FIRST® LEGO® League Jr. Multimedia Connections

Below is a session-by-session list of all the Multimedia Connections for the MISSION MOON℠ Challenge. These resources include links to websites, videos, building instructions, and other online tools related to the content of each session.

Consider sharing some or all of the resources during team meetings, and/or encourage your team to explore them between sessions (with permission and supervision from a parent or guardian). Before sharing any of the resources, be sure to preview them in order to familiarize yourself with the content and to make sure they are appropriate for the ages and ability levels of your team members.

Note: *Points of view or opinions contained within the resources referenced in the Multimedia Connections do not necessarily represent the official position or policies of FIRST® or the LEGO® Group.*

General Resources about the Moon for All Sessions

- For an overview of the Moon, along with Moon facts, photos, and an interactive map, visit NASA's Earth's Moon website.
- Visit the European Space Agency's The Moon: ESA's Interactive Guide to explore lunar exploration through videos, facts, and interactive features.
- Check out the ESA Space Insights video playlist to hear experts from the European Space Agency talk about a wide range of topics related to space travel. Episodes include Working in Space (2 minutes, 9 seconds), Gravity (1 minute, 27 seconds), and Robots on the Moon (1 minute, 55 seconds).
- If you have access to binoculars, invite your team use them to observe the Moon. To prepare, watch the Ready Jet Go!: Binoculars video (1 minute, 30 seconds) from PBS Kids. Download the International Observe the Moon Night's Moon Viewing Ideas for the Whole Family (PDF) and/or NASA Night Sky Network's Observing the Moon (PDF) for additional activity ideas and printable handouts.
- To view the latest high-resolution images of the Moon taken by NASA's Lunar Reconnaissance Orbiter Camera (LROC), visit the LROC website. Watch the Tour of the Moon in 4K video (4 minutes, 56 seconds) for a detailed visual tour of the Moon using images captured by the LROC. Learn even more about the LROC, and explore some of its discoveries, on the Smithsonian's A New Moon Rises website.
- Tour the Apollo landing sites with Google Moon. To zoom in on craters and other features across the entire lunar surface, visit the Moon on Google Maps.
- For a variety of small- and large-group activities related to the Moon and designed for children ages 8 to 13, visit the Explore! Marvel Moon webpage and Explore! To the Moon and Beyond! webpage from the Lunar and Planetary Institute.
- For kid-friendly general information and games about outer space, visit the NASA Kids' Club website.

Session 1: Name Your Team

- Watch the Session 1: Name Your Team video (1 minute, 16 seconds) from *FIRST*® LEGO® League Jr. for an overview of this session. A Spanish version is also available.
- View the LEGO® Education WeDo 2.0 video (1 minute, 33 seconds) and LEGO® Mini-Builds video (1 minute, 31 seconds) to learn more about these topics.
- For an introduction to the various resources that people would need to live on the Moon, watch the NASA BEST: Living on the Moon video (2 minutes, 42 seconds).
- For one idea of what an international lunar habitat could look like, view the European Space Agency's Moon Village video (4 minutes, 26 seconds).
- To view all mission patches from past NASA missions, visit the NASA History Program Office's Mission Patches website. For additional international mission patch examples, visit the European Space Agency's Mini-Gallery: European Human Spaceflight Patches website.
- Watch the Make Your Own Astronaut Mission Patch video (3 minutes, 37 seconds) to learn about mission patches on the International Space Station and to see an example of how to design a mission patch as a group.
- Your team can design a simple mission patch online via Disney's Design a Mission Patch website.
- If your team chooses to design their own mission patch and/or team logo, consider printing clip art versions of rocket ships, the Moon, spacesuits, etc. for them to use for inspiration or tracing. Word processing programs often include clip art, or visit an online clip art website such as Open Clip Art.

