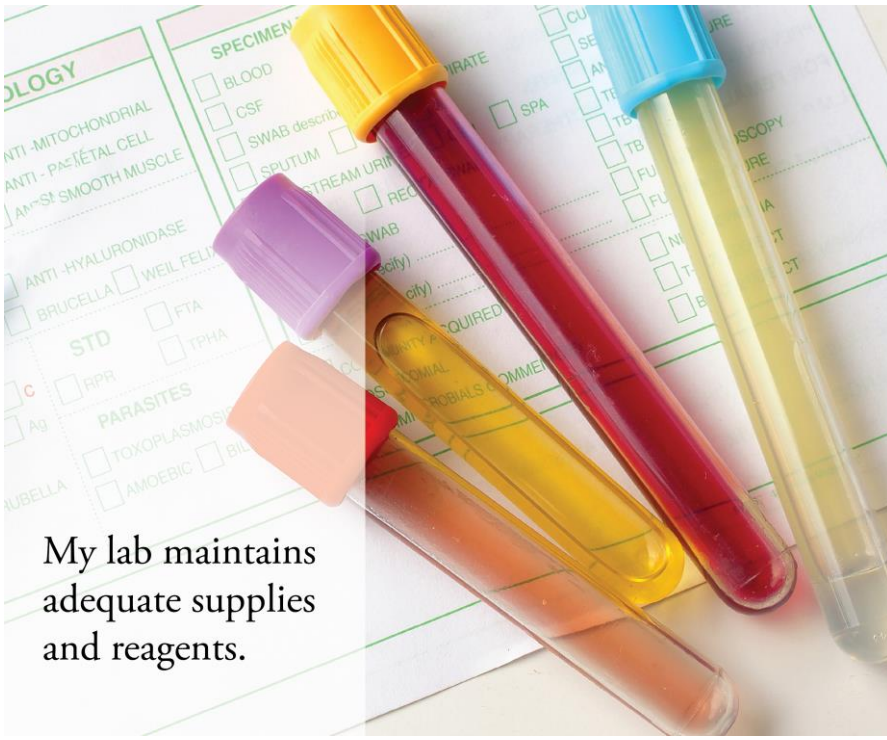
MODULE 4

Procurement Management

2015 Version



SLMTA Trainer's Guide

Overview

MODULE 4. PROCUREMENT MANAGEMENT

Performance Outcome

With satisfactory participation in the training and successful implementation of laboratory improvement projects, a participant's laboratory should achieve the following outcome:

- Fresh supplies are always available for continuous service

Checklist Items Supported by this Module

This module supports the requirements for the following items from the SLIPTA Checklist:

1.5, 2.2, 7.1, 7.5, 7.7, 7.12

Learning Objectives (Management Tasks)

By the end of this module, participants should be able to perform the following management tasks:

1. Accurately evaluate needs for equipment, supplies and reagents taking into consideration past patterns, present trends, and future plans
2. Place orders as necessary in accordance with needs and budgetary constraints
3. Monitor procurement orders
4. Appropriately document and maintain accurate records of all purchase orders and requisitions

What's in this Module?

ACTIVITY TITLE	PURPOSE	DURATION
Forecasting & Calculating Order Amount	An effective procurement management system is one that ensures sufficient inventory is available to meet testing needs while simultaneously avoiding waste incurred from unused and expired reagents. In this activity, participants learn how to forecast and determine reorder levels for their laboratory. The concepts are reinforced with an assigned homework activity.	1 hr 15 min
	TOTAL ACTIVITY TIME:	**1hr 15 min**

Overview

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ACTIVITY Forecasting and Calculating Ordering Amounts Module 4

PURPOSE:

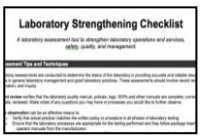
An effective procurement management system is one that ensures sufficient inventory is available to meet testing needs while simultaneously avoiding waste incurred from unused and expired reagents. In this activity, participants learn how to forecast and determine reorder levels for their laboratory. The concepts are reinforced with an assigned homework activity.

