

# Other Bases #1

NAME \_\_\_\_\_

DATE \_\_\_\_\_

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We have been studying place value in the base 10 system. We have 10 fingers and 10 toes. What if we had 8 fingers and 8 toes? We would probably count like this.

1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 20, ...

This is called the base 8 or octal number system. Write the next 20 numbers in octal (starting with 20).

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In base 10, the number 259 means:

$$(2 \times 100) + (5 \times 10) + (9 \times 1) = 259$$

To find the decimal equivalent of an octal number, you have to figure it out by adding and multiplying. For example,

$$34_8 = (3 \times 8) + (4 \times 1) = 28_{10} \text{ and}$$

$$456_8 = (4 \times 8 \times 8) + (5 \times 8) + (6 \times 1) = \underline{\hspace{2cm}}_{10}$$

Convert these octal numbers to decimal.

$$56_8 = \underline{\hspace{2cm}}$$

$$27_8 = \underline{\hspace{2cm}}$$

$$241_8 = \underline{\hspace{2cm}}$$

Note that you can also use unifix cubes. How?

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Draw the octal number 154 on the back. Show how you can find its decimal equivalent.