



QUICK START TUTORIAL CREATING A PROJECT STEP-BY-STEP

Welcome! We assume that you have successfully installed Pintar **VirtualLabTM** Sound on your computer. You are now ready to use this fantastic tool to explore the mysterious phenomenon of sound.

For a novice user, the quickest way to become familiar with Pintar **VirtualLabTM** Sound is to follow this step-by-step tutorial. Throughout this tutorial, you will find quick references to the detail description, as indicated by the (?) symbol.

This tutorial also assumes that you possess a working knowledge of Windows 9x, NT, 2000, Me and XP. Certain words used to describe operations in this tutorial have specific meaning.

Click	Press once on the mouse button.
Double-click	Press twice on the mouse button in quick succession.
Select	Click once on a specific object.
Drag	Press the mouse button and drag, holding the mouse button down as you do so. Let go to the mouse at the intended location.
Type	Press on a specific key on the keyboard.
Choose	Select a menu item.

Launching Pintar VirtualLabTM Sound

We assume that you have successfully installed the Pintar **VirtualLabTM** Sound. In the Sound folder, double-click on the icon labelled SNDX.EXE.

Before proceeding any further, you should understand the basic concept of sound waves. This understanding is crucial to for the effective use of Pintar **VirtualLabTM** Sound.

TUTORIAL

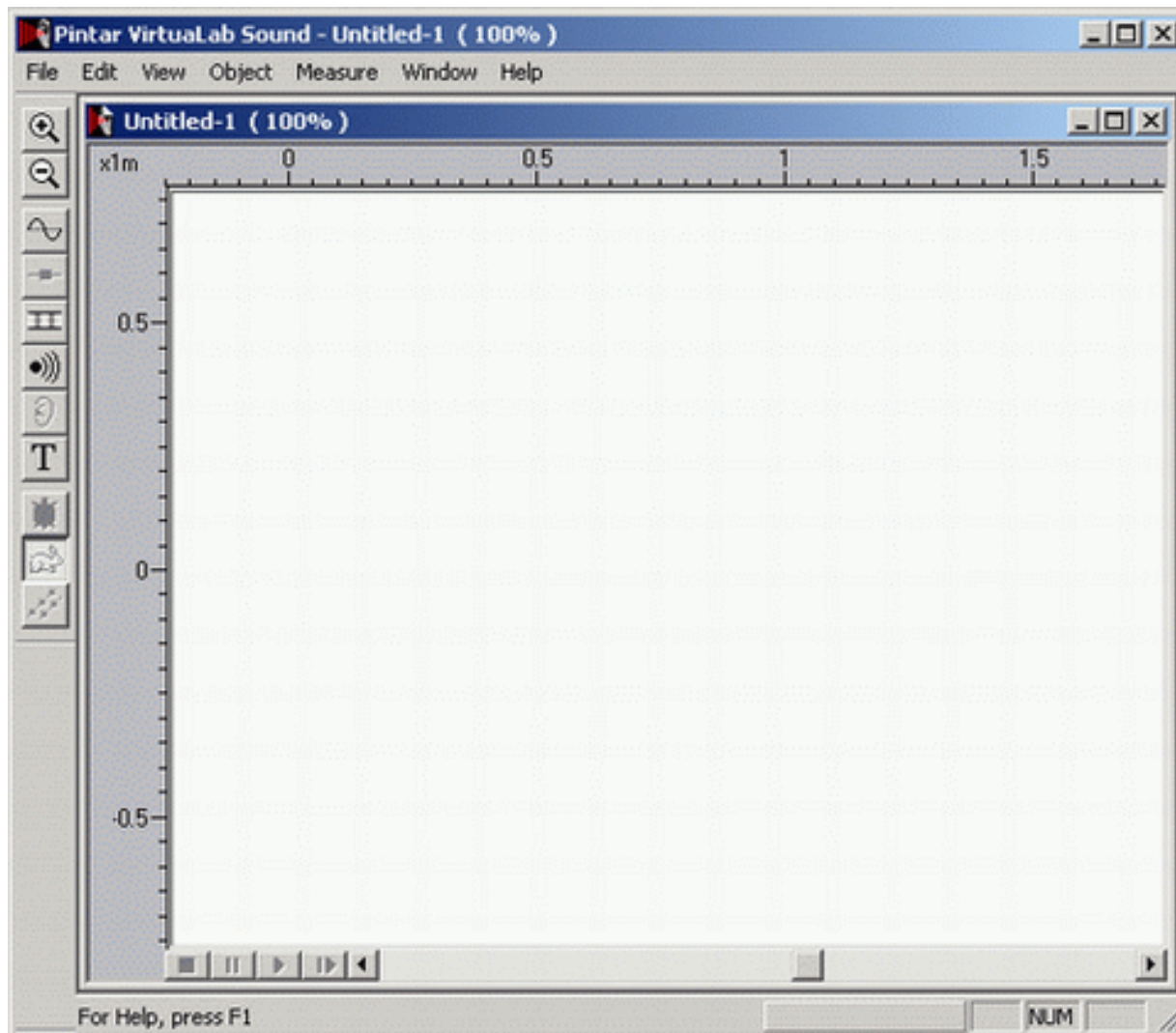
OBJECTIVE:

