend through the ages. What happens during an eclipse and how can we observe it safely? In this activity, explore these fascinating natural phenomena and create a simple model of the Sun, Earth and Moon.



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QUALITY LIGHTING TEACHING KIT


15 June 2016

The American National Optical Astronomy Observatory (NOAO) produced the "Quality Lighting Teaching Kit" for the International Year of Light (IYL2015). Their goal is to increase student and public awareness of light pollution issues, dark skies preservation, quality lighting and energy conservation. In doing so, the kit aims to foster the next generation of astronomers and scientists who will be responsible for protecting the night sky for future generations.


More news:

- > Celebrating 10 Years of Universe Awareness
- > Space Awareness Webinar
- > Space Education International Workshop


Images




qllteaching
Quality Lighting Teaching Kit



Winner of **Science** SPOR Award



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RESOURCES


The Earthball is a fantastic tool for discussing our planet with children, combining playtime with education!

Cecilia Soczea, EU-UNAWE Germany

Educational Material



The Invisible Universe
French



Model of a Black Hole
(Farsi)



Earth Ball Activity Book



SPACE AWARENESS

NEWS

CAREERS

READ

PARTICIPATE

SPACE
awareness

EDUCATE

DEVELOP

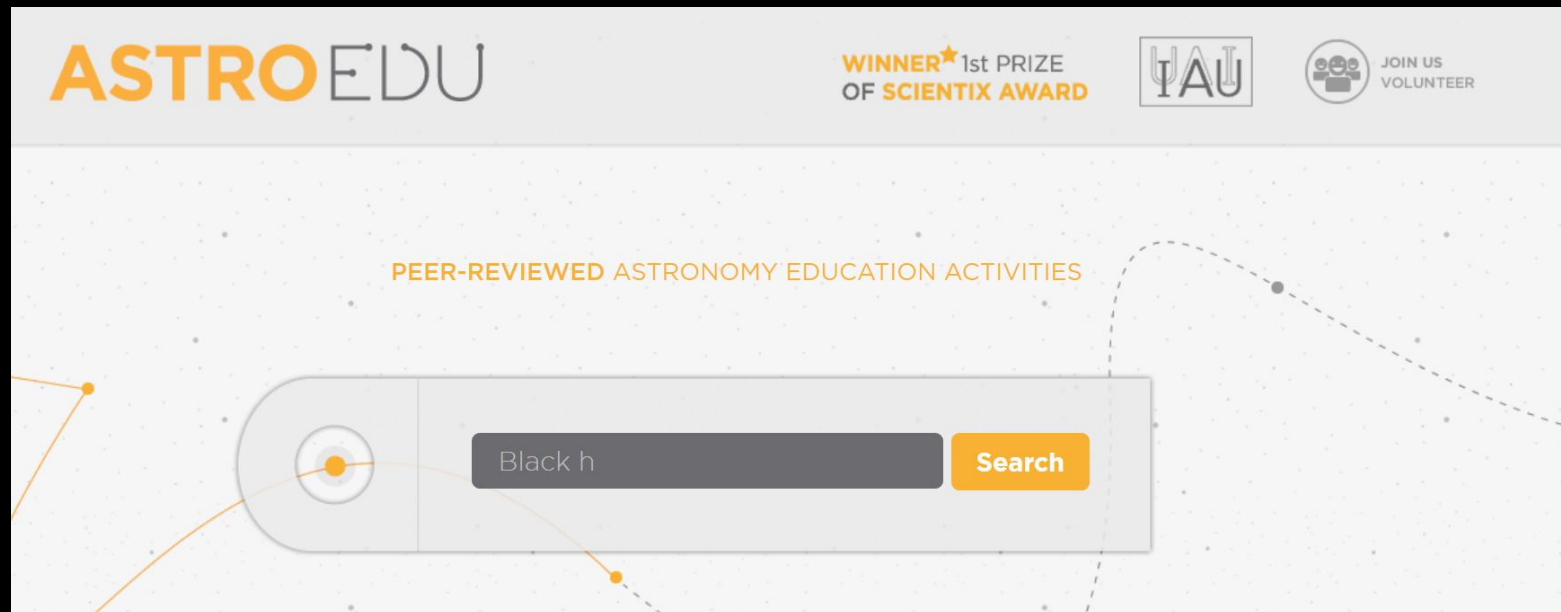
KNOW US

INSPIRING A NEW GENERATION OF SPACE EXPLORERS

