CREATE JR.

To inspire and prepare the youth of today to become the engineers and scientists of tomorrow.

Game Manual
2022 - 2023

Table of Contents

Section 1: Introduction

1.1 - Overview

This section provides background for the ***CREATE Jr. game Moon Mining.*** CREATE Junior is played as a Collaborative competition for students primarily in the 4th, 5th and 6th grades. Younger students who are ready for this level of engineering challenge are welcome to participate as well.

1.2 - Introduction

NASA named the rim of Shackleton Crater at the South pole of the Moon as a candidate for its lunar outpost. The location would promote self-sustainability for lunar residents, as perpetual sunlight on the south pole would provide energy for solar panels. Furthermore, the shadowed polar regions are believed to contain the frozen water necessary for human consumption and could also be harvested for fuel manufacture. The crater is a major landing site candidate for the Artemis program and could be explored by a crew starting in 2024 with the first lunar outpost in 2028.

The CREATE Foundation is facilitating the exploration of the Shackleton Crater by sending four robots and an Analyzer to the area. Four drills have already been placed on the site, along with Seismic sensors and a revolutionary ”Teseract Cube”, which is heat source to keep the robots warm in the frigid shadows on the Moon.

Your Mission: to place the seismic sensors in the quake zone, move rock from the Drill sites to the Analyzer, Keep three Robots warm, and send One robot out on a search for a landing site.

It's up to you! Are you up to the challenge?

1.3 – Questions to Ponder

Here are some questions to ponder about this challenge. Who knows, you just might be asked some of these questions during the judges' interview...

1. How was the Moon formed?
2. What is the Moon made of?
3. How do we / did we get to the Moon?
4. What are some important things to know about the Moon?
5. How do we explore the Moon?

1.4 – Further Exploration

Here are some possible areas of study you could explore:

1. How can we find raw materials on the Moon?
2. How can we use Engineering and Technology to establish an outpost for humans on the Moon?
3. What new exploration ideas can you think of for the Moon?

1.5 – Let's Go!

On the following pages are the rules of this fast-paced challenge. Your team will have the opportunity of designing, building, and testing your own robot to push, lift, and race beyond the competition. Good Luck. We begin in 3, 2, 1...

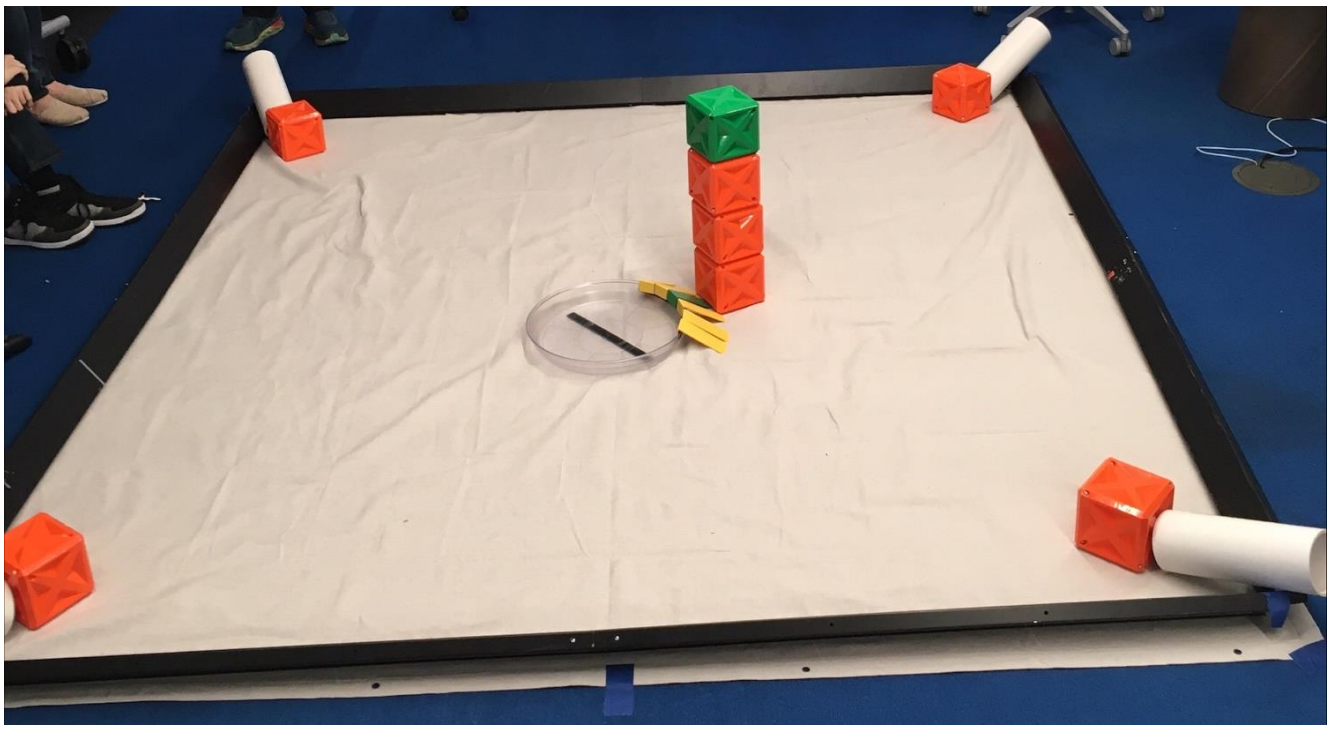
Section 2: The Game

2.1 - Overview

This section describes the CREATE Jr. game for 2022-2023 called Moon Mining. It also lists the game ***definitions, scoring,*** and game ***rules.***

