EOQ 1

- **EOQ** = Economic Order Quantity and limitation of this model
- **EQO** = Deterministic model
- Variables used to derive EOQ basic formula (see slide EOQ5)
  - $Ch$ = Cost to hold one unit inventory for a year
  - $Cp$ = Cost to place a single order
  - $A$ = Demand for the year
  - $Q$ = Quantity

- The economic order quantity (EOQ) is the order quantity that minimizes total holding and ordering costs for the year. Even if all the assumptions don’t hold exactly, the EOQ gives us a good indication of whether or not current order quantities are reasonable.

- **Total Relevant Cost (TRC)**
  - why relevant? - because they are affected by order quantity
- $TRC$ = Yearly Holding Cost + Yearly Ordering Cost
  \[
  \frac{Q}{2} * C_h + \frac{A}{Q} * C_p
  \]

  Average inventory carrying cost – see EOQ4 slide
EOQ 2

• What is the EOQ Model?
• Cost Minimizing Order quantity (Q)
• Assumptions=prerequisites:
  – Single item only
  – Relatively uniform (continuous) & known demand rate
  – Fixed item cost
  – Fixed ordering and holding cost
  – No stock shortage and Instantaneous shipment

• Constant lead time =LT (see slide EOQ3)
EOQ 3

Notice, that inventory never goes below zero; shortages do not exist!!
To verify this relationship, we can specify any number of points values of Q over the entire time period, t, and divide by the number of points. For example, if Q = 5,000, the six points designated from 5,000 to 0, as shown in the figure, are summed and divided by 6:

\[
\text{average inventory} = \frac{5,000 + 4,000 + 3,000 + 2,000 + 1,000 + 0}{6} = 2,500
\]
To calculate derivative of TRC and put it to 0

\[
d\frac{TRC}{dQ} = 0 = Ch/2 + \frac{A \cdot C_p}{Q^2}
\]

\[
Q = \sqrt{\frac{2 \cdot A \cdot C_p}{Ch}}
\]
Pam runs a mail-order business for gym equipment. Annual demand for the TricoFlexers is 16,000. The annual holding cost per unit is $2.50 and the cost to place an order is $50. What is the economic order quantity?

\[ \sqrt{\frac{2 \times 16,000 \times 50}{2.50}} = 800 \text{ units per order} \]
Thanks for your attention!