

2015 –2016 Jr.FLL WASTE WISESM Challenge



Think About It

When you are done with something, you probably call it “trash” or “waste” and throw it away. Trash is any item you are done with and want to dispose of. It adds up in little ways – a wrapper from your snack, a soda can, a broken toy, and the box from your new game... By the end of the day, all of that trash needs to go somewhere.

In the city of Asunción, Paraguay, the people send all of their trash to a giant landfill outside of town. The **landfill** is smelly and dangerous, but it contains many things that could be recycled. People come to the landfill every day to find jars, plastic bottles, and cardboard boxes that they can sell to recycling companies. The people who search for **recyclables** created a town called Cateura near the landfill.

A man named Favio Chavez worked at the landfill. He wanted to help the people of Cateura, because he saw that the landfill caused many problems in the town. How could he help? In addition to his job at the landfill, Favio also played music. “Maybe,” he thought, “I could start an orchestra for the kids of Cateura. I can teach them to play musical instruments.”

Favio knew the kids of Cateura would have fun learning to play in his orchestra, but his plan had a problem. He did not have enough money to buy instruments for all the kids.

That’s when Favio had his strange idea. He found a man named Don “Colá” Gomez who lived in the town and often searched the landfill. Favio and Cola made a plan to supply instruments for the orchestra, and Colá got to work.

When the kids arrived to join the orchestra, they had a big surprise. All of the instruments were made from trash! The kids could see spoons, food tins, and even hairbrushes used as parts of the instruments. They looked a little funny, but it sure was fun learning to play those trash instruments.



A landfill is a place where lots of trash is stored. Most landfills start with a hole in the ground which is covered with a protective lining, then with layers of trash, soil, and other materials.



Recyclables are materials that can be broken down and made into something new, such as bottles or cans.



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Today the orchestra of Cateura is called “Los Reciclados,” or The Recycled Orchestra. They have played concerts in many countries around the world. Their instruments still look a little unusual, but the kids in The Recycled Orchestra love to play those recycled instruments. Favio and Colá showed them that throwing something away does not mean it is worthless. Even something you call trash could become something amazing if you use a little imagination.

Every person makes trash – you, your parents, friends, teachers, grandparents... everyone! That means a lot of people making a lot of trash. It's time to learn what really happens to all that trash in your community. It's time to become WASTE WISESM.



Your Jr.FLL Challenge this season is to:

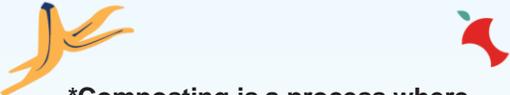
- Choose a piece of trash that you might throw away;
- Learn about what happens to that piece of trash after you are done with it;
- Then show what you have learned through your LEGO® model and *Show Me* poster.

Learn About It

Your team will become trash detectives. You will gather all the information you can about a piece of trash and where it goes. Make sure you pick a piece of trash that interests your whole team, because you will learn a lot about it.

Pick a Piece of Trash

First, choose a piece of trash that you or someone like you might throw away. Choose an item that fits into one of the categories below.

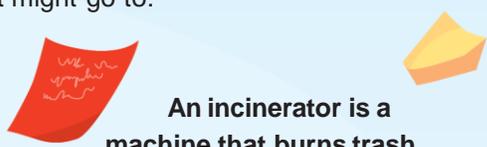
Categories of Trash	Examples (add your own examples if you want!)
Reusable: <i>Items that can be used again by you or someone else</i>	<ul style="list-style-type: none"> • Clothes (still wearable) • Books • Glass jar • Plates and drinking glasses • Old toys • Plastic grocery bag • What else do you reuse?
Recyclable: <i>Items that can be broken down and made into something new</i>	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="flex: 1;"> <ul style="list-style-type: none"> • Soda bottle • Soup can • Clothes (ruined) • Car tires • School papers • Cardboard shipping box • Banana peel* • What else do you recycle? </div> <div style="flex: 1; text-align: center;">  <p>*Composting is a process where food and plant waste (like a banana peel) breaks down. The composted food becomes fertilizer you can use to help plants grow.</p> </div> </div>
One-time use: <i>Items that can only be used one time before being thrown away</i>	<ul style="list-style-type: none"> • Candy wrapper • Disposable chop sticks • Paper towel or paper napkin • Plastic wrap • Packaging made from a mixture of different materials • What else do you throw away?

You may find that some items fit in more than one category depending on where you live or how you use these items. That's ok. Just pick the category that you think fits your piece of trash best, and then learn about it. You can decide later which category your piece of trash belongs in.

