## CREATE Open – Rules Addendum
## 2019-2020

1) All VRC current season rules for the game and robot apply unless expressly stated otherwise below.

2) Game Modifications
1. Matches will start with a 20 second autonomous mode, followed by a pause ending with a 100 second driver mode. Remotes must be placed on the ground to start the match. All team members must be standing upright when the ref launches a match. No buttons on the remote or robot may be touched once the match is launched.
2. No button on the remote, robot, or other device may be used to start the autonomous portion of the match. The proper way to start the autonomous portion of the match is to use data coming from the Reoff.
3. Remotes are to be placed on the ground and may not be touched until driver's mode has started.
4. There will be a seven(7)-twenty(20) second pause between autonomous and driver control. The exact duration of this pause will be made by the tournament Event Partner.
5. The Autonomous Bonus is worth 6 points for a win and 3 points for a tie. This is the same as the normal game. However, in addition to the points, the winner of autonomous will get 2 purple cubes that will automatically scored at the end of the match. No need to introduce them into the match. They will be manually scored at the end of the match. This will make the autonomous bonus worth at least 8 points, maybe more! Should there be a tie in autonomous then each alliance will get 1 purple cube that will be scored at the end of the match. The autonomous bonus will be determined by specific tasks. The Alliance that successfully completes the most tasks will be awarded the autonomous bonus. Each task is weighted the same. The tasks are as follows:
    1. Place a cube in or on the alliance's small goal zone. NOTE: It does not have to be officially "scored", but rather placed in or on the barrier of the goal zone such that no part of the cube touches the tile on the outside of the goal zone and is not touching an alliance robot.
    2. Place a cube in or on the alliance's large goal zone. NOTE: It does not have to be officially "scored", but rather placed in or on the barrier of the goal zone such that no part of the cube touches the tile on the outside of the goal zone and is not touching an alliance robot.
    3. Place a cube on a placed cube in either goal zone. NOTE: It does not have to be officially "scored", but rather on top of a placed cube such that it does not touch any foam tile or an alliance robot.
    4. Place a cube in or on the neutral tower on the alliance's side of the field. NOTE: It does not have to be officially "scored", but rather on or in the tower such that no part of the cube is touching a floor tile, is in or above the tower and not touched by an alliance robot.
    5. Place a cube, of the alliance's pre-load color, in or on the high tower in the middle of the field. Each alliance will have access to this tower so be careful not to break the center barrier. NOTE: It does not have to be officially "scored", but rather on or in the tower such that no part of the cube is touching a floor tile, is in or above the tower and not touched by an alliance robot. In the event that both alliances successfully place cubes in this tower each alliance will receive a point.

All tasks are counted at the end of autonomous. A task completed but the reversed during autonomous will NOT be counted as a completed task.

6. Teams touching their remotes, or even bending down to pick up their remotes, outside of designated times may receive a 2 point penalty for their alliance. Egregious infractions may result in disqualification.
7. Starting autonomous early is an automatic 2 point penalty and forfeiture of autonomous bonus. The task count for the offending alliance will be set to zero.
8. Moving beyond the 20 second autonomous period is an automatic 2 point penalty and forfeiture of autonomous bonus.. The task count for the offending alliance will be set to zero.
9. Starting drivers mode early is an automatic 2 point penalty. Egregious/repeated infractions may result in

disqualification.  NOTE: If a team both touches their remote early AND starts the drivers mode early they will be accessed one 2 point penalty, not two.

10. Teams must have a license plate on each side of their robot which is clearly visible to the refs.  The license plate must use the template found here: http://create-found.org/CreateOpen.php, or adhere to the license plates rules found in 19) below.

11. "**IN THE BALANCE**" Teams will find the outcome of a match "in the balance" with the Open Program's unique twist  in scoring.  At the end of a match if a robot has been able to balance on a cube such that no part of the robot is touching a field tile, is not in contact with another field element, field wall or another robot of the same alliance, then 4 cubes of the color on which the robot is balanced will be scored for that alliance.

    1. The cubes will first come from the opposing alliance scored cubes.  If there are not enough opposing alliance scored cubes of that color the remaining cubes will be taken from the floor.  If there are not enough cubes that meet these two criteria then only those cubes that meet the criteria will be scored for that alliance.  Clearly, this will put the outcome of the match "In the Balance".

    2. If opposing alliance's each have balanced on the same color cube, those will cancel each other and no cubes will be moved.

