HPS Measurement Packet Questions 1 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per \_\_\_\_\_

OBJECTIVE: compare and contrast random errors and systematic errors, giving examples and how to prevent if possible.

BACKGROUND INFO: Science aims to come to a common understanding of the universe. Scientists suspend judgement until they have a good reason to believe a claim to be true or false - evidence! Evidence comes from observation and experimentation. Evidence is used to:

1. Develop **theories**: well-tested explanation of things or events based on observations & investigations (research). (can change)
2. Generalize data to form **laws**: statements about what happens in nature and that seems to be true all the time. (tell what happens, but doesn’t always explain why or how)
3. Propose **hypotheses**: explanatory statements (could be true or false) suggesting a relationship between 2 factors.

**Types of Errors:**

1. Draw or insert a picture illustrating the difference between accuracy and precision.

1. According to the packet, are measurements ever exact? Explain.
2. What are significant figures? Why are they important?
3. What determines the precision of a measurement?
4. Using a table, Venn Diagram, or other graphic organizer, compare and contrast random and systematic errors.
5. Complete the table outlining the three types of systematic errors:

|  |  |  |
| --- | --- | --- |
|  | What the error could be | How to avoid the error |
| Personal Error |  |  |
| Instrumental Error |  |  |
| Method Error |  |  |

1. Actively read the rest of the packet, paying specific attention to proper measurement technique, finding the uncertainty, and significant figures.