Session 2: Rocket Ship to the Moon

- Watch the Session 2: Rocket Ship to the Moon video (1 minute) from *FIRST* LEGO League Jr. for an overview of this session. A Spanish version is also available.
- View highlights from the first human landing on the Moon in NASA's Apollo 11 Overview video (2 minutes, 18 seconds).
- For detailed text, photos, and interactive graphics about past Moon landings, explore Dorling Kindersley Limited's Moon Landings website, which includes sections about the Apollo program, the journey to the Moon, and the Saturn V rocket.
- For background information on the Apollo program, visit NASA's What Was the Apollo Program? webpage and the Smithsonian's Apollo to the Moon website.
- Access the building instructions for the MISSION MOON Inspire Model, and see a video of it in action, on *FIRST* LEGO League Jr.'s Inspire Set webpage. For this session, use pp. 1–30 of the PDF to build the manual version of the rocket ship. ***Note:*** *The LEGO elements for the Inspire Model can be found in your MISSION MOON Inspire Set in the bag labeled "1." If you got excited and already opened all the bags, use the MISSION MOON Inspire Set Element Overview: Bag 1 (PDF) to locate the elements needed for the Inspire Model.*
- Download the WeDo 2.0 Teacher Guide and Preparation Materials from the LEGO Education website. For more WeDo 2.0 resources, visit the LEGO Education WeDo 2.0 Support webpage.

Session 3: Be an Engineer

- Watch the Session 3: Be an Engineer video (1 minute, 8 seconds) from *FIRST* LEGO League Jr. for an overview of this session. A Spanish version is also available.
- For an introduction to engineering, watch the Intro to Engineering video (2 minutes, 42 seconds) from NASA for Kids or the What Is Engineering? video (4 minutes, 17 seconds) from The University of Newcastle, Australia.
- For a more detailed look at engineers and the engineering design process, view the What's an Engineer? Crash Course Kids #12.1 video (4 minutes, 29 seconds) and the Engineering Process: Crash Course Kids #12.2 video (5 minutes, 16 seconds) from Crash Course Kids.
- Visit the Design Squad website from PBS Kids to find videos, games, and projects about engineering for youth, including information about the various parts of the engineering design process.
- If your team would like to build one of this session's suggested WeDo 2.0 models offline, download the *Milo* building instructions (PDF) or the *Pull Robot* building instructions (PDF).

Session 4: Water on the Moon

- Watch the Sessions 4, 5, and 6: Designing Solutions to Problems on the Moon video (1 minute, 1 second) from *FIRST* LEGO League Jr. for an overview of Sessions 4, 5, and 6. A Spanish version is also available.
- Share the Airbus Foundation: Discovery Space's Water on the Moon video (1 minute, 37 seconds) for information on how water recycling and water ice mining could work on the Moon.
- Check out the "Water and Ice" section of NASA's Kids Zone 4: The Moon website.
- To get a detailed overview of the history of lunar exploration, water on the moon, impact craters, and the future of lunar exploration, watch the European Space Agency's Destination: Moon video (8 minutes, 32 seconds).
- Explore NASA Space Place's Why does the Moon have craters? webpage to learn more about impact craters. A Spanish version is also available.
- If your team would like to create their own models of impact craters, try NASA's Whip Up a Moon-Like Crater activity. Watch the How to Make a Crater video (2 minutes, 42 seconds) to see how the activity works.
- If your team would like to build one of this session's suggested WeDo 2.0 models offline, download the *Crank* building instructions (PDF) or the *Sweep* building instructions (PDF).

Session 5: Energy on the Moon

- Share the Airbus Foundation: Discovery Space's Powering the Moon video (1 minute, 32 seconds) for an overview of the pros and cons of using solar energy to power a Moon base.

- For a simple explanation of how people use solar energy on Earth, read Mystic Aquarium's Solar Energy Is a Bright Idea book. Online narrations are available in English and Spanish. For more detailed information on how solar power works, visit the U.S. Energy Information Administration's Solar website.
- For detailed background information on a variety of ways to get energy on the Moon — including solar, chemical, and nuclear options, check out NASA's Moon Power: Human Exploration Project I: Energy and Power Curriculum (PDF) for grades 1–5.
- Share the European Space Agency's Future Astronauts Could Use Moondust to Produce Power webpage for an alternative idea about how to get energy on the Moon.
- If your team would like to build one of this session's suggested WeDo 2.0 models offline, download the *Grab* building instructions (PDF) or the *Robotic Arm* building instructions (PDF).

