

# Multimedia Connections









# FIRST® LEGO® League Explore 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*<sup>®</sup> or LEGO<sup>®</sup> 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).

	<b>General Resources</b>	
Support from LEGO Education	Class Pack- FIRST LEGO League Explore	FIRST LEGO League (global)
Email for General Support	Teamwork Makes the Dream Work FIRST LEGO League Music Video	FIRST LEGO League (US)

Coach & Mentor Resources		
FIRST Youth Protection	FIRST Mentor Network	Creating a Sense of Belonging Training
FIRST Volunteer Resources	FIRST Mentoring and Coaching with FIRST videos	I Can Be Inclusive Too e- Course)
Supporting all Team Members: Inclusive Recruitment & Enrollment Strategies		

Family Engagement		
FIRST Family Engagement Resources	LEGO Education Let's Build Together	Articles for Families on Play from NAEYC
LEGO® Family Fun - things to do with kids	LEGO® Family YouTube Channel	LEGO® Activities for 8- to 10-Year-Olds from Scholastic Parents



### **Professional Development and Training Resources**

#### **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 Explore in a remote or hybrid setting.
  - FIRST LEGO League Explore Guide for Distance Education
- Hybrid & Remote Learning Resources from LEGO Education

#### **FIRST** Resources

- FIRST Certified Professional Development
- FIRST Education Philosophy
- <u>FIRST LEGO League Explore Scope and Sequence Options</u>
  - 15 hours / 30 hours / 40 hours / 60 hours / 80 hours
- <u>Explore Skills Progression</u> student learning outcomes by grade level
- Standards Alignments for FIRST LEGO League Explore
- <u>FIRST</u> Equity, Diversity, and Inclusion <u>Training</u>
- <u>FIRST</u> Equity, Diversity, and Inclusion Video Playlist
- FIRST Impact

### LEGO Education & LEGO Foundation Resources

- LEGO Education Teacher Community
- <u>Self-Guided Professional Development</u> from LEGO Education
- <u>LEGO Foundation's Research Knowledge</u>
   Base
- Buying Replacement Parts

#### **Learning Through Play**

- <u>Let's Play</u> activities from the LEGO Foundation
- <u>Learning Through Play Whitepaper</u> from LEGO Education
- <u>Learning through Play: Education does not</u> stop when recess begins from The Atlantic

#### **Research Resources**

- Oregon School Library Information System
- OSLIS Elementary Research Videos
- How to Skype with an Expert in your Classroom from Class Tech Tips
- <u>Nepris.com</u> Tool to connect to industry professionals (Requires registering to access)

Team Management Resources		
MAIN	How to Do Goal Setting With Your Students This School Year	Weareteachers.com
	How To Set Goals (4 Easy Steps)	Rocket Kids – Length 4:40
	LearnStorm Growth Mindset: How to write a SMART goal	Khan Academy – Length 2:52
MAIA	Give Every Student a Stake in Group Work	Common Sense Education
MAA	How Can Students Plan their Projects?	Thoughtful Learning
MAA	Keeping Organized	Droid Robotics
MAIN	Kanban for Kids: Using Productivity Tools to Raise Resilient Children	Kanban Zone
MAA	The 9 Best Online Tools For Student Collaboration	Weareteachers.com

#### **Pre-Session Resources**

#### FIRST LEGO League Explore Resources

- Getting Started with FIRST LEGO League Explore video
- About FIRST LEGO League flyer
- **Explore Team Management Resources**
- Start A FIRST LEGO League Explore Team **Flyer**
- FIRST LEGO League Explore Mini Brochure
- FIRST LEGO League Explore: How It Works
- FIRST Mentor Network

#### **SUPERPOWERED<sup>SM</sup> General Season** Resources

- Season launch resources
- Links to season videos
- **Explore Overview**
- Explore Welcome Letter
- Explore Introduction
- Explore Set Building Instructions
- Student participation certificates

FIRST ENERGIZESM and SUPERPOWEREDSM season content

Logos to use in flyers, emails, or other resources you may wish to create)

SUPERPOWERED<sup>SM</sup> Team Meeting Guide, Engineering Notebook and Individual Session PowerPoint Slides Google Slides version

 Found on Thinkscape through your FIRST Dashboard for US/CAN or through your country's Program Delivery Partner.