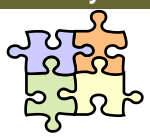
RESOURCES FOR FACILITATOR:

- ❑ PowerPoint slides: 4.6 to 4.10
- ❑ Tool 1:Urinalysis Answers
- ❑ Tool 2: Glucometer Answers
- ❑ Tool 3: Calendar
- ❑ Tape and flipchart
- ❑ 3 different colored markers

RESOURCES FOR PARTICIPANT:

- ❑ Worksheet 1: Urinalysis (401)
- ❑ Worksheet 2: Glucometer (402)
- ❑ Job Aid: Calculating Supplies (403)

This activity supports the following laboratory management tasks and SLIPTA checklist items	
Management Tasks 	3.3 Monitor consumption rate and inventory level to determine when and how much to re-order 4.1 Accurately evaluate needs for equipment, supplies and reagents taking into consideration past patterns, present trends, and future plans 4.2 Place orders as necessary in accordance with needs and budgetary constraints 4.4 Appropriately document and maintain accurate records of all purchase orders and requisitions
Checklist Items 	1.5 Laboratory Policies and Standard Operating Procedures Are policies and/or standard operating procedures (SOPs) for laboratory functions, technical and managerial procedures current, available and approved by authorized personnel? (Purchasing and Inventory Control) 2.2 Management Review Does the laboratory management perform a review of the quality system at a management review meeting at least annually? 7.1 Inventory and Budgeting System Is there a system for accurately forecasting needs for supplies and reagents? 7.5 Budgetary Projections Are budgetary projections based on personnel, test, facility and equipment needs, and quality assurance procedures and materials? 7.7 Laboratory Inventory System 7.12 Laboratory Testing Services Has the laboratory provided uninterrupted testing services, with no disruptions due to stock outs in the last year or since last audit?

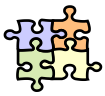
This activity is related to the following activities:	
	Module 1: Creating a Management Calendar Module 1: How Do You Assign Personnel to Tasks? Module 3: What's Wrong with this Storeroom? Module 3 & 4: Did You Receive What You Ordered?

ACTIVITY AT-A-GLANCE				
Step		**Time**	**Resources**	**Key Points**
1	Introduce key terms and concepts	20 min	Slides 4.6 to 4.9 Job Aid Wall Calendar (from Tool 3)	
2	Introduce the activity	10 min	Slide 4.10 Worksheet 1 Tool 1 Job Aid	
3	Conduct the activity	15 min	Worksheet 1 Job Aid	
4	Debrief the activity	10 min	Worksheet 1 Tool 1 Job Aid Worksheet 2	
5	Conclude the Activity	5 min		
	TOTAL TIME:	**60 min**		
6	Review the homework assignment	15 min	Worksheet 2 Tool 2	
(Activity/Homework Review) TOTAL TIME:		**75 min**		
Note: It is recommended to assign Worksheet 2 as homework. If the training schedule does not accommodate the homework review for the following day, then facilitate Step 6 immediately after Step 4.				

