**AP CSP CodeX**

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| **LESSON: Binary Numbers Applications** | | **Time: 45 minutes** |
| **Project Goal:** Students will determine the result of code segments.  **Learning Targets**   * I can convert binary numbers to decimal. * I can convert decimal numbers to binary. * I can determine the number of bits needed to store data. * I can apply binary numbers to real-world problems. | **Key Concepts**   * The AP CSP multiple choice exam will have questions that involve binary numbers. * Students will not have any manipulatives during the exam, but they should be familiar with the place values of binary and can make their own chart on scratch paper. | |
| **Assessment Opportunities**   * Binary Numbers Applications Activity Guide | **Success Criteria**   * Convert decimal and binary numbers * Apply binary numbers to real-world problems | |
| **AP CSP Framework**  **DAT-1.A** Explain how data can be represented using bits.  **DAT-1.C** Calculate the binary equivalent of a positive integer and vice versa. Compare and order binary numbers. | **Materials**   * Binary Numbers Applications slides * Binary Numbers Activity Guide / Answers * Unit 2 Review and Test Questions | |
| **Teacher Notes**   * This lesson is best with partners or in groups of three. * This lesson could be printed or presented digitally. * The practice problems are a great opportunity for student collaboration. Students can work in groups of two or three. You can print the problems and have students work on them randomly so they can discuss their thinking and check their answers with other groups. This can lead to a rich discussion on binary numbers and real-world problems. * The 10 application problems all come directly from AP Classroom as possible exam questions. Any problems that are part of official practice exams have been modified. | | |