

A PROGRAM OF THE INSTITUTE OF COMPETITION SCIENCES

## EDUCATOR QUICK GUIDE



#### WHAT IS THE PLANT THE MOON CHALLENGE?

The Plant the Moon Challenge is a global science experiment, learning activity and inspirational project-based challenge to see who can grow the best crops using lunar and Martian regolith simulant. The PTMC is for anyone daring enough to explore and stretch the limits of human possibility. The Challenge supports NASA's new lunar exploration program, Artemis, and gives YOU the chance to help astronauts learn to grow their own food on the moon!

# CHALLENGE STRUCTURE

At the core of this challenge is the scientific method and design process. These steps can be summarized into the four parts of conducting a PTMC experiment: Research, Design, Plant & Monitor, and Analyze & Present. Within each phase, you will encounter check point tasks that will step you through the process of completing your experiment. These will be supplemented with live events from which you can gain additional support and networking opportunities.



#### Research

To start your PTMC process, you and your students will want to research some of the fundamentals of agriculture, botany, and space science. For elementary and middle school students, you may want to help them think about the basic differences between Earth and Lunar soils (such as the fact that Earth has biological nutrients, Lunar doesn't) and understand the basics of what crops need to grow well (sunlight, water, nutrients). For older students, you may consider exploring the specific nutrients and minerals provided by the lunar regolith and compare that to what various crops need so that the team can identify the soil additives that best fit the specific needs of their crops.



## Design

After you have covered the basics with your students, you'll want to help them identify the experimental parameters they are going to study. Each experiment should have clearly defined variables that you change from one pot to the next, while you keep all other parameters constant. Only changing one variable between pots helps you isolate any effect on the crop growth seen to that variable. To complete the Design Phase, your students should have a specific, written Experimental Design document that identifies these parameters and variables.

## Plant & Monitor

Once your team has designed their experiments, it's time to plant your crops. The PTMC is set up with an 8-week growperiod during which your teams will monitor the growth and track the parameters and variables they have identified in their Experimental Design.

#### Analyze & Present

To wrap up your PTMC project, your team will analyze the data you have gathered during the grow-period. You will write up a Final Experimental Report identifying how well your crops grew under the different conditions you identified and you will discuss how changing the variable(s) you are studying affected the crop growth.



#### WHAT IS THE TIMELINE FOR THE PTMC?

## PTMC Timeline



#### HOW MUCH TIME DO I NEED TO COMMIT TO THE CHALLENGE?

Embarking on the Plant the Moon Challenge is a rewarding and exciting undertaking. Through the Pre-Season Planning, Grow Period, and Report Period of the challenge, the Team Coach will have different roles and responsibilities. You can expect to commit 12-24 hours to the challenge across the season. The total time you will commit depends on the level of involvement that you wish to have throughout the project.

#### WHAT'S NEEDED FOR A TEAM?

There is no minimum or maximum number of team members required to participate. We have had successful teams ranging from one person to an entire classroom. However, each simulant pack provides for around 10 plants, so we recommend a limit of 10 people per team. The Challenge is judged for Best in Show Awards at four levels - Elementary School, Middle School, High School, and Undergraduate/Professional.

#### WHAT COMES IN A KIT?

Each kit comes with a 5 kg bag of lunar or Martian simulant, a pH meter, masks, 10 small pots, and a flyer to help you get started. With your purchase and registration, you will also gain access to the digital Project Guide which provides in-depth guidance on each phase and task of the competition. Supplemental materials will be needed to conduct your experiment such as pots, seeds, and soil amendments. The additional materials that you will need to purchase will vary based on the parameters of your experimental design.

# **GETTING STARTED**

#### Funding for PTMC kits:

Teachers in select states may apply for general Space Grant support to receive a free lunar simulant kit and PTMC registration!

The Fall 2024 season will launch our PTMC NASA Space Grant Regional Expansion Project! Teachers in select states can apply for support that includes free lunar simulant kits, stipends, enhancement activities, and professional development opportunities.



2

3

Space Grant support is not available in all states. Visit **plantthemoon.com/register-now** to see if you are eligible.



Selection for Space Grant funding is not guaranteed and subject to availability.



Underserved/underrepresented teams are encouraged to apply.

You are welcome to seek your own sponsorship! Reach out to local and state organizations to inquire about financial support or supply donations. Be creative! Make sure to recognize your sponsors as you promote your participation.

Kits can be purchased directly by you! Expedite your registration and get started at plantthemoon.com.

# WHAT'S NEXT?

#### If your team applies for Space Grant support:

All Space Grant applications will be processed at once after the application deadline for each season. Typically teams are notified of their status approximately one week after the application deadline.

If accepted, you will receive a commitment form that will need to be completed before your package will be shipped or your team can be registered.

### If you purchased your kit directly from the PTMC website or have submitted your Space Grant commitment form:

You will be placed into the shipping queue! You can expect to receive your kit(s) prior to the Opening Symposium.

- You will receive an email with information to register your team(s) on the ICS Portal where you can access the electronic PTMC Project Guide and explore the submission items for the competition.
- You should review the Project Guide for details on how to help your students through each step of the PTMC.
- Bring your team together and start planning!

2

3

4



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