What is a My Block?

The Common and Complete palettes in the NXT-G programming system contain all of the built-in blocks that you can use to create an NXT program. The NXT-G software also allows you to create your own blocks called "My Blocks". These blocks are blue in color and appear on the Custom palette in NXT-G. A My Block is a sequence of other blocks that is packaged up into a single block to make it easier to use in a program. Users of other programming languages might know this as a "subroutine", "subprogram", or "function".
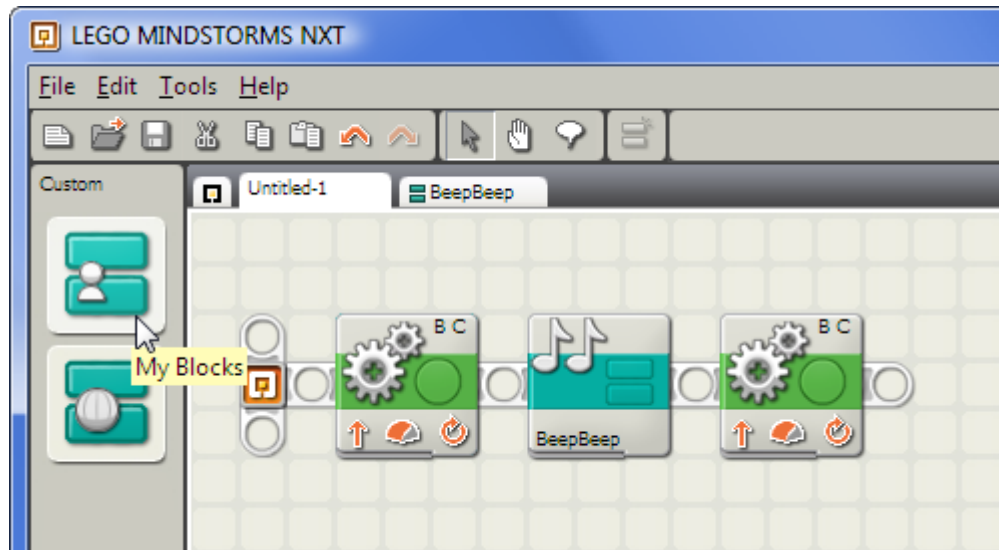

Figure 1: My Blocks are blue in color, and they appear in the Custom palette in NXT-G.

Why Use My Blocks?

The most common reason to use a My Block is that it allows you to easily re-use a sequence of blocks over and over again, without needing to re-create the sequence each time. Using a My Block, you only need to create the sequence once, and then you can use it as many times as you want in any of your programs by just inserting a single My Block for each use. Another advantage of using My Blocks is that the program sequence that makes up the My Block is only stored in the NXT's memory once for each program that uses it, even if the program uses the My Block several times, so My Blocks can be a good way to fit more programming into the NXT's limited memory. Finally, you might also use My Blocks simply to break up a long program into chunks to make it easier to work with, even if you don't plan to use a chunk more than once, because working with smaller programs is much easier in NXT-G.

Making your First My Block

For our first example My Block, we will create a block named **BeepBeep** that will sound two tones from the NXT speaker, and then we will use it in a program along with other blocks that make the robot move. This simple example will show the basic steps needed to create and use any My Block.

Creating a My Block

The first step to creating a My Block is to write a program that uses the desired sequence of blocks. Figure 2 shows a program made of up of five blocks that makes a robot move forward, sound two tones from the speaker, then move forward again. The three selected blocks in the middle are responsible for the two sound

