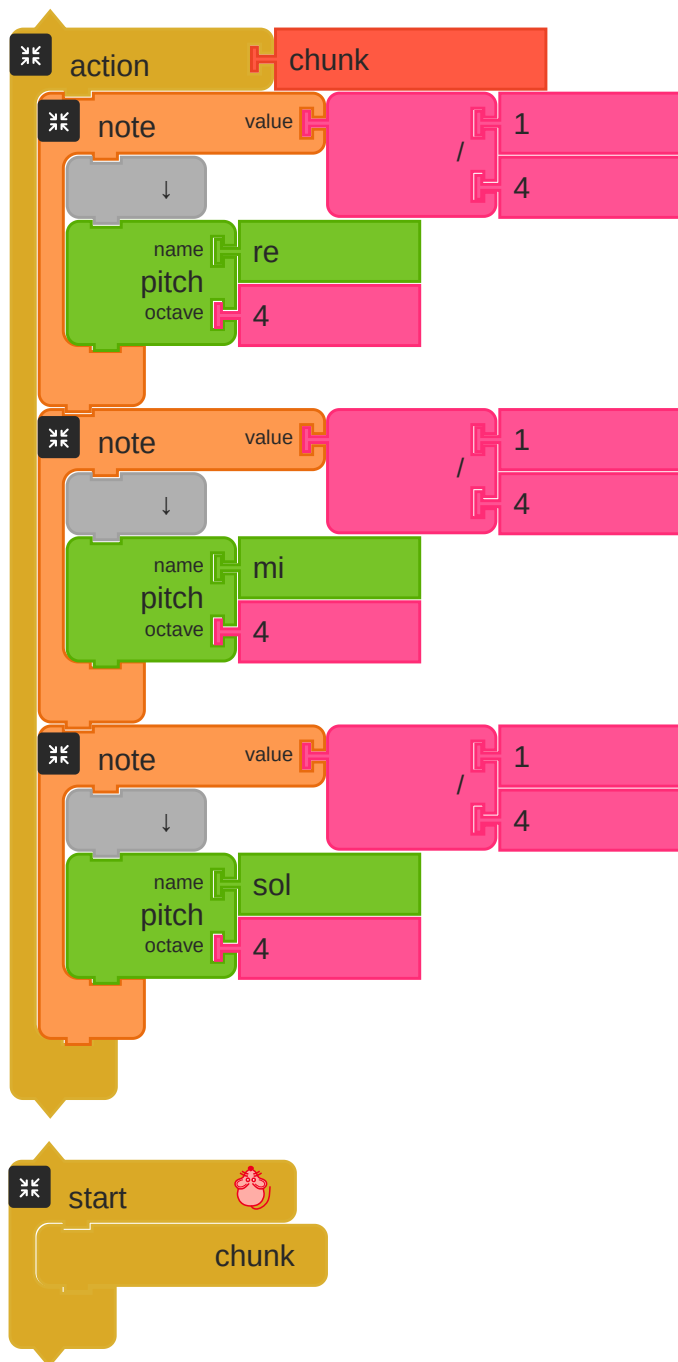


## 3. Programming with Music

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This section of the guide discusses how to use chunks of notes to program music. Note that you can program with chunks you create by hand or use *The Phrase Maker* widget to help you get started.

### 3.1 Actions



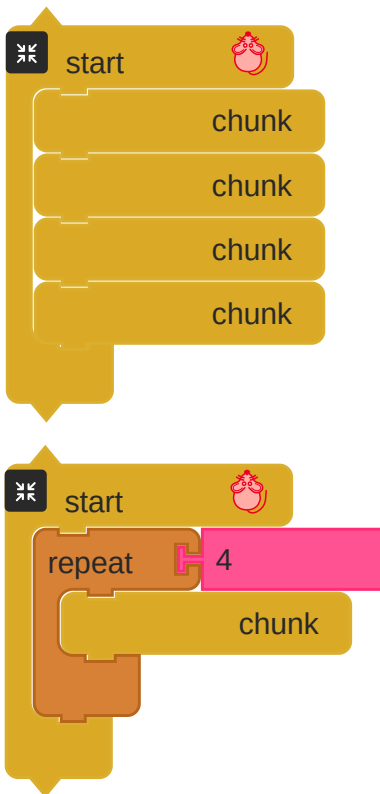
Every time you create a new *Action* stack, Music Blocks creates a new block specific to, and linked with, that stack. (The new block is found at the top of the *Block* palette, found on the left edge of the screen.) Clicking on and running this block is the same as clicking on your stack. By default, the new blocks are named `chunk` , `chunk1` ,

chunk2 ... but you can rename them by editing the labels on the *Action* blocks.

