FIRST LEGO LEAGUE CHALLENGE

Mission Brainstorming Worksheets

TEAM NAME:

TEAM NUMBER:

Updated: August 2023

Instructions

This document is *NOT* a substitute for reading the Robot Game Rulebook (RGR). The main purpose of this document is to brainstorm mechanisms and methods for solving missions. We assume that every student will start by reading all the rules.

Instructions for students:

1. **Read the rules carefully - https://www.firstlegoleague.org/season#resources**
2. **Check for any updates - https://www.firstlegoleague.org/season#resources**
3. **Brainstorm ideas.** Think about what you might have to build or program to solve this mission. Do you need to push/pull/pick up/drop off? What type of mechanism would be needed?

Not part of scoring!

Very important to scoring!

EXAMPLE MISSION LAYOUT

Model Picture	Field Location	The story or background to the mission Basic description of each mission (not used for scoring).

- Regular black text under the mission description lists the main requirements: **XX points are in bold red.**
- If the referee sees these things performed or completed: **XX points as described.**

Blue italic text is for very important added requirements, leniency, or other helpful facts.

Sometimes, pictures teach you with an example score.	Sometimes, a picture has a description to help explain it.	The pictures may not show you all the scoring possibilities, just some examples!
XX points are in bold red.	**XX points are in bold red.**	**XX points are in bold red.**

Credit: *FIRST LEGO League* Robot Game Rulebook.

EQUIPMENT INSPECTION

If your robot and all your equipment fit completely in one launch area and are under a height limit of 12 in. (305 mm) during the pre-match inspection: **20**

Home — Home

Left Launch Area

Right Launch Area
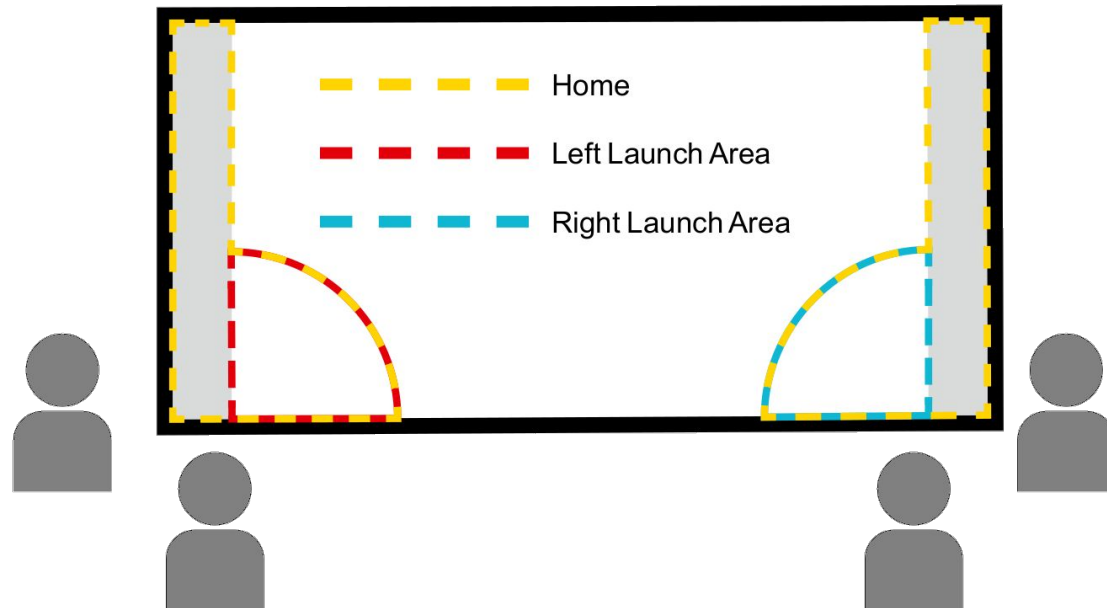
How can we make sure that everything fits in one launch area?
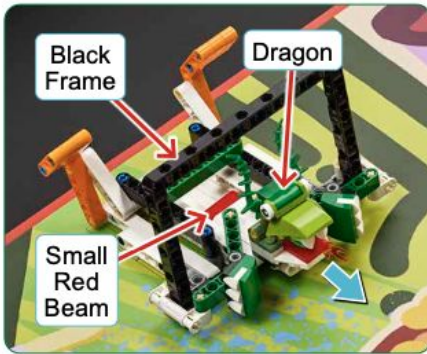
3D technology adds depth and interactivity to the cinema experience, making it more enjoyable.

Trigger the 2D cinema screen to become a 3D experience.

• If the 3D cinema's small red beam is completely to the right of the black frame: **20**

Black Frame

Dragon

Small Red Beam

0

20

20

**What model will we make? How can we solve this mission?**

Mechanical technology can support a theater performance by seamlessly changing the scenery, keeping the audience focused on the story.