SUPERPOWERED<sup>SM</sup> FIRST LEGO League Video Resources on the FIRST LEGO League YouTube Channel



### Core Values Resources

The Squirrels who Squabbled by Rachel Bright	Fiction book about conflicts
A Little SPOT of Teamwork: A Story About Collaboration and Leadership by Diane Alber	Fiction book about teamwork
Brave Irene by William Steig	Fiction book about perseverance
The Invisible Boy by Patrice Barton	Fiction book about inclusion
My Mouth is a Volcano! by Julia Cook	Fiction book about taking turns
The Little Red Pen by Janet Stevens	Fiction book about cooperation
Going Places by Paul and Peter Reynolds	Fiction book about creativity

### **Core Values Resources**

M.A. A.	FIRST at Home activities	A variety of resources, activities and links available for free from FIRST
Man	FIRST Core Values through Social, Emotional Learning Activities	Part of the <i>FIRST</i> at Home activities
MANA	Core Values Activities	Droid Robotics
MANA	22 Fun Team Building Games & Activities for Kids	UNICEF
Mala	33+ Awesome Team-Building Games and Activities for Kids	We Are Teachers
Main	Team Building for Kids: A Complete Guide	Venture Team Building
MAM	Great Group Games: Team Building for Kids	Scholastic
	Team Building and Cooperative Games - Physical Education	Jakob Gyring - PE Teacher in Norway
	All Together - Team Building Game - Ultimate Camp Resource	A teambuilding game from Ultimatecampresource.com - Length 0:35
	The Hand Game	A teambuilding game from Ultimatecampresource.com - Length 1:20
	Summer Camp Team Building Activities For Kids	Quick Team Building Activities - Length 4:42
	Team Building Games YouTube Channel	Herman Otten, Teambuilding and Communications trainer from the Netherlands
1	How Google builds the perfect team	Tech Insider – Length 2:22
	The Big Book of Teambuilding Games	Trust-Building Activities, Team Spirit Exercises, and Other Fun Things to Do by John W. Newstrom, Edward E. Scannell
	Really Fun Team Building Activities for Kids	By Jeff Millett
	Duct Tape Teambuilding Games 50 Fun Activities to Help Your Team Stick Together	By Tom Heck
	Silver Bullets: A Revised Guide to Initiative Problems, Adventure Games, and Trust Activities	by Project Adventure
	Cowstails and Cobras 2: A Guide to Games, Initiatives, Ropes Courses & Adventure Curriculum	by Karl Rohnke
	Quicksilver	by Steve Butler

Multimedia Resources SUPERPOWERED<sup>SM</sup>

### **Robotics Resources**

Robot Design Resources		
MANA	Technical Resources	Links from <i>FIRST</i> to LEGO Education SPIKE <sup>™</sup> Essential and WeDo 2.0 Resources
Mara	Buying Replacement Parts	LEGO Education
	Yoshihito Isogawa's YouTube Channel	Building ideas from the author

# LEGO Education WeDo 2.0 Resources

- Getting Started with WeDo 2.0
- <u>LEGO Education WeDo 2.0 Element</u> <u>Survey Page</u>
- <u>Download WeDo 2.0 Software and view</u> <u>System Requirements</u>
- WeDo 2.0 Product Support
- WeDo 2.0 Lessons
  - Spy Robot Lesson
  - Glowing Snail Lesson
  - Cooling Fan Lesson
  - Moving Satellite Lesson
  - Milo, the Science Rover Lesson
  - Moving Materials Lesson
  - City Safety lesson

# LEGO Education SPIKE Essential Resources

- Software Download
- o <u>FIRST LEGO League Explore</u> <u>Unit</u>
- Element Survey Page
- Getting Started with SPIKE Essential
- SPIKE Essential Unit Plans
- SPIKE Essential Resources
- Product Support Videos



Engineering Design Process, Design, and Computational Thinking		
MAA	What is Computational Thinking?	Teach Your Kids Code
	The Engineering Process: Crash Course Kids #12.2	Crash Course Kids – Length 5:16
	The Engineering Design Process	YouTube Playlist from FIRST LEGO League – From 2016
MAR	Engineering Design Process Curriculum	Teach Engineering.org
MANA	Engineering Design Process – Choose the Best Solution	Science Buddies
M.A.A.	Engineering Design Process	NASA
MARA	Design Thinking Resources for Educators	Innovation Training
	Design Thinking: A Problem Solving Framework	Edutopia – Length 5:22
	Rosie Revere, Engineer by Andrea Beaty	Fiction Book

