INSTRUCTIONAL EQUIPMENT REQUEST 2017-2018

Internal Use
IE #: FALL-22
Total $: 854.82

Requester Name: Carol Edson/Ruth Hanna **Division Name:** Geology/MSEPS

SECTION 1: SUMMARY INFORMATION

Brief Title of the Request:

Equipment for construction of an Augmented Reality Sandbox.

Purchased in the usual way, these learning tools cost between $6000 and $8000. Our goal is to build on here at LPC for less than half that cost, and give students a true engineering introduction.

This project is a faculty-guided, student-driven engineering design and construction experience. We have a group of 6-7 STEM students who are working to build this learning tool that allows users to move sand in a sand box while a projection system creates the matching topographic elevations in color. It is a beautiful, compelling device being used world wide in colleges, K-12 and museums. Our student group has made great progress, and we are ready to move from the design phase of the last 16 weeks into the purchase and construction part.

Equipment Location Building: L1800 **Room:** L1824

Location Comments:

The Augmented Reality sandbox will be used by Geology, Environmental Science and Geography courses on a regular basis to illustrate through hands on play what topographic maps tell us. The AR sandbox takes the topography created by the uer's hands and shows the elevations in color. By holding one's hand under the projector one creates a cloud...and that lets blue 'water' flow into all the low spots. People of all ages love experimenting with this learning tool. Our students often need help understanding how to picture in 3D what a topographic map is telling them in 2D. The Augmented Reality sandbox does that in a compelling and fun way. Because it has computer components and a weight of around 300 pounds the AR sandbox will reside in 1824 where it can be easily accessed by Geology and Geography classes.

11/16/17 SRR

SECTION 2: EQUIPMENT DESCRIPTION

The equipment is: ☐ A Replacement ☐ An Upgrade ☒ New Equipment/Technology

Describe the specific equipment requested and how it will be used to replace, upgrade or provide new technology to LPC from what is currently in place:

Currently we use a simple, low tech version of playing with sand to help illustrate the concepts of topographic map information. Our sand boxes are just that....and students use simple topographic maps to guide how they shape the sand to match the terrain shown on the maps. This meets with some success but does not illustrate in the same way that the AR sandbox does. The most our students can do is make a hill shape or a valley shape, in a simplistic cartoon like way. With the AR sandbox they would be able to literally see the areas of same elevation illuminated in the same color. The rainbow like pattern is striking, clear and informative...you see what the paper map shows but in full relief WITH color.

Geology and Geography students have always struggled with the mental translation of flat maps to visualizing the 3D landscapes the represent. The AR sandbox is helpful in a unique and non-threatening way.

SECTION 2: EQUIPMENT DESCRIPTION (contd)

If applicable, describe the legal requirement, mandate, or safety concern for purchase of this equipment, making specific reference to the legal requirement or regulation:

N/A

SECTION 3: LPC MISSION STATEMENT AND LPC PLANNING PRIORITIES

LPC MISSION STATEMENT:

LPC is an inclusive learning-centered institution providing educational opportunities and support for completion of students' transfer, degree, basic skills, career-technical, and retraining goals.

LPC PLANNING PRIORITIES:

- **Accreditation: Establish regular and ongoing processes to implement best practices to meet ACCJC standards.**
- **Curriculum: Provide necessary institutional support for curriculum development and maintenance.**
- **Tutoring Services: Expand tutoring services to meet demand and support student success in Basic Skills, CTE, and Transfer courses.**
- **Professional Development: Coordinate available resources to address current and future professional development needs of faculty, classified professionals, and administrators in support of educational master plan goals.**

Specify how the equipment supports *LPC's Mission Statement* and *Planning Priorities*:

Using an Augmented Reality sandbox gives students of all abilities and life experience a level playing field. This tool facilitates learning by experimentation, guessing what will happen and then seeing immediate feedback in a delight-filled, hands-on way. Maps are part of the curriculum for Geology and Geography courses, and present a challenge for many students. Environmental Science/Studies students benefit also. Users are able to see how watersheds work, how to choose a hiking route, and even can extrapolate to demonstrating landforms found on other planets in our Solar System. Increasing deep understanding of our planet, its processes, its resulting geomorphology and topography is the goal served by this amazing equipment.

SECTION 4: EDUCATIONAL ITEMS – PROGRAM REVIEW

Specify the educational programs this equipment supports:

Geology, Oceanography, Geography and Environmental Science will all be served by the AR sandbox as a teaching tool, a non-threatening fun way to explore topography, and as a deep learning experience for the group of Engineering students who have taken on this design and building work, with the help of Dr. Travis White.

