

A Day in the Life with Photonics

The following brief story from *Harnessing Light* is printed with permission by National Academy Press. It illustrates just a few ways that optical technologies impact our daily lives. That impact is rarely noticed because the optical technology in the products we use is, ironically, often invisible and because we adapt so swiftly to modern technology. Today, we pay as little attention to infrared remote controls, light-emitting diodes, and laser printers as to the mirrors that have been with us since antiquity.

<p>John reached over and shut off the alarm (1) clock. He turned on the lights (2) and got up. Downstairs, he began to make his morning coffee and turned (3) on the television to check the weather (4) and (5) forecast. Checking the time on the kitchen clock (6) he poured his coffee and went to the solarium (7) to sit and read the newspaper (8).</p>	<ul style="list-style-type: none"> (1) light-emitting diode (LED) displays (2) energy saving compact fluorescent lamps (3) infrared remote controls (4) optical fibers for distributing cable television (5) satellite-based optical weather imaging (6) liquid crystal displays (LCDs) (7) temperature-moderating window coatings (8) phototypesetting
<p>Upstairs, the kids were getting ready for school. Julie was listening to music (9) while getting dressed (10). Steve felt sick, so Sarah, his mother, checked his temperature (11). Julie would go to school and Steve would stay home.</p>	<ul style="list-style-type: none"> (9) compact disks (10) laser fabric cutting (11) infrared non-contact "ear" thermometers
<p>John drove to work in his new car (12), a high-tech showcase. He drove across a bridge (13), noticing the emergency telephones (14) along the side of the freeway. He encountered traffic signals (15), highway signs (16), and a police officer scanning for speeders (17).</p>	<ul style="list-style-type: none"> (12) infrared automobile security systems; optical monitors for antilock brakes; LED, LCD, and optical fiber dashboard displays; LED taillights (13) optical-fiber sensors to monitor bridge integrity (14) solar power for emergency services (15) LED traffic lights (16) high-reflectivity surfaces for highway signs (17) laser traffic radar
<p>Awaiting John in his office were several telephone (18) messages and a fax (19). He turned on his computer (20), checked some reference data on a CD-ROM (21), and printed (22) it to look at later. After copying (23) some last-minute handouts, he went to the conference room to make a presentation (24).</p>	<ul style="list-style-type: none"> (18) optical fiber telephone cables (19) optical scanners and fax machines (20) photolithography for making computer chips (21) optical data storage (22) laser printers (23) photocopiers (24) overhead projectors, slide projectors, laser pointers
<p>Meanwhile, Julie was walking to school. As she passed the neighbors' house, a security light (25) came on. On the next block she passed a construction site (26) for a new apartment building, then a block of medical (27) offices. A few blocks away was the factory (28) where her uncle worked.</p>	<ul style="list-style-type: none"> (25) infrared motion sensors for home security (26) laser range-finders/surveying equipment (27) laser surgery, optical tools for medical diagnosis (28) laser welding/cutting, optical stereo-lithography for rapid three-dimensional prototyping
<p>At school, Julie's first class was biology. The students looked for microbes (29) in water samples they had collected on a nature walk</p>	

<p>the previous day. On the walk they had also done some bird-watching and taken still and video pictures (30) of the plants and wildlife. The teacher put on her glasses (31) to read Julie's lab report.</p> <p>At lunchtime, John left his office to do some grocery shopping. At the checkout counter (32) he paid with a credit card (33). Among his purchases were a bag of apples (34), a bottle (35) of wine, and a carton (36) of milk. Each was labeled with a bar-code (37).</p> <p>At home, Steve was watching a movie (38) on the large-screen television (39). With her sick son occupied, Sarah connected her laptop computer to the office network (40). Modern technology let her do her work, despite having to stay home with a child --- and at least John was stuck doing the shopping.</p>	<p>(29) microscopes, magnifying lenses (30) binoculars, cameras, video cameras (31) eyeglasses</p> <p>(32) supermarket bar-code scanners (33) credit card holograms to prevent counterfeiting (34) image recognition for produce quality control (35) optical inspection to ensure clean bottles (36) optical inspection for labeling and packaging (37) bar-code readers for inventory control</p> <p>(38) video disks and videodisk players (39) television displays (40) optical fiber local area networks</p>
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