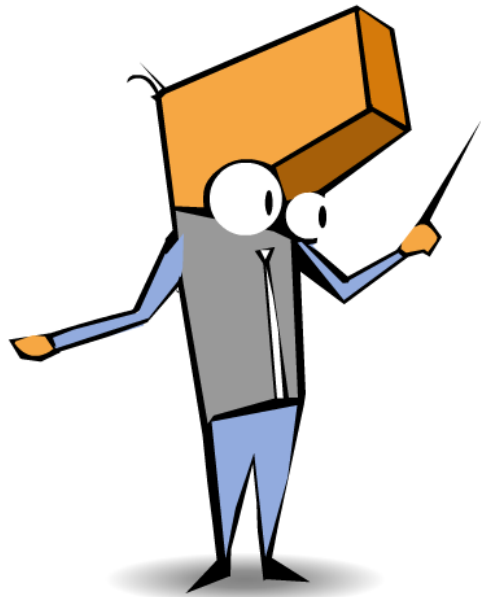




# Inventory management in the supply chain

# Stock replenishment systems

Learn the theoretical basics



Operational inventory management is mostly about answering 3 questions:  
What... When... How much...  
... to order?

Inventory replenishment policies help us do it

Before discussing inventory replenishment policies, we need to explain the notion of **free stock**.

**Free stock**, also known as disposable stock, is stock that can be released to customers (external or internal) at present or in the foreseeable future. Therefore, free stock includes stock that has been ordered from suppliers but has not yet been delivered. It will, however, be delivered in the foreseeable future and it will increase stock on hand. Disposable stock does not include goods that have been purchased by an external customer or reserved by an internal customer, but have not physically left the warehouse.

### How to calculate free stock?

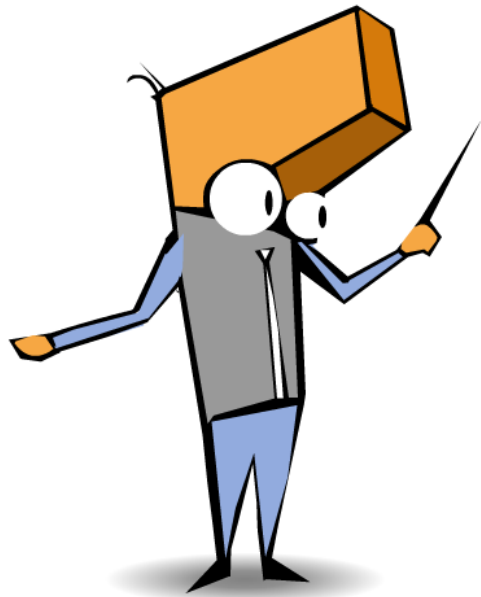
$$FS = SoH + SO - SR$$

FS - free stock

SoH - stock on hand

SO - stock ordered (not delivered)

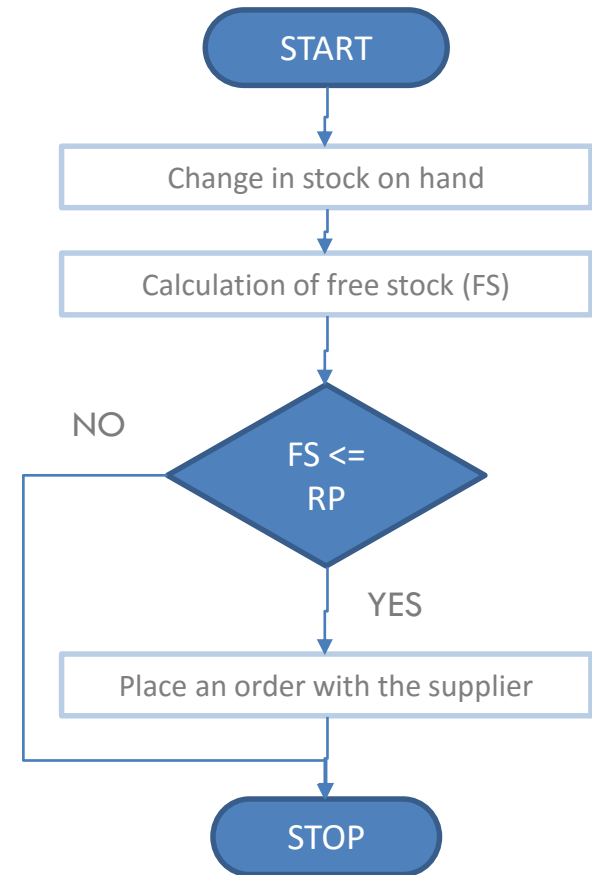
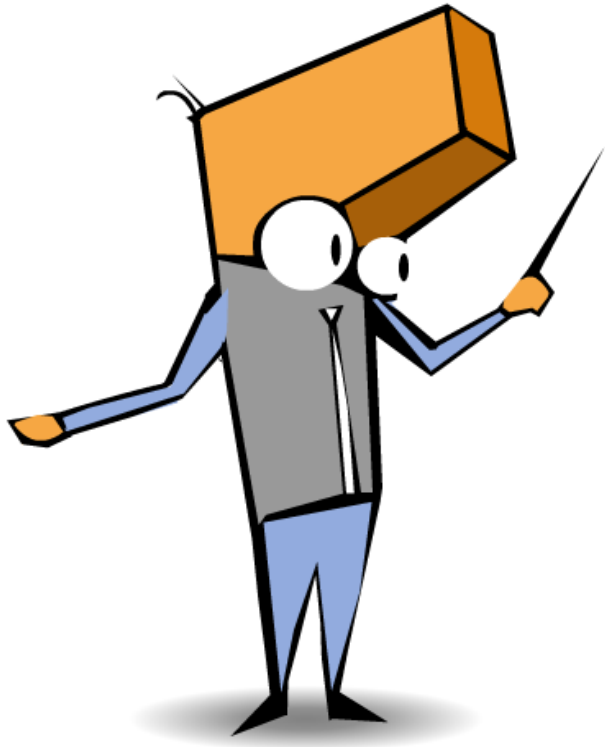
SR - stock reserved (but not released from the warehouse)



