2014 *FIRST*® LEGO® League (FLL®) Topic Guide

FLL WORLD class℠
Learning Unleashed

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Coaches: Many of the resources listed here were designed for adults. *FIRST*® does not control or endorse the content of these external websites. They are provided as optional references only. Please preview all resources based on the maturity level of your team.

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Resources

We provide these resources to help you start your FLL WORLD CLASS℠ Project research, but do not limit yourselves to the list below. Remember that your library, school, local government, museum, park district, or activity center may have a lot of information to share about learning. Contacting professionals is also a good way to learn about the topic. Read more in the Ask a Professional document.

Some of these resources were designed for adults. Do not be afraid to ask a Coach or Mentor for help if some of the material does not make sense or some vocabulary is too difficult. Discussing the work of others can help everyone understand the topic better – team members and Coaches alike.

Examples of Kids Teaching Others

Think about the topic these kids are teaching and the method they use to teach it. Do they use a specific tool to help them teach? Do they combine technology and discussion? Also, think about who they are teaching – what is the best method to reach that audience?

- ***Sylvia's Super-Awesome Maker Show*** teaches viewers how to make simple technology and craft projects. http://sylviashow.com/
- **Thomas Suarez** gives a brief introduction to how he develops and publishes apps at 12 years old. http://www.ted.com/talks/thomas_suarez_a_12_year_old_app_developer
- **Quin Etnyre** teaches Arduino building and programming. http://www.popsci.com/technology/article/2013-08/short-circuit

Video

- **Re-imagining school:** TED provides a playlist of videos from different perspectives about how to improve education. http://www.ted.com/playlists/24/re_imagining_school
- **Sir Ken Robinson**, education researcher and speaker, is interviewed by a group of students about his ideal school in this 3-part video. http://www.youtube.com/watch?v=dG4uQ2gHyO4
- **Tech2Learn: Success Stories of Technology Integration in the Classroom:** This video series from the George Lucas Educational Foundation looks at ways that teachers use technology in their classrooms. http://www.edutopia.org/tech-to-learn-classroom-technology-resources

Websites and Articles

Technology in Learning

- **The Digital Media and Technology in Afterschool Programs, Libraries, and Museums:** This report looks at how kids can learn with technology outside of a classroom.
  http://dmlhub.net/publications/digital-media-and-technology-afterschool-programs-libraries-and-museums

- **EdTech: Focus on K12:** This magazine looks at technology use in schools for teaching, learning, and administration.
  http://www.edtechmagazine.com/k12/

- **Internet4Classrooms: Resources by Subject and Topic:** Find learning resources by grade, subject, or learning need on Internet4Classrooms.
  http://www.internet4classrooms.com/k12links.htm

- **Learning Curve:** The radio show Marketplace takes a year-long look at how technology has been used in education. The site includes an interactive timeline of education technology history.
  http://www.marketplace.org/topics/learning-curve

- **Mission: Math… Sabotage at the Space Station:** This iPad game provides an example of one way to make learning fun.
  http://venturebeat.com/2013/07/22/family-develops-ipad-game-to-inspire-young-girls-to-love-math/?goback=.gde_3391879_member_261680244

Teaching and Learning

- **Association for Childhood Education International (ACEI):** This site explores learning resources from around the world.
  http://acei.org/general-links-resources/educator-learner-resources

- **Early Childhood Education Topics:** The National Association for the Education of Young Children (NAEYC) provides information about teaching children through age 8.
  http://www.naeyc.org/topics

- **The LEGO® Foundation:** The LEGO® Foundation publishes reports on education and play.
  http://www.legofoundation.com/en-us/research-and-learning/

- **National Science Foundation (NSF):** This list of resources from the NSF is designed to help both teachers and students.
  http://www.nsf.gov/news/classroom/education.jsp

- **Public Broadcasting Service (PBS):** The PBS Learning Media site provides online learning tools like videos and games.
  http://www.pbslearningmedia.org/

Visit the FLL WORLD CLASS℠ Resources webpage to find links to additional websites: http://www.firstlegoleague.org/challenge/fll-world-class-resources

Books

- ***All Kinds of Minds: A Young Student's Book about Learning Abilities and Learning Disorders*** by Melvin D. Levine
  Educators Publishing Service, Inc. (June 1992)
  Stories of children who struggle with different learning difficulties.
- ***Book of Think: Or How to Solve a Problem Twice Your Size*** by Marilyn Burns
  Little, Brown Young Readers (1976)
  Tips and simple, fun exercises to get you thinking more creatively.
- ***Learning to Learn, Revised Edition: Strengthening Study Skills & Brain Power*** by Gloria Frender
  Incentive Publications (2003)
  Learning and study techniques designed for kids.
- ***Smarter Than You Think: How Technology is Changing Our Minds for the Better*** by Clive Thompson
  Penguin Press (2013)
  Written for adults. A hopeful look at how technology is helping us find new information and changing the way we think.
- ***Visible Learning and the Science of How We Learn*** by John Hattie
  Routledge (2013)
  Explains the major principles and strategies of learning, outlining why it can be so hard sometimes, and yet easy on other occasions.
- ***You're Smarter Than You Think: A Kid's Guide to Multiple Intelligences*** by Thomas Armstrong
  Free Spirit Publishing (2014)
  Explains different types of intelligences, and helps kids identify their own learning strengths.

