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Introduction Round #2 of FIRST Robotics SA (2021)

Please read this document for details of the opportunities that are available. There is an application link in this document **PLEASE READ DOCUMENT FIRST!** Please submit using the link. Applications will be reviewed. Successful applicants will be notified and will be required to sign an MOU. Equipment will only be released on the receiving of a SIGNED MOU. Successful applicants will be required to collect or to arrange for the couriering of equipment.

The following timelines apply:

- First allocation 15 May. All MOUs must be signed and returned, and equipment dispatched by 30 May 2021.
- Second allocation 30 May. All MOUs must be signed and returned, and equipment dispatched by 15 June 2021.

Educators, students, and visionary community leaders are embracing the robotics training and equipping opportunities. These opportunities include (but are not limited to) the I-SET Robotics Live Online Learning, the I-SET Robotics Massive Open Online Courses (MOOCs) and I-SET Robotics Short Learning Programmes. To extend these training opportunities, FIRST SA is presenting several grant opportunities. However, we are all very aware of the budgetary constraints of visionary schools, who wish to start robotics at their school or community centre to develop robotics teams of learners. These opportunities provide an opportunity to loan robotics equipment to trained educators or leaders, and to ensure that a greater number of learners are afforded the opportunity to build and program robots.

Thus, the purpose of this document is to create awareness of the grant opportunities offered by FIRST SA for the SA Robotics community. These grants have been sponsored by LEGO Foundation and FIRST SA. This document presents the plans and opportunities to start and develop robotics at schools in South Africa for learners Grade R to Grade 12.

Grades	Minimum Robotics Kit Required	Competitions
R-1	Steam Park Set (one for max 8 learners)	FIRST LEGO League Discover
1 to 3	WeDo Core set (one for max 6 learners)	FIRST LEGO League Explore
4 to 10	EV3 EDUCATION Core or Spike Prime Core (one for max 10 learners)	FIRST LEGO League Challenge
8 - 12	(details in a separate document)	FIRST Tech Challenge

How to start robotics at your school

To start robotics at a school, a dedicated team of educators is required to champion robotics at the school (who will also participate in the I-SET Robotics training and equipping events), a 3 YEAR school plan for the development of robotics at the school, an envisioned school robotics budget (and the identification of fund-raising initiatives), and a focus: Learning focus. Robotics can either be presented as part of the curriculum (during school hours) or as an extra-mural activity after school. Grade focus. There are three separate age-appropriate robotics programmes. In an ideal world, a learner would have an opportunity to participate in all three programmes. To start robotics at a school:

- **Identify the educators** and commence with the robotics training.

- **Identify the learners** (classes) who may be included in the school robotics team (if a single team) or the class (if a class pack is implemented).
- **Logistics** are specified including the class times, venue (class) and time (at least 90 minutes per week). A schedule of the teaching can be set up, guided by the educator training materials. If a class pack is implemented, the session team meeting guide for the educator and engineering notebook for the team is provided. Explore and Discover require 10 sessions, while the Challenge requires 12 sessions.
- **Arrival of equipment.** All equipment is on-loan as part of a grant. On approval of the grant, an MOU will be sent to the grant holder. A signed MOU is required before the equipment will be dispatched. All grant holders are required to collect or arrange courier of the equipment.
- **Commencement, progress, and completion of all sessions.**
- **Review** of the progress reports for 2021 and plan for 2022.

Robotics Competitions in South Africa

There are several robotics competitions in South Africa. Each competition has a unique format and requirements. It is important that each learner is given the opportunity to participate in a competition. The current collection of competitions include: FIRST Lego League, World Robotics Olympiad, Robothon at Science Faire, Techno Youth Programme (Robotics) and Conquest Quiz. For **FIRST LEGO League**, there are two options:

- The single team option (usually robotics is an extra-mural activity at the school/centre). The school/centre only has a single team, the team will compete in an annual regional and national FIRST LEGO League robotics competition.
- The class pack option (robotics is an in-class activity at school/centre). The class is divided into teams, these teams compete in a celebration event at the school/centre.