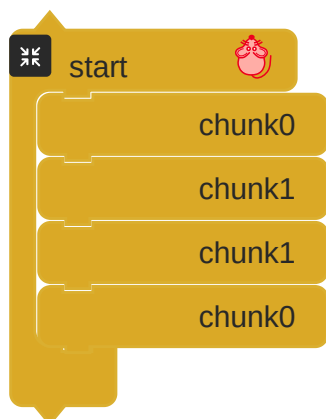
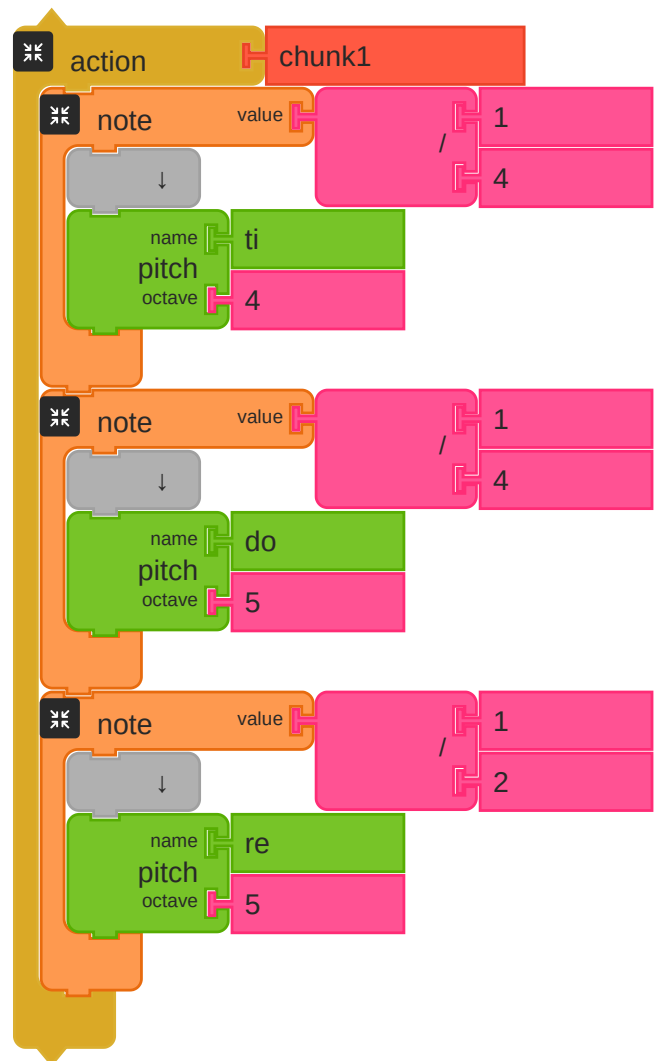
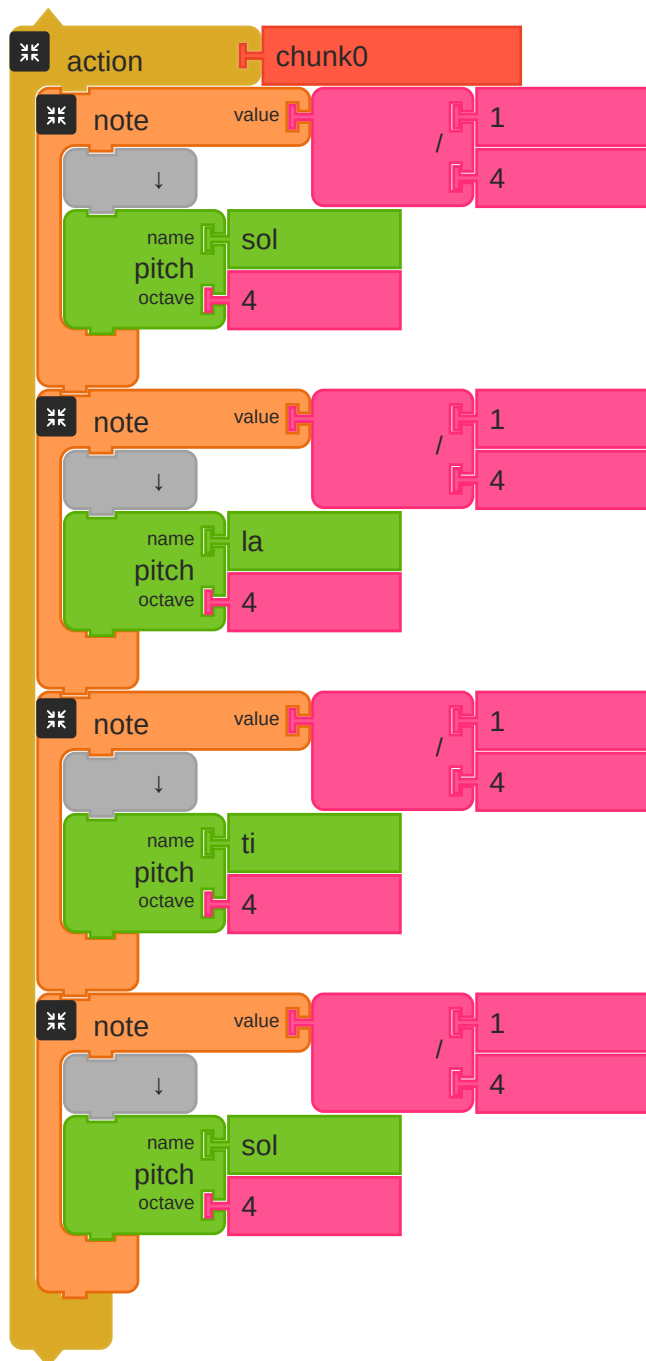
An *Action* block contains a sequence of actions that will only be executed when the block is referred to by something else, such as a start block. This is useful in orchestrating more complex programs of music.

