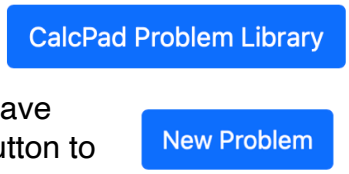
CalcPad – Writing a Problem

Task Tracker users of The Calculator Pad have access to an easy-to-use **Problem Builder** than can be used to write their own problems. Such problems can be added to modified problem sets or even form the basis of a user's own problem set.

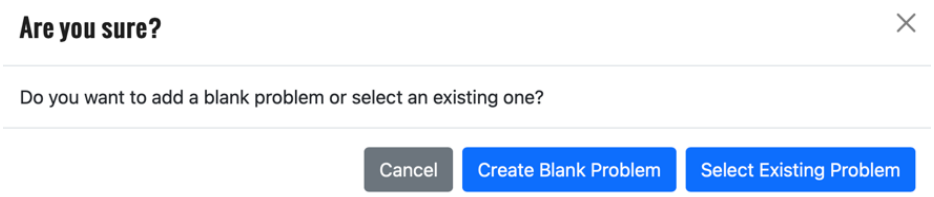
Accessing the Problem Builder

The **Problem Builder** can be accessed in one of two ways.

1. The **Problem Builder** can be accessed from the CalcPad Problem Library. The Problem Library is the holding place for all problems that you have created. You can navigate to the library by tapping on the **CalcPad Problem Library** button found on any Class page. Once there, you will find a searchable list of all problems you have written. Above the list is a **New Problem** button. Tap on this button to open the **Problem Builder**.



2. The **Problem Builder** can also be accessed when you add a problem to an existing problem set. Problems can be added by tapping on the **+** button (for add new problem) located across the header of any individual problem on a problem set. When tapped, you will be prompted with a choice - to create a blank problem (meaning a new problem) or to select an existing problem. If you tap **Create Blank Problem**, the **Problem Builder** will be opened and you can begin writing a new problem.

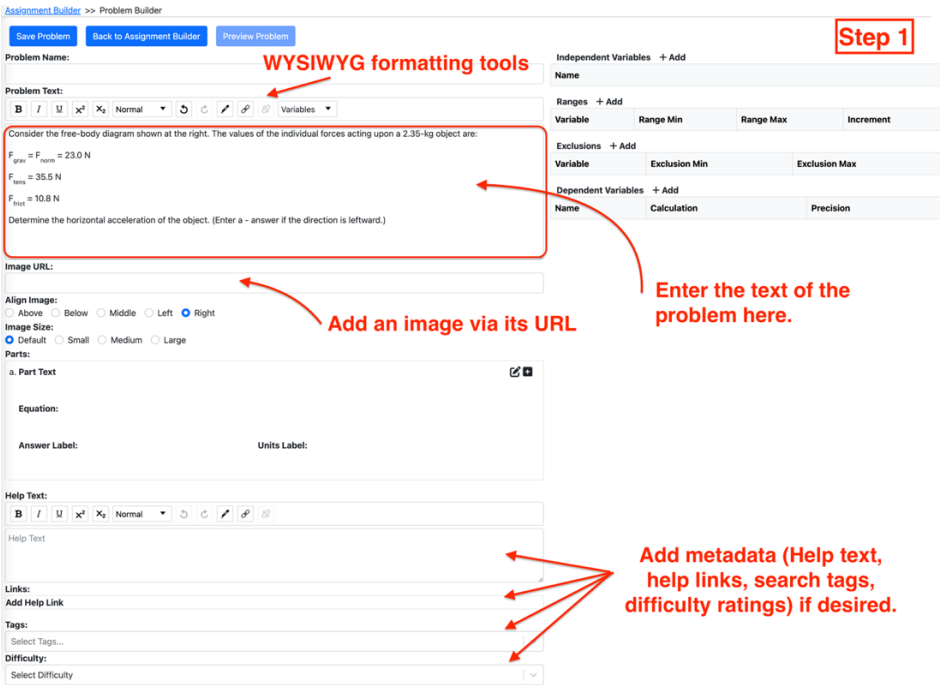


Writing a New Problem

Once the **Problem Builder** is open, you can begin to write your problem. Every problem has at least one part. Think of a part as being a question with an answer blank and an answer. Some problems are multi-part problems with several questions, answer blanks, and answers. The process of writing a problem (single part or multi-part) involves filling in a form for the problem and a form for each of the parts of the problem. Here's the steps.