tones (a **Wait** block is used to separate the tones into two distinct sounds). We will convert this sequence of three blocks into a My Block named **BeepBeep**, which will allow us to easily re-use this sequence.
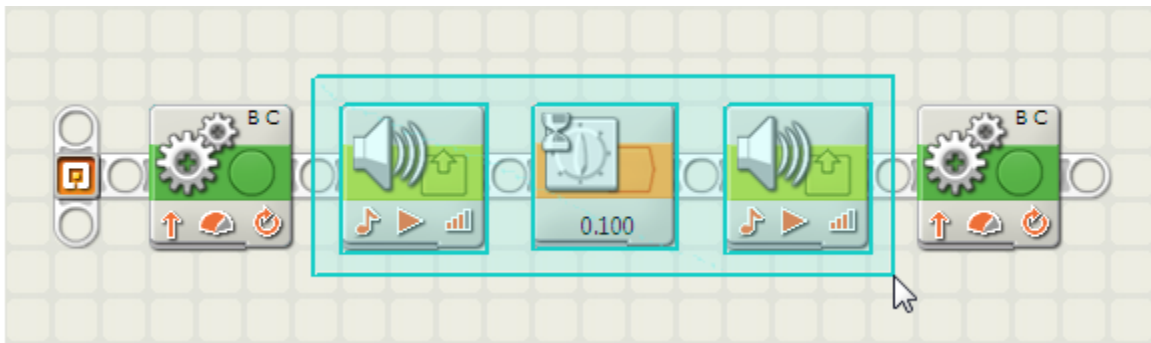

Figure 2: A sequence of blocks can be selected and converted into a My Block for easier re-use.

Once you have a working program that includes the behavior for your My Block, select the sequence of blocks that will make up the My Block by dragging a selection rectangle over them as shown in Figure 2. Each selected block should then show a blue selection outline. To make a My Block out of the selected blocks, click the Create My Block button on the toolbar, as shown in Figure 3, which will bring up the *My Block Builder* window, as shown in Figure 4.
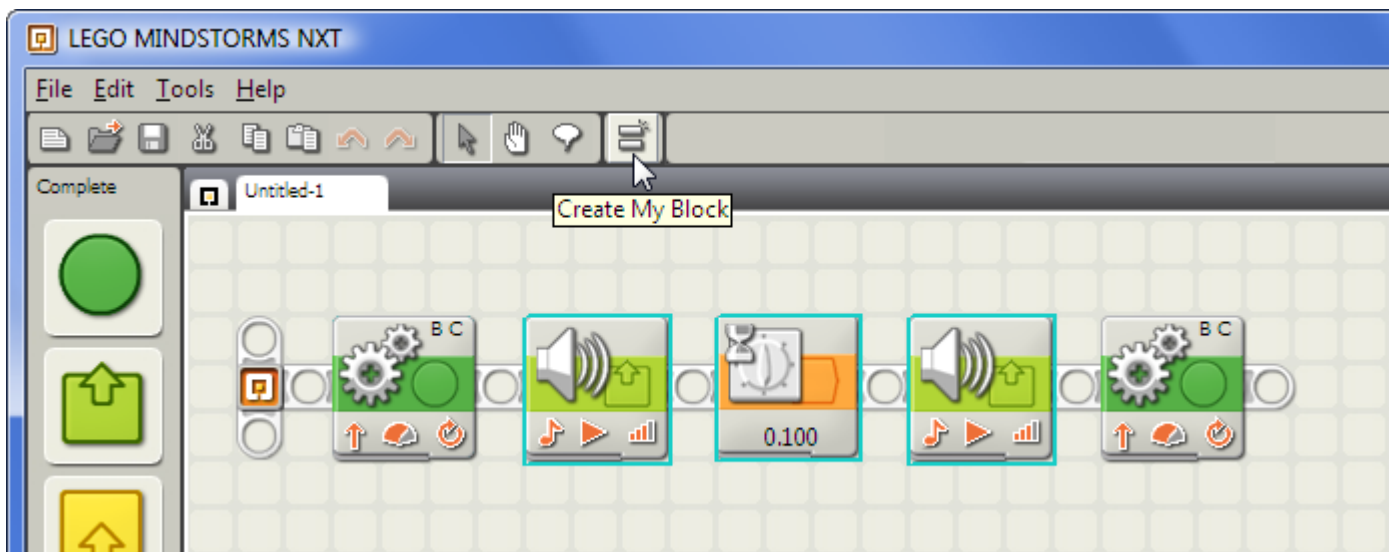

Figure 3: With a sequence of blocks selected, click the "Create My Block"
toolbar button to create a My Block

The *My Block Builder* consists of two steps. The first step shown in Figure 4 shows a preview of the My Block's contents in the *Selected Blocks* section. In this step you must enter a name for the My Block in the Block Name box (here **BeepBeep**). Choose a name for your block that is descriptive but short. Although longer names are accepted, they will be cut off when displayed on the block and thus harder to read in a program. You can also enter an optional description of the block in the *Block Description* box. This description will be printed along with the block diagram if you print the contents of your My Block using the *Print* command from

the *File* menu. You can also leave the description blank and just describe your block using the*Comment* tool inside the block contents.

