#9

COMPLETE

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Page 1: Please review the following:

Q1

Contact Person:

Name	**Michelle Garcia**
Email Address	**michelle.garcia@gcccd.edu**

Q2

Department:

Biology

Q3

Title of Request:

Plants That Speak: Electrical Signaling Technologies for Interactive Biology Instruction

Q4

Location of Request:

H-222

Q5

Type of Request (Select one):

Equipment: Tangible property with a purchase price of at least $200 and a useful life of more than one year.Technology related items such as hotspots, computers, tablets should be requested through the College Technology Committee

Q6

Description of Request:Please provide a description of the supplies, equipment, or miscellaneous request. When making your request, please be as specific as possible and include information such as make, model, manufacturer, color, quantity, etc.

Request approval to purchase eight (8) plant electrical signaling visualization devices (plant electrophysiology sensors) at approximately $149.99 each (estimated total $1,199.92). These are portable, low-voltage, non-invasive sensor units that attach to plant tissue using electrode leads/clips and connect to a digital display interface/software (vendor app or computer interface) to record and visualize real-time plant electrical signaling activity in response to environmental stimuli (e.g., touch, light changes, temperature/moisture changes).

Make/Model: Plant Spiker Box
Manufacturer: Backyard Brains
Color: NA
Quantity: 8 devices (to support small-group lab rotations).
Intended use locations: Biology laboratories in H222 and KUMY/BIO ethnobotany/ecology lab spaces.
Primary instructional use: Bio 240 and KUMY/BIO 134 & 135 (shared across additional sections as available).

Q7

Estimated Cost:

8 Plant Spiker Boxes at $149.99 each
Total: $1,199.92

Q8

Respondent skipped this question

Please attach quote, if available

Q9

Total Cost of Ownership:Your requested item may incur ongoing expenses.What are the ongoing expenses associated with your request? If there are ongoing expenses, please detail how you plan to support these costs with your existing budget by completing the text boxes below.

Initial Cost of Item	**$1,199.92**
Service Agreements/Warranties	**na**
Maintenance	**na**
Upgrades	**na**
Impacts to Staffing	**na**
Replacement Costs	**na**
Other	**na**
Total	**$1,199.92**
Amount available in departmentbudget to support this requestSmarkey:	**na**
Remaining requested amount	**na**

Q10

Justification of Request:The justification of the request is a key area to focus on. The ROC encourages you to strengthen your request by providing a robust rationale detailing all relevant criteria. When writing the rationale, keep in mind that those reviewing the justification may not be familiar with your department and needs. Providing detailed information and context can help clarify the need for your request.Please select the applicable criteria(s) and provide the details of how the criteria(s) relate to your request.

Critical need,

Program expansion,

Impact on student success and access,

Equity and Antiracism,

The justification of the request is a key area to focus on. ROC encourages you to strengthen your request by providing a robust rationale detailing all relevant criteria. When writing the rationale, keep in mind that those reviewing the justification may not be familiar with your department and needs. Providing detailed information and context can help clarify the need for your request.:

Justification of Request This request supports instructional innovation, student success, and equity across Biology and Ethnobotany by providing students with access to real-time plant electrical signaling visualization technology. These devices allow students to directly observe plant responses to environmental stimuli, transforming abstract biological processes into visible, data-driven learning experiences. The request meets multiple Resource and Operations Council criteria as outlined below. Critical Need While not driven by an immediate safety hazard, this request addresses a critical instructional need: students often struggle to understand plant signaling and communication because these processes are invisible and highly abstract when taught through static images or lecture alone. This challenge disproportionately affects students with limited prior exposure to laboratory science. The requested devices eliminate reliance on less effective or potentially hazardous chemical demonstrations and instead provide a safe, non-invasive, low-voltage alternative that allows students to engage with living systems in a controlled, accessible manner. This improves both instructional clarity and safety while modernizing outdated instructional approaches. Program Expansion / Innovation This request represents a high-impact instructional innovation that expands the department’s capacity to deliver cutting-edge, interdisciplinary science education. The devices will be shared across multiple courses, including Bio 240 (Ecology/Biology majors) and KUMY/BIO 134 & 135 (Ethnobotany and Ethnoecology Labs), supporting both majors and non-majors. The technology enables: *real-time visualization of plant electrical and chemical signaling, *inquiry-based experimentation and data interpretation, and *interdisciplinary integration of ecology, physiology, and ethnobotany. This innovation directly supports emerging instructional priorities, including MAT Science (Modern and Traditional knowledge integration), and positions the department to offer distinctive, forward-looking learning

experiences not otherwise available using standard lab equipment. Impact on Student Success and Access The requested equipment significantly enhances student success and access by making complex biological concepts tangible and understandable. Students work in small groups using shared devices, ensuring broad access across multiple sections and reducing barriers related to cost or prior experience. By converting abstract theory into observable phenomena, the devices: *improve conceptual understanding and retention, *increase student engagement and persistence in STEM courses, and *support skill development aligned with transfer-level biology expectations. Because the equipment is portable and reusable across courses, it provides sustained, scalable access to high-impact learning experiences without recurring costs. Equity and Antiracism This request strongly supports equity and antiracism goals by embedding culturally responsive, inclusive pedagogy into laboratory instruction. The devices are intentionally integrated into Kumeyaay Ethnobotany and Ethnoecology courses, where students examine plant responsiveness through both Modern scientific frameworks and Indigenous Traditional Ecological Knowledge (TEK) perspectives that emphasize relationality, plant agency, and environmental stewardship. This approach: *affirms Indigenous ways of knowing as valid scientific frameworks, *supports belonging and identity for historically underrepresented students in STEM, and *challenges deficit-based narratives by positioning students as knowledge-makers rather than passive recipients. By ensuring that students from all backgrounds have access to innovative, culturally grounded science experiences, this request advances antiracist practice and equity in both curriculum and outcomes. Summary This is a low-cost, high-impact, and low-maintenance investment that advances instructional innovation, student success, and equity across multiple programs. The requested equipment modernizes laboratory instruction, strengthens interdisciplinary learning, and supports inclusive, culturally responsive STEM education directly aligning with the Resource and Operations Council’s evaluation criteria.

Q11

Program Goals:Please identify the program goal(s), as stated in your current annual or comprehensive program review, that this request would help your program achieve. Provide a brief explanation of how it would do so.

This request directly supports the Biology Department's two primary program goals:

Goal 1: Expand access to underserved populations across Biology pathways.
The plant electrical signaling visualization devices expand equitable access to high-impact laboratory experiences by making complex biological processes visible, interactive, and accessible to all students, regardless of prior laboratory exposure. Their use in both Biology major (Bio 240) and Ethnobotany/Ethnoecology (KUMY/BIO 134 & 135) courses supports inclusive, place-based learning and affirms Indigenous knowledge systems, helping students from historically underserved backgrounds see themselves reflected in science pathways.

Goal 2: Reduce equity gaps in retention and success in 100-level Biology courses.
By transforming abstract concepts into real-time, observable phenomena, these devices improve conceptual understanding, engagement, and persistence. These are key drivers of student success in foundational science coursework. The shared, group-based use of the equipment ensures broad access while supporting inquiry-based learning aligned with student success and transfer expectations.

Together, this request advances both access and success by removing structural barriers to learning, strengthening culturally responsive instruction, and embedding innovative, equity-minded practices into the Biology curriculum.