**Creating a Tune Player**

When the computer keys are pressed, musical notes assigned to computer keys will be recorded in a list. A *TuneScope Player* will be used to play the tunes recorded in this manner.

The same type of computer loop used to combine tones in the previous module (*Sound Machine*) can also be used to play a series of notes. To use a loop to play a sequence of notes, first place the notes in a list in the order in which they will be played. (The **List** code block is found in the *Variables* section of the *Command Palette*.)



In order to play the notes, a method of accessing individual notes in the list is required. The **Item** code block (also found in the *Variables* section of the *Command Palette*) can be used to access the notes. For example, **Item 1** can access the first item in the list (the note A4), **Item 2** can access the second item in the list, and so on.
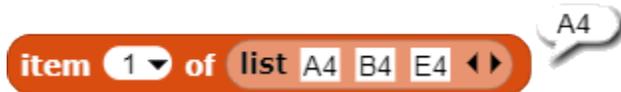


**Using a Loop to Play a List of Notes**

If the list is placed in a loop, a single **Play** code block (shown in purple in the illustration below) can be used to play an entire list of notes. (Note: The **Play** code block is found in the *Sound* section of the *Code Block Palette*.)  The variable " *i* " (depicted in orange in the illustration) has a value of "1" during the first iteration of the loop. This value is increased to "2" during the second iteration of the loop and to "3" during the third (and final) iteration of the loop.



Once a list has been created in this manner, it can be assigned to a variable. (The *Make a Variable* button is found just below the *Variables* section of the *Command Palette*.) The name of the variable is chosen by the programmer. In this instance, the name "Note List" is meaningful because items in the list will be names of notes. However, the name "List of Notes" (as well as other possible choices) would have worked equally well.
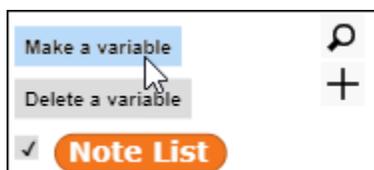


Once the variable *Note List* has been created, the contents of the list of notes can be assigned to the variable.

A checkbox to the left of the variable name under the *Command Palette* can be used to display a table with the items in the list that has been assigned to the variable.



Once the list of notes has been assigned to the variable *Note List*, the oval block displaying the variable name can be dragged into the input slot of the **Item** code block, replacing the actual list. Creation of the variable *Note List* will make it easier to add additional items to the list of notes in the future.



Because the number of items in the list will change in the future, **For I = 1 to 3** has been replaced with **For I = 1 to Length of List** in the first line of the **For** loop. This is a powerful computational concept that allows code to be dynamic and respond to the changing size of the list without the necessity of updating the code.



Until now, all of the notes have been the same duration – a quarter note. However, a second variable, *Note Lengths*, can be created and used to specify the duration of each note. (This variable could have also been named *Note Duration* because that also would have been a meaningful name.)



At this point, two lists have been created – a list of notes and a parallel list of note durations.
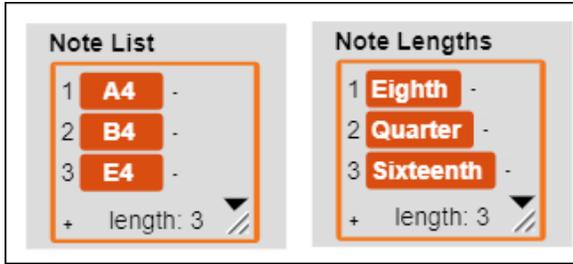
The **Item** code block is used to access the note length in the **Play** code block in a manner similar to the way in which the **Item** block is used to access the notes in the list of notes.



**Creating a Tune Player Code Block**

Once this code has been tested, it can be incorporated into a custom **Tune Player** code block created by the programmer.



Clicking this custom block plays the tune recorded in the list of notes.



The **Tune Player** block could be further refined and enhanced by incorporating additional variables such as the type of instrument played (for example).