Change the scenery to a different configuration, and consider what the other team will do so that you end with matching scenes.
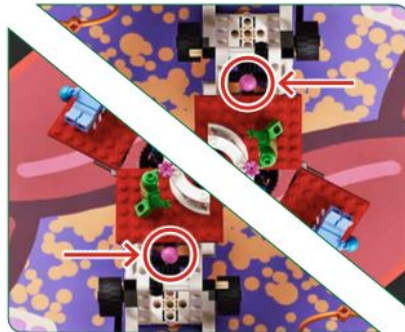
- If your theater's red flag is down and the active scene color is: **Blue: 10**   **Pink: 20**   **Orange: 30**
  - **Bonus**: And if both teams' active scenes match: **Blue: 20 ADDED**   **Pink: 30 ADDED**   **Orange: 10 ADDED**
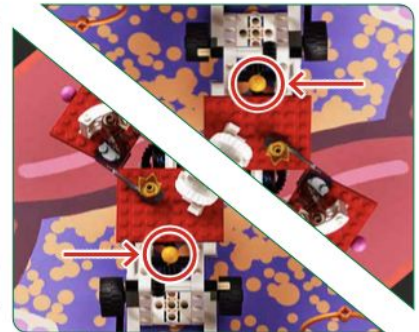
Teams may activate only their own model.
It is not possible to earn the bonus in remote competitions or if there is no opposing team.

Active Scene

Colored Ball: Blue
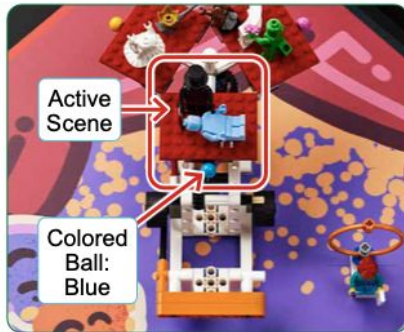
10

20 + 30

30 + 10
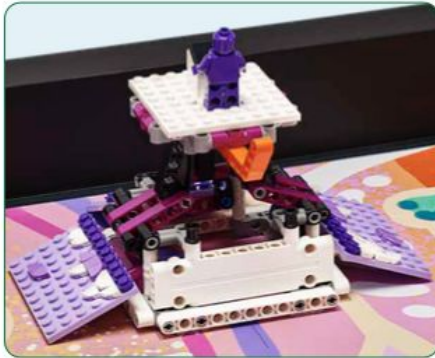
How can we solve this mission?

Immersing viewers so they are surrounded by the art allows them to experience and appreciate it in new ways.

Trigger the immersive experience for the viewer in the model.

• If the three immersive experience screens are raised: **20**

To score, team equipment may not be touching the immersive experience model at the end of the match.

0

0

Equipment

20

How can we solve this mission?

What makes something art? Create an amazing art piece worthy of being displayed in a museum.

You can use the bricks in Bag 4 to build your team's LEGO® art piece. Bring it to the match and then deliver it on the pedestal to the museum.

- If your team's LEGO art piece is at least partly in the museum target area: **10**
  - **Bonus**: And if the art piece is completely supported by the pedestal: **20 ADDED**

To score the bonus, at the end of the match, the art piece may only be touching the pedestal and the pedestal may not be touching any team equipment except the art piece

Museum Target Area

10

10+20

How can we solve this mission?

Augmented reality transforms a piece of art into an experience.

Rotate the statue to reveal an augmented reality experience.

• If the augmented reality statue's orange lever is rotated completely to the right: **30**
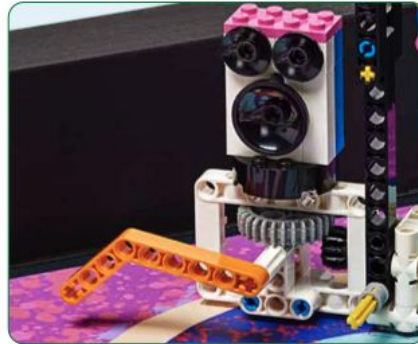
| 0 | 0 | 30 |

Visual and audio effects make a powerful impact and can be used to help the audience focus on different parts of the performance.

Set up the music concert by switching on the lights and sound.