    3. A robot from an opposing alliance may not interfere in any way with a robot that is balanced or attempting to balance if the cube they are balancing on is touching or in the balancing robot's protected zone.  This include any contact directly or indirectly, and pushing game elements into contact with the balancing robot.  Egregious infractions will result in disqualification.  Accidental contact which does not result in a loss of balance will result in a warning. (Repeated "incidental" contact by the same robot in a single match or subsequent matches may result in disqualification at the discretion of the ref.)  Accidental contact that results in a loss of balance may result in scoring the balance as successful at the discretion of the ref.

## 3) Skills Modifications

1. The "In the Balance" scoring twist **does** apply for skills.  Should a robot be balanced on a cube as specified above then 4 floor cubes of that color will be scored for the skills match.

## 4) Robot Build modifications

1. Any control system or material may be used to build the robot.  This includes all VEX parts, electronics, motors, etc., but also allows Arduino based control system (or any other) as well as 3D printed/laser cut parts, hand made parts, etc.

2. A maximum of 2 pneumatic tanks per robot may be used.. (Again a desire to keep the playing field level.)  Also for this year only VEX pneumatics (pistons and tanks) are allowed.

3. A maximum of 10 motors, or 12 if pneumatics are not used, are allowed.  This applies to ALL robots regardless of what control system or motors used.

4. Up to 2 of the batteries that meet the criteria below may be used to power your robot.  (These are in addition to the internal battery of the Reoff.).  These 2 batteries may be used for any purpose.  Examples are: They can be used to protect wireless communication, or to power lights, or power your motors/sensors/sound. Electronics such as Go Pros that have their own internal batteries that are in no way connected to the robots electrical system are legal and do not count toward the two battery limit.  There are two types of batteries that can be used, those on the Specified list and those that meet the criteria for power tool batteries.  Please note that no modifications may be made to any battery on either list.  Here is the Specified list:

    1. Tenergy NiMH 9.6V 2000mAh High Capacity Battery Pack --- Item No. 11401-01
    2. Tenergy NiHH 8.4V 1600mAh Flat Battery Pack --- Item No. 11328
    3. Tenergy NiMH 7.2V Flat Battery Pack 3000mAh --- Item No. 11204-01
    4. Tenergy NiMH 9.6V 3800 mAh battery --- Item No. 11408
    5. VEX 9.6V Remote Battery NiMH – Discontinued
    6. Venom NiMH 9.6V 3000mAh battery --- Model 1532-8
    7. Venom NiMH 9.6V 4200mAh battery --- Model 1546-8
    8. Venom NiMH 9.6V 5000mAh battery --- Model 1548-8
    9. VEX 7.2V Robot Battery NiMH 2000mAh --- P/N: 276-1456
    10. VEX 7.2V Robot Battery NiMH 3000mAh --- P/N: 276-1491
    11. Tenergy Universal Smart Charger for HiMH/NiCd Battery Packs (6V – 12V) --- Item No. 0102

In addition to the specified batteries above, power tool batteries can be used that meet the following criteria: either

    1. They are commercially available.
    2. Unmodified.  No modifications may be made to these batteries.
    3. Only hard case batteries will be allowed.
    4. Batteries must be either NiMH, or Lithium chemistry.
    5. They either have the rated voltage on them or spec sheets accompany the batteries at all times, and they are limited to 12V rated voltage.
    6. Teams understand how to use a voltage meter and can use it to show tournament officials the current voltage of

the battery when requested.

7. Teams have the battery specifications and voltage meter with them whenever they are getting inspected, or are participating in a match or skills.
8. At no time can any battery used exceed 15V when tested.  Should any battery exhibit this behavior it will be taken by tournament officials and then returned at the end of the event.  Should a robot come to a match or skills with a battery that tests over 15V it will result in immediate disqualification from a match and a zero on their skills attempt..
9. Here is an example of a legal power tool battery and charger:
    1. Battery https://www.amazon.com/Lasica-Lithium-48-11-2402-Milwaukee-Cordless/dp/B0756BRJ6Z/ref=sr_1_11?keywords=power+tool+battery+12V&qid=1561866443&s=gateway&sr=8-11
    2. Charger:https://www.amazon.com/Milwaukee-Genuine-48-59-2401-Lithium-Indicating/dp/B0086AJFAM/ref=pd_bxgy_469_2/130-8308049-9166344?_encoding=UTF8&pd_rd_i=B0086AJFAM&pd_rd_r=c9e97b12-9ae9-11e9-99da-dd5cbc43a5ca&pd_rd_w=FJDaz&pd_rd_wg=wKcYS&pf_rd_p=a2006322-0bc0-4db9-a08e-d168c18ce6f0&pf_rd_r=1DWZMA4JX1JBF7HD0466&psc=1&refRID=1DWZMA4JX1JBF7HD0466