# **SUPERPOWERED<sup>SM</sup> Resources**

General	Energy Resources	
MAIN	PBS Learning Media for students	Search "energy"
Maa	National Energy Education Development (NEED) Student Energy Information & Resources	Background info for teams, videos, and more resources
MAIN	NEED Energy Graphics	Energy graphics resources for teams
MAIN	e²   podcasts   PBS	Energy podcasts from the PBS series e <sup>2</sup>
M.M.A.	Alliant Energy Kids	Energy information and teacher resources from Alliant Energy
MAIN	Department of Economic and Social Affairs Sustainable Development	United Nations
MANA	US Energy Information Association Energy Kids	Background information for teams, videos, games, and more
MAIN	Learning Resources about Energy Efficiency	NH Saves
MAA	US Department of Energy	General energy information and career resources – Background information for teachers
MARA	Lesson Plans, Teacher Guides and Online Environmental Resources for Educators: Energy	United States Environmental Protection Agency Teacher Lesson plans & Resources
MAIA	Lesson Plans on Energy	Mountain Electric Cooperative
MAIN	Free Teaching resources about climate and energy	Climate Literacy and Energy Awareness Network (CLEAN)
MAIA	Energy Safe Kids	Activities, info, lesson plans about safety around natural gas
MAN.	STEM Classroom Activities & Resources	Shell
	Energy reading recommendations by grade level (grades 3-5)	Project Learning Tree
	Energy reading recommendations by grade level (grades K-2)	Project Learning Tree
	Energy Theme Reading List for Pre-Schools and Primary	Green Schools Ireland
	Climate Change & Environmental Books for Children	climatecaretakers.org
	Energy and Sustainability Book Recommendations	Sustainable Wellesley

Session	1: Energy Journeys	
	History of Energy	ENERGYminute - Length 5:30
	Ask APS: How does electricity get to my house?	Arizona Public Service - Length 3:11
	Energy Explained: Where does it come from and how much do we use?	Inside Energy - Length 3:25 (from 2017)
	Where does my power come from?	Electric Authority New Zealand - Length 3:33
	How Electricity is Made	Idaho Power - Length 2:19
	Electricity 101: How Power Gets to Your Home	FirstEnergy – Length 1:12
1	How Power Gets to Your House	EPCOR – Length 2:35
	Power Generation	PSEG Long Island – Length 2:35
	The journey of hydropower: How energy moves from nature to your home	Bonneville Power based in Portland Length 14:01
	How Do We Use Energy at Home?	The Atlantic – Length 1:55
	Solar energy for kids: Learn how electricity works	Alliant Energy - Length 5:24
	What is Nuclear Energy?	Nuclear Energy Institute
	Bioenergy: America's Energy Future	US Department of Energy - Length 15:00 – from 2014
	How Rotting Vegetables Make Electricity   World Wide Waste	Business Insider - Length 5:31
Main	Energy Harvesting: Pavegen and the Rise of Kinetic Tile Tech	The Switch UK

<sup>\*\*\*</sup> See the Career Resources section for resources on energy jobs.

Session 2: Energy Sources		
	Wind Power	NOVA PBS Official - Length 2:33 – from 2012
	Energy 101: Wind Power	US Department of Energy - Length 3:16
	How is wind energy produced? - Sustainability for kids Part 1	From Vestas - Length 2:06
	How does a wind turbine work? - Sustainability for kids Part 2	Vestas - Length 2:46
	8 Inventions and Technologies that will Change our World!	Innovative Techs - Length 7:56 - reviews innovative energy designs

More Session 2: Energy Sources		
6	How does renewable energy work? Solar, Wind & Wave power Explained	LEGO - Length 9:21
M.M.m.	Renewable energy lessons	LEGO Education
	Fossil Fuels 101	Fossil Fuels 101 from Student Energy - Length 2:42
10	How do wind turbines work? - Rebecca J. Barthelmie and Sara C. Pryor	Ted-Ed - Length 5:02
	Advantages and Disadvantages of Using Renewable Energy - Alternative Energy Lesson Plans Middle	Dynamic Earth Learning – Length 3:12
	Who Cleans Up When a Wind Farm Retires?	Inside Energy - Length 5:36

Session 3: Energy Connections		
	How does a battery work? - Simple and easy explanation for kids	Phil McCordic – Length 4:56
	How do batteries work?	Mystery Doug – Length 6:02
MANA	How Batteries Work: An Animated Guide to the Science of Batteries	Save on Energy
6	The Power of Circuits!	SciShow Kids – Length 4:41
	World's Largest Batteries - (Pumped Storage)	Practical Engineering - Length 9:12
MAN	Heated Volcanic Rocks Store Energy	The American Society of Mechanical Engineers
M.M.M.	Pumped Hydro Storage	GE Renewable Energy
(a)	Storing Electricity - SWITCH ENERGY ALLIANCE	Switch Energy Alliance – Length 3:00
	The Future Of Energy Storage Beyond Lithium Ion	CNBC - Length 14:21
	The Smart Grid Explained - An Understanding for Everyone	EPCE (Energy Providers Coalition for Education) - Length 3:00 - From 2011
MARIN	The Smart Grid	US Department of Energy Office of Electricity
	Oil Platform vs Super Typhoon: Weathering the Storm from Korea to the Gulf of Mexico	Shell - Length 11:55
	Solar with Storage: The Basics	Energy Queensland - Length 1:41
	How Australia's Most Powerful \$16 Billion Solar Power Plant Will Power Singapore	Innovative Techs - Length 6:26

