





Through a production function (the black box) that combines the capital and labor, we can produce a certain quantity. Note that in addition to K & L, the output produced also depends on the technology level (A).

8. T: The cost of producing that certain quantity is:  

$$\text{Cost} = \text{wage } (w) \times \text{Labor } (L) + \text{rent } (r) \times \text{Capital } (K)$$
9. T: Assume that K, A, w, r are fixed and  $P = 3$  (*show Case A P. 3 in Appendix II*), say the 2<sup>nd</sup> ROW, we can easily compute that:  

$$\begin{aligned} \text{Sales revenue} &= 3 \\ \text{Cost} &= 1 \\ \Rightarrow \text{Profit} &= 2 \end{aligned}$$

Thus, if price = 3, if we supply 1 unit we earn \$2 profit.  
But is this the best choice of output?
10. T: Take the 3<sup>rd</sup> row, we can compute:  

$$\begin{aligned} \text{Sales revenue} &= 4.5 \\ \text{Cost} &= 2 \\ \Rightarrow \text{Profit} &= 2.5 \end{aligned}$$

Thus if price = 3, if we supply 1.5 units, we will earn \$2.5 profit.
11. T: Take the 11<sup>th</sup> row, sales revenue = 9.6; cost = 10, so profit = -\$0.4. So if price = 3, if we supply 3.2 units, we will have a negative profit of -\$0.4.
12. T: If we continue to do so, we will be able to see that, if  $P=3$ , we will get the highest profit when we produce (supply)  $Q = 1.5$  and hire 2 units of labor.
13. T: Now I will let you do the rest of the calculation by groups and figure out the best output level for different prices.
14. T: To do so, you need to compute the missing entries in the case tables and summarize your results in the Summary

	<p>Table. After you do so, please also plot your result on the transparency provided. (<i>Divide students into 6 groups and hand each group Case A, Summary Table, graph paper, one blank transparency and different color transparency pens</i>)</p> <p>15. When students finish computing and plotting Case A, ask them to do another set – Case B and plot the curve on the same graph.</p> <p>16. Thus,</p> <ul style="list-style-type: none"> <li>➤ Group 1 &amp; 4 compute and compare Case A versus Case B1</li> <li>➤ Group 2 &amp; 5 compute and compare Case A versus Case B2</li> <li>➤ Group 3 &amp; 6 compute and compare Case A versus Case B3</li> </ul> <p>17. Groups with the same cases discuss the reason(s) behind the shift</p>	<p>5 mins</p> <p>5 mins</p> <p>5 mins</p>
<p>Result comparison / Discussion</p>	<p>1 Student presentation –</p> <ul style="list-style-type: none"> <li>➤ Group 1 &amp; 4 jointly explain why there is a shift in curve;</li> <li>➤ Group 2 &amp; 5 jointly explain why there is a shift in curve;</li> <li>➤ Group 3 &amp; 6 jointly explain why there is a shift in curve and then</li> </ul> <p>2 Teacher presentation –</p> <ul style="list-style-type: none"> <li>➤ Basic shape of supply curve (<i>show Fig. 3</i>): <ul style="list-style-type: none"> <li>■ Upward sloping</li> <li>■ May hit zero below some prices</li> <li>■ The supply curve needs not be linear</li> </ul> </li> <li>➤ Summarize the result presented by students (<i>use Table 1</i>)</li> </ul> <p>3 Teacher facilitates the following discussion questions:</p> <p>3.1 Can you think of other factors that may shift the supply curve?</p> <p>3.2 How much are you willing to pay to adopt the new technology?</p> <p>3.3 How much are you willing to pay for an increase in capital?</p>	<p>2 mins</p> <p>2 mins</p> <p>2 mins</p> <p>5 mins</p> <p>15 mins</p>