If this equipment is included in your Program Review, please include the exact wording. If equipment is not included, explain why:

C) Continuing to pursue and support the construction and implementation of the Augmented Reality Sandbox for the Geology and Geography programs – with tremendous thanks and gratitude to Physics Instructor Travis White for coordinating this as a student maker-space project, and additional thanks to Nan Ho for finding some funds for Travis. W and his students to be able to start work on this project this summer 2017. We are currently awaiting word on an Innovation grant to continue funding this ongoing project.
This is quoted from PR section F, subhead C.

SECTION 5: TEACHING AND LEARNING

Describe in detail the impact this equipment will have on <u>teaching</u>:

Anxiety is rampant among students, and especially Science students who struggle with the unfamiliar concepts presented. This inviting playful experiential tool lets students explore with guided facilitation when appropriate to see the relationships between landforms, water, and human activities. Where might one choose to put a dam? WHy? Where do you think the water will go if the dam breaks? How would you suggest hiking from point A to point B to have the gentlest slopes to climb? What about the shortest, steepest route? All these examples illustrate how this tool can be set up ahead of time with questions to go with it as a lab station, or for more free form experimental work on topography in general.

Describe in detail the impact this equipment will have on <u>learning</u>:

Students that feel fearful about maps and science are quick to embrace this fun way to feel see and CREATE landforms themselves. With guided questions students can guess what will happen if it rains on the tallest mountain they create, and then see where the water actually goes when they hold their hand to act as a 'cloud' allowing 'rain' to fall. Since the sand can be changed in a few seconds, and the projector has a rapid refresh rate, the dynamic nature of the device allows multiple kinds of experineces. There is no limit on how it can be used to generate deeper understanding of how our Earth works, changes over time and is impacted by humans, and vice versa.

Each academic year, this equipment will impact: 15 **# of classes/sections** 400 **# of students**

SECTION 6: OUTCOMES (SLOs)

Using your documented SLOs, specify how the equipment will enable student learning outcomes to be achieved.

GEOL12L - Intro to Oceanography
Lab
- Upon completion of Geology 12 laboratory, students will be able to construct bathymetric contours.

GEOL7 - ENVI GEOL:RESC/USE IMPACT/POLL
- Upon completion of Geology 7, students will be able to define and identify the geology of divergent, convergent and transform plate tectonic environments.
- Upon completion of Geology 7, students will be able to identify and differentiate the various types of fossil fuels.
- Upon completion of Geology 7, students will be able to identify and/or evaluate the various methods of groundwater pollution.

GEOL5 - ENVIRON.GEOL:HAZARDS/DISASTERS
- Upon completion of Geology 5, students will be able to define and identify the geology of divergent, convergent and transform plate tectonic environments.
- Upon completion of Geology 5, students will be able to identify and/or explain the fundamentals of stream systems, including flooding.
- Upon completion of Geology 5, students will be able to identify and/or explain volcanic geohazards.

These are all current SLOs that will be more easily met and with deeper understanding when we have the use of the AR sandbox to demonstrate these processes.

What are the consequences related to learning outcomes if request is not funded?

There is no substitute for this tool. Watching others use it on YouTube is amazing, but personal experience with it is where the magic happens. Flat maps are very useful and portable -but they do not invite one to play and experiment hands-on to learn concepts regarding geologic processes. Also...and very dear to my heart...is the volunteer group of Engineering students who have been researching and planning to make this happen. This is a deep learning experience incorporating all the aspects of any large Engineering project. They must design and research, plan, communicate, do prototypes, and recover from failures. All these are valuable skills. Dr. Travis White is shepherding this group as they step through the process of envisioning, delegating tasks, meeting weekly to assess progress, and order parts. Without the support of funding, all their work to date will be wasted, and we will send a sad message that their initiative and dedication over the past six months is not valued. Please help us keep their momentum going forward by supporting this very worthwhile and important undertaking.

SECTION 7: TOTAL COST OF OWNERSHIP (FINANCIAL & SUSTAINABILITY)

What is the potential life span of the requested equipment?

The potential lifespan is 5-10 years. By the end of that timespan, advances in projection systems will probably mean needing to purchase a new projector. The sandbox itself will be sturdy, and will not degrade. A new grant proposal would be done at that time for the projector if needed.

If new storage is needed what are the storage requirements, location requirements, and costs associated with the new equipment: (NOTE: Specific storage costs should be detailed in the "*Part A: Initial Start-up Costs*" section below.)