To study the formation of beats.

PROCEDURE:

1. Starting a new project.

Select 'New' from the File menu. A blank Workbench labelled "Untitled-1" is created.

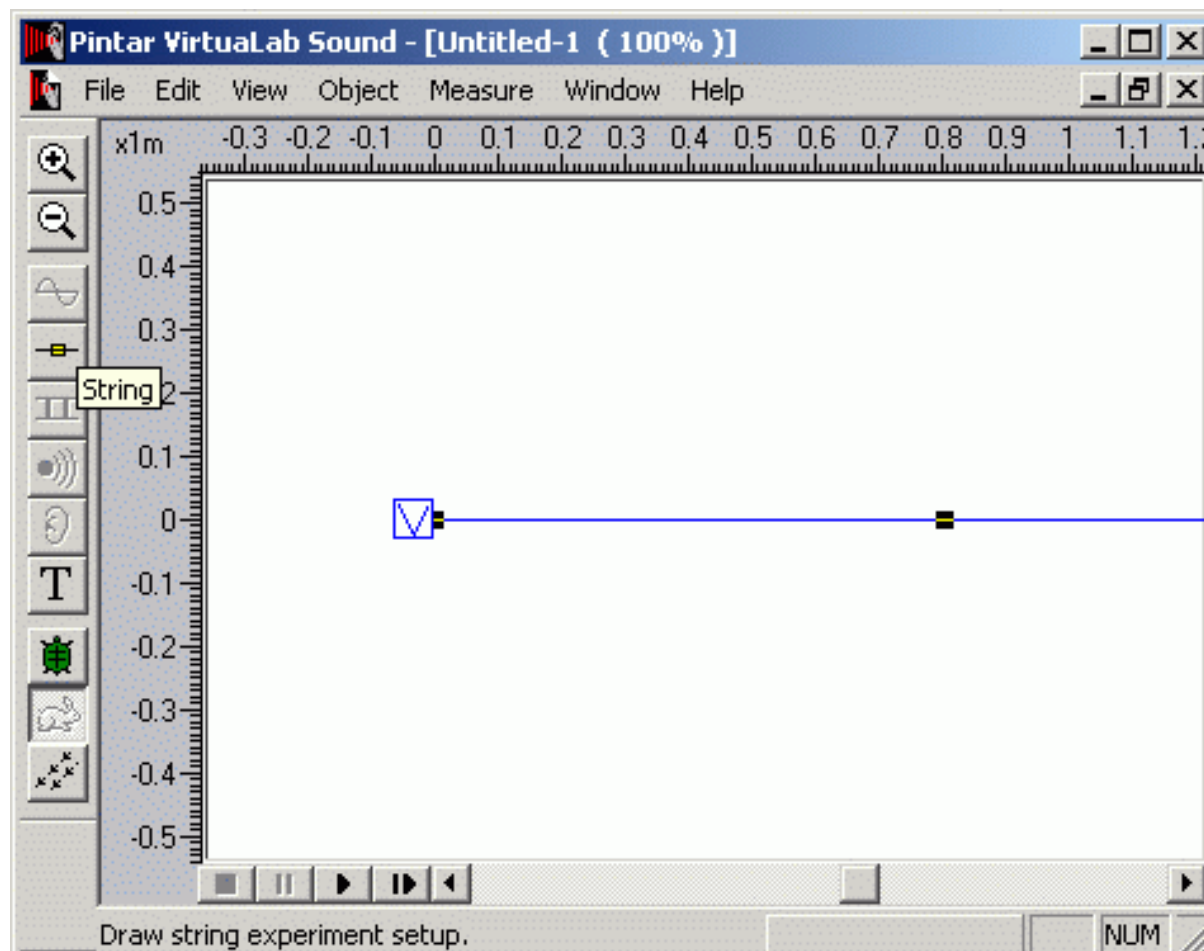


2. To set up a string wave experiment on the Workbench

Do either one of the following:

- Choose the command String from the Objects menu.

- Click on the String tool  on the Tool bar.



3. To set the properties of the string

In anticipation of the objective of this experiment, the parameters of the experiment must be set.

- Double-click on the string. A String properties dialog appears.
- Set the parameter of the string to:

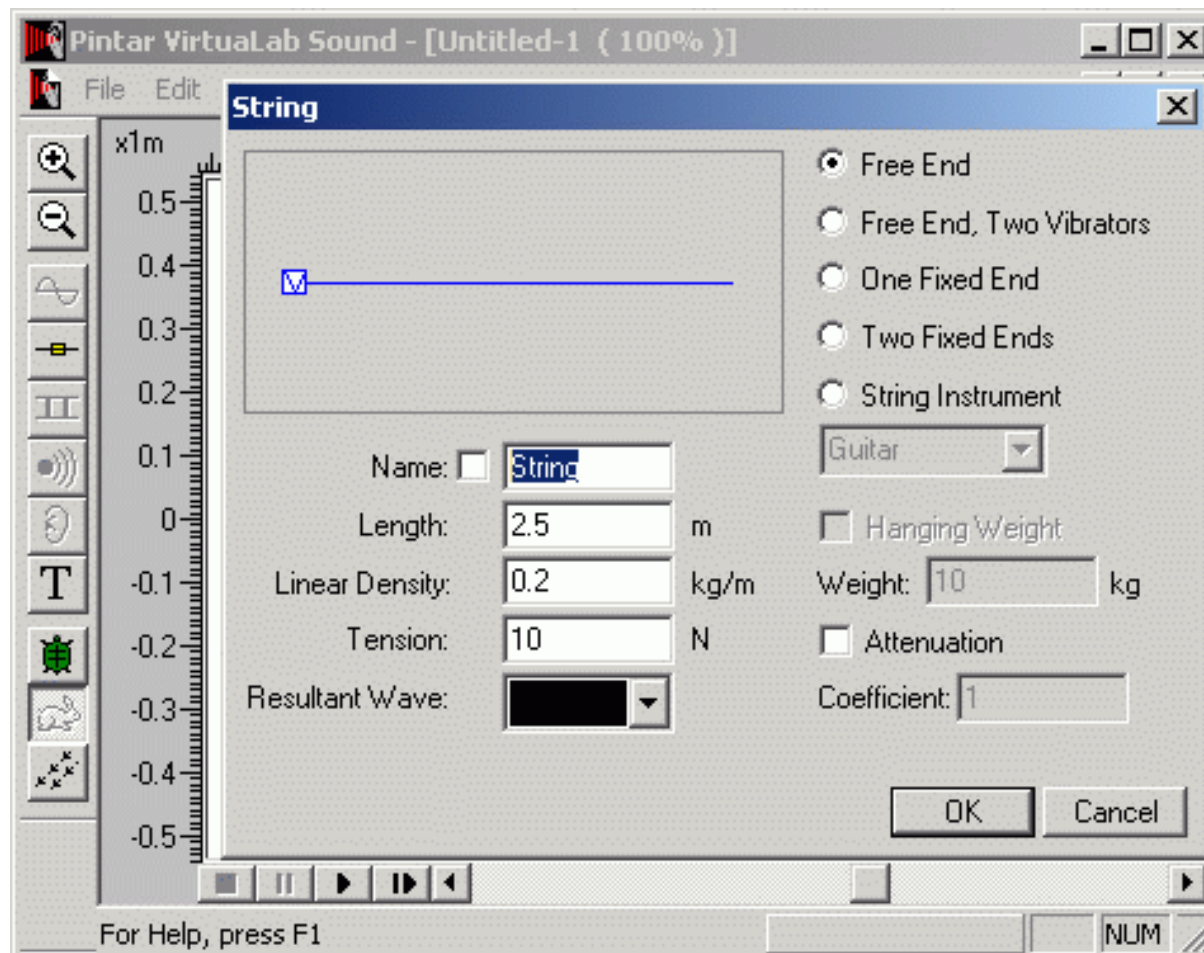
Type of setup:	Free End
Length of string:	2.5 meters

Since the string has a free end, the length of the string does not affect the outcome of the experiment. The other parameters don't have to be altered.

