

Duplication Formula

$$\text{Number of copies} = 1 + \frac{\text{Days in loan period} \times \text{Number of circulations}}{\text{Days in circulation life}}$$

Number of copies	Total copies of a title recommended for the collection (including current copies, if any).
Days in loan period	.50 <i>availability</i> : Mean length of loan period, in days. If this is not available, the number of days in the formal loan period for the title (example: 2 week adult fiction loan period = 14 days). .68 <i>availability</i> : Mean length of loan period, plus 10. .95 <i>availability</i> : Mean length of loan period, plus 20. .99 <i>availability</i> : Mean length of loan period. Plus 30.
Number of circulations	Total circulation count for all copies of the measured title in a known circulation life period (typically the title's most recent annual circulation).
Days in circulation life	Days the copies of the measured title have been active for circulation; days in the sample period during which the number of circulations are totaled (typically 365, for a title's annual circulation).

Based on my empirical experience with the formula, I have modified the original tool crib model presented in Grant and Leffler (below):

1. Rather than apply the formula by title, I have assumed that titles with the same loan period will exhibit similar circulation characteristics, and generalized the formula to any title with a particular loan period.
2. I have recommended substituting the formal loan period if the actual mean length of the loan period cannot be calculated from available data. I verified this standard rule of thumb using a year's worth of circulation at the Ames Public Library in 1988-89.
3. Rather than use actual standard deviations for the length of loan, which cannot be calculated from data routinely available, I have used a value of 10. This value was derived from a year's worth of circulations analyzed at the Ames Public Library in 1988-89.
4. I have added a base constant of 1, which weights the formula toward a broader base of titles and significantly improves browsability of the overall rhizome.

Grant, Robert S. "Predicting the Need for Multiple Copies of Books." *Journal of Library Automation* 4, no. 2 (June 1971): 64-71.

Leffler, William L. "A Statistical Method for Circulation Analysis." *College and Research Libraries* 25 (November 1964): 488-490.