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Study Guide Physics Principles And Problems Answers

Chapter 1 continued

Section Review 1.2 Measurement pages 11-14

page 14

18. Accuracy: Your wooden ruler do not start with 0 at the edge, but have it so in a few millimeters. How could this improve the accuracy of the ruler?

As the edge of the ruler gets worn away over time, the first centimeter or two of the scale would also be worn away if the scale started at the edge.

19. Tools: You find a measurement that need to measure objects to the nearest 0.01 mm) that has been built here. How would it compare to a new, high-quality instrument in terms of its precision? Its accuracy? It would be more precise but less accurate.

20. Parallax: Does parallax affect the precision of a measurement that you make? Explain. No, it doesn't change the fineness of the divisions on its scale.

21. Error: Your friend tells you that his height is 182 cm. In your own words, explain the range of heights implied by this statement. His height would be between 181.5 and 182.5 cm. Precision of a measurement is one-half the smallest division on the instrument. The height 182 cm would range ± 0.5 cm.

22. Precision: A box has a length of 18.1 cm and a width of 19.2 cm, and is 20.3 cm tall.

- What is its volume?
 $7.05 \times 10^3 \text{ cm}^3$
- How precise is the measure of length? Of volume?
nearest tenth of a cm, nearest 10 cm^3
- How tall is a stack of 12 of these boxes?
243.6 cm

4. How precise is the measure of the height of one foot (31.12 inches)? nearest tenth of a cm; nearest tenth of a cm

23. Critical Thinking: Your friend states in a report that the average time required to circle a 1.0 km track was 61.6 s. This was measured by timing 7 laps using a clock with a precision of 0.1 s. How much confidence do you have in the results of the report? Explain.

A result can never be more precise than the least precise measurement. The calculated average lap time exceeds the precision possible with the clock.

Practice Problems 1.3 Graphing Data pages 14-19

page 18

24. The mass values of equal volumes of pure gold nuggets are given in Table 1.4.

Volume (cm^3)	Mass (g)
1.0	19.3
2.0	38.6
3.0	57.9
4.0	77.2
5.0	96.5

a. Plot mass versus volume from the values given in the table and draw the curve that best fits all points.

