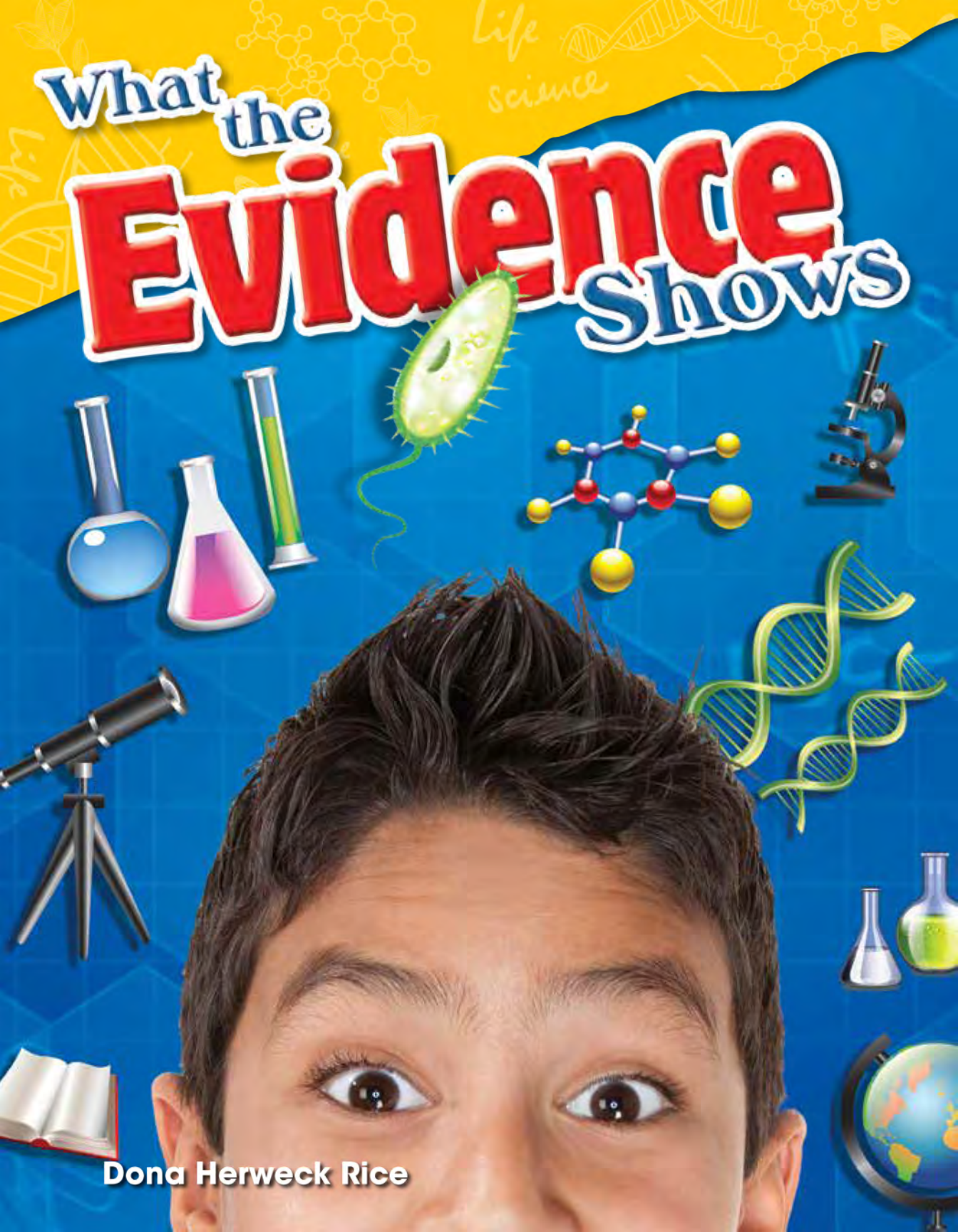
What the Evidence Shows



Dona Herweck Rice

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Order in the Court!

"Ladies and gentlemen of the jury, the **evidence** clearly shows…."