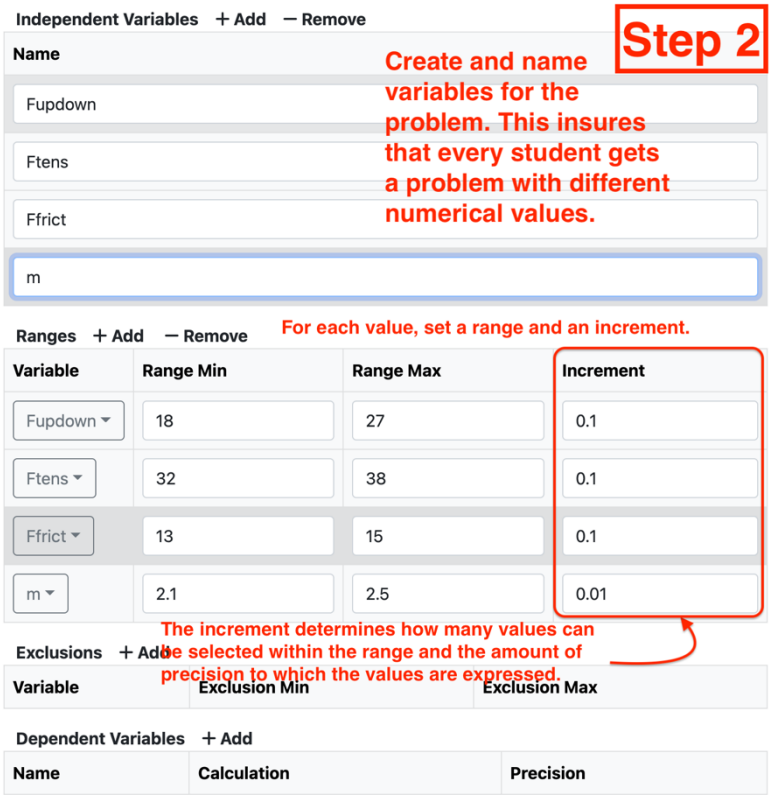
Step 1: Enter and format the text of the problem.

If the problem already exists in MS Word or a Google Doc, just copy and paste it into the **Problem Text** area. Otherwise type it into the **Problem Text** area yourself. We suggest entering the problem with actual numbers. Later you will create variables and replace the numbers with variable names. Use the WYSIWIG pallet to add formatting – bold-face, italics, color, subscripts or superscripts. You can even add a link to an external URL to include an image. There are several additional fields that you can use to provide a helpful hint (**Help Text**), links to online resources relevant to the problem, search terms (**Tags**) for finding the problem in your Library, and a **Difficulty** rating. See screenshot.



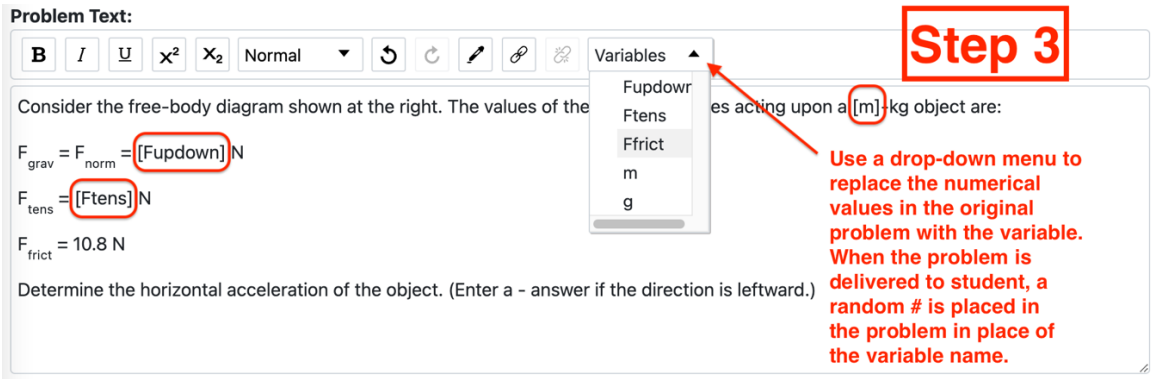
Step 2: Create and name variables.

