

FIRST[®] LEGO[®] League ***TUT^QRIALS***

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Doing Background Research

BY BAYOU BUILDERS & NeXT GEN



RESEARCH PROJECT LESSONS

About Us

NeXT Gen are a middle school team from Garrett County, Maryland with 13 years in FIRST LEGO League (including competing in International Tournaments).

They have won first place in 2013 Global Innovation Award. They also won Top 20 GIA Semi-Finalist in 2017 for innovative solution, BeeHaven.

In addition, they won first Place Innovative Solution at Mountain State Invitational in 2017.



Bayou Builders are a 10-person, community-based team in Hammond, Louisiana.

They have won the Champions' award every year and attended the North American Open as well as World Festival. In 2017, they were also nominated for the Global Innovation Award from Louisiana.



Types of Sources

- Use a variety of sources including websites, books, magazines, reports, professionals
- Go on fieldtrips
- Collect your own survey data
- Remember that all sources need to be cited



	Beginning	Developing	Accomplished	Exemplary
	Problem Identification * Clear definition of the problem being studied			
N	unclear; few details	partially clear; details missing	mostly clear; detailed	clear; very detailed
D				
Research	Sources of Information Quality and variety of data/evidence and sources cited			
	N	minimal quality; variety limited	quality OR variety need improvement; did not include professional(s)	sufficient quality and variety; included professional(s)
	D			extensive quality and variety; included multiple professionals
	Problem Analysis Depth to which the problem was studied and analyzed by the team, including extent of analysis of existing solutions			
N	minimal study; no analysis	minimal study; some analysis	sufficient study and analysis	extensive study and analysis
D				

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Creating a Bibliography

- Creating a team bibliography can be helpful
 - Allows a team to easily find the resources again if additional information is needed.
 - Bibliographies can also be handed to the judges to show research.

Tips:

- a. Google Drive:** Share your resources with your team using Google Sheets
- b. Annotated Bibliography:** An annotated bibliography that describes briefly what each website or other source taught us is very helpful in remember the sources

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Going on Fieldtrips

Sometimes fieldtrips to local companies and organizations are possible

Fieldtrip destinations are based on the problem you are studying or the solution you have come up with.

- In World Class, we decided to create a computer-based math game to help students practice different math facts while also learning a piece of music. We ended up identifying a local software design company through the white pages. We called them up and ended up meeting with them at their company to pitch our game and learn more about how to implement it.
- In Trash Trek, we had heard that the glass we set out to recycle is only collected brought to our local MRF (recycling facility) and is then reloaded and brought to a landfill. We got the contact information for the plant manager for our MRF and then asked our coaches to make the call and set up a tour.
- In Animal Allies, we sent an email to the Water Quality Specialist at the New Orleans Aquarium to learn more about their water filtration system for their large exhibit tanks.



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Talking to Experts

- Brainstorm potential professionals who might know about the subject/problem.
- Do Internet searches for local professionals
- We refer to our local Chamber of Commerce directory, University directory and other state environmental and business bureaus.
- Develop an initial email to send out to these professionals, explaining who we are, what FLL is and what information we are hoping to learn.
- Experts don't have to be near you: In Animal Allies, we Skyped with one chemistry professor and met with another to get a better understanding of pH.
- You might run into professionals at a community outreach who can help you: Last March we presented our FLL project at the Louisiana Green School Summit. While there we met specialists from the New Orleans Sewage & Water Treatment program who have become a great contact for us and have helped us meet more people in our area.



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Doing Research Online

- We do a lot of initial Google searches to see what is out there.
- Do web searches and get information from reputable sources
- Tips for finding reputable sources:
 - Our first rule is to utilize “.gov” websites first.
 - When we are researching other websites, it is our next goal to make sure any information gained is also supported by at least two other websites.
 - We will also often look to different university websites that also provide educational content.
 - We try to steer clear of Wikipedia since it can contain a lot of opinion rather than straight facts.
 - We will also often present any information gained from this Internet research with the professionals we are in contact with to see if they also confirm and agree with the information.



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Surveys

- In the past, we have also developed surveys using Survey Monkey.
- We did this with Animal Allies to learn from teachers how they care for class aquariums.
- Tips for developing a survey
 - Brainstorm Questions: Brainstorm questions that will help define your problem and help develop a plan for developing our project
 - Keep the survey short and to the point: Our goal was to keep the survey answer time to about a minute or so to increase honest participation.
 - Share the Survey: We sent out survey out through social media and different educational sites. Include an explanation as to who you are and what you are hoping to accomplish to different educational sites. We also send an email link to the survey to our local school board, area schools and through two different university systems.



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Next Step

Once a solution is identified and developed, you need to do research to ensure that it's original and practical.

See the next lesson about developing an Innovative Solution by Team Phoenix.



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Credits

This lesson was written by Bayou Builders FLL Team #4043 (www.bayoubuilders.org) and Team 3659 NeXT GEN (Facebook:Garrett County FIRST LEGO League Team 3659).



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