Innovative Solutions
UNDERSTANDING THE FIRST LEGO LEAGUE ANNUAL PROJECT CHALLENGE
Famous FIRST LEGO League Innovative Solutions

- 3D printed hands for children
- Washable barcodes for produce to make sure food is fresh
- Baby temperature monitor for car seats
- Smart cane for visually impaired, using an ultrasonic sensor
- Easy grip spoon for seniors and individuals with diseases like Parkinson’s
- Cigarette butt legislation in Washington state
Identify a Problem

- Start with answering the sample questions from the challenge manual
- Personal interactions with the theme
- If you already know an expert, what are they working on?
- What are local universities doing in the area of the theme?
- Anything your team already knows, or is already interested in with regards to the theme.
Dive Deep

- What is already being done to address the problem – why aren’t they working?
- Has someone solved a similar problem, will that solution work in this case?
- Are there solutions, but they aren’t being used? Why? How could you change that?
- What is being developed, but isn’t finished yet? Can you help or suggest changes based on your research?
- Is there a group that is excluded by existing solutions, can you help them to be included?
Design a Solution

- How does the solution solve the problem?
- What about it is new and different?
- Why was it not being done already?
- How much does it cost? For who?
- If your solution already exists, why does the problem still exist? Can you design a solution to THAT problem?
- Solutions can be physical, social, legislative, or virtual – what works best for your problem? Why?
- Can your solution be made at this time? What other technology is needed to do this? Star Trek style solutions are still welcome, but they are a tough sell with Oregon judges. You need to know your stuff!
The Problem of Plastic Bags

Problem: Plastic bags not only clog landfills, but escape into the environment endangering animals and destroying habitats. They cause infrastructure damage in water drainage systems and cost our cities lots of money in repairs.

- **Solution:** Turn plastic bags into rope – by twisting bags together we can make a very strong rope. We already have rope twisting technology we just need to collect and twist the bags. We tested our rope to show how it is stronger than other ropes.

- **Solution:** Pass legislation to ban the use of one-time use plastic bags being given away at stores. This prevents plastic bags from entering the environment and becoming a problem. We know this works because it is done in several other places.

- **Solution:** Park plastic bag collection bins. Make it easier for people to recycle plastic bags, by placing secure slender bins in parks and putting in place a volunteer program to collect the bags weekly to be taken to a local recycling facility. The team observed people threw bags in loose trash cans if a recycling option was a farther walk.
In your research you should learn who else is working on this problem, or who is in a position to use your solution.

Your experts will have opinions and knowledge. Listen to their criticism and be prepared to think critically about your solution given their feedback. Do you need to make changes? How would you address a similar criticism in the future?

Remember the basics of a journal article: Who, What, Where, Why, and How – you should know all of this for your solution.

Nothing in life is free, everything has a cost – what would your solution cost. A good solution with a high cost needs to be rationalized as to why it is better than a lower cost solution.
Fact from Fiction

There are lots of ideas on the internet, in books, and with our experts. It is important to be able to tell what is opinion, what is a fact, and what is made-up.

- **TEST the Idea**: When possible do an experiment!

- **Share Data**: If you can’t do an experiment, can you use someone else’s? How many people have done experiments that show your solution would work or at least address the problem?

- Is the information from multiple trusted sources? Your expert is great, but they are still only one person. Do their scientific peers agree? Is it published in a peer-reviewed journal? Is it on Wikipedia? Is it in the Onion?

- Does it sound too good to be true? Why hasn’t anyone else discovered this?
What is Innovative?

- Something completely new
- Using an existing solution in a new way – BE CAREFUL – the judges need to see how this is a new way too!
- Improving something that already exists
- Improving access to or awareness of an existing solution
- Making an existing solution easier to use.
Styrofoam to Glue for School

- Existing Solution: Orange Oil dissolves Styrofoam and turns it into glue. The team learned this in their online research and tested it in their home. They even tested the strength of the glue.

- Innovative Solution: Create a mixing device for making the glue AND an app so that people can find schools that own the mixing devices and are collecting Styrofoam to make their own glue for schools.
Judging

You can do everything we have mentioned and still not get marked well if you don’t share the right information with the judges. – Answer all the questions on the rubric!

- What is the problem being solved?
- What is the Solution?
- What is Innovative about your solution?
- How did you come up with your solution? Did you have to change your design, approach, or ideas?
- What research have you done? Who have you shared with? Don’t forget any experiments!
- What are the limitations, costs, problems with your idea?
- What other solutions address your problem and what are their failings?
- Why is your idea a good one?

You have 5 minutes to creatively share all of this in a memorable way!