Session 6: Air on the Moon

- Share the Airbus Foundation: Discovery Space's Air on the Moon video (1 minute, 30 seconds) for an overview of how algae, plants, and/or regolith could help provide air on the Moon.
- Check out the "Moon Rocks" section of NASA's Kids Zone 4: The Moon website.
- View the What If We Lived on the Moon video (7 minutes, 43 seconds) from Unveiled for a futuristic view of what a lunar city might look like, including discussions of air (and what to do if a lunar habitat has an air leak), water, entertainment, scientific research, energy, and food on the Moon.
- If your team would like to build one of this session's suggested WeDo 2.0 models offline, download the *Motion* building instructions (PDF) or the *Alarm Device* building instructions (PDF).

Session 7: Solving Problems on the Moon

- Watch the Session 7: Solving More Problems video (58 seconds) from *FIRST* LEGO League Jr. for an overview of this session. A Spanish version is also available.
- Share the Airbus Foundation: Discovery Space's How to Communicate on the Moon video (1 minute, 29 seconds), Food on the Moon video (1 minute, 31 seconds), Traveling on the Moon video (1 minute, 24 seconds), Waste Management on the Moon video (1 minute, 32 seconds), What Materials to Build Your Home on the Moon? video (1 minute, 20 seconds), and/or Radiation on the Moon (1 minute, 36 seconds) for more information on other problems your team might face on the Moon.
- Watch NASA's "I Was Strolling on the Moon One Day" video (24 seconds) and Driving on the Moon video (31 seconds) for footage of Apollo astronauts having fun as they navigate the lunar surface.
- For an overview of robots, regolith, and how a 3D printer could be used to build a Moon base, view the European Space Agency's 3D-Printing a Lunar Base video (4 minutes, 54 seconds).

- If your team would like to build one of this session's suggested WeDo 2.0 models offline, download the *Walk* building instructions (PDF) or the *Luna Rover* building instructions (PDF).

Sessions 8 and 9: Create Your Moon Base

- Watch the Sessions 8 and 9: Create Your Moon Base video (50 seconds) from *FIRST* LEGO League Jr. for an overview of Sessions 8 and 9. A Spanish version is also available.
- Access the MISSION MOON Inspire Model Building Instructions (PDF) on *FIRST* LEGO League Jr.'s Inspire Set webpage. Use pp. 31–41 of the PDF to motorize the rocket ship with WeDo 2.0.
- Consider downloading LEGO Digital Designer — free, 3D-modeling software for Windows PC and Mac OSX that allows users to design and build 3D models using virtual LEGO pieces. Let your team members know that they can use the software to help them envision what their Moon Base might look like in 3D.
- Visit the LEGO Pick a Brick online catalogue to search for, view, and purchase individual LEGO pieces. This catalogue is useful for acquiring new pieces and replacing lost pieces.
- Explore free, online tools such as Photoshop Express Editor or Google Photos to edit any photos you take for the team's *Show Me* poster.
- Download the WeDo 2.0 Teacher Guide and Preparation Materials from the LEGO Education website. For more WeDo 2.0 resources, visit the LEGO Education WeDo 2.0 Support webpage.

Sessions 10 and 11: Make Your *Show Me* Poster

- Watch the Sessions 10 and 11: The *Show Me* Poster video (42 seconds) from *FIRST* LEGO League Jr. for an overview of Sessions 10 and 11. A Spanish version is also available.
- To see some examples of posters from past *FIRST* LEGO League Jr. seasons, search Google Images for "*FIRST* LEGO League Jr. posters."
- Try a free, collaborative whiteboard website such as Padlet if your team would like to design their poster online.

Session 12: Prepare to Share

- Share *FIRST's* What Happens at a *FIRST* LEGO League Jr. Expo? video (1 minute, 47 seconds) with your team members to give them a glimpse of what happens at an Expo.
- Search for local *FIRST* LEGO League Jr. events on the Events and Teams in My Area webpage.
- Share photos of your team's Moon Base and *Show Me* poster via social media with #FIRSTLEGOLeagueJr and #MISSIONMOON. Encourage your team to browse the models and posters that other teams have shared as well!