Note that the focus of this document is the *FIRST* LEGO League Robotics Competition, as the grants offered by this competition are detailed. However, all robotics competitions in SA are part of the ASTEMI Science Olympiads and Competitions and are detailed in the ASTEMI Brochure on the ASTEMI website. <https://www.astemi.co.za/wp-content/uploads/2019/04/ASTEMI-Brochure.pdf>

Glossary

EN	Engineering Notebook. For challenge, each team receives a book to complete as part of the 12-session programme. The sessions are detailed. For explore and discover, each learner receives their own engineering notebook. May be an electronic version.
FLL	<i>FIRST</i> LEGO League Robotics competition consists of the three focus competitions, namely Discover, Explore and Challenge.
I-SET	Inspired towards Science, Engineering and Technology is a Community Engagement flagship project of the College of Science, Engineering and Technology (CSET) at UNISA
MOOC	Massive Open Online Course. The I-SET Robotics Programme presents robotics training on the UNISA MOOC portal. There are current 4 I-SET Robotics MOOCs (M1-M4) and 4 I-SET Electronics MOOCs (M5-M8) are planned for 2021.
SLP	Short Learning Programme. I-SET Robotics presents currently 2 SLPs, with 2 new SLPs launching in 2021. See I-SET Robotics Educator Support.
TMG	Team Meeting Guide. For each class pack, there is a book to use as a guide through the 12-session programme. May be an electronic version.

I-SET Robotics Engagement

The community engagement opportunities include the following:

- I-SET Robotics Live Online Learning Sessions that are hosted on MS teams.
- I-SET Robotics MOOC training available on the UNISA MOOC portal.
- I-SET Robotics Short Learning Programmes for Certification.
- Robotics coach and mentor support group is available on WhatsApp.

I-SET Robotics Live Online Learning (Educators Grade 0-12)

- (1 hour/week discussion) Schedule published monthly. Invite contains meeting link.
- Sessions include but are not limited to MOOC Discussions, *FIRST* LEGO League Robotics Challenge, *FIRST* LEGO League Robotics Explore, *FIRST* LEGO League Robotics Discover, Chemistry, Physics, Student Developer Group.

I-SET Robotics MOOCs (M1, M2, M3, M4) (Educators Grade 4-12)

Each MOOC has 4 units, and assessment criteria. The units are also presented as part of and in conjunction with the I-SET Robotics Live Online Learning Sessions. A monthly schedule is available. The MOOCs restart annually and remain open until November. The MOOCs are free and focus on the practical implementation of Robotics. The MOOCs are available under [joinable sites](https://mooc.unisa.ac.za/portal) on: <https://mooc.unisa.ac.za/portal>

I-SET Electronics MOOCs (available in 2021) (Educators Grade 4-12)

There will be 4 MOOCs available.

I-SET Robotics Short Learning Programmes (Educators Grade 4-12)

I-SET Robotics also presents Short Learning Programmes (SLPs). Registrations open in December for semester 1 (starts January) and June for Semester 2 (starts July). SLPs include a registration cost, assignments, and an examination. The registration form is online. There are currently 4 SLPs available:

- PRACTICAL: I-SET Robotics: Components and Pedagogy (CSR0B1E)
- PRACTICAL: I-SET Robotics: Problem Solving, Data and Debugging (CSR0B2E) (Assumes CSR0B1E completion)
- THEORY: I-SET Robotics: Robotics Fundamentals (theoretical with examples) (Starts January 2022)
- THEORY: I-SET Robotics: Robotics in the Future (applications) (Starts July 2022)

FIRST SA Grants (2021)

Introduction to *FIRST* LEGO League DISCOVER Class Pack (Grade R-1)

The *FIRST* LEGO League DISCOVER Class Pack grants provide for an opportunity for a class to participate in a robotics competition at their school annually. It is recommended that a class have at least two trained educators (ideally, each team in the class should have a coach). *FIRST* LEGO League Discover Class Pack. The class of learners are divided into teams of 4 learners. The teams follow the 10-session programme as per the team meeting guide. Each learner is given an engineering notebook and a box of six-bricks to take home. Each team uses a Discover Box. Two teams share a Steam Park. At the end of the 10-session programme, the teams participate in a Celebration Event organized by the school, so that the learners can proudly present their project to parents and peers. The grant requires that the programme be presented to two classes in succession. The Steam Park and Discover boxes are re-used.

Introduction to *FIRST* LEGO League EXPLORE AND CHALLENGE Class Pack

Note that all the Challenge and Explore Class Pack grants for 2021 have already been allocated.

Introduction to *FIRST* LEGO League Single Team for Explore (Grade 1-3)

For teams in Grade 1-3, single Explore team grants (5 learners per team) are available. Multiple Explore teams (to a maximum of 4) may be requested.

