

Rooibos in Space STEM Programme



Safety and Good Practice Guidance for Classroom, After-school and Practical Experiments

This document provides practical safety and good practice guidance for educators, facilitators and school programme leads who are implementing Rooibos in Space activities using the Springbot and the Space STEM class kit. It supports safe classroom work, after-school sessions, practical investigations, outdoor data collection, smart farming activities and learner evidence gathering.

The guidance is intended to be used together with the Springbot Getting Started Guide, the learner worksheets, experiment modules, parent or guardian consent templates, assessment rubrics, and the school's own safety, safeguarding, ICT and learner supervision policies.

Guiding principles

Rooibos in Space is designed to give learners a practical, safe and inspiring introduction to coding, sensing, data collection, environmental monitoring, smart farming and Earth systems thinking. The class kit uses low-voltage education electronics and modular sensors that are safe for school use when handled with ordinary care, clear supervision and sensible classroom routines.

The most important safety principle is simple: learners should explore, test and investigate in a controlled way, with an educator or facilitator present, and with equipment used only for its intended educational purpose.

- Learners are briefed before each practical activity and understand the boundaries of the task.
- Springbot boards and xChip sensors are treated as reusable educational equipment.
- Water, soil, plants, outdoor spaces and learner movement are managed deliberately.
- Data, photographs, video and learner work are handled responsibly and only used where consent is in place.
- Every experiment includes a question, a fair method, a safe working plan, recorded observations and a short reflection.

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1 Scope of this guide

This guide applies to Rooibos in Space activities that take place in classrooms, laboratories, computer rooms, libraries, after-school club spaces, school halls, school gardens, courtyards and supervised outdoor areas on the school property. It also applies to short practical investigations where learners move between indoor and outdoor spaces to collect data.

The guidance covers activities using the Springbot, supplied USB cable, MicroBlocks, supplied xChips or sensors, WiFi or Bluetooth where used, environmental data collection, soil moisture investigations, light and air temperature investigations, air temperature and humidity investigations, data recording, learner evidence collection and basic troubleshooting.

This guide does not replace the school's formal health and safety policy, safeguarding policy, ICT policy, laboratory policy, excursion policy or emergency procedures. Where a school policy is stricter than this guide, the school policy takes priority.

2 Roles and responsibilities

Safe implementation depends on clear roles. Each school should identify a Programme Lead educator and at least one support educator or facilitator who can assist with sessions, equipment care and learner supervision.

- Programme Lead educator: responsible for planning the session calendar, securing safe venues, managing the kit inventory, coordinating educator support, and ensuring that consent and school procedures are followed.
- Session educator or facilitator: responsible for delivering the activity, briefing learners, supervising safe behaviour, checking equipment, supporting data collection and recording incidents or issues.
- Support educator or assistant: helps manage groups, movement, attendance, equipment handout and collection, and practical troubleshooting.
- Learners: use the equipment responsibly, follow instructions, work in assigned roles, report damage or hazards immediately, and record data honestly.
- School management: supports suitable venues, safe storage, parent or guardian communication, after-school arrangements, and alignment with school policies.

3 Supervision and safeguarding

Rooibos in Space sessions should always be supervised by an educator, facilitator or authorised adult. Learners should not be left alone with the equipment during formal programme activities, especially when equipment is connected to computers, power banks, WiFi networks or outdoor activity areas.

- Keep an attendance register for every session, especially after-school sessions.
- Know which learners have permission to participate, to be photographed or filmed, and to have work or images published.
- Follow the school's normal adult-to-learner supervision requirements. For practical group work, smaller supervised groups are better than one large, unmanaged group.
- For after-school sessions, confirm collection arrangements, transport expectations and emergency contact procedures before the first session.
- Do not allow learners to leave the agreed activity area without permission.
- Avoid one-on-one unsupervised situations. Work in visible, open spaces where possible.
- Use learner first names only where names are needed for classroom management. Do not publish learner names, photographs, videos or identifiable work unless the required consent is in place.

4 Before each session: educator checklist

Before a session begins, the educator or facilitator should complete a simple practical check. This does not need to be complicated. A two-minute routine can prevent most issues.