- If the lights' orange lever is rotated completely downwards: **10**
- If the speakers' orange lever is rotated completely to the left: **10**

10
Lights

10
Speakers
Benefit of the Doubt

10 + 10

How can we solve this mission?
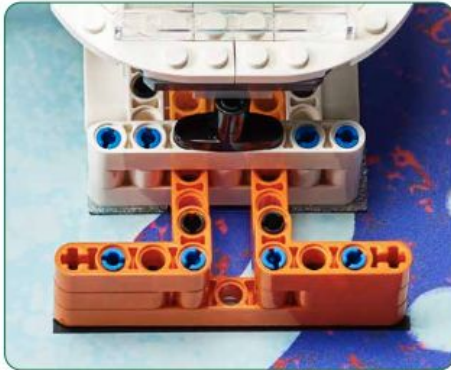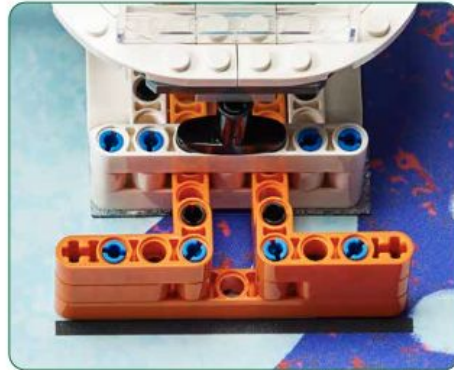
Innovative audiovisual technology can bring new characters to life through the use of holograms.

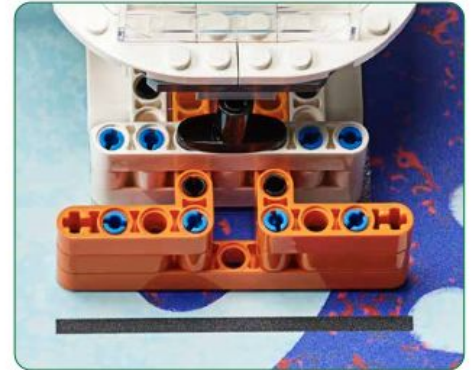Set the stage for the hologram performer to start the show.

• If the hologram performer's orange push activator is completely past the black stage set line: **20**

0

20

20

How can we solve this mission?

Getting a camera into exactly the right position to capture a shot requires a lot of precise movement and great communication with the actors.

Release the camera down the track to shoot the movie scene.

- If the rolling camera's white pointer is:
  - Left of dark blue, but right of medium and light blue: **10**
  - Left of dark and medium blue, but right of light blue: **20**
  - Left of dark, medium, and light blue: **30**

If the white pointer is on a colored tile, you earn points for the higher scoring area of the track.
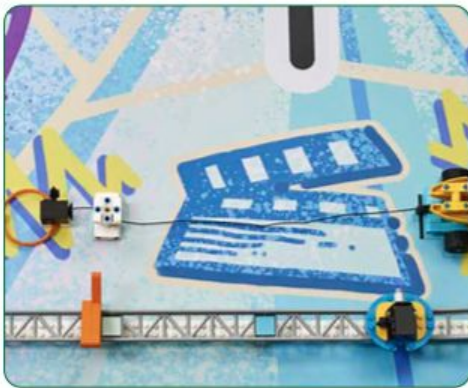
10

20

30

How can we solve this mission?

Pulleys, gears, and levers are some of the mechanical technologies used to move props to create the special effects for a movie.

Act out the scene by pulling the boat model along.
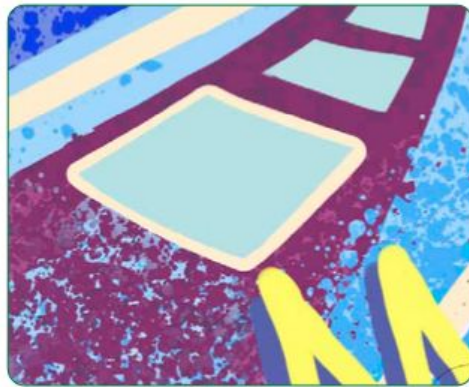
- If the boat is touching the mat and is completely past the black scene line: **10**
- If the camera is touching the mat and is at least partly in the camera target area: **10**

The camera includes the loop, but not the string.
When scoring, the scene line extends vertically from the top to the bottom of the field.

10

Camera Target Area

10

How can we solve this mission?

Mixing different inputs to produce the right balance of sound for the performance is an important task for any show.

Adjust the sound levels in the studio for ideal audio recording.

• If a sound mixer slider is raised: **10 EACH**

To score, team equipment may not be touching the sound mixer or sliders at the end of the match.

0
Equipment

10

10 + 10 + 10

How can we solve this mission?

Mission 11 LIGHT SHOW

Worm gear technology creates rotation that can enhance the way lights move in a light show.

Trigger the light show on the tower by raising the handles.

• If the light show's white pointer is within zone: **Yellow: 10   Green: 20   Blue: 30**

If the white pointer rests between zones, you earn points for the higher scoring zone of the two.

10

30

30

How can we solve this mission?

Virtual reality technology can transport an audience into new worlds, making their experience feel real.

Trigger the model repeatedly to create an artistic sculpture.

