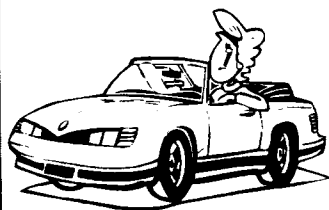




NOW, THAT'S FAST



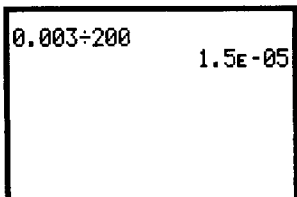
What measuring device would you use to accurately measure 0.1 of a mile?

You will be using the **distance formula** throughout this activity. It states:

$$\text{Distance} = \text{rate} \times \text{time}$$

Exponential Notation on the CFX-9850G

Divide 0.003 by 200. The result is shown below:



1.5E-05 represents 1.5×10^{-5} , which is equivalent to 0.000015.

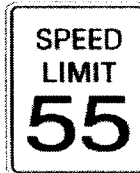
Using Ans to Access a Previous Answer

In the RUN Menu
Press SHIFT key
X² key
16
EXE key
SHIFT key
X² key
SHIFT key
(-) key (Ans)
EXE key

Standards: Problem Solving, Communication, Reasoning, Connections, Algebra, and Functions

Materials: CFX-9850G or CFX-9850Ga PLUS and a stop watch

Calculator Menus: RUN and LIST



Ray Evernham is Crew Chief for Jeff Gordon's Number 24 NASCAR stock car. Late in 1997, Jeff was penalized for speeding while on pit road. In a radio communication, Ray said he wondered how the officials could tell that Jeff was speeding.

NASCAR racing used to be a southern, rather localized sport. It has turned into a national sport that is big business. Jeff Gordon became only the second driver to earn \$1,000,000 for winning 3 of 4 predetermined races. The NASCAR teams use technology extensively. This is shown by the many notebook computers visible in the pits, sophisticated weather tracking systems in some of the car haulers, and the many websites for the sport and drivers.

You can model this principle by establishing a speed trap of your own to check for speeders. Select a straight section of road where people are assumed to speed often. Measure 0.1 of a mile. Other distances could be used but this is convenient and allows enough time to assure fairly accurate timing. Some methods for measuring 0.1 of a mile will be more accurate than others.

Describe the method you used for measuring your 0.1 of a mile. **A.**

You can use the distance formula, $d = rt$, to compute the time required for a car to pass through a distance at the legal rate. Suppose the speed limit for the 0.1 of a

mile that you measured is 45 mph. Solving for t , you get $t = \frac{0.1}{45} = 2.2(10)^{-3}$ hours.

The hours can be converted to seconds by multiplying by 3600 which yields that the car traveling at the legal limit should take 8 seconds to cover 0.1 of a mile.

Suppose a car takes 9 seconds to travel 0.1 of a mile in a 45 mph speed zone. Is the driver speeding? **B.** _____

Suppose a car takes 6.5 seconds to travel 0.1 of a mile in a 45 mph speed zone. Is the driver speeding? **C.** _____

How fast is this driver going in the vehicle takes six and a half second to go 0.1 of a mile? **D.** _____

Now, THAT's FAST

Entering Data in a List

In the STAT Menu
Place the cursor in row 1
column 1 of List 1.
Enter the desired value
Press EXE key
Repeat process.

Deleting a List

In the STAT Menu
Place the cursor List to
delete.
Press F6 (▷)
F4 (DEL-A)
F1 (YES)

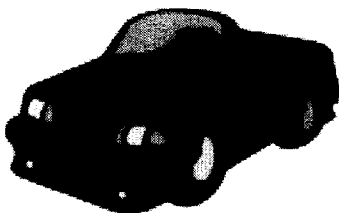
Using an Expression to Fill a List

Highlight the top of List 2
as shown below.

	List 1	List 2	List 3	List 4
1	12			
2	18			
3	19			
4	17			
5	14			

With data in List 1,

Press: 0.1
÷
(
OPTN
F1 (LIST)
F1 (List)
1
÷
3600
)
EXE



EXPERIMENT

Record times for 20 vehicles going through your speed trap. Enter the time required for each car to go through the trap in List 1 in the LIST Menu. The LIST Menu will allow you to use an expression to compute the rate (speed) for each time you entered. Be sure to move the cursor so List 2 is highlighted as shown in Figure 1.

	List 1	List 2	List 3	List 4
1	12			
2	18			
3	19			
4	17			
5	14			

Figure 1

$$0.1 \div (\text{List1} \div 3600)$$

Figure 2

To convert the vehicle times to mph, press the OPTN key followed by

$$0.1 \div (\text{F1} \text{ F1} \text{ 1} \div 3600) \text{ EXE}$$

The expression is shown in Figure 2. List 2 now shows the speed in mph generated by the times recorded in List 1.

How many vehicles were speeding when you obtained your times? **E.** _____

Is this a good place for a speed trap? Why or why not? **F.**

How much does a speeding ticket cost in your state? **G.**

You can check a speedometer by timing a vehicle through a measured distance. A mile is not a good distance because small errors have a huge impact. For example, your timing could be inaccurate or the mile marker might be slightly off placement. It is best to take longer distance and drive at a given rate (according to the speedometer - - cruise control is quite helpful). Runs of 10 miles or longer are good on an interstate highway because they generally have a marker at each mile. You will know the distance and time so you can compute the average speed.

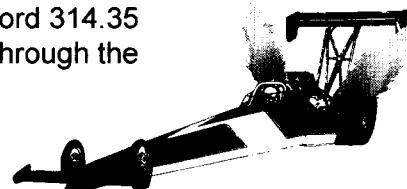
Is the speedometer in your vehicle accurate? How do you know? **H.**

There is a 66 foot speed trap at the end of a drag strip with an electronic timing light at each end.

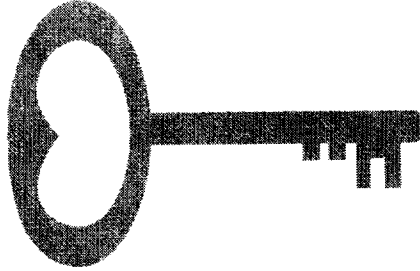
The following information was taken from www.nhra.com on 10/30/97. In September of 1997, Joe Amato set a world record for top fuel dragsters by traveling 318.24 mph at the end of a quarter mile drag race. Assuming the timing lights are 66 feet apart, how long did it take this top fuel dragster to go between them? **I.**

In October of 1997, John Force set a world record 314.35 in a funny car. How long did it take him to go through the 66 foot speed trap? **J.**

Now, THAT is fast!



Solution Key



Now That's Fast

A. Answers will vary.
D. 55.38461538 mph
J. 0.143152537 sec

B. No
E. - H. Answers will vary

C. Yes
I. 0.1414027149 sec