



## INSTRUCTIONAL EQUIPMENT REQUEST

**Due in Dean/Unit Head's Office on October 15, 2010 (FALL) and February 11, 2011 (SPRING)**

The Definition of Instructional Equipment can be found in the California Community College's Budget and Accounting Manual. A copy of these definitions is on the PBC webpage at:  
<http://grapevine.laspositascollege.edu/pbc/InstructionalEquipment.php>

Name of Requestor: M. Ansell, R. Grow, A. Flores, G. Gire Ext: 1341

Division/Unit : MSEPS/Chemistry

Brief title of request (equipment or materials being requested must be similar, related or part of a system): 4 micro pipettors, 8 vials and 12 heating mantles

**Request amount** (unit cost and total cost, including tax and shipping;. please include all costs, such as installation, modification to existing facilities to accommodate new equipment, etc...; this information should come from the vendor quote):

Item (s) cost	\$2,245.08
Tax (.0975)	\$218.90
Shipping	\$4.40
Installation	\$0
Facilities Modification	\$0
Other	\$0
Total Cost	\$2,468.38

**Attach copy of quote(s), estimate(s) and requisition(s).**

(Must attach quote & requisition; absence of either will delay processing)

**Please provide a brief description of the specific equipment or materials requested, including the # of pieces being requested, and what they will be used for (e.g., 10 crayola crayons, sky blue, etc...) in 250 words or less:**

The Organic Chemistry students need to have the hand on experience of doing the reactions they are studying. We do most of our experiments on the micro-scale to increase safety in the lab. To insure that we have enough reaction vials, we need to purchase 8 thin walled reaction vials in the 5 mL size. We also need to add 4 more micro pipettors that deliver 0.1 – 1.0 mL to allow the students to accurately add small volumes of the reagents for the experiments. We also need 12 small 100mL flexible heating mantles to insure that we do not have to divide the class into groups performing different experiments on the same day.

Is this in your Program Review? Yes  No

**Please describe how this request is incorporated into your Program Review:**

Our Chemistry Program Mission states we serve "Transfer students majoring in the sciences, engineering, or preparing for careers in medicine, pharmacy, or dentistry". The mission also states "We strive to provide an outstanding set of classes taught by great teachers in small classes with high standards, with an attention to safety, and a focus on student success." We stated in our Challenges and opportunities section number 3 that we will be requesting "funding to replace stockroom equipment, student locker materials, standard lab instrumentation, and safety equipment" these three items are standard lab equipment that is supplied to the students from the stockroom and allow the students to work safely and individually with small amounts of chemicals

Is it a replacement? Yes  Upgrade? Yes  New technology? Yes

**Please explain?**

The equipment requested is a replacement or an increase in the number we already have. At this time we have enough of the small vials for half of the class. The have enough of the small heating mantle for 1/6 of a class. We only have 2 micro pipettors at present which increases the time it takes the students to start the experiments.

**Below is the evaluation criteria; please see corresponding Instructional Equipment Rubric at:  
[http://grapevine.laspositascollege.edu/pbc/documents/PBCInstructionalEquipmentRubric\\_2010-11.pdf](http://grapevine.laspositascollege.edu/pbc/documents/PBCInstructionalEquipmentRubric_2010-11.pdf)**

**Teaching & Learning/Impact on Enrollment (Total = 10 points for A& B)**

**A. How will this item have a positive impact on instruction and/or teaching and learning in the classroom?  
Is this for use by the Instructor or students, or both?**

This equipment will be used by the students to give them the kind of hands on experience that is needed to understand the concepts taught in Organic Chemistry. The students spend 2/3 of their time in the lab.

They do not get the kind of education we want to provide if they have to work in pairs using very small glassware. We need enough reaction vials for every student to work individually. We have registered 24 students each of the last four semesters and we only have 16 of these reaction vials. Working in pairs on this small scale limits the students ability to see what is happening. Student wonder why we do not have enough of these small inexpensive vials for each student to have their own during the lab. The 16 we now have was fine when we only had 16 or less students in the class.