Session 4: Energy Consumption		
	How Does A "Fairground Carousel" Work?	Maddie's Do You Know? – Length 6:00
	Solar-Powered Theme Park Uses the Sun and People to Run Its Rides	Mashable Deals – Length 1:53
	Six Flags Discovery Kingdom Powered with Solar Energy	sPower US – Length 5:03
	Portable Water Turbine that Charges Phones	HENRY FORD Museum – Length 2:30
www.	Energy Conservation and Emissions Reduction	Disneyland Public Affairs
www.	Harnessing the Sun to Power Disney Parks Around the World	Disney Parks Blog
WWW	Estimating Appliance and Home Electronic Energy Use	US Department of Energy
MAIN	How Much Electricity do my Home Appliances Use?	IGS Renewable Energy company

Session 5: Energy Capture		
Main	SPIKE Essential FIRST LEGO League Explore Unit: Lesson 1	LEGO Education
MAIA	WeDo 2.0 Classroom Projects: Cooling Fan	LEGO Education
	The Physics of Windmill Design	Minutephysics – Length 3:26
	Should Wind Turbines Have TWO Blades?	Engineering with Rosie – 6:14
	Why Wind Farms Don't Always Turn When It's Windy	Tom Scott – Length 1:55
	Wind turbine energy storage - IN 60 SECONDS	DOB-Academy – Length 1:25
	The Glaring Engineering Mistake That Made Wind Turbines Inefficient	Discovery UK - Length 7:46
	Wind power storage plant   ACCIONA	Acconia – Length 1:38
Mala	What's Good and What's Bad about Wind Energy?	Kids Discover
Main	Curious Facts about Wind Power	Curious Kate on Fun Kids Radio – website, video, and audio podcast



Session 6: Motorize Model		
MAIN	SPIKE Essential FIRST LEGO League Explore Unit: Lesson 2	LEGO Education
MAN	WeDo 2.0 Classroom Projects: Spy Robot	LEGO Education
	Enercon E126 - The Most Powerful Wind Turbine in The World	Extreme World – Length 3:42
	The World's Biggest Wind Turbine	Tech Vision – Length 8:09
	Virtual Wind Farm Tour Ep 5: The Nacelle	EDP Renewables – Length 2:51
	MJR Power & Automation Offshore Wind On-Turbine Vessel Charging System	MJR Power & Automation – Length 3:01
	Northwest Crane Service, L.L.C. Liebherr LTM 1750-9.1 Kansas Wind Turbine Project	Northwest Crane Service – Length 5:09

Session	7: Electric Car	
MAIN	SPIKE Essential FIRST LEGO League Explore Unit: Lesson 3	Lesson from LEGO Education
MAIN.	WeDo 2.0 Classroom Projects: Milo the Science Rover	Lesson from LEGO Education
	Amazon's custom electric delivery vehicles hit the road in LA	From Amazon News – Length 1:01
MAIN	Henry Ford Museum	Virtual Field Trip for students
Mare	Carl Gets Some Rest: A Coloring and Story Book	A downloadable coloring about transportation alternatives from the US Environmental Protection Agency
MAIA	What is a Hybrid Car and How Do They Work?	Car and Driver
	What's next for oil?   CNBC Explains	CNBC - Length 3:32
	VIDEO: Investing in Electric Car Charging Stations	WKRG News from Mobile, AL – Length 2:35
WWW	The future of gas stations: Do EVs dismantle local pumps?	Road Show by CNET article and video
MAIA	Driving to Combat Climate Change	Amazon





Session	Sessions 8-9: Team Model	
	Recap of the 2019 FIRST LEGO League World Festival in Detroit	Length 1:09.  *Have your students watch for example team models in the video.
MMA	USPTO Educational for Kids, Parents, and Teachers	United States Patent and Trademark Office
MAKA	There's Got to be a Better Way – Developing a Product	Resources from Fun Kids – UK children's Radio Station
MALA	Prototyping Builds Resiliency	Article from Connected Science Learning
	Science of Innovation: What Is Innovation?	NBC News Learn – Length 6:56
	Designing and Building the LEGO Model & Creating the Show-Me-Poster	Coach webinar from <i>FIRST</i> in Texas – Length 30:24