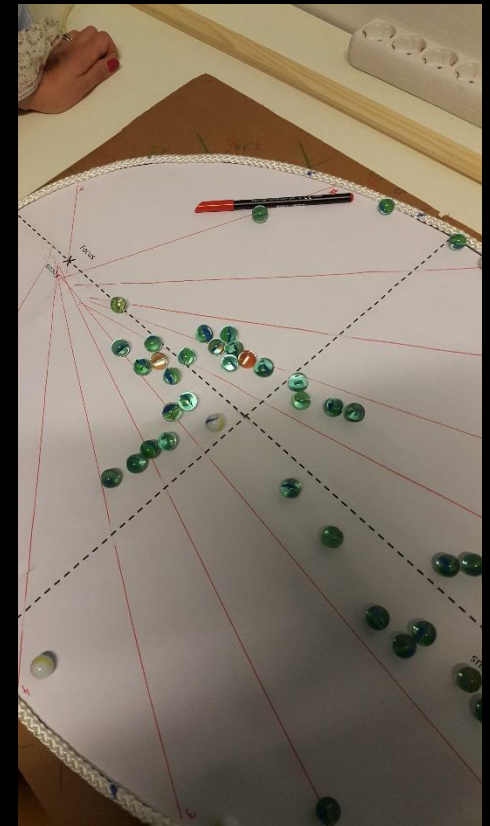


SPACE AWARENESS WEBINAR: NAVIGATION THROUGH THE AGES: USING ASTRONOMICAL INSTRUMENTS



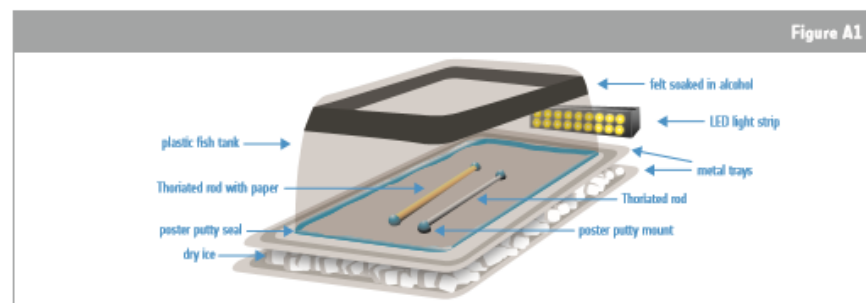


EGU – GIFT WORKSHOP: SOLAR SYSTEM AND BEYOND



Building a cloud chamber

In this experiment you will build a cloud chamber, which is a radiation detection device. This will allow you to observe the radioactive decay of thorium-232, a radioactive thorium isotope. Alpha and beta emission can be observed in the form of condensation trails (contrails) in the alcohol vapour inside the chamber, allowing us to better understand radioactive decay.



↑ Experimental setup.

Equipment

- Two thoriated tungsten welding rods (or other alpha/beta source)
- About 2.5 kg dry ice (solid CO₂)
- 20 ml isopropyl alcohol, also known as isopropanol (or ethanol if this is unavailable)
- A plastic fish tank with pre-attached felt
- Two metal trays (baking trays work well)
- One piece of black card or laminated black paper (to line trays if they are not dark)
- One or two intense light sources (e.g. an LED light strip, torch, or slide projector light)
- A sheet of paper to wrap around one rod
- Poster putty or reusable adhesive
- A pipette
- Thermal protective gloves
- Safety glasses (one pair per person)

Health & Safety

Isopropanol (and other alcohol if used):

- Isopropanol is highly flammable - do not use near naked flames.
- Safety glasses must be worn at all times.
- Ensure that you immediately replace the top on the propanol bottle.

Dry Ice:

- Wear safety glasses and thermal protective gloves when handling dry ice and anything that has been in contact with dry ice, including the metal trays. If a dry ice burn is obtained, treat it as a normal burn - soak under cold water for 10 minutes and seek further medical assistance if necessary.
- Inhalation of cold vapours can cause lung damage and asthma attacks in asthma sufferers.

Thoriated tungsten rods – low level radiation source:

- Keep the rod away from your mouth.
- Warn your teacher if the rod is showing signs of flaking or disintegrating.

→ MARBLE-OUS ELLIPSES

Speed and time of orbiting bodies

FAST FACTS

Age range: 14-16 years old

Type: student activity

Complexity: medium

Teacher preparation time: 1 hour

Lesson time required: 15 minutes to 1 hour

Cost: low (less than 10 euro)

Location: indoor (any classroom)

Includes use of: marbles, rulers, no hazardous materials

Students should already know

- The concept of kinetic energy and gravitational potential energy.
- The concept of velocity vector.

Learning outcomes

- Students should be able to construct a graph of speed against time and link this to ideas of acceleration and distance to understand the principles of orbital mechanics.
- Students should understand how the strength of gravity varies with distance from a planet or star.
- Students should relate this to how a planet or satellite accelerates and decelerates in an elliptical orbit.

You also need



↑ Marble-ous ellipses video. See Links section.

Curriculum links

Physics

- Orbits
- Satellites
- Comets
- Planets
- Stars
- Gravitation (variation of gravitational strength with distance)
- Kepler's laws

Mathematics

- Graphs of speed against time
- Area under graph equal to distance
- Gradient at a point equal to acceleration
- Drawing graphs and their interpretations
- Geometry: ellipses, eccentricity, major and minor axes

Outline

In this activity, students will use an elliptical board to obtain speed and distance measurements for an object in an elliptical orbit. The results are then plotted on a graph of speed against time in order to understand how gravity effects (or changes) the speed of a planet or a satellite in an elliptical orbit.



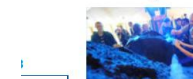
26-Jun-2016



May 2016
Galileo satellites
launched into orbit



- ESERO offices
- Belgium
 - Ireland
 - the Netherlands
 - Nordic ESERO
 - Poland
 - Portugal
 - Romania
 - United Kingdom



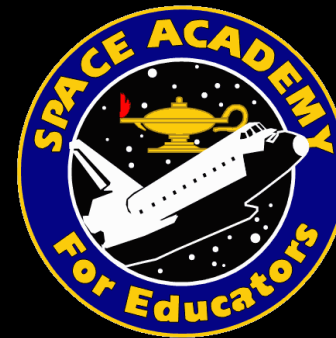
Teach with Rosetta





HESA 2016

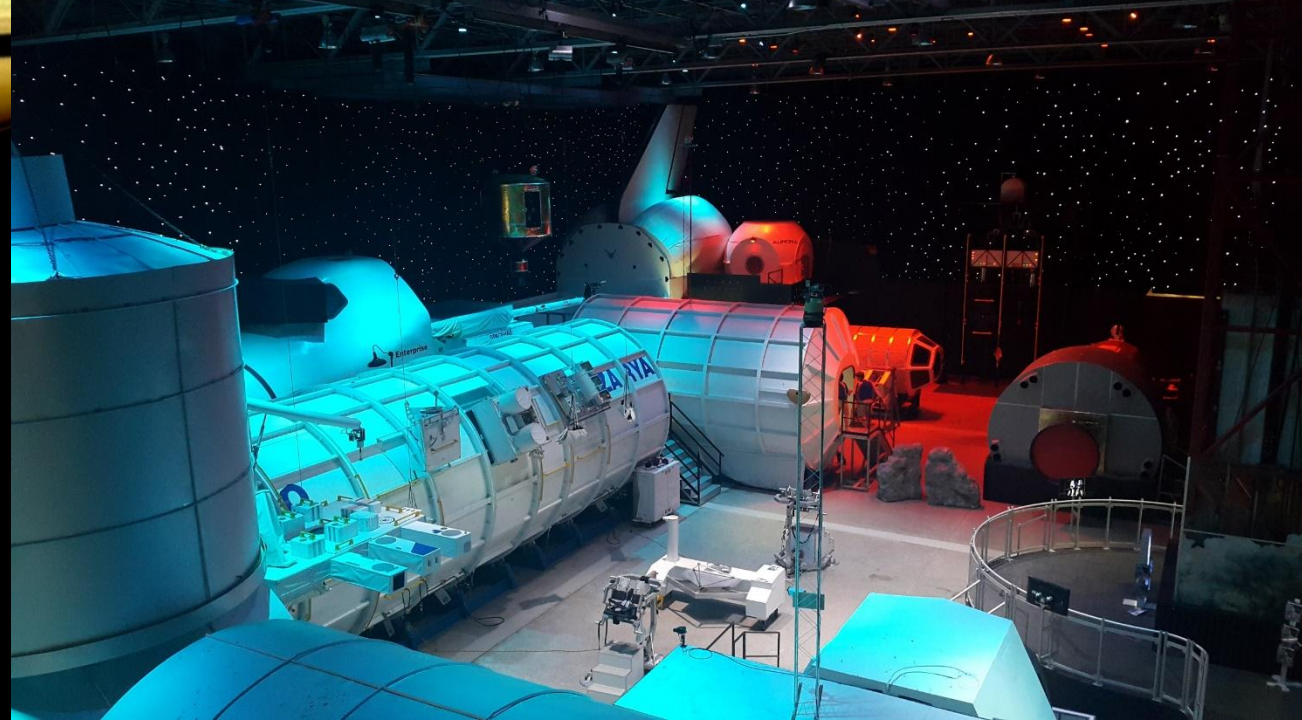
