**AP CSP CodeX**

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| **LESSON: Types of Division** | | **Time: 45 minutes** |
| **Project Goal:** Students will learn about different types of division, including integer (floor) division and modulo.  **Learning Targets**   * I can evaluate expressions that use decimal division, integer division and modulo division. * I can determine possible answers for modulo. * I can give applications for using modulo division. * I can use modulo division in a program. | **Key Concepts**   * Real number, or decimal, division gives a decimal answer. * Integer division is the whole number only of a division problem, or the number of times the divisor goes into the dividend. * Modulo division is the integer remainder of long division. | |
| **Assessment Opportunities**   * Types of Division Activity Guide * Billboard\_modulo program | **Success Criteria**   * Evaluate expressions with decimal, integer and modulo division * Determine possible answers for modulo division * Give applications for using modulo division * Use modulo division in a program | |
| **AP CSP Framework**  **AAP-1.B** Determine the value of a variable as a result of an assignment.  **AAP-2.C** Evaluate expressions that use arithmetic operators. | **Materials**   * Types of Division slides * Types of Division Activity Guide * Types of Division Activity Guide Answers * Teaching Guide and Problem Sets for Printing * Code solution for program   + Billboard\_modulo * Unit 3 Review and Test Questions * [Types of Division Kahoot Review](https://create.kahoot.it/share/types-of-division-review/7c4b9298-1bc7-4ca7-9c85-050933c2ef3b) (5 questions) | |
| **Teacher Notes**   * This lesson is best with partners or in groups of three. I recommend random groups and having students work at white boards for this activity. You can print the problems and have students work on them, which will enable them to discuss their thinking and check their answers with other groups. * Modulo division isn’t expressly used in the CodeX missions, but it is covered in the AP curriculum. This is a good time to pause on programming a mission and cover some AP material. Students will use this in Mission 9. * Go through the slides first. The set for printing includes step-by-step instructions for guiding this lesson as a whole-class with random groups of three. * The third part of the lesson has students modify a program in CodeSpace. Remember to use the sandbox, and have students rename the program. A code solution for the program is available. * After all four parts of the lesson, give the activity guide for students to complete as the wrap-up or check for understanding. * The activity guide can be printed or presented digitally. | | |