
What's Your Benchmark?

ID: 12291

Time required
45 minutes

Activity Overview

*This activity introduces students to the importance of benchmarks when estimating measurements. Students will also use the **Convert** menu to change from one unit to another.*

Topic: Measurement

- *Apply appropriate techniques, tools, and formulas to determine measurements*
 - *Use common benchmarks to select appropriate methods for estimating measurements*
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Teacher Preparation and Notes

- *TI-Navigator is not required for this activity, but an extension is given for those teachers that would like to use it.*
- *The StudyCard application is used for the TI-Navigator extension. It should be loaded on the TI-73 calculator before beginning the extension. To download the app, go to education.ti.com.*
- ***To download the student worksheet and calculator file, go to education.ti.com/exchange and enter "12291" in the quick search box.***

Associated Materials

- *MGAct19_Benchmark_worksheet_TI73.doc*
- *BNCHMARK.73v*

Suggested Related Activities

To download the activity listed, go to education.ti.com/exchange and enter the number in the quick search box.

- *Measurement Benchmarks (TI-73 Explorer with TI-Navigator) — 6689*
- *Estimation and Precise Measurement (TI-73 Explorer) — 6246*
- *Geometry and Measurement (TI-73 Explorer) — 5197*

Problem 1 – Finding Benchmarks

Questions 1–10

Helping students find memorable benchmarks for standard measurements will help them determine reasonableness of answers and to make reasonable estimates of measurements. Students may find very individual items that they can remember.

Problem 2 – Calculator Measurements

As a part of finding benchmark measurements, having students compare benchmarks to a non-standard unit, a TI-73. Again, a goal of this set of questions is to help students with estimation using a benchmark.

Questions 11–14

Although students should estimate the number of TI-73s that are equal to a given length, you could also allow groups to line their calculators up and compare to a yardstick or tiles on the floor.

Students' estimation skills should be improving as they progress through the lesson. If students' estimations are considerably off, have them provide justification for their estimate. Communicating why they feel an estimate is appropriate may provide insight as to how they are over or under estimating a given length.

Question 15

After performing several estimates, students should begin to see the value of having a benchmark in their mind for making estimates. Emphasize that having a benchmark in mind can help in many situations, including testing situations. Students can use benchmarks to help determine if an answer selection is reasonable.

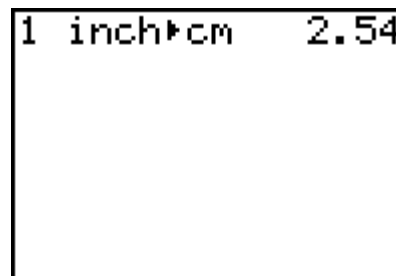
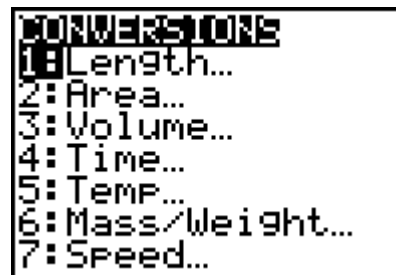
Problem 3 – Benchmark Challenge

Questions 16–20

Students should select at least one unit to compare with the first unit. This exercise will help students look at relative size of unit and compare them.

From a clear home screen, press the following for Question 16. **[1]** **[2nd]** **[UNIT]**, and **[1]** for Length, then **[4]** **[2]**, and **[ENTER]** to evaluate. This will convert 1 inch to centimeters. Each of the other conversions can be done in a similar manner.

You may want to encourage students to convert to several different units and discuss with a partner what they have learned. Being more familiar with the relative size of different units will only help with estimations.



Problem 4 – Using Your BenchmarksQuestions 21–25

In this question set, students should use the benchmarks they are identified in previous questions to assist in estimating. Add other measurements for students to estimate based on need.

Have two students walk a certain distance apart and then have a third student estimate the distance. Have students switch roles until everyone has had an opportunity to be the estimator.

Solutions – student worksheetProblem 1

1–10. Answers will vary. Make sure the benchmarks selected by students are reasonable.

Problem 2

11. 8 TI-73s long

12. 5 TI-73s long

13. 5 TI-73s long (about the same as a yard)

14. 2.5 TI-73s long

15. Answers will vary. Sample answer: Knowing a benchmark helps me visualize how many of those benchmarks make up the length of an unknown object.

Problem 3

16–20. objects will vary. Check students' answers for reasonableness.

17. 0.394 inches

18. 0.26 gallons

19. 0.45 kilogram

20. 3.28 feet

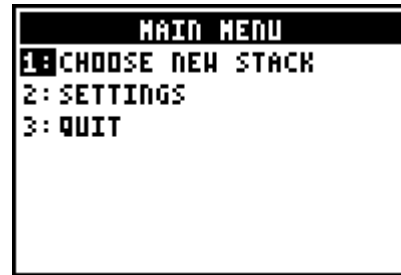
21–24. Answers will vary.

25. Sample answer: Knowing a benchmark helps me visualize how many of those benchmarks make up the length of an unknown object.

Extension – TI-Navigator™

1. Send the **BNCHMARK.73v** StudyCard™ stack to students for practice. This is a self-check stack that provides additional examples of benchmarks for measurements.

They need to start the **StudyCrd** app and then select BNCHMARK from the Choose New Stack menu.



2. When students are asked to perform an approximation, have them enter their value (in the stated unit) on a blank home screen. Then use **Screen Capture** to gather their estimates. Have students discuss any values that are well above or below the average response.
3. Once students have discussed benchmarks for various measurements, use **Quick Poll** (with Open Response) to ask several questions such as:
 - Estimate the height of the flagpole in front of the school knowing that a school bus is about 36 feet long.
 - Estimate the height of the school knowing that each floor is about 10 feet in height.
 - Estimate the width of your desk knowing that a standard piece of paper is 11 inches long.

Remember to start and stop the poll before and after each question. The question format can also be changed to give students ranges to choose from. (under 50 ft, 50 ft to 75 ft, or over 75 ft)