



# Multimedia Resources



# FIRST® LEGO® League Challenge

## Multimedia Resources

Below is a list of Multimedia Resources for this season. These resources include links to websites, videos, building instructions, and other online tools related to the content of each session.

Some of the resources below are from third-party sites not developed or managed by FIRST® or LEGO® Education, but they're too great not to share!

You could share resources during sessions and/or encourage your students to explore them between sessions (with permission and supervision from a parent or guardian).

General Resources		
<a href="#">Support from LEGO Education</a>	<a href="#">Class Pack- FIRST LEGO League Challenge</a>	<a href="#">FIRST LEGO League (global)</a>
<a href="#">Email for General Support</a>	<a href="#">Teamwork Makes the Dream Work FIRST LEGO League Music Video</a>	<a href="#">FIRST LEGO League (US)</a>
Coach & Mentor Resources		
<a href="#">FIRST Youth Protection</a>	<a href="#">FIRST Mentor Network</a>	<a href="#">Coach Corner resources</a> (Community created resources by Droid Robotics)
<a href="#">FIRST Volunteer Resources</a>	<a href="#">FIRST Mentoring and Coaching with FIRST videos</a>	<a href="#">I Can Be Inclusive Too e-Course</a>
<a href="#">Creating a Sense of Belonging Training</a>	<a href="#">Supporting all Team Members: Inclusive Recruitment &amp; Enrollment Strategies</a>	

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## Professional Development and Training Resources

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### Hybrid & Remote Learning Resources

- [Hybrid & Remote Learning Resources from FIRST](#) – Developed for the 2020-2021 season and may be helpful if you need to lead FIRST LEGO League Challenge in a remote or hybrid setting during the 2021-2022 CARGO CONNECT season.
  - FIRST LEGO League Challenge [Guide for Distance Education](#)
- [Hybrid & Remote Learning Resources from LEGO Education](#)



## **FIRST Resources**

- [FIRST Certified Professional Development](#)
- [FIRST Education Philosophy](#)
- [FIRST LEGO League Challenge Scope and Sequence Options](#)
  - [26 hours / 35 hours / 45 hours / 65 hours / 80 hours](#)
- [Challenge Skills Progression - student learning outcomes by grade level](#)
- [Standards Alignments for FIRST LEGO League Challenge](#)
- [FIRST Equity, Diversity, and Inclusion Training](#)
- [FIRST Equity, Diversity, and Inclusion Video Playlist](#)
- [FIRST Impact](#)
- [Class Pack video playlist](#)

## **LEGO Education & LEGO Foundation Resources**

- [Learning Through Play Whitepaper](#)
- [LEGO Education Teacher Community](#)
- [Self-Guided Professional Development from LEGO Education](#)
- [LEGO Foundation's Research Knowledge Base](#)
- SPIKE PRIME Professional Development
  - [Product Support for SPIKE Prime Professional Development](#)
  - [Classroom Management - SPIKE™ Prime Professional Development](#)
  - [Pedagogy - SPIKE™ Prime Professional Development](#)
  - [21st Century Skills - SPIKE™ Prime Professional Development](#)
  - [STEAM Concepts - SPIKE™ Prime Professional Development](#)

## **Additional Professional Development Resources and Research**

- [What is Computational Thinking?](#)
- [Playtime Matters Research Report from Outdoor Play and Learning](#)

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## **Pre-Session Resources**

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### **FIRST LEGO League Challenge**

- [About FIRST LEGO League flyer](#)
- [Start a FIRST LEGO League Challenge Team Flyer](#)
- [FIRST LEGO League Challenge: How It Works](#)
- [FIRST LEGO League Challenge Mini Brochure](#)
- [Challenge Team Management Resources](#)

### **Community Created Resources**

- [Challenge Worksheets and Guides](#) (created by Droid Robotics)
- [Share and Learn Learning Content](#) (created by Droid Robotics)

### **CARGO CONNECT<sup>SM</sup> General Season Resources**

- [FIRST LEGO League Challenge CARGO CONNECT Informational Video Playlist](#)



- [CARGO CONNECT Challenge Introduction: Materials and Guidebooks Video](#)
- [CARGO CONNECT Challenge Set: Unboxing Video](#)
- [CARGO CONNECT season resources](#) page (includes student certificates)
  - [Interactive Robot Game Rulebook](#)
  - [Challenge Overview](#)
  - [Challenge Welcome Letter](#)
  - [Challenge Introduction](#)
  - [Table building instructions](#)
  - [Challenge Updates](#)
- Season Videos
  - [CARGO CONNECT Season Launch](#)
  - [CARGO CONNECT Season Teaser](#)
  - [Robot Game Missions](#)
- [FIRST FORWARD and CARGO CONNECT season content](#) (Logos to use in flyers, emails, or other resources you may wish to create)
- CARGO CONNECT *Team Meeting Guide*, *Engineering Notebook* and Individual Session PowerPoint Slides ([Google Slides version](#))
  - Found on Thinkspace through your *FIRST* Dashboard for US/CAN or through your country's Program Delivery Partner.

