

# Decimal Hunt

## Introduction

Your job is to find a mystery number that is between 0 and 10 no more than one decimal place. You can ask the calculator “less than” questions or “greater than” questions like “Is the mystery number less than 2?” or “Is the number greater than 7?”

Turn on the HP 39gs and press the APLET key. Look for the aplet **DECIMAL HUNT** (you may have to scroll). See your teacher if you don't have the aplet. Once you have **DECIMAL HUNT**, highlight it and press the START menu key. Read the starting note and press the VIEWS key. Choose **Ask a question** and proceed from there. You may ask as many questions as you like but you only get one chance to guess the unknown. If you guess wrong, the calculator picks a new number so ask a lot of questions. You should ask enough questions so that your guess isn't really a guess at all.

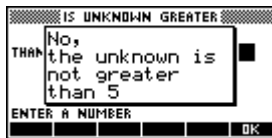
At any time you can choose **See plot**. This brings up a plot showing an interval that contains all of the numbers that the mystery number could be.

## Example:

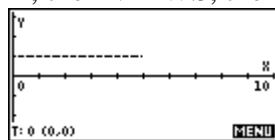
Choose **Ask a Question:**

Is the unknown greater than 5?

The answer:



Press OK, then VIEWS, then Choose **See plot:**



The dotted line is above all possible values of the mystery number *after* the question was answered.

Press VIEWS again to ask another question.

## Exercises

- 1) Continuing the example above, would “Is the unknown greater than 7?” be a good question to ask right now? Explain.

- 2) Play the game until you get the mystery number. How many questions did it take?
- 3) Play the game again but this time, be more systematic. Fill in the following table as you go.

What question did you ask?	What was the answer?

- 4) A *wasted question* is one whose answer doesn't give any new information. Which of the following questions was wasted?

What question did you ask?	What was the answer?
Greater than 5?	Yes
Greater than 7?	No
Less than 6?	No
Greater than 5.5?	Yes
Greater than 6.5?	No
Less than 6.3?	No
Greater than 6.2?	Yes
Less than 6.4?	Yes

- 5) What is the mystery number in exercise 4?
- 6) Play the game a few more times. Write down some hints or strategies that allow you to find the mystery number more easily or in fewer guesses.