PROCESS

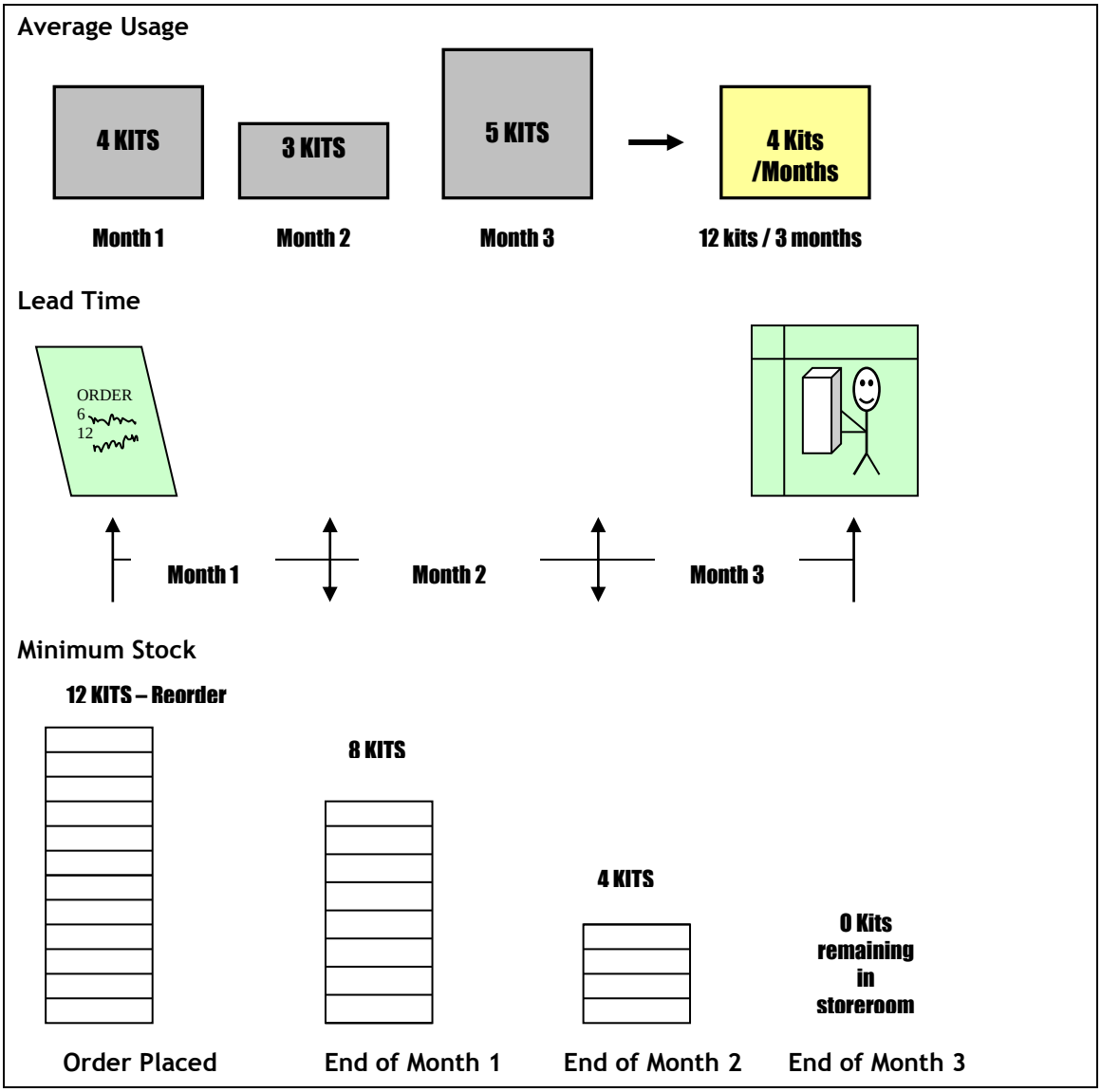
Preparation

- Recreate Worksheet 1: Urinalysis onto two flipchart pages so that the worksheet is large enough for participants to see.
  - Tape the 2 pages side-by-side or place 2 flipchart stands next to one another. See attached photos.
  - Consider using a different colored marker to write the formulas [i.e. (a),(b), (a) x (b) = (c), (c) x 3 = (d), etc] on the worksheet. A different color (red was used in the attached photos) allows the facilitator to quickly point as the values are calculated
- Recreate Worksheet 2: Glucometer in the same manner that you created worksheet 1.
- OVERNIGHT HOMEWORK (recommended): Assign participants to complete Worksheet 2 after facilitating the activity. Ensure sufficient classroom time to review the worksheet is provided for the following day.
- Print 4 copies of Tool 3: Calendar to create a 'Wall Calendar.' If the calendar sheets from the activity, *Creating a Management Calendar*, are still posted, you may use those calendar sheets. For a 3 month lead time (lead time used in Worksheet 1, you will need to display a 4-month time period. Tape the calendar pages to the wall in a linear fashion near where the activity will be facilitated.



Step 1. Introduce key terms and concepts 20 min

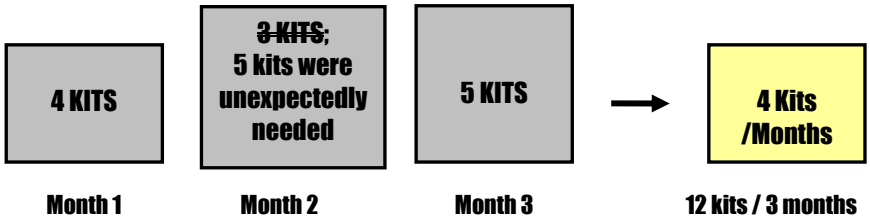
- Project Slide 4.6 to introduce the activity.
- Explain the importance for accurately evaluating and forecasting essential supplies. Indicate that it is essential to forecast the laboratory supply needs and accurately determine reorder levels so that supplies are available for continuous service.
- Distribute Job Aid: Calculating Supplies.
  - Direct the participant's attention to the 'Key Terms and Concepts' area.
  - Explain each term. You may decide to illustrate the key concepts using the flipchart so that participants better grasp their meanings. See suggested drawings for quick sketching ideas illustrating a 3 month lead time. You may also use the 'Wall Calendar' to assist with your explanations.



- Direct the participant's attention to the 'Calculating Ordering Amounts' area (Job Aid: Calculating Supplies) and highlight the key points for each column.
  - Explain that the text boxes describing the calculating process will be better understood as the class works through a specific calculating example.
  - Emphasize that lead time can be determined by reviewing the ordering/receiving history of a supplier or a particular item.
  - Project Slides 4.7 to 4.9 to illustrate the importance of performing a stock count to determine the 'stock on hand.' Emphasize how the procurement and inventory process are interrelated. Errors or oversight in one will affect the other. For example, a disorganized storeroom will result in an incorrect stock count, thus affecting the supply calculation. Connect this to the activity, *What's Wrong with this Storeroom?*.
  - Explain why a reserve quantity is included in the calculation of (f) by providing concrete examples using the flipchart or 'Wall Calendar.' See suggested drawings for quick sketching ideas.

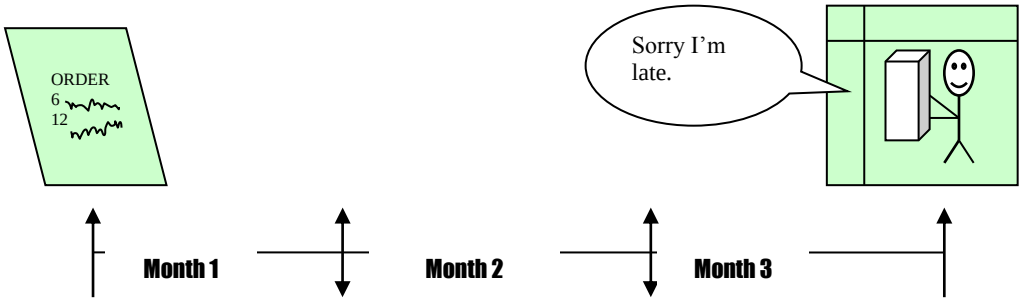
Average Usage

Since an average testing volume is used, the reserve quantity covers those months that are above the average value. If this consistently occurs, then the average usage needs to be redetermined. The reserve amount will also absorb sudden peaks for a specific test.



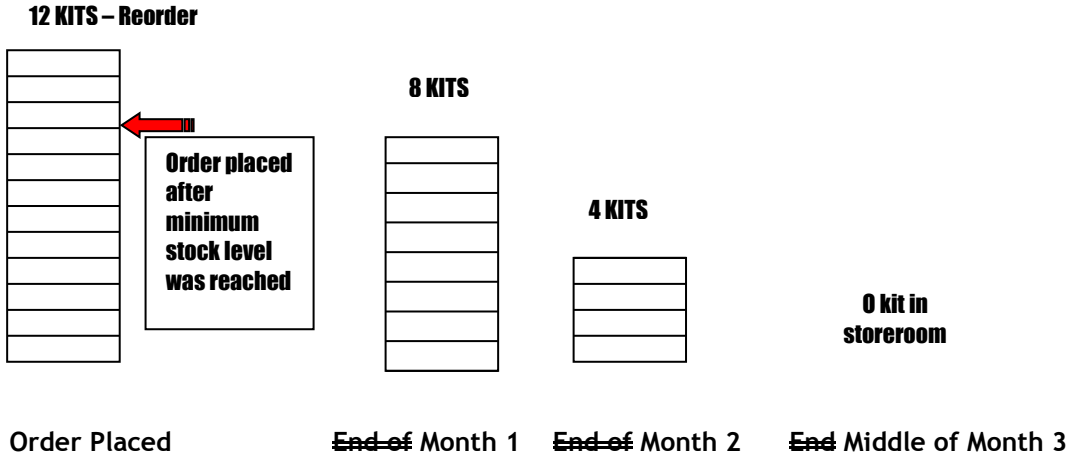
Lead Time

Unexpected issue arises within the ordering/receiving process that causes the expected receipt date to be delayed. The reserve quantity will absorb the difference.

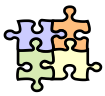


Minimum Stock

If the minimum stock level is inadvertently reached before the physical inventory is counted and the orders are placed, the reserve quantity will absorb the difference.



- Emphasize that the item's orderable unit must be considered. Ask participants what they would receive for the following scenario:
  - Supplier's Orderable Unit for microscope slides are either 'Box' (100 slides) or 'Case' (12 boxes).
  - The laboratory needs to order 100 individual slides.
  - On the order request form '100' is entered.