Career Resources

- **Career Kids:** Find articles and videos about careers in many different fields.
  http://www.careerkids.com/careers/
- **International Technology and Engineering Educators Association (ITEEA):** The ITEEA provides links to many career and teaching resources.
  http://www.iteea.org/Resources/resources.htm

No matter what topic your team chooses, there is probably a professional association of teachers who focus on that topic. Here are just a few examples. Use a search engine to find many more online.

- **National Council of Teachers of English:** http://www.ncte.org/
- **National Dance Education Organization:** http://www.ndeo.org/
- **World History Association:** http://www.thewha.org/

Ask a Professional

Talking with professionals (people who work in the field of this year's Challenge theme) is a great way for your team to:

- Learn more about this season's theme
- Discover potential topics for your FLL WORLD CLASS℠ question
- Find current data
- Get feedback on your innovative solution

Examples of Professionals

Consider contacting people who work in the following professions. You can probably think of people who work in other jobs that are just as relevant, so don't limit yourselves to this list. Many corporate, professional association, government, and university websites include contact information for professionals.

Job	What the do	Where they work
Author	Writes stories, articles, or other types of content.	Publishing companies, magazines, newspapers, non-profit organizations, private companies
Curator	Manages exhibits in places such as museums, zoos, and historic sites. Curators plan and prepare exhibits to teach about the collections they manage.	Museums, galleries, zoos, historic sites, public gardens
Curriculum writer	Develops new and revised teaching materials for teachers, businesses, and others.	Schools, universities, private companies, non-profit organizations
Educational toy designer	Designs toys to help teach concepts or skills. Combines artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design.	Toy manufacturers, private companies, non-profit organizations
Health educator	Teaches individuals and communities about behaviors that encourage healthy living and prevent diseases and other problems.	Healthcare facilities, schools, private businesses, public health departments, non-profit organizations

Job	What the do	Where they work
Instructional coordinator	Oversees school curricula and teaching standards, develops teaching material, coordinates its implementation with teachers and principals, and assesses its effectiveness.	Elementary and secondary schools, colleges, professional schools, education support organizations
Librarian	Helps others use books and other materials to find information. Librarians may also help people evaluate sources of information and introduce young children to research.	Libraries, schools, governments, private companies
Park ranger	Ensures the safety of visitors to state and national parks. A park ranger may also prepare exhibits, lead tours and nature walks, or develop conservation programs.	State and national parks, historic sites, nature preserves
Playground designer	Designs playground equipment or landscapes to maximize learning and fun.	Playground manufacturers, private companies, non-profit organizations
Professor	Teaches at a school of higher learning. Usually teaches older students who have completed high school.	Colleges, universities
Software developer	Designs computer programs or apps to teach about a topic.	Software companies
Speech-language pathologist	Diagnoses communication disorders and teaches students communication skills to improve learning. Assesses and monitors student progress.	Elementary and secondary schools, non-profit organizations, clinics, hospitals
Teacher	Helps others learn information or skills. Teachers often work in schools, but you will also find teachers in dance studios, museums, parks, libraries, and many other places.	Schools of all kinds, activity centers, government agencies, non-profit organizations, private companies
Teacher assistant	Works under a teacher's supervision to give students additional attention and instruction.	Public and private schools, childcare centers

You can probably think of people who work in other jobs that are just as relevant, so don't limit yourselves to this list.

Who Do You Know?

One of the best recruiting tools for your Project is your own team. Think about it. Who do you know? Chances are you know a professional who works with learning in some way. You probably know someone who can answer your questions about how different topics are taught today.

Think about the people who help you learn. Think about the technology that you use to learn and the people who create it. Use the list of professionals above to help you brainstorm ideas. Do your parents or guardians know anyone who has a job helping people learn?

Make a list of people you might want to interview for your Project research. Include the people you know, but also include any other professionals you can think of in the field of learning.

Who Should You Ask?

AS A TEAM - talk about your list of professionals and choose one or more who you think could help your team find some answers about learning. Do a little research about the person if you can. Find out how the professional works with the topic you are researching and think about what questions you might want to ask in an interview.