N/A

If this equipment replaces old equipment but the old equipment will not be retired, are there on-going storage requirements, location requirements, and costs associated with the old equipment? If so, provide details.

N/A

What will be required to maintain the equipment, such as regular servicing or upkeep? (Specific on-going costs should be detailed in the "*Part B: On-Going Annual Operating Costs*" sections below as applicable.)

N/A

Explain how this equipment meets or exceeds basic sustainability efforts and/or provides renewable resources to the college:

We are using recycled, donated and pre-owned parts to the greatest extent possible to keep costs down. But the remailing parts must be purchased and hence this request. The students have been very enterprising in sourcing donations, finding available components and researching the best vendors. This is an ongoing process.

Part A: Initial Start-up Costs

Item	Cost	Comments
Equipment or Materials see quotes		$780.66
Taxes (9.5%)		$ 74.16
Shipping or Delivery Charge		
Installation Costs *		
Miscellaneous Costs:		
Facilities Modifications		
Operator Training		
Maintenance & Repair Training		
Storage		
Other:		
Vendor Discount		
Grand Total:		$ 854.82

***For items requiring installation, requesters are required to check with District Purchasing (Victoria Lamica) regarding District policies.**

Part B: On-Going Annual Operating Costs

Item	Cost	Comments
Annual Service or Maintenance		
Estimated Parts Replacement Per Year	50.00	
Outside Standardization or Calibration Costs		
Storage Costs		
New Supply Costs		
Miscellaneous Costs:		
Maintenance & Repair Labor		
Other:		
Annual Operating Costs:	Estimate 50.00	

Indicate the source of funding for on-going annual operating costs:

If needed some funds from the Geology general budget could be utilized for small items. This would most likely be replacement sand, at a cost of about one dollar per pound for the recommended Sandtastic.

Part C: Incremental Labor Costs N/A

OPERATOR:

Indicate the key operator: _____

Is this in their current scope of duties? _____

Indicate cost to train key operator (include in Initial Start-up Costs above): _____

Indicate amount of time per month key operator will use equipment: _____

MAINTENANCE & REPAIRS:

Indicate the person performing maintenance and repairs: _____

Is this in their current scope of duties? _____

Indicate cost to train for maintenance and repairs: _____

Indicate amount of time per month maintenance will be required: _____

APPROVALS

Funded requesters will be expected to respond to a brief RAC feedback survey by a requested deadline. Requests for computer-related equipment and printers must be reviewed by the LPC IT Department.

Signatures:

Requester — Date: 10-30-17

IT Department (if required): N/A — Date: _____

Dean/Manager — Date: 11-7-17

Vice President — Date: _____


This shows the Augmented
Reality Sandbox in action.

LAS POSITAS COLLEGE Equipment, Apparatus and Service Requisition

#R

FOR REIMBURSEMENT: List payee name & ssn

SUGGESTED VENDOR: Home Depot

TAX ID#

FOR OFFICE USE ONLY

NAME OF STAFF MEMBER	DATE WRITTEN	DATE REQUIRED	DIVISION/ DEPARTMENT	For inventory purposes include room # where equipment will reside:	RETURN COPY of REQUISITION TO:
C Edson	11-7-17	ASAP	WSERS	L1829	Linda x1183

DESCRIPTION (PRODUCT, TYPE, SIZE, COLOR, STOCK NUMBER)	UNIT	QTY	UNIT PRICE	Amt
				$ -
Wood and supplies for augmented reality sandbox structure.				$ -
				$ -
				$ -
				$ -
See quote				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
Comments:	Subtotal			$ -
BT#	Tax		$ 0.0975	$ -
	Shipping (if available):			

Original invoices and receipts must be attached for payment. Include current taxes unless incorporated in price.

TOTAL COST $ 231.06

ACCOUNT # ____________
FUND ORG ACCT PROGRAM

APPROVALS

Supervisor/ Coordinator/ Director: Nan K

Dean/ VP/ President: [signature]

Business Office

Notice of Cancellation (see Exhibit A) may be sent to this address:
HOME DEPOT U.S.A., INC.
Store 0629 PLEASANTON
6000 JOHNSON DR
PLEASANTON, CA 94588

Phone: (925) 847-9200
Salesperson: MXS3115
Reviewer:

QUOTE

SOLD TO

Name: MC DANIEL ASHLEY
Phone 1: (925) 200-7746
Address: 1533 LOGANBERRY WAY
Phone 2:
Company Name:
City: PLEASANTON
Job Description: school
State: CA Zip: 94566 County: ALAMEDA

2017-10-29 18:17
Prices Valid Thru: 10/29/2017

CARRY OUT MERCHANDISE

MERCHANDISE AND SERVICE SUMMARY

We reserve the right to limit the quantities of merchandise sold to customers

REF # W09 SKU # 0000-515-664 The items listed in this section will be carried out of the store by the customer at time of sale.

