



March 2021

Dear Parent,

This year our school will be participating in an **optional and ungraded** special kind of science fair called the Invention Convention. It is designed to promote your child's problem-solving and creative-thinking skills. Your child will be following a step-by-step process to invent a new product or develop a new method for solving a problem that they identify in their life, or your family or the community. Due to the current pandemic situation, this year our fair will be “virtual”!

AES scholars have learned about inventors and their inventions. Over the years, students have done a number of activities in our classes or online to assist them in thinking outside of the box. By doing these activities, we have seen the students gain an appreciation for the engineering design and inventing processes and thus be better prepared to create their own inventions. The first step in the actual inventing process will be finding an idea for an invention. Your child will be encouraged to find a problem that needs to be solved. They may ask if you have a need for something that will help you solve a problem. Your interest and encouragement at this stage will help to make the inventing process a fun learning experience for your child.

Once your child has settled on an idea and researched it to make sure that the idea has not been used before, an Intent to Invent needs to be completed and signed. To approve your child's video to be shared publicly in the AES Invention Convention video, we will need a completed and signed Release Form. Your child can then begin the planning stage as well as begin keeping their Invention Log.

As your child begins the actual process of inventing, your continued interest and encouragement will be helpful. Discuss the progress they are making and any problems that are encountered. Remind your child that although inventors often experience failure along the way, they remain persistent and keep trying and thinking of new ideas to solve a problem. It is important that your young inventor uses the Invention Log to document his/her inventing process as it unfolds. Although, the Invention Log is not required to be turned in, it will help guide their engineering and inventing processes.

A video describing each student's entry will be submitted, as will the student's labeled sketch of the invention. Each participant will receive a participation award and recognition from this optional experience. We know your child will enjoy and benefit from this experience in scientific problem solving. Your support and cooperation in this are greatly appreciated.

**Assignments to be submitted by the DUE DATE OF MAY 21ST:**

- **Intent to Invent**
- **Video Release Form (Optional)**
- **Labeled Sketch of Invention**
- **Video (Answer provided questions)**

Sincerely,

Ms. Akopian & Ms. Simons

Chairpersons, Science Fair Committee

## Intent to Invent

Dear Parent/Guardian,

Your child must complete this preliminary plan for their invention. This is NOT meant to be a final design or product, but only the first step in planning what they want to do. The inventor can always make changes to their plans later as the need arises. PLEASE, only assist as an advisor or coach – the ideas and work must come from the student. After you review this form, please sign below and return.

Student Name \_\_\_\_\_ Teacher & Grade \_\_\_\_\_

The steps to build an invention are:

1. **Identify-** a problem means brainstorming and using research to discover problems and who might have these problems.
2. **Understand-** the problem means you know what is causing the problem and exactly what you want to happen when the problem is solved. The better you understand the problem, the better your solution will be.
3. **Ideating-** means thinking about the problem: brainstorming and researching different ideas and options to solve the problem.
4. **Design-**means deciding what your invention solution will be made of, what it will look like, and how it will work.
5. **Building-** means assembling your invention based on your solution design using the materials and the process you have decided to use.
6. **Testing-** your solution is how you find what works and what doesn't. You will modify or change your design, build in those changes, and test the changes. Testing also includes an analysis of the pros and cons of the invention, its impact on society and the environment, its marketability, and its social value. You keep repeating this process until your invention or prototype works and works well.
7. **Communicating-** means explaining the problem and your research, how your invention solution solves the problem, who might use your invention, your process in creating this invention, and how you might

Identify some problems that I might be able to solve:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Choose 1: What is the problem I intend to solve? \_\_\_\_\_

\_\_\_\_\_

What are the materials I might need? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Places where I might find some materials are \_\_\_\_\_

People who might help me are \_\_\_\_\_

Signature of Student \_\_\_\_\_ Signature of Parent/Guardian \_\_\_\_\_

Email of Parent \_\_\_\_\_

## Release Form (School Upload)

Complete **ONLY** if you want your video included in the AES Invention Convention!



### Los Angeles Unified School District Parent/Guardian Publicity Authorization and Release

Dear Parent/Guardian:

The Los Angeles Unified School District requests your permission to reproduce through printed, audio, visual, or electronic means activities in which your pupil has participated in his/her education program. Your authorization will enable us to use specially prepared materials to (1) train teachers, (2) increase public awareness and promote continuation and improvement of education programs, and/or (3) highlight accomplishments of students and educational programs including but not limited to honor roll, school/District awards, and graduation/culmination, through the use of mass media, displays, brochures, websites, social media, approved blogs, and related District publications.

1. Name of Pupil (please print)

2. Birthdate (please print)

3. Name of Parent (please print)

- a. I, as a parent or guardian, of the above named pupil fully authorize and grant the Los Angeles Unified School District and its authorized representatives, the right to print, photograph, record, and edit as desired, the biographical information, name, image, likeness, and/or voice of the above named pupil on audio, video, film, slide, or any other electronic and printed formats, currently developed, (known as "Recordings"), for the purposes stated or related to the above.
- b. I understand and agree that use of such Recordings will be without any compensation to the pupil or the pupil's parent or guardian.
- c. I understand and agree that the Los Angeles Unified School District and/or its authorized representatives shall have the exclusive right, title, and interest, including copyright, in the Recordings.
- d. I understand and agree that the Los Angeles Unified School District and/or its authorized representatives shall have the unlimited right to use the Recordings for any purposes stated or related to the above.
- e. I hereby release and hold harmless the Los Angeles Unified School District and its authorized representatives from any and all actions, claims, damages, costs, or expenses, including attorney's fees, brought by the pupil and/or parent or guardian which relate to or arise out of any use of these Recordings as specified above.

My signature shows that I have read and understand the release and I agree to accept its provisions.

4. Signature of Parent/Guardian

5. Date Signed

6. Address (Number, Street, Apartment Number)

7. City

8. State

9. Zip Code

10. Telephone

Granting of permission is voluntary. Please return completed form to school.

11. Principal

Approved as to form by the  
Office of the General Counsel.

This form shall not be amended without  
written approval of both the Office of  
the General Counsel and the Office of  
Communications/Public Information

12. School

## **Invention Log**

### **What is an invention?**

An invention is something new that enables us to solve a problem or do something better or easier.

### **The purpose of this Invention Log**

All stories have an ending. In this case, the ending of what you are doing is your invention. But all stories also have a beginning and middle. The purpose of this Invention Log is to tell the entire story of your invention. In it, during every step you take in making your invention, you will record what you did, why you did it, and how you did it. This Invention Log is an important part of the invention process and is a complete and accurate record of the ideas, plans, and processes by which the invention was created. Invention Logs can be used by students to prove they came up with the idea and invention. Oftentimes, they are used as part of the patenting process.

### **How to use this Invention Log**

The Invention Log is not a book report, but it is a guide while you invent. It is a diary that is continuously filled in as you work on your invention. Follow the steps of the invention process and fill out the various pages as you work on them. When you are done with a page, print your name and the date at the bottom. Once you are done, put the pages in the order in which you did them and staple them to make a complete Invention Log.

**The Invention Log is for guidance purposes only and it will NOT be turned in.**

**The name of the invention:** \_\_\_\_\_

**The problem that it solves:** \_\_\_\_\_

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## Statement of Originality

I promise that the ideas in this Invention Log are my own. (If a team, all should complete.)

