The Case of the Kilowatt Caper

The sign on the door says *No Case Too Big – No Case Too Small*.

You can find that door down a long, narrow hallway, three flights up, in a dusty old building tucked away on a side street in Nashville, Tennessee.

If you open that door, you'll find me, Jimmy Ruff, Private Detective.

The sign on the door means what it says. I've cracked cases for some of the largest corporations in Tennessee. I've also helped little Izzy Noblin find her missing goldfish…or at least what was left of Goldie after the cat was finished with her. I'm not going to tell you where I found the remains.

So, I wasn't surprised then when the door crashed open and a kid rushed in like his hair was on fire. Actually, his hair did look like it was on fire. It was bright red with orange spikes shooting out in every direction.

"You gotta help me!" he cried. "You're my last hope!"

"Don't worry, kid," I reassured him. "I'll track down the stylist responsible for destroying your hair. She'll do hard time for a crime like that."

"It's not my hair," he spluttered, "it's this!" He shovel passed a crumpled wad of paper in my direction.

I took the wad and uncrumpled it on my desk. "Mr. Reznick's Kilowatt Caper," I read. "This looks like some kind of homework assignment."

"This isn't regular homework, it's another one of Reznick's impossible special projects! First he made us write a 40 page paper comparing the cost of groceries between 'Bargain Mart' and the 'La Dee Dah High End Food Emporium.' Next he made us spend three months filling out tax forms using the wages from the imaginary careers he gave us. I was a 'Whack-A- Mole' repairman. And now, this!"

"It's the old 'math is part of everyday life' trick," I said. "Let's take a look at what he's up to this time."

The assignment looked like your typical worksheet. It started out with some simple definitions, followed by a series of word problems.

"OK," I said to the kid, "let's start at the top. It says here that electricity is often measured in *watts*."

“What’s a watt?” he whined.

“A watt is what you get when you multiply the amps times the volts, “ I explained.

The kid gave me one of those deer in the headlights kind of stares.

“OK, OK,” I said, “I don’t think you have to worry about the amps and volts. A watt is simply a way to measure how much electricity is being used at any given time. Just like you might tell how fast a Brett Favre pass is by measuring it in miles per hour.”

“Why didn’t old Reznick say that in the first place?” the kid grumped.

I didn’t point out to him that the teacher had basically said the same thing on the top of the sheet. I did point out that Reznick said a *kilowatt* is equal to one thousand watts, and that a *kilowatt hour* was the total number of kilowatts that were used in one hour.

“Now remember this,” I said to the kid, “for the problems on the worksheet the electricity costs 10 cents per kilowatt hour. That’s important.”

“10 cents per kilowatt hour …10 cents per kilowatt hour,” the kid repeated. “Got it.”

The kid leaned over the desk and we read the first problem together: A washing machine uses 500 watts of power. If you wash clothes for one hour each day, how much will it cost to wash clothes for one week?

“Who washes clothes everyday?” the kid asked. “If my Ma doesn’t catch me, I wear the same clothes every day!”

“Yeah, I can tell,” I said, putting some distance between myself and the smelly youth. “Let’s see if I can talk you through the problem.”

“The first thing we have to do is find out how many kilowatts are being used. To do that we divide the number of watts, 500, by the number 1000.”

The kid did some quick figuring in his head. “500 watts divided by 1000…that equals .5 kilowatts,” he said smiling. Maybe this kid wasn’t so bad after all.

“You got it, kid. Now to figure out the kilowatt hours, you multiply the total number of hours times the number of kilowatts.”

“OK,” he said, “I can do that. I multiply the kilowatts, .5, times the hours. That would be .5 kilowatts times one hour.”

“Slow down,” I cautioned, “look again at how many hours we’re talking about here.”

He gave me a withering look. “It says right here one hour each day.” He jabbed his finger

at the worksheet. "Are you blind or something?!"

"One hour each day," I said, ignoring his rudeness, "but for how many days?"

He took another look at the problem, then grinned sheepishly. "One hour each day for an entire week. That would be seven days. I knew that. I was just testing you."

"Of course you were. Now do the math," I instructed.

"One hour a day for seven days," he said, "that's seven hours. We multiply seven hours by .5 kilowatts and we end up with 3.5 kilowatt hours."

"You're in the home stretch," I said. "Now how much does 3.5 kilowatt hours of electricity cost?"

"Well, one kilowatt hour costs 10 cents, so, if I multiply 3.5 times .10 that will tell me the total cost." This time he jotted down the numbers and worked the problem out on the back of the worksheet. "35 cents!" he proclaimed triumphantly. "The electricity would cost 35 cents!"

"That's it, hot shot! Now see if you can solve the rest of 'Mr. Reznick's Kilowatt Caper'."

How about you? Can you solve the rest of "Mr. Reznick's Kilowatt Caper?" Be sure to read the problems carefully to find all of the clues. It's fine to use a calculator or scratch paper if you want; some of the problems are pretty tricky. And watch out for Problem 4 – part of that problem will have to be solved backwards!

Good luck!