Activity: the spindle housing's record

Chapter 6, Material and Distribution Requirements Planning

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Work in pairs. 14 minutes.

Names: _____

The item. The spindle housing (H) from the mower deck structure. Its lead time is **2 periods**. There are **45** on hand at the start of period 1, and a scheduled receipt of **40** is due in **period 2**. The planner holds a safety stock of **10**. Order **lot-for-lot**.

Conventions. Projected on hand is an end-of-period figure. A net requirement is never negative. A release sits in the period its receipt is due, less the lead time. A release that would fall before period 1 is *past due*: write its receipt in the planned order receipts row and count it in projected on hand as if it arrives, but leave the release out of the release row and report it below the record.

Notation. For period t: G_t is the gross requirement, SR_t the scheduled receipt, I_t the projected on hand at the end of the period (I_0 is the opening stock, 45 here), NR_t the net requirement, POR_t the planned order receipt and Rel_t the planned order release. SS is the safety stock and L the lead time, in periods.

$$I_t = I_{t-1} + SR_t + POR_t - G_t, \qquad NR_t = \max(G_t + SS - SR_t - I_{t-1},\ 0), \qquad Rel_{t-L} = POR_t$$

Part A. Complete the record

Period		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Gross requirements		20	35	0	50	30	0	60	25
Scheduled receipts		0	40	0	0	0	0	0	0
Projected on hand	45								
Net requirements									
Planned order receipts									
Planned order releases									

Check: opening stock + scheduled receipts + planned receipts = total gross requirements + ending on hand. Does yours balance? _____

Part B. The receipt is late

The supplier calls: the 40 housings will arrive in **period 4**, not period 2. Complete the record again.

Period		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Gross requirements		20	35	0	50	30	0	60	25
Scheduled receipts		0	0	0	40	0	0	0	0
Projected on hand	45								
Net requirements									
Planned order receipts									
Planned order releases									

How many units are past due, and in which period are they needed? How many of them are an outright shortage, and how many only restore the safety stock? What should the planner do about it?

Part C, if you have time. A fixed order quantity

Back to Part A's data. Now every *planned* receipt is **80**, or the net requirement if that is larger. (The scheduled receipt of 40 is unchanged.) Complete the record.

Period		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Gross requirements		20	35	0	50	30	0	60	25
Scheduled receipts		0	40	0	0	0	0	0	0
Projected on hand	45								
Net requirements									
Planned order receipts									
Planned order releases									

Compared with Part A: how many orders, and what is the sum of the projected on-hand row?

Part D, if you have time. Without the safety stock

Without doing the whole record again: which rows of Part A change if the safety stock is removed, and by how much?

Exit ticket (tear off and hand in)

Name: _____

1. In one sentence: what does the max in the net requirement stop from happening?

2. Next time we plan the housing's *parent* first. Which of the parent's rows do you think becomes the housing's gross requirements?