Note: The values mentioned here are all in the default SI units system. To change the unit of measurement, go to Preferences... in the File menu.

c) After you have made the necessary changes to the string parameters, click OK.

? • **To inspect or edit the properties of the string**



4. To set the properties of the string vibrator

After you have set the properties of the string, the settings of the vibrator must be made.

- Double-click on the vibrator. A Vibrator properties dialog appears.
- By default, channel 1 is selected. Set the parameter of this channel to:

Wave Type:	Sine
Color:	Blue
Frequency:	90Hz
Amplitude:	0.2m
Initial phase:	0 deg

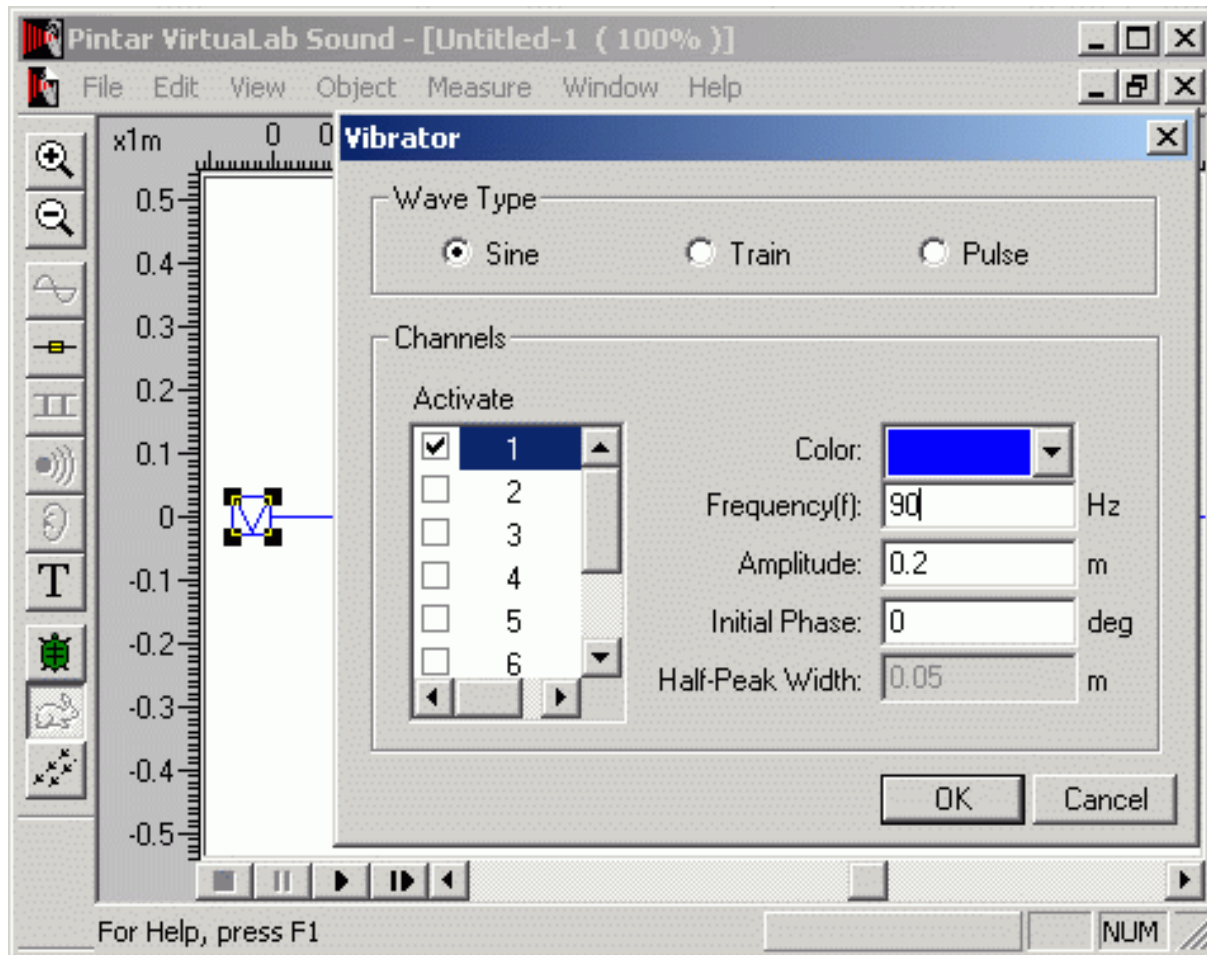
- A beat is caused by the superimposition of two waves that have very close frequencies. Therefore, we want the vibrator to generate two waves on the same string, and view the resultant wave. Now, select channel 2, and set its parameter to:

Wave Type:	Sine
Color:	Red
Frequency:	99Hz
Amplitude:	0.15m
Initial phase:	80 deg

d. Click OK.

