

表 6.8 學習曲線的單位值

舉例：第一個單位須 10 小時完成，學習率為 80%，第五個單位需時多久  
答：從第五例，80%該行對應的值為 0.5956，即第五單位須花  $10 \times 0.5956 = 5.956$  小時

first car 3.6 hours  
fourth car 1.76 hours

$1.76/3.6=0.49$   
check table 6.8  
fourth row for 0.49  
we can find 學習率  
70%

單位	改良率								
	60%	65%	70%	75%	80%	85%	90%	95%	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
2	0.6000	0.6500	0.7000	0.7500	0.8000	0.8500	0.9000	0.9500	
3	0.4450	0.5052	0.5682	0.6338	0.7021	0.7729	0.8462	0.9219	
4	0.3600	0.4225	0.4900	0.5625	0.6400	0.7225	0.8100	0.9025	
5	0.3054	0.3678	0.4368	0.5127	0.5956	0.6857	0.7830	0.8877	
6	0.2670	0.3284	0.3977	0.4754	0.5617	0.6570	0.7616	0.8758	
7	0.2383	0.2984	0.3674	0.4459	0.5345	0.6337	0.7439	0.8659	
8	0.2160	0.2746	0.3430	0.4219	0.5120	0.6141	0.7290	0.8574	
9	0.1980	0.2552	0.3228	0.4017	0.4930	0.5974	0.7161	0.8499	
10	0.1832	0.2391	0.3058	0.3846	0.4765	0.5828	0.7047	0.8433	
12	0.1602	0.2135	0.2784	0.3565	0.4493	0.5584	0.6854	0.8320	
14	0.1430	0.1940	0.2572	0.3344	0.4276	0.5386	0.6696	0.8226	
16	0.1296	0.1785	0.2401	0.3164	0.4096	0.5220	0.6561	0.8145	
18	0.1188	0.1659	0.2260	0.3013	0.3944	0.5078	0.6445	0.8074	
20	0.1099	0.1554	0.2141	0.2884	0.3812	0.4954	0.6342	0.8012	
22	0.1025	0.1465	0.2038	0.2772	0.3697	0.4844	0.6251	0.7955	
24	0.0961	0.1387	0.1949	0.2674	0.3595	0.4747	0.6169	0.7904	
25	0.0933	0.1353	0.1908	0.2629	0.3548	0.4701	0.6131	0.7880	
30	0.0815	0.1208	0.1737	0.2437	0.3346	0.4505	0.5963	0.7775	
35	0.0728	0.1097	0.1605	0.2286	0.3184	0.4345	0.5825	0.7687	
40	0.0660	0.1010	0.1498	0.2163	0.3050	0.4211	0.5708	0.7611	
45	0.0605	0.0939	0.1410	0.2060	0.2936	0.4096	0.5607	0.7545	
50	0.0560	0.0879	0.1336	0.1972	0.2838	0.3996	0.5518	0.7486	
60	0.0489	0.0785	0.1216	0.1828	0.2676	0.3829	0.5367	0.7386	
70	0.0437	0.0713	0.1123	0.1715	0.2547	0.3693	0.5243	0.7302	
80	0.0396	0.0657	0.1049	0.1622	0.2440	0.3579	0.5137	0.7231	
90	0.0363	0.0610	0.0987	0.1545	0.2349	0.3482	0.5046	0.7168	
100	0.0336	0.0572	0.0935	0.1479	0.2271	0.3397	0.4966	0.7112	
120	0.0294	0.0510	0.0851	0.1371	0.2141	0.3255	0.4830	0.7017	
140	0.0262	0.0464	0.0786	0.1287	0.2038	0.3139	0.4718	0.6937	
160	0.0237	0.0427	0.0734	0.1217	0.1952	0.3042	0.4623	0.6869	
180	0.0218	0.0397	0.0691	0.1159	0.1879	0.2959	0.4541	0.6809	
200	0.0201	0.0371	0.0655	0.1109	0.1816	0.2887	0.4469	0.6757	
250	0.0171	0.0323	0.0584	0.1011	0.1691	0.2740	0.4320	0.6646	
300	0.0149	0.0289	0.0531	0.0937	0.1594	0.2625	0.4202	0.6557	
350	0.0133	0.0262	0.0491	0.0879	0.1517	0.2532	0.4105	0.6482	
400	0.0121	0.0241	0.0458	0.0832	0.1453	0.2454	0.4022	0.6419	
450	0.0111	0.0224	0.0431	0.0792	0.1399	0.2387	0.3951	0.6363	
500	0.0103	0.0210	0.0408	0.0758	0.1352	0.2329	0.3888	0.6314	

Source: Albert N. Schreiber, Richard A. Johnson, Robert C. Meier, William T. Newell, and Henry C. Fischer, *Cases in Manufacturing Management* (New York: McGraw-Hill, 1965), p. 464. Reprinted by permission of McGraw-Hill, ©1965.