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## Robotics Resources

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	<a href="#">FIRST Core Values through Social, Emotional Learning Activities</a>	
	<a href="#">FIRST at Home activities</a>	A variety of resources, activities and links av
	<a href="#">Core Values Activities</a>	Droid Robotics
	<a href="#">How Google builds the perfect team</a>	Tech Insider – Length 2:22

### Robot Design Resources

	<a href="#">Robot Design and Robot Game Activities</a>	Droid Robotics
	<a href="#">Community Webinar: Robot Design, Engineering Process, and Documentation</a>	Droid Robotics
	<a href="#">Community Webinar: Programming For Reliability</a>	Droid Robotics











	<a href="#">Community Webinar: Building for Reliability</a>	Droid Robotics
	<a href="#">Community Webinar: Building Attachments Tips and Tricks</a>	Droid Robotics
	<a href="#">Community Webinar: How to Develop a Robot Strategy</a>	Droid Robotics
	<a href="#">How to Design your Robot to Meet Game Requirements</a>	NanoGiants Academy
	The LEGO Technic Idea Book: Simple Machines	by Yoshihito Isogawa
	The LEGO Technic Idea Book: Wheeled Wonders	by Yoshihito Isogawa
	The LEGO Technic Idea Book: Fantastic Contraptions	by Yoshihito Isogawa
	The LEGO Power Functions Idea Book, Volume 1: Machines and Mechanisms	by Yoshihito Isogawa
	The LEGO Power Functions Idea Book, Vol. 2: Cars and Contraptions	by Yoshihito Isogawa
	LEGO Technic Non-Electric Models: Simple Machines	by Yoshihito Isogawa

### SPIKE Prime Resources




	<a href="#">SPIKE Prime Computer Science Courses</a>	LEGO Education
	<a href="#">SPIKE Prime Product Support Resources</a>	LEGO Education
	<a href="#">Training Camp 1: Driving Around Lesson</a>	SPIKE Prime Competition Ready Unit <i>Supports Session 2</i>
	<a href="#">Training Camp 2: Playing with Objects Lesson</a>	SPIKE Prime Competition Ready Unit <i>Supports Session 3</i>
	<a href="#">Training Camp 3: Reacting to Lines Lesson</a>	SPIKE Prime Competition Ready Unit <i>Supports Session 4</i>
	<a href="#">Assembling an Advanced Driving Base Lesson</a>	SPIKE Prime Competition Ready Unit <i>Supports Session 6</i>
	<a href="#">My Code, Our Program Lesson</a>	SPIKE Prime Competition Ready Unit
	<a href="#">Time for an Upgrade Lesson</a>	SPIKE Prime Competition Ready Unit
	<a href="#">Mission Ready Lesson</a>	SPIKE Prime Competition Ready Unit
	<a href="#">Mission Training: Creative Problem Solving</a>	SPIKE Prime Competition Ready Unit

	<a href="#">SPIKE Prime Supplementary Lessons</a>	SPIKE Prime Competition Ready Unit
	<a href="#">SPIKE Prime Programming for FIRST LEGO League playlist</a>	Bruce Schafer
	<a href="#">Prime Lessons</a>	Droid Robotics

## MINDSTORMS EV3 Resources







	<a href="#">MINDSTORMS EV3 Product Support Page</a>	MINDSTORMS EV3 Resources
	<a href="#">Robot Trainer Unit</a>	MINDSTORMS EV3 Resources
	<a href="#">Objects and Obstacles</a>	MINDSTORMS EV3 Robot Trainer Unit <i>Supports Session 2</i>
	<a href="#">Grab and Release</a>	MINDSTORMS EV3 Robot Trainer Unit <i>Supports Session 3</i>
	<a href="#">Colors and Lines</a>	MINDSTORMS EV3 Robot Trainer Unit <i>Supports Session 4</i>
	<a href="#">Angles and Patterns</a>	MINDSTORMS EV3 Robot Trainer Unit <i>Supports Session 6</i>
	<a href="#">Real World Vehicles Unit</a>	MINDSTORMS EV3 Resources
	<a href="#">Coding Activities Lessons</a>	MINDSTORMS EV3 Resources
	<a href="#">EV3 Lessons</a>	Droid Robotics
	<a href="#">Building instructions for robots using one LEGO MINDSTORMS Education core set</a>	NanoGiants Academy

