



INVESTIGATE: to examine the particulars of so as to learn about something hidden, unique, or complex.

BUILD: to develop according to a systematic plan, by a definite process.

This year you will pursue an investigation or build project of your choice. There are several options to choose from...

1. Rube Goldberg Project
2. Science (Fair) Investigation
3. Build Project (Whirligig, Automata, etc)
4. Blue Man Group Contest, Tech Challenge, ROV, etc

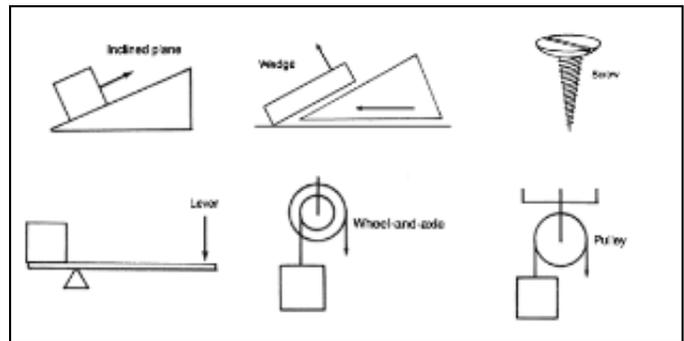
The big idea is for students (you) to make something they are proud of. The project needs to investigate or construct something that shows problem solving skills, care in construction/execution, and an understanding of how things work.

1. Rube Goldberg Projects

Simple machines and the art of making the simple complex . . .

Rube Goldberg was the master of making the simplest of tasks very complex. While Goldberg created his on paper from his imagination, you will be creating yours in real life.

1. Your challenge is to create a 'Rube Goldberg' - like project making sure to include each of the simple machines (shown above). Each should be labeled or identified on/in the final project. You must include each simple machine at *least* twice. The screw will need some attention as they must be an active part of the contraption, not just an assembly fastener. Your contraption must take at least 20 seconds (30 seconds teams) to complete its task.



You may elect to video your project at home if it is not possible to transport it or if it is too large or fragile to demonstrate in class. (All projects will be presented.)

2. You may **NOT** use fire **or** other hazardous materials without:

A. A signed letter from your parents **AND**

B. Your parents notify me by phone that they have given you the Academy phone 335-5762)

okay. (Nature

3. You may work alone or in **pairs**. (Remember, pairs have additional requirements)

4. There are many sources of inspiration for Rube Goldberg contraptions on both the internet as well as in movies. (*Back to the Future* , *Ferris Bueller's Day Off* and *Wallace and Gromit - The Wrong Trousers* are good examples.) **Be sure your creation is your own!**

2. Science Fair - Informal

This is basically the same as a formal science fair investigation with the exception of having a wider range of choices in how you *present* your project. While a formal project has dimensions and requirements for board size, what can be displayed, etc; here you may choose to do a powerpoint, involve the class with samples of your investigation (food, drink, survey, etc) or ??? Be creative! Formal science fair guidelines which can be of help in organizing your project can be found at:

<http://science.santacruz.k12.ca.us/pdfs/ScienceFairGuide.pdf>

3. Whirligigs, Automata and other creative constructions

This is the choice to put your simple machine knowledge to a creative finished project. We have looked a many video clips in class for inspiration. Successful projects will be well executed, have a degree of complexity that requires the problem solving skills and care of construction to make you proud of your work.

