READ ME: Licensing and functionality.

About PowerMath Logo and licensing.
PowerMath Logo is a modern version of the Logo computer language licensed under the GNU Public License. Please read and agree to the **key license provisions** before you use or distribute the program.

Key license provisions. As a GNU-licensed product, PowerMath Logo may be freely distributed, but this GNU license summary must remain with it when copies are made and passed to others. **PowerMath Logo should never be sold or used as commercial barter or as any means of financial gain.**

Beta version. The PowerMath application is stable and adequately functional, though a few key commands are known not to work. Yet, all File menu items work as expected. Navigation for loading and saving .logo files is functional.

Please note that *The Expert Mathematician* lesson plans for daily mathematics classwork with Logo are a commercial product; per individual purchase, they are only to be used with students in one school building. The Logo is free; the math lessons are purchased seperately.

Other beta versions.
Skill Games and Teacher Files: most function as intended, several do not and are yet to be updated. These files are all copyright protected. In the current PowerMath version they are included with the software for direct access and are not to be extracted. Any additional Skill Games or Teacher Files that may become available will also be copyright protected and are not to be distributed separately and should never be sold or used as commercial barter or as any means of financial gain.

PowerMath Logo can run on any computer that has **Java OpenJDK** installed.

About Java.
Java is a computer language used to design many software programs. Java programs can run on any operating system as long as it has a small utility that sits between the software application (such as Logo) and the native operating system. The Logo application will not run without this utility. The utility is free.

Choose the latest "hotspot" version from this URL:
https://adoptopenjdk.net/index.html?variant=openjdk16&jvmVariant=hotspot

From the dropdown menu, choose and install the option for your operating system.

Click-open the PowerMath Universal folder. Double click the PowerMath.jar file to start.

Problem starting Logo on your computer? Confirm Java is installed.

Apple Mac platform. If PowerMath Logo does not start up after confirming the machine or server is Java enabled, school computers may have a security block on anything not recognized. Operation of PowerMath may require changing a security setting to enable recognition of the software. This can be done in the Preferences > Security pane.

Windows platform.
In your **Start menu,** click **Run...**
At **"Enter command you want to run",** type: **cmd**
This will bring up a **DOS prompt:** Type: **java -version**

If Java is not found, a message box will state that. Refer to the URL above, download and install the correct version for your operating system.

Logo functionality.
Procedures window. Follow the steps explained in the tutorial for creating and operating "procedures" from the Procedures window.

Tutorial and software controls. Please begin by working through the tutorial. It briefly introduces how to use the Logo application and what it can do.

The **Teacher Files** are exact copies of all the procedures students build during lessons. They can be used for verification or debugging if you get stuck, or a skill game or other file gets scrambled. Password to unlock the Teacher Files: tfss123

Explore the Skill Games menu.
To operate Skill Games, click on a game to load into the Procedures window. From there, you must **hold down the Control key and press F** (**do a Cntrl-F on both Mac and Windows platforms**) to "define" the procedure and ready it to operate. **Cntrl-F** switches the cursor to the Command Center. Once there, to operate a skill game or a procedure you develop, simply type the name of the procedure (without the word TO) and press return/enter.

When you have activated a skill game, you will be prompted for an answer. Type the correct answer in the Command Center and press return. The skill games comprise the full range of math skills students should know through algebra I. They are simply designed, keeping the focus on the math, not on fancy graphics. Most students learn to enjoy doing them as a practice part of the complete program. Lessons prompt practice concurrent with use of the skill in applying concepts being taught.

Why the "power" in PowerMath Logo? In general, it refers to mathematical investigations, made easy.

More specifically, four key claims proven by Logo advocates.

1. Middle school youths can learn to understand number logic (arithmetic) by generating and editing original mathematical statements that produce a result—both visually and numerically—in real time. They do this using the Logo computer tool which they can control symbol-by-symbol, much like a child can learn to create text by typing letters in a word processor.

2. Logo is a tool for teaching inquiry—getting in the habit of asking the deeper question—here, with a main emphasis on reasoning, construction and communication of powerful mathematical ideas. Why does this happen when I change that? How can I combine mathematical expressions to create the output that I want? Top down? Bottom up? Hmmmm. O.k. I'll try this. Yes. This inquiry skill, using math and technology, is now a prerequisite for high paying jobs. Prompts such as these are provided in TEM lessons.

3. Access to the codes of real mathematical thinking via the Logo tool also helps because students control the process. This is the basis of genuine constructionsim.

4. For teachers, the Logo environment is ideal for teaching methodical and inquisitive logical thinking. Of course, teachers model this directly in their interactions with students, as well.