



ARCHIE'S MATH RESOURCES LIST

FOR BINARY NUMBER SYSTEM EXHIBIT

● Manipulatives ● Activities ● Games ● Posters ● Worksheets ● Downloads & Freebies



THE BINARY SYSTEM

When we count & do everyday calculations, like adding & multiplying, we use the **Base 10 Number System: 1, 2, 3, 4...**

When computers count, calculate & process words, they use the **Binary Number System: 110101**

All digital technology such as mobile phones, computers & satellite communications use binary numbers. We now live in a digital world & the most important digits are **1 and 0**

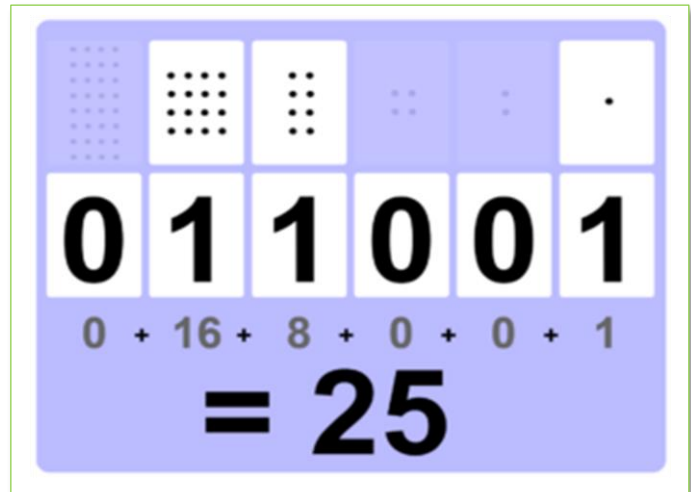
Decimal	Binary	Decimal	Binary
1	01	17	10001
2	10	18	10010
3	11	19	10011
4	100	20	10100
5	101	21	10101
6	110	22	10110
7	111	23	10111
8	1000	24	11000
9	1001	25	11001
10	1010	26	11010
11	1011	27	11011
12	1100	28	11100
13	1101	29	11101
14	1110	30	11110
15	1111	31	11111
16	10000		

DIGITAL BINARY MACHINE

Available at **MATHZONE – Mark Weddell Binary Counter**

<https://mathszone.co.uk/count-and-understand/binary-numbers-mw/>

This is the exact machine we use, except it has 6 places – while our machine has five places. This online machine converts base 10 numbers to binary numbers, up to 63. Students are able to count from 1 to 63, enter their age, or any other number. The screen shows the base 10 number for each binary number entered (25). The amazing thing about binary is you can count to 63 with just six switches! Enter the link shown above and it will take you directly to the online binary machine at the MATH ZONE website.

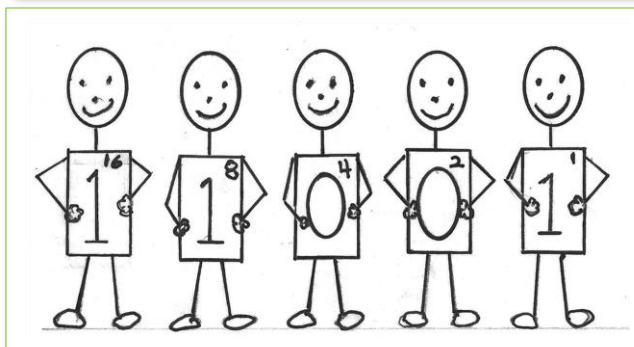
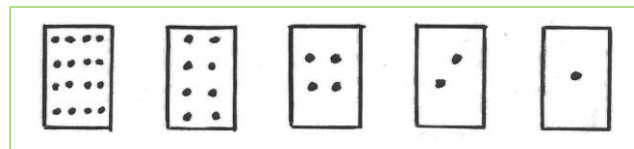


YOUR CLASS CAN BECOME A BINARY MACHINE

THIS IS A FUN, INSTRUCTIVE, AND INTERACTIVE LESSON AND CLASSROOM ACTIVITY TO TEACH YOUR CLASS ABOUT BINARY NUMBERS

STEP ONE - Make two set of cards as shown here. Hang binary dot cards on the wall behind where kids will be standing. The second set, two-sided binary cards, will be held by each team player during the game. We suggest using five places to keep it simple to start.

STEP TWO – After the kids are in place holding their cards, choose a number between 1 and 31..say 25, and have the class answer **yes** (1) or **no** (0) as you move from the student on the left thru to the student on the right.