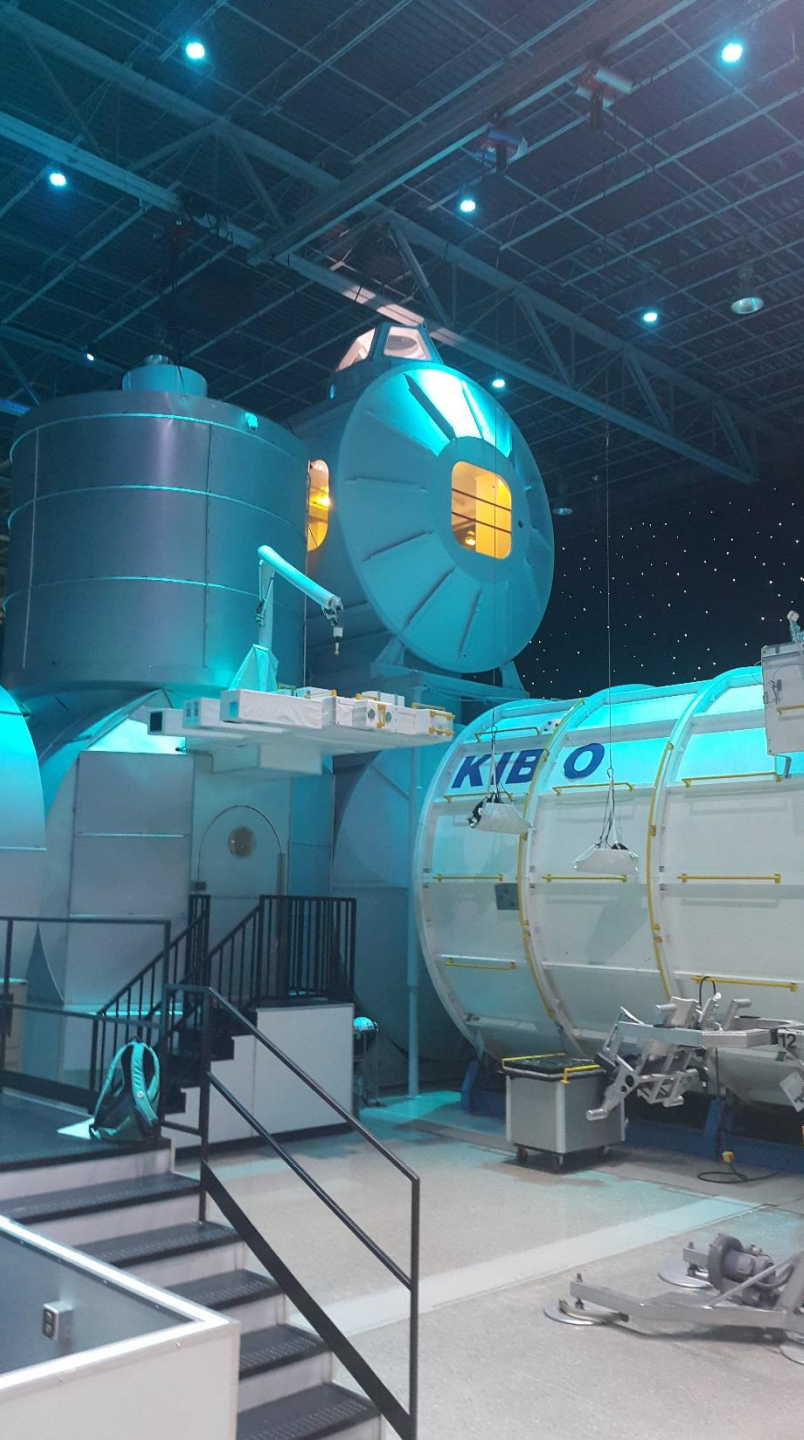
Honeywell educators @ Space Academy








