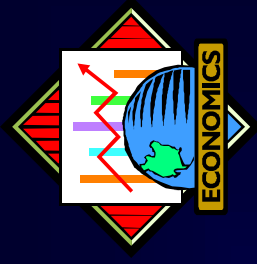


Cost indexes

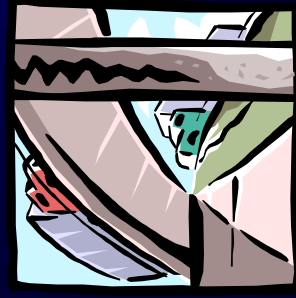


A cost index is a ratio of the *cost* of something *now* to its cost at some time *in the past*

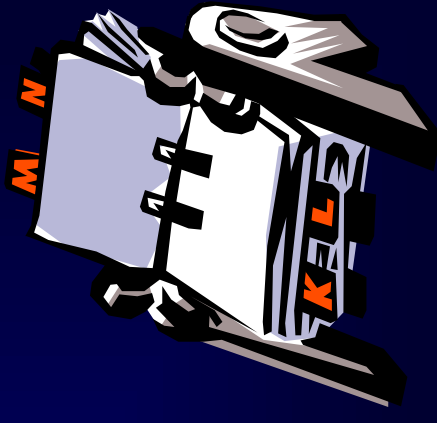
General equation is: $C_t = C_0(I_t/I_0)$

Example: The construction cost of a certain highway ramp was \$380,000 in 1990. The ENR construction cost index had a value of 4770.03 at that time. If a similar project is to be constructed at a time when the index value is 7059.63, what would the estimated cost be?

Solution:

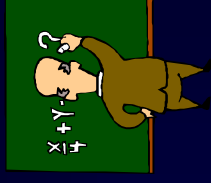


$$\begin{aligned} C_t &= 380,000 (7059.63 / 4770.03) \\ &= \$562,400 \end{aligned}$$



Cost Capacity Equations

$$a^2 + b^2 = c^2$$



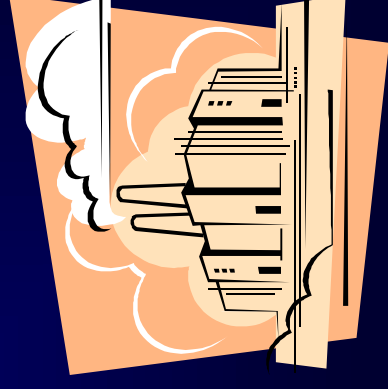
A cost-capacity equation relates the **cost** of something **to its size**

General equation is: $C_2 = C_1(Q_2/Q_1)^x$

Example: The cost of a 0.5 MGD wastewater aeration pond was \$120,000. How much would a 4.0 MGD pond be expected to cost if the exponent in the cost-capacity equation is 0.74

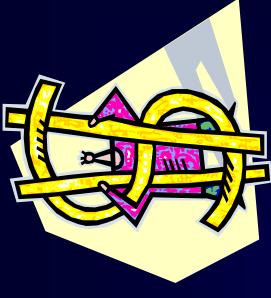
Solution:

$$\begin{aligned} C_{4\text{MGD}} &= 120,000(4.0/0.5)^{0.74} \\ &= \$559,070 \end{aligned}$$





Cost Factors



Cost factors are used for estimating *total plant costs* from equipment costs.

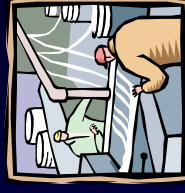


General equation is: $C_T = hC_E$

Where : C_T = total plant cost

C_E = total equipment cost

h = overall cost factor = $1 + \sum$ individual cost factors



Example: The cost of equipment for a certain manufacturing facility is expected to be \$600,000. If the labor cost factor is 0.23, the construction materials cost factor is 0.54, and the indirect cost factor is 0.26, estimate the total cost of the facility.

Solution:

The overall cost factor is $h = 1 + 0.23 + 0.54 + 0.26 = 2.03$

$$C_T = 2.03(600,000)$$

$$= \$1,218,000$$