2.2 – Game Description / Field Layout

Matches are played on a field initially set-up similar to the figure below:



Four teams, making up an alliance, collaborate, using their robotic Moon Rovers, in each match. The object of the competition is to attain a higher combined score than all the other teams. Points are scored by performing mandatory and optional tasks. This will include:

Mandatory tasks:

1. Place at least THREE balls in a goal.
2. Move SEVEN Cubes of the same color to the wall (a cube is scored if a ball can be placed so that it touches the wall and the cube)

Optional tasks:

1. TWO Tubes removed from the Field
2. FOUR Tubes removed from the field
3. ONE Robot exits the field
4. BALL placed in Goal
5. THREE Robots touch the single color Cube at the same time

GAME ELEMENTS

There are a total of:

- 12 (twelve) balls (baseball sized)
- 7 (seven) Cubes (approx. 5x5x50 of the same color
- 1 (one) Cube (approx. 5x5x5) of a different color
- 4 (four) Tubes Aprox. 3 inches in diameter and 12 inches long
- 1 (one) Goal. Approx 15 inches in diameter with a 2 inch high lip
- 6 (six) ramp sections which attach to the goal as shown

The following is a detailed description on how to setup the field elements.

- Place the round Goal in the center of the field. A piece of Velcro should be used to keep the goal in place.
- Attach the Ramps to the Goal such that they touch each other (side by side). The Ramps may point any direction, this is the choice of the Event Partner or referee.
- Place a stack of FOUR Cubes (Three of the same color on the bottom and the one different color on the top) such that the stack touches the ramp.
- Place ONE Tube in each corner (45degree angle from each wall). Start with the end of the Tube on the top of the corner (where two walls meet) then gently push the Tube outward until just before it tips out. This ensures maximum angle for the balls to roll out.
- Place ONE Cube of the same color in front of each Tube such that the Cube and Tube touch.
- Place THREE Balls in each Tube (load from the back once Cube is in place)
- ROBOTS start either touching the Goal (in the center of the field) or Ramp -OR- touching a Robot that is touching the Goal or Ramp.

When setting out the game elements for the first time it is recommended that a washable marker be used to mark all the spots where game elements are to be placed. This should last the season and will not leave a permanent mark on the tarp.

2.3 – Game Definitions

Alliance – Four randomly paired teams that work together during a match in the collaboration game.

Coach - A student or adult designated as the team adviser during the tournament.

Drivers - Team members responsible for operating and controlling the Robot. Only the two drivers from a team are allowed to be in the Driver's Station during a match.

Driver Change – Changing from the first to the second driver between 65 and 50 seconds remaining in the match.

Driver's Station – The designated region where the drivers stand during the match.

False Start – A robot moving before the match begins will be considered to have false started. A five-point penalty will be assessed for each robot that false starts. If the false start is severe, at the discretion of the referee, the robot may be disqualified.

Match - A one minute and thirty second driver-controlled period. A match starts when the timer counts down from 3,2,1.

Pre-placement of Robots – Each team places their robot to start either touching the Goal (in the center of the field) or Ramp -OR- touching a Robot that is touching the Goal or Ramp.

Removed from the field – Any game object that leaves the field. All objects that leave the field of play stay out for the duration of the match.

Remaining time bonus – The number of seconds remaining on the clock when all mandatory tasks have been complemented and remotes are returned to the floor. (Maximum is 35)

Robot – Anything (which has passed inspection) a team places on the field prior to the start of a match.

Team Member – Any of the participants that make up the team. Team members may assist the drivers with the pre-placement or pre-loading of the robot. Only the two drivers (per team) are allowed in the Driver's Station for the match. Not all games will have pre-placement and/or pre-loads.

2.4 - Scoring

	SCORING	
Object	**Scoring Task**	**Points**
Tubes	TWO Tubes out of the Field out of the field	10 points
Tubes	FOUR Tubes out of the Field out of the field	30 points
Robot	ONE Robot out of Field	15 points
Balls	EACH Ball scored in the Goal	9 points per ball
Double Cube	THREE Robots touching the Double Cube at end of match	DOUBLES SCORE
Time Remaining	When the mandatory tasks of: THREE Balls scored in the goal AND SEVEN of the same-color Cubes are at the Wall (if a ball can be placed so that it touches the wall and the cube), all 4 teams ***may*** set their remotes on the ground. Once on the ground, time stops and the number of remaining seconds is added to the bonus points earned. 35 Points Maximum	Time is Points (max 35)
False Start	Penalty	-5 points
Driving after time has expired	Penalty	-10 points

2.5 – Game Rules

2.5.1 – Safety Rules

1. If at any time the robot operation is deemed unsafe or has damaged the playing field, surface, barriers or wall, by the determination of the referees, the offending team may be disqualified. The robot will require re-inspection before it may take the field again.

