

Junior FIRST LEGO League

Suggested Lesson Plans

As Created by Stamford Robotics (FLL and JFLL in Stamford, CT)

Please send any corrections or suggestions for update through our contact form at

www.stamfordrobotics.org

Table of Contents

Purpose	2
JFLL Coaches Promise.....	2
Coaches' Promise.....	2
FLL Core Values	2
Season Overview.....	3
Resources.....	4
Week #1 – Get to know each other and make a team promise	5
Week #2 – What thing will we pick?.....	6
Week #3 – Let's decide!	7
Week #4 – Start Model Planning, Continue Learning.....	8
Week #5 – Build It, Show It, Learn It.....	9
Week #6 – Simple Machines and Building Week!	10
Week #7 – Lets tell our story	11
Week #8 – Complete the model and poster.....	12

Purpose

Although JFLL is not a "class" in the formal sense of the word, we know that coaches want and need some structure to help them understand how they can run their meetings and have a sense if they are "on track". To that end we have published Lesson Plans for a sample 8 week schedule on our website. You can and SHOULD deviate from these plans whenever you feel that you can do something different or better for your team. But we hope they will help take away some of the "What do I do now?" anxiety that we know some of you are probably feeling.

JFLL Coaches Promise

As the coach of a JFLL team, please read the information below for further understanding of JFLL core values. As coach, you are responsible for honoring and communicating JFLL core values to team members, team volunteers, and others affiliated with your team. All JFLL teams are expected to abide by JFLL rules and guidelines as they exist now and as they may be set forth during the season. Team rules, guidelines, and policies and procedures are detailed in this guide. Any updates will be communicated to JFLL coaches via email.

Coaches' Promise

- 1) The kids come first. JFLL is about the kids having fun and getting excited about science and technology. Everything my team does starts and ends with that principle.
- 2) The kids do the work. This is their opportunity to learn and grow. The kids on my team do all of the research, problem solving, and building. Adults can help them find the answers, but cannot give them the answers or make the decisions.
- 3) My team is comprised of six or fewer members, all team members participate on only one official registered JFLL team, and all team members are no older than 9 on January 1st of the Challenge year.
- 4) JFLL communicates with my team via the primary email address I provided, and I am responsible for reading and relaying all aspects of JFLL guidelines and rules to my team, other coaches, volunteers, and parents.
- 5) I will encourage my team members, other coaches, volunteers, and team supporters to develop and practice a set of JFLL Values that reflect FIRST's goal to change culture in a positive way by inspiring others through our team's actions and words.

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FLL Core Values

- We are a team.
- We do the work to find the solutions with guidance from our coaches and mentors.
- We honor the spirit of friendly competition.
- What we discover is more important than what we win.
- We share our experiences with others.
- We display gracious professionalism in everything we do.
- We have fun!

Season Overview

In this section we give a brief overview of where your team should be as the season progresses. This will help you to feel “on track” as you learn with the kids and guide them in preparing their work for the Expo.

We will break this down as “early”, “middle”, and “late” in the season.

When	Learning	Model	Poster
Early	Kids will start with some ideas about transportation. They will probably understand that people move by cars and trains, but may not have given much thought to how other things are transported. Even in cases where they know how other things are transported, they may not understand the multiple transportation steps that many items must take to get to them. First third of the season is spent learning about different modes of transporting thing and different things that can be transported	Kids should just be playing with LEGOs at this point. Don't have them trying to build any sort of final model at this point. Way to early in the season. Kids should know that making a LEGO model representing what they learned is part of the challenge.	Tell kids making a poster is part of the challenge. Focus as a coach is collecting/storing all artwork or work product for later use on the show me poster! That's all for now.
Middle	At this mid point in the season team should have a fairly good understanding of both different modes of transportation as well as a good variety of things that are transported and how. Focus is on selecting their “one thing” and learning as much about it as possible.	Focus is on deciding what will be on the model and practicing simple machine building concepts from the samples that come with the kit. Transition into building actual model with most of model done as you get to the late stage.	A decent amount of material should have been collected for the poster. This is probably a good time to start reminding kids what ultimately needs to be on the poster and start tasking the team to produce any materials that are needed.
Late (last couple of weeks)	Kids should have not only a deep understanding of various transportation methods and types of things that are transported, they should have an especially complete understanding of how their “chosen thing” is transported from origin to destination with all the various steps in between	The LEGO model should be basically done with maybe some last minute tweaking or embellishing. Kids should be practicing how to describe their model to reviewers.	The poster materials should be pretty much done with only final assembly steps needed. Kids should be practicing how to describe their poster to reviewers.

Resources

Everything in the below guide is just that – a GUIDE! Much will depend on your kids (are the 2nd or 4th graders or a mix?), how many meetings you'll have (the below can/should be compressed/expanded as needed), etc.