- Remind participants that they should always keep a copy of the order request at their site to reconcile the purchase invoice and order request when the shipment is received. Connect this to the activity, *Did You Receive What You Ordered?*

Step 2. Introduce the activity 10 min

- Project Slide 4.10 to provide an overview of the activity.
- Distribute or refer participants to Worksheet 1: Urinalysis.
- Divide the class into groups of 2-3 participants.
- Point to the recreated worksheet flipchart pages and explain that the class will be calculating the supplies required for a 'Routine Urinalysis with Microscopic.'
- Begin populating the first three rows (cups, towelettes, and dipsticks) on the recreated worksheet flipchart pages.
  - Consider using a different colored marker that was not used to initially create the flipchart worksheets to highlight the answers.
  - Refer to additional teaching notes supplied in Tool 1: Urinalysis Answers and column explanations located in the text boxes on Job Aid: Calculating Supplies.
  - Point to the equations and the individual equation factors to illustrate how you derive the answers. Verbalize your thought process used to calculate the values. For example by explaining that since the cups and towelettes are used in the pre-analytical phase during the specimen collection, the QC test numbers from (a) would not be applicable in the equation to calculate (c). However, since QC material validates the dipsticks, both the patient and QC test numbers from (a) would be used to calculate (c).
- Indicate that for the next 15 minutes each group will work together to calculate the remaining items.

Step 3. Conduct the activity 15 min

- Provide assistance and coaching as needed.

Step 4. Debrief the activity 10 min

- Ask the participants to provide responses for the remaining rows. Complete one row at a time. As responses are given, populate the answers on the flipchart pages.
- Explain how the worksheet can be modified to reflect their procurement system or to fit their laboratory testing procedures specific to their site.
- Distribute Worksheet 2: Glucometer and assign it for homework. Request that participants review Job Aid: Calculating Supplies before they begin their individual homework assignment. Indicate the class will briefly review the answers and any additional questions at the beginning of tomorrow's training day.

Step 5. Conclude the Activity 5 min

- Emphasize that the data needed to accurately calculate orderable amounts is within the participants grasp. Relate how documentation and a systematic

approach to determine minimum stock can be used as an advocacy tool with upper management when issues arise with sustainability.

- Highlight or reiterate the key messages below.
- Make certain participants achieved the objectives of the activity.

KEY MESSAGES

- An effective procurement management system is one that ensures sufficient inventory is available to meet testing needs while simultaneously avoiding waste incurred from unused and expired reagents.
- An orderable amount needed to sustain testing can be calculated instead of relying on guesswork by utilizing data available to laboratory staff.
- Due to the interrelationship between the procurement and inventory management systems, errors or oversight in one will affect the other resulting in service interruptions and decreased patient care.

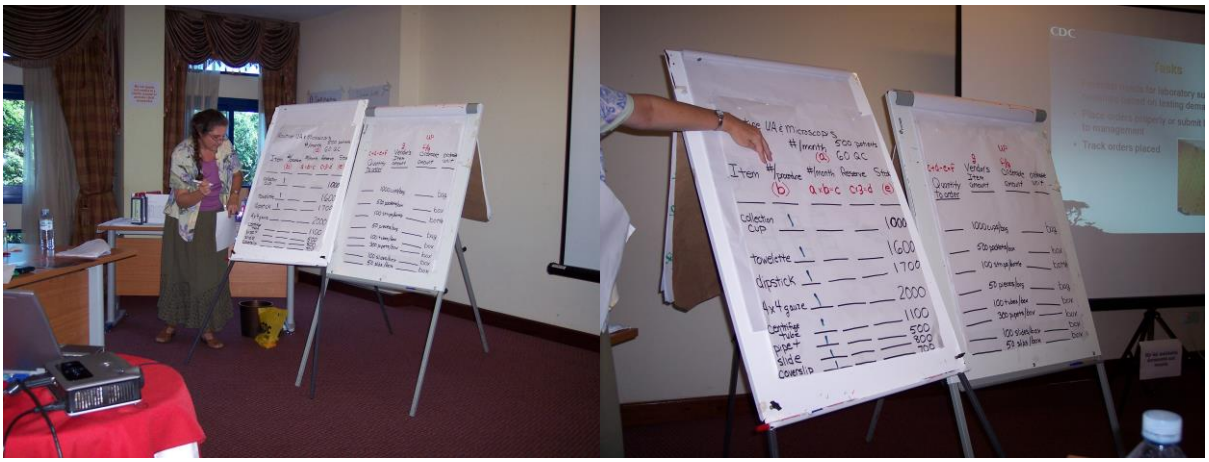
Can they:

- Define key terms and concepts related to calculating and forecasting supplies?
- Calculate the correct amount of supplies to order based upon a given lead time and orderable unit?

ACTIVITY OBJECTIVES MET?

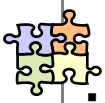
Step 6. Review the homework assignment 15 min

- Display the recreated worksheet flipchart pages for Worksheet 2: Glucometer.
- Review the answers with the participants (Tool 2: Glucometer Answers). You may choose to populate the flipchart pages prior to the review and have the participants compare their answers or populate the worksheet together as an in-class activity.
- Answer any remaining questions about calculating supplies.



➤➤ Connections and Applications

- Since the in-class example has a 3 month lead time (Worksheet 1:Urinalysis), four calendar months need to be displayed to demonstrate why the reserve quantity (c) is included in the equation to calculate (f).
- Using the BIN card ordering strategy, an order must be placed when the minimum stock level is reached. Frequently in laboratories, this is not the case. A specific ordering date may be dictated by the purchasing department. The reserve quantity is able to absorb delays that occur in the ordering and receiving process.
- An effective procurement and inventory system will address testing service sustainability while simultaneously avoid waste and increased costs. Both systems require the needed processes and procedures to be standardized and the tasks assigned to keep them current and organized. Link this to *How Do You Assign Personnel to Tasks?* and *Creating a Management Calendar* activities.



- By accurately forecasting supply needs, reagent costs may be reduced by negotiating contracts that involve bulk purchases.
- An accurate calculation of supply needs will eliminate or reduce the number of emergency deliveries required to maintain services and the increased costs incurred with these deliveries.
- Calculating supply needs becomes more difficult when reconstitution or opened in-use expiration dates of reagents, calibrators and controls differ from the manufacturer's expiration date. Manufacturers can be a resource to determine supply quantities needed for their analyzers when an average test volume is provided.

Tool 1: Urinalysis Answers

(a) - Since the number of tests may vary from month to month, it is important to obtain an average number. If testing volume changes throughout the year, it is important to adjust for this change.

Routine Urinalysis with Microscopic

Number of Tests Performed in One Month **(a)**

Patients: 500
Total QC: 70 (normal and abnormal controls analyzed daily during morning workstation set-up, and each time a new reagent bottle is opened)

(e) - Emphasize these values were obtained by performing a physical stock count. Remind participants about the importance of maintaining an organized stockroom.

(c) - Explain that the reserve quantity can easily be increased or decreased depending upon the reliability of the participants' procurement system. In this worksheet, one month was chosen as the default reserve quantity.

(f) – Many sites include a 10% wastage factor (reanalyzing a specimen, etc) when determining reorder levels. However, in this worksheet, this is addressed by including (c) into the quantity to calculate (f).

	List Each Item	Item # needed to perform one procedure **(b)**	Item # needed per month *(Reserve Quantity)* **(a) x (b) = (c)**	Minimum Stock required for a three month lead time *(Reorder Level)* **(c) x 3 = (d)**	Stock on hand *(physical inventory)* **(e)**	Quantity to be ordered **(c) + (d) - (e) = (f)**	Vendor's item amount **(g)**	Orderable Amount (rounded **UP** to the nearest whole number) **(f) / (g)**	Orderable Unit
1	collection cup	1	500	1500	1000	1000	1000 cups/bag	1	bag
2	cleaning towelette	1	500	1500	1600	400	500 packets/box	1	box
3	urine dipstick	1	570	1710	500	1780	100 strips/bottle	18	bottle
4	4 x 4 gauze	1	570	1710	2000	280	50 pieces/bag	6	bag
5	centrifuge tube	1	570	1710	2300	0	100 tubes/box	0	box
6	plastic disposable pipette	1	570	1710	1700	580	300 pipettes/box	2	box
7	slide	1	500	1500	800	1200	100 slides/box	12	box
8	coverslip	1	500	1500	1900	100	50 slips/box	2	box
9	Normal QC	10 ml	350	1050	1300	100	200 ml/box **	1	box
10	Abnormal QC	10 ml	350	1050	650	750	200 ml/box **	4	box

Box of QC material = 4 bottles/box x 50 ml

(f) – Explain by including column (c) into the equation it adds a reserve quantity. Illustrate how the reserve quantity buffers and absorbs any problems that may arise with ordering and receiving.

(column 'c' for items 4, 5, and 6) - Explain why the QC numbers must be included when using Good Laboratory Practices for this procedure. Indicate the QC material is never tested in the original bottle but must be transferred/aliquoted using the pipette and centrifuge tube. The QC tested dipstick is read in a horizontal position by placing it onto a gauze pad to prevent chemical mixing from adjacent reagent areas.

('a' and column 'c' for items 9 and 10) - Typically, QC monthly workload statistics indicate the total QC performed by test and not broken down by QC material. Remind participants the importance of standardizing data collection regarding workload (i.e. repeats, proficiency testing, QC) with their staff.

(d) - Using the calendar months, explain lead time specific to this worksheet. Indicate that the worksheet can easily be modified to accommodate a different lead time. The glucometer homework assignment uses a different lead time to illustrate this point.

(e) - Explain how the cup and urine dipstick quantity on hand will interrupt testing. Both values are below the minimum stock quantity. Using the calendar months, indicate when the approximate stock-out date for these items will occur.

(f) / (g) – Explain the orderable amount must be used when requesting supplies from the vendor. Provide an example of what would be shipped to their laboratory if the value calculated for (f) was used on the order request instead of (f) / (g).

Tool 2: Glucometer Answers

Glucose by Glucometer

Number of Tests Performed in One Month: **(a)**

Patients: 300
Total QC: 66 (low and high controls analyzed daily during phlebotomy workstation morning set-up, and each time a new reagent bottle is opened)

	List Each Item	Item # needed to perform one procedure **(b)**	Item # needed per month *(Reserve Quantity)* **(a) x (b) = (c)**	Minimum Stock required for a two month lead time *(Reorder Level)* **(c) x 2 = (d)**	Stock on hand (*physical inventory*) **(e)**	Quantity to be ordered **(c) + (d) - (e) = (f)**	Vendor's item amount **(g)**	Orderable Amount (rounded **UP** to the nearest whole number) **(f) / (g)**	Orderable Unit
1	lancet	1	300	600	400	500	1000 lancets/box	1	box
2	alcohol pad	1	300	600	800	100	100 packets/box	1	box
3	2x2 gauze	1	366 (300)	732 (600)	100	998 (800)	50 pieces/bag	20 (16)	bag
4	reagent strip	1	366	732	800	298	50 strips/bottle	6	bottle
5	QC Low**	1	33	66	75	24	50 tests/bottle	1	bottle
6	QC High**	1	33	66	25	74	50 tests/bottle	2	bottle

** Manufacturer's QC package insert specifies that the quantity in each bottle is sufficient for 50 tests (dispense 1 drop, wipe, test second drop)

(column 'b' & 'g' for items 5 & 6) – The units are 'tests/bottle' and not 'drops/bottle.' Even though 2 drops are dispensed to perform QC, the insert reports the quantity in 'tests/bottle.'

(column 'c' for item 3) – Participants may or may not add the QC total depending on how the QC material is handled. For example, many package inserts indicate to dispense the first drop onto a gauze pad and then apply the second drop, or to wipe off the first drop from the QC's dispenser nozzle and then apply the second drop. The value within parentheses is for QC values NOT included.

Tool 3: Calendar

Monday	Tuesday	Wednesday	Thursday	Friday	Sat/Sun
	1	2	3	4	5/6
7	8	9	10	11	12/13
14	15	16	17	18	19/20
21	22	23	24	25	26/27
28	29	30			

Job Aid: Calculating Supplies

An efficient procurement management system will provide the amount of required supplies to fulfill needs without waste due to the expiration of unused supplies.

Key Terms and Concepts:

- **Lead Time** – time between placing an order and receiving it.
- **Average Usage** - number of test kits, reagents or supplies used in a given time period.
- **Minimum Stock** -amount of stock required to support testing operations until additional supplies are received.
- **Reorder Level** - the minimum stock level at which you should reorder the item and the amount you should reorder.
- **Reordering Equation** - Average Usage x Lead Time = Minimum Stock (Reorder Level).

(a) Determine the average number of patients, survey samples, and QC performed for a month. To obtain an average, review several month's worth of tally data to reflect an accurate testing volume. Many sites will include a 10% wastage factor to accommodate repeat testing, training or competency assessments. However, by including column (c) as a reserve quantity into the equation used to calculate column (f) that may not be necessary. If testing volume fluctuates for specific time periods throughout the year, then adjust the average.

