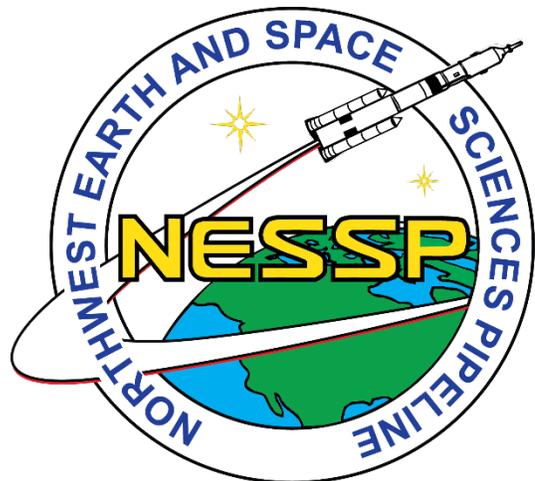
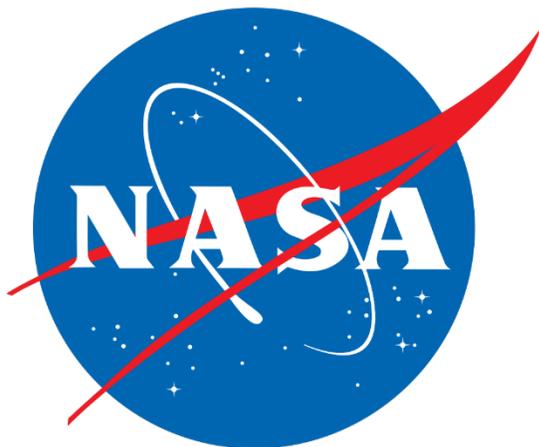




# MONTANA

REGIONAL SUPPLEMENTARY MANUAL



# 1 INTRODUCTION

## 1.1 About the Montana Learning Center

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The Montana Learning Center at Canyon Ferry Lake is a 501(c)(3) nonprofit organization that has been serving students and teachers since the mid-1980s. Founded by two Helena-area teachers, the MLC has been offering summer learning camps for kids and teacher training ever since. Located on a beautiful 10-acre campus at Canyon Ferry Lake, the MLC offers a unique setting for study in the STEAM fields (Science, Technology, Engineering, Arts & Mathematics).

The MLC's campus consists of classroom spaces, a dining hall and lodging space that sleeps up to 100 people. Constructed in the late 1940s, the MLC buildings offer a rustic setting that complement the learning that takes place there. The facility exists as a partnership between state and federal governments.

The MLC now houses two state-of-the-art observatories that feature the largest public-use telescope in Montana. Located 30 minutes outside Helena, the dark skies make it an ideal setting for observing the night sky.

Visit our website: [www.montanalearning.org](http://www.montanalearning.org)

### **Contact us:**

Montana Learning Center  
7653 Canyon Ferry Road  
Helena, MT 59602  
Email: [MontanaLearningCenter@gmail.com](mailto:MontanaLearningCenter@gmail.com)  
Phone: (406) 475-3638

## 1.2 Important Dates & Deadlines

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|------------------|--|
| FEBRUARY 1, 2019 | Official announcement of program, registration opens, manual released  |
| FEBRUARY 28      | Montana supplementary manual released  |
| MARCH 31         | Local organization registration closes   |
| MARCH 30-JUNE 24 | Local organization challenges and team selection   |
| MAY 19           | Mission patch due  |
| MAY 19           | Social media post due  |
| MAY 31           | Organizations nominate up to one team in each division for Montana challenge   |
| JUNE 17          | Montana challenge invitations issued   |
| JUNE 28          | Teams confirm Montana challenge event attendance and submit travel requests  |
| JULY 12          | Montana hub responds to travel requests  |
| JULY 16-20       | Apollo 11 50 <sup>th</sup> anniversary week, Montana challenge events occur July 19 (high school division) and 20 (middle school division) |
| AUGUST 5-7       | Top-scoring high school team showcase and tour at Johnson Space Center, Houston, Texas   |
| TBD              | Top-scoring middle school team showcase and tour at Kennedy Space Center, Cape Canaveral, Florida  |

## 2 REGIONAL EVENT INFORMATION

### 2.1 Professional Development

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The Montana Learning Center & Northwest Earth and Space Sciences Pipeline will host professional development across Montana at the end of April. Dates and times TBD based on organizational and team registrations.

It is highly recommended that each organization/team participating in the Montana Challenge register at least one adult mentor for a 1.5-day training. Those teams that receive equipment scholarships will receive their loaner equipment at these trainings.

Those teams that receive scholarships from the Montana Hub will also receive a \$250 coaching stipend after the Regional Challenge has taken place. This stipend can be used to help support a mentor, purchase other needed supplies for the team, or to be used to support the cost of driving to/from the Montana Challenge.

