

Reducing ink use in public PDFs

A PrintLight benchmark and standard-page cost model

Teaching packs, community handouts and reports are often designed for screens. Dark panels, colored backgrounds and photographs can consume ink without helping someone read a paper copy. PrintLight prepares a lighter version by clearing backgrounds, whitening paper and optionally omitting large pictures.

EXECUTIVE FINDINGS / 11 SELECTED PDFs, 319 PAGES

56%

less estimated color-ink coverage

\$15–\$17

modeled ink saving / 100 color pages[1]

The 56% result combines all pages in the savings group, weighted by original ink coverage. The dollar estimate uses standard HP 923 cartridges and a separate comparison with official printer test pages. Both describe this selected document mix; neither is a physical ink-depletion test.

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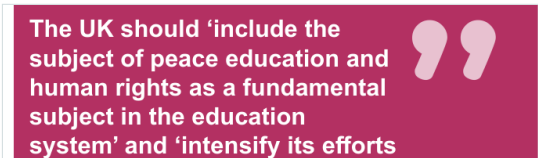


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Figure 1. Background cleanup in a child-rights handout. Matching crops from UNICEF, page 1. Colored panels become white; the icons and labels remain visible. Whole four-page PDF: **74% Ink Savings**. This example has its own result; the executive findings above cover the full savings group.

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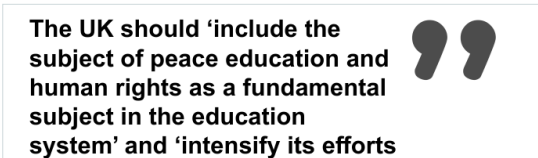


Figure 2. A quotation made lighter. Matching crops from *Peace at the Heart*, page 6. Whole 64-page report: **48% Ink Savings**. Images in this paper are actual PDF captures.

01 Results across whole documents

Every page of each listed PDF is included. Titles link to public originals. The savings group focuses on documents with avoidable ink-heavy content.

PUBLIC PDF	Ink Savings*
NASA Roman brochure	98%
CDC Stop Germs! poster	76%
UNICEF child-rights PDF	74%
NGA workforce report	66%
Amnesty child-rights toolkit	55%
EPA school-waste guide	50%
WHO handwashing poster	49%
Quakers: Peace at the Heart	48%
Duke school-discipline report	44%
Lincoln letters, scanned book	43%
BEA economic report	36%

***Ink Savings:** estimated reduction in combined cyan, magenta, yellow and black coverage, with large pictures omitted by default. The **56% combined reduction** compares total ink before and after; it is not the average of the table percentages.

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Figure 3. A lighter public-health poster. The CDC poster’s colored banners become white while its five instructional illustrations remain unchanged. Whole one-page PDF: **76% Ink Savings**.

Preserve useful content; preview the output

Low savings can be a good result. NPS maps saved 6% while retaining meaningful colors and details. The IRS W-4 and NASA factsheet saved 0%; all six page images were unchanged. These are outside the savings group. The mostly text-based NIST definition is also excluded.

Pictures can carry information. Default picture removal erased a worded Duke logo; choosing **Keep pictures** restored it. A worded recycling-sign photo in the EPA guide disappeared in both settings. Check important images, pale text, labels and tables before printing.

02 What the estimates mean

Scope. This owner-commissioned evaluation completed 15 public PDFs (334 pages); one additional PDF failed because of unsupported image encoding. The 11-PDF savings group (319 pages) was selected after review. It is a convenience sample, not a random sample or an independent certification. The benchmark output is frozen to the tested version.

A cost estimate matched to page coverage

We compared our pages with the official five-page ISO/IEC 24712 test PDF, fitted to the same printable page size and measured separately for each ink color. Original pages had **1.3–1.5 times** the standard’s combined coverage; cleaned pages had **0.55–0.69 times**. [1]

BEFORE / 100 COLOR PAGES	AFTER / 100 COLOR PAGES	INK SAVED / 100 PAGES
\$30–\$33	\$15–\$16	\$15–\$17

The model uses standard HP 923 cartridges: **\$37 black and \$19 for each color**, with ISO yields of **500 black / 400 color pages**. [2] It scales each channel’s cartridge use by its measured coverage, then subtracts after from before. Two color-conversion methods give the range; it is a sensitivity check, not a confidence interval. Tank, high-yield and third-party inks can cost less.

Carbon savings, including extra computing

HP reports a **0.56 kg CO2e lifecycle footprint per standard HP 923 cartridge**, covering manufacture, distribution and disposal. [3] Applying the same cartridge-use model gives **3.7–4.2 kg CO2e avoided per 1,000 color pages**, after extra processing and review electricity—about **9–11 miles of gasoline-car driving**. [4]

Extra electricity is modeled at about **0.011 kWh per 1,000 pages**: under one cent and about 4 g CO2e. [4] Power is assumed, not metered. Other computing and network impacts are unmeasured. Maintenance ink is held unchanged. Benefits assume less ink eventually means fewer cartridge purchases; actual results may fall outside the range. Shipping is counted once. Paper, printer wear and printer electricity receive no savings credit. Tool fees and time are excluded.

Scale, in context. Smithers estimated 44.67 trillion A4-equivalent prints in 2023, about 122 billion a day, including packaging and labels. [5] PrintLight addresses an unmeasured portion: ink-heavy PDFs people already intend to print.

Prepare once. Preview carefully. Print lighter. [Try PrintLight at supertool.org/printlight-pdf/](https://supertool.org/printlight-pdf/)

Sources and supporting data. [1] [ISO test-page source](#) (2007 PDF; coverage model, not ISO certification). [2] [Consumer Reports: HP 8122 cartridge prices](#) (review prices); HP 923 yields. [3] [HP ink-cartridge LCA, May 2026, pp. 3–4, 7](#) (manufacturer study). [4] [EPA eGRID](#), [EPA car equivalency](#) (0.393 kg/mile, operation), [EIA electricity prices](#). [5] [Smithers print-market estimate](#). Companion evidence files provide document sources, measurements and model inputs. Source publishers do not endorse PrintLight.