Remember that free stock is used in stock replenishment to determine order timing and order quantities.

The actual release of goods from a warehouse is based on stock on hand. You can't release something that has been ordered, but it not physically in the in the warehouse.

# Continuous review systems



# Continuous review systems

- To successfully use the system, we need to calculate the &\*reorder point properly:

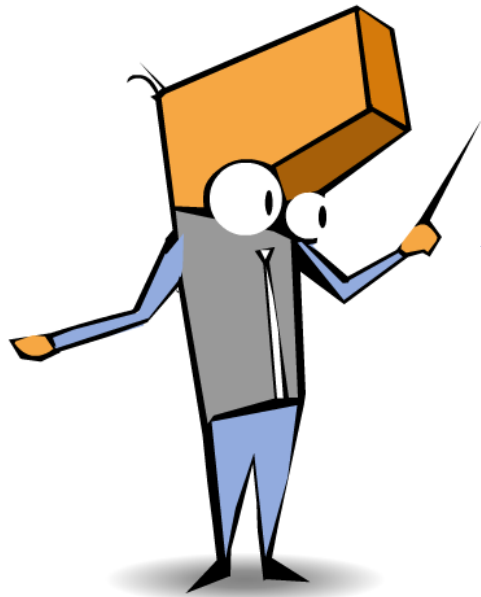
$$ROP = D \cdot T + SS$$

ROP - reorder point

D - average demand per unit of time (eg. a week) may be replaced with a forecasted value - for more, see lessons on *Demand Profile* or *Forecasting*

T – replenishment lead time – for more, see lesson on *Basic concepts*

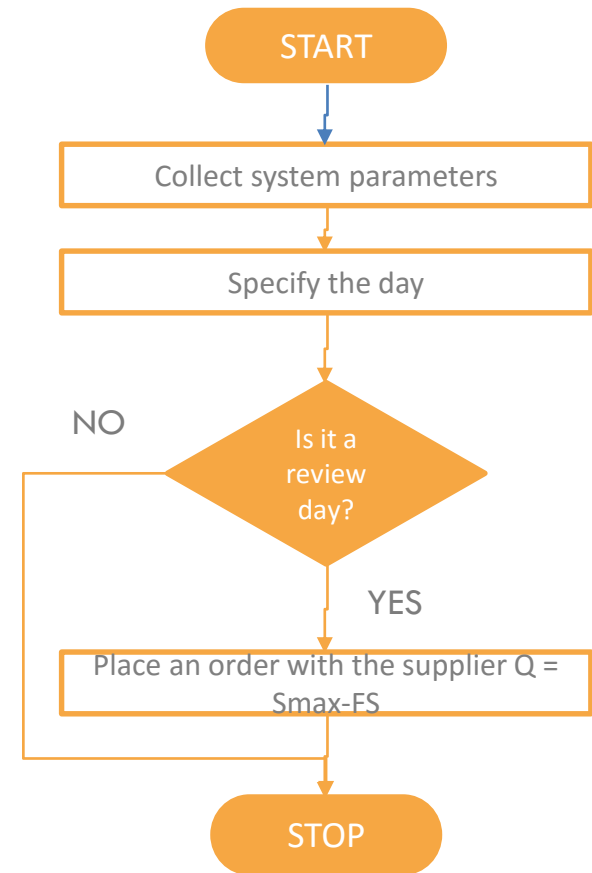
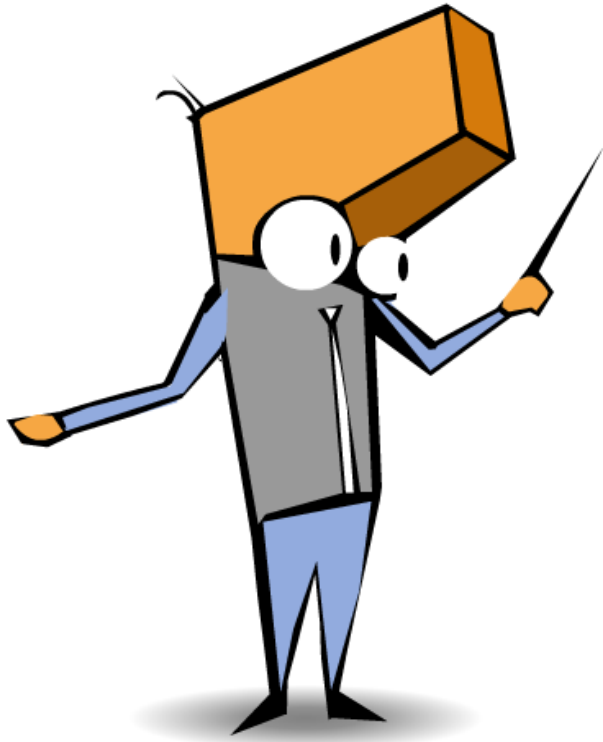
SS – safety stock – for more, go to *Inventory Structure*



