Chapter 1 Measuring Devices and Units

Student Edition, p. 36 Class Time: 50 minutes

Objective	Skills Focus
Students will develop an understanding and better appreciation for standardized units.	Measuring, graphing, drawing conclusions, summarizing

Materials (per group)	Safety
• yardstick • foot-long ruler with inch markings • various objects to measure	Students should follow the safety procedures outlined in Appendix D (pp. R72–R73) of the Student Edition.

Procedure

Teaching Tips

- For the analysis to be meaningful, it is important that students measure each item separately and then share data.
- When measuring using standardized units, both metric and non-metric units are fine. The key is that partners both use the same standard unit.
- The items listed in the data table are simply suggestions. You can alter this list as necessary. Try to include large and small items.

Expected Outcome

Sample data is shown on the following page.

For Enrichment

Have students create their own standard length and cut a dowel rod to this standard length. Have the groups use this as the new standard to measure one item and compare results.

Data Table				
Item	**Length measured by *you* using *your* standard unit of measure**	**Length measured by *your partner* using *your partner's* standard unit of measure**	**Length measured by *you* using a modern standardized ruler**	**Length measured by *your partner* using a modern standardized ruler**
Pencil	6.5 thumbs	7 thumbs	13 cm	13 cm
The room	8 spans	8.5 spans	7.1 m	7.2 m
Desk	2.2 feet	2.0 feet	58 cm	57.8 cm
Paperclip	1.4 thumbs	1.5 thumbs	2.0 cm	2.0 cm
Hallway	23 spans	24.5 spans	20.5 m	20.6 m
Height of Person	6.5 feet	6 feet	1.7 m	1.65 m

Analysis

1. This answer will depend on whether the student's foot (or shoe) is longer or shorter than a standard foot.

2. The two "inches" will likely be similar, but not exactly the same.

3. Students should choose to use yards or meters, because longer lengths (such as the length of a room) are more accurately measured using a longer standardized unit.

4. A paperclip might cause problems because it is smaller than the smallest standardized unit. (It can be difficult to accurately estimate partial units.) The length of a room or a hallway might be difficult to measure because it is so large. (Repeatedly laying the ruler end to end can result in error.)

5. Answers will vary depending on how similar the two students' personal standard units were.

6. Student measurements when using modern standardized units should be very similar.

Conclusions

1. Sample answer: It is important for scientists to maintain consistency in their data. Science should be reproducible, meaning that other scientists should get the same results I do. If each scientist used her own nonstandard units, there would be no easy way to compare results.