2. If a robot gets hung up on the perimeter or unintentionally drives out of the field, teams MAY pick up their robot and place it on the field. To do this, the Driver signifies the intent to the referee by holding the remote above their head. The non-driving team member may then slowly walk around the field to the stranded robot to place it back into the field. The robot should be placed just inside the point that it got stuck and should follow the guidelines below. The non-driving team member may then walk back to the driver's station and the driver may lower the controller and continue as before. If teams are not performing this action safely, the Alliance may be disqualified at the discretion of the referee.

    A. The robot should be placed in the field as near to where it became caught on the side rail or exited the field as possible.

    B. The robot cannot be touching any robot or any game elements that were not already captured by the robot at the time of getting stuck. An object is captured if the robot can be lifted straight up and the object stays with the robot.

3. If a robot goes completely out-of-bounds (outside the playing field) and continues to move, clear intent of returning to the field MUST be demonstrated. If a robot is being driven with any other intent, the robot/Alliance may be disqualified or stopped, and the match ended at the discretion of the referee. A robot may not re-enter the field in a scoring position.

2.5.2 – General Game Rules

1. At the beginning of a match, each robot must not exceed a volume of 14 inches wide, by 14 inches long, by 14 inches tall. An offending robot will be removed from the match at the Head Referee's discretion.

    NOTE: Alignment devices (templates, tape measures, lasers, etc.) that are not part of the robot may NOT be used to assist with the positioning of the robot.

2. For each match, teams shall include two drivers. The drivers may change from match to match.
3. During a match, the drivers are the only people allowed in the driver's station.
4. Any team member may assist in Pre-placement of the robot or the pre-load of the scoring object. (For games that have pre-placement and/or pre-loads.)
5. Scoring objects that leave the playing field are considered out of play. They will not be returned to the field for that match.
6. Drivers are prohibited from making intentional contact with any game or field object. The first instance of intentional contact may result in a warning, egregious and/or repeated infractions may result in disqualification.
7. During a match, robots may be remotely operated only by the drivers.
8. Robots may not intentionally detach parts during any match or leave mechanisms on the field. Multiple infractions may result in disqualification for the entire competition.
9. Robots must be designed to permit easy removal of scoring objects from any grasping mechanism without requiring the robot to have power after the match.

Field tolerances may vary by as much as +/-1". Teams must design their robots accordingly.

2.5.3 – Moon Mining Specific Rules

1. Before the match can begin, all remotes must be on the floor.
2. Drivers must change (Driver change) sometime between 65 and 50 seconds remaining in the match. Driver one may hand the remote to driver two anytime between 65 and 50 seconds remaining on the clock. If a team exchanges the remote too early or too late in a match the robot may be disqualified for that match at the discretion of the referee. If the remote is exchanged significantly outside of the designated time, the referee may disqualify the team or alliance, which will receive a zero score for that match.
3. The referee will stop the timer when all remotes are placed on the floor.

Section 3: The Tournament

3.1 - Overview

The ***CREATE Jr. game*** will be played in a tournament format. Each tournament will include ***qualification*** and ***finals matches*** with ***practice matches*** available at the event partner's discretion. The top teams, no fewer than eight, with the highest cumulative qualifying scores will participate in the finals. No fewer than 8 teams will participate in the finals. The number of teams beyond 8 that advance to the finals matches is at the discretion of the event partner.

3.2 - Tournament Definitions

Team Captain – A person chosen to represent their team.
Finals Match – The final matches which determine the tournament finalist and champions.
Practice Match – An un-scored match used to provide time for teams to get acclimated to the official playing field.
Qualification Match – A match used to determine the rankings for each team.
Event Partner – The organizers of the event/tournament, also known as the host school/program.

3.3 - Registration

When your team arrives at the tournament, the first stop is the registration table. Here, your team will be checked in, drop off their Engineering Notebook (optional), get information on the schedule, including a judge's interview schedule, and find out where the pit is located.

3.3.1 - Inspection

The next step after registration is inspection. Your team cannot compete until your robot has passed inspection. The robot is checked for size, safety, and so on. If there is a problem, the team must return to your pit, correct the problem and be re-inspected. Don't worry. The judges, other volunteers, and even other teams will help you get your robot ready to pass inspection. See the appendix A of this document for more information on Inspection Guidelines.

3.3.2 - Pit Area

The Pit area is usually in a large room such as a cafeteria or gym. The team may be instructed to find a table to use or may be assigned a specific table for their use. Power outlets will be nearby. This is your team's 'home base' for the day. This is where your team works on the robot, charges the batteries, and so on. The pit area is a great place to talk with other teams as well.

3.3.3 - Practice Matches

At the event, practice matches may be played during the team registration time until the Drivers Meeting begins. Check the event schedule.

3.4 - Judging

Judging takes place in a formal manner once the team is registered and inspected. You might be given a schedule of where and when to go for your team's judges interview or you might be asked to go to your team's interview after a match. Some events allow teams to be interviewed on a first come, first interviewed basis. The format chosen is at the discretion of the Event Partner. During the interview, your team explains their creative process, shows off their robot, answers questions, and generally gets the opportunity to shine. Informal judging takes place during the entire tournament. Judges and other tournament officials observe teams all day. Both the formal and informal judging is the basis for several awards at the end of the day. Always do your best, even when no one is watching. Please see appendix B: Awards for more information.