	<p>3.4 When capital cost is not equal to zero, how would that affect the supply curve?</p> <p>3.5 What is the optimal amount of capital?</p>	
Roles of Teachers	<ul style="list-style-type: none"> <li>➤ Facilitator</li> <li>➤ Summarize the result presented by students</li> </ul>	
Tools	<ul style="list-style-type: none"> <li>➤ Blank transparencies – 1 sheet for each group</li> <li>➤ Transparency pen – 3 different color pens for each group</li> <li>➤ Case tables of production data and pre-computed entries</li> <li>➤ Pre-printed transparencies, based on the data of various tables, to be presented by teacher</li> <li>➤ Overhead projector</li> </ul>	
Definitions	<ul style="list-style-type: none"> <li>➤ Supply curve – is graphical presentation of the relationship between price and quantity the supplier is able and willing to supply, all other things being constant (Li, 1997).</li> <li>➤ Supply schedule – is a table showing the relationship between price and quantity the supplier is able and willing to supply, all other things being constant.</li> <li>➤ Production function/schedule – “describes the relationship between inputs and outputs” (Wong, 1999. P.191).</li> <li>➤ Profit – the difference between sales revenue and production cost.</li> <li>➤ Production cost – the sum of the costs of all the inputs a firm uses in production (Parkin, 1996. P.977).</li> <li>➤ Sales revenue – the price of a good times the quantity sold of that good (Varian, 1999:269)</li> </ul>	
Homework	<ol style="list-style-type: none"> <li>1. What does a supply curve show?</li> <li>2. An increase in A shifts supply curve to the left, ceteris paribus. (True/False)</li> <li>3. A decrease in K shifts supply curve to _____, ceteris paribus. It is because _____</li> <li>4. How the supply curve is affected by an increase in r?</li> <li>5. An increase in w shifts supply curve to the left, ceteris paribus. (True/False)</li> <li>6. Matching <ul style="list-style-type: none"> <li>Profit maximization                      供給表</li> <li>Production function                      利潤極大化</li> <li>Sales revenue                              供給量</li> <li>Cost    供給曲線</li> </ul> </li> </ol>	

	Supply curve Supply schedule Quantity supplied	生產成本 銷售收入 生產函數	
Variations of this experiments	<ul style="list-style-type: none"> <li>➤ Output price changes with output quantity =&gt; monopoly case</li> <li>➤ Input price changes with input quantity =&gt; monosony case</li> </ul>		
References	<p>Li, W., S., 1997. <i>New Introductory Economics 1 2<sup>nd</sup> ed.</i> HK: Longman Asia Ltd.</p> <p>Parkin, M., 1996. <i>Economics 3<sup>rd</sup> rd.</i> USA: Addison-Wesley Publishing Company, Inc.</p> <p>Varian, H., R., 1999 <i>Intermediate Microeconomics – A Modern Approach.</i> USA: W. W. Norton &amp; Company, Inc.</p> <p>Wong, Y. C., 1999. <i>Understanding Microeconomics 1 2<sup>nd</sup> ed.</i> HK: Pilot Publishers Services Ltd.</p>		

### Appendix I – Materials for Students

1. Case A (5 pages) – Base Case (one set per each group)
2. Case B1 (5 pages) -  $\Delta$  K (one set for only one group)
3. Case B2 (5 pages) -  $\Delta$  A (one set for only one group)
4. Case B3 (5 pages) -  $\Delta$  w (one set for only one group)
5. Supply Schedule – for students to plot their supply curves (one per each group)
6. Graph papers (one per each group)
7. Homework

### Appendix II – Tables and Graphs for Teacher

1. Fig.1 & Fig. 2 – TP curves
2. Fig 3 – Basic Shape of A Supply Curve
3. Table 1 – Summary of Result Presented by Students
4. Case A (5 pages) – Base Case (with answers & graph)
5. Case B1 (5 pages) -  $\Delta$  K (with answers & graph)
6. Case B2 (5 pages) -  $\Delta$  A (with answers & graph)
7. Case B3 (5 pages) -  $\Delta$  w (with answers & graph)
8. Supply Schedule – with answers
9. Answers for Quiz