

Dear Beakman,  
How does a computer work?  
Arthur Bond  
Cockeysville,  
Maryland

Dear Arthur,  
Computers are very complicated things. How they work is really hard to explain in the space of a comic strip. But, I can give you a new way to think about computers. *You Can* think about them and they cannot think about you!

Computers are just machines that follow instructions we give them. We call the instructions a *program*. That means a computer is like a *program-player*. And the computer turns into anything – any kind of machine – we can tell it to.

With the right program, a computer can be a typewriter, a game, a musical instrument, or even a telescope. It can be any kind of machine we can program it to be. This is why the job of being a computer programmer is such a big deal.

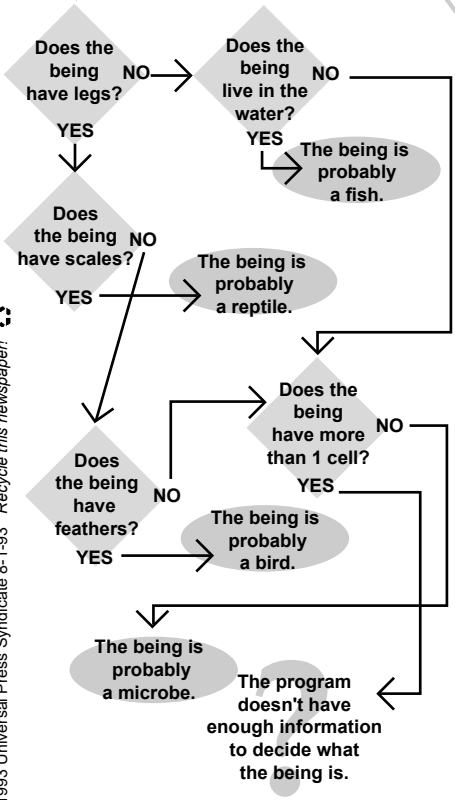
Here's a secret: I don't use a pencil to draw this comic. I use a computer that has been turned into a drawing machine by the programs I play on it.

*Beakman*  
Beakman Place

### A bunch of Yes/No switches

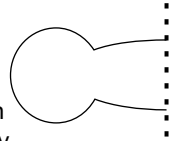
I have a living being here. What kind of creature is it?  
Computers are just lots and lots of switches that answer yes/no, on/off kinds of questions.

Does the being have any hair or fur?  
NO  
YES  
The being is probably a mammal.

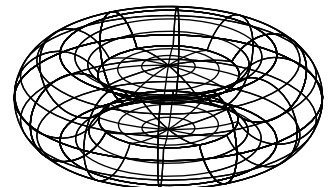


### computer art

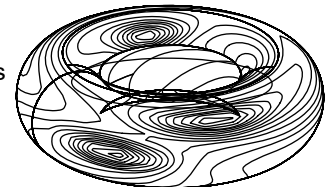
I want to draw a red blood cell. I start by drawing this shape on the computer. It's really a bunch of math that describes this curvy thing.



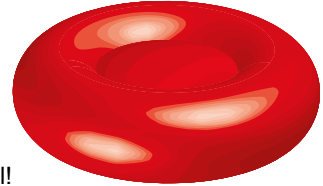
Next, I tell the computer program to spin the shape around the dotted line. I get this thing that looks like a bagel-shaped bird cage.



Now I tell the program to pretend the bird-cage-thing has a shiny surface and that there are 2 lights shining on it. What does it look like now?



Lastly, each weird little area is given a color that represents how light or dark it would be if a light was shining on it. The areas together turn out to be a good drawing of a red blood cell!



P.S. from Jax: When a mistake is written into a program, it's called a bug. The first bug was really a bug. A moth got caught in a switch in an early computer.