3.4.1 - Exploration Challenge

At some tournaments, there may be an opportunity to present your Exploration Challenge. This is an optional part of CREATE Jr. and you can read more about it in Section 6 of this game manual. The Event Partner will communicate in advance if they will be offering judging for this optional award. You will need to email the Event Partner to let them know if you intend to participate. This will allow them to be organized for the judging of Exploration Challenge participants at the event.

3.5 - Drivers / Coaches Meeting

The Drivers / Coaches meeting is a short presentation about the competition and the venue. This is followed by a question-and-answer session. This is your opportunity to get all your questions answered. Do not hold back because you think the question may be a dumb question. Chances are that many other teams are wondering the same thing.

3.6 - Opening Ceremony

There will be an opening ceremony lasting 5 to 10 minutes. A welcome is extended to all teams, the schedule is reviewed, logistics are explained, and qualification match schedules will be passed out.

3.7 - Qualification Matches

- Find your team on the schedule and note which matches you will compete in. There are four robots on the field in each match.
- You will note that your team will be partnered randomly throughout the qualification rounds. Be sure to have your team talk with their partners sometime prior to the match to determine strategy, strengths, weaknesses, etc. Teams work together to

score points. The final score of the match is given to each team in Collaboration.

- Each team will be scored in the same number of qualification matches, usually between four and six rounds.
- At the end of the Qualification Rounds each team will have a point total from all of their qualifications matches combined A team ranking is published based on these scores. After each match, rankings of all teams will be posted.

3.8 - Finals

- There are three different size classifications of CREATE Jr. tournaments. Tournaments with:
  - fewer than 16 teams have the top eight teams advance to the finals.
  - between 17 and 24 teams have the top twelve teams advance to the finals (at the discretion of the Event Partner).
  - more than 24 teams have the top sixteen teams advance to the finals (at the discretion of the Event Partner).
- The alliances will be formed by consecutively ranked teams; 1-4 in the top alliance, 5-8 in the next alliance, and so on for the collaboration game.
- In the event of a tie for the last qualifying spot another alliance will be added to the finals.
- The alliances will participate in the finals with the lowest ranked alliance competing first. For example, in an 18-team tournament with 3 alliances in the finals, teams ranked 9th-12th would go first, followed by the alliance made up of the 5th-8th ranked teams. The last alliance to participate, the top seeded alliance, would be made up of the 1st -4th ranked teams.
- The alliance with the highest single round score in the finals will be the tournament champions.

3.9 - Awards Ceremony

Awards are given to the tournament champions (four teams) and sometimes the tournament finalists (four teams). There is an award for engineering excellence and one for overall team performance as well. At some tournaments a skills award is also given. Judges may also choose to give an award for the Exploration Challenge. Please see appendix B: Awards for more information.

3.10 - Tournament Rules

1. Referees have ultimate authority during the competition. ***Their rulings are final.***
   A. The referees will not review any recorded replays.
   B. Any questions for the referees must be brought forward by a driver within the

time period of two matches.

2. The only people permitted by the playing field are the two drivers.
3. Each team will be allotted ONE time out of no more than three minutes. The time out can only be called directly preceding a team's match and **cannot** be taken during a match. Time outs can only be taken during the finals of a tournament. The matches must progress according to schedule.

NOTE: If a robot cannot report for a match, at least one member of the team should report to the field for the match.

Section 4: The Robot

4.1 - Overview

This section provides rules and requirements for the design and construction of your robot. A CREATE Jr. robot is a remotely operated vehicle designed and built by a registered CREATE Jr. team to perform specific tasks when competing in CREATE Jr. challenge. Prior to competing at each event, all robots will have to pass an inspection. Refer to Appendix A for the Inspection Guidelines.

4.2 - Robot Rules

There are specific rules and limitations that apply to the design and construction of your robot. Please ensure that you are familiar with each of these robot rules before proceeding with robot design.

1. One robot is allowed to compete per team. Though it is expected that teams will make changes to their robot at the competition, a team is limited to ONE robot.

NOTE: It is against the intent of this rule to compete with one robot, while a second robot is being modified or assembled.

2. Every robot will be required to pass a full inspection before being cleared to compete. This inspection will ensure that all robot rules and regulations are met. Initial inspections will take place during team registration/practice time.
    A. If significant changes are made to a robot, it must be re-inspected before it will be allowed to compete.
    B. All robot configurations must be inspected before being used in competition.
    C. Teams may be requested to submit to random spot-inspections by event personnel. Refusal to submit will result in disqualification.
    D. Referees or inspectors may decide that a robot is in violation of the rules. In this event, the team in violation will be disqualified and the robot will be barred from the playing field until it passes re-inspection.
    E. For more information on the inspection process please refer to Appendix A: Inspection Guidelines.
3. The following types of mechanisms and components are NOT allowed:
    A. Those that could potentially damage playing field components.
    B. Those that pose an unnecessary risk of entanglement.
4. At the beginning of any match, the maximum size of a robot is 14” x 14” x 14”.
    A. During inspections, robots will be required to pass within the perimeter of a sizing tool. To pass inspection, a robot must fit within the sizing tool without exerting ANY force on the tool. The orientation of the robot when sized must be the same as its orientation when placed on the field.
    B. Robots may expand beyond starting size constraints after start of a match.
    C. Any restraints used to maintain starting size (i.e., zip ties, rubber bands, string, etc.) MUST remain attached to the robot for the duration of the match.
5. Three classes of robots may participate in CREATE Jr. games: VEX IQ robots, LEGO robots,

and CREATE Open robots. Robot construction is constrained to the following:

A. **VEX IQ robots:** All parts from the VEX IQ line or parts which are identical to the VEX IQ parts line are acceptable for use in the VEX IQ class.
B. **LEGO robots:** All parts from the LEGO EV3 product line and add on kits.
C. **CREATE Open robots:**

a. Only one control system may be used on a robot. The control system for the robot, which includes the motor controller and the remote-control system, must be one of the following:
    1. HOI Control System (HCS-UNO or HCS-Apollo) supplied by Higher Order Innovation (HOI) with the competition code (supplied by CREATE) downloaded
    2. LEGO EV3 system
    3. A VEX IQ control system supplied by VEX Robotics
b. For the construction of the robot, any official VEX component may be used except as limited below:
    1. Up to six motors or servos. (Any combination up to six).
    2. Only one battery pack from the VEX Power Pack (VEX P/N: 230-0036) or the 7.2V battery packs that come with the kits. NOTE: HOI Control Systems sold after 6/1/2015 are allowed to and required to have two battery packs.
    3. Electrical components found in the VEX-RC "Blue" product line are prohibited.
    4. Any/all packaging, manual binders, Styrofoam, cardboard, plastic bags, etc. from the VEX or HOI kits are NOT included and CANNOT be used for robot construction. Only VEX or HOI parts themselves are allowed.
    5. Parts identical to legal HOI or legal VEX parts may be used.

D. The following additional components may also be used on any CREATE Jr. robot:
    a. (10) elastic bands, #32 size only.
    b. 20" of 1/8" nylon rope.
    c. 6" of 3/4" wide Velcro
    d. 12" x 15" of non-slip pad
    e. Teams may add non-functional decorations from parts not on the above list, provided that these parts do not affect the outcome of the match and must be in the spirit of the competition.
    f. No additional components may be used.

6. All parts that are used must be tracked through a Bill of Materials (BOM).
7. During inspections if there is a question about whether something is an official VEX component, a team will be required to provide documentation to an inspector, which proves the component's source. Such types of documentation include receipts, part numbers, or other printed documentation.
8. No modification of the control system is allowed of ANY kind.
9. Parts may NOT be modified as follows:
    A. Motors, extension cords, sensors, controllers, battery packs, and any other electrical component of the VEX Robotics Design System may NOT be altered from their original state in ANY way.
    B. Welding, soldering, brazing, gluing, or attaching in any way that is not provided

within the VEX System will NOT be allowed. NOTE: Mechanical fasteners may be secured using Loctite or a similar thread-locking product. This may be used for securing hardware ONLY.

10. Robots must display their team number (numerals/alpha only, i.e., “148” or “148-A”).
    A. The judges, referees, and announcers must be able to easily identify robots by team number.
    B. Team number must be visible from each side.
    C. The numerals must each be at least three inches high, at least in ¾-inch stroke width and in a contrasting color from their background.

11. ***The robots are to be built by the students.*** Adults, coaches, parents, mentors are to be facilitators, offer suggestions, teach and guide. We understand that each student is unique, and their learning facilitated by different styles which may benefit from varying levels of assistance. For instance, if a child cannot remove a stripped bolt, it is perfectly acceptable for an adult to do that for the student. If a student has never seen a particular mechanism, it is a great learning experience for the student to build it with an adult. However, any mechanism that is in ANY significant way built by an adult should be dis-assembled and re-assembled by the student(s). It is very important that the students understand their robot and are able to fix it during the tournament as adults are not to assist in any capacity, except to help remove stripped bolts or where safety is involved. Teams with adults acting in discord with this rule will be removed from consideration for judged awards. Repeated and/or egregious infractions may result in a team being disqualified from the tournament.