Explore It

What do you already know about your piece of trash? What else could you find out? You might want to ask questions like:

- What is your piece of trash made from? Does that make a difference in where and how you throw it away?
- Where does your piece of trash usually go after you throw it away? It might go to:
 - A transfer station where recyclables are sorted before being made into something new.
 - A landfill where trash is stored and covered.
 - An **incinerator** where trash is burned to create energy.
- Does anyone make decisions about what will happen to your trash? What is the name of their job? You might find jobs like:
 - An environmental engineer works to solve or prevent environmental problems caused by trash.
 - A sanitation worker collects trash from your home or works at a trash collection site.
 - A city planner makes plans for how a whole city or town will collect and handle trash.
- Is your trash handled by any special vehicles or machines? How do they work?
- Could something new be made out of your piece of trash? What is it and how is it made?



An incinerator is a machine that burns trash. Incinerators often burn trash to create energy to power homes or businesses.

Find resources to learn more about your piece of trash and what happens to it.

- Try websites, books, or documentaries.
- Try taking a field trip to the place where your trash goes after you throw it away. Make sure you ask permission first!
- Try interviewing your family, sanitation workers, or other people in your community.
 - Do they know where your piece of trash goes?
 - Has the way they handle trash changed over time?
 - How do they reduce, reuse, or recycle?

Bring together all the information you learn about your piece of trash and discuss it with your team. Do you feel like you know your item pretty well? Alright then, let's build it!



Build It

Now it's time to build your LEGO model. Show your piece of trash, what happens to it after you are done with it, or where it goes.

Something on your model must move using a LEGO motor. (Need a hint? Remember, people move all the time! If your trash does not move by itself, could you show a person handling it?) Here are some examples.

Items that can be reused by you or someone else:

- Show someone cutting ruined clothing into rags for cleaning.
- Show a flower growing out of a flower pot made from a used plastic bottle.
- Show someone pouring fresh jelly into glass jars that have been cleaned.
- Show someone cutting a used shipping box to make a poster board for a school project.
- Show someone putting on a pair of donated eye glasses.

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Items that can be broken down and recycled into something new:

- Show someone drinking from a soda can.
- Show a machine sorting recyclable bottles, cans, paper, and more.
- Show a machine shredding used plastic bottles so they can be made into something new.
- Show a worm helping to compost (break down) food scraps.
- Show someone making a shirt out of recycled plastic.

Items that can only be used one time and thrown away:

- Show someone removing non-recyclable packaging from a new toy.
- Show a garbage truck collecting trash.
- Show a tractor covering a new layer of trash at a landfill.

Here are the rules for your model:

- Build your team's model using your imagination (not a kit with instructions).
- Build your model out of LEGO elements only. You can use any LEGO bricks, figures, or moving parts you need.
- You must make something move on your model using a LEGO motor. You may use any LEGO motor.
- You must include at least one simple machine – gears, pulley, lever, wheel and axle, inclined plane, or screw.
- Your model must be no bigger than 15 inches by 15 inches. This is the size of a LEGO XL baseplate, but you may use any LEGO base up to 15 inches by 15 inches.
- Do not paint or decorate the LEGO pieces in any way.

Share It

Your team has learned so much! Now it's time to share what you have learned so others can learn about it too.

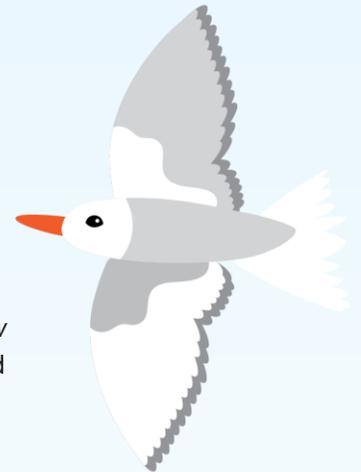
Show It

Create a *Show Me* poster to show your team and what you have learned. Your *Show Me* poster will help you teach others about your team and your trash's journey – and show them how hard you worked. Your poster should show:

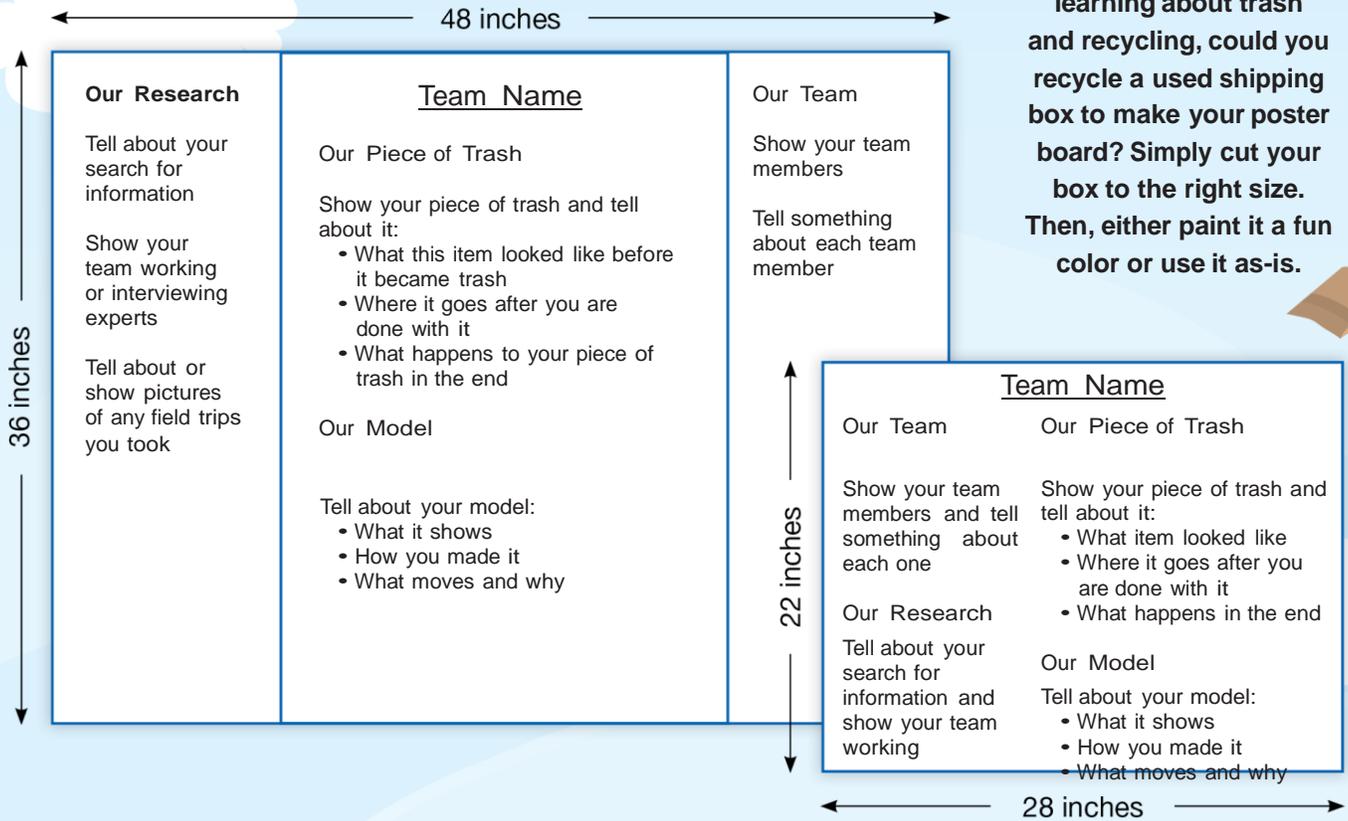
- Your piece of trash and what you learned about where it goes.
- The places you hunted for answers and any people who helped you learn more.
- What your model represents and how you made it.
- Your team. Include something nice about each team member and Coach.

Here are the rules for your *Show Me* poster:

- Use a poster board that is either 22 inches by 28 inches (flat) or 36 inches by 48 inches (tri-fold) – no bigger.
- Use words, drawings, photos, or small objects attached to the poster to tell about what your team learned.
- Tell about your model – including what part moves and how you used a simple machine.



Lay out your *Show Me* poster in sections like this:



Since you are learning about trash and recycling, could you recycle a used shipping box to make your poster board? Simply cut your box to the right size. Then, either paint it a fun color or use it as-is.

Present It

There are many ways for your team to share what you have learned. Pick the right one for your team. You could:

- Invite the people who helped your team to a special team meeting. Invite people like your parents, guardians, teachers, or others. Present your model and *Show Me* poster to the audience.
- Attend a Jr.FLL Expo if one is available in your area. An Expo is a special type of Jr.FLL event where you will talk with Reviewers and other teams. All teams attending will receive an award at the end.
- Participate in a virtual Expo experience on the Jr.FLL Online Showcase at <http://jrfillshowcase.usfirst.org>. Create a team profile, share your poster and model, and collect virtual stickers from other teams.

Just for Coaches

These additional helpful documents are provided to registered teams. You may find them on the Coach Portal at <http://jrfillshowcase.usfirst.org>.

- Find suggestions on how to organize your team, your role as a Coach, and the season schedule in the Jr.FLL Coaches' Manual.
- Find meeting plan suggestions and optional worksheets in the Jr.FLL Team Meeting Guide.
- Find websites, books, and vocabulary words to help your team begin their research in the Coaches' Resources document.
- Still have questions? Email jrfillteams@usfirst.org for Team Support.