### 2.2 Support

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#### 2.2.1 Funding

Thanks to the generosity of our sponsors (4/2019), we are able to offer a set number of full team scholarships.

- NASA Science Mission Directorate
- Northwest Earth and Space Sciences Pipeline
- Montana Space Grant Consortium
- Montana Office of Public Instruction
- Montana State University – Academic Technology and Outreach
- Dennis and Phyllis Washington Foundation
- Gianforte Family Foundation
- Force1 RC
- Seattle Design & Print
- Montana Learning Center

Funding support will be given preference to those organizations with Free & Reduced Lunch (50% or greater) and underserved and underrepresented minorities (40% or greater).

#### 2.2.2 Supply Lending

Those teams that receive support from the Montana Challenge will have equipment on loan until the date of the Regional Competition. These teams must compete in this challenge or that equipment must be returned to the Montana Hub prior to the challenge. After the regional competition takes

place and if that organization/team competes, the loaner equipment then becomes property of that organization.

If approved, supplies provided to each scholarship award group include one Force1 U49W Blue Heron WIFI FPV Drone, one LEGO Mindstorms EV3 Education Edition kit, and one 8'x10' competition mat.

For those teams that do not receive a scholarship from the Montana Hub and wish to purchase a competition mat, they may do so by contacting Christina Jarvis at [cjarv@uw.edu](mailto:cjarv@uw.edu). Those groups must include "Montana Team Mat Order" in the subject line of their email.

### 2.2.3 Travel Support

Teams that receive a full scholarship and reside more than 1.5 hours from the Montana Learning Center will receive room/board at the MLC the evening before their Montana Challenge. These teams are expected to arrive after 6pm that evening (July 18 – High School Division and July 19 – Middle School Division). Teams are expected to bring sleeping bags, pillows, towels and may share dorm space with other teams.

Meals for those teams will be provided at the MLC the day of their competition (July 19 – High School Division and July 20 – Middle School Division). Dinner will not be provided the arrival night of July 18.

8:00 am – Breakfast

12:00 – Lunch

6:00 pm – Dinner

If a team resides more than 5 hours from the Montana Learning Center, they can request a second night of room/board support at the MLC.

Teams are needed to checkout of their lodging space by 11am the day of the competition so that we can prepare that space for the next groups.

The MLC site can be used for recreation purposes during competition downtime, including hiking and lake use for swimming and kayaking. Lake use is at your own risk as there is not a lifeguard present.

## 2.3 Regional Hub Challenge

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### 2.3.1 Date and Location

The Regional Challenge Event will be held on July 19 and 20, 2019, at the Montana Learning Center at Canyon Ferry Lake -- 7653 Canyon Ferry Road, Helena, MT 59602. Parking will be available at the top of the complex.

July 19 – High School Division

July 20 – Middle School Division

Each competition will begin promptly at 9 am and will go until the winners are announced.

### 2.3.2 Modifications to Challenge Rules

Judges, individual teams at the time of their competition and media will be allowed in the competition area. Spectators cannot view the competition due to limited space. Video recording cannot be used to question judging. The decisions of judges are final.

Please follow main competition manual for rules and scoring, however, but the following below are the Montana Hub Guidelines scoring changes.

- When the lunar lander lands on the competition surface, 4 points will be awarded if dragged less than 8cm. 0 points will be awarded if dragged greater than 8cm.
- If the wheels or travel track of the rover cross over a crater, 4 points will be deducted from that team's score for each occurrence.
- 4 Narrations must occur during the competition. Each will be awarded 4 points.
  - 1<sup>st</sup> Narration – Upon Landing
  - 2<sup>nd</sup> Narration – Place flag or artifact in Green Circle
  - 3<sup>rd</sup> Narration – Identifying rock sample
  - 4<sup>th</sup> Narration – Return to lunar lander
- The Blue Circle will contain a Lego either blue, green or yellow, that the rover must identify. To detect this color, the rover must move a 16oz Solo Cup. The cup will be painted flat black.
- If more than one rock sample is collected and returned within the blue rings, 2 points will be deducted for each sample that is not the correct one.
- Science 4.3.5

Science Officer correctly identifies lunar rock sample (4 points) and presents 4 detailed facts on that type of lunar rock sample (4 points).

- Blue = Basalt,
  - Green = Breccia,
  - Yellow = Anorthosite
- For the High School Challenge, teams may place a magnet both on the lunar module and on the flight clip of the drone for the purpose of picking up the lunar module and transporting it back to home base with the drone.
- See ANGLEs Challenge Score Sheet.xlsx for scoring. Each division has 212 points possible.

### 2.3.3 Challenge Field

The Challenge field will be constructed on a 8'x10' wood platform. It is essential that the platform is level and sit close to the ground. It also must be free of any imperfections as these can give the LEGO EV3 robot trouble.