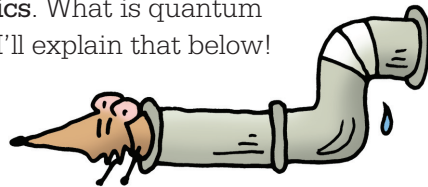


1947

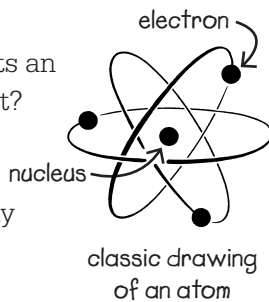
Bell Labs has just invented the **transistor**, a world-changing device using **quantum mechanics**. What is quantum mechanics? I can't believe I'm saying this, but I'll explain that below!

Weird Science



Don't be scared off by the term quantum mechanics. A **quantum** is the tiniest bit of energy inside an **atom**. And mechanics is the study of motion. So quantum mechanics is the field of science that deals with the motion of tiny stuff inside atoms. And, boy, is that world a weird one!

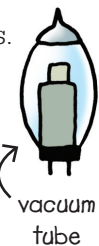
Take an **electron**, for example. It's a tiny particle that orbits an atom's **nucleus**. Kind of like a planet orbiting the Sun, right? Wrong! Experiments have shown electrons can behave like **waves**. And trying to predict where one will be at any moment is a guessing game because electrons can instantly jump from one orbit to another—making **quantum leaps**!



But it gets even weirder. Two **quanta** (the plural of quantum) can share a mysterious link, even if they're far apart. In one experiment in 2012, scientists took a connected pair of **photons** (quanta of light) and separated them. **Photon 1** was then altered, and guess what? **Photon 2**, on an island 88 miles away (143 km), was instantly altered as well! The two were **entangled**, a strange connection between quanta that no one can really explain.

In fact, there's a lot about quantum mechanics that scientists have trouble explaining. Even **Richard Feynman**, a quantum brainiac, once said, "I think it is safe to say that no one understands quantum mechanics." But here's the thing: quantum mechanics isn't just weird. It's useful! Especially to inventors.

The **transistor** was one of the first inventions using quantum mechanics. It replaced **vacuum tubes**, which were big, easy to break, and needed a lot of electricity. Transistors made the **computers** of today possible. They're also responsible for **digital cameras**, **CD and DVD players**, **cell phones**, **ATMs**, **lasers**, and the list goes on and on.



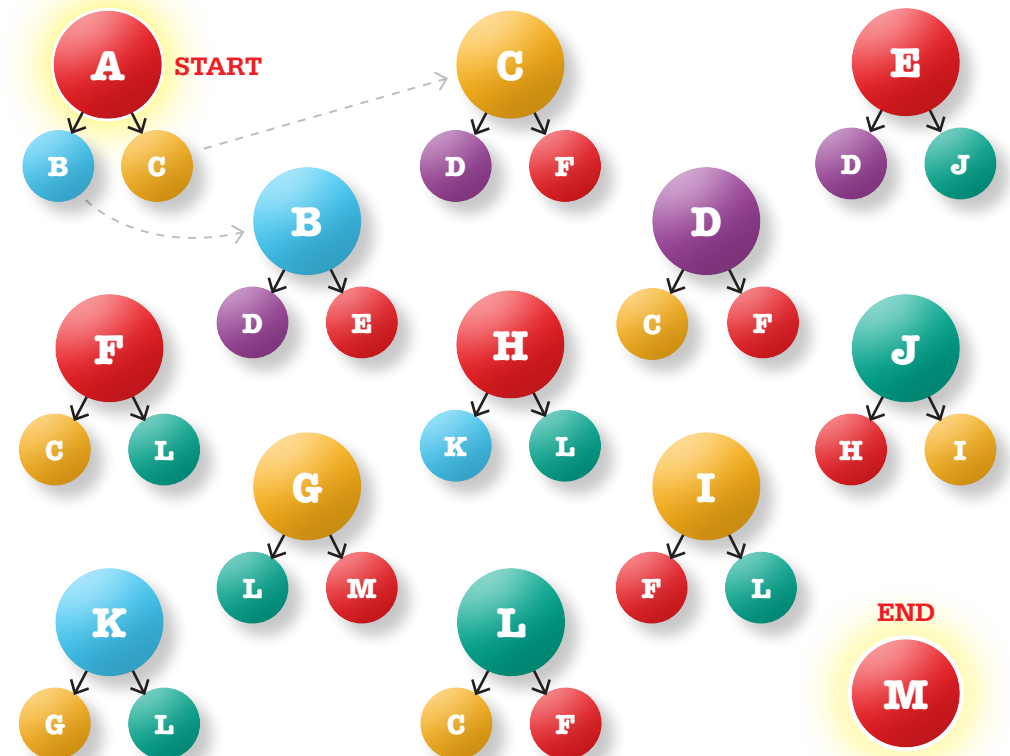
So, now you know what I know—which isn't much. But hopefully it's more than you knew about quantum mechanics when you woke up today. :-)

Albert Einstein called the idea of entangled quanta "spooky action." And he kept trying to prove it wasn't possible!

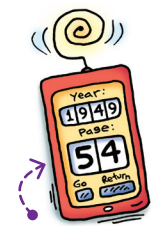
iPuzzle

Entanglement

Start at A. From there, either jump from small B to big B (an entangled pair) or from small C to big C (another entangled pair). After each jump, you'll have two new choices. Find the one route that goes from A to M.



Alternate Universes: One of the most bizarre ideas suggested by quantum mechanics is that every action you take has the potential for a different outcome, each playing out in a different universe. Not all scientists believe this, but the math suggests it's possible. If so, you'll continue reading this book in this universe. But in another, you've just tossed it aside and are eating a big plate of asparagus.



Jump to this page or follow the pipes.

The goal of this puzzle is to get from A to M. (A to M... Hey! That spells ATOM.)