表 6.9 學習曲線的累計值

舉例：第一個單位須 10 小時完成，學習率為 80%，生產前五單位只須多少小時  
答：從第五例，80%行的值可對應出 3.738，因此，前五個單位  
需時  $10 \times 3.738 = 37.38$  小時

單位	改良率								
	60%	65%	70%	75%	80%	85%	90%	95%	
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2	1.600	1.650	1.700	1.750	1.800	1.850	1.900	1.950	
3	2.045	2.155	2.268	2.384	2.502	2.623	2.746	2.872	
4	2.405	2.578	2.758	2.946	3.142	3.345	3.556	3.774	
5	2.710	2.946	3.195	3.459	3.738	4.031	4.339	4.662	
6	2.977	3.274	3.593	3.934	4.299	4.688	5.101	5.538	
7	3.216	3.572	3.960	4.380	4.834	5.322	5.845	6.404	
8	3.432	3.847	4.303	4.802	5.346	5.936	6.574	7.261	
9	3.630	4.102	4.626	5.204	5.839	6.533	7.290	8.111	
10	3.813	4.341	4.931	5.589	6.315	7.116	7.994	8.955	
12	4.144	4.780	5.501	6.315	7.227	8.244	9.374	10.62	
14	4.438	5.177	6.026	6.994	8.092	9.331	10.72	12.27	
16	4.704	5.541	6.514	7.635	8.920	10.38	12.04	13.91	
18	4.946	5.879	6.972	8.245	9.716	11.41	13.33	15.52	
20	5.171	6.195	7.407	8.828	10.48	12.40	14.61	17.13	
22	5.379	6.492	7.819	9.388	11.23	13.38	15.86	18.72	
24	5.574	6.773	8.213	9.928	11.95	14.33	17.10	20.31	
25	5.668	6.909	8.404	10.19	12.31	14.80	17.71	21.10	
30	6.097	7.540	9.305	11.45	14.02	17.09	20.73	25.00	
35	6.478	8.109	10.13	12.72	15.64	19.29	23.67	28.86	
40	6.821	8.631	10.90	13.72	17.19	21.43	26.54	32.68	
45	7.134	9.114	11.62	14.77	18.68	23.50	29.37	36.47	
50	7.422	9.565	12.31	15.78	20.12	25.51	32.14	40.22	
60	7.941	10.39	13.57	17.67	22.87	29.41	37.57	47.65	
70	8.401	11.13	14.74	19.43	25.47	33.17	42.87	54.99	
80	8.814	11.82	15.82	21.09	27.96	36.80	48.05	62.25	
90	9.191	12.45	16.83	22.67	30.35	40.32	53.14	69.45	
100	9.539	13.03	17.79	24.18	32.65	43.75	58.14	76.59	
20	10.16	14.11	19.57	27.02	37.05	50.39	67.93	90.71	
40	10.72	15.08	21.20	29.67	41.22	56.78	77.46	104.7	
60	11.21	15.97	22.72	32.17	45.20	62.95	86.80	118.5	
80	11.67	16.79	24.14	34.54	49.03	68.95	95.96	132.1	
90	12.09	17.55	25.48	36.80	52.72	74.79	105.0	145.7	
50	13.01	19.28	28.56	42.08	61.47	88.83	126.9	179.2	
100	13.81	20.81	31.34	46.94	69.66	102.2	148.2	212.2	
50	14.51	22.18	33.89	51.48	77.43	115.1	169.0	244.8	
100	15.14	23.44	36.26	55.75	84.85	127.6	189.3	277.0	
50	15.72	24.60	38.48	59.80	91.97	139.7	209.2	309.0	
100	16.26	25.68	40.58	63.68	98.851	151.5	228.8	340.6	

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