FLL Team #3632 No Named Ninjas - Innovation Project

Lego Is More Than A Toy Because: Lego Can Be Art

What makes Art….Art?

Art is the expression or application of human creative skill and imagination, typically in a visual form such as painting or sculpture, producing works to be appreciated primarily for their beauty or emotional power.

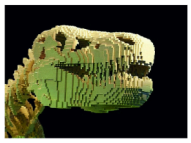
Lego Art is doing the above with Lego

What is special about Lego Art?

How are Legos alone Art?

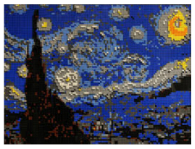
Lego come in a variety of pieces that can be combined together to create many different things such as things (see below)

Lego Art can…



Help you to learn about the past

Imitate Art



Allow you to imagine things that don't even exist…yet





Enable you to experience parts of nature that is hard to see

…be whatever you want it to be

Ryder volunteered to create something that he thought would be Lego Art and what he came up with was this beautiful sunset

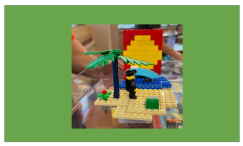


How We Shared Our Lego Hobby

Sharing Lego Art and Making It Your Own

To share our Lego building hobby, we shared Ryder's actual Lego Sunset Artwork with other teams in Agawam MA: Challenge Team #3643 - Brick Brains and Explore Teams #137 - Ninja's With Names and Team #138 - Cha Cha Dingos and Discover Team #104991

*We learned more about them by asking them questions and asked them to build their own Lego Art with the pieces from the sunset….**and this is what we learned…….***







Team #3634 - Brick Brains

What is your team #/name and who is on your team? *We are team 3634, Aaron, Quinn and Sophia*

What does your robot look like? *Our robot is named Nomnom because we have a chomping face on the top and we are still working on our end effectors*

Who are your favorite artists? */ musicians: Our favorite musicians include taylor Swift, Blue Man Group, Bruno Mars and Blink 182. Our favorite artists are Leonardo Di Vinci and Bob Ross. We also like ot think of ourselves as artists*

What missions are your team doing? *We are doing the (M8) rolling camera, (M10) sound mixer and (M2) Theater Scene Change.*

What Lego Art did you create from the Lego Sunset*? Forbidden Mc Island where the island monster lives and attacks anyone who tries to get to the golden arches.*

Team #137 - Ninja's With Names

What is your team #/name and who is on your team? *We are team 137, Johnathan, Jax, Cullen, Colton, Lucas and Mehmet*

What have you built this season? *Self portraits, Lego Bridges and Concert Venue with lights and a spinning stage*

Who are your favorite Artists?*: . Mr. Sawyer, Imagine Dragons, Jvke, Jimmy Buffet, Drop Kick Murphys*

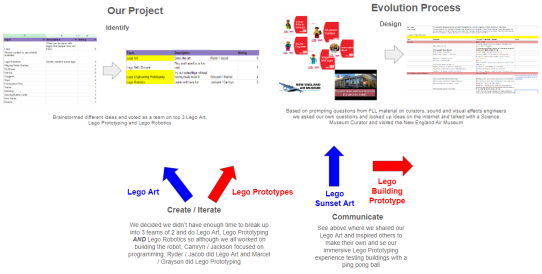
What other hobbies besides robotics do you have? *History, Floor Hockey, Pokemon, Video Games.*

What Lego Art did you create from the Lego Sunset*? We call it "When lava meets the ocean*





Our Project Evolution Process



Lego is More Than A Toy Because: Lego Can Make Prototypes

What is Lego Prototyping?

Building something on a small scale to test if an idea works

Save money and time. learn if things work on a small scale

How does it make a difference?

How can we use Lego Prototypes…



Robot Arm - duplicating body parts are complicated and materials used such titanium are expensive so this helps to try out designs before doing it for real



Clock - it's hard to keep accurate time. Before building a clock out of metal wood or something else taking lots of time the lego clock could test out if the design works



Tree House - before trying to see what braches can hold weight of rooms and if branches will allow for big rooms for people to fit a lego tree house can help test these out.



Crane - building a giant crane that can pick up heavy objects requires a lot of engineering. Lego prototype can determine the math if certain structures can pick up certain weights when scaled up.

Grayson's Lego Prototype Bridge Example



The well constructed bridge holds 15 pounds easily while the poorly constructed bridge bends while holding only 8 pounds

Marcel / Jacob's Immersive Experience

Our lego buildings demonstrate a stable design vs an unstable design….**TRY TO KNOCK OVER EACH WITH A PING PONG BALL TO TEST ITS STABILITY**

Test out this building prototype stability before building a real one



And compare it against this one



WHICH ONE WORKS BETTER?

FLL Team #3632 No Named Ninjas - About Us and Our Robot

Other Things We Did:
To Learn and Have Fun

Trip to the Air Museum!