(C)	Recap of the 2019 FIRST LEGO League World Festival in Houston	Length 1:10.  *Have your students watch for example team posters in the video.
Co-	Sessions 10 & 11 - The Show Me Poster – English	FIRST LEGO League – Length 0:42
UNITW	Team poster - FIRST® LEGO® League Explore	The IET in the United Kingdom
10	FIRST® LEGO® League Jr. Boomtown Build Season – Sessions 10 & 11; Make your Show Me Poster!	The IET in the United Kingdom – Length 4:48. From 2020.
NW.	6 tips for teaching students to create awesome science posters	Fizzics Education

Session 12: Prepare for Event		
	Schooled by Kids:  Presentation Skills, Part 1  Presentation Skills, Part 2	From Green Ivy Schools. Part 1 Length 1:44 / Part 2 Length 1:31
6	How to Prepare for your Festival	The IET in the United Kingdom – Length 1:39
	FIRST LEGO League Explore Festival at River City Science Academy Mandarin	Shiva Robotics Academy – Length 1:57
	FIRST LEGO LEAGUE EXPLORE EXPO 2020 HIGHLIGHTS	Prospect North Primary School in Australia – Length 6:30
MAN	Explore Certificates	Printable certificates to provide to the children

### **Career Resources**

General Career Resources		
MAA	Visit the <u>Learning Lab</u> and search careers from A-Z	PBS LearningMedia
M.A.A.	Amazon Future Engineer Class Chat	Amazon
MAA	O*NET OnLine	United States Department of Labor
MAAA	Career Exploration Lesson Plans	Nebraska Department of Education
Main	Career Resources for Elementary Grades P-5	Workforce Solutions
MAA	Career Exploration	Career profiles from the United States Bureau for Labor and Statistics

Energy Career Resources		
MAA	The Office of Energy Efficiency and Renewable Energy Career Resources	United States Department of Energy
Mann	Get into Energy	Center for Workforce Development
Maa	Get Energised: Careers in renewable energy	National Museums Scotland - Length 3:08
1	Energy Cluster	Career Girls
	Renewable Energy Engineering Jobs: My Education and Career Path as a Mechanical Engineer	Engineering with Rosie - Length 8:09
	A Day In The Life Of A Wind Turbine Engineer	Broadcast Media Services - Length 5:55
	Energizing Careers at Consumers Energy	Consumers Energy - Length 3:57
	Day In The Life of a Lineman	Community Electric Cooperative - Length 6:27
To the second	Women in Energy	RTI International – Length 3:31
	Women at Imperial: Inspiring women in the energy sector	Energy Futures Lab – Length 3:31
	Member Spotlight: Maria Telkes, Biophysicist & Inventor	Society of Women Engineers

### **Additional Resources**

Extension Activity Resources		
ALR. A.	FIRST@Home	These free activities supplement the FIRST season materials.
M.M.M.	What is a Robot?	Lesson plan from PBS Learning Media
MAAA	Wild-Inspired Robotic Arms	Video, background reading, and lesson plan from PBS Learning Media
A.A.A.	Evaluating Legitimate Sources	Lesson Plan from Common Sense Media
MAIA	Engineering for Good	Project-based Unit from PBS Learning Media
	Project Management Fiction Books for Youth Ages 10-12	Project Management Institute Educational Foundation
	Books on Inventors	Inventive Kids
WWW	Invent It, Build It	Lesson plan from PBS Kids
MAIN	Invention Education Curricula	Links to invention-focused lesson plans from Invent Ed
Man.	Drawing Designs in Detail	Hands-on activity plan from teachengineering.org
MAIN	Energy Transfer Lesson for Kids   Sound, Light & Heat, Grades 3-5	Lesson Plan from Generation Genius
WALA	Windmill STEM Challenge – The Boy Who Harnessed The Wind	Activity about wind power for Teams with book link
MAIN	Nuclear Science Lesson Plans	Nuclear Science Week
MMA	The Sustainable Transportation Lesson Package	Learning for Sustainable Future
M.M.A.	Flow of Electrons, Circuits, and Batteries	Lesson plan from the National Electronics Museum
MAIN	HANDS-ON ACTIVITY: Two-Cell Battery	Teachengineering.org Lesson Plan
MAA	Behind the Scenes Tour of Robotics at an Amazon Fulfillment Center	Amazon
M.M.A.	Human and Robots Working together	Amazon
Men	Renewable Energy Lessons	Minecraft Education Edition



















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