## More Robotics Resources

	<a href="#">Buying Replacement Parts</a>	LEGO Education
	<a href="#">Download Software and System Requirements</a>	LEGO Education
	<a href="#">Mr. Hino's LEGO Robotics Channel</a>	Mr. Hino
	<a href="#">Droid Robotics Channel</a>	Droid Robotics
	<a href="#">BrickWise Channel</a>	Former members of the Tacocats










# Innovation Project Resources











## General Innovation Project Resources

	<a href="#">Innovation Project Activities</a>	Droid Robotics
	<a href="#">How to Skype with an Expert in your Classroom</a>	Class Tech Tips
	<a href="#">Nepris.com</a>	Tool to connect to industry professionals ( <i>Requires registering to access</i> )
	<a href="#">2021 Global Innovation Awards Team Innovations</a>	Learn about the innovations designed by the top teams
	<a href="#">2021 Global Innovation Awards Team Pitches</a>	Hear 30 second pitches for the innovations designed by the top teams
	Schooled by Kids: <a href="#">Presentation Skills, Part 1</a> <a href="#">Presentation Skills, Part 2</a>	Green Ivy Schools. Part 1 Length 1:44 / Part 2 Length 1:31



## CARGO CONNECT Innovation Project Resources

### General Transportation Resources


	<a href="#">PBS Learning Media for students</a>	Search “transportation”
	<a href="#">Transportation Modes</a>	Background information from the Geography of Transport Systems
	<a href="#">Transportation</a>	Background information from Britannica Kids
	<a href="#">New York Transit Museum</a>	Remote learning resources including virtual field trips
	<a href="#">Transportation Information from BrainPOP</a>	Background Information for teachers
	<a href="#">Supply Chain Modes of Transportation</a>	Background information from Blume Global
	<a href="#">Transportation and Infrastructure</a>	National Academies Press
	<a href="#">Transportation for America</a>	Advocacy organization
	<a href="#">US Department of Transportation</a>	

	<a href="#">U.S. Trade and Development Agency Transportation Section</a>	
	<a href="#">Freight Transportation</a>	Bureau of Transportation Statistics
	<a href="#">Trade Industries</a>	International Trade Administration
	<a href="#">Journey of your Online Order</a>	Amazon India – Length 4:14
	<a href="#">How Robots Can Assist - Not Replace - Humans in Factories</a>	CNBC – Length 8:43
	<a href="#">Inside Australia Post's High Tech Parcel Sorting Facility</a>	7News Australia – Length 1:30
	<a href="#">Sorting and logistics handling systems</a> at Deutsche Post DHL	Deutsche Post DHL (Germany) – Length 2:48
	<a href="#">Behind the scenes at Christmas: Heathrow Worldwide Distribution Centre</a>	Royal Mail (United Kingdom) – Length 2:43
	<a href="#">Journey of a Parcel</a>	New Zealand Post – Length 4:06
	<b>Cars, Trains, Ships, and Planes:</b> A Visual Encyclopedia of Every Vehicle by DK	Non-Fiction Book
	<b>“A Package for Mrs. Jewls”</b> from Wayside School is Falling Down by Louis Sachar, pp. 21-31	Fiction Book

#### Air Transportation



	<b>Drones</b> by Katie Marsico	Non-Fiction Book
	<a href="#">How 715,000 Pounds of Cargo Moves Through Dallas Fort Worth Airport In 24 Hours</a>	Business Insider

#### Land Transportation




	<a href="#">Vestas Wind Turbine Blade Transportation</a>	From Vestas – Length 2:51
	<a href="#">Amazon's custom electric delivery vehicles hit the road in LA</a>	From Amazon News – Length 1:01
	<a href="#">Henry Ford Museum</a>	Virtual Field Trip for students (Requires registering to access)










## Water Transportation

	<a href="#"><u>Unique Look Inside One of the Biggest Container Ships in the World</u></a>	From Discovery Australia – Length 7:20
	<a href="#"><u>How Container Ships Work</u></a>	From PolyMatter – Length 9:46




## Innovations in Transportation



	<a href="#"><u>Ford's Delivery Robot Walks on Two Legs Like a Human</u></a>	From Tech Insider – Length 3:00 Search YouTube for “delivery robots” to find other videos about innovative delivery solutions.
	<a href="#"><u>The Future of Transportation TEDx Talk</u></a>	
	<a href="#"><u>Future of Mobility</u></a>	Deloitte

## Project Spark - Efficiency (Session 1)

	<a href="#"><u>National Multimodal Freight Policy</u></a>	US Dept of Transportation
	<a href="#"><u>Freight Rail Overview</u></a>	US Dept of Transportation Federal Railroad Administration
	<a href="#"><u>US DOT's Energy Blueprint: Efficient Transportation for America</u></a>	US Dept of Transportation
	<a href="#"><u>Freight Operational Efficiency</u></a>	The National Academies Press
	<a href="#"><u>The Hidden Toll of Shipping</u></a>	Background information from Gizmodo
	<a href="#"><u>How UPS Is Using Big Data to Transform Package Deliveries</u></a>	From CNBC – Length 3:48
	<a href="#"><u>How Amazon Delivers Packages So Fast</u></a>	From Tech Vision – Length 5:18