Press the *Next* button to go on the second step of the My Block Builder, which will allow you to choose an icon to display on the face of your My Block. Pressing *Finish* after the first step will skip the icon choice and use a generic My Block face.
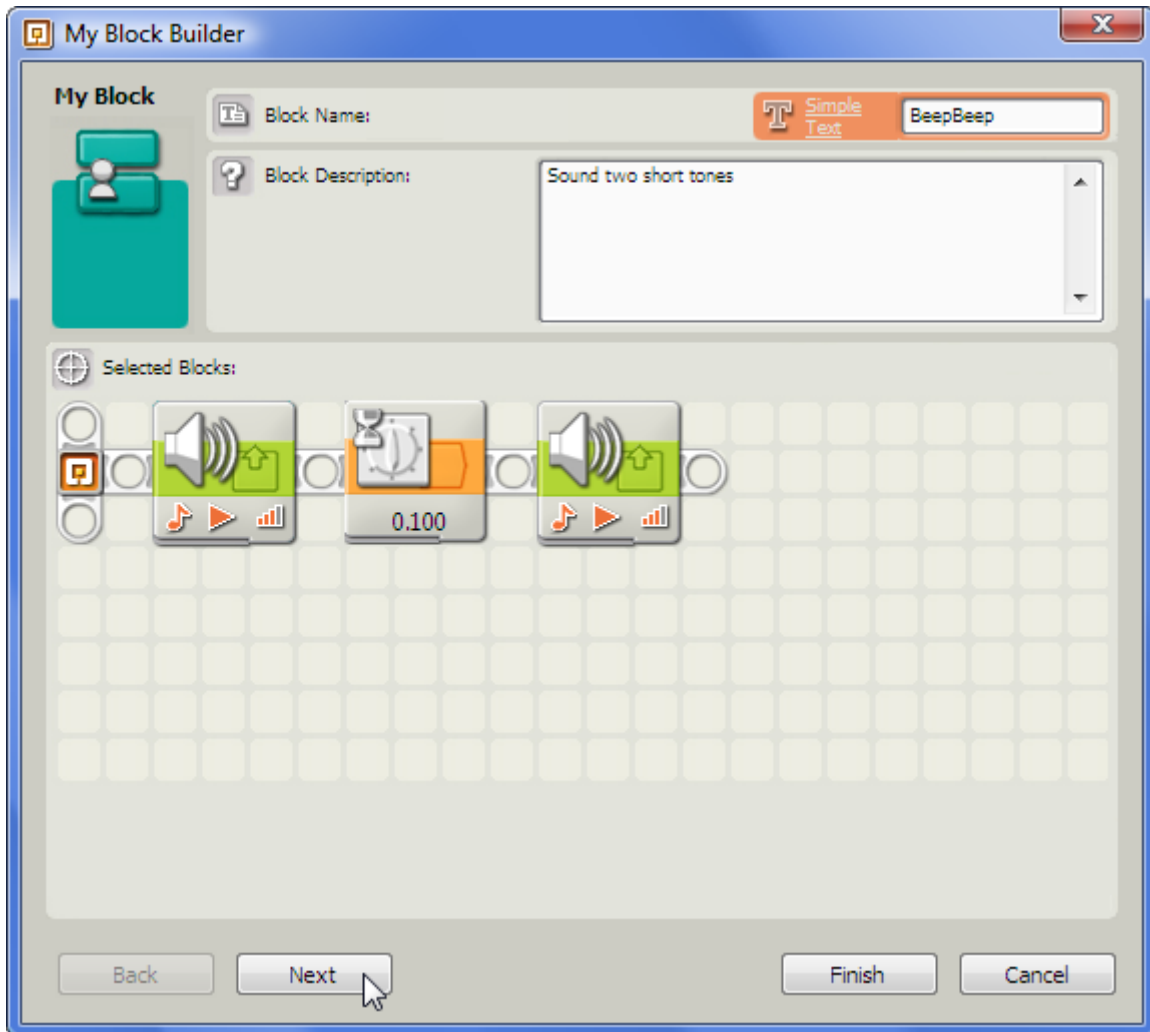

