

## We're Problem Solvers: An Engineering Song

Excerpted from "Imagine That!" workshop  
By Wolf Trap Master Teaching Artist Penny Russell

**Engineering:** "The work of designing and creating large structures (such as roads and bridges) or new products or systems by using scientific methods." (Merriam-Webster)

We use the engineering method in the early childhood classroom to teach habits of mind. We regularly encounter problems during the day, and the engineering method gives children the power to solve these problems. Integrating the arts into the engineering method encourages its use in an exciting, creative way.

1. **Problem:** An engineering problem is a problem that can be solved by building, creating or manufacturing. State the problem in clear terms.
2. **Plan:** State how you intend to solve the problem. Your plan will include your choice of building materials. Your group may have many ideas. Choose one idea before moving to Step 3.
3. **Build:** Use the plan and materials stated in Step 2. Build your structure or machine.
4. **Test:** Does it work? Use your structure or machine. Refer to Step 1 and observe the results. Did this solve your problem sufficiently?
5. **Redesign:** If your structure or machine failed the test, or if you think it can be improved, go to Step 2. You return to Step 2 with more information than you had originally. Every "failed" test is a positive result, because you learn something new with each test. Why did your test fail? Use the evidence and deduce the answer. Redesign, plan again, with this new information.  
3-5: Continue steps 3-5 until you have the desired results.
6. **Share the Results:** Share the results with your teachers and classmates. Walk them through your process: What was your problem? What was your plan? How did you build? What was your test? Did it work? Why not? How did you redesign? What was the final result? Scientists share their results to help others.

Children will find ways to use the engineering method throughout the school day. Teachers have reported that they have heard the vocabulary used in the block corner ("Redesign!") as well as the playground ("Now, what is our problem? We need a plan.").

Song Lyrics:

One: We have a problem

Two: We make a plan

Three: Then we build it

Four: We test it

Well...did it work?

Yes or no? Why not?

Five: Redesign, redesign, redesign, redesign...

If you test your plan and it works, then move on to the last step:

Six: Share the results! Share the results! Share the results! Share the results!