- Confirm the activity objective and the experiment question for the session.
- Check that the venue is suitable, dry, tidy and free from obvious trip hazards.
- Check that desks, chairs, cables and bags do not block walkways.
- Confirm that tablets or computers are charged and in working order.
- Check WiFi details only if the activity requires WiFi.
- Review the safety points specific to the activity, such as water use, soil handling, outdoor movement, sunlight exposure or cable management.
- Remind learners to report problems immediately rather than trying to force a connection or repair equipment themselves.

5 Safe use of the Springbot and xChips

The Springbot is designed for education and real-world STEM investigations. It uses a microcontroller, connects to MicroBlocks, and can work with modular xChips and sensors. Learners can add sensors and interfaces without soldering, breadboarding or complicated wiring. This makes the system suitable for first-time users, provided that learners handle it carefully and follow the educator's instructions.

- Use only the supplied USB cable or a known data-capable USB cable.
- Connect and disconnect cables gently.
- Do not force connectors. If a connector does not fit easily, stop and ask the educator to check it.
- Keep food, drinks and open water containers away from the electronics.
- Do not place the Springbot directly on wet soil, damp grass, puddles, metal surfaces or unstable outdoor surfaces.
- Do not connect unknown components, mains-powered equipment, high-voltage parts or improvised wiring to the board.
- Do not modify the board, cut wires, remove components or try to repair damaged electronics during a learner session.
- If a board, cable or sensor becomes hot, smells unusual, sparks, smokes, cracks or behaves unexpectedly, stop using it immediately and give it to the educator.
- If rechargeable batteries or power banks are used, use only supplied or approved charging equipment, keep them away from heat and water, and report swelling, leakage or damage immediately.

6 USB, computer and power safety

Most early Springbot activities begin by connecting the board to a computer, Chromebook or compatible device using a USB cable. This is low-voltage and suitable for classroom use, provided that cables and devices are managed properly.

- Place computers and Springbots on stable surfaces where they cannot fall.
- Route USB cables so learners do not trip, pull devices off desks or strain ports.
- Avoid stretching a USB cable across a walkway.
- Do not use damaged cables, exposed wires or loose USB ports.
- Do not allow learners to plug or unplug devices roughly or repeatedly without a reason.
- Keep devices away from sinks, water bottles, wet soil trays and outdoor irrigation areas.
- Where power banks are used, keep them dry, do not overload them, and return them to the educator at the end of the session.
- Only educators or authorised learners should manage charging routines.

7 MicroBlocks and coding good practice

MicroBlocks allows learners to test ideas immediately. This live feedback is powerful because learners can change the code and observe the Springbot responding. It also means learners should learn to test one change at a time, observe carefully and keep a record of what changed.

- Start with simple activities before moving to connected or multi-sensor projects.
- Ask learners to predict what will happen before they run a programme.
- Test one change at a time so that learners can understand cause and effect.
- Use meaningful file names or project names that do not include learner personal details.
- Save working versions before making large changes.
- Encourage learners to explain their code to a partner before testing it.
- Avoid unnecessary buzzer use in a crowded classroom. Set volume, timing and repetition so that it does not disrupt other classes or distress learners sensitive to sound.
- When using sensor thresholds, discuss what the threshold means and why it was chosen.

8 WiFi, Bluetooth and connected data safety

Springbot can connect to WiFi and send data for visualisation when the activity requires connected work. Some activities may also use Bluetooth. Connected technology is valuable for Internet of Things learning, remote sensing foundations and data dashboards. It should be managed through the school's ICT procedures.

- Obtain school approval before connecting devices to the school network.
- Where required, ask the school IT department to confirm that the relevant services are allowed through the firewall.
- Do not write WiFi passwords on public whiteboards or learner worksheets that may leave the venue.
- Do not ask learners to share personal hotspot passwords unless the school has agreed to this approach.
- Use project-safe kit names. Avoid learner names, ID numbers, personal phone numbers, home addresses or other identifying details in device names, dashboard names or datasets.
- If a temporary network name or passkey appears on the Springbot display during setup, treat it as session information and do not publish it.
- If WiFi is unreliable, continue with offline activities rather than allowing the session to become unsafe or chaotic.
- When using dashboards, check the time range, kit name and data source before assuming that data has failed.

9 Classroom workspace management

A well-organised workspace supports safety and learning. Learners should be able to see the demonstration, access their equipment, write results and move safely between groups.