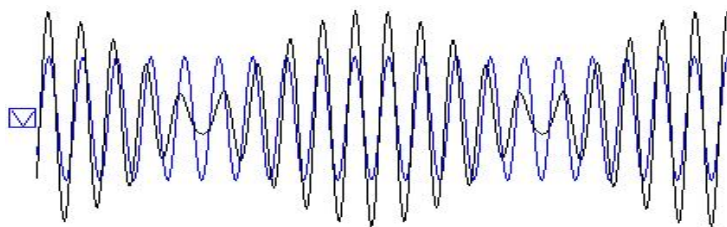
? • [To inspect or edit the properties of a vibrator](#)

? • [To activate or deactivate a channel](#)



5. Making a trial run of your experiment.

Let us see how are things have progressed up till this point. In the Tool bar, click on the Run icon. You'll see the characteristic wave of a beat being generated.



? • [The Control Panel](#)

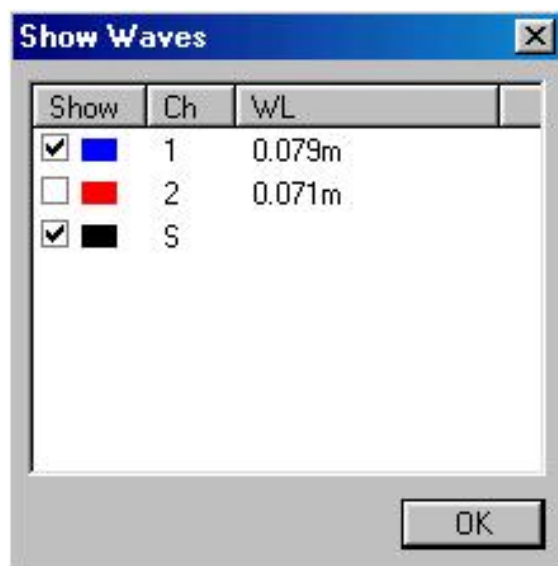
6. Save your experiment.

Being quite pleased with the result, now is a good time to save the work so far completed. Choose Save As... from the File menu.

? • [Save As...](#)

7. To inspect the component waves of the beat.

We can now play around with the wave to look at its constituent components.



In the View menu, choose Show Waves... This opens the Show Waves dialog. In it, there are three waves listed: the two component waves in channels 1 and 2, and the resultant wave in channel S.


You do not see the component waves on the Workbench because they are hidden. To see them, click in their checkboxes under the Show column.

You can selective show or hide any of the channels by toggling their checkboxes.

Clicking the Step button in the Control Panel moves the waves forward one step at a time. This feature allows you to study the progression of the component waves and see how they interfere with each other to generate the beat.

8. Annotating your experiment

If you are quite satisfied with your experiment, you can share it with your classmates. However, you may want to add some text to annotate your experiment, so that your experiment can be better understood.

- a) Select the Text tool . The cursor changes to a cross-hair.
- b) Move the cursor to the Workbench and click to set where you want the type to be. A 'text' object appears at where you clicked.
- c) Double-click on the text object. A Text dialog appears.
- d) Click inside the text area and enter, "Experiment To Study The Formation of Beats."
- e) Set the text alignment to 'Center'.
- f) Next, click on the Choose Font button. The Font properties dialog opens. Set the font attributes to:

Font:	Arial
Font Style:	Regular
Size:	24 points
Effect:	Underline
Color	Black

- g) Click OK. Your text will appear on the Workbench where you clicked.
- h) Click and drag the text object to make fine adjustments with regards to the position of the text on the Workbench.
- i) By following the same steps described here, add another text object to your experiment that reads, "Beats are formed when two waves that have very close frequencies are sounded together."

9. Ending your work session.

Finally, when you are ready to call it a day, choose Quit from the File menu.

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