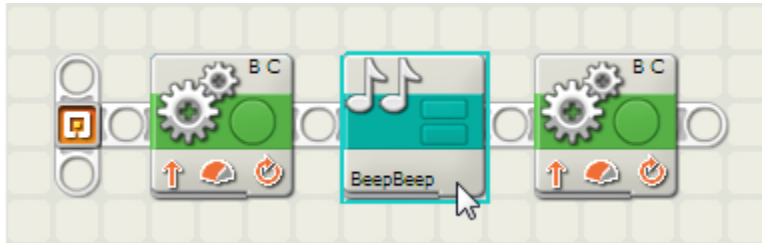*Figure 4: In the first step of the My Block Builder, enter a name and description for the My Block.*

The second step of the *My Block Builder* shown in Figure 5 allows you to choose an icon that will display on the face of your My Block. You can select an icon from the list shown and drag it to the white square on the top of the dialog. You can then position the icon on the face of the block by dragging it with the mouse or pressing the arrow keys on the keyboard. You can also resize the icon by dragging the black corners of the selection rectangle. If you want, you can select more than one icon from the list and overlay them as desired to create an image that is a combination of icons. In Figure 5, two copies of the musical note icon (the second icon in the list) are used to create an image that is suggestive of this block's function of sounding two tones.
Press *Finish* to complete the *My Block Builder* and create your My Block.
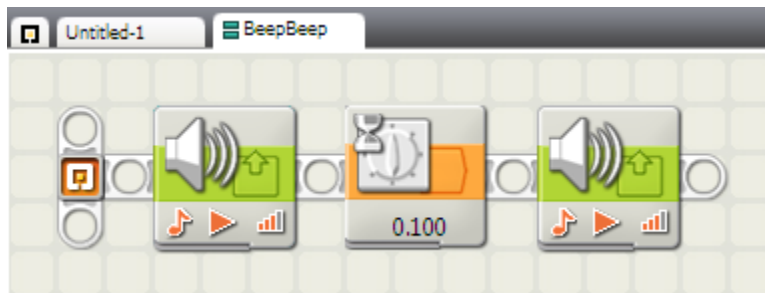
Figure 5: The Icon Builder step allows you to customize the icon for your My Block.

After creating our My Block, the modified program is shown in Figure 6. The three blocks that make up the **BeepBeep** block have been replaced by a single blue My Block displaying the name and image that we chose for the **BeepBeep** block. The program will still do the same thing as it did before (go forward, sound two tones, then go forward again), but now part of the program is contained inside the My Block.

Note: Sometimes after creating a My Block in a program, extra space in the white sequence beam will be left over where the original blocks were. To eliminate this extra space, you can shrink the sequence beam by placing your cursor in the location shown in Figure 6 and dragging to the left.

Viewing and Editing the Contents of a My Block

Once our **BeepBeep** block has been created, the blocks contained inside it have disappeared from view in the original program, as shown in Figure 7. To view the contents of a My Block or edit the blocks contained inside, you can double-click on the My Block, which will open the contents of the My Block as a new tab in the NXT-G program editor, as shown in Figure 8. This looks similar to having another NXT-G programs open, except that the **BeepBeep** tab is marked with two blue bars to indicate that the contents is a My Block instead of a normal program.

Figure 7: To view or edit the contents of a My Block in a program, double-click the My Block.

Figure 8: A My Block opened for viewing or editing will open as another NXT-G program in a new tab,
with the name of the My Block on it and two blue bars to signify that it is a My Block.

