



SAFE
K.I.D.S.

Audrey Larson

Inventor, Safe K.I.D.S.





Meet your Team

- Brenda Payne - Director CaIC
 - Anne Cawley - Development
- Jennifer Mead - Teacher - Fremont USD

Professional Development Resources

- Christine Lawlor King - Connecticut
 - Susan Mostowy - Connecticut
 - Brenda Payne - California
 - Kristin Lehman - Washington
 - Deb Johnson - Washington
- Veronica Lynagh - Ohio / STEMIE Coalition



Creativity Study

At 5 years old, 95% of kids score as creative geniuses!

At 10 years old, only 30% score that high

As adults, only 2% score as creative geniuses

Creativity is not learned; it is unlearned.

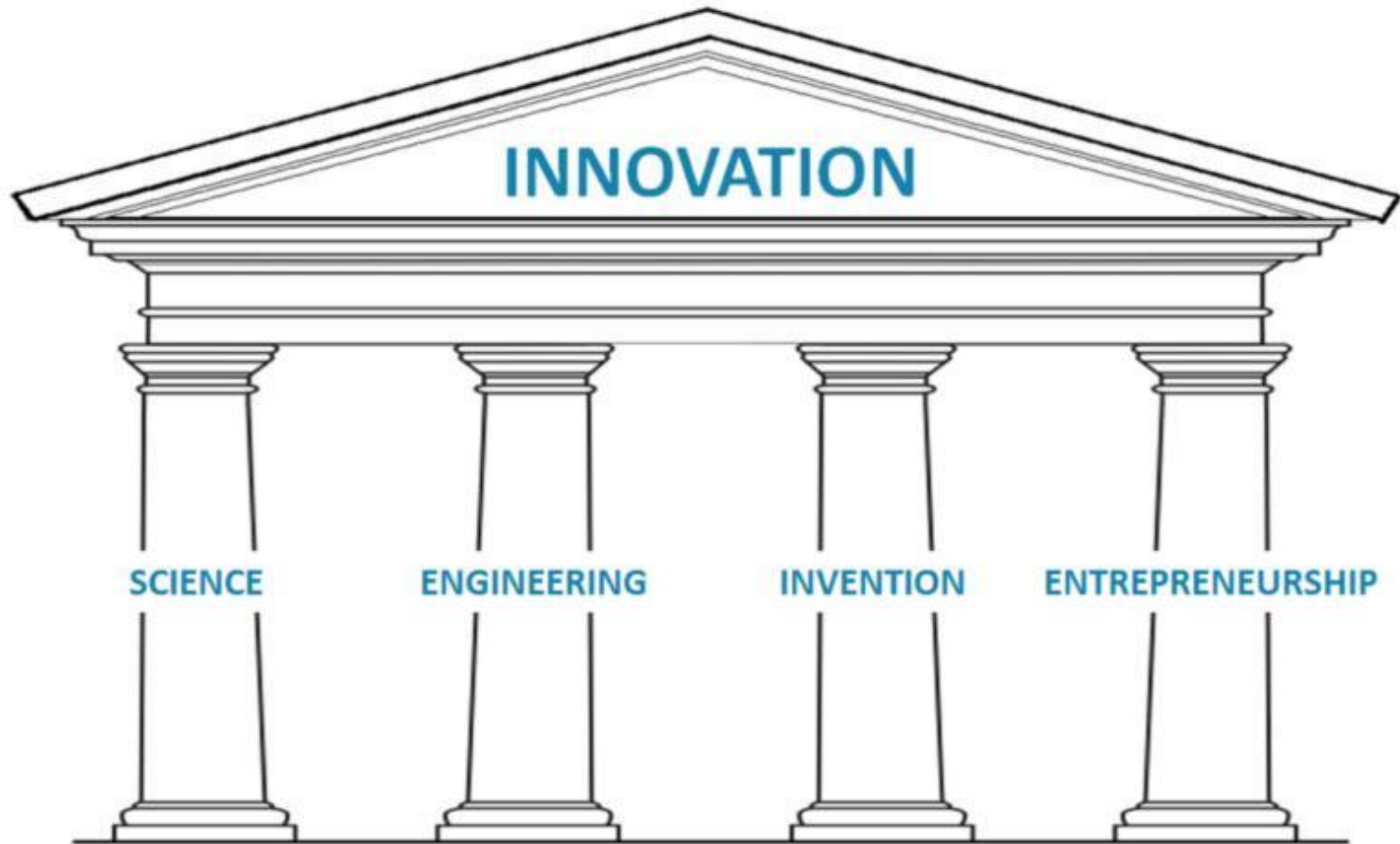
Don't let this be discouraging...It's like riding a bike; it can be practiced and relearned like any other skill!!







Who Are We?