**Inventor Name(s):**

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**Signature(s):**

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**Date:** \_\_\_\_\_

**Grade:** \_\_\_\_\_

**School:** \_\_\_\_\_

**Town:** \_\_\_\_\_

## Suggestions for Resources

- **The internet** (e.g., [www.google.com](http://www.google.com), [www.bing.com](http://www.bing.com))
- **Stores** (e.g., [www.amazon.com](http://www.amazon.com), [www.bestbuy.com](http://www.bestbuy.com), [www.walmart.com](http://www.walmart.com), [www.target.com](http://www.target.com))
- **Books about your topic(s)** (look up at [www.bn.com](http://www.bn.com) or [www.amazon.com](http://www.amazon.com))
- **Professionals in the industry** (check out [www.linkedin.com](http://www.linkedin.com) for possible people to interview)
- **Trade/industry-specific publications** (each industry has topical magazines and websites)
- **United States Patent and Trademark Office** (visit [www.uspto.gov](http://www.uspto.gov) to search for patents and trademarks)
- **Domain registrars** (e.g., [www.GoDaddy.com](http://www.GoDaddy.com) to see if your product name .com is taken)

## The Steps You Will Take

As you work on your invention, follow these steps and check them off as you complete them. Don't write your ideas here – use the appropriate space in the following pages to complete each of the sections.

1. What problem are you trying to solve?
2. What is the result you are trying to achieve?
3. What are some possible solutions and which one did you choose to do?
4. Has this solution been done before? 5. Make a model (drawing) of the invention.
6. What problems might you encounter with this design?
7. How will you fix those problems?
8. Repeat steps 5 to 7 until you have a design that you think will work.
9. What parts and materials will you need to make the invention?
10. Where will you get those parts and materials?
11. What additional skills will you need to make the invention?
12. Who can help you do those activities?
13. Get the parts and materials and build the invention. Get any help you need to build it.
14. Test and evaluate the invention.
15. Identify any problems with the invention.
16. Repeat steps 5 to 15 until the invention works as planned.
17. Name the invention.
19. Practice what you will say about your invention in the video.
20. Be proud of what you have done!!!!

### **Explaining the Problem and Identifying a Solution (Identifying and Understanding)**

1. What problem are you trying to solve? The more specific you are in describing the problem, the better your solution will be. How did you come up with the problem?
2. What is the result you are trying to achieve? The more specific you are in describing the result you want, the better your solution will be.
3. What are some possible solutions? Which one did you choose to pursue? How did you decide which solution to try? The more specific you are in describing the solution you will create, the better your invention will be. How did you come up with the solution?
4. Has this solution been done before? If it exists, how is your approach different and better? What research did you do to see if this invention had been done before? Who did you talk to? Where did you look? What website did you search? You should show 4 pieces of evidence of different types of research – talking with experts, searching the internet, interviewing friends and family as to how useful this would be, etc

Where I looked to see if my idea is new:

- A.
- B.
- C.
- D.

Document any similar inventions you found, describing how yours will be different:

### **Creating and Improving the Design (Ideating and Designing)**

5. Draw a model (a sketch or drawing) of the invention you are thinking about building. Label all the important parts and features. Explain how the invention will work. If you need more space, use another blank page.

6. What problems or issues might you encounter with this design? Is this design compatible with the principle of sustainability? Who did you talk to about this design (another student, parent, teacher, etc.)? What were their comments about your design?

7. How can you fix those problems or address those issues?

8. Repeat steps 5 to 7 until you have a design that you think will work. You may have to make multiple copies of a blank page until you have a good design.

### **Building the Invention or Prototype (Designing, Building, Testing)**

9. What parts, materials, and tools will you need to make the invention and how much will they cost?

10. Where will you get those parts and materials?

11. What additional skills or abilities will you need to make the invention?



- How is your invention different from others that may already be on the market? If it is similar, what did you do to make it better? How is it different?

- Who is your target audience? Who would use your invention?

**Some creative attention-getting techniques you can use are:**

- Alliteration (using the same first letters or sounds): “Kit Kat”

- Rhyming: “Light Bright”

- Alternative spelling: “Sno Bal”

- Using numbers in the name: “Super Clean 3000”

- Describing the function of the invention: “Hydro-Blast”

- Based on this analysis, what are some good names for your invention?

- Which name do you like best and why?

## **Labeled Sketch**

**(Will be turned in)**

- Draw a detailed sketch or drawing of your invention that you built.
- Label all the important parts and features.
- You can use any blank piece of paper to complete this step of your invention process.
- Must be neat, organized, and legible. Include: your name, grade level, and teacher's name.

