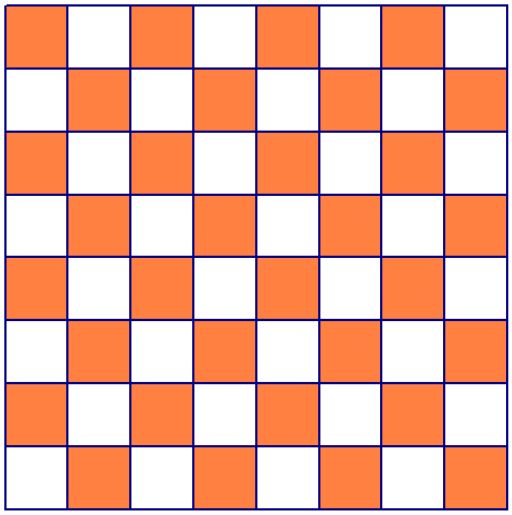
Number Relations

1. A chessboard consists of an area of 8 squares by 8 squares of alternating colours.



a) Pick a rectangular area of n squares by m squares. Choose integers greater than 0 and less than 9 for m and n.

b) How do the areas of the 2 colours in your rectangle compare?

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c) Is it possible to pick m and n such that the areas of the 2 colours in your rectangle are equal? Give 1 reason for your answer.

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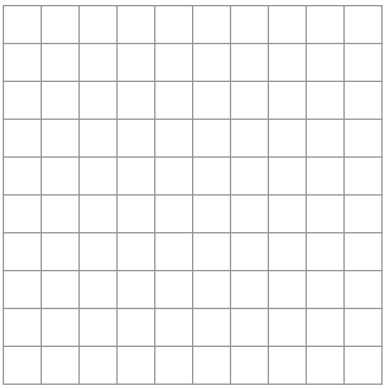
2. House numbers are groups of integers such as 67, 234, or 7293.

a) Consider the house numbers on 1 page of a telephone book. Suppose that you counted how many times each digit from 0 to 9 occurred and then drew a graph with the digits along the x-axis and the number of times each occurred along the y-axis. What would the graph look like? Make a sketch and give 1 reason why you chose the type of graph.



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For information about which type of graph to use for displaying data, follow the Web Links on the same page where you found this file on the *MathLinks 8 Adapted* Online Learning Centre.

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b) Choose a page of a telephone book at random.
- Record all the house numbers that occur on the page.
- Count how many times each digit occurred.
- Use grid paper and make a graph to show your results.

c) How does your graph compare to the sketch you made?

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3. Not everyone in the world tells time in the same way. People who speak Swahili measure time in a different way than you do. For example, 7 a.m. is considered 1 a.m. on a Swahili clock. Use the Internet or the library to investigate why this is so.

a) Where do most people who speak Swahili live? _____

b) Why would a Swahili clock be connected with the sunrise?
Use a map to explain your answer.

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c) Draw a picture of a Swahili clock showing the placement of the hours.

d) How can you convert the time on a standard clock to the time on a Swahili clock?
Explain why this works.

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For information about the Swahili clock, follow the Web Links on the same page where you found this file on the *MathLinks 8 Adapted* Online Learning Centre.

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4. Data are often estimated by taking a sample. This always introduces some error.

a) You need three 500 mL measuring cups, a bag of dried beans (use large beans), and a 25 mL measuring spoon. Pour
- 100 mL of beans into the first cup
- 250 mL into the second cup
- 500 mL into the third cup

b) Take a 100 mL sample from each of the cups in turn. Count how many beans are in the sample. Then, use the samples to estimate the number of beans in the cup.
Record your results in the table in part d).

c) Count the *actual* number of beans in each cup.
Record your results in the table in part d).

d) Use the table to organize your data. Compare the errors in each of the 3 cases as percents. Hint: Error ÷ actual number × 100.

Cup	Number of Beans in 100 mL Sample	Estimated Number of Beans in Sample	Actual Number of Beans	Error (Actual # of beans − # of beans in sample)	Percent Error (Error ÷ actual number × 100)
100 mL					
250 mL					
500 mL					

e) How does the percent error depend on the sample size?

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