8.1.4 Laser Printing Facts

As a PC technician you will support laser printers because they're very widely implemented. They create very high quality output, they're very fast, and they're reasonably economical to use.

This lesson covers the following topics:

- Laser printer components
- Printing process

Laser Printer Components

In addition to the laser, laser printers share the following components:

- Laser printers use a laser and electrical charges to transfer images to paper.
- Laser printers move paper through the printer via motorized rollers.
- Each laser printer has a high-voltage power supply to charge the drum. This power supply converts AC current into higher voltages required for the printing process.
- Each laser printer has a DC power supply to operate most of the electronic components inside the printer.
- Each laser printer has a controller, which is a circuit board that acts like a motherboard in the printer. This controller board makes it possible for the printer to have and add its own memory.
- Laser printers are classified as page printers, because they print text and graphics simultaneously one complete page at a time.
- Laser printers use a laser to charge a metal drum. The drum picks up plastic toner, and the toner is then fused onto the paper (using rollers and heat).
- Of all the types of printers discussed in this course, laser printers have the highest print quality.
- A duplexing assembly is required to print two-sided output on a laser printer. Many inkjet printers also use duplexing assemblies to print two-sided paper. Duplexing assemblies are typically mounted on the back of a laser or inkjet paper.
- A transfer belt is used on some high-end color laser printers. Colors are applied to the transfer belt and then to the paper. This step is repeated for different colors.

Printing Process

The layout of physical parts in laser printers can vary greatly, however, the basic process remains the same. The following table describes the steps in the laser printing process:

Step	Description
Cleaning	The cleaning phase prepares the drum by removing the previous image printed. It uses a rubber cleaning blade to remove any excess toner on the drum and then it scrapes off the debris into a debris cavity. Next, a heat roller is lubricated to ensure that enough heat will be evenly applied to transfer the next image printed. Then an electrostatic erase lamp neutralizes the electrical charges that remain on the drum from the previous printed image.
Processing	The printer receives a document to be printed from the connected computer and converts it into a bitmap raster image, which is divided into horizontal raster lines.
Charging	The primary corona prepares the photosensitive drum for writing by causing it to receive a negative electrostatic charge. Depending on the printer, the primary corona will be wires or rollers.
Exposing	A laser beam changes the charge on the surface of the drum in a pattern of the page's image.
Developing	The developing roller applies toner to the drum. The toner sticks to the charged areas on the drum.
Transferring	The transfer roller charges the paper to attract the toner.
Fusing	The fusing assembly attaches the toner to the paper using rollers that press and melt the toner to the paper. As the paper leaves the printer, a static eliminator strip removes the static charge from the paper.