

KINEMATICS

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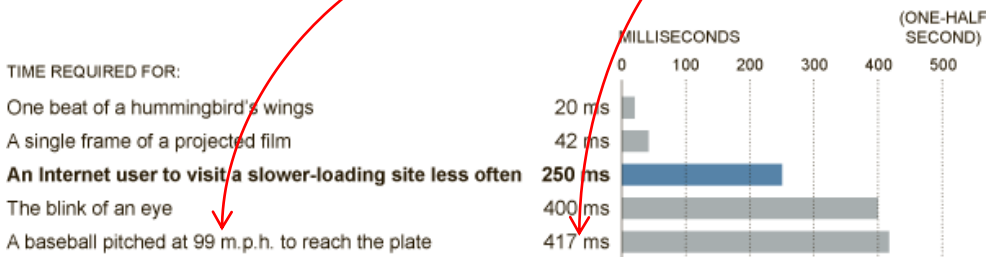
For Impatient Web Users, an Eye Blink Is Just Too Long to Wait



Arvind Jain, a Google engineer, pointed out the loading speed of individual elements of a website on a test application used to check efficiency, at Google offices in Mountain View, Calif.

INTRODUCTION: From the pitcher's mound to Home plate it is 60.5 ft. **QUESTION:** Verify THAT IT IS 60.5 ft with what is stated below using kinematic motion concepts. **HINT:** 60 mph = 88 ft/s, ms = 10^{-3} s
 $x = vt$

Wait a second.



The Blink of an Eye? Oh, Please

No, that's too long.

Remember when you were willing to wait a few seconds for a computer to respond to a click on a Web site or a tap on a keyboard? These days, **even 400 milliseconds – literally the blink of an eye – is too long, as Google engineers have discovered.** That barely perceptible delay causes people to search less.

“Subconsciously, you don't like to wait,” said Arvind Jain, a Google engineer who is the company's resident speed maestro. “Every millisecond matters.” Google and other tech companies are on a new quest for speed, challenging the likes of Mr. Jain to make fast go faster. The reason is that data-hungry smartphones and tablets are creating frustrating digital traffic jams, as people download maps, video clips of sports highlights, news updates or recommendations for nearby restaurants. The competition to be the quickest is fierce.

People will visit a Web site less often if it is slower than a close competitor by more than 250 milliseconds (a millisecond is a thousandth of a second). “Two hundred fifty milliseconds, either slower or faster, is close to the

magic number now for competitive advantage on the Web,” said Harry Shum, a computer scientist and speed specialist at Microsoft. The performance of Web sites varies, and so do user expectations. A person will be more patient waiting for a video clip to load than for a search result. And Web sites constantly face trade-offs between visual richness and snappy response times. As entertainment and news sites, like The New York Times Web site, offer more video clips and interactive graphics, that can slow things down. But speed matters in every context, research shows. Four out of five online users will click away if a video stalls while loading. On a mobile phone, a Web page takes a leisurely nine seconds to load, according to Google, which tracks a huge range of sites from the homes of large companies to the legions of one-person bloggers. Download times on personal computers average about six seconds worldwide, and about 3.5 seconds on average in the United States. The major search engines, Google and Microsoft's Bing, are the speed demons of the Web, analysts say, typically delivering results in less than a second.