CH. 2: THE BLINDFOLD AND THE CHESTNUTS

It's all right to be blind. But don't pretend you can see.

When the chestnuts finished roasting, a sweet aroma filled the kitchen. The student was about to dig in when, out of nowhere, a blindfold appeared in front of her eyes.

"No peeking," the teacher warned.

The student heard the chestnuts being poured. "Now," the teacher said, "I have divided your chestnuts among three bowls.

"I've also taken ten pieces of wasabi root, and carved them into the shape of chestnuts." The teacher laughed. "These will not be to your liking. Bite into one, and your eyes will cry rivers, while your nose burns like a dragon's.

"Now," the teacher continued, "I am dividing my ten wasabi chestnuts among your delicious roasted ones. Six wasabi into the first bowl." The student heard six plinking sounds. "Three into the second bowl." More plinking sounds. "And one into the third." Plink.

"You may reach into one bowl," the teacher said, "and draw a chestnut at random. Which bowl do you choose?"

"The third, obviously," the student said. "It only has one of your devil chestnuts."

The student's hand groped around the third bowl, but found only a single chestnut. Throwing off her blindfold, she saw that its color was a pale wasabi green. Peering into the bowls, this is what the student saw:

Bowl	**Regular Chestnuts**	**Wasabi "Chestnuts"**
First	100	6
Second	20	3
Third	0	1

"That's not fair!" the student said. "You tricked me."

"You tricked yourself," the teacher said. "Why did you believe that the third bowl would be the best?"

"I figured the bowls would all have the same number of roasted chestnuts."

"Why? Did anyone tell you this?"

"No," the student said. "Once you said 'three bowls,' I just assumed you'd split the good chestnuts equally."

"So what have you learned?"

"Well," she said, "a probability is all about context. It doesn't really matter how many wasabi nuts there are. It matters how many wasabi nuts there are *compared* with the other nuts. Even though the first bowl had the most wasabi, my probability of getting one was lowest, because there were so many other nuts, too."

The teacher nodded. "What else?"

"You've got to know what information you're missing, and what assumptions you're making."

"What else?"

"Never make a decision blindfolded."

The teacher laughed. "An impossible wish. We're all wearing blindfolds, every moment of our lives, and they come off far less easily than this cheap piece of cloth."

"Then what should we do, when we can't take the blindfold off?"

"Do the best you can," the teacher said, "and never forget that you're wearing it."

CH. 2: DISCUSSION

Lesson #1: A probability is a ratio. It's the number of outcomes you're interested in, divided by the total number of outcomes. A probabilist must remember that the numerator (in this case, the number of wasabi "devil chestnuts") isn't all that matters. You've also got to pay attention to the denominator (in this case, the total number of chestnuts).

Lesson #2: We often make hidden assumptions (in probability as in life). You can't avoid making assumptions altogether—for example, without *any* assumptions, the student could never have chosen a bowl—but it's important to know when you're making them. The assumptions that torment us most are the ones we're unaware of.

CH. 2: QUESTIONS

1. Was the student wrong to reach for the third bowl? What would you have done?

2. More generally: What *should* a sensible person do in the student's place, and what does this tell us about how we should behave under uncertainty?

3. Give a way of dividing the 120 good chestnuts so that…
    a. The third bowl would be the best choice
    b. The second bowl would be the best choice
    c. All three bowls would be equally good choices

4. Hidden assumptions are always dangerous in math. But why are they *especially* dangerous in solving probability problems?