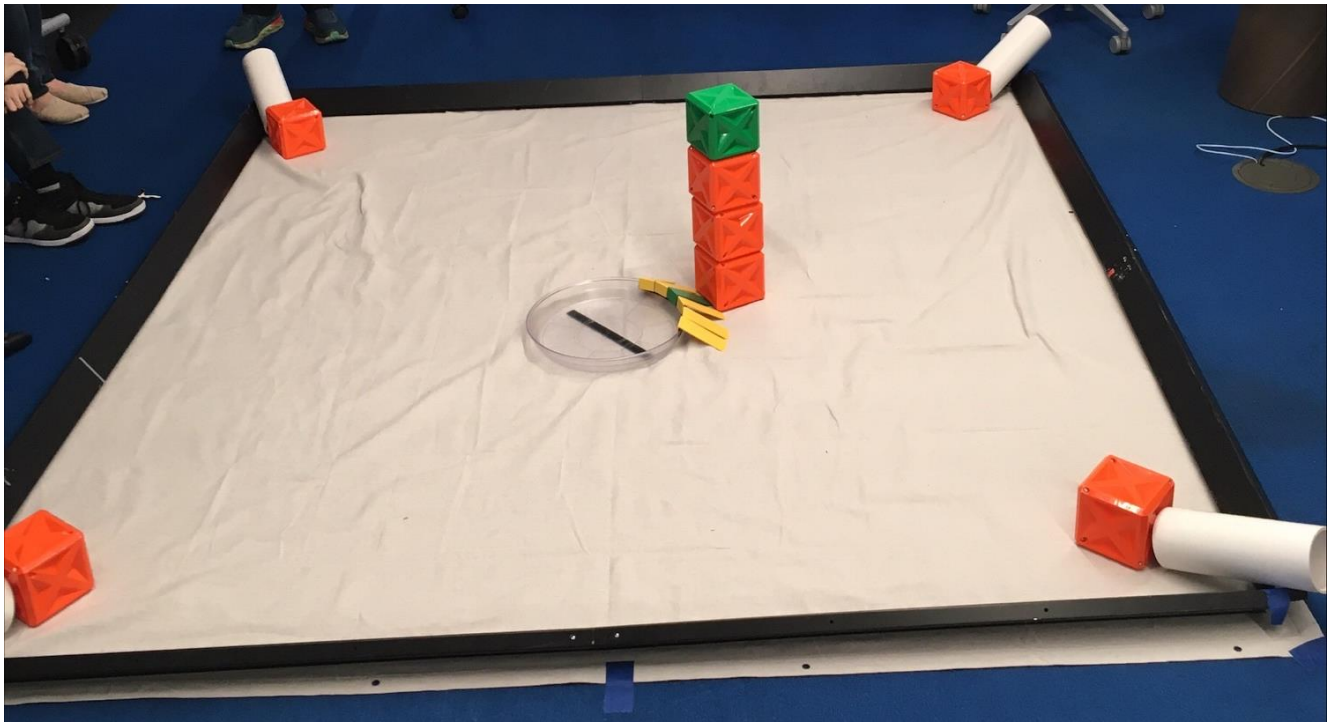
Section 5: Skills

5.1 - Overview

CREATE Jr. Skills is the opportunity for a team to take the field alone and to score as many points as possible in 60 seconds. Skills test a team's robot and driving ability in a lone challenge.

5.2 - Rules

1. All skills matches will be 60 seconds in length.
2. Drivers must switch between 25-35 seconds into the match.
3. The field will be set up as seen below.



4. Drivers start with their remotes on the ground and do not reach down to pick them up until the countdown clock goes 3,2,1
5. Drivers stop as soon as the referee says stop, or when the team places their remote back on the ground.
6. Scoring as follows:
    1. Two Tubes out of the field 10 pts.

2. Four Tubes out of the field 30 pts. more
3. Robot out of the field 15 pts.
4. Each Ball scored in a Goal 9 pts.
5. Robot touching the single color Cube at end of match DOUBLES the Score of the Skills Match.
6. When TWO ball are scored in the Goal and FOUR Cubes of the same-color are at the Wall (if a ball can be placed so that it touches the wall and the cube).. time remaining is points scored. Max is 20.

7. Skills rankings will be determined by the highest single score a team has achieved. If two or more teams have the same highest score, their next highest score will be used to break the tie, and so on. If teams are still tied after comparing all their scores it will be up to the Event Partner to either have the teams continue to do skills, alternating turns, until the tie is broken, or award multiple skills champions. NOTE: If team A has done skills twice and team B has done skills only once, and they have the same high score, team A will win the tie breaker as team B's second score will be zero.

	SKILLS SCORING	
Object	**Scoring Task**	**Points**
Tubes	TWO Tubes out of the Field out of the field or scored in a goal	10 points
Tubes	FOUR Tubes out of the Field out of the field or scored in a goal	30 points
Robot	Robot out of Field	15 points
Balls	EACH Ball scored in the Goal	9 points
Double Cube	Robot touching the Double Cube at end of match	DOUBLES SCORE
Time Remaining	When the mandatory tasks of: TWO Balls scored in the goal AND FOUR of the same-color Cubes are at the Wall (if a ball can be placed so that it touches the wall and the cube), the team ***may*** set their controller on the ground. Once on the ground, time stops and the number of remaining seconds is added to the bonus points earned. 20 Points Maximum	Time is Points (max 35)
False Start	Penalty	-5 points
Driving after time has expired	Penalty	-10 points

5.3 - Event Rules

1. Skills are an ***optional*** portion of CREATE Jr. and may not be offered at all events.
2. If Skills are offered, the number of tries will be up to the Event Partner but CREATE recommends no less than two tries per team.
3. Skills are optional. Teams are not required to participate, nor required to take all their allotted turns.
4. Scheduling of Skills will be up to the Event Partner. Some may offer fields set up specifically for Skills and might be scheduled while matches are going on. Some may do all Skills prior to matches starting. Be sure to review the schedule early in the day.
5. It is up to each team to ensure they get all their turns in. Don't wait until the last minute that Skills is scheduled. You may miss your chance.
6. Trophies are optional for this challenge. However, CREATE recommends that any tournament with more than 18 teams awards a Skills Champion Trophy.

Section 6: Exploration Challenge

6.1 – Overview

CREATE Jr. ***Exploration Challenge*** is the opportunity for a team to learn more about a topic that pertains to the current year's challenge. A suggested list of topics can be found in section 1 of this game manual. Teams may use one of these topics or choose one of their own. There is no team size limit for this portion of the CREATE Jr. challenge. On-field drivers are limited to two, but a team may have as many team members as they would like to participate in the Exploration Challenge.

