CITIZEN SCHOOLS

The Design Process

1

Understand the problem

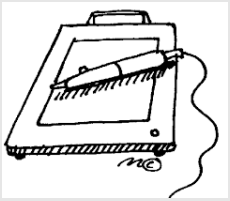
2

Do you face this challenge anywhere else?

Generate Ideas

What do you do there?

3



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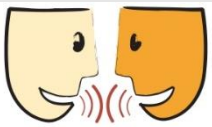
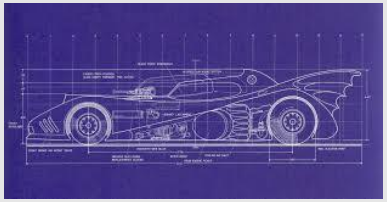


Talk about it!

Design



Draw it!

5

6

Test and Assess

7

What was it supposed to do?

Talk about it and…

8

Where can we go from here?

Sources—1:playinggrownups.com; 2:Alexis Hair; 3:coolclips.com; 4:sweffling.wordpress.com; 5:myconfinedspace.com; 6:safedriving.wordpress.com; 7:clipartpanda.com; 9:imgkid.com

1 CAR: EXIT TICKET NAME:

This lesson introduces you to the design process.

1.1 WHAT DID YOU THINK ABOUT TO BUILD YOUR CAR?

1.2 WHAT RESTRICTIONS DID YOU HAVE TO CONSIDER?

1.3 HOW DID YOU COME TO CHOOSE YOUR FINAL IDEA? (WHAT IDEAS DID YOU HAVE TO ELIMINATE? WHY?)

1.4 HOW DID YOUR VEHICLE PERFORM? WAS IT AS EXPECTED?

1.5 NOW THAT YOU ARE AWARE OF THE DESIGN PROCESS, WHAT WOULD YOU HAVE DONE DIFFERENTLY TO ACHIEVE YOUR GOAL?

Apprenticeship
Design Thinking/LESSON 1

CITIZEN SCHOOLS

UNDERSTANDING THE PROBLEM

Restate the Problem in your own words.

What is success?

Describe the device and the brown bag at the end of a successful test. How do you know if the test was successful?

What can hold you back?

What are your constraints? How much time do you have? What can you use to build your device?

Why is this a problem?

What would happen if the device couldn't carry the bag nor travel far?

Do you understand the problem now?

Now that you understand the problem, move on to Idea Generation

Apprenticeship
Design Thinking/LESSON 1

CITIZEN SCHOOLS

GENERATING IDEAS

Look at the examples of transportation given. Now try to come up with 2-3 more that you have seen before.

How is transportation used in the real world?

How do your examples demonstrate transportation?

What does it mean to transport an item?

How can these concepts be applied to your device?

Now Think About Your device!

LET'S THINK OF IDEAS!!

On the back of this paper, draw, describe, show a brain tree, or use whatever method you like to generate ideas to create a device to carry your bag.

Got your ideas?

Now that you have your ideas, you can move on to evaluating and comparing your solutions!

Apprenticeship
Design Thinking/LESSON 1

CITIZEN SCHOOLS

Look at your Design ideas!

What are the pros and cons of each?

Which design do you think fits in the constraints and will transport the bag the best? Why do you think this design Is the best? Justify your choice with 2 each of strengths and flaws.

Prediction?

On a scale of 1-10(ten being the best) how well do you predict your design will transport the bag?

Evaluating and Comparing

Build and Test It!!!

Were you able to construct your design as planned?

On the same 1-10 scale, how well and how far did your device transport the bag? Did it perform as expected? Why or why not? If you could do it over what, if anything, would you do differently?

Draw your final result.

2 THROWING THINGS: EXIT TICKET NAME:

This lesson focuses on designing your solutions to the problem.

2.1 WHAT WERE THE BIGGEST PROBLEMS YOU FACED WITH THE ACTIVITY?

2.2 HOW WELL DID YOUR DESIGN WORK?

2.3 WHAT WOULD YOU DO DIFFERENTLY IF YOU WERE TO DO THIS AGAIN?

2.4 HOW DID YOUR BRAINSTORMING SESSION AFFECT YOUR FINAL DESIGN?

2.5 WHY DO YOU THINK BRAINSTORMING MULTIPLE IDEAS IS IMPORTANT IN DESIGN?

Apