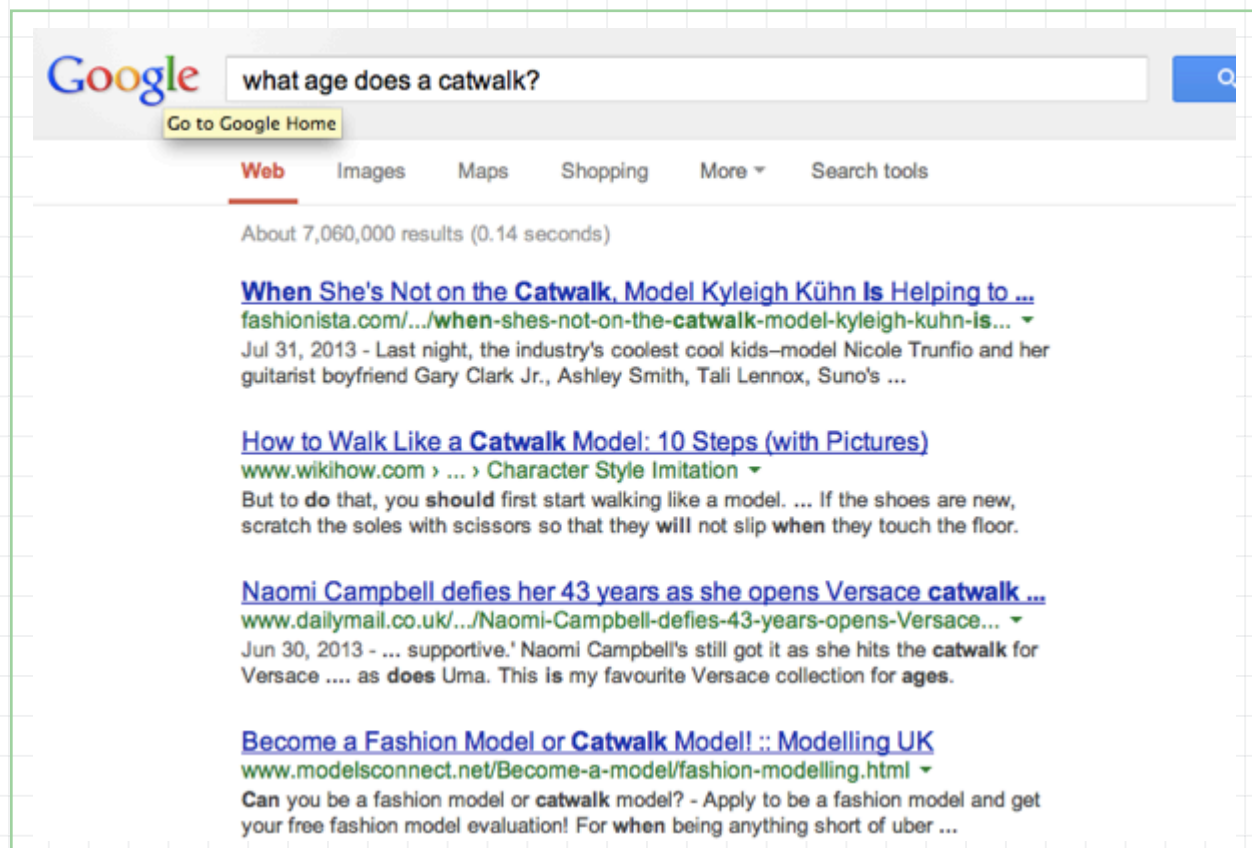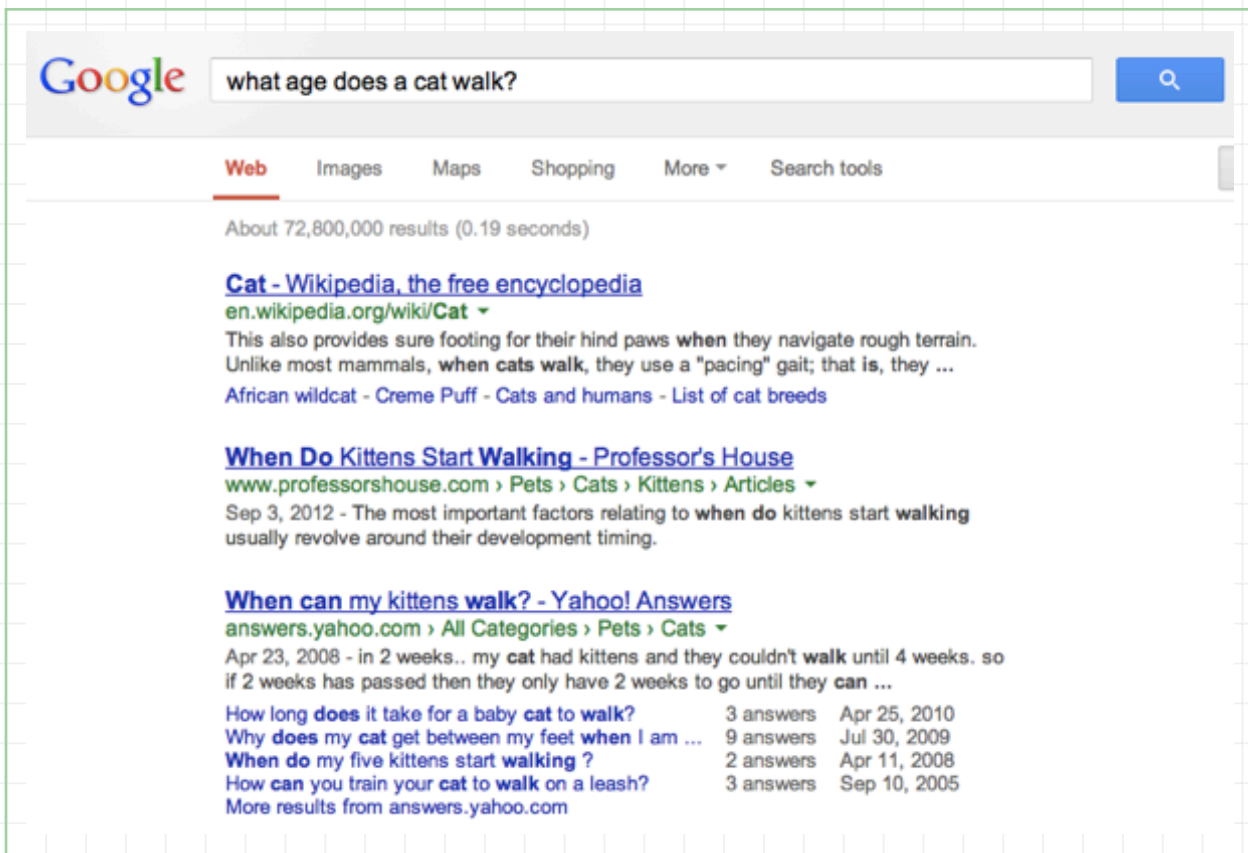# A GOOGLE DILEMMA