Students lose interest if they spend most of their lab time waiting in line to add small amounts of reagents. They need to spend the time in the lab performing the experiment. Now that our Organic Chemistry classes are filled up each semester, we need another 4 micro pipettors. We only have two now and the students routinely mix two different chemicals. It may take the student 30 - 40 minutes just to get the chemicals they need. It should take 10 minutes at most. When students routinely stay 30 - 40 minutes after class to finish up they start to rush during the labs. We need to provide enough equipment for the 24 students to finish the lab in the scheduled time. We have six balances to reduce lines when weighing solids and we need 6 micro pipettors to reduce the lines when liquids are measured.

It is also difficult to maintain safety in the lab when the class is divided into two groups. One group does one experiment (using the small heating mantles we have) while a second group is doing a different experiment. The use of the small heating mantles may even be span three different lab periods to finish one experiment. This means there are twice as many chemicals in the room increasing the chances for accidents. This also means that the waste generated in class is from 3 different experiments, which also increases the safety issues. In the past I have tried to have the students use some of our larger heating mantles but this increases the chances that the small round bottom flask will break do to the inconsistent heating rate. We can not heat these small round bottom flasks on the hot plates unless we stay below the boiling point of water.

In our Student Learning Outcomes part of our program review we have stated "It is possible that Organic Chemistry should have a lower cap. Twenty four students in the organic lab maybe a little overcrowded. With the number of students we are turning away in Organic Chemistry, we are planning to add a second section when the third chemistry laboratory is completed. We would like to reduce the cap to 20-22 students to reduce long waiting times for students to use instruments and the limited availability of glassware." Until we can add a new section and reduce the number of students in a section we must provide enough equipment for the 24 students we are taking each semester. To increase the safety in the lab we have continually tried to reduce the amount of chemicals used by the students and reduced the size of the glassware used.

**B. How will the equipment impact enrollment, attract, or increase the number of students participating in a course or program?**

We have already increased the number of organic chemistry students to 100% full classes for the last 4 semesters. To increase any more we would need to add another section. We are trying to have enough equipment to accommodate the number of students we already have. In our Student Learning Outcomes part of our program review we have stated:

"It is possible that Organic Chemistry should have a lower cap. Twenty four students in the organic lab maybe a little overcrowded. 2/3 of the class time is done in the lab for this class. With the number of students we are turning away in Organic Chemistry, we are planning to add a second section when the third chemistry laboratory is completed. We would like to reduce the cap to 20-22 students because of long waiting times for students to use instruments and the limited availability of glassware."

Until we can add another section and reduce the number of students in a section we must provide enough equipment for the 24 students we are taking each semester. If we do not have enough equipment for the students registered in the class we may find that the enrollment or retention in Organic Chemistry may begin to drop.

Students start to wonder about the quality of their education when the equipment supplied is not enough for the number of students in the class. If we supply the students with enough equipment to allow them to do their experiments, on the same day, and without long lines we may find that we are able to add another section (in the future) and it may also fill.

Our Organic Chemistry lab has individual hoods for the students safety. We have great instruments for the students to use (FT-IR, nmr, and GC). We should not short change the students on the small things like enough flasks, small heating mantles and micro pipettors to finish their labs individually and on time.

**Outcomes (Total = 10 points)**

**How does this equipment enable or enhance SLOs? What are the consequences related to learning outcomes if request is not funded?**

In our Program Maintenance Form we have stated that:

"The Chemistry Program needs a reliable source of funding to maintain its lab support staff, facilities, equipment, and supplies to respond to increased enrollments, stricter safety regulations, and the need to incorporate safer techniques in its lab activities."

We also state that:

"Fulfillment of this need supports our Student Learning Outcomes

Our Chemistry SLO's are directly related to what students do in the lab. Students will asses higher in these SLO's if the knowledge and skills they need to demonstrate proficiency is reinforced in a more meaningful way through hands-on applications.

Our Program Maintenance form also states that:

"To learn chemistry is to do chemistry. To teach chemistry is to show how chemistry is done. The laboratory work is a critical component of teaching and learning chemistry. This is where students:

- 1) learn general experimental methods and techniques,
- 2) improve their analytical skills,
- 3) are able to relate actual observations and experimental conclusions through the various activities that reinforce and enhance the learning of conceptual material.

Without the ability to run safe laboratories, activities that promote student learning would be limited to paper exercises and computer simulations, which do not support the hands-on nature of learning chemistry."

We believe we may already be seeing a decline in our student's results on our SLO for Organic Chemistry (12B) due to the increased enrollment and the lack of equipment and space in the lab class. The SLO is based on the students score on a standardized Organic Chemistry test given to college students at various colleges and developed by the American Chemical Society.

When our fill rate for Organic Chemistry was 80% or higher (spring of 2007 and spring 2010) the proficiency rate of our Organic Chemistry students based on our organic chemistry (12B) SLO dropped to 50%. When our fill rate dropped to 60 - 70% ( between the spring of 2007 and the spring of 2010) the proficiency rose to 70 - 80%. This data may indicate that as our lab class fills and becomes more chaotic the students proficiency suffers. One way to reduce the chaos and to give the students a better learning environment would be to have enough equipment for 24 student.

In our Student Learning Outcomes part of our program review we have stated:

"It is possible that Organic Chemistry should have a lower cap. Twenty four students in the organic lab maybe a little overcrowded. 2/3 of the class time is done in the lab for this class. With the number of students we are turning away in Organic Chemistry, we are planning to add a second section when the third chemistry laboratory is completed. We would like to reduce the cap to 20-22 students because of long waiting times for students to use instruments and the limited availability of glassware."

This equipment may help us increase our SLO scores and proficiency until we are able to reduce the cap and add a second section of Organic Chemistry.

**Total Cost of Ownership (Total = 5 points)**

*(This section attempts to identify what the ongoing costs of purchasing this equipment will be to the institution)*

- a) **What is the lifespan of the equipment? 5 years? 10 years? 20 years?**
- b) **Is there sufficient current/planned space available for the storage and use of this equipment? If so, where will it be housed? If not, is there a proposed location and are there any costs associated with installation or modifications to the space?**
- c) **Are there operating costs and how will they be covered by the department?**
- d) **What will be required to maintain the equipment, such as regular servicing or upkeep? Who will perform maintenance, and what will the estimated costs be?**

A) The lifespan for the 5 mL reaction vials is probably 10 years and is based on routine breakage. The lifespan of the heating mantles are probably about 20 years. The lifespan of the micro pipettors is probably 8 – 10 years.

B) All of this equipment can fit in the storage cabinets we have in the Organic Chemistry lab room 1805.

C) The only operating cost of this equipment would be the electricity used when the heating mantles are in use and this is probably very small.

D) The only required maintenance would be the calibration of the micro pipettors which is about \$35 for each pipettor every two years.

**Health and Safety (Total = 2 points)**

**Explain if this equipment responds to a security or health and safety need for faculty and students:**

The small reaction vials, the small heating mantles and the micro pipettors all allow the students to perform the normal Organic Chemistry experiments using much smaller amounts of chemicals. These smaller amounts of chemicals will increase the safety in the lab and reduce the amount of waste material generated in our lab classes.

The heating mantles will also allow us to have the students perform the same experiment in one class without breaking them into groups doing the experiment over two or three lab periods. This allows for a safer lab environment since there will be fewer chemicals put out during each lab period. We will also be able to use only the appropriate size heating mantles. Using our larger heating mantles with the small round bottom flasks would increase the chance of breakages occurring while heating the reaction mixtures. Doing one experiment during the lab period would also reduce the number of different chemicals going into the waste containers in the classroom.

