## **Measurement and Conversion with Distance Calculator**

## Using this projectdecorative

Students can identify rectangles in their school environment, such as classrooms, sidewalks or sports fields/courts, and use the BBC micro:bit to measure side lengths. They can use those measurements to practice using formulas to calculate the perimeter and area of rectangles.

Students can convert the measurements made with the micro:bit in a larger unit (feet or meters) to a smaller unit (inches or centimeters).

## Standards relevant to this project

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| **Relevant CA CCSS Math Standards** |
| **Measurement and Data: Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit**4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), . . .*4.MD.A.3 Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.* |

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| **CA CS Standards** |
| 3-5.AP.11 Create programs that use variables to store and modify data. (P5.2)  3-5.AP.12 Create programs that include events, loops, and conditionals. (P5.2)  3-5.CS.2 Demonstrate how computer hardware and software work together as a system to accomplish tasks. (P4.4)  3-5.CS.3 Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies. (P6.2)  3-5.AP.14 Create programs by incorporating smaller portions of existing programs, to develop something new or add more advanced features. (P4.2, P5.3)  3-5.AP.17 Test and debug a program or algorithm to ensure it accomplishes the intended task. (P6.2) |

## Find the right level for you and your class

Select the level of integration spice you’ll use:

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| **Mild**  🌶️  30 mins | **Learning outcome:** I can use the micro:bit distance calculator program to measure side lengths to calculate the perimeter and area of a rectangle. I can convert measurements to a smaller unit. |
| **Activity description:** Using existing code, walk the sides of a rectangle to measure their lengths in feet or meters. Calculate the rectangle’s perimeter and area using the measurements collected and convert to smaller units of measure (inches or centimeters). |
| **Medium** 🌶️🌶️  45 mins | **Learning outcome:** I can modify my own distance calculator program to measure side lengths to calculate the perimeter and area of a rectangle. I can convert measurements to a smaller unit. |
| **Activity description:** Modify the starter project to code your own distance calculator project to walk the sides of a rectangle to measure their lengths in feet or meters. Calculate the rectangle perimeter and area using the measurements collected and convert to smaller units of measure (inches or centimeters). |
| **Spicy** 🌶️🌶️🌶️  45-60 mins | **Learning outcome:** I can create my own distance calculator program to measure side lengths to calculate the perimeter and area of a rectangle. I can convert measurements to a smaller unit. |
| **Activity description:** Code your own distance calculator project to walk the sides of a rectangle to measure their lengths in feet or meters. Calculate the rectangle perimeter and area using the measurements collected and convert to smaller units of measure (inches or centimeters). |

## Let’s get started…Screenshot of Teacher Project Guide for this project

* Use our Teacher Project Guide to plan how to integrate this project into your teaching. The guide outlines the recommended steps for each level, including the relevant code links and helpful hints.
* Use the [Project Quick Reference Chart](https://mbit.io/us-quickreference) as a quick summary of the project, including the key standards covered mapped to integration level.