Want to supplement the below guide with additional travel related activities? If so, feel free to visit these websites to find more resources, games, activities, etc.

And if you find one, let us know by contacting us via our contact form at <http://stamfordrobotics.org> !

<http://www.enchantedlearning.com/crafts/vehicles/> (This one is awesome and my favorite!!)

<http://www.atozkidsstuff.com/tran.html#air>

<http://www.artistshelpingchildren.org/transportationartscraftstvehiclescarstrucksboatstrainskids.html>

<http://americanhistory.si.edu/onthemove/index.html>

<http://americanhistory.si.edu/onthemove/games/>

<http://www.dot.ca.gov/kids/>

<http://edtech.kennesaw.edu/web/transport.html>

<http://www.iowadot.gov/kidspages/games.html>

http://www.google.com/search?hl=en&rls=com.microsoft:*&q=activities+and+games+for+kids+to+learn+about+transportation&start=10&sa=N

Week #1 – Get to know each other and make a team promise

	<p>Coach!</p> <p>Prepare for this week by reviewing the Smart Move Challenge document. In particular you are focusing on the “Think About It” section for this week.</p> <p>HIGHLY RECOMMENDED!!</p> <p>Review this word list of transportation words before the meeting! http://www.enchantedlearning.com/wordlist/transportation.shtml</p>	
1	Introduction- Get to Know Each Other	10 to 15 minutes
2	<p>Go over the FLL values and Make rules for the team meetings for example</p> <p>We will always come on time</p> <p>We will not shout over each other</p> <p>We will always cleanup before we leave</p> <p>We will always be polite</p> <p>We will have fun</p>	10 to 15 minutes
3	<p>Discuss Transportation</p> <p>Discuss as below, or use an activity from this page to help... http://www.enchantedlearning.com/crafts/vehicles/ I like this one... http://www.enchantedlearning.com/wordlist/writebycategory5/vehicle/ but perhaps change the categories a bit for example (air transportation, sea transportation, land transportation, human powered transportation, space transportation, Snow/Ice transportation, Motorized/or machine transportation) instead of the categories for parts.</p> <p>What kinds of things go from one place to another? - People, Food, What else (brainstorm)?</p> <p>How do things go from one place to another? For each of the above things, discuss different ways they get from one place to another - Trains, Planes, etc... (brainstorm)</p> <p>End up with a lists of “things that travel”, and “different ways they travel”.</p> <p><i>Don't take too long or go into too much detail at first meeting. The kids will come up with more as the season progresses!</i></p>	20 to 30 minutes
4	<p>Something to do at home...</p> <p>1. Have each team member pick one of the modes of transportation they came up with in the meeting. Whatever they pick they should draw/color a picture of for the next meeting.</p>	10 minutes
5	<p>If time permits...</p> <p>Break out some LEGO and make something that travels</p>	0 to 20 minutes
6	Cleanup	10 minutes
7	Total	60 to 80 minutes

Week #2 – What thing will we pick?

	<p>Coach!</p> <p>Prepare for this week by:</p> <ul style="list-style-type: none"> - Making sure you have a large folder to keep all kids work. You'll need it when it's time to create the show me poster! - Review the Smart Move Challenge document. In particular this week you are focusing on the start of the "Learn About It" section as your team gets enough choices and information to decide in week 3 their chosen "thing" 	
1	Start the Meeting – Review Team Promise	5 minutes
2	<p>Go over @home activity from last meeting</p> <p>Coaches:</p> <ul style="list-style-type: none"> - Collect any pictures or work from the kids - Record the "modes of transportation" the kids picked - Discuss other modes of transportation the team may have missed and record. 	5 to 10 minutes
3	<p>Start discussing what "thing" you will pick.</p> <p>How will your team decide?</p> <ul style="list-style-type: none"> - Distance? - Number of different ways it travels? - Size? - ??? <p>Come up with 6 candidates (or 1 per team member) for the "thing" you will research.</p>	10 to 15 minutes
4	<p>@home activity</p> <p>Assign each candidate "thing" to a team member</p> <p>Each team member should list the following for their "thing"</p> <ul style="list-style-type: none"> - How big is it? - How many different ways does it have to travel to get from where it starts to where it ends? - How far does it travel? - Does it have more than one "piece" that travels? - Is it something you buy? <p>Finally, write two or three sentences on why you think your thing would be good to study.</p> <p>Perhaps include an activity from one of the "resources" websites – like this one...</p> <p>http://www.enchantedlearning.com/connectdots/train/</p>	10 to 15 minutes
5	<p>Building Time:</p> <p>If you have enough LEGO, split into two groups. One group should "free build" some sort of transportation device (vehicle, simple boat, whatever). The other group should try to build one of the simple machine instructions that comes with the standard kit.</p>	15 to 20 minutes
7	Cleanup	10 minutes
8	Total	60 to 85 minutes

Week #3 – Let’s decide!

	<p>Coach!</p> <p>Prepare for this week by:</p> <ul style="list-style-type: none"> - Doing your own research on the 6 candidate “things” the kids are deciding on. Make sure you can add detail that the kids may miss if necessary. - In this week you are focusing on deciding on the “thing” your team will focus on. Almost anything is fine here. Something creative and interesting to the kids is a plus. - You’ll soon be having kids working more with LEGO and simple machines. If you have the official kit, try building some of the sample models that come with the kit instructions. There are many sample simple machines and none of them should take you more that 15 minutes or so to build. 	
1	Start the meeting – review the team promise	5 minutes
2	Go over @home activity from last meeting <ul style="list-style-type: none"> - Put each candidate “thing” on a whiteboard or similar 	5 to 10 minutes
3	Decide on your team’s chosen “thing”! How your team will decide will depend a lot on your team’s dynamics and maturity. If you can guide them to have a reason for their choice great. Ideally the choice will be something fun and interesting to the kids.	15 to 20 minutes
4	@home activity Now that we have a decided “thing” let’s find out more. Assign kids on the team to find our more in an age appropriate way. Older kids maybe can do research on the internet or look for books. Younger kids perhaps can talk to their parents about the chosen thing. <ul style="list-style-type: none"> - All team members: Think about “who can we ask” for more information about our chosen thing (ex. If cars, go to a car dealer, if gum go to a candy store, etc.) - Additional research as appropriate - Be prepared to talk about what you found out with the team at the next meeting - Think about a team name! Something to do with transportation? Lego? Our thing? Come with ideas! 	5 to 10 minutes
5	Building Time: If you have enough LEGO, split into two groups. One group should “free build” some sort of transportation device (vehicle, simple boat, whatever). The other group should try to build one of the simple machine instructions that comes with the standard kit. (Should switch groups from last meeting to all kids get to try building one of the simple machine examples)	20 to 30 minutes
6	Cleanup	10 minutes
7	Total	60 to 85 minutes

Week #4 – Start Model Planning, Continue Learning

	<p>Coach!</p> <p>At this midpoint of the season you want to have accomplished the following by the end of this meeting:</p> <ul style="list-style-type: none"> - Selected a “thing” that travels - Collected at least some information about how that thing travels - Built an understanding of different ways things travel - Ready for home stretch to make model and poster 	
1	Start the meeting – review the team promise	5 minutes
2	<p>Go over @home activity from last meeting</p> <ul style="list-style-type: none"> - Record all information discovered about chosen thing - Make list of “who we can ask” ideas 	5 to 10 minutes
3	<p>Discuss:</p> <ul style="list-style-type: none"> - Are we missing any information about our chosen thing? - What questions should we ask an expert if we can? 	5 to 10 minutes
4	<p>Our Model:</p> <ul style="list-style-type: none"> - Ask kids to think about if we want to show all of our things travel or just part of it in detail - Have kids break into pairs or groups of three to draw and write down what things they want on the model. 	5 to 10 minutes
5	<p>Building Time:</p> <p>Possible choices here</p> <ul style="list-style-type: none"> - Have kids practice building simple machines - Have kids build one or more of the things they want on the model <p>Note: You don’t want the model finished “too soon” otherwise there won’t be much LEGO to work with towards the later parts of the season.</p>	15 to 30 minutes
6	<p>Decide on a Team Name!</p> <ul style="list-style-type: none"> - Take a few minutes before meeting is over to decide on a team name 	10 minutes
7	<p>@home</p> <p>Invite a visitor (this might be a homework assignment for the coach!!)</p> <p>OR Email a visitor (again probably a homework assignment for the coach!!)</p> <p>Kids:</p> <ul style="list-style-type: none"> - Make a picture of the chosen thing for the poster - Assign each team member to write “something nice or interesting” for the poster about another team member (make sure all team members are assigned) 	5 to 10 minutes
8	Cleanup	10 minutes
9	Total	60 to 80 minutes