The micro pipettors will allow the students more time to do the experiments without waiting in line. This will reduce the chaos in the lab and stop the students from rushing to finish their experiment. Having more micro pipettors will allow us to spread the chemicals around the room more and reduce the chance that the chemicals will be contaminated in the reagent bottles.

**Visibility/Profile within Community (Total = 1 point)**

**Is this a "flagship" item that will bring recognition/notoriety to the College or raise the stature of the program? Will it attract students and/or enhance the image of the College in the community because of its rare, one-of-a-kind status?**

Enrolling 24 students into a lab class and then not having enough equipment for each student to work efficiently would cause the students to have an unfavorable impression of our chemistry program. Long lines in lab waiting to get the chemicals needed to start the experiment would also lead to an unfavorable impression. The confusion arising from having students doing different labs would also lead to a chaotic environment in the lab. Small things like the lack of proper quantities of glassware actually distract from the idea that our chemistry labs have state of the art instruments and individual safety hoods for the students that attract students to our Chemistry Department.

**Commitment to Sustainability (Total = 1 point)**

If the equipment exceeds basic sustainability goals or provides renewable resources to the College, provide specific details:

This smaller scale equipment will allow us to use smaller amounts of chemicals and reduced the amount of waste material generated in our lab classes thereby increase the sustainability of our labs.

**Access (Total = 1 point)**

Provide evidence that the requested equipment is consistent with universal design\* and will ensure access above and beyond standard capability.

In Organic Chemistry, 2/3 of the class time is spent in the lab. It is this hands on experience in the lab that allows the students to see and understand the concepts taught in the lectures. For all students to gain this experience we need to have enough of the micro scale equipment for each student to work individually. This is why we need to complete our set of thin walled 5 mL reaction vials. Some students have a harder time controlling the amounts delivered by the older graduated pipets. To give all of the students the ability to add small accurately measured volumes we need to have 4 additional micro pipettors (we only have 2 which are about 10 years old). To insure that the lab room is less chaotic and easier to monitor we need enough of the small (100 mL) heating mantles which would allow the whole class to do the same lab on the same day.

*\*Universal design is an approach that addresses and redresses the primary barrier to making expert learners of all students. Some examples include: light switches with large flat panels rather than small toggle switches; buttons and other controls that can be distinguished by touch; bright and appropriate lighting, particularly task lighting; auditory output redundant with information on visual displays; visual output redundant with information in auditory output; contrast controls on visual output; use of meaningful icons with text labels; clear lines of sight to reduce dependence on sound; volume controls on auditory output; speed controls on auditory output; choice of language on speech output. Items incorporating the principles of universal design feature: equitable use; flexibility in use; simple and intuitive; perceptible information; tolerance for error; low physical effort; and size and space for approach and use. (Wikipedia)*

**Signatures (required)**

(If requesting computer-related equipment/software, LPC IT Department Review is required.)

Requested by



Dean/  
Unit Head



IT Department Signature

Vice President



LPC VP Admin. Svcs/President

LPC Business Office Use (Account Number)



# LAS POSITAS COLLEGE Equipment, Apparatus and Service Requisition

#R

#P

Track #

FOR OFFICE USE ONLY

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

SUGGESTED VENDOR: **Fisher Scientific**

NAME OF STAFF MEMBER: **R.Grow** DATE WRITTEN: **11-Mar-11** DATE REQUIRED: \_\_\_\_\_ DIVISION/DEPARTMENT: **Chemistry** For inventory purposes include Room # \_\_\_\_\_ where equipment will reside: \_\_\_\_\_ RETURN COPY of REQUISITION TO: **L.Camino G.Gire**