(f) The calculation takes into account your reorder level and includes a reserve quantity. To avoid wastage from expired reagents, the calculation subtracts the available stock you currently have on hand.

(g) Catalogs and order requisitions can be used as a resource to determine the vendor's amount. For example, if you list a test kit as an essential supply and the test kit accommodates 20 individual tests, then the amount is 20 tests per kit. Likewise, if you indicated 3 ml of a stain is required for each test in column b for AFB testing and the stain comes in a liter bottle, then the amount is 1000ml per bottle. Ensure proper units are used to calculate the correct orderable amount.

(b) Determine the amount of supply needed to perform one procedure.

List the essential supplies required to perform the test.

Calculating Ordering Amounts

Number of Tests Performed in One Month: **(a)**

Item	Item # needed to perform one procedure **(b)**	Item # needed per month **(a) x (b) = (c)**	Minimum Stock **(c) x lead time = (d)**	Stock on hand **(e)**	Quantity to be ordered **(c) + (d) - (e) = (f)**	Vendor's item amount **(g)**	Orderable Amount **(f) / (g)**	Orderable Unit

(f) / (g) Always round up to the nearest whole number. This number is the amount to indicate on the ordering requisition for the specific catalog number or description.

(d) This is the minimum stock you must have on hand to support testing until additional supplies are received. When this quantity is reached, you must reorder. You will not sustain testing services for this procedure if you go below this quantity. Lead times may vary for different vendors. Review your previous ordering/receiving history to determine the lead time.

(c) This is the average usage for the month for test kits, reagents or supplies. This amount will also be used as the reserve quantity.

(e) You determine the stock you have on hand by performing a physical stock count, physically counting the available supplies. The available stock should never run below the minimum stock level. To determine the correct quantity, the stockroom must be organized and maintained. The inventory records must be current.

Worksheet 1: Urinalysis

Procedure:

Routine Urinalysis with Microscopic

Number of Tests Performed in One Month: **(a)**

Patients: 500
Total QC: 70 (normal and abnormal controls analyzed daily during morning workstation set-up, and each time a new reagent bottle is opened)

	List Each Item	Item # needed to perform one procedure **(b)**	Item # needed per month *(Reserve Quantity)* **(a) x (b) = (c)**	Minimum Stock required for a three month lead time *(Reorder Level)* **(c) x 3 = (d)**	Stock on hand (*physical inventory*) **(e)**	Quantity to be ordered **(c) + (d) - (e) = (f)**	Vendor's item amount **(g)**	Orderable Amount (rounded **UP** to the nearest whole number) **(f) / (g)**	Orderable Unit
1	collection cup				1000		1000 cups/bag		bag
2	cleaning towelette				1600		500 packets/box		box
3	urine dipstick				500		100 strips/bottle		bottle
4	4 x 4 gauze				2000		50 pieces/bag		bag
5	centrifuge tube				2300		100 tubes/box		box
6	plastic disposable pipette				1700		300 pipettes/box		box
7	slide				800		100 slides/box		box
8	coverslip				1900		50 slips/box		box
9	Normal QC	10 ml			1300		200 ml/box **		box
10	Abnormal QC	10 ml			650		200 ml/box **		box

Box of QC material = 4 bottles/box x 50ml/bottle

Worksheet 2: Glucometer

Procedure:

Glucose by Glucometer

Number of Tests Performed in One Month: **(a)**

Patients: 300
Total QC: 66 (low and high controls analyzed daily during phlebotomy workstation morning set-up, and each time a new reagent bottle is opened)

	List Each Item	Item # needed to perform one procedure **(b)**	Item # needed per month *(Reserve Quantity)* **(a) x (b) = (c)**	Minimum Stock required for a two month lead time *(Reorder Level)* **(c) x 2 = (d)**	Stock on hand (*physical inventory*) **(e)**	Quantity to be ordered **(c) + (d) - (e) = (f)**	Vendor's item amount **(g)**	Orderable Amount (rounded **UP** to the nearest whole number) **(f) / (g)**	Orderable Unit
1	lancet				400		1000 lancets/box		box
2	alcohol pad				800		100 packets/box		box
3	2x2 gauze				100		50 pieces/bag		bag
4	reagent strip				800		50 strips/bottle		bottle
5	QC Low**				75		50 tests/bottle		bottle
6	QC High**				25		50 tests/bottle		bottle

** Manufacturer's QC package insert specifies that the quantity in each bottle is sufficient for 50 tests (dispense 1 drop, wipe, test second drop)