What type of goods is the continuous review system recommended for?



# Periodic review systems



# Continuous review systems

- To successfully use this system, we need to determine the maximum inventory level properly:

$$S_{MAX} = D \cdot (T + T_0) + SS$$

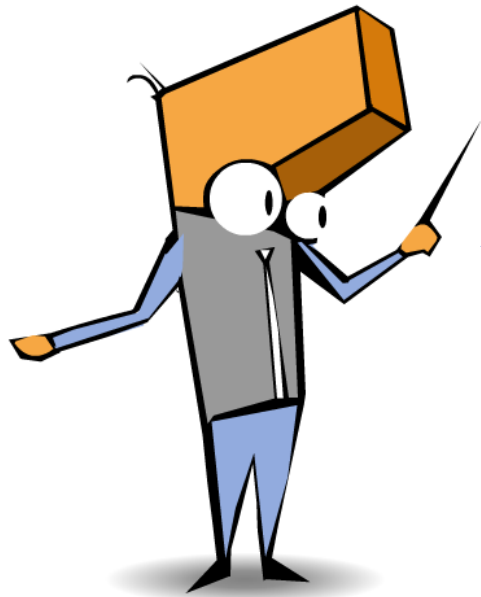
$S_{max}$  - the maximum inventory level

$D$  - average demand per unit of time (eg. a week) may be replaced with a forecasted value - for more, see lessons on *Demand Profile* or *Forecasting*

$T$  – replenishment lead time – for more, see lesson on *Basic concepts*

$T_0$  - review cycle time

$SS$  – safety stock – more on this in the lesson *Inventory Structure*



What type of goods is the periodic review system recommended for?

Due to the fact that the inventory level in this system is reviewed periodically, the level of stock held is slightly greater than in the continuous review system. For this reason, it's recommended for low-value goods used up at a regular pace.

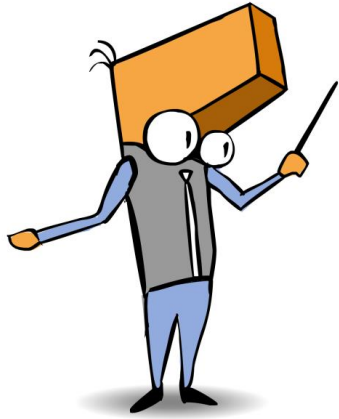
# Replenishment systems – a comparison

## Continuous review system

- Orders placed at different time intervals
- Information on the current level of inventory available on an ongoing basis
- The basic parameter: reorder point
- Fixed order quantities

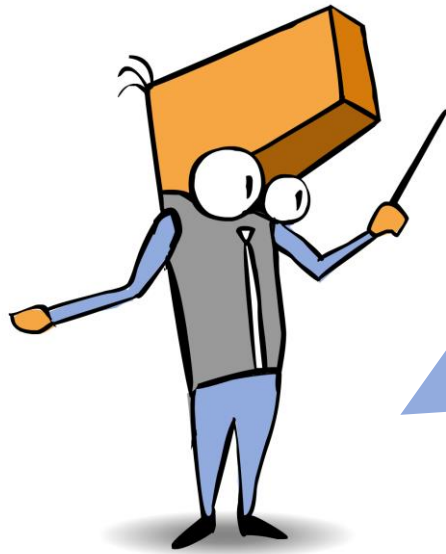
## Periodic review system

- Information on inventory available only on review days
- Orders placed at regular intervals
- Basic parameter: maximum stock level
- Order quantities change



Let's recapitulate what you've learned about stock replenishment systems:

- The continuous review system is based on the value of the reorder point. When the level of free stock falls below the reorder point, an order must be placed.
- Order quantities are relatively constant.
- The periodic review system consists in checking the free stock level at regular intervals and ordering a quantity of goods following a review that bring the free stock to the required maximum level.



In the next lesson, we're going to talk about other stock replenishment systems. They are based, however, on the two classic approaches we've just discussed.

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End  
of the lesson