Invention Project **Name** _____

PLANNING

1. Your goal is to design an invention that solves a particular problem.
   - You may work individually or with a partner. Groups will be evaluated on how well both partners contribute to and understand the project. Pick a partner who complements your skills (and not just someone with whom you would like to hang out :--).
   - Your problem may be:
     a. A real one that you face
     b. One that you identify by interviewing a client (such as a teacher, classmate, younger sibling, grandparent, etc.).
     c. Or, it may be one that you create as part of a segmentation exercise (but that serves a broader market than just the one imaginary person of your exercise).
   - You must begin with a problem, not an invention in search of a problem.
2. Clarify and narrow the problem until it is:
   - Interesting to you
   - Specific
   - Doable – there is a reasonable chance that you can generate several potential solutions and complete one of them.
   - Inspiring – you think original ideas will come from attempting to solve it.
3. Create a thorough list of relevant criteria that will make for a successful solution (e.g., safe, quiet, etc.).
4. Brainstorm many possible solutions to your problem. Be open-minded. Write them all down (serious, silly, high-tech, low-tech).
5. Create a problem-solving matrix and evaluate each possible solution according to the criteria. Total your ratings. If you feel that some criteria are much more important than others, assign each a weight or scale.

Getting past a wall…	Safe	Fun	Effective	TOTAL
Pogo Stick	0	+	0	(1)
Dynamite	–	0	+	0

Getting past a wall…	Safe (0 – 5)	Fun (0 – 2)	Effective (0 – 5)	TOTAL
Pogo Stick	2	2	1	5
Dynamite	0	1	5	(6)

For example, in the matrix at left, each category counts the same and Pogo Stick wins as the choice. In the matrix at the right, "fun" does not count as much and dynamite becomes the preferable option.

6. Write a list of specifications: specific goals for how well a good solution would meet each criterion (cost range, weight, etc.). Do consider ergonomics for any user operated device.

DESIGNING

7. Sketch designs for the shapes, mechanisms, and (if needed) electrical features of your invention. Consider different approaches (you may want to do another round with a problem-solving matrix as you refine your design).
8. Consider different materials (Lego, wood, cardboard, plastic, etc.) for building your design. Which will make for a sturdy, testable prototype?
9. On graph paper (or in a CAD program), draw a scale diagram of your design.

BUILDING

10. Build a prototype (a working model) of your invention that you can test out.
11. Analyze how well it meets your criteria and specifications.
12. Discuss how successful it is and how you would improve it.

EXTENSIONS (pick one)

A. Economic analysis – detail what you think the manufacturing costs for your invention would be and what a reasonable price would be (taking both profit and what people are willing to pay into consideration). Consider material and labor costs, etc.

B. Patent Search – research related patents. What other solutions have been proposed in your problem area?

C. CAD – make a detailed CAD assembly of your device.

Your final project will include:

- A report that discusses the Planning and Design stages and a brief note on the building process.
- A drawing or drawings of your designs.
- A prototype.
- One extension.

Your project will be evaluated on:

- **Creativity**.
- How well you **apply the ideas** that you have studied this year.
- How well you identify, research, and apply any **new knowledge** that you may need.
- The **thoroughness** of your efforts and your attention to detail.
- The **neatness** and **attractiveness** of your presentation components - written, diagrams, model. Your work should be presented in a formal format that conveys pride in your effort.
- **Organization** of your processes.