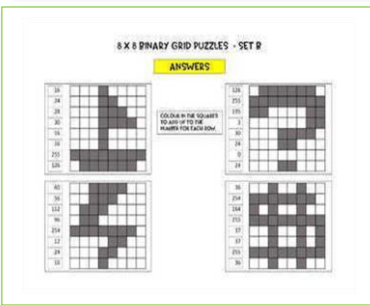
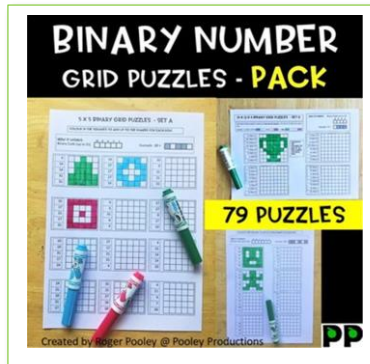
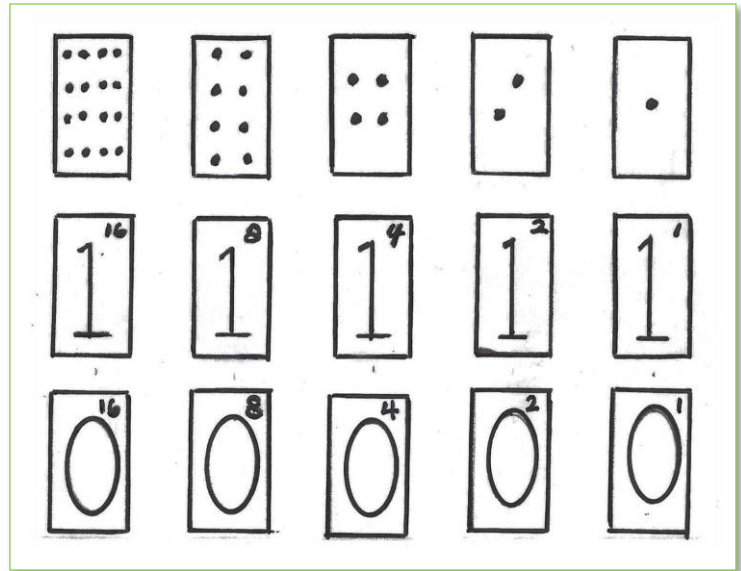
STEP THREE - The binary team students will flip their cards to indicate **yes** (1) or **no** (0). The class will determine if it is the correct number: 25. Have different students take turns being the binary team until all students have had their turn. When reading binary number, have students say: '1,1,0,0,1'.

See Side 2 of this resource sheet for directions for making the game cards!

Make Your Own

BINARY MACHINE GAME PLAYING CARDS!

Use these cards as your patterns for the cards that you will use to play the Binary Machine game. The cards shown at the top right, are the one-sided binary dot cards that you will place on the wall or blackboard. The cards shown in the middle and bottom rows of the illustration shown at right, are the fronts and backs of the binary cards that the student team players will hold. Make sure to include the little numbers shown in the top corner of each of these cards. Card stock will work best for this use and you can make them as large as you wish.



Binary Numbers Grid Puzzles WORKSHEETS

Available From
TEACHERS PAY TEACHERS

This resource is a collection of fun, hands-on worksheet activities to help your kids understand binary system. Understanding binary numbers is not only learning within the digital curriculum, they are also a core element of maths knowledge and learning about different counting systems.

WRITE YOUR NAME IN BINARY CODE

Available from Science Friday.com

Follow the link below to the Science Friday website to download this fun learning activity that will teach your students how to spell their name in Binary numbers!
www.sciencefriday.com/educational-resources/write-your-name-in-binary-code



RESOURCES/DOWNLOADS/FREEBIES

- www.teacherspayteachers.com A great resource for teaching aids for all math subjects at all grade levels. Their selection of worksheets and activities is second to none. Don't miss their **Binary Code Letters & Numbers digital & distance learning bundle!**
- www.mathzone.co.uk This is the website for the digital binary machine. Site also features other fun activities and binary number learning aids that will help kids understand the binary system.
- www.sciencefriday.com A good source for games and activities that help kids understand and practice using binary numbers.
- www.teachyourkidstocode.com Great information on coding and the value of teaching kids to code at an early age. Lots of games, and fun activities with binary numbers, and how kids can quickly turn their knowledge of binary numbers into building code!
- www.mathcurious.com Wide range of teaching aids and activities that will generate a better understanding of the Binary system for your students.
- www.instructables.com This website features some fun games for helping your students understand Binary numbers. Don't miss their version of Scrabble...**"Binary Number Scrabble...The Game"!!**
- www.learningresources.com Check out their blogs for ideas and activities relating to Binary numbers and coding.
- www.sciencekiddo.com Activities and teaching tips for helping kids learn about the Binary Number system.
- www.mathmaniacs.org Lesson plans, teaching tips and activities for teaching Binary numbers.
- www.mathartfun.com Fun resource for math games, activities, and more
- www.professorpuzzles.com This site has some of the best puzzles and math-related games and activities. Be sure to check out their **Brain Teaser Binary Challenge Puzzle Game...great fun!**



“BINARY” RESOURCE SHEET - Cost Information

SIDE #1:

<u>ITEM DESCRIPTION</u>	<u>Listed Internet Price</u>	<u>Source</u>
(1) Binary Number System (general information only – no product offered)	N/A	N/A
(2) Digital Binary Machine Online tool only - no product for sale	N/A	www.mathzone.co.uk
(3) Binary Machine Game D-I-Y Game Instructions only – no product for sale	N/A	N/A

SIDE #2:

(4) Binary Machine Cards D-I-Y instructions to create game pieces only – no product for sale	N/A	N/A
(5) Binary Numbers Grid Puzzle Worksheets	Free Digital Download	www.teacherspayteachers.com
(6) Write Your Name in Binary Code	Free Instant Download	www.sciencefriday.com

NOTE:

In researching manipulatives and learning aids for this Teachers Resource Program we selected items that dovetailed with the Archie’s Math exhibits that students and teachers would have experienced at an Archie’s Math event. We also kept in mind the cost outlay to teachers and schools. We found in our research that in many cases there were similar products to choose from, and in varying price ranges. To find additional options than those shown on the Research Sheet be sure to check the **“Resources/Downloads/Freebies”** section at the bottom of each resource sheet for more internet sites offering cost effective teacher aids, activities and worksheets on that subject.