- Educational, statewide, non-profit organization
- Aligned with California's Learning Standards & and the national Next Generation Science Standards (NGSS)
- Part of National Invention Convention & Entrepreneurship Expo (NICEE) & STEMIE Coalition
- Free to Students, Educator Supported
- Corporately Funded by **Maxim Integrated, Parallax Inc., Motorola Solutions**
- Feeder Program to STEAM

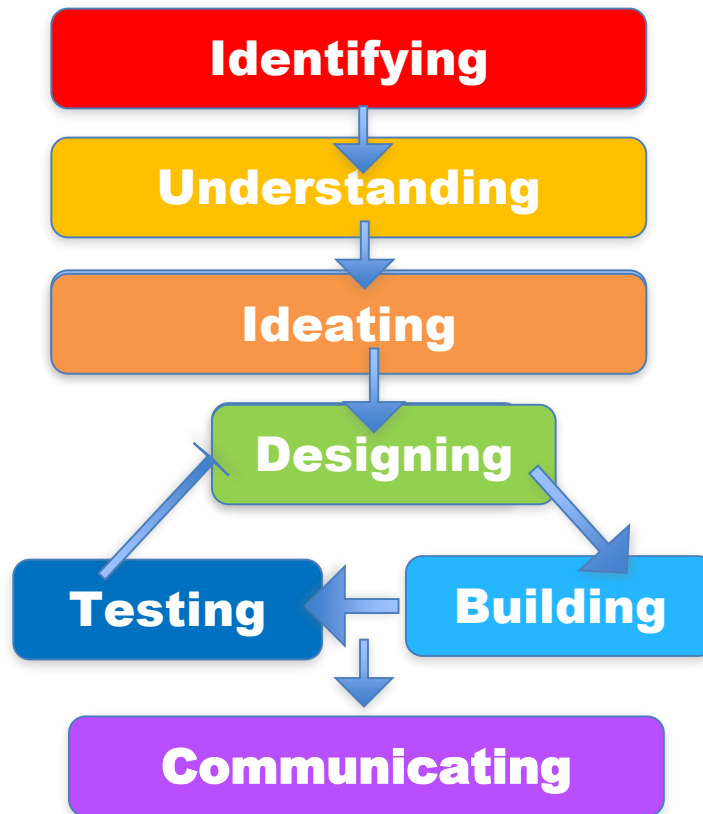
4 Pillars of Innovation



<p>www.nextgenscience.org/</p>  <p>NEXT GENERATION SCIENCE STANDARDS For States, By States</p>	<p>www.k12.wa.us/CoreStandards/</p>  <p>CCSS COMMON CORE STATE STANDARDS —WASHINGTON—</p> <p>COMMON CORE STATE STANDARDS INITIATIVE PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER</p>	<p>www.careertech.org/career-technical-education/cctc/info.html</p>  <p>CCTC Common Career Technical Core</p>	<p>www.p21.org/overview/skills-framework</p> <p>21ST CENTURY</p>  <p>SKILLS</p>	
<p>Science and Engineering Practices</p> <p>S1. Asking questions (for science) and defining problems (for engineering)</p> <p>S2. Developing and using models</p> <p>S3. Planning and carrying out investigations</p> <p>S4. Analyzing and interpreting data</p> <p>S5. Using mathematics and computational thinking</p> <p>S6. Constructing explanations (for science) and designing solutions (for engineering)</p> <p>S7. Engaging in argument from evidence</p> <p>S8. Obtaining, evaluating, and communicating information</p>	<p>Mathematical Practices</p> <p>M1. Make sense of problems and persevere in solving them</p> <p>M2. Reason abstractly and quantitatively</p> <p>M3. Construct viable arguments and critique the reasoning of others</p> <p>M4. Model with mathematics</p> <p>M5. Use appropriate tools strategically</p> <p>M6. Attend to precision</p> <p>M7. Look for and make use of structure</p> <p>M8. Look for and express regularity in repeated reasoning</p>	<p>English Language Arts Practices/Portraits</p> <p>E1. They demonstrate independence</p> <p>E2. They build strong content knowledge</p> <p>E3. They respond to the varying demands of audience, task, purpose, and discipline</p> <p>E4. They comprehend as well as critique</p> <p>E5. They value evidence</p> <p>E6. They use technology and digital media strategically and capably</p> <p>E7. They come to understanding other perspectives and cultures</p>	<p>Career Ready Practices</p> <ol style="list-style-type: none"> Act as a responsible and contributing citizen and employee. Apply appropriate academic and technical skills. Attend to personal health and financial well being. Communicate clearly, effectively and with reason, social and economic impacts of decisions. Demonstrate creativity and innovation. Employ valid and reliable research strategies. Utilize critical thinking to make sense of problems and persevere in solving them. Model integrity, ethical leadership and effective management. Plan education and career path aligned to personal goals. Use technology to enhance productivity. Work productively in teams while using cultural/global competence. 	<p>Skills</p> <p>1. Learning & Innovation Creativity and innovation Critical thinking and problem solving Communication and collaboration</p> <p>2. Information, Media and Technology Information literacy Media literacy Information, communications and technology literacy</p> <p>3. Life and Career Flexibility and adaptability Initiative and self-direction Social and cross-cultural skills Productivity and accountability Leadership and responsibility</p> <p>Core Subjects and 21st Century Themes Global awareness Financial, economic, business and entrepreneurial literacy Civic literacy Health literacy Environmental literacy</p>