If you've watched a courtroom television show, you've heard that phrase. Lawyers on each side present evidence to support their side of the case. Of course, they *want* to show only the evidence that's in their favor. Who wouldn't want to? It's their job to prove their side of the story. So, if evidence proving otherwise somehow mysteriously disappears…huh. How could that happen? Go figure! (Wink, wink.)

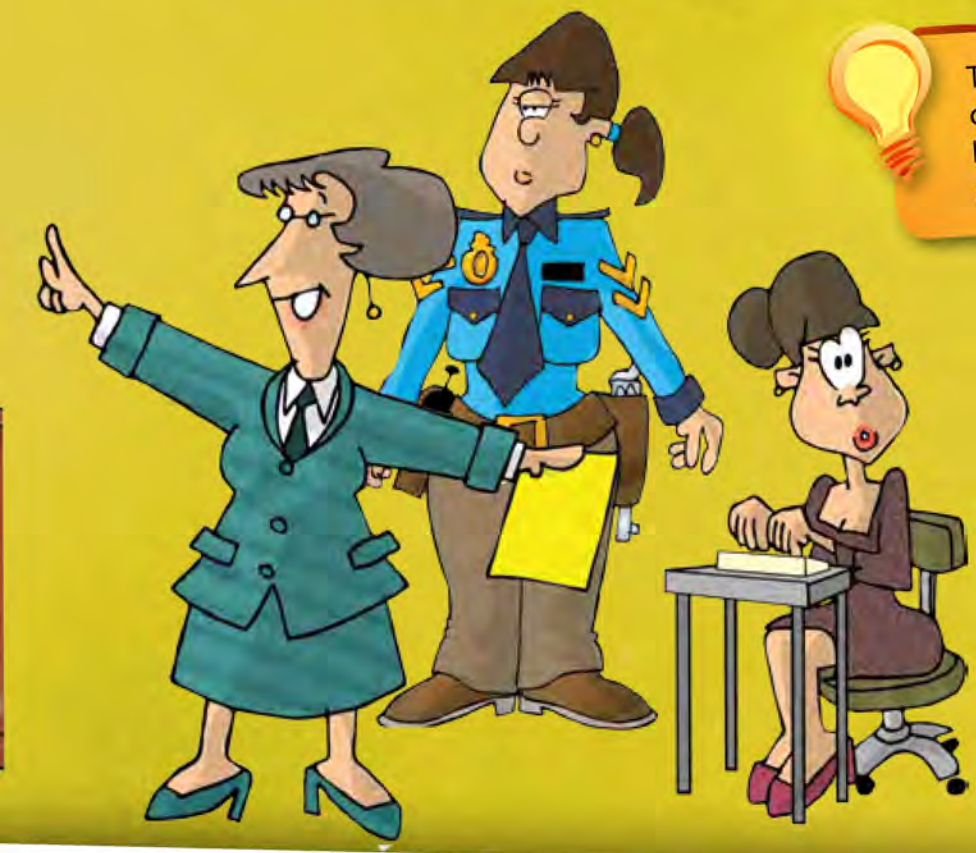


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Well, evidence in a television courtroom is one thing, but evidence in the real world—the world of science—is quite another thing altogether. There is no way to make scientific evidence disappear. And no scientist is trying to prove anything. (It's not in the job description.) It's all about what the evidence shows—ALL the evidence. The evidence is just WHAT IT IS and can't be changed, twisted, rejected, or overlooked. In fact, the evidence is in the law itself—the laws of science—and these laws cannot be broken!

Scientists don't want to twist the truth: they want to find it. They don't want to manipulate facts; they want to get them straight. They don't want to miss any detail. They work with focus and determination until every detail has been discovered, logged, studied, **analyzed**, tested, and tested again.

If scientists had their own television dramas, the shows would never end. There's always more evidence to be found!