STOCK MERCHANDISE CARRIED OUT:

REF #	SKU	QTY	UM	DESCRIPTION	PI	TAX	PRICE EACH	EXTENSION
R01	0000-185-884	5.00	EA	1.5IN X 7.25IN - 8FT #2BTR FSC DF /	A	Y	$7.98	$39.90
R02	0000-819-174	3.00	EA	1.5IN X 3.5IN - 8FT #2BTR FSC DF /	A	Y	$3.76	$11.28
R03	0000-454-559	1.00	EA	0.709IN X 48IN X 96IN; SANDE PLYWOOD /	A	Y	$39.98	$39.98
R04	0000-915-394	1.00	EA	0.688IN X 48IN X 96IN; CDX PLYWOOD /	A	Y	$33.88	$33.88
R05	0000-328-329	6.00	EA	3.5IN X 3.5IN - 8FT PRIME FSC DF /	A	Y	$10.92	$65.52
R06	0000-900-236	1.00	PK	5/16"FLUTED DOWEL PINS /	A	Y	$2.88	$2.88
R07	0000-133-938	1.00	BX	#8 X 2" PG10 EXT SCREW 1 LB /	A	Y	$8.47	$8.47
R08	0000-639-073	1.00	EA	TITEBOND III ULTIMATE WD GLUE 16 OZ /	A	Y	$7.84	$7.84

*** CONTINUED ON NEXT PAGE ***

LAS POSITAS COLLEGE Equipment, Apparatus and Service Requisition #R

FOR REIMBURSEMENT: List payee name & ssn. TAX ID#

SUGGESTED VENDOR Projector Superstore

FOR OFFICE USE ONLY

NAME OF STAFF MEMBER	DATE WRITTEN	DATE REQUIRED	DIVISION/ DEPARTMENT	For inventory purposes include room # where equipment will reside:	RETURN COPY of REQUISITION TO:
C Edson	11-7-17	ASAP	MSEPS	L1824	Linda Ext#: x1183

DESCRIPTION (PRODUCT, TYPE, SIZE, COLOR, STOCK NUMBER)	UNIT	QTY	UNIT PRICE	Air
				$ -
				$ -
Projector - see quote.				$ -
				$ -
For Augmented Reality Sandbox				$ -
construction by student group				$ -
				$ -
see quote				$ -
				$ -
Vendor Information/ Remit To: **Deliver To, include room # (optional):**				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
Comments:	Subtotal			$ -
	Tax		$ -	$ -
BT#	Shipping (if available):			

Original invoices and receipts must be attached for payment. Include current taxes unless incorporated in price.

TOTAL COST $ 569 -

ACCOUNT # _____
FUND ORG ACCT PROGRAM

Business Office

APPROVALS

Supervisor/ Coordinator/ Director

Dean/ VP/ President

projector SuperStore
the way AV should be
A Subsidiary of CCS Presentation Systems

17350 N. Hartford Drive
Scottsdale, AZ 85255
(480) 348-0100 fax (480) 348-0101

Visit us online at:
www.projectorsuperstore.com

Billing Questions? Contact us at:
billing@projectorsuperstore.com

Quote

Order No.:	**1008126**
Order Date:	10/31/2017
Account Rep:	Taylor Phillips
Customer ID:	401944

BILL TO:	SHIP TO:
Las Positas Community College 3000 Campus Hill Dr. Livermore CA 94551 UNITED STATES Attn: Yosef Mirsky	Las Positas Community College 3000 Campus Hill Dr. Livermore CA 94551 UNITED STATES Attn: Yosef Mirsky

CUSTOMER P.O. NO.	TERMS	CONTACT
CC	CREDIT CARD	PHILLIPS TAYLOR,TAYLOR@PROJECTORSUPERSTORE.COM
FOB POINT	**SHIPPING TERMS**	**SHIP VIA**
		GROUND

NO.	ITEM	QTY.	UOM	PRICE	EXTENDED PRICE
1	MW632ST: BENQ 3,200 LUMEN WXGA ST PROJECTOR	1.00	EACH	569.00	569.00
2	SHIPPING: Ground Shipping	1.00	EACH	0.00	0.00

Approved by:

X _____

Sales Total:	569.00
Tax Total:	0.00
Total (USD):	569.00

Invoices subject to 1 1/2% interest charge per month if not paid within terms.