The Invention Process





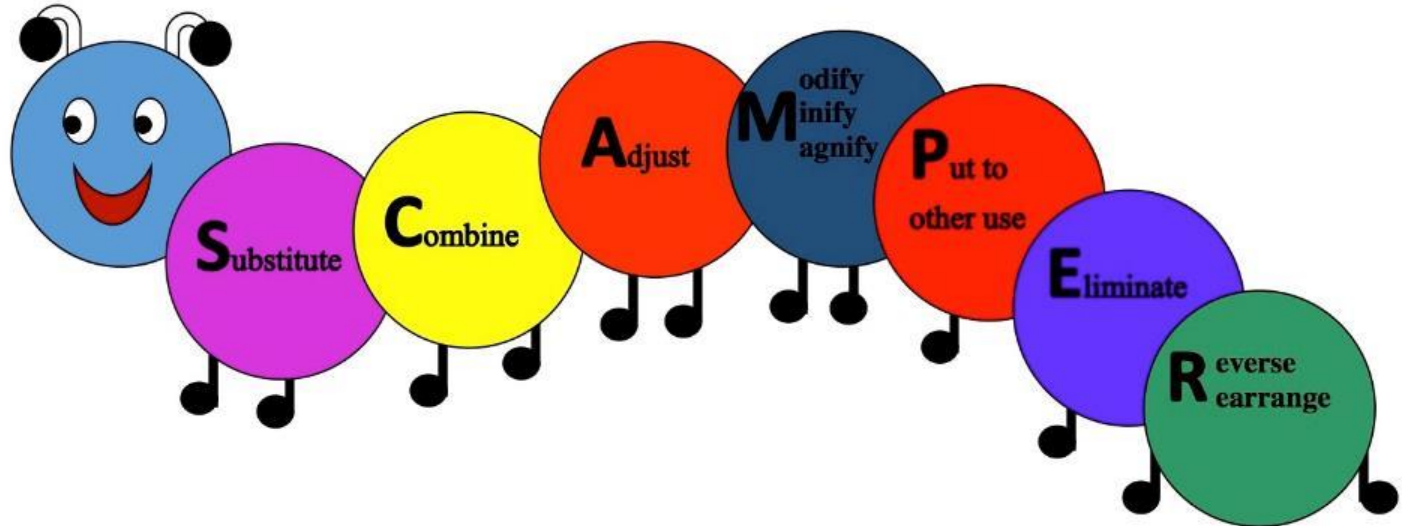
The Invention Process

Identifying

Understanding

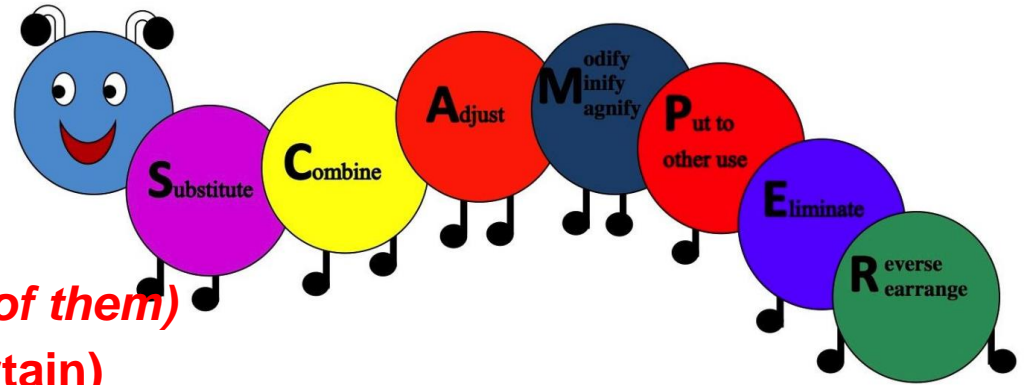


Let's try one of the first steps to invention: Identifying Often called Brainstorming a Problem!



SCAMPER ITEMS

1. Simple (not a lot of parts)
2. Inexpensive (*will need a few of them*)
3. Unknown (actual use is uncertain)
4. Hand-held



SCAMPER LESSON

1. Teams of 2 or 3
2. Each team does all sections
3. Write down what they did to the object and what can be done with it
4. Each team reports on different section

SCAMPER Worksheet

Name:

Date:

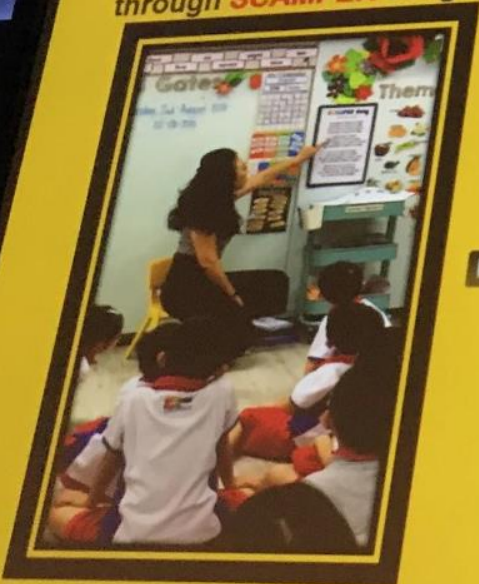
Instructions: SCAMPER techniques are best used to improve and test an idea during the invention process. To learn how to SCAMPER, use a common object such as a paper bag, paper clip, comb, etc. Close your eyes and listen as someone reads each strategy aloud. Imagine in your "minds eye" what changes might happen if you perform each strategy to it. Record your ideas and be prepared to discuss your best changes.

What you would do

How it would change and what can you do with it now

<p>Substitute What else? Who else? Other materials? Other approaches?</p>	
<p>Combine Combined units? Combined ideas?</p>	
<p>Adapt Other ideas? What else is like this? New uses?</p>	
<p>Modify New form? Add to? Take away?</p> <p>Magnify Greater frequency? Stronger? Higher? Longer?</p> <p>Minify Condensed? Omit? Subtract?</p>	
<p>Put to Other Use New uses? If modified, how would you use it?</p>	
<p>Eliminate Remove parts of it</p>	
<p>Rearrange Interchange components? New pattern or layout? Sequence? Transpose cause and effect</p> <p>Reverse Positive to negative? Opposites? Reverse roles?</p>	

Teaching one step at a time
through **SCAMPER** song!



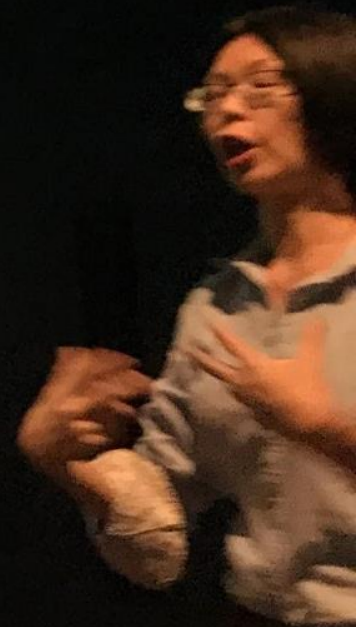
SCAMPER Song

Tune: Farmer in the Dell

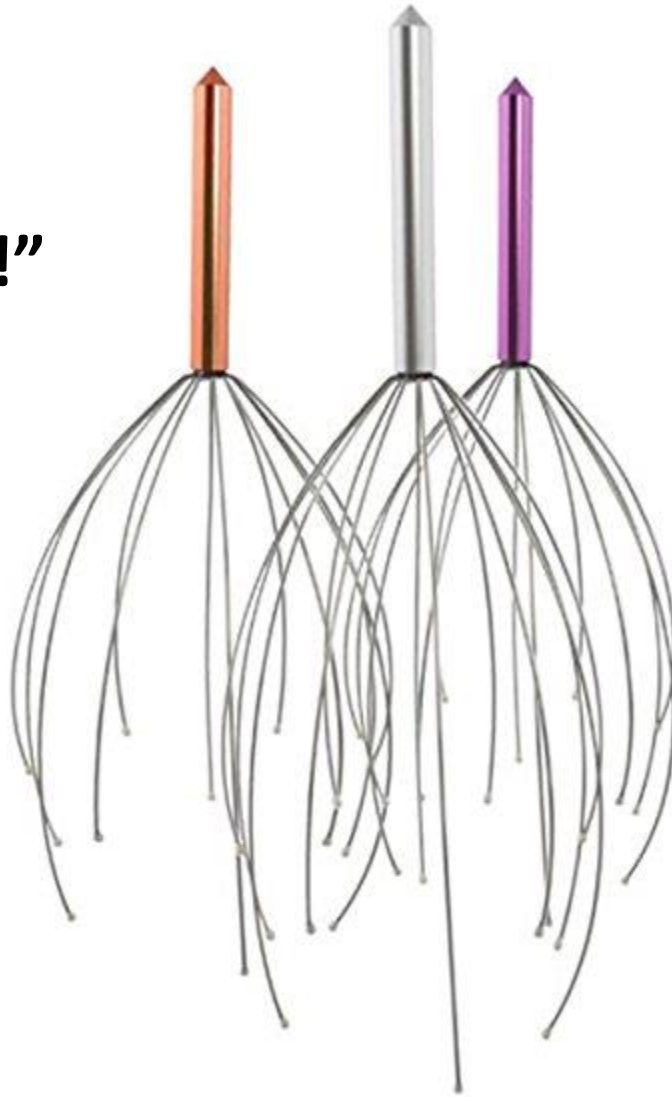
Scamper's here to help
Scamper's here to help
Don't worry I'll be there
Scamper's here to help
Substitute a part
Combine it with a thing
Adapt / Adjust to make it work
Oh, Scamper's here to help!

Can we make it big?
Can we make it small?
Or put the thing to other use?
Oh, Scamper what a sight!
What can we remove
Reverse or rearrange
Our little minds can be great
So, come on let's begin!

COURTESY: PCF HILLION, SINGAPORE



**“That one’s a
real
Head Scratcher!”**



Get them thinking: Team Marketing Report

1. What did you do to the item?
2. How can it be used now?
3. How much would you sell it for? What would an ad in a magazine look like?
4. What would a TV commercial look like?
5. Where would you sell the product?
(store?, radio?, TV?, Internet?)
6. What might go wrong or break?
7. How could you fix that problem?

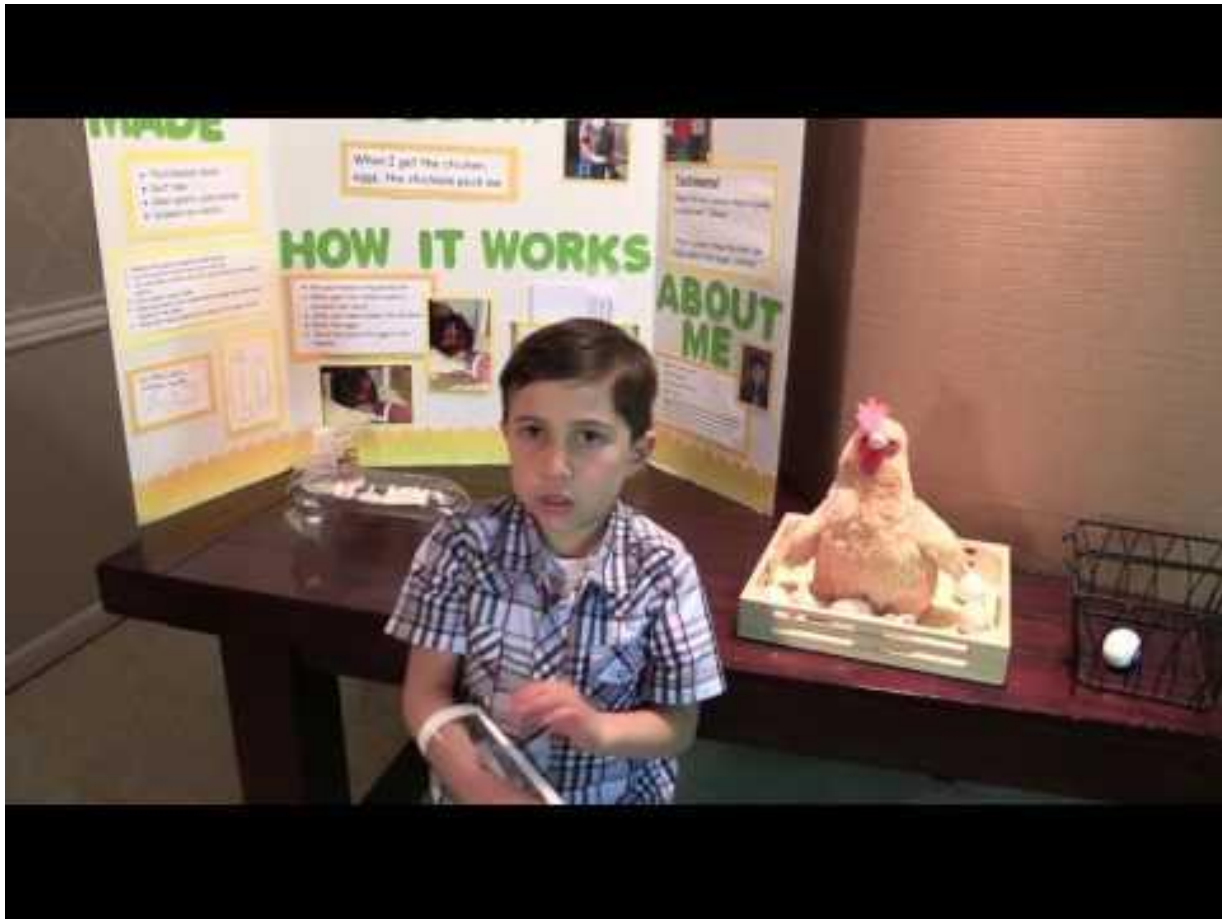
Market & Profit
great lesson to
reinforce these
concepts



The Invention Process

Identifying

Understanding





Learning technological principles
through analysis of
structure, function and operation.

Take-Apart

TAKE-Apart is **NOT BREAK-Apart**

All devices were **assembled in a logical** manner
and
they can be **taken apart in a logical** manner

By learning how things can be **taken apart**,
students learn how things can be **put together**.

Using Tools for possibly the first time

- You may need to use the following tools in your quest to take the product apart.

- *Phillips-head screwdriver*
- *Flat-head screwdriver*
- *Magnifying Glass*
- *Needle-nosed pliers*



Parts Review

You may come across the following parts in this activity:



Previewing the Product

- Answer the following questions in your packet:
 - What parts of the toy can you see?
 - What does this toy do? How does it do this?
 - How would you go about taking this toy apart?
What is the first step? The second step? Etc.?

Take Apart

- Begin to take the product apart.
- Once you have done so, begin to label each of the parts with a sticky note and take an inventory of the parts in your packet.

Helpful Hints

- Some of the screws may be hidden. You may have to try taking off some of the parts by hand in order to find them.



Helpful Hints

- The white box that you'll see after opening the toy up is the motor. Use a screwdriver or pick to pry open the motor and expose the spring and gears.



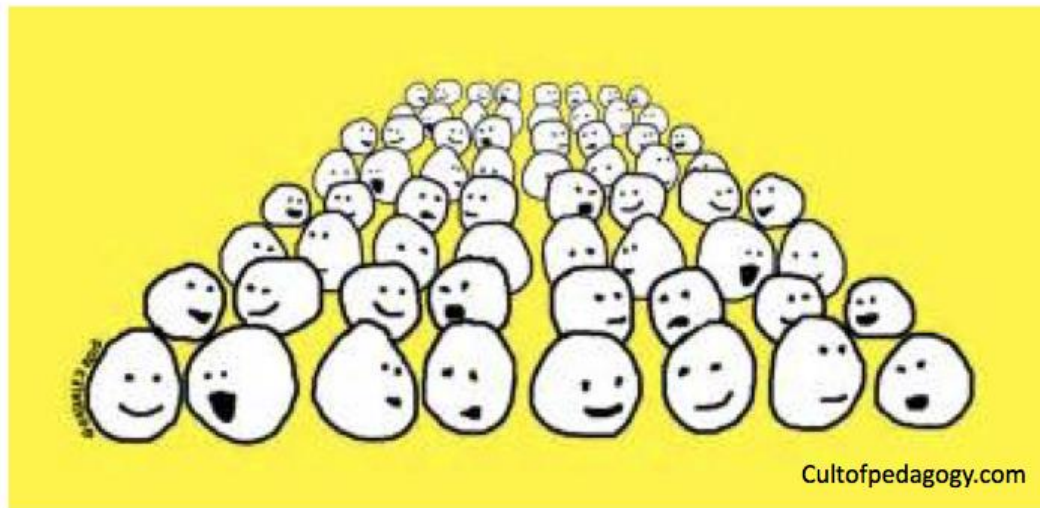
After Taking it Apart...

- Why are some of the parts made of metal and some made of plastic?
- How could you use parts like these in your own invention?
- If you have time, try putting it back together. This is *very* challenging!

After Taking it Apart...

- Reflect upon how your original model was different.
- Introduce how your toy works to your partner.

How could you implement these strategies in your classroom?

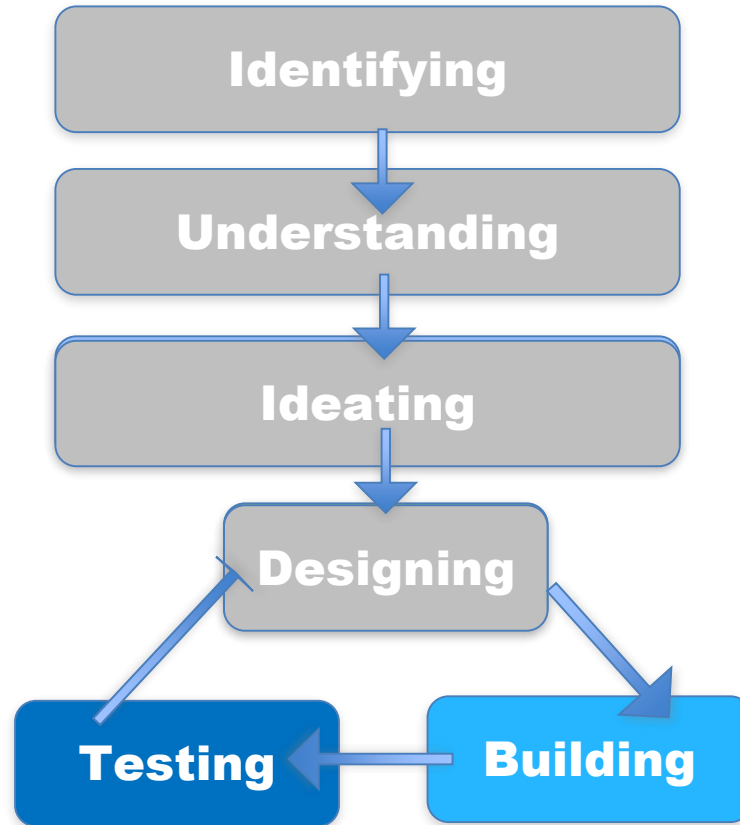


3-5 Curriculum

<https://www.dropbox.com/sh/qg7zrogtb5e24j2/AAoZUqdiyZdCumAlizsQ5TOa?dl=0>



The Invention Process





Channel 3 Breaking News



- October 27 2018
- San Diego CA– A tractor trailer carrying nuclear waste has reportedly turned over on the Coronado Bridge in San Diego, CA. California State Police are at the scene of the accident and have begun evacuating residential and commercial properties within one mile of the incident due to the potential for a nuclear waste spill. The driver has been transported to a local hospital and is currently in serious condition.
- All traffic to the island has been halted as the Coronado Bridge is the major thoroughfare connecting San Diego and Coronado.



What questions do you have about this report? Take 5 minutes to write questions and discuss.



Initial Report from DEEP

TO: McVac Environment and Clear Harbors Emergency Response Teams
FROM: Macky McCleary, Deputy Commissioner, Environmental Quality, CA DEEP
DATE: October 27, 2018
SUBJECT: Nuclear Waste Clean-up

The tractor trailer involved in the incident on the Coronado Bridge, in San Diego CA this morning was headed to a nuclear waste disposal facility loaded with spent radioactive material. It is imperative that the spill on the bridge be contained and taken to the disposal facility without any harm to the surrounding areas, including downtown. You will be working together to accomplish this task. As more information becomes available, the California Department of Energy and Environmental Protection (DEEP) will pass it along to you.

Your Task



You will design a solution to clean up the nuclear waste (*the marbles*)...San Diego is depending on you!

FIRST: Write down things you need to be aware of/concerned with when cleaning up nuclear waste. Think about yourself and the environment.

As you complete the task, fill out a group copy of the Invention Log.

Timer: 5 minutes



DEEP ALERT

TO: McVac Environment and Clear Harbors Emergency Response Teams
FROM: Macky McCleary, Deputy Commissioner, Environmental Quality, DEEP
DATE: October 27, 2018
SUBJECT: Clean-up Confirmation and Materials

Thank you for your correspondence via your telephone call. We have all of the equipment necessary to begin this clean-up operation. As always, your safety is of the utmost important to us. As such, the following conditions must be followed by your employees:

- a) Keep your hands and feet away from the nuclear material at all times.
- b) Your hands must stay at least 1 meter away from the material at all times.

I will be on site to supervise the clean-up and the removal of the material. Please refer to the attachment for the equipment list.

Email Attachment

- Please be advised that the California Department of Energy and Environmental Protection will be providing the following materials to the Emergency Response Teams.
 - Clay
 - Paper Clips
 - Rubber Bands
 - Scissors
 - Crayons
 - Balloons
 - Ruler
 - Cotton Balls
 - Popsicle® sticks
 - Paper
 - *Marbles, the nuclear waste material...be careful!*



Begin to design your nuclear waste removal apparatus (on paper).

Timer: 10 minutes



TO: McVac Environment and Clear Harbors Emergency Response Teams
FROM: Macky McCleary, Deputy Commissioner, Environmental Quality, CA DEEP
DATE: October 27, 2018
SUBJECT: Clean-up Materials

- All of the materials provided by the DEEP have been delivered to the site of the tractor trailer incident. I have also been informed that we are approaching the allowable exposure limit, so we can only get one chance at recovering all of the materials before we must evacuate the area.
- I will alert you again when I get more information, so please **begin assembling the nuclear waste removal apparatus.**

Timer: 10 minutes



TO: McVac Environment and Clear Harbors Emergency Response Teams
FROM: Macky McCleary, Deputy Commissioner, Environmental Quality, DEEP
DATE: October 27, 2018
SUBJECT: Clean-up Materials

With time running out, I have also been informed by the Nuclear Regulatory Commission that we are approaching the allowable exposure limit. Your crews have about 5 minutes left before they need to evacuate. A timer will be connected to a mega-horn at the scene which will be buzzing when it is time to evacuate ASAP.

