**COSMOS EDUCATIONAL TOOLKIT: Presentation of IP Address**

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| **Grade/ Grade Band**: 8-12 | **Topic**  Presentation of IP address | **Lesson #** \_\_\_\_\_ **in a series of** \_\_\_\_\_ **lessons** |
| **Brief Lesson Description**: Students will learn what the IP address is and discover the binary representation of IPv4 address. |
| **Specific Learning Outcomes:** Different representation of IP address |
| **Narrative / Background Information**  |
| **Prior Student Knowledge Required:** Evaluating exponents |
| **Problem Solving Practices (Ex: Standards for Mathematical Practice):** [CCSS.Math.Content.HSF.IF.C.9](http://www.corestandards.org/Math/Content/HSF/IF/C/9/)Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).  | **Main Content Ideas:** Different presentation of IP address | **Possible Multidisciplinary Concepts:** Computer Science: Purpose of IP addressMath: Conversion of decimal into binary code |
| **Possible Preconceptions/Misconceptions:** IP address are represented from 4-12 digits. |
| **LESSON PLAN – 5-E Model**  |
| [**ENGAGE: Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions:**](http://www.youtube.com/watch?v=PUB1GU_tvpI&safe=active) Why was the person told that he was wrong? Did Interviewer make a mistake? |
| **EXPLORE: Lesson Description – Materials Needed / Probing or Clarifying Questions:** Worksheets, COSMOS toolkits |
| **EXPLAIN: Concepts Explained and Vocabulary Defined:** **Key Vocabulary:** IP (Internet Protocol) address, Binary presentation |
| **ELABORATE: Applications and Extensions:**  |
| **EVALUATE:** **Formative Monitoring (Questioning / Discussion):** What would be the correct answer for the question above?Correct answer is 32 binary digits with correct explanation.**Summative Assessment (Quiz / Project / Report):** Students research and calculate how many more address can be added with IPv6 than IPv4. |
| **Elaborate Further / Reflect: Enrichment:** 1. IPv6 has how many binary bits to create a unique address?
2. What is the significance of having the IPv6 address?
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