- Keep only the required equipment on the desks.
- Keep liquids off the working surface unless the educator has set up a controlled water or soil activity.
- Give each group enough space to place the Springbot, computer and worksheet without crowding.
- Use group roles to reduce grabbing and confusion: coder, tester, recorder, equipment manager and presenter.
- Have a clear handout and return process for boards, cables and sensors.
- Use a visible “equipment return point” at the end of the session.
- Do a quick floor and desk check before learners leave.

10 After-school implementation guidance

After-school sessions are often ideal for practical STEM work because learners have more time to explore, test and improve. They also require stronger routines because the session takes place outside the normal timetable.

- Confirm which learners are registered for the programme and which learners have permission to attend after school.
- Keep an attendance register and record late arrivals or early departures.
- Share session times, venue, collection arrangements and emergency contact procedures with parents or guardians through the school’s normal communication channel.
- Keep the activity area within the agreed school boundaries.
- Avoid practical work that requires learners to move around the school grounds if supervision is not sufficient.
- End with enough time to collect, check and store the equipment before learners leave.
- Record any incidents, near misses, equipment damage or safeguarding concerns using the school’s process.

11 Good scientific and engineering practice

Good practice is not only about preventing harm. It is also about teaching learners how scientists and engineers work. Each Rooibos in Space practical activity should help learners ask better questions, test fairly, improve designs and explain findings from evidence.

- Start with a clear question.
- Ask learners to make a prediction before collecting data.
- Change one variable at a time where possible.
- Keep the method consistent between groups or locations.
- Record the unit, location, time and conditions for each reading.
- Repeat readings where time allows and compare results.
- Discuss outliers and unexpected results rather than deleting them without a reason.
- Separate observations from opinions.
- Ask learners what could be improved if they repeated the experiment.
- Link data to decisions, for example where to place a plant, when to water, how to compare microclimates, or how to explain differences in environmental conditions.

12 Data recording and evidence

Data is central to the programme. Learners should learn to record data in a way that is useful, honest and easy to interpret later. Educators should encourage neat, complete records and discourage “making the data fit” a preferred answer.

- Use the supplied data sheets or learner workbook templates where available.
- Record the date, time, location and group name for each dataset.
- Use group names that do not reveal personal information.
- Record the sensor used and the unit or scale where known.
- Record what changed between readings.
- Label graphs clearly and use sensible axes.
- Keep raw data until the activity is complete.
- Do not overwrite or delete another group’s data.
- When presenting evidence, include the question, method, data, finding and one improvement.

13 Responsible use of photographs, video and learner work

Photographs and short videos are useful for project evidence, showcases and sponsor reporting. They must be collected respectfully and only where the necessary school and parent or guardian permissions are in place.

- Use the programme consent templates and the school's usual permission process before taking or publishing identifiable learner images.
- Respect learners who do not have consent for photographs or video. Give them meaningful roles that do not require being filmed or photographed.
- Avoid capturing private information on boards, worksheets, screens, attendance registers or device labels.
- Do not publish learner contact details, home information, private circumstances or personal identifiers.
- When capturing practical work, focus on hands, equipment, data sheets, group work and demonstrations where suitable.
- Store photographs and videos in the agreed school or project folder, not on unmanaged personal devices where avoidable.
- Check captions before publication to ensure that they are accurate, respectful and aligned with the programme.

14 Responsible use of AI-enabled educator support

The Rooibos in Space Educator Assistant may be used to adapt lessons, generate worksheets, differentiate activities and create assessment ideas. It is a support tool for educators, not a replacement for educator judgement.

- Do not enter learner personal information into the AI assistant.
- Check all AI-generated lesson content before using it with learners.
- Check facts, calculations, units and safety instructions before printing or distributing materials.
- Use AI to support inclusion, such as simplifying instructions, creating extension questions or developing vocabulary support.
- Do not use AI-generated assessments without educator review and alignment to the intended learning outcomes.

15 Equipment inventory, storage and care

The class kit is reusable. Good care protects the investment and helps future learners benefit from the programme.

- Keep a simple inventory of Springbots, sensors, USB cables, power banks where supplied, storage boxes and printed materials.
- Number or label boards and sensors so that each item can be tracked.
- Store electronics in a dry, clean, secure place.
- Return sensors and cables to the correct storage compartments after each session.
- Do not store electronics with wet soil samples, damp plant material or leaking containers.
- Check that boards and cables are dry before packing them away.
- Record missing, damaged or unreliable items immediately.
- Do not allow learners to take kit items home unless this has been formally approved by the school and programme team.
- At the end of each term or project phase, conduct a kit check and update the inventory.