## Project Spark – Safety (Session 2)






	<a href="#"><u>US DOT Safety</u></a>	US Dept of Transportation
	<a href="#"><u>Transportation Accidents by Mode</u></a>	Bureau of Transportation Statistics
	<a href="#"><u>Transportation Safety</u></a>	Bureau of Transportation Statistics

	<a href="#">Safety &amp; Security Industry</a>	International Trade Administration
	<a href="#">Governors Highway Safety Association</a>	

#### Project Spark – Access (Session 3)

	<a href="#">Medical Supplies to Remote African Communities</a>	The Medium
	<a href="#">Making Deliveries to Remote Places by Drones</a>	Drone Life
	<a href="#">US Postal Service Providing Access to Rural Communities</a>	Vox
	<a href="#">Autonomous Aircraft Delivery</a>	Zipline
	<a href="#">This "Flying Drawbridge" Lifts And Lowers In A Unique Way</a>	Tech Insider – Length 3:11
	<a href="#">Helicopters drop food for wallabies in Australia</a>	CBS This Morning – Length 0:40
	<a href="#">WFP's Innovative Supply Chain Solutions</a>	United Nations World Food Programme – Length 5:36
	<a href="#">WFP Airdrop</a>	United Nations World Food Programme – Length 1:00

#### Project Spark – Connections (Session 4)

	<a href="#">Supply Chain Services</a>	International Trade Administration
	<a href="#">Trucking Services</a>	International Trade Administration
	<a href="#">Air Transport Services</a>	International Trade Administration
	<a href="#">Improving Mobility</a>	Government of Netherlands
	<a href="#">Tracking for Priority Shipping</a>	From United States Postal Service – Length 1:26

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## Additional Resources

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### Event Preparation Resources

- [Events Page](#)
- [Rubrics](#)
- [Judging Session Flow Chart](#)
- [Awards List](#)
- [Event Hub](#)








### General Career Resources













- Visit the [Learning Lab](#) and search careers from A-Z (PBS LearningMedia)
- [Amazon Future Engineer Class Chat](#)
- [Career One Stop – Pathways to Career Success](#) (US Dept. of Labor)
- [O\\*NET OnLine](#) (US Dept. of Labor)
- [O\\*NET Interest Profiler](#) (US Dept. of Labor)
- [Career Exploration Lesson Plans](#) (Nebraska Department of Education)

### Transportation Career Resources

- [Transportation & Logistics Careers](#) (Amazon)
- [New Robots, New Jobs](#) (Amazon)
- [Career Videos for Transportation, Distribution and Logistics](#) (US Dept. of Labor)
- [Transportation, Distribution, and Logistics Careers](#) (Minnesota State University)
- [Transportation Career Lesson Plans](#) (Northeast Transportation Workforce Center)

### Extension Activity Resources

	<a href="#"><b><u>FIRST@Home</u></b></a>	These free activities supplement the FIRST season materials.
	<a href="#">Teacher Resource Center- Lesson Plans</a>	Mid-America Transportation Center
	<a href="#">Transportation Activities and Videos</a>	PBS Design Squad
	<a href="#">Moving Cargo- Transportation Educator Guide</a>	NASA
	<a href="#">Exploration: Then and Now - Transportation Lesson</a>	NASA
	<a href="#">Let's Get There Fast</a>	Teach Engineering
	<a href="#">Port: A Transportation System Classroom Resources</a>	Helen Delich Bentley Port of Baltimore

	<a href="#"><u>How Transportation Transformed America: Going to Market Lesson Plan</u></a>	US Library of Congress
	<a href="#"><u>Transport, Past and Present</u></a>	US Mint
	<a href="#"><u>Shipping Containers Lesson</u></a>	UK Geographical Association
	<a href="#"><u>Transport and Logistics Teacher Resources</u></a>	UK Geographical Association
	<a href="#"><u>The Sustainable Transportation Lesson Package</u></a>	Learning for Sustainable Future
	<a href="#"><u>Moving Cargo- Transportation Educator Guide</u></a>	NASA
	<a href="#"><u>Amazon Fulfillment Center Virtual Tour</u></a>	Amazon
	<a href="#"><u>Behind the Scenes Tour of Robotics at an Amazon Fulfillment Center</u></a>	Amazon
	<a href="#"><u>Driving to Combat Climate Change</u></a>	Amazon
	<a href="#"><u>Amazon Scout Delivery Robot</u></a>	Amazon
	<a href="#"><u>Drone Delivery</u></a>	Amazon
	<a href="#"><u>Human and Robots Working together</u></a>	Amazon