

New Engineering Standards - You Know More than You Think!

SUMMARY

If you're like most educators, you might have some doubts about your ability to teach the engineering content included in the Next Generation Science Standards (NGSS). If so, RAFT has good news: by combining what you already know with our simple activities, you will be able to do an outstanding job.

AUDIENCE

All educators, Science & Engineering

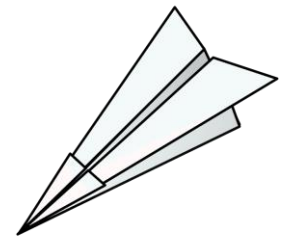
GET STARTED

To get started, look at the [Science and Engineering Practices](#) section of the NGSS website. These practices help students to see themselves as scientists and engineers. Your students are already natural engineers: they love to ask questions, make things, and share their ideas. The NGSS practices provide a wonderfully-organized structure to encourage these behaviors.

STEP 1: TAP INTO YOUR INNER ENGINEER

RAFT activities offer quick and easy ways to introduce each practice to your students. Here is an example using the RAFT Idea Sheet [On Target with Paper Airplanes](#):

- Ask Questions – “How do airplanes work?”
- Investigate – “I don't know – let's find out!”
- Use Models – “Watch this paper airplane fly!”
- Analyze – “What happens if we add weight to the nose?”
- Measure – “How far did it go?”
- Design – “Try making some other planes!”
- Share Ideas – “Tell us about your design.”
- Use Evidence – “What are its best features?”



At this point you might be thinking, “I don't have time to cover all this at once.” Fine – then start simple. Show your students two parachutes – one made with a pie pan and the other with a plastic bag. Drop the parachutes side by side. Ask the students to notice how each one performs, and speculate about what might make it work better. Use this 10-minute activity to introduce five of the practices. Have the students work on analysis, measurement, and design another day.

STEP 2: LEVERAGE THE REAL WORLD

Engineering is a down-to-earth subject that is full of familiar physical examples children and adults can relate to easily. Once you harness these familiar examples, such as comparing a pin wheel and a windmill, understanding follows! Here are some examples of engineering concepts from the NGSS, and real world (RAFT) examples you can harness:



- Force – Build and test a simple bridge (**Leonardo's Arched Bridge**)
- Motion – Roll a simple little car down a ramp (**Car on a Roll**)
- Energy - Simple solar cooker (**Solar Collector**)



STEP 3: CALL IT WHAT IT IS

Embrace the language of engineering. Some terms may seem daunting at first, but once the students start using the right words, their understanding will skyrocket. Calling that “coil thingy” an “electromagnet” will help learners develop and share new insights.

RELATED RESOURCES

Some RAFT hands-on activities related to the Engineering Standards:

On Target with Paper Airplanes – <http://www.raft.net/ideas/On Target with Paper Airplanes.pdf>

Leonardo's Arched Bridge – <http://www.raft.net/ideas/Leonardos Arched Bridge.pdf>

Car on a Roll – <http://www.raft.net/ideas/Car on a Roll.pdf>

Solar Collector – <http://www.raft.net/ideas/Solar Collector.pdf>

Egg Drop – <http://www.raft.net/ideas/Egg Drop.pdf>

Retractor Car – <http://www.raft.net/ideas/Retractor Car.pdf>

Rollback Can – <http://www.raft.net/ideas/Rollback Can.pdf>

Hovercraft – <http://www.raft.net/ideas/Hovercraft.pdf>

Next Generation Science Standards (NGSS) - <http://www.nextgenscience.org/>

Creating a Design Challenge & other RAFT Tip Sheets - <http://www.raftbayarea.org/tip-sheets>