• If the chicken is intact and has moved from its starting position: **10**
   • **BONUS**: And is over or completely past the lavender dot: **20 ADDED**

0	10	10 + 20
Starting Position		

How can we solve this mission?
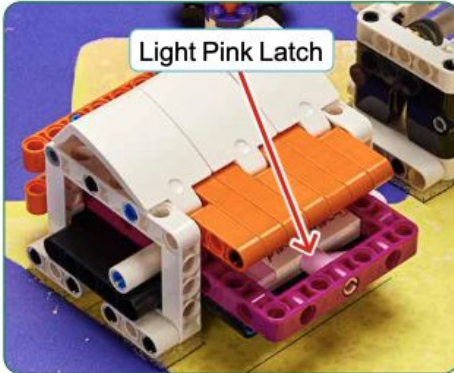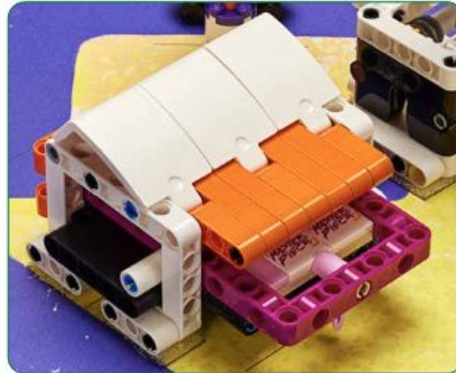
Many technologies are used to enable all sorts of great creations to be made anywhere.

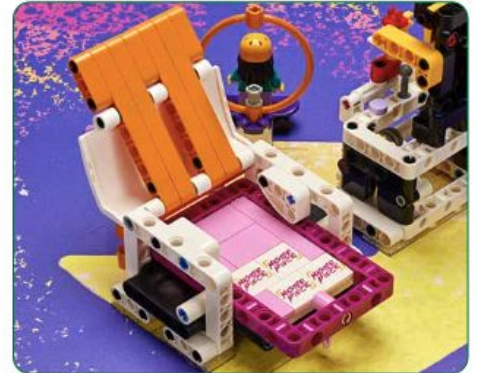Release the creation from the craft machine.

- If the craft machine's orange and white lid is completely open: **10**
- If the craft machine's light pink latch is pointing straight down: **20**

Light Pink Latch

0

20

10 + 20

How can we solve this mission?

There is no show without an audience! We love to share our artistic creations with others.

Deliver the seven audience members to the target destinations.

• If an audience member is completely in a target destination: **5 EACH MEMBER**
• If a target destination has at least one audience member completely in: **5 EACH DESTINATION**

Audience Member Target Destinations

5 + 5 + 5 +
5 + 5
(3 Members + 2 Destinations)

5 + 5 + 5 +
5 + 5 + 5
(3 Members + 3 Destinations)

How can we solve this mission?

Every type of artistic venue is filled with experts who are just as critical as the artists themselves. What careers would you find interesting?
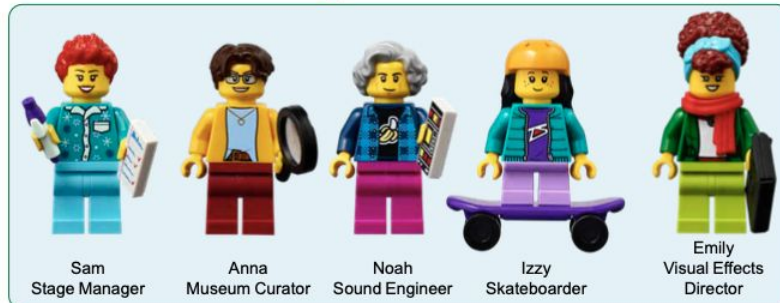
Deliver the experts to their target destinations.

• If the following experts are at least partly in their target destinations: **10 EACH**
  • Sam the Stage Manager in Movie Set
  • Anna the Curator in Museum
  • Noah the Sound Engineer in Music Concert
  • Izzy the Skateboarder in Skate Park
  • Emily the Visual Effects Director in Cinema

The expert includes the loop and the base.

Movie Set	Museum	Music Concert	Skate Park	Cinema

**Expert
Target Destinations**

**0
Experts in Wrong Locations**

Sam Stage Manager	Anna Museum Curator	Noah Sound Engineer	Izzy Skateboarder	Emily Visual Effects Director

Experts

**20
Izzy and Emily**

How can we solve this mission?

PRECISION TOKENS

You begin the match with six precision tokens worth 50 points. If you interrupt the robot outside of home, the referee will remove one token. You earn points for the number of tokens remaining at the end of the match. If the number remaining is:

1: 10,   2: 15,   3: 25,   4: 35,   5: 50,   6: 50

(See Rules, Outside Home 1 and 2)

How do we keep our free points?