Week #5 – Build It, Show It, Learn It

	<p>Coach!</p> <p>This meeting agenda will depend a lot on where you are and what you have from week 4.</p> <p>Examples:</p> <ul style="list-style-type: none"> - Do you have an “expert” the kids can talk to? If so that may take up a lot of time this week. - Do you have an expert the kids can email? In that case this meeting can be used to write that email for you as coach to send. 	
1	Start the meeting – review the team promise	5 minutes
2	<p>Go over @home activity from last meeting</p> <ul style="list-style-type: none"> - Collect pictures of the chosen thing for use on the show me poster - Collect the “something nice or interesting” about each team member for the show me poster 	5 to 10 minutes
3	<p>Learning:</p> <ul style="list-style-type: none"> - Talk to expert if available - Did you learn anything new? What do you know about how your thing travels? 	0 to 5 minutes
4	<p>Poster Planning:</p> <ul style="list-style-type: none"> - Let’s review what goes on the poster (from the challenge). What do we have? What do we need? - Help the team make decisions about what they want on their poster. 	5 to 10 minutes
5	<p>Model Planning:</p> <ul style="list-style-type: none"> - Did the team decide to model the whole route of transport of the thing or just part? - Get team agreement on what will be on the model. - Can the different parts of the model be assigned to pairs of kids to work on and complete? 	10 to 15 minutes
6	<p>Build It:</p> <ul style="list-style-type: none"> - Assign building tasks as above 	20 to 30 minutes
7	<p>@home</p> <p>As necessary assign things for the kids to do. Hopefully the team is starting to drive this and help in planning what needs doing! Examples:</p> <ul style="list-style-type: none"> - Does anything need to be written/drawn for the show me poster? - Are there any details or information about our chosen thing we still want to find out? - Will we include our pictures on our show me poster? Real pictures, hand drawn, etc.? 	5 minutes
8	Cleanup	10 minutes
9	Total	60 to 90 minutes

Week #6 – Simple Machines and Building Week!

	Coach! Time to finish the model! You can still work on this in week 7/8, but it is nice to have all the critical model elements done here. That way you can focus on the show me poster, embellish the model as necessary, and practice how the kids will talk to the reviewers.	
1	Start the meeting – review the team promise	5 minutes
2	Go over @home activity from last meeting - As necessary/assigned	10 minutes
3	Discuss Simple Machines - What on our model will move? - Will it use a motor?	10 minutes
4	Building Time: - Build a simple machine or moving element for the model - Other team members can continue to build model - Try to get the model mostly done	20 to 40 minutes
5	@home - Anything still needed for the Show Me poster? Bring that in or create.	5 minutes
6	Cleanup	10 minutes
7	Total	60 to 80 minutes

Week #7 – Lets tell our story

	<p>Coach!</p> <p>Focus here is getting the show me poster done. Hopefully you have collected lots of good material to put on the poster already! This is a good week to bring in fun art supplies and maybe get help from parents if possible or needed.</p>	
1	Start the meeting – review the team promise	5 minutes
2	Go over @home activity from last meeting	5 minutes
3	<p>Decide who on the team will do what for the SHOW ME Poster (reference the “Show It” step in the challenge)</p> <p>a. Team info (team name, members, and coach)</p> <ul style="list-style-type: none"> - make sure to include something special about each team member <p>b. Where did you look for answers about transportation</p> <ul style="list-style-type: none"> - books? - Internet? - People you talked to? <p>c. Tell about your “thing that travels”</p> <ul style="list-style-type: none"> - what is it? - where it went? - how it got to EACH place? <p>d. Tell about your model</p> <ul style="list-style-type: none"> - what is moving on your model? - where is it moving? - how is it moving? <p>e. make it fun and attractive</p> <ul style="list-style-type: none"> - add pictures you made? - attach objects to it? 	20 to 30 minutes
4	<p>BUILDING TIME – Build/finish your team model (reference the “Build It” step in the challenge)</p> <p>Build a LEGO model that shows how your “thing” moved</p> <ul style="list-style-type: none"> - Model should be ALL LEGO and ONLY LEGO - Model should be built and fit on the 15” x 15” LEGO baseplate - Model should have at least one thing that moves. This could be with the motor included in the standard kit (preferred), or something that moves by hand. - Model should include a “simple machine” (can be built with LEGO ramps, levers, pulleys, gears, wheels, axles, etc. Examples of simple machines and building instructions are included in the standard kit to guide coaches) - Do not print or decorate LEGO parts or use arts and crafts on the MODEL. 	10 to 20 minutes
5	Discuss what needs to be done at the next and last meeting to be 100% ready for the Expo!	5 minutes
6	<p>Something to do at home</p> <p>Finish pictures and write ups for the Show me poster!</p>	5 minutes
7	Cleanup	10 minutes
8	Total	60 to 80 minutes

Week #8 – Complete the model and poster

	Coach! Tip from the “pros”. Try to have time for the kids to practice talking to the reviewers. Does everyone speak, or does one team member do all the talking? Do the kids treat each other with respect or talk over each other? Tips: - Assign kids to talk about specific things as per the Challenge - Practice!	
1	Start the meeting – review the team promise	5 minutes
2	SHOW ME POSTER – Complete Poster	As necessary
3	LEGO MODEL – Complete Model	As necessary
4	Practice how you will present your model and poster at Expo to reviewers - Make eye contact with reviewers - Speak one at a time - Make sure everyone on your team gets a chance to speak or answer questions - Have a plan, who will talk about what?	15 minutes
5	Something to do at home... Remember to invite your family and friends to come to the Expo!	5 minutes
6	Cleanup	10 minutes
7	Total	As necessary!