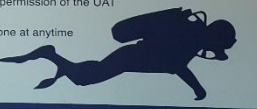


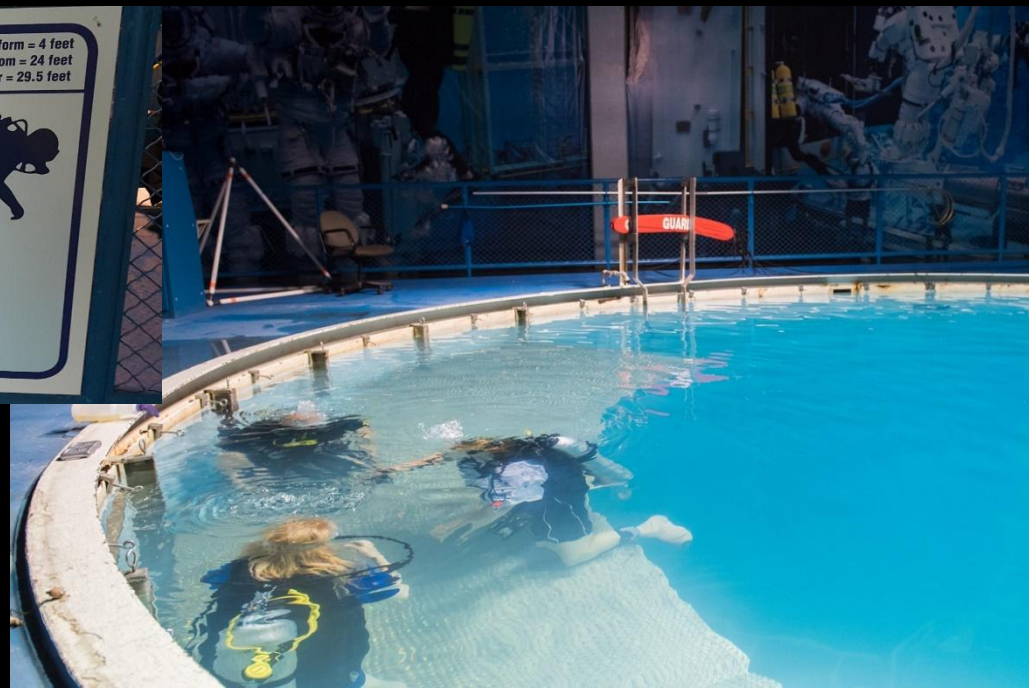


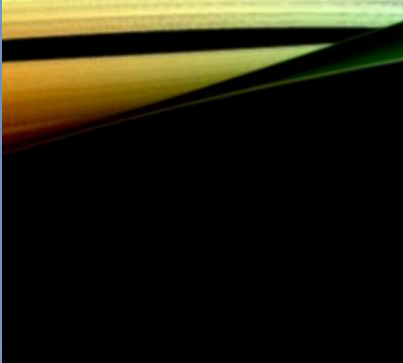
Underwater Astronaut Training Facilities

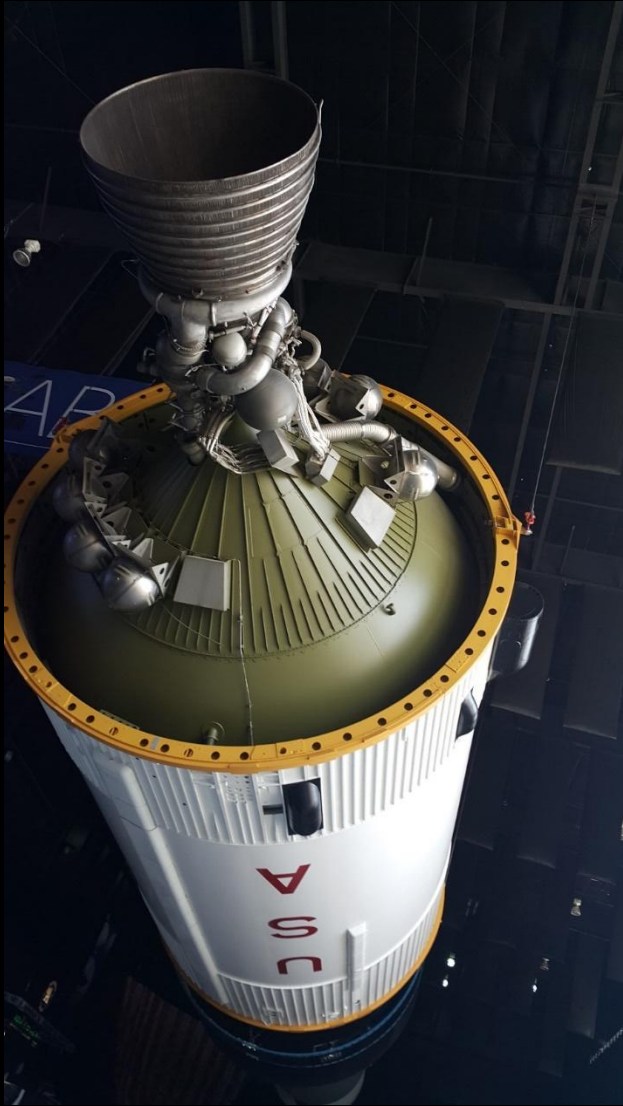
1. Report to training staff before entering facility
2. Obey lifeguards at all times
3. You must pass the swim test to enter the UAT
4. Walk **ONLY** on UAT deck or adjacent areas
5. Expectorate **ONLY** in gutters of skimmers
6. All food, glass, gum, and tobacco off limits in tank area
7. Hand pass all objects in the UAT area - no throwing
8. Persons with contagious or infectious health conditions such as colds, ear fungus or infections, skin diseases or open sores may not enter the UAT
9. Pets allowed outside fenced area **ONLY**
10. Games, tubes, or other water equipment used only with the permission of the UAT management or staff
11. Management reserves the right deny use of the UAT to anyone at anytime
12. Unsupervised non-swimmer must not enter the water.
13. A t-shirt must be worn in the UAT
14. No swimming under the net