DESCRIPTION (PRODUCT TYPE, SIZE, COLOR, STOCK NUMBER)	UNIT	QTY	UNIT PRICE	Air
Finnpipette F1 100-1000UL Cat # 14386309	EA	4	\$ 234.36	\$ 937.44
5ML 14/10 Val Cat # 509558861	EA	12	\$ 19.13	\$ 229.56
Heating Mantle 100ML 115/AC-DC Cat # 1147210B	EA	8	\$ 134.76	\$ 1,078.08
<b>Sales Quotation (attached)</b>				
<b>INSTRUCTIONAL EQUIPMENT - SPRING 2011</b>				
<b>Comments:</b>				
Subtotal			\$	2,245.08
Tax			\$ 0.0975	218.90
Shipping (if available):			\$	4.40
<b>BT#</b>				

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

**TOTAL COST \$ 2,468.38**

ACCOUNT # \_\_\_\_\_ FUND \_\_\_\_\_ ORG \_\_\_\_\_ ACCT \_\_\_\_\_ PROGRAM \_\_\_\_\_ Business Office

APPROVALS Neal Ely 3/15/2011 Date \_\_\_\_\_ VP/President



Sales Quotation			
Quote Nbr	Creation Date	Due Date	Page
1073-0837-57	03/14/2011		1 of 1
Payment Terms		Delivery Terms	
NET 30 DAYS		DEST	
Valid To		Prepared By	
04/13/2011		SARSON, JAMES E.	
Customer Reference		Sales Representative	
RFQ 3/14/11		JAMES SARSON	
To place an order	Ph: 800-766-7000	F: 800-926-1166	
Submitted To:		Customer Account <b>948334-001</b>	
RICHARD GROW RGROW@LASPOSITAS COLLEGE.EDU  925-424-1341		LAS POSITAS COLLEGE 3033 COLLIER CANYON RD LIVERMORE CA 94551-9797	



FISHER SCIENTIFIC COMPANY LLC  
4500 TURNBERRY DRIVE  
HANOVER PARK IL 60133-5491

PLEASE REFER TO THE QUOTE NUMBER ON ALL  
CORRESPONDENCE

THANK YOU FOR YOUR INTEREST IN FISHER  
SCIENTIFIC COMPANY LLC

FOR COMPLETE TERMS AND CONDITIONS VISIT  
OUR WEBSITE AT  
[www.fishersci.com/salesterms](http://www.fishersci.com/salesterms)

Nbr	Qty	UN	Catalog Number	Description	Unit Price	Extended Price
1	4	EA	14 386 309	FINNPIPE TTE F1 100-1000UL Pipetter; Finnpiptette F1; Variable Volume; Single Channel; 100-1000?L Vendor Catalog # 4641100 This item is being sold as 1 per each List Price: 316.00 CDC: 017	234.36	937.44
2	12	EA	50 955 8861	5ML 14/10 VIAL Vial, Conical reaction, Research, 5.0mL, Threaded outer standard taper14/10 joint Vendor Catalog # 9591-21 This item is being sold as 1 per each Original Catalog Number 959121 List Price: 20.20 CDC: 052	19.13	229.56
3	8	EA	11 472 10B	HEATING MANTLE 100ML 115VAC-DC Glas-Col Flexible fabric heating mantle, 100mL, 80W 120V Vendor Catalog # 36225-02 This item is being sold as 1 per each List Price: 183.49 CDC: 014	134.76	1,078.08
MERCHANDISE TOTAL						2,245.08
Fuel Surcharge						4.40
Estimated Sales Tax						219.32
TOTAL						2,468.80

**NOTES:**

We now offer highly competitive financing with low monthly payments. Please contact your local sales representative for more information.

Tell us about your recent customer service experience by completing a short survey. This should take no longer than three minutes. Enter the link into your browser and enter the passcode: USA-PGH-CS1

[http://survey.me.dallia.com/fisher\\_sci](http://survey.me.dallia.com/fisher_sci)



To: RICHARD GROW

Date: 03/14/2011

Message: HI RICHARD,

HOPE THIS GETS TO YOU IN A TIMELY MANNER.

PLEASE LET ME KNOW IF YOU HAVE ANY QUESTIONS.

THANK YOU,

JAMES

724-517-2217