Introduction to *FIRST* LEGO League Single Team for Challenge (Grade 4-10)

For teams in Grade 4-10, single Challenge team grants (10 learners per team) are available.

Awarding of grants guided towards

- The schools where no robotics exists, or little or no experience in robotics, BUT have a plan to implement robotics.
- The coaches completed MOOC M1 and M2 and participating in I-SET coach community.
- The districts of all provinces of South Africa need to be considered.
- The grant allocations are only for the year 2021. These allocations are reviewed annually, and thus may be allocated to another visionary school.
- This project is intended to provided equipment to start or support *FIRST* LEGO League, with particular emphasis on sites in areas with underserved children.
- All equipment must be used in a non-profit manner. Thus, NGO's cannot use this equipment to raise funds.

Terms and Conditions

- Grants are allocated to schools (the SGB signs as legally responsible), centres (the directors sign as legally responsible) or NGOs (the directors sign as legally responsible).
- All equipment remains the property of FIRST SA and must be returned complete and in the same condition as received.

- The team coach is responsible for the safe keep and insurance of all signed for equipment. Lost, damaged, or stolen items will need to be replaced.
- The coach is responsible for the registration of the team(s) on the firstsa.org website.
- The coach must submit for weekly progress reports.
- The coach is required to complete I-SET Robotics M1 training.
- Each class pack grant must be implemented at least once in 2021.

Implementation Requirements

- The grant holder is required to collect (or arrange the couriering of) all equipment from FIRST SA in Pretoria.
- The coach **MUST** submit the progress report every week.
- After ONE implementation of a competition, the grant has been completed and all targets are met. If the equipment is no longer required, all equipment must be returned to FIRST SA. On presentation of the robotics implementation plan, a re-allocation may be negotiated.
- The SESSIONS (as presented in the team meeting guide) must be adhered to.
- Communication between applicant grant holder and FIRST SA must be regular.
- Grant-holders and coaches are required to attend weekly meetings in MS teams.

FAQ

The FIRST SA website will maintain an updated list of all FAQ.

GRANT: Challenge Single Team (up to 10 learners, challenge completion) Grade 4-10

<i>FIRST</i> LEGO League Robotics CHALLENGE TEAMS	
Pre-requirements	Name of coaches Proof of coach completion of M1/M2 or SLP Plan for robotics at school Coach participation in I-SET Robotics Live Online Learning Robotics coach and mentor support group is available on WhatsApp
Grant includes equipment on loan from FIRST SA	1 Spike Prime Set (core and expansion kits) 1 <i>FIRST</i> LEGO League Robotics challenge set (current or previous season) Electronic Team Meeting Guide (coach) and Engineering Notebook (team)
Grant covers costs	None.
Progress requirements	The coach must submit weekly progress reports as per 12-session in TEAM MEETING GUIDE emailed to challenge@firstsa.org by Friday The coach must register the team on firstsa.org
Close out requirements	Participation at regional competition. If you choose to continue, then a next plan is required. If you choose not to continue, then all on loan equipment must be returned to FIRST SA (at own expense).

GRANT: Explore Single Teams (4-6 learners, challenge completion) Grade 1-3

FIRST LEGO League Robotics EXPLORE TEAMS	
Pre-requirements	<ul style="list-style-type: none"> Name of coaches. Plan for robotics at school. Coach participation in I-SET Robotics Live Online Learning. Robotics coach and mentor support group is available on WhatsApp
Grant includes equipment on loan from FIRST SA	1 WeDo Set 1 explore/Inspire set (current or previous season) Electronic Team Meeting Guide (coach) and Engineering Notebook (team)
Grant covers costs	None.
Progress requirements	The coach must submit weekly Progress reports as per 12-session programme emailed to explore@firstsa.org by Friday. The coach must register the team on firstsa.org
Close out requirements	Participation at regional competition. If you choose to continue, then a next plan is required. If you choose not to continue, then all on loan equipment must be returned to FIRST SA (at own expense).