[YouTube - Animated Whirligigs](http://www.youtube.com/watch?v=LPSpKaJtOFE&feature=related) <http://www.youtube.com/watch?v=LPSpKaJtOFE&feature=related>

[Creative Jolly Roger Whirligig](http://www.youtube.com/watch?v=RznCVIG9QAk&feature=related) <http://www.youtube.com/watch?v=RznCVIG9QAk&feature=related>

[Heron and Fish](http://www.youtube.com/watch?v=udp025IYkpM&feature=related) <http://www.youtube.com/watch?v=udp025IYkpM&feature=related>

[Wooden Dragon Automata](http://www.youtube.com/watch?v=BivrdzMSQil&feature=related) <http://www.youtube.com/watch?v=BivrdzMSQil&feature=related>

[Timberkits Caterpillar - Wooden Automata](http://www.youtube.com/watch?v=yoGR3lvTrWw&feature=related) <http://www.youtube.com/watch?v=yoGR3lvTrWw&feature=related>

[Brushing My Teeth](http://www.youtube.com/watch?v=_VBBDWuuwtl&feature=related) http://www.youtube.com/watch?v=_VBBDWuuwtl&feature=related

[Wooden combination lock](http://www.youtube.com/watch?v=CZ8WRDVgKrk&feature=related) <http://www.youtube.com/watch?v=CZ8WRDVgKrk&feature=related>

[Wooden air engine](http://www.youtube.com/watch?v=ngb4SYR74m4&feature=relmfu) <http://www.youtube.com/watch?v=ngb4SYR74m4&feature=relmfu>

[Marble adding machine](http://www.youtube.com/watch?v=GcDshWmhF4A&feature=related) <http://www.youtube.com/watch?v=GcDshWmhF4A&feature=related>, <http://www.youtube.com/watch?v=md0TISjIags&feature=related>

[Da Vinci Bridge folio 69ar](http://www.youtube.com/watch?v=L9d_ItQrrEw&feature=related) http://www.youtube.com/watch?v=L9d_ItQrrEw&feature=related

[A Theo Jansen's mechanism](http://www.youtube.com/watch?v=CufN43By79s&feature=related) <http://www.youtube.com/watch?v=CufN43By79s&feature=related>, <http://www.youtube.com/watch?v=PWm4VMR8D0w&playnext=1&list=PL199650F0D691ACD6>

[Stirling Cycle Engine from Tin cans](http://www.youtube.com/watch?v=hazK8kxd-uA&feature=related) <http://www.youtube.com/watch?v=hazK8kxd-uA&feature=related>

[automata mechanisums](http://automata.co.uk/mechanisums.htm) <http://automata.co.uk/mechanisums.htm>

[School Automatas](http://www.youtube.com/watch?v=-qoYVg-mbaQ) <http://www.youtube.com/watch?v=-qoYVg-mbaQ>

4. Blue Man Group Musical Instrument Invention Contest

The Blue Man Group and Scholastic Books have teamed up for a middle school challenge.

The "Invent an Instrument Contest" is a competition for students in grades 5-9 designed to inspire and reward creativity and original thinking, as well as to help students develop awareness of connections between science, math, and performing arts.

Blue Man Group creates its own instruments out of PVC pipe and other unusual materials. Students will use their ingenuity, creativity, and sense of fun to invent their own original, never-before-played musical instrument out of repurposed or everyday objects.

More info at... <http://www.scholastic.com/blueman/>

This Project should honor the work and style of the Blue Man Group. They build sophisticated instruments primarily out of pvc. One key element is the use of musical scales and tune ability of their instruments. Students completing this project should be able to perform a well known song on their creation.

[PVC instrument](http://www.youtube.com/watch?v=6dl9pEVuBbA&feature=related) <http://www.youtube.com/watch?v=6dl9pEVuBbA&feature=related>

[YouTube - FeroPhone made out of Propane Tank](http://www.youtube.com/watch?v=IGO4ScfEtI4&feature=related) <http://www.youtube.com/watch?v=IGO4ScfEtI4&feature=related>

[MILLTONE Drum Magnetic Tuning Demo](http://www.youtube.com/watch?v=ha86pMKGG6I&feature=related) <http://www.youtube.com/watch?v=ha86pMKGG6I&feature=related>

There you have it. Four choices for how to pursue your Lifeskills of Curiosity, Problem Solving, Effort and Perseverance. Execute with excellence and have fun!