Intro to Binary

by *DonV*

INTRODUCTION

Most elementary-age children can find no reason to learn about the binary number system: It is not immediately relevant to their survival, and probably for most kids it is not inherently interesting. We adults know that there are at least two benefits in studying binary numbers: First, binary numbers aid in the appreciation of place value in the decimal number system; second, a knowledge of binary numbers is essential in the field of computer studies. So, there is a disconnect between what we adults feel is important and what children find interesting.

This is where the Turing Tumble (TT) comes in: Working with TT, first of all, is hands-on. It presents a novel alternative to pencil & paper learning. Second, there is the auditory and visual stimulation of hearing and seeing the balls drop and the effect that the components have upon those balls. TT is not essential to the study of binary numbers—it simply makes the endeavor interesting.

The present package is rather large for this endeavor, but I am not suggesting that a teacher use all of the worksheets or that a learner should complete every single item in a worksheet in order to make progress: If the objectives can be reached in fewer steps than what is provided, so much the better. But, as the cliché goes, “it's better to have and not need, than to need and not have.”

CONTENTS:

TARGET AUDIENCE: This module has been used successfully with 2nd through 5th graders, but the content is appropriate for anyone who wants an introduction to binary numbers.

PREREQUISITE: Successful completion of TT Puzzle Book challenges 1 and 2.

GOAL: The learner will be able to convert the decimal numbers 0 through 15 to binary numbers and will be able to relate binary numbers 0000 through 1111 to the positions of the four bits in a TT register.

PROCEDURE: The Determinator, The Count, PT, all described individually.

DURATION: Estimated total duration for the module is two hours.

EVALUATION: Learner will accurately and independently complete one of the PT worksheets.

FOLLOW UP:

- TT Puzzle Book challenges 12 - 25
- Continuation in the binary number system.
- Exploration of base 5, base 16, etc.