GRANT: Discover Class Pack (teams of 4 learners, celebration event) Grade R-1

FIRST LEGO League Robotics DISCOVER TEAMS	
Pre-requirements	<ul style="list-style-type: none"> Name of coaches. Plan for robotics at school. Coach participation in I-SET Robotics Live Online Learning. Robotics coach and mentor support group is available on WhatsApp.
Grant includes equipment on loan from FIRST SA	1 STEAM Park (in container) (one to share between 2 teams) 1 discover set (one per team) 4 six bricks sets (four per team, one per learner) Electronic Team Meeting Guide (coach) and Engineering Notebook (team)
Grant covers costs	Team registration (includes TMG and EN) Team Celebration Certificates for all learners participating.
Progress requirements	The coach must submit weekly progress reports as per 10-session in Team Meeting Guide emailed to discover@firstsa.org by Friday, The coach must register the team for Class Pack on firstsa.org
Close out requirements	Participation at celebration event (all documentation to be submitted). If you choose to continue, then a next plan is required. If you choose not to continue, then all on loan equipment must be returned to FIRST SA (at own expense).
NOTE	If you have smaller classes, please add information on your grant application.

PLEASE READ ALL THE DETAILS IN THE DOCUMENT ABOVE - BEFORE COMPLETING Application Form

- Application form <https://forms.gle/WU2n9pSbsBEi7VA7>

THE APPLICATION FORM (FIRST SA 2021)

Introduction

For this ROUND 2 of the FIRST SA Grants, FIRST SA offers the following grants for 2021. For each type of grant, there are only a limited number available. An application form will be available for each of the following grants:

Information Category	Definition	Information required
Grant type	<ul style="list-style-type: none"> • Class Pack FIRST LEGO League Discover (10 teams per class, 40 learners in teams of 4) • Class Pack FIRST LEGO League Discover (6 teams per class, 24 learners in teams of 4) • Class Pack FIRST LEGO League Discover (4 teams per class, 16 learners in teams of 4) • One team FIRST LEGO League Explore (5 learners in a team of 5) • Two team FIRST LEGO League Explore (10 learners in 2 teams of 5) • Three team FIRST LEGO League Explore (15 learners in 3 teams of 5) • Four team FIRST LEGO League Explore (20 learners in 4 teams of 5) • Single team FIRST LEGO League Challenge (10 learners in a team of 10) 	Select an option.
Province	Gauteng Western Cape Eastern Cape Northern Cape North West KwaZulu Natal Free State Limpopo Mpumalanga Other: _____	Select a province.
District	District in Province	Type in district.
Institution This describes the institution that will be using the grant to implement robotics.	ECD Centre Primary School High School Science Centre	Select an option.

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	Community Centre Other: _____	
Institution vision for robotics and motivation for grant application	What is the vision for the growth of robotics? Why are you motivated to apply for this grant?	Type a paragraph.
Which learners will participate in robotics?	The learners that participate in the activities of the grant are in which grades?	Type a paragraph.
Applicant Type The applicant is the contact person who shall sign the contract of responsibility for the on-loan equipment for one year.	<ul style="list-style-type: none"> • School SGB Chairperson. • Community Centre Director. • NGO Director 	Select an option.
Applicant Details	Title Name Surname ID number Cell Number Email address	Text required.
Venue for Robotics The venue is the address of the site where the robotics training will be implemented. This is the address to which the equipment will be couriered and where the equipment will be kept safely.	<ul style="list-style-type: none"> • School • Community Centre • NGO Venue • Other: _____ 	Select an option.
Venue Details	Name of building Street Address	Text required
Courier Address (if it differs from venue) Address to which equipment will be couriered.	Name of building Street Address	Text required
Store Address (if it differs from venue) Address at which equipment will be stored.	Name of building Street Address	Text required
Team Coach 1	Title	Text required

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<p>This person is committed to the implementation as stipulated in the T&C of the grant. This person has training in the implementation of the programme.</p>	<p>Name Surname ID number Cell Number Email address</p>	
<p>Team Coach 2 This person is committed to the implementation as stipulated in the T&C of the grant. This person has training in the implementation of the programme.</p>	<p>Name Surname ID number Cell Number Email address</p>	Text required
<p>To ensure that the T&C of the grant are adhered to:</p>	<p>I have read the requirements of the implementation of the grant.</p>	Y N
	<p>The Challenge coaches have completed I-SET Robotics M1 course.</p>	Y N
	<p>The coaches are participating in the I-SET Robotics Live Online Learning and will contribute in terms of community learning.</p>	Y N
	<p>The coaches are participating in the Coach WhatsApp Group.</p>	Y N
<p>If you were to receive the grant, do you have any ideas for the future use of the grant equipment to reach additional learners (beyond the targets required in the grant).</p>	<p>We would really appreciate the sharing of other ideas to reach more learners and welcome any suggestions.</p>	Type a paragraph