



## Learning Binary using Scratch and Cisco Binary Game - September 23, 2015

### What is Binary?

A computer is only as smart as we make it, and we must instruct the computer what to do. Unfortunately, a computer does not speak English. In fact, the computer only speaks *Binary*. We must use binary to explain to the computer exactly what we want it to do.

Binary is “relating to, using, or expressed in a system of numerical notation that has 2 rather than 10 as a base.” Binary is numerical system of base two, therefore, when counting in binary you only use zeros and ones. For example, the number three is represented by 11, said “one”. Binary system is used because a computer is designed with millions of switches that are either on or off. A 1 turns a switch on and a 0 turns it off. In English, certain binary numbers correspond to letters, numbers, or common commands for the computer. For this challenge we will be learning the basics of counting in the binary number system.

### Let’s get started!

Choose the option that best fits your students. This activity is worth 8 points.

#### Novice – Scratch Binary Quiz

*Scratch* is an internet site that allows people to create their own online games and post them for others to play. Their main goal is to help young people learn to think creatively, and provide them the skills needed to thrive in the twenty-first century.

To Play:

- 1) Go to Scratch Binary Number Quiz or click on: <https://scratch.mit.edu/projects/723745/>
- 2) Read the directions and select your difficulty level.
- 3) To play, you will enter a number that you believe is represented by the binary number. The easy mode has the number of dots that each place value represents, the hard mode does not.

#### Intermediate and Advanced – Cisco Binary Game

Cisco Systems, Inc. is a multinational tech company. They specialize in designing, manufacturing and selling networking equipment. Their biggest consumers are fast growing multi-location organizations. Cisco allows companies to have multiple offices and stay connection and functioning at the highest level.

To play:

- 1) Go to Cisco Binary Number Game or click on [http://forums.cisco.com/CertCom/game/binary\\_game\\_page.htm](http://forums.cisco.com/CertCom/game/binary_game_page.htm)
- 2) Click “Instructions” to learn how to play
- 3) Click “Start Game” to begin.

### How to earn points:

- 1) If you haven’t registered your class, please go to [cs.montana.edu/looney-challenge](http://cs.montana.edu/looney-challenge) and click on the “Register for Looney Challenges” link.
- 2) Discuss with your class the difficulty of the activity. What did they learn? How difficult was the activity? Do they understand the concept?
- 3) Briefly, in a couple of sentences, describe in your email what happened during the activity? Did your students understand the concept(s)? Email your description to [looneychallenges@gmail.com](mailto:looneychallenges@gmail.com)

- 4) If you want to attach an example, photographs of students working, or video of student's outcomes, please send them as an attachment.
- 5) We will send you a confirmation and provide you your point total for the activity and your total points for Looney Challenges.

All Looney Challenges can be completed at any time during the 2015-2016 school year. All Challenges are due, June 30, 2015.

Questions? Please send an email to [looneychallenges@gmail.com](mailto:looneychallenges@gmail.com) or call Sharlyn Izurieta at (406) 994-4794.

Thank you for participating in Looney Challenges!