Sources of Error Worksheet

Here you will have the chance to identify sources of error in given situations. First, let's make sure you understand the type of error you may encounter:

What type of error influences the accuracy of your measurements and can come from faulty calibration of an instrument? _____

What type of error influences the precision of your measurements and can be limited by taking repeated measurements? _____

OK, let's take a look at some scenarios. After each one, you will identify what the sources of error might have been. Remember: Sources of error are not mistakes made by the observer; rather they are possible sources of uncertainty.

Scenario 1:

A group is working on finding the mass of an unknown substance. They are using a digital balance. The first time they take the measurement the balance reads "2.5g." They try again and the balance reads "2.6g." They take one final reading and balance reads "2.5g." They find the mean mass by adding up the values and dividing by three (the number of measurements taken). Their final answer for the mass of the substance is 2.53g.

What are the possible sources of error for this measurement?

Scenario 2:

A group is trying to find the volume of a given liquid. To do this, they are using a graduated cylinder that is graduated by milliliters. They pour the substance into the graduated cylinder and take their reading. One group member says there are 25.5mL. Another group member says it's 25mL exactly and a third group member says they think it's 25.6mL.

What are the possible sources of error for this measurement?

Scenario 3:

A group is working on conducting a survey of their classmates to see if students prefer having lunch before noon, at noon, or after noon. They give their survey to five people. The results they find are that all five students prefer having lunch after noon. The group concludes that all students prefer having lunch after noon.

What are the sources of error in this study?

Scenario 4:

A group of students is working on tracking the growth of a plant over an entire month. Each day one member of the group needs to measure the height of the plant and record it in the group's log book. At the end of the month the groups looks at their data and notices that the numbers went up every day except one where the number went down, but then went up again the next day.

What are the sources of error for the tracking of the plant growth?