A *Start* Block is a *Action* that will automatically be executed once the start button is pressed. This is where most of your programs will begin at. There are many ways to *Run* a program: you can click on the *Run* button at the upper-left corner of the screen to run the music at a fast speed; a long press on the *Run* button will run it slower (useful for debugging); and the *Step* button can be used to step through the program one block per button press. (An extra-long press of the *Run* button will play back the music slowly. A long press of the *Step* button will step through the program note by note.)

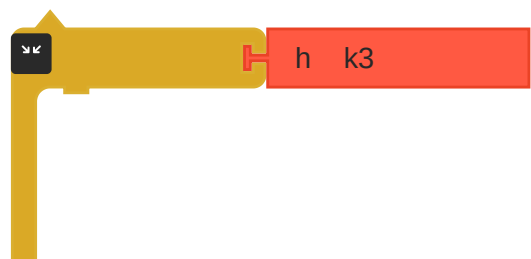
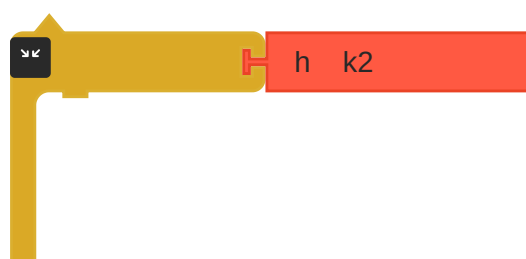
In the example above, the *Action* block named "chunk" is inside of a *Start* block, which means that when any of the start buttons is pressed, the code inside the *Start* block (the *Action* block) will be executed. You can add more chunks after this one inside the *Start* block to execute them sequentially.