5. All parts, EXCEPT pneumatics and the Reoffs, may be modified from their original factory condition.  This includes all motors and electronics.  Please keep in mind however that safety is a primary concern.  Any robot deemed unsafe by the inspectors/referees will not be allowed to compete until the safety issue is resolved or may be disqualified from the tournament.
6. No rare earth magnets or electromagnets, other than those used in shielded motors, may be used as these pose an interference hazard with both electronics and metal.
7. No control system, part or set of parts can act in a fashion that inhibits the normal operation and/or communication of other robots is allowed.
8. No power sources other than pneumatics, batteries or compression (rubber bands, springs, etc.) are allowed.
9. CREATE officials reserve the right to restrict any material or part that interferes with the normal operation of the field or another robot.  If you are unsure, ask first.
10. Voltage may not be combined.  (i.e. you cannot double your voltage and halve your current.)
11. Any  Reoff (Remote On/Off Switch) must be installed such that the Reoff LED lights are clearly visible  from all 4 horizontal sides of the robot at the start of a match.
12. An Ethernet port is standard on the 2019-2020 Reoff.  It is expected to be used ONLY rarely IF the Reoffs are not responding wirelessly.  Here are the rules regarding the Ethernet port:
    1. Any Reoff must be installed such that the Ethernet port accessible when placed on the field.  The port should be positioned such that the driver can plug the Ethernet cord into the port directly, without bending the Ethernet cord. (In the case where an Ethernet cord is required.)   Referees, during inspections will determine if the port is properly positioned.  After your robot passes inspection, should you change the position of the Ethernet port you will need to get re-inspected.  It is permissible to use an Ethernet extension cord to allow easy access to the Ethernet port.
    2. Once the field Ethernet cable has been attached to the robot, it may not be touched again until the light bars on your robot indicate the match has been launched.
    3. The Ethernet cable must be pulled out within 3 seconds of the launch of a match.  If the cable is not pulled out within that time all power will be cut from the robot.  Power will not be turned back on until 2 seconds after the cable is pulled. Matches will NOT be restarted if this happens.  It is up to each team to pay attention and pull the cable out when the match is launched.  Failure to do so will result in lost time
13. A team license plate must be:
    1. Displayed on two opposite horizontal sides of their robot.
    2. White background with black lettering. (Some small decorations/color may be added to the edge of the license plate.)
    3. Must be easily identified by judges, referees and announcers.
    4. Must have numerals/letters that are at least 1.5" high, at least 1/2" stroke width.
    5. Must be strong enough to survive match play.  I.E. if you use the CREATE license plate template and print your license plate, the paper must be protected by a clear plastic protective sleeve or placed behind plexiglass.

4) The CREATE Open program is open to students of all ages, including College/University teams.  However, there are a number of restrictions for College/University teams:

1. University teams are welcome and encouraged to participate in regular season Open Tournaments/Events.
2. In regular season events College/University teams may not alliance with another College/University team.
3. A University teams is defined as a team that has 1 or more members that have graduated high school and attends a college or university. Please note that this a) allows for mixed teams of university and hs/ms students, and b) is meant to disqualify professional engineers.
4. University teams may participate in regular season tournaments but they may not participate in the China Cup. The China Cup and the trophies and partially sponsored trip that goes along with it is reserved for Middle School and High School teams.
5. University teams may not participate at the Open Program State Championship. This is a state championship level event and will be restricted to ms/hs teams only.
6. We welcome university teams to participate at the U.S. Open. They will not be able to participate in the regular Open Division, but if we get enough teams a smaller division will be created for them. There will be NO registration fee for University teams at the 2020 CREATE U.S. Open, instead they will be asked to a) run their division and b) volunteer during the tournament.

5) Awards - CEATE Open awards share many similarities to awards at events you are accustomed to with one significant exception. Great focus will be given to innovation. i.e. Using new methods of construction (3D printing, etc.) and different types of motors, controllers, etc. We really want to spur creativity.

6) This document is considered a draft document until October 1st, 2020. Changes may be made up to that date. Additional changes may be made during the season if warranted AND it will not be uncommon for CREATE to make U.S. Open specific changes to these rules. Any U.S. Open specific rules changes will be made at least 4 weeks prior to the U.S. Open.

7) Translations – Any translation of any of the CREATE Open Program documents are to be considered and used as a courtesy. The English version of any/all documents will be considered the final authority on rules, guidelines and recommendations for the CREATE Open Program.