NEW ENGLAND AIR MUSEUM

- What did you learn about air and space
- What did you learn about exhibits
- What did you like about some exhibits
- What didn't you like about other experiences
- What ideas are similar to what we used for our project

Science Museum Curator Interview



Springfield Science Museum Curator Questions

1. **What does your job entail?**
   Many different things! I am he STEM curator. I curate the people's experience and what they see in the museum. I do a lot with Astronomy. I work with an Aquarium maker too. I am always looking for something the museum hasn't had before
2. **How do you keep on technology/keep it up to date?**
   It depends on how much money the museum can spend and what grant money we can get and what the museum needs. The inner planetarium was the most recent large tech update. It was the 6th planetarium in the US and was built almost 86 years ago. We wanted to add videos and shows to the experience so we updated it but kept the original Planetarium too. Interesting fact, planetariums just turned 100 last Saturday and were originally developed in Germany.
3. **What are their hobbies and interests?**
   Landinature photography. Simulation games on computer. Sims style games. Biogenesis game. Game of Life.
4. **There used to be a fossil digging exhibit - is it still there?**
   No, that was a travelling exhibit that they were able to get for a few months.
5. **Does anything get broken? How do you protect the exhibits?**
   In the International Space Station room, we put in a "mini planetarium" that makes it seem like you are looking down on earth from the space station. Someone ripped the tablet from the stand. They will rebuilt and we made it a little bit stronger so that would not happen again. We made special casing for some items like rock/mineral collections. Our valuable items get more security to keep them safe.
6. **What is the one thing you want to get in the museum but can't get?**
   There is a huge pendulum at the entrance of the museum. They start it moving every morning. There are lines on the floor but the pendulum follows the earth's movement so it looks like it has moved. So as it moves, they would like it to knock things down. There is no door to get in there. There is no way to reset things every day. I would love to have dominos that little robots to set back up each day!
7. **What is your favorite part of your job?**
   Same as the last question, it's always different and there are new challenges to figure out. I have a great team to work with. I would get really bored doing the same thing every day.
8. **What is the most challenging part of your job?**
   No two days are the same. We have to fix things that have no manual, no plans and no youtube video to watch on how to fix them. Our telescope is something that can stop working - its over 50 years old and we need to fix it. We are lucky to know the son of the person who invented it and he helps us repair it when it breaks.
9. **Why did you become a curator?**
   I was asked to be one. I started working at the museum about 28 years ago and worked in the planetarium. That planetarium kept growing and had more added to it. Once I figured out how the things worked, I had value to the museum and they didn't have to pay for servicing. I was part time and worked as a teacher as my full time weekday job. I continued to take on more and more responsibility. I have a degree in zoology. I had to study chemistry and physics, math. I learned as much about the natural world as I could. I am a lifelong learner.
10. **Who are the people behind the scenes to help in curating the museum?**
    We have an assistant and also people who come in and run the shows. One very important job is the Preparator. This role takes the ideas and makes it work. We have an Aquarium curator, a project manager, a director to keep everything going and come up with the ideas. We also have financers to get grants and money to support our projects
11. **How do you make learning more interesting and engaging?**
    How do you make math/science interesting? They already are! You have to get to the interesting bits. Being hands on and minds on. Then helping the students to figure out the answer but not telling them the answers to make it interesting.
12. **What kind of technology is used for your exhibits?**
    We added video cameras so they can show some of our exhibits in their classrooms. We have monitors to show things and computers. We need to know how electrical circuits work so we can fix things. There is a lot of tech in the fish tanks - pumps and filters to recreate the systems that keep the environment clean and the animals alive.
13. **How often do you change exhibits and why do you decide to change them?**
    They haven't changed often enough. There is a section that gets changed three times a year. There is a Gingerbread exhibit, then winter exhibit and then one in summer. We are looking at changes for the live animal area. The Africa hall really needs a change too. It comes down to how much money there is to fund the projects. Maybe they do not to be changed but just be refreshed instead.

About Or Team:
Team #3632 No Named Ninjas



This years team has 6 participants: Grayson, Camryn, Jackson, Ryder, Jacob and Marcel working as a team on organizing a plan and materials, designing a robot to maximize points, programing the robot to implement the design and developing a project to have a serious impact.

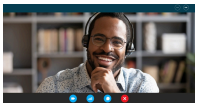
- Robot Design - link to our repository for brainstorming and choosing our design
- Robot Programming - link to github where we store our code with version control
- Project - our research, materials and final project information
- Core Values - how we implement Discovery, Teamwork, Impact Innovation, Inclusion and Fun
- Team Management - we use Asana for actions, tasks, milestones and assignments

(make sure we have stuff in the above links)
Check out our team page on www.filagawamrobotics.org

DISCOVERY – We explored new skills and ideas starting with having meetings in August and first discovered stuff about each other (Yoyo, etc.) and what we were interested in for FLL (programming, building etc.) We discovered more together when the game was released as we each brainstormed attachments for different missions, made prototypes and brought them to the team to teach each other different ways of solving problems.









