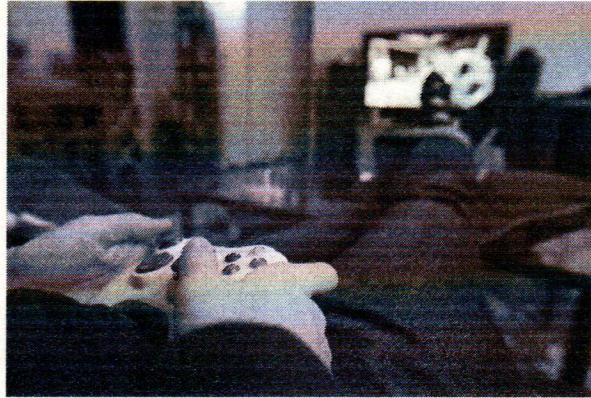# 9.7 Slacker's Simulation

A *Solidify Understanding Task*

I know a student who forgot about the
upcoming history test and did not study at all.
To protect his identity, I'll just call him Slacker.
When I reminded Slacker that we had a test in
the next class, he said that he wasn't worried

because the test has 10 true/false questions. Slacker said that he would totally guess on every
question, and since he's always lucky, he thinks he will get at least 8 out of 10. That's what he did
on the last quiz and it worked great.

I'm skeptical, but Slacker said, "Hey, sometimes you flip a coin and it seems like you just keep
getting heads. You may only have a 50/50 chance of getting heads, but you still might get heads
several times in a row. I think this is just about the same thing. I could get lucky."

1. What do you think of Slacker's claim? Is it possible for him to get 8 out of 10 questions
   right? Explain.

   Yes, although it gets less likely as there are more trials

I thought about it for a minute and said, "Slacker, I think you're on to something. I'm not sure that
you will get 80% on the test, but I agree that the situation is just like a coin flip. It's either one way
or the other and they are both equally likely if you're just guessing." My idea is to use a coin flip to
simulate the T/F test situation. We can try it many times and see how often we get 8 out of 10
questions right. I'm going to say that if the coin lands on heads, then you guessed the problem
correctly. If it lands on tails, then you got it wrong.

2. Try it a few times yourself. To save a little time, just flip 10 coins at once and count up the
   number of heads for each test.

	# Correct (Heads)	# Incorrect (Tails)	% Correct
Test 1	7	3	70%

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Test 2	3	7	30%
Test 3	3	7	30%
Test 4	6	4	60%
Test 5	5	5	50%

Did you get 8 out of 10 correct in any of your trials?

3. Based on your trials, do you think Slacker has a good chance of getting 80% correct?

It definitely happen once, unlikely to happen often.

4. Collect the data from the entire class and display it using technology. Now what do you think of Slacker's chances of getting 80% correct? Explain why.

Slim, but possible

5. What would you expect the graph to look like if you continued to collect samples? Why?

a normal distribution

6. Based upon your understanding of this distribution, what would you estimate the likelihood of Slacker getting 80% on the test without studying?

mean: 5

$$\frac{8-5}{1.581} = \frac{3}{1.581} = 1.90 \qquad 97.13\%$$

$S_x : 1.581$

< 5% chance

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