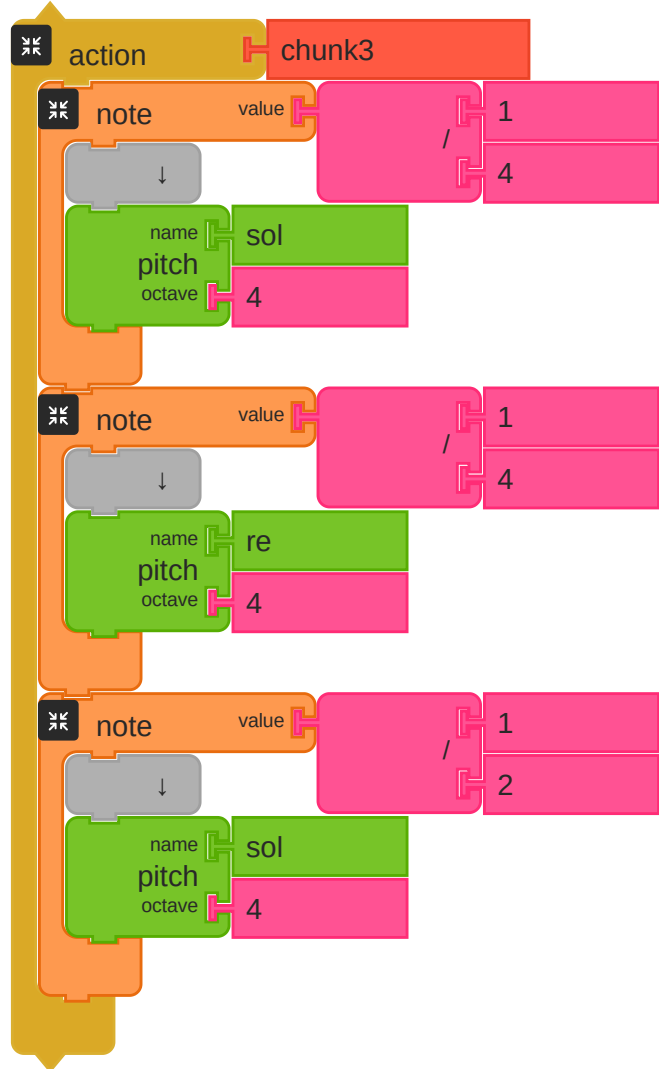
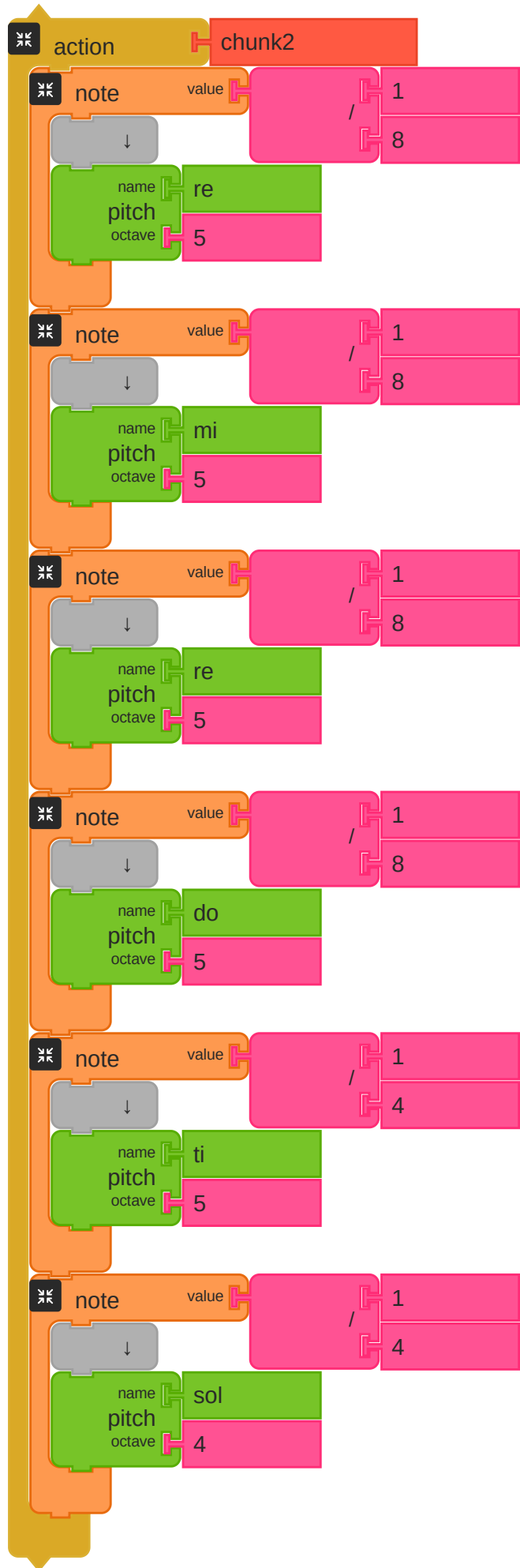


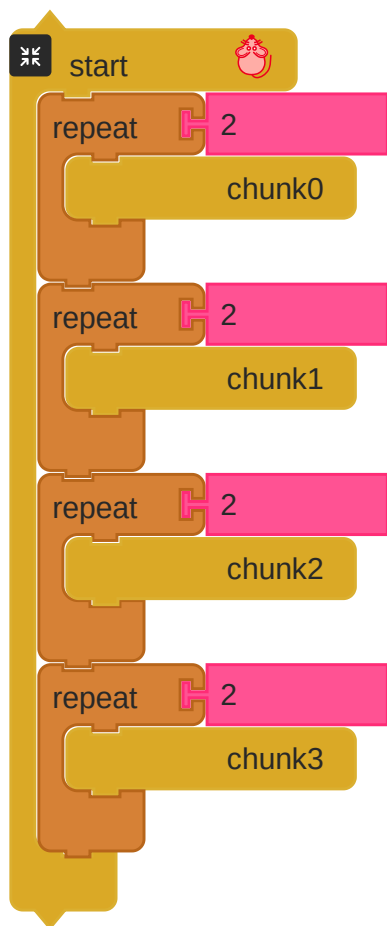
You can repeat actions either by using multiple *Action* blocks or using a *Repeat* block.



You can also mix and match actions. Here we play the *Action* block with name `chunk0` , followed by `chunk1` twice, and then `chunk0` again.







A few more chunks and we can make a song. (Can you read the block notation well enough to guess the outcome? Are you familiar with the song we created?)