Next, ask your Coach or Mentor to help you contact the professional you chose. You can make contact by telephone, email message, or letter. Explain a little about FLL and what you are researching this season. Also, tell the professional about your goals and ask if you can interview him or her. Make sure you suggest a day for the interview when your Coach, Mentor, or another adult is available to attend too.

What Should You Ask?

Prepare a list of questions before you interview any professional. When you think about questions to ask:

- Use the research you did to brainstorm questions about the professional's area of expertise.
  You want to ask questions that the person can answer.
- Keep your Project goal in mind. Ask questions that will help you learn more about your topic and design an innovative solution.
- Keep your questions short and specific. (Say what you want to know as clearly as possible.)
- Do NOT ask the professional to design an innovative solution for you. Your team's solution must be the work of team members. If you already have an innovative solution though, it is ok for the professional to provide feedback on your idea.

Say what you want to know as clearly as possible. Do not be afraid to ask a question.

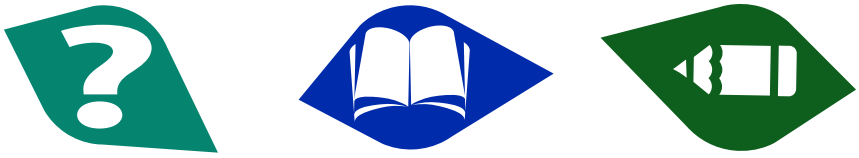
It is easy to lose track of time when you're learning about a really interesting topic. Decide who will be responsible for politely telling the rest of the team when the time is nearly over. Show your Gracious Professionalism® during the interview, and remember to thank the professional for his or her time!

At the end of the interview, ask the professional if your team may contact him or her again. You might think of more questions later. Find out if your professional would be willing to answer more questions by telephone or email. Maybe the person would be willing to meet with your team again or give you a tour. Do not be afraid to ask.

Glossary

Word or Phrase	Definition
21st Century Skills	Skills that many people consider essential for success in modern jobs and life. These include skills such as problem-solving, communication, and teamwork.
Assessment	In a school, assessment usually means the way that a teacher measures the knowledge or skills of a student. This may include tests, interviews, observations, project evaluations, or other methods.
Common Core	A set of U.S. standards designed to say what every student should know at the end of each school year from kindergarten through 12th grade. The Common Core only covers the subjects of math and English language arts/literacy.
Competency	Showing the ability to apply learned knowledge and skills on a specific topic. Sometimes also called proficiency.
Competency-based learning	Students show they have mastered the knowledge and skills in a topic before moving on to the next topic.
Curriculum	Curriculum usually refers to the specific knowledge and skills a student should learn, as well as lessons, assignments, and materials used to organize and teach a particular course.
Engage	To get and hold someone's attention. An engaging lesson is one where the students are actively interacting with the information being taught.
Flipped classroom	Students learn new facts or concepts outside of class (through video, podcasts, reading, etc.) and spend class time on interactive or project-based learning.
Informal learning	Learning outside a classroom – such as visits to museums, playing games, or watching videos at home.
K-12	All the grades from kindergarten through 12th grade (the end of high school). The letter K stands for kindergarten and any grade after that is represented with a number (ex: K-3 means kindergarten, first grade, second grade, and third grade).

Word or Phrase	Definition
Knowledge	Understanding, awareness, or simply something that you know.
Learn	To get some knowledge or skill by studying or being taught.
Learning disorder	A condition in the brain that makes it more difficult to store, process, or give information.
Learning environment	The place where people learn. The learning environment may also include factors like how the space is laid out and the culture of learning (ex: how the room is decorated and how people treat each other).
Learning style	An individual's unique approach to learning based on strengths, weaknesses, and preferences. It is usually based on some combination of watching, listening, reading, writing, moving, and even playing.
Learning tool	An object, program, or system that can help someone learn. (Ex: a map, a learning game on a tablet computer, or a website could all be learning tools.)
Next Generation Science Standards	A set of U.S. standards designed to say what every student should learn in the subject of science.
Pedagogical approach	A way of teaching a particular topic. This might include the tools used to teach a topic as well as the method.
Pedagogy	The art, science, or profession of teaching.
Skill	Ability that comes from training or practice.
Student	A person who studies or learns. A student could be a person of any age – as long as they are learning.
Teach	To show or help to learn new information or skills.
Project-based learning	Learning by completing projects that use a variety of knowledge and skills. Projects may be as different as creating a video, completing a community service project, or building a robot. Most project-based learning happens over many days – up to a semester or a whole year.
Topic	For the purpose of the FLL WORLD CLASS℠ Project, a topic is a skill or type of information that a person could learn. It could be broad (ex: science) or very specific (ex: the different parts of a cell).



www.usfirst.org | www.firstlegoleague.org | FLL is the result of an exciting alliance between *FIRST*® and the LEGO Group.