Teacher note: This problem could be introduced by the teacher with the searches shown to students on screen, or students could look them up themselves, or the text & photos below could be given to them.

Part 1. "The Hook"

Two people conducted Google searches, to find out when their new baby kitten would learn to walk. **What happened?**
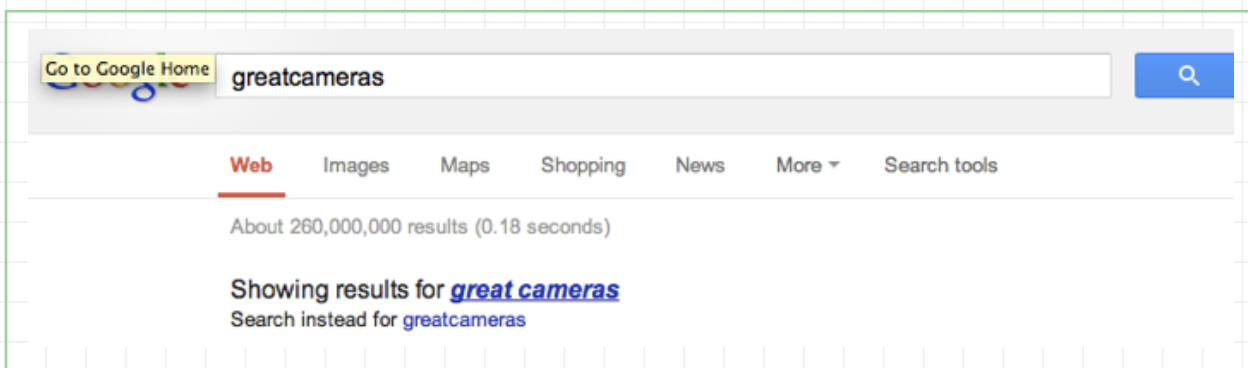
Group Discussion

Questions: **Why do the searches produce different results? Which words has the search engine paid most attention to in each case? Why do you think the 2nd search produced over ten times as many results as the first?**

Class Discussion

This was a problem engineers at Google faced when they started the company. They wanted their search engine to be able to work out what people really meant. In most cases if you type in 2 words together, such as "greatcameras" the search engine works out that you mean "great cameras".

The Google engineers worked out a way for the search engine to recognize the words people really mean. **What do you think the team of people thought about and discussed in order to come up with their solution?**

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Part 2.

The Google team solved the problem using probabilities.

Click here to find a list of words with the number of times the word occurred in a text of approximately 1,000, 000 words

The beginning of the word list looks like this:

a   21160
aah   1
aaron   5
ab   2
aback   3
abacus   1
abandon   32

This says that the word "a" is very common, appearing 21,160 times, while "abacus" is very rare, appearing only once.

How could the search engine use this information to decide whether a searcher wanted links about cats and dogs or cat sand dogs when catsanddog is typed? Justify your answer using the word list.

Can you find a Google search that gives different results when words are put together? What is the probability of each option occurring?

Extension for Budding Coders
Can you write a computer program for a search engine to use probabilities and help Google solve this problem?

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