# Lesson Day 10: Binary Introduction

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| Overview *Introduce binary number system and how to count in binary. Students will learn how to convert between binary and decimal numbers in the context of topics that are important to computer science*Lesson Summary* *Journal Entry--* *How high can you count with your ten fingers?*
* *Students share journals with peers using number head strategy. Each student is given a color arrow for sharing in his or her journal entry. Each student shares their journal based on their color and their peers add to their journals based on the ideas shared by their peers.*
* *Khan Academy Binary Introduction Video*
* *CS Unplugged Activity 1: Count the Dots—Binary Numbers (counting in binary)*
* *Discussion of why binary numbers are important in computer science*
* *Binary Number Game—to practice counting using binary numbers students will count forward and backward using binary numbers, and convert decimal numbers into binary numbers*

CS Content *Students will learn to understand the importance of binary numbers in computer science. Students will learn to solve problems using the steps to problem solving.*  |  |  | Objectives**Students will be able to:*** Count forward and backward in binary
* Explain why binary numbers are important in computer science
* Use binary digits to encode and decode messages

Materials and Prep* Bell,Tim, Ian Witten, and Mike Fellows. Computer Science Unplugged. Canterbury, New Zealand: 2002.
* Computer Science Unplugged Activity 1: Count the Dots—Binary Numbers, pp. 3-­13
* Binary number cards for each student
* Large binary number cards for the demonstrations

Resources**Student Documents*** Counting Binary Chart
* Counting the Dots—Binary Numbers
* Sending Secret Message Chart

**Code Studio*** Concept Internet Wires Cables Wifi Video <http://videos.code.org/2015/csp/concept_internet_wires_cables_wifi.mp4>

**Video*** Binary Introduction <https://www.khanacademy.org/math/pre-algebra/applying-math-reasoning-topic/alternate-number-bases/v/number-systems-introduction>

**Assessments*** Binary Game—Level 2 <http://forums.cisco.com/CertCom/game/binary_game_page.htm>
* Sending Secret Message Chart

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