

## Stress-Free, High-Impact Science Fairs

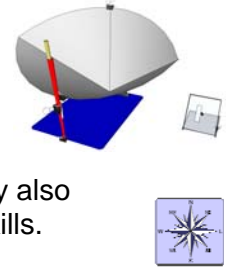
### SUMMARY

Science fairs provide powerful opportunities for student learning and self-discovery. The process of planning, conducting, and presenting a science fair project helps students see themselves as scientists and engineers. RAFT Idea Sheets and Activity Kits are perfect launch-points for high-impact science fair projects.

**AUDIENCE:** Educators in grades 3-12.

### SCIENCE FAIRS SUPPORT NEW CURRICULUM REQUIREMENTS

New education standards require students to do real-world science and engineering projects. Science fair participants not only learn new facts, they also practice teamwork, creative problem-solving, and other vital 21<sup>st</sup>-century skills.



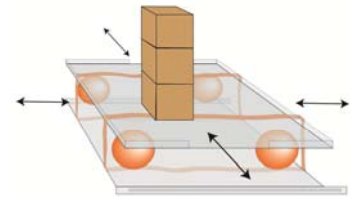
### KEEP IT SIMPLE!

#1. Focus students on *simple experiments* that test *one variable* and yield *measurable* results. RAFT hands-on activities (see examples on page 2) are designed with this in mind. If several students (or even several teams of students) do similar projects, the opportunities for learning and collaboration increase.

#2. If possible, conduct the experiments *at school or in a similar environment*. Other steps, such as research and data analysis can be done at home, but doing the experiments in class often leads to better outcomes. Most RAFT activities can be done in one class period.

### GET THE STUDENTS ENGAGED

Too often, students pick science fair projects from long lists, without giving much thought to their choices. When it is time for your students to identify a project, place a variety of pre-built RAFT kits around the classroom. These samples will help students focus, stimulate their curiosity, and prompt them to ask scientific questions they are eager to answer!



**Example:** Let a small team of students “play” with a RAFT **Staple Remover Catapult**. After five minutes, ask: What makes the catapult work? How far did the projectile go? What would happen with a larger or lighter object? What else could be used to build a catapult? Their comments will become the basis of a project they actually care about!

### A GREAT PROJECT STARTS WITH A PLAN

Before any experimenting is done, have the students write up their procedures. They need to list the materials they will use, imagine each step of their experiment, and create the tables they will use to record their data. Review plans carefully to make sure each experiment will work and can be completed in one class period.

## DO IT!

Pick a class period, ask several parent helpers to come in, and have the students do their experiments. Encouraging team projects will enhance learning and reduce the complexity of this process.

Make sure the students follow their procedures and enter their data into the tables they designed earlier. Did their procedures work as expected? What does the data tell them?

Provide a second period for additional experimentation to allow students to confirm/extend their results (or do a new experiment if their first attempt did not succeed).

## PREPARE TO PRESENT

As homework, ask the students to write short and simple content for their backboards. For younger students, these handwritten notes can be attached to a board and the presentation is done! Older students will want to add more pizzazz. Depending on the age of the students, board content can include a summary, background research, hypothesis, data, analysis, conclusion, and acknowledgements.

## LET THE STUDENTS SHINE!

If possible, invite parents or other adult role models to come in and speak with the students about their work. Remind the adults that they are there to encourage, not to judge. Let the students do the talking! It is likely that the kids will not have all the answers. Focus on the methods they used and the knowledge and skills they gained.

## THE MOST IMPORTANT PART: REFLECTION

The biggest impact of a successful science fair has nothing to do with the content of the projects. It isn't about the catapults. It is about students seeing themselves as scientists and engineers. Invite the students to think/talk/write about this impact!

## SAMPLE PROJECTS

These RAFT kits are easy to build and are perfect launch points for high-impact science fair experiments and engineering projects:

**Colors of Light –**

<http://www.raft.net/ideas/Colors of Light.pdf>

**Finger Phone –**

<http://www.raft.net/ideas/Finger-Phone.pdf>

**Hovercraft –**

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

**Human Reaction Time –**

<http://www.raft.net/ideas/Human Reaction Time.pdf>

**Retractor a Go-Go Car –**

<http://www.raft.net/ideas/Retractor a Go-Go Car.pdf>

**Shake Table –**

<http://www.raft.net/ideas/Shake Table.pdf>

**Shake Your Butter –**

<http://www.raft.net/ideas/Shake Your Butter.pdf>

**Staple Remover Catapult –**

<http://www.raft.net/ideas/Staple Remover Catapult.pdf>

