What's the Unit of Choice?

ID: 12290

Time required
45 minutes

Activity Overview

*This activity provides students with an opportunity to determine the most appropriate units for a given situation. They will also use the **Convert** menu to change from one unit to another.*

Topic: Measurement

- *Understand measurable attributes of objects and the units, systems, and processes of measurement*
- *Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume*

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.*
- *Students should already be familiar with both customary and metric measurements for weight, capacity, and length.*
- ***To download the student worksheet and TI-Navigator files, go to education.ti.com/exchange and enter "12290" in the quick search box.***

Associated Materials

- *MGAct20_Units_worksheet_TI73.doc*
- *MGAct20_Nav_TI73.act*
- *MGAct20_LrnChk_TI73.edc*

Suggested Related Activities

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

- *Bingo! (TI-73 Explorer with TI-Navigator) — 6688*
- *Comparing Units of Measure (TI-73 Explorer with TI-Navigator) — 9395*
- *Units and Conversions (TI-84 Plus family) — 1462*

Problem 1 – Choosing the Unit

In the first set of questions, students are to select the most appropriate unit for the indicated measurement. In many cases, students may be familiar with a customary unit and may have trouble selecting an appropriate metric unit.

Questions 1-9

Students can be paired to discuss the most appropriate units for each given situation. The discussion and reasoning will likely help students remember the relative size of units better.

If more practice is needed, enter a number on the overhead calculator and then give the students the situation. They should respond with the unit to label the number for the given situation.

You can also call students to the front of the class and have them give a number and situation for the class to solve.

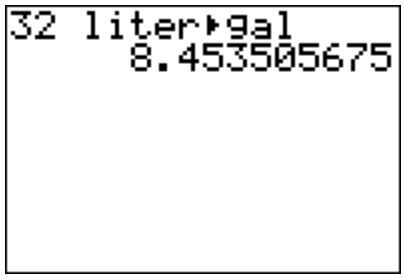
Questions 10-11

Some students will find two units to be appropriate measures for some situations. Help students understand that using a unit that is either (a) most commonly used for that measurement or (b) that makes the number a reasonable size.

Problem 2 – Changing the Unit

In the second set of problems, the purpose is to select a more appropriate unit and to convert the given unit to the new unit. This includes changing from metric to customary or increasing the unit size.

Questions 12-18



Students can use the **Convert** menu (2nd UNIT) to change between units. For Question 12, press the following to convert liters to gallons. From the home screen, press CLEAR 3 2 2nd UNIT then 3 to choose Volume, 1 to select liters, 2 to select gallons, and press ENTER to evaluate.

Questions 19-20

Again, discussion to help students understand why selecting the most appropriate unit is necessary (and helpful) is appropriate here. Students should see that if an inappropriate unit is selected, numbers become very small or very large and are less manageable to work with. Students should also see that there are appropriate units for all measures in both metric and customary. The unit selected may depend on the situation (i.e. discussion in a different country or scientific discussion might be more likely to use metric).

Solutions – student worksheet

Problem 1

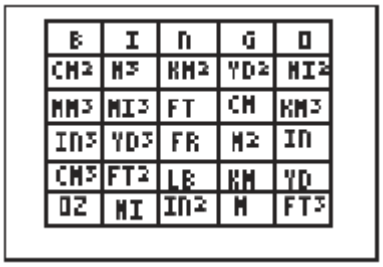
1. mm^3
2. mi
3. cm
4. oz
5. km
6. yd
7. ft^2
8. yd^3
9. cm^2
10. Answers will vary. Sample answers include: oz or lb could be appropriate for Question 4; mm or cm could be appropriate for Question 3.
11. mi

Problem 2

12. 8.45 gallons
13. 5 miles
14. 8.45 oz
15. 4.69 gallons
16. 8.25 km^2
17. 35 m
18. 180 ft
19. Sample answer: Kilometers are a reasonable measure of larger distances. If meters were used, the number would be much larger and less manageable.
20. One criterion would be if the number is very large or very small, then a different unit may be needed. Other answers could include if the unit is a "typical" unit for the given measurement. For example, cm^3 is less "typical" than oz or L for measuring volume.

Extension – TI-Navigator™

1. Load the ***MGAct20_Nav_TI73.act*** activity settings file into Activity Center. The diagram displayed in Activity Center will match the sketch shown at the right.



Start the activity and instruct students to press **1:Activity Center**. Students will see the image shown above on their calculator screen.

You will ask 10 questions of students in which Bingo is obtained on the tenth question. Students are expected to mark their answer to each question by referencing the diagram on their calculator. You should mark the answer as well, which will serve as the answer key (teacher marks appear in green) at the conclusion of the activity.

Ask questions that will require students to select a most appropriate unit of measure. For example, you may ask:

- What is the best unit of measure to use when measuring the amount of medicine in a capsule? (mm3)
- What is a customary measurement unit that can be used to determine the distance between New York City and Los Angeles? (mi)

The units given are abbreviations with the following meanings (Note: some are given as square units or cube units):

IN → inch	FT → foot	YD → yard
MI → mile	CM → centimeter	M → meter
KM → kilometer	LB → pound	OZ →ounce

After the tenth question, have students select **SEND** to mark their points in the Activity Center window. The answer should be evident in Activity Center because of the green teacher marks as well as a large cluster of answers from the student responses. You can also click the **List-Graph** tab, sort by student names, and scroll through the points to see who won. This activity can be repeated several times, using different questions each time.

3. Use the ***MGAct20_LrnChk_TI73.edc*** file to assess students understanding of units and selecting appropriate units for specific circumstances. You can change the file to a self-check if you would like. Otherwise, you can retrieve student answers and then have a class discussion regarding the questions missed most often by students. This may help determine if there is a trend such as students having more difficulty with metric units or capacity.

Problem 1 – Choosing the Unit

In this problem set, you will select the most appropriate unit for the measurement given. If more than one unit could be appropriate, choose the *best* choice from the list.

mm	mm^2	
mm^3	km	
$in.^3$	in.	
m^3	yd	
mi	m	
oz	lb	
ft^2	$in.^2$	
cm^2	cm^3	
yd^3	cm	
yd^2	ft^3	

1. What is the best unit to measure the medicine in a capsule?

_____

2. What is the customary unit for measuring the distance between New York and Dallas?

_____

3. What is the metric unit for measuring the length of a paper clip?

_____

4. What is the unit for measuring the weight of a serving of fish?

_____

5. What is the metric unit for measuring the distance a marathon runner runs during practice?

_____

6. What is the customary unit for measuring the distance a player throws a football?

_____

7. What is the customary unit for measuring the area of wall that needs to be painted?

_____

8. What is the customary unit for measuring the volume of sand a dump truck carries?

_____

9. What is the metric unit for measuring the surface area of a small birthday present?

_____

10. Could more than one unit be appropriate for Questions 1-9? If so, given an example and explain why. _____

_____

_____

_____

11. If Question 5 did not specify metric unit, what other unit would be appropriate?

_____

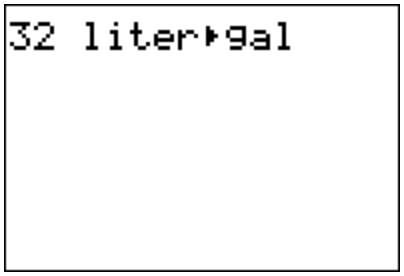
Problem 2 – Changing the Unit

In Questions 12 – 18, convert each given unit to a more appropriate unit. Use the **Convert** menu if needed.

12. Your cousin in England says she used 32 liters of gas to go to work last week. You tell this to a friend at school.

Answer: _____

From a clear Home screen, press 32 [2nd] [UNIT], then choose [3] for volume, [1] to choose liters, [2] to choose gallons, then [ENTER].



13. Ron said he jogged 26,400 ft last Saturday.

Answer: _____

14. Angie's doctor told her to drink 250 cm^3 of milk three times a day.

Answer: _____

15. The label on a package reads "Mix with 600 oz of warm water."

Answer: _____

16. Your grandpa describes the size of a fishing pond as 8,250,000 m^2.

Answer: _____

17. Jodi says the distance between her house and your house is 0.035 km.

Answer: _____

18. The carpenter described the fence around the yard as 2,160 inches.

Answer: _____

19. Why is using kilometers to discuss distance between cities better than meters?

_____

_____

20. Name one criterion you might use for deciding if a different unit should be use for a given measurement?

_____

_____