## Video Instructions & Questions

The length of the video will be 3-4 minutes. Include the following information in your video presentation.

### 1. Introduction:

State your name, grade level, teacher's name.

Show invention & your labeled sketch!

2. How did you come up with the idea for this invention?
3. What people, situations, or conditions does this problem affect?
4. How did you think up your solution to the problem?
5. Where did you get the materials for the invention?
6. Who helped you build the invention and what did they help you do?
7. Are there other, better materials you could have used that would improve the invention?
8. Who has used your invention and what did they think about it?
9. What changes might you want to make to your invention?

**PRACTICE, PRACTICE, PRACTICE before recording your video.**

**Make sure the sound and video is clear before submitting, please!**

## Terms to Know

These are terms that have to do with inventing. Some of these terms are used in this Invention Log, and some may be terms that you will want to use to describe your process. Please read over these terms before you get started.

**advertise** – the act or practice of calling public attention to one's product, service, need, etc., especially by paid announcements in newspapers and magazines, over radio or television, in social media, on billboards, etc.

**brainstorm** – to produce an idea or way of solving a problem by holding a spontaneous group discussion or individual thinking session.

**data collection** – the process of gathering and measuring information of different variables, in a systematic way that helps one to answer research questions, test hypotheses, and evaluate outcomes.

**design** – to plan and make decisions about something that is being built or created. To create the plans, drawings, etc. that show how something will be made.

**durable** – able to withstand wear, pressure or damage. **engineer** – people who invent, design, analyze, build, and test machines, systems, structures, and materials to fulfill objectives and requirements while considering the limitations imposed by practicality, regulation, safety, and cost.

**entrepreneur** – a person who organizes and operates a business or businesses, taking on greater than normal financial risks in order to do so.

**experiment** – a scientific procedure undertaken to make a discovery, test a hypothesis, or demonstrate a fact.

**hypothesis** – a proposed explanation using previous knowledge, but made on the basis of limited evidence; a starting point for further investigation.

**improvements** – the act or process of making something better; the quality of being better than before.

**interview** – a formal discussion to establish needs or requirements; a report or reproduction of information is obtained.

**inventor** – a person who invented a particular process or device or who invents things as an occupation.

**invest** – to put (money) to use, by purchase or expenditure, in something offering potential profitable returns.

**market** – to advertise and offer a product for sale; to present something in a particular way and make people want to buy the product.

**marketable** – able or fit to be sold or marketed; meets enough market needs to be able to be sold.

**original** – created directly and personally by a particular artist; not a copy or imitation.

**operational** – in or ready for use. **patent** – a government authority or license conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention.

**perseverance** – continued effort to do or achieve something despite difficulties, failure, or opposition.

**pitch** – promotion by means of an argument and demonstration; a short verbal dialogue that tells the story and benefits of a product.

**problem** – a matter regarded as unwelcome or harmful and needing to be dealt with and overcome.

**product** – something that is made or grown to be sold or used.

**profit** – money that is made in a business, through investing, etc., after all the costs and expenses are paid; a financial gain.

**profitable** – yielding advantageous returns or results; yielding a financial profit or gain.

**prototype** – an original or first model of something from which other forms are copied or developed; an early version of a product that helps the inventor consider different options for design before finalizing a go-to-market design.

**publication** – the act or process of producing or printing a book, magazine, newspaper, etc. and making it available to the public.

**research** – the study of materials and sources in order to establish facts and reach new conclusions.

**seek** – to search for something or someone; ask for help to achieve something.

**solution** – something that is done to deal with a problem; something that solves a problem.

**source** – the point or place which something starts; a place, person, or thing from which something originates.

**substantially** – to a great or significant extent.

**test** – a procedure intended to establish the quality, performance, or reliability of something, especially before it is taken into widespread use.

**testimonial** – a written or spoken statement in which you say that you used a product or service and liked it.