Depth platform = 4 feet
Depth Bottom = 24 feet
Diameter = 29.5 feet









Eggs-Prize: Payload Ops Score Sheet



Requirements:

1. Egg must remain in the provided sandwich bag.
2. (Bagged) Egg must ride in the rover
3. Rover must be inside the lander
4. Egg MUST survive the landing to receive score

Lander:

Budget: 100 Credits

Supplies	Price Per Item	Quantity Used	Total Cost
Cardboard (~30 cm x 45 cm)	Free	1	0
Duct Tape (30 cm)	Free	1	0
Balloon	20		
Cotton Ball	2		
Duct Tape (1 cm)	1		
Nylons (1 leg)	15		
Straw	2		
String (30 cm)	2		
Tissue Paper	5		
Lander Credits Used:			

Rover:

Budget: 100 Credits

Supplies	Price Per Item	Quantity Used	Total Cost
Cardboard (~30 cm x 45 cm)	Free	1	0
Duct Tape (30 cm)	Free	1	0
Balloon	20		
Cardboard Tube	5		
Craft Stick	5		
Cup	5		
Dowel Rod	10		
Duct Tape (1 cm)	1		
Pipe Cleaner	5		
Straw	2		
Water Bottle	20		
Wheels (each)	5		
Rover Credits Used:			

Criteria	Calculations	Points Awarded
Unused Lander Budget	100 - lander credits used (___) = (___)	
Unused Rover Budget	100 - rover credits used (___) = (___)	
Landing Accuracy	-1 point for each inch outside the landing zone (___)	
Rover Distance	+1 point for each inch the rover traveled (___)	
Survival	+200 pts. - Eggstronaut is unscathed +100 pts. - Eggstronaut is cracked, but no leak Mission FAILED - Eggstronaut is leaky / scrambled	
TOTAL =		



ECLSS :

Environmental Control & Life Support Systems

Space Academy for Educators

1 ½ - 2 hours



Overview:

Trainees will learn about the Environmental Control and Life Support Systems on both the Orbiter and the International Space Station. In the activity, trainees attempt to create a water filtration system that will clean a waste water sample utilizing information learned in the power point.

Objective:

- Define and understand the importance of a closed loop system
- Define nominal values for air on Earth, Orbiter and Station
- Define nominal values for temperature on the Orbiter and Station
- Understand how water is provided for and disposed of on the Orbiter and Station
- Understand how the ECLSS works to provide a safe and comfortable environment for astronauts
- Create a water filtration system that creates potable water from waste water

Educational Standards:

Next Generation Science Standards: ETS 1-1, 1-2, 1-3; ESS 3-2, 3-4; LS 4-6
Common Core State Standards ELA SL 9-10b, 9-10c, 11-12b, 11-12c

Materials:

For the briefing:

- Projector
- PowerPoint

For the activity:

- Waste Water in a pitcher (Recipe in *Additional Activity Notes* section.)
- Plastic Cup
- Rubber Bands (Optional - to hold filters)
- pH Strips or pH Meter
- Conductivity Meter / TPS Meter
- Paper Towels
- ¼ Cup Measuring Cups
- Budget Sheets
- Score Sheets
- Graduated Cylinders
- Result Chart Paper / Result Spreadsheet

PRIJAVITE SE NA:

- <https://educators.honeywell.com/>