16 Risk assessment for practical activities

Each practical experiment should have a brief risk assessment. This can be done in plain language. The purpose is to help the educator think through what could go wrong and what controls are needed.

For each activity, ask:

- What are learners doing?
- What equipment, substances, materials or spaces are involved?
- What could cause harm or disruption?
- Who could be affected?
- What controls are already in place?
- What additional instructions are needed before learners begin?
- What will we do if the activity needs to stop?

Common controls include supervision, clear boundaries, dry work surfaces, cable management, small water quantities, no forced connectors, no high-voltage components, consent for photographs and

videos, safe outdoor routes, handwashing after soil activities, and immediate reporting of damaged equipment.

17 Incident, near-miss and equipment issue reporting

A near miss is an event that could have caused harm or damage, even if no one was hurt and no equipment was damaged. Recording near misses helps the programme improve.

- Stop the activity if there is an immediate safety concern.
- Move learners away from the hazard where needed.
- Disconnect equipment only if it is safe to do so.
- Follow the school's first-aid, safeguarding and incident reporting procedures.
- Report damaged equipment to the Programme Lead educator.
- Record what happened, where it happened, who was present, what action was taken and whether follow-up is needed.
- Do not restart the same activity until the risk has been addressed.

18 Troubleshooting good practice

Troubleshooting is part of STEM learning. It should be calm, structured and safe. Learners should not be blamed when equipment does not connect or a sensor reading seems unusual. They should learn how to test likely causes one step at a time.

- If the Springbot does not connect, check the USB cable and port first.
- If MicroBlocks does not detect the board, close and reopen MicroBlocks, then reconnect the device.
- If a sensor reading seems wrong, check the sensor orientation and repeat the reading.
- If WiFi does not connect, check the network name and password carefully and confirm whether the network allows the required connection.
- If dashboard data does not appear, check the kit name, the time range and the network connection.
- If the issue continues, record the device number, activity, error message, steps already tried and any relevant photographs, then escalate through the agreed support pathway.

19 Activity-specific safety notes

Sunlight and air temperature

- Do not look directly at the Sun.
- Avoid very hot surfaces that may damage equipment or burn learners.
- Use shade breaks for outdoor work in strong sunlight.
- Keep groups within sight of the educator.

Air temperature and humidity

- Use natural differences between locations rather than artificial heat, steam or sprays.
- Do not use flames, heaters, boiling water, aerosols or chemicals.
- Allow readings to stabilise before recording data.

Soil moisture monitoring and control

- Keep electronics away from water and wet soil.
- Use small amounts of water and clean spills immediately.
- Wash hands after handling soil or plant material.
- Label pots and samples clearly.

20 Inclusion and learner confidence

Good practice also means creating a classroom environment where all learners can participate. Practical STEM can be highly motivating when learners feel safe to try, fail, fix and explain.

- Rotate group roles so that every learner has a chance to code, test, record and present.
- Give first-time coders a small first success before increasing complexity.
- Use paired work so learners can help each other.
- Support learners who may find sound, crowding, outdoor heat or fast-moving group work difficult.
- Use extension tasks for confident learners without making other learners feel left behind.
- Praise careful observation, honest data recording and thoughtful troubleshooting, not only correct answers.

21 What good implementation looks like

A safe and well-run Rooibos in Space session is active, practical and calm. Learners know what they are investigating, how to use the equipment, what their role is, and how to record evidence. The educator does not need to solve every technical problem immediately. The educator creates the conditions for learners to test carefully, ask better questions, and use data to explain what they observe.

By the end of the early sessions, learners should be able to connect the Springbot, open MicroBlocks, run a simple block-based programme, read at least one sensor value, describe how readings change in different conditions, record results clearly, and suggest one improvement or next investigation.

22 Final reminder

Rooibos in Space is built around curiosity, careful measurement and real-world problem-solving. Safety and good practice make this possible. When learners are supervised, equipment is cared for, data is recorded honestly, and practical work is planned thoughtfully, the programme becomes a strong foundation for coding, environmental science, smart farming, data analysis and future-ready STEM learning.

Document note: This guide is prepared for inclusion in the Rooibos in Space Educator Support Pack. Schools should adapt operational details to their own policies, facilities and learner supervision requirements.