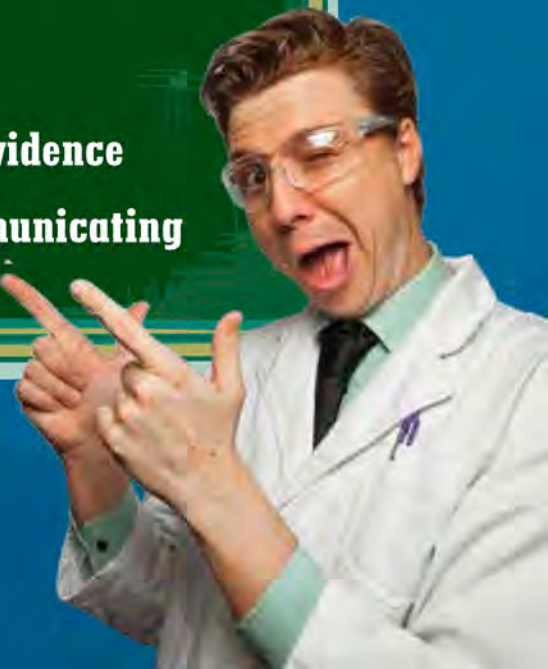
The word *evidence* comes from the Latin word *evidentia*, meaning "clearness."

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Scientific Practices

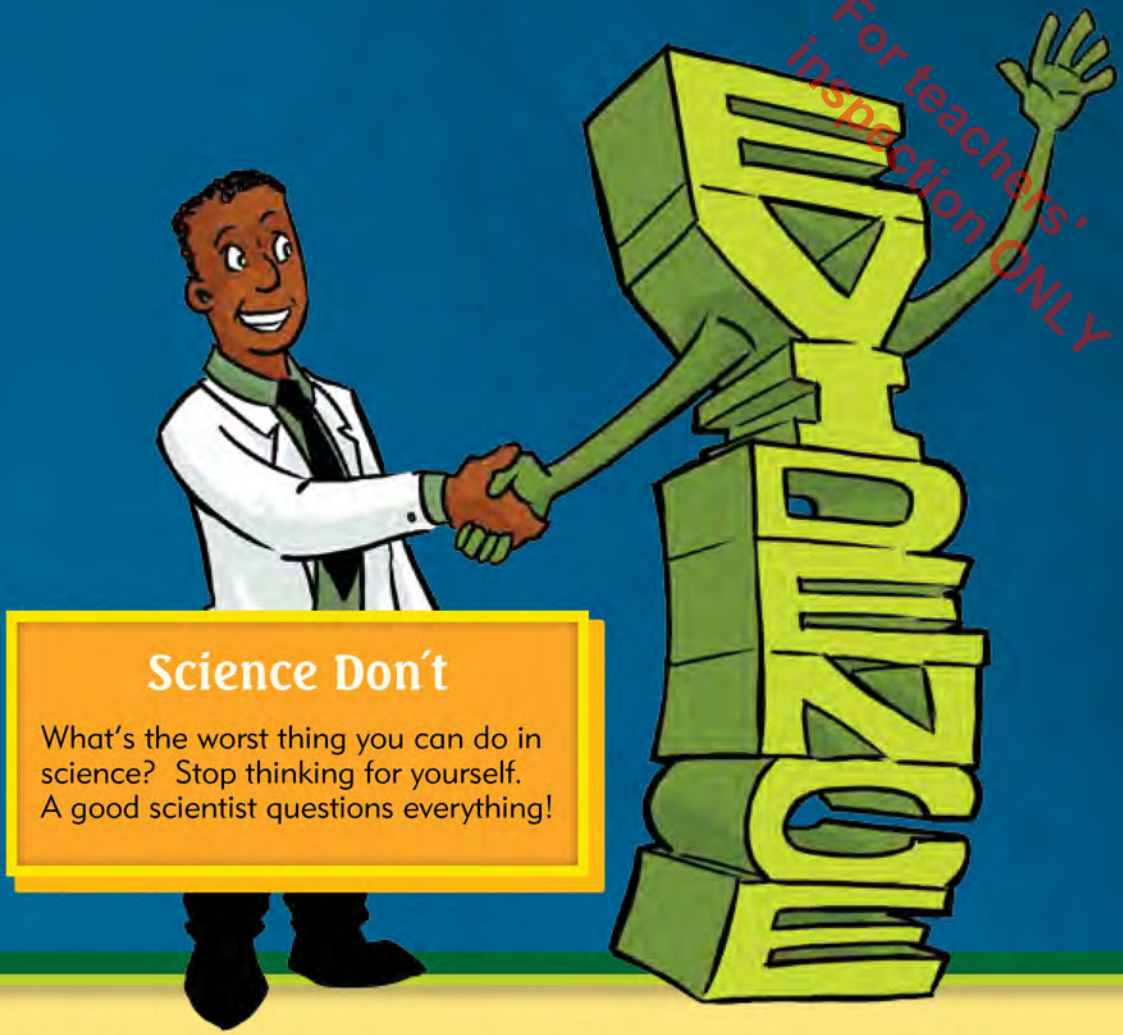
Every good scientist follows essential practices in his or her work. These are SCIENCE DOs (as opposed to SCIENCE DON'Ts). In fact, experts say there are eight main science practices*, listed here:

1. **Asking questions**
2. **Developing and using models**
3. **Planning and carrying out investigations**
4. **Analyzing and interpreting data**
5. **Using mathematics and computational thinking**
6. **Constructing explanations**
7. **Engaging in argument from evidence**
8. **Getting, evaluating, and communicating information**



Adapted from the Next Generation Science Standards, Appendix F, April 2013

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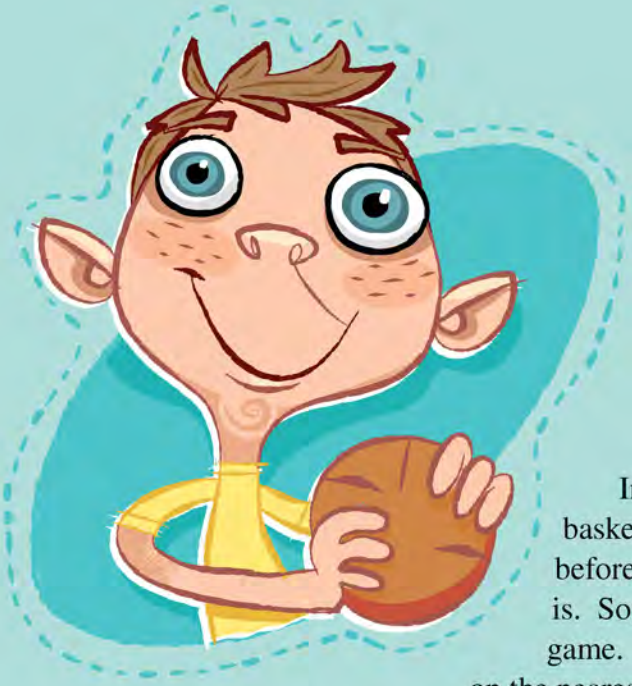


Science Don't

What's the worst thing you can do in science? Stop thinking for yourself. A good scientist questions everything!

Scientific evidence is an important part of every one of those practices. Take a look at them again, and you'll see that evidence is a very big deal! If you are going to ask a scientific question, you've probably seen some evidence that prompted you to think of the question. If you are going to develop a scientific model, you need quality evidence for that. If you are going to construct an explanation, you'll be explaining the evidence.

Science and evidence are very good friends! Scientists know that evidence is essential and that they can't just make up stuff, jump to conclusions, or take what someone else says and think, "Well, sure, if you say so!" Scientists dig in to find out for themselves so they can be sure that all evidence is good evidence, that it is accurate, and that it is complete.





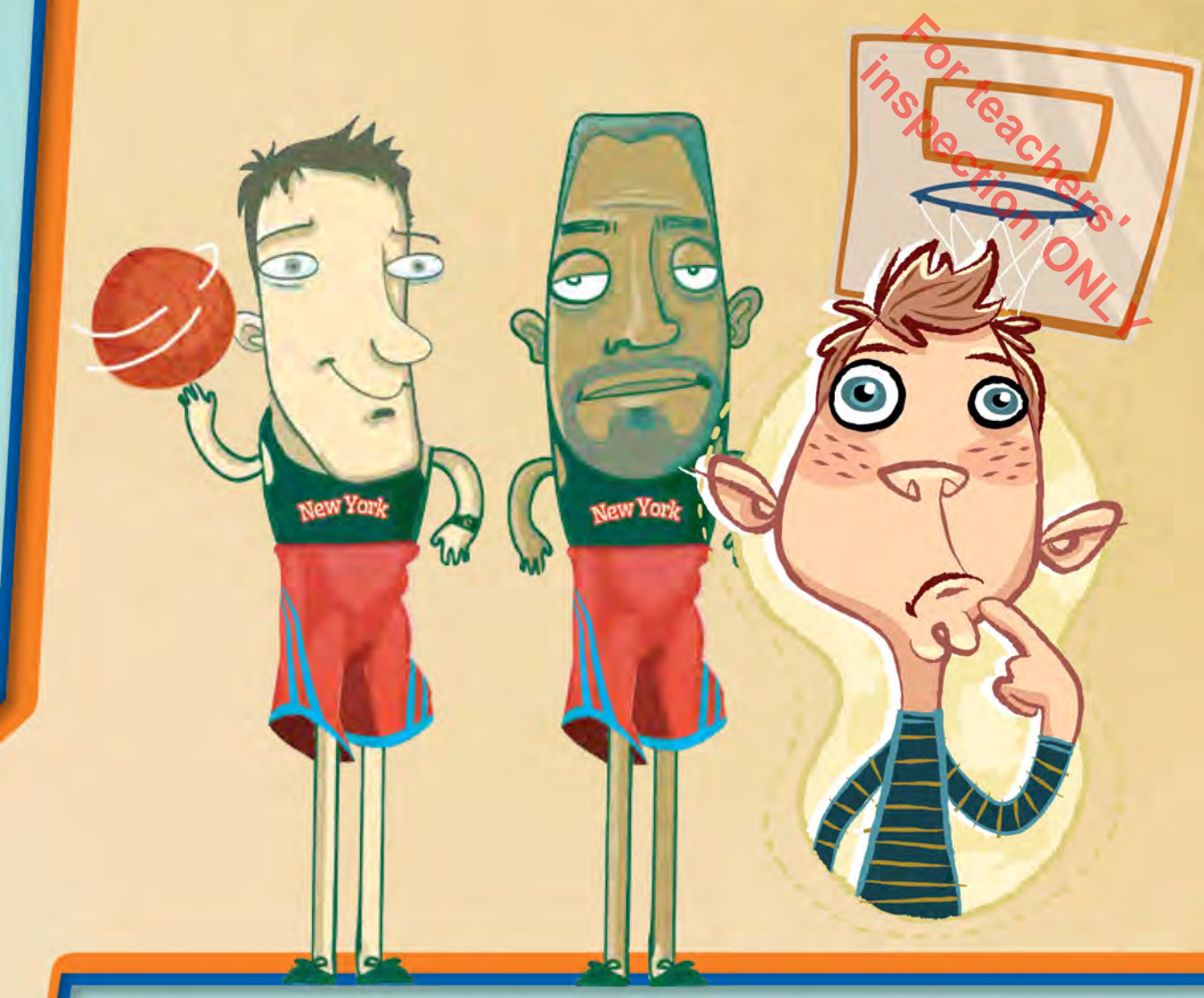
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Imagine that you want to play a game of basketball, and although you have never played before, everyone tells you what a great game it is. So, you grab a basketball and find a pickup game. A group of kindergarten kids is playing on the nearest court, and you ask them if they want to play. "Wow!" you think. "I'm fantastic at this game! I'm totally beating these kids! It's like I'm a basketball-playing machine!" After all, the evidence clearly shows that you are an awesome player, right? You're unstoppable, and it's as if you were born to play the game!



A Constant

Whenever conducting an experiment in which there is a comparison, scientists use something called a constant. A constant does not change. Things being compared are tested against something that is the same for both of them. That is the only way to be able to test a difference.



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So, the next day, feeling pretty good about your skills, you head to the court again, where this time you find the New York Knicks shooting some hoops. You ask if you can play, too, and they say, "Sure, kid!" But, ouch! It's sooooo not like yesterday. You get creamed, slaughtered, demoralized, and pulverized. "Man, I'm the worst player ever," you wail. "I can't even get my hands on the ball!"

Of course, in both cases, you're wrong. The evidence is incomplete, and it's not based on anything consistent. All you know is that you have a good chance of beating kindergartners at basketball and that the Knicks are much better players than you are.

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Think Like a Scientist

How can you think like a great scientific inquirer? Experiment and find out!

What to Get

- board or ramp
- clay
- gravel
- potting soil
- sand