6.2 - Rules

1. Teams will do research and prepare a presentation on a topic related to the current year's challenge.
2. Teams will give their presentation to a panel of judges. This presentation is different from the judge's interview.
3. The presentation will be a maximum of 10 minutes long: 6 minutes for the actual presentation, and 4 minutes for questions and answers.
4. Teams will be scored on content, communication skills, and full participation. (It is highly encouraged to have all students have some part in the actual presentation.)
5. The top team(s) will receive the Exploration Challenge Award.

6.3 - Event Rules

1. The Exploration Challenge is an ***optional*** portion of CREATE Jr. and may not be offered at all events.
2. If the Exploration Challenge is offered, the schedule of interviews will be up to the Event Partner.
3. The Exploration Challenge is optional. Teams are not required to participate. However, any team that wants to participate must opt-in by notifying the event partner of their desire to participate at least on week prior to attending the event.
4. Trophies are optional for this challenge. However, CREATE recommends that any tournament with more than 18 teams, awards an Exploration Challenge Trophy.

6.4 - Guidelines and Suggestions

- ***Brainstorm -*** Look at this year's theme and see what you know, what you would like to know, and what topics are related to this year's challenge. Find a topic you are interested in and excited to learn more about.

- ***Narrow down your topic -*** After your brainstorming, look at all the possible topics, and pick a few to look into deeper. Once you have looked at these topics a little deeper, decide on one topic that you want to be an expert on!
- ***Look for more information -*** Once you have a topic to learn about, start looking for more information. You can use books, magazines, newspapers, and the internet! Talk to an expert. (Make sure to keep a list of where you found your information to make a list of sources.)
- ***Organize your findings -*** Put your information together in a way that makes sense. Use an outline, diagrams, or other organizational aids to logically group the information you have acquired.
- ***Decide how to communicate your information - This*** is where you get to be really creative! How are you going to tell others about what you have learned? How you present can be totally up to you. Visual aids are always encouraged as you figure out how you want to present!
- ***Continue to learn -*** After you present, think of the questions you may have been asked or you thought of that relate to your subject. Do more research, is there any new information out there? Add the new information to your research and prepare to present at your next competition!
- ***HAVE FUN!*** Learning and sharing your knowledge is fun. Congratulations on taking on the Exploration Challenge.

Appendix A: Inspection Guidelines

A.1 - Overview

This section describes Robot Inspection for the CREATE Jr. competition. It also lists the inspection ***definitions*** and inspection ***rules***.

A.2 - Description

The ***robot*** will be required to pass a full inspection before being cleared to compete. This inspection will ensure that all robot rules and regulations are met. Initial inspections will take place during team registration/practice time. The official ***"Competition Inspection Checklist"*** is another important document which can be used by teams as a guide to pre-inspect their robot. The "Competition Inspection Checklist" can be found on the CREATE Jr. game page of the CREATE website: www.CREATE-Found.org.

A.3 - Definitions

- ***Robot*** – An operator-controlled vehicle designed and built by a CREATE Jr. team to perform specific tasks while competing. The robot can be constructed using only approved components. No other parts will be allowed on the robot. Prior to participating in the competition, each robot will be required to pass an inspection.
- ***Robot Sizing Tool*** – A tool used during robot inspections which has interior dimensions 14 inches (35.56 cm) wide. The robot's height, width and length must fit within this tool without exerting ANY force on the edge of the tool.

A.4 - Inspection Rules

1. The team's robot must pass inspection before being allowed to compete. Noncompliance with any robot design or construction rule may result in disqualification of the robot at an event.
2. The Official Team Number must be displayed on the robot prior to inspection as defined in the Robot section of the manual.
3. Robot construction is constrained by the components a team may use as defined in the Robot section of the manual.
4. The maximum size of the robot for starting a Qualifying or Elimination Match is 14 inches (35.56 cm) wide by 14 inches (35.56 cm) long by 14 inches (35.56 cm) high. The robot must fit within a Robot Sizing Tool. The robot must be self-supporting while the Sizing Tool is passed over it.
5. The starting configuration of the robot at the beginning of a match must be the same as a robot configuration inspected for compliance, and within the maximum allowed size.
6. If Robot designs have more than one possible starting configuration, the largest possible configuration must be used during size inspection.
7. When a team makes a modification to improve performance or reliability of their robot, the team may request a re-inspection of their robot by an Inspector.
8. Inspectors evaluate robots to ensure each robot has been designed to operate and function safely. The robot must be designed for safe operation and handling. Specific safety rules and limitations apply to the design and construction of a robot.
9. A robot is deemed successfully inspected when all items listed on the "Competition Inspection Checklist" have been recorded as passed by an Inspector.

Appendix B: Awards

B.1 - Overview

This section describes the awards for the CREATE Jr. competition. It also describes the format of ***judging*** and offers helpful hints for teams to be used in preparation.

B.2 – Types of Awards

There are three types of awards given to teams competing in the CREATE Jr game:

On-Field Awards - Based solely on the scores obtained on the field.

Judged Award - Based solely upon the scores received in the judged portion of the competition.

Hybrid Award - Based on the combination of on-field performance, the judged portion of the competition, and social interaction throughout the tournament. Teams must do well in both the On-Field and Judged Award categories.

