Nuclear Science Week – Activity – MISSION TO MARS!

**Preparation:**

* Print a few (8?) copies of the preparation materials for volunteers. Have virtual copies for reference during event.
* Have all necessary videos downloaded or available via wifi. Sound required.
* Print Nuclear Science Week Ballot – (78 students/teams of 4 = ~20 worksheets)
* Volunteers be prepared to introduce yourself and your job briefly, and answer questions related to your job.

**Run of Day Agenda (45mins)**

* :00-:05 - Teachers: Have the students sitting in teams and Introduce the Moderator and volunteers.
  + MODERATOR: Welcome everyone! DC Women in Nuclear, MPR Associates, and Nuclear Energy Institute (NEI) are excited to engage with you today! This week is very special because its Nuclear Science Week! We love nuclear science week because it’s a chance to celebrate and learn about all the cool things that nuclear science does for us. We use nuclear science to solve a lot of today’s world problem like providing carbon-free energy and medical treatments for diseases.
  + Today ,we are going to do an exercise to imagine some of the ways that nuclear science can help us in the future! We are going to be imaging ourselves as space explorers building one of the first communities on Mars! First, we will learn some information by watching videos about nuclear energy, different kinds of reactors, and about Mars and traveling to space. Then you will learn about your mission…to choose the right reactor for your new Mars Community. Finally, we have a panel of engineers that we will introduce you to later that will answer your questions to help you pick the right reactor. You will work with your team to tell us your reactor pick and why you choose that reactor, the best answer will get a prize!
  + MODERATOR: So now let’s start…

SCENE: Townhall… held virtually since the Classrooms are on Mars and the Panel of Scientists are on Earth…

* :05-:08 MODERATOR: Welcome to our Townhall Meeting on October 18, 2036 to discuss the options to power your Mars Scientific Exploration Community. Thank you Martian delegates and Earthling delegates for being here and agreeing to help us build this community! I am Space Commander Katherine Inge from the Global Space Alliance and will be leading your townhall today. We have put together a diverse panel of scientists to help you in deciding what power generator would be best to provide the community power. We already have rovers on Mars and they needed power. Let’s learn a little bit about the kind of power the Mar’s rovers use…… [<https://rps.nasa.gov/resources/8/spacecraft-power/> 0:00-1:24] This power is great but we need more power for things like lights, communication, habitability, and much more! So we have to keep that in mind.
* Even though we have been able to get the rovers up to Mars to explore, getting earthlings up to Mars was no easy task! Here’s a short video of the journey to Mars… [<https://www.youtube.com/watch?app=desktop&v=VWD-nx9gA0o&t=8s> 0:00-1:11].
* Now that both the Martians and Earthlings are on Mars starting the community, we can truly get started! I would like to thank our Martian Delegates for allowing the Earthlings to set up a Community and for being such nice hosts to the Earthlings. It is very important for the power generation on the Community to benefit both Martians and Earthlings and not have a negative environmental impact. An information package was provided that has a lot of good information that will help you think of questions to ask the panel of scientists. You can always go back to the information package to help you throughout today. To provide you an overview of your mission, Mission Control has sent a message for you… it looks like he’s at remote location… you’re ready to go Adam Debass…
* :08-:11 Mission Control Video 0:00-1:58 +<https://www.tva.com/kids/electricity/nuclear-power> 0:00-1:29
* :11-:18 MODERATOR: Thanks Adam! As reflected in your information packets, there are 2 options for reactors to be built on Mars. The first is a Fusion reactor [<https://www.youtube.com/watch?v=mZsaaturR6E>--- 0:00-3:00]. The second is a Molten Salt Reactor [<https://www.youtube.com/watch?v=aqPLU8ge-0w>--- 0:00-2:55]. You will have decide between these 2 reactors.
* There are installed 3D printers [start the Adv Mfg clip 0:00-0:30; talk through what’s happening], welded, and robots that will build it, so as a group, you need to decision which plans should be sent to the 3D printers. It is our understanding that your teams will vote on the technology choice and determine which one will be built.
* :18-:45 MODERATOR: Let me introduce you to the panelists who will be here to answer questions:
  + Panelist from MPR – 1min intro (Cecile Dame)
  + Panelist from NEI – 1min intro (Emma Derr)
* MODERATOR: Now who has a question for the panel?
  + Alternate between Earthlings and Martians
* :45-:46 MODERATOR: Thank you all for your questions and best of luck in choosing your energy source! In your teams, please submit your vote and statement of support and the Global Space Alliance will announce the energy source chosen.

NOTE: Any extra time will be given to Q&A, also have backup questions ready just in case.

NOTE: Moderator can change every time

NOTE: We can have different panelists every time as well – just be diverse

Backup Questions for Nuclear Science Week Module

1. What is the difference between these reactors and a nuclear bomb?
2. What is the main drawback for using Fusion?
3. What is the main drawback from using Fission (Molten Salt Reactor)?
4. Why can’t we just use all solar?
5. What can’t we just use all wind power?
6. What is the footprint of each of the reactors? Will it take up a lot of space on the planet?
7. What is the environmental impact of using each of the reactors?
8. Will either of the reactors bring jobs to the community?
9. How near can an Earthling or Martian get to the reactor with no adverse effects?
10. If there is an issue with either of the reactors, will it blow up like a nuclear bomb?