



## **FIRST® LEGO® League Jr. Multimedia Connections**

Below is a session-by-session list of all the Multimedia Connections for the MISSION MOON<sup>SM</sup> Challenge. These resources include links to websites, videos, 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.
- If you have access to a pair of binoculars, consider having your team use them to observe the Moon and/or other interesting targets in outer space. Get started by watching the [Ready Jet Go!: Binoculars](#) video (1 minute, 30 seconds) from PBS Kids.
- To view the latest high-resolution images of the Moon taken by NASA's 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.
- 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 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 [Getting Started with FIRST LEGO League Jr.](#) playlist on the FIRST LEGO League Jr. YouTube channel for video introductions to the [Inspire Model](#) (1 minute,



07 seconds), [LEGO® Education WeDo 2.0](#) (1 minute, 34 seconds), [LEGO Mini-Builds](#) (1 minute, 32 seconds), and [Team Model](#) (1 minute, 44 seconds).

- For an introduction to the various resources your team will 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 Warner Bros' [Interstellar Patch Creator](#) website or 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.
- For detailed text, photos, and interactive graphics about past Moon landings, encourage your team to 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 more background information on the Apollo program, check out 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.  
**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, please use the [Element Overview](#) list 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, invite your team to 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, have your team 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.
- Have your team 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 the next few sessions. A [Spanish version](#) is also available.
- Share the Airbus Foundation: Discovery Space's [Water on the Moon](#) video (1 minute, 37 seconds) for an overview of how water recycling and water ice mining could work on the Moon.
- Have your team 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).
- Check out the 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.
- Have your team 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.
- 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 these sessions. A [Spanish version](#) is also available.
- Download the [MISSION MOON Inspire Model WeDo 2.0 building instructions](#) to motorize the LEGO rocket ship.
- 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 these sessions. 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 FIRST LEGO League Jr. events in your area 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!