INNOVATION – We used creativity and persistence to solve problems. We used an online random name generator to decide who was going to be the team lead for the day. We knew we wouldn't have time so visit all the places we wanted so we setup a Google Meet with the Springfield Science Museum curator

IMPACT – Team applied what they learned to improve their world.
We had a few ideas. Making lego art and selling it around town to get money to buy lego sets to donate to kids that don't have them. Then we thought we could reach a broader audience by inspiring others to build Lego Art and make Lego Prototypes to solve real problems.

See **Lego Art** and **Lego Prototyping** on our other display to learn more

INCLUSION – Team demonstrated respect and embraced their differences.
We wanted to make sure we included everyone's ideas when selecting a project and voted down a list of 13 to a list of 3. The top 3 were all lego related and we couldn't decide on 1 so we broke up into teams of 2 and went after all 3 projects.

We also got all the different ideas from our team on where we should visit

Trip	Details (Museum Curator, Stage Manager, Visual Effects Director, Sound Engineer)	Priority	Reach Out	
New England Air Museum	Museum Curator: Open daily. Have planes, engines, exhibits, simulators(12 and up). Tickets 13-15 per kid.	4		
Springfield Museums	Museum Curator: Fine Arts, Science, Dr. Seuss, History	3	sent email	
TV Nexus Studio 22 News	Sound editor, Visual effects director	2	sent email	Feedback
Mass Mutual Center	Sporting events, festivals, shows etc.	2	sent email	
Videographer	Visual Effects Director, Sound Editor	2		
Radio Station 95.5	Sound editor	0	sent email	
Museums already visited gather pics		0		
Symphony Hall	Sound editor, Visual effects director	0	sent email	Feedback

Topic	Description		Voting
Lego Art	Enjoy the art	Ryder / Jacob	6
Lego Sell / Donate	Play and have fun at low cost		3
Lego Engineering Prototyping	Try out somethign without having really build it	Grayson / Marcel	4
Lego Robotics	Learn and have fun	Jackson / Camryn	5

TEAMWORK – Team clearly showed they had worked as a team throughout their journey.

With only 6 team members and not a lot of experience we decided to drop 1 project to let that pair work on programming.

FUN – Teams clearly had fun and celebrated what they have achieved.

We had lots of fun making our T-Shirts and trading cards

Picture

doing our project and working on missions

Picture

sharing our success with other teams in town through a mock competition

Picture

And sometimes just goofing around…like trying to spell lego with our bodies!
[photos of team spelling LEGO]

About Our Robot:
Gimmy

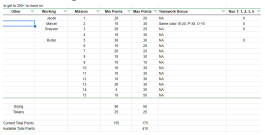
Designed by Everyone
Programmed by Camryn / Jackson

Why Is He Named Gimmy? Well actually it was Jimmy with a J last year that one of our team members threw out and then to mix it up we went with Gimmy with a G.

Total Points: Max points is 225=150 Missions + 50 Sizing + 25 Tokens

IDENTIFY – Team had a clearly defined mission strategy and explored building and coding skills they needed in all team members

- Clear mission strategy - do simple missions with the same attachment that is close together.



- Evidence of building and coding skills i all team members. - Everyone worked on the building of different attachments and because we had to divide and conquer to do the missions and project Camryn/Jackson focused on coding while the other team members focused on the project.

DESIGN – Team produced innovative designs and a clear work plan, seeking guidance as needed.

- Clear evidence of an effective plan - started trying to do a mission every meeting but then went to a mission a week due to time conflicts or some missions were more difficult than others.
- Clear explanation of robot and code's innovation features - each run is in a different project and backed up on the cloud. Made slight modifications to the arm/attachment to perform multiple missions

CREATE – Team developed an effective robot and code solution matching their mission strategy.

- Detailed explanation of robot its attachment and sensor functionality
  - Small robot to maneuver the tight space. Did prototypes of arms and selected the best of the best. Adapted the arm as we tried to do more missions
- Clear explanation of how code mades robot act
  - Used angles and degrees to determine robot direction changes and arm movement. Refined through testing and trial and error.

ITERATE – Team repeatedly tested their robot and

		code to identify areas for improvement and incorporated the findings into their current solution.
		- Clear evidence of testing their robot and code
		  - Tried to create a basket to do Mission 14 Audience Delivery but adding the basket had a negative affect on our current mission so we dropped it. Adapted same arm attachment to do many missions
		- Clear evidence their robot and code was improved
		  - Old baseline code did 4 missions and new baseline code does 6 missions
		  - Originaly tried to do mission 2 with the arm without success. Then added a bumper instead robot didn't have bumper so we could do mission 2 successfully
		
		Also learned how to back up
		
		COMMUNICATE – Team's explanation of the robot design process was effective and showed how all team members have been involved.
		- Clear explanation of robot design process
		  - Decided on a mission first. All team members would prototype ideas on attempts, we would take a little of the ideas from each to create the best of all ideas. Then we would create a simple program that would drive up to the mission first and then worked getting it to execute the mission
		- Clear evidence that all team members were involved