The Yo-Yo Mystery

Name(s): _____

Last night, the Yo-Yo Factory was broken into and robbed. Detectives investigating the break-in think that it was an "inside job." Their prime suspect has been working at the Yo-Yo Factory for six months.

The police want you to look at some data that could help solve the mystery. Before you look at the data, you need to know some of the facts of the case.

Information from the Police Report

The Yo-Yo Factory makes yo-yos. The plastic bodies of their yo-yos are made by a machine that can make about 147,600 yo-yo bodies each day. The machine runs 24 hours a day.

Yesterday evening, the last person to leave the Yo-Yo Factory was the manager. He left at 8:00 P.M. He was also the first person to arrive in the morning, at 6:00 A.M. When he got there, he discovered the front door had been forced open. He also found that the company's safe had been broken into. About $4,500 was missing.

Every two minutes, the yo-yo machine automatically records the number of yo-yo bodies it has made during the last two minutes. The number of yo-yos it makes every two minutes varies, but on average it makes about 210 yo-yos.

The front door was forced open during last night's break-in. When that happened, all the power went off just for a moment, and then it came back on. When the power goes out, even for a moment, the yo-yo machine slows down a little. It then keeps working at this slower speed until someone who knows how readjusts it. This means that for the rest of the night after the break-in, the machine was running at this slower speed, making fewer yo-yos on average than it normally does.

The police hope that by looking at the data from the yo-yo machine, you will be able to tell them when the break-in happened. What they most want to know is whether the break-in happened before 12:00 A.M. or after 3:00 A.M., because these are times when their suspect has no alibi.

The suspect told police that last night he went home right after work at 5:30 P.M., ate, and then slept for a while. He lives alone, so no one can back up his story. He was at a club with friends from 12:00 A.M. to 3:00 A.M. People at the club saw him there during those times. He says he was home alone sleeping from 3:30 A.M. to 7:00 A.M.

The police made this chart to show what they know so far:

| Time	Event at Factory	Suspect's Location
8:00 P.M.	Manager last to leave	?
9:00 P.M.		?
10:00 P.M.		?
11:00 P.M.		**?**
12:00 A.M.		Arrives at club
1:00 A.M.		At club
2:00 A.M.		At club
3:00 A.M.		Leaves club
4:00 A.M.		?
5:00 A.M.		?
6:00 A.M.	Manager discovers break-in	?

Plot and Investigate

Now you'll look at the data to see what they say.

1. Open the document **Yo-Yo Mystery.tp.** You'll see a stack of data cards like the one at right. The attribute names are described below the data cards. Read the descriptions so that you know what the attribute names mean. If you're uncertain, make a few simple graphs of the attributes to figure them out.

2. The data card at right shows the data for case 274.

    a. Explain what the value of 201 for *Number_YoYos* means.

    b. Explain what the value of "five" for *Hour* means.
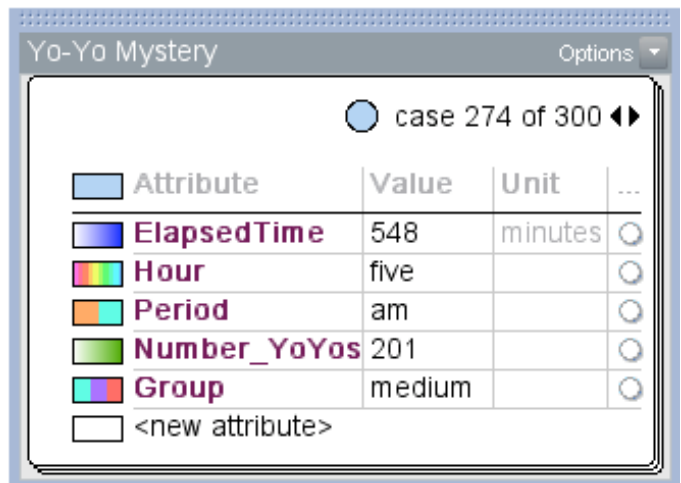
    c. Explain what the value of 548 for *ElapsedTime* means.

3.   Make a graph that helps you decide when the break-in probably happened. Include a copy of your graph with your assignment.

4.   Looking at the data, about when do you think the break-in happened? Explain how your graph backs up your conclusion.

5.   Based on your graph, could the suspect have committed the break-in? Explain.