B.3 – Judging

Judging is done throughout the day. It is done informally by judges and event officials as they watch your team's interaction with event officials, referees, judges, other teams and fans, and how you relate to members within your team. There are two types of judging/judges interviews that occur at a CREATE Jr. tournament:

B.3.1 – Team Judging for Honor and Engineer Awards

Team judging is offered to every team attending a CREATE Jr. tournament. It has a formal structure as follows:

- ***Team Presentation*** – During the first three minutes your team will have an opportunity to present to the judges. Your focus can be your robot, how it works, and/or your engineering journey. You will be judged on presentation skills and technical knowledge.
- ***Scripted Questions*** – During the middle five minutes each team will be asked the same set of questions. A list of questions will not be available before the competition and each team promises not to discuss the interview until all interviews are completed. Some questions will be technical in nature, some will focus on your engineering journey, and others will focus on team interaction.
- ***Judges Questions*** – During the last two minutes the panel of judges may ask any question they would like.

B.3.2 – Judging for Exploration Challenge Award

Exploration Challenge judging is an optional component of a CREATE Jr. tournament. It is not offered at every event. For events that offer the Exploration Challenge, teams must opt in by notifying the event partner of your desire to participate. This must be done **PRIOR** to your arrival at the event to ensure enough judges are available to carefully consider each teams' work. Exploration Challenge judging has a formal ten-minute interview structure which is broken up into the following parts:

- ***Team Presentation*** – During the first six minutes your team will have an opportunity to present to the judges. Why you selected your topic, what resources you used, and what you learned should all be covered in this part of the presentation.
- ***Q&A*** – During the last four minutes each team will be asked questions related to their exploration.

B.4 – Helpful Hints

Awards are based upon each team's performance throughout the entire day. Please keep in mind that everything you do says something about you and your team. Judges and event officials will be with you in the pit area, playing field and all the common areas. The following are characteristics of winning teams:

- Respectful - Respectful of each other, other teams, officials and everyone at the tournament.
- Enthusiastic - Enthusiasm is contagious. Great teams have plenty of it and spread it around!
- Focused – Everyone on your team should have a role to play and should take their role seriously.
- Knowledgeable – Each member of your team should have a good understanding of your drone, drone add-on equipment and team-built game mechanism. They should know how team-built components were constructed and what decisions were made in the final design of these mechanisms.
- Each team member contributes to the presentation and to answering questions. It is perfectly acceptable to have one team member (student) lead the presentation. However, the best teams are careful to make sure that every member of their team has a part in the presentation.
- Engineering notebooks are VERY helpful for the judges in team judging. Teams are strongly encouraged spend the time to write a first-class engineering notebook. A well-written engineering notebook, which details not only your designs, both rejected and accepted, but also your journey as a team, will be looked on very favorably by the judges. The notebook is also an excellent way to prepare for your 8-minute interview as it helps you remember things that happened throughout the year and organizes your thoughts. Please keep in mind that all elements of the notebook are to be done by the students.
- Well run teams have coaches and mentors that understand that their role is to be a facilitator. During the interview all questions should be answered by the students only, unless specifically directed to a coach/mentor.

B.5 – Awards List / Descriptions

Champion *– "To defeat all opponents in a competition or series of competitions, so as to hold first place."* This award is given to each team of the winning alliance.

Finalist *– "To defeat all opponents in a series of competitions except for the Champion, so as to hold second place."* This award is given to each team of the second place alliance. The Finalist award will be awarded at large format tournaments.

Skills Champion *– "To defeat all opponents in a competition or series of competitions, so as to hold first place."* This award is given to the team ranked first in the Skills Challenge.

Engineer *– "To design or create using the techniques or methods of engineering."* This award is given to the team that has the best overall design and construction. Creative design as well as excellence in construction will be taken into account. Teams winning this award will have robots that are well constructed, have no sharp edges that could cause injury to people or the field, their electrical cables are securely fastened to the frame and their robot is solid with no

loose parts. Also, the journey the team took to arrive at their final design and steps to construct their robot will be an important consideration in determining the winner of this award.

Exploration *– "The activity of searching and finding out about something."* This award is given to the team that has the best in-depth knowledge of any topic of their choice, related to this year's game theme, and ability to communicate what they have learned. One of the most important aspects of this will be the enthusiasm and love of leaning developed through their study. Communication aids such as charts, graphs, diagrams, etc., are welcome, but will not be nearly as important as a team's ability to verbally communicate what they have learned.

Honor – "*Honesty, fairness and integrity in one's beliefs and actions." "A source of credit or distinction." "High respect, as for worth, merit or rank."* This is CREATE's highest award. They honor themselves and their team by working together, working hard, and building a robot worthy of their potential. For a team to be considered for this award they must perform well in all aspects of the tournament. This award is given to the team that exemplifies all aspects of CREATE's honor code.

B.6 – "Honor by Design"

Honest – Follow the spirit of the rules of the competition. Do "what's right" when no one is looking.

Competitive – Always give your best. Be humble in victory and gracious in defeat. Be respectful of your teammates, coaches and mentors, competitors, judges and spectators.

Collaborative – Act in the best interest of the team's goals and be supportive of your fellow teammates. Share knowledge, tools, and parts with other teams.

Leader – Encourage, praise, involve and constructively challenge your teammates.

Professional – Works hard and is determined. Overcomes obstacles. Is well trained and acts in a professional manner.