

FIRST® **LEGO**® **League**

TUT  **RIALS**

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INNOVATION PROJECT OVERVIEW

SESHAN BROTHERS

ABOUT THE AUTHOR

- Seshan Brothers were on team Not the Droids You Are Looking For
- Our research project for Trash Trek was a Global Innovation Award semi-finalist project (Top 20 out of 30,000 teams).
- Our research project in Nature's Fury won Innovative Solution at the FIRST LEGO League International Open in Toronto.
- Our research project for World Class was EV3Lessons.com which resulted in the site you are currently on! ;-)
- We are the Champion's award winners from World Festival 2018



WHAT IS THE INNOVATION PROJECT?

- A group research project related to the year's theme
- Research a real-world problem
- Come up with an innovative solution
- Iterate the idea and share your solution

Themes:

- 2011: Food Factor (food safety)
- 2012: Senior Solutions (senior citizens)
- 2013: Nature's Fury (natural disasters)
- 2014: World Class (education)
- 2015: Trash Trek (garbage)
- 2016: Animal Allies (animals)
- 2017: Hydro Dynamics (water)
- 2018: INTO ORBIT (space)
- 2019: City Shapers (cities)
- 2020: RePLAY (exercise)
- 2021: Cargo Connect (transportation)
- 2022: SUPERPOWERED (energy)
- 2023: MASTERPIECE (arts)

THE RUBRICS WILL GUIDE THE PROCESS

■ Identify

- Identify a problem, do background research, analyze existing solutions

■ Design

- Think of different solutions, select one and come with a plan

■ Create

- Develop a solution including a prototype/model/drawing

■ Iterate

- Share the solution with others and improve the idea

■ Communicate

- Create an effective presentation for judges

BEGINNING 1	DEVELOPING 2	ACCOMPLISHED 3	EXCEEDS 4
<i>How has the team exceeded?</i>			
IDENTIFY – Team had a clearly defined problem that was well researched.			
<input type="checkbox"/> Problem not clearly defined	<input type="checkbox"/> Partially clear definition of the problem	<input type="checkbox"/> Clear definition of the problem	<input type="checkbox"/>
<input type="checkbox"/> Minimal research	<input type="checkbox"/> Partial research from more than one source	<input type="checkbox"/> Clear, detailed research from a variety of sources	<input type="checkbox"/>
DESIGN – Team generated innovative ideas independently before selecting and planning which one to develop.			
<input type="checkbox"/> Minimal evidence of an inclusive selection process	<input type="checkbox"/> Partial evidence of an inclusive selection process	<input type="checkbox"/> Clear evidence of an inclusive selection process	<input type="checkbox"/>
<input type="checkbox"/> Minimal evidence of an effective plan	<input type="checkbox"/> Partial evidence of an effective plan	<input type="checkbox"/> Clear evidence of an effective plan	<input type="checkbox"/>
CREATE – Team developed an original idea or built on an existing one with a prototype model/drawing to represent their solution.			
<input type="checkbox"/> Minimal development of innovative solution	<input type="checkbox"/> Partial development of innovative solution	<input type="checkbox"/> Clear development of innovative solution	<input type="checkbox"/>
<input type="checkbox"/> Unclear model/drawing of solution	<input type="checkbox"/> Simple model/drawing that helps to share the solution	<input type="checkbox"/> Detailed model/drawing that helps to share the solution	<input type="checkbox"/>
ITERATE – Team shared their ideas, collected feedback, and included improvements in their solution.			
<input type="checkbox"/> Minimal sharing of their solution	<input type="checkbox"/> Shared their solution with user OR professional	<input type="checkbox"/> Shared their solution with user AND professional	<input type="checkbox"/>
<input type="checkbox"/> Minimal evidence of improvements in their solution	<input type="checkbox"/> Partial evidence of improvements in their solution	<input type="checkbox"/> Clear evidence of improvements in their solution	<input type="checkbox"/>
COMMUNICATE – Team shared a creative and effective presentation of their current solution and its impact on their users.			
<input type="checkbox"/> Presentation minimally engaging	<input type="checkbox"/> Presentation partially engaging	<input type="checkbox"/> Presentation engaging	<input type="checkbox"/>
<input type="checkbox"/> Solution and its potential impact on others unclear	<input type="checkbox"/> Solution and its potential impact on others partially clear	<input type="checkbox"/> Solution and its potential impact on others clear	<input type="checkbox"/>

START WITH THE CHALLENGE PROMPT



START

Explore your energy journey. How can you reimagine a better energy future? It starts here, with your critical thinking and innovation leading the way to tomorrow's energized world with *FIRST*® *ENERGIZE*™ presented by Qualcomm.

**SAMPLE FROM
SUPERPOWERED**

➔ Identify a specific problem related to improving your energy journey.

An energy journey is where energy comes from and how it is distributed, stored, and used. The Project Sparks (see Sessions 1-4) explore problems related to different energy journeys. Your problem could come from a Project Spark, or it could be a different problem you want to solve.

➔ Research your problem and solution ideas.

Explore energy sources and how energy is stored, distributed, and used in your community. Can you find ways to make part of your energy journey better? Can you improve one step to be more efficient, reliable, affordable, accessible, or sustainable? What solutions already exist? Are there any experts or users you could interview?

➔ Design and create a solution that could improve your energy journey.

Use your research and explorations to either improve an existing solution used in your energy journey or design a new innovative solution. Can you make different energy technology choices? Make a drawing, model, or prototype of your solution.

➔ Share your ideas, collect feedback, and iterate on your solution.

The more you iterate and develop your ideas, the more you will learn. What impact will your solution have on your community?

➔ Communicate your solution with a live presentation at an event.

Prepare a creative and effective presentation that clearly explains your Innovation Project solution and its impact on others. Make sure your whole team is involved in sharing your progress.

PICK A PROBLEM THAT IS MEANINGFUL

- Always think of a problem first
- The problem can be as small or big as you want
- Most students relate better to local problems that impact their lives

SAMPLE PROBLEMS FROM PAST YEARS

- **2011: Food Factor (food safety)**
 - Detecting spoilt milk
- **2012: Senior Solutions (senior citizens)**
 - Helping seniors remember where they left their possessions
- **2013: Nature's Fury (natural disasters)**
 - An early-warning ash detection system for airplanes
- **2014: World Class (education)**
 - A better way to learn to program the EV3 (EV3Lessons.com)
- **2015: Trash Trek (garbage)**
 - A more efficient way to recycle batteries
- **2016: Animal Allies (animals)**
 - Bats getting killed by wind turbines
- **2017: Hydro Dynamics (water)**
 - Detecting leaking pipes



CREDITS

- This lesson was written by Sanjay and Arvind Seshan
- More lessons available at www.ev3lessons.com and www.flltutorials.com



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