**Test your apparatus. RECORD YOUR WORK UNDER STEP 5:TEST
IN THE STUDENT JOURNAL**

Timer: 5 minutes



TO: Macky McCleary, Deputy Commissioner, Environmental Quality, CA DEEP
FROM: McVac Environment and Clear Harbors Emergency Response Teams
DATE: October 27, 2018
SUBJECT: Nuclear Waste

- Due to the levels of exposure, the current teams need to leave. New teams are coming in. Please leave your apparatus and vacate the area. Leave your log.
- You will be assigned a new apparatus.
- Test the apparatus first, then if you feel that it is necessary, please send additional resources to the site.
- **You may add to the original design and retest. RECORD YOUR WORK ON THE TEST(CONTINUED) PAGE**

Timer: 10 minutes



TO: McVac Environment and Clear Harbors Emergency Response Teams
FROM: Macky McCleary, Deputy Commissioner, Environmental Quality, CA DEEP
DATE: October 27, 2018
SUBJECT: Evaluation

The California DEEP requests that you present your solution(s) that contained the nuclear waste spill earlier today. This is so that the agency can evaluate the effectiveness of the solution and make recommendations to address future nuclear waste spills. We also require you to submit a log of your solution and the process of developing it.

We will begin our press conference now, thank you for participating.

Breaking News

- October 27, 2018 1:00 PM
- San Diego, California (Associated Press) – The tractor trailer incident previously reported on the Coronado Bridge, in San Diego has been rectified. Environmental clean-up crews from Emergency Response spent the morning and afternoon containing the spill and removing it to a nuclear waste disposal facility.
- Fortunately, the crews were able to prevent the spill from seeping into the Bay. Residents and businesses within 1 mile of the spill were forced to evacuate during the spill and its clean-up. The driver of the tractor trailer was sent to Sharp Coronado Hospital in Coronado and has been upgraded to fair condition from critical condition earlier this morning. After the spill clean-up and subsequent investigations, residents and business were allowed back in the area.

Adding different constraints

- Bigger marbles
- Use something besides marbles
- You could use liquid in a pan, instead of marbles



<http://www.nationalinventioncurriculum.org/>

Curriculum Links

K-2 Curriculum


<https://www.dropbox.com/sh/pg7u1zayfn7c88n/AAAhKZ0X4DF4WRx3HNiuC-gEa?dl=0>

3-5 Curriculum

<https://www.dropbox.com/sh/qg7zrogtb5e24j2/AAAoZUqdiyZdCumAlizsQ5TOa?dl=0>

6-8 Curriculum

<https://www.dropbox.com/sh/35ywma4edk0qqob/AAB4Aa2WqBeYftscKzmjdX5Aa?dl=0>



2019 California Invention Convention Competition

Apr. 13th at Maxim Integrated - San Jose

1. School is provided Invention Convention Program Materials

2. School rolls out program locally and students compete to advance to State Competition

3. Selected students attend State Invention Convention & Entrepreneurship Competition



Local Implementation Steps

1. Lead teacher chosen at site - signs up school in November
2. Information will be available on Website
3. Define Local Program Scope
4. Roll Out Program to Teachers, Students and Parents
5. Host Local (School or District) Competition & Select Students to Advance to State Competition
6. Stipend to first 20 Title One teachers to implement - link on website.
7. Ask an Expert program - more information to be sent by email.



Local Implementation Steps

Step 2. Access Materials from Website

- Activities
- Invention Log
- Links to NGSS Lesson Plans
- Videos
- Additional Resources
 - All materials referenced in training that you can use with your students & parents
 - Materials to help you run your Invention Convention including judging rubrics.



Local Implementation Steps

Step 3. Define Local Program Scope

- How will you implement?
 - o As part of the curriculum day (Recommended)
 - o As an afterschool program/workshop
 - o Independent home-based program



Local Implementation Steps

Step 3. Defining your program (continued)

- Will you allow teams of two?
- Will your inventors compete? If so, when?
- How will you determine which inventors to advance to the State Final?

Contact California Invention Convention as needed.



Local Implementation Steps

Step 4. Rolling out your local program:

- Share your timeline:
- IC Rubric
- Invention Log
- Lesson Plans
- Parent letter, and many other materials available



Local Implementation Steps

Step 5. Hosting your local competition

- Judges
 - o Recruiting
 - o Training (available on website)
- Judging
 - o Where/when
 - o Rubric
- Certificates
- Share the great news - Press Releases



National Invention Convention & Entrepreneurship Expo (NICEE)

Inventors from our State Invention Convention competition will receive national recognition for their solutions to everyday problems at the National Invention Convention and Entrepreneurship Expo (NICCE) in Detroit, Michigan @ The Henry Ford Innovation Museum May 30-June 2.

36 states, 400+ students will be represented; **California Invention Convention** will send it's best inventors for a chance to compete, to be celebrated & recognized, along with winning awards.



What to Expect from your
California Invention Convention Team?

School Educators & District Coordinator Communication

- Program Critical Dates
- Downloadable Videos & Program Materials
- State Competition Online Student Registration Details
- Complete State Competition Event Day Details
- PR Opportunities for the District
- One-on-One Support as needed



What to Expect from your
California Invention Convention Team?

Other Opportunities for Your Students & Educators:

- Continuing Education Webinars & Development
- Inventor Experience Field Trips
- Contest Recognition
- Patent Consultation (case by case)