Add variables using the **+ Add** button. Give the variable a meaningful name (one *word*). Set a range for each variable. Set an increment to identify the number of possible values within the range. For instance, a range from 1 to 9 with an increment of 1 will allow for 9 possible values for that variable. A range from 1 to 9 with an increment of 0.1 will allow for 90 possible values for that variable. The increment also determines the amount of precision in the numerical value. An increment of 0.1 means that the numerical value that is randomly selected will be expressed to the first decimal place. And an increment of 0.01 or even 0.10 means that the numerical value will be expressed to the second decimal place. **Dependent Variables** are calculated from **Independent Variables**. For instance, a variable named PE could be calculated from the variables [mass] and [height] using a formula of [mass]*9.8*[height]. The **Precision** represents the number of decimal places.



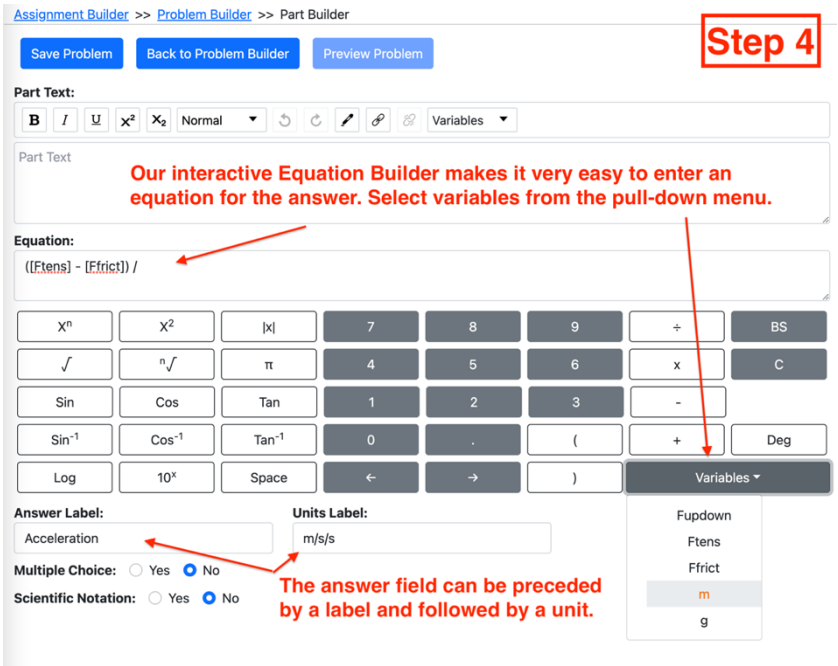
Step 3: Replace Numerical Values with Variables

Select the numerical values in the problem and replace them with a variable using the **Variables** drop-down menu. Once done, the numerical value is replaced with the variable's name enclosed in brackets. When the problem is delivered to students, a numerical value will be selected from within the range you have defined in **Step 2**. This means each student will have different numerical values. Not all numerical values need to be replaced by variable values; but we recommend at least one variable in order for different students to have different problems with different answers. Note that the variable **[g]** is present for every problem. **[g]** is the gravitational field constant and its value is set on your **Account** page in the **Profile Settings** area.



Step 4: Set Up the Part(s)

Problems will have at least one part with an answer blank preceded by an **Answer Label** and followed by a **Units Label**. An equation must be written that shows how the variables can be used to determine the answer. Observe the **Parts** section in the **Problem Builder**. It is initially empty; you will have to edit it. Tap the pencil button to open the **Parts Builder** and to edit the parts. Tap the **+** button to add additional parts. The **Equation** field holds the equation that Task Tracker uses to evaluate your students' answers. It must be expressed in terms of the variables used in the problem. Our interactive **Equation Builder** makes this a surprisingly easy task. You can type directly into the **Equation** field or tap on the buttons in the interactive **Equation Builder** displayed below the **Equation** field. You should also identify an **Answer Label** and a **Units Label**. These will display in



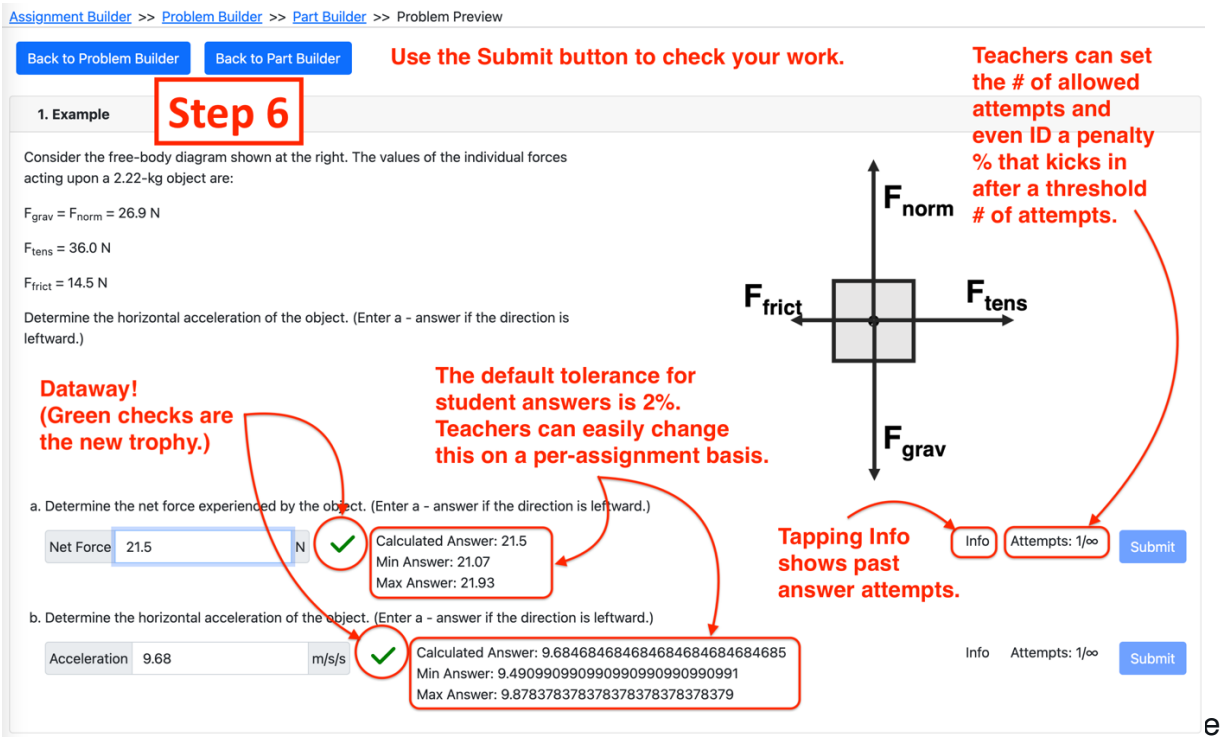
the students' view of the problem. Finally, you can enable the **Scientific Notation** option if you anticipate the answer being really large or really small. When you do, students have the option of using or not using the scientific notation field.

Step 5: Add Multiple Parts … If Desired

Multi-part problems are easy to make. You can add a part by tapping the **+** button in the **Problem Builder** or by tapping on the **Add Part** button across the top of the **Part Builder**. When a new part is added, you can add text for the part in the **Part Text** field (optional). You should also add an **Equation**, an **Answer Label**, and a **Units Label**.

Step 6: Save – Preview - Edit

We always recommend previewing and testing the problem. First tap the **Save Problem** button. Then tap on the **Preview Problem** button. Make sure its appearance and its answer(s) are just as intended. Be sure to check the answer using the **Submit** button. If adjustments need to b made, return to the **Problem Builder** or the **Part Builder** as needed to make your edits. Save and test again in the **Problem Previewer**.



Writing problems for your own students that include random numbers isn't rocket science. And it doesn't even involve the use of computer code. Our interactive Problem Builder makes the task easy as π.