To change the contents of a My Block, simply edit the blocks in the contents tab as in a normal program. Any changes made to the contents will affect all uses of the My Block in all programs that use it, after those program(s) are re-compiled and re-downloaded to the NXT.

Note: After changing the contents of a My Block, any program that uses it must be re-downloaded to the NXT to incorporate the changes, otherwise the program will remain unchanged and use the original contents of the My Block. A common mistake after editing a My Block is to download the contents of the My Block itself to the NXT instead of the program that uses it (because you have that tab selected in the editor), which not affect any programs that use the block.

Inserting a My Block into a Program

After creating a My Block, NXT-G will automatically modify the original program to use the My Block in place of the original block sequence as shown in Figure 7 above. Now you can also re-use the My Block by inserting other uses of it in the same program or in other programs. To insert a new use of a My Block into a program, select the Custom Palette as shown in Figure 9. The top menu of blocks in the Custom Palette contains the My Blocks that you have created. Figure 10 shows the **BeepBeep** block along with seven other My Blocks that I have created. The blocks are ordered alphabetically by the block name in the menu. If you are using multiple NXT-G user profiles, each user profile will contain its own list of My Blocks that were created by that user profile.
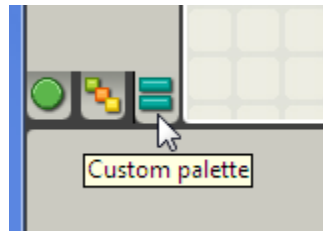

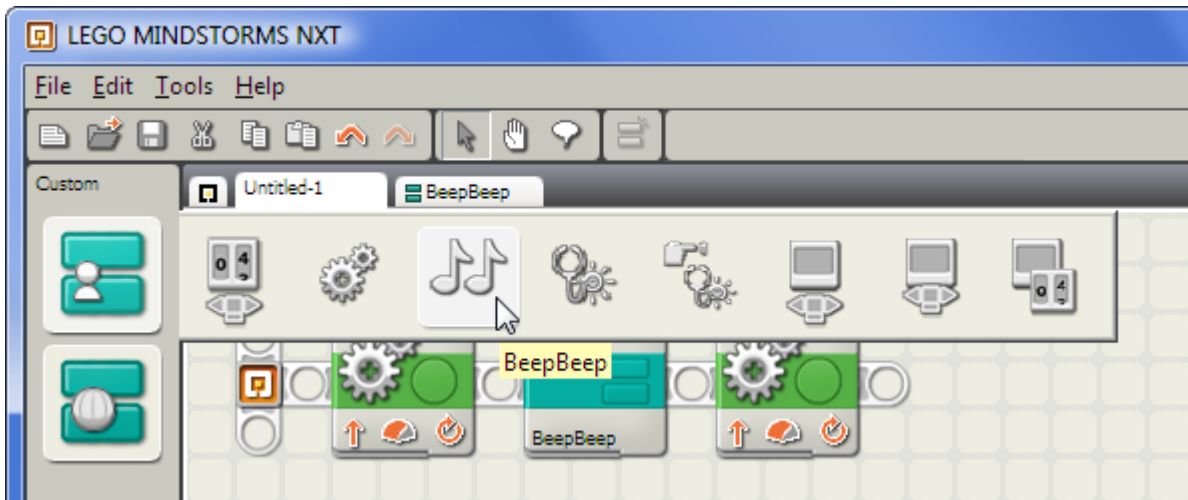*Figure 9: To insert a My Block into a program, select the Custom Palette.*

Figure 10: The top menu in the Custom Palette contains the My Blocks you have created.
My Blocks chosen from the Custom Palette can be inserted into a program just like regular blocks. The modified program in Figure 11 now uses the **BeepBeep** block twice. Compared to the alternative of inserting the 3-block sequence of the **BeepBeep** block directly into the main program twice, the program using the**BeepBeep** block is shorter, easier to read, easier to modify, and takes less memory on the NXT.

Figure 11: My Blocks can be easily re-used, saving both programming time and memory on the NXT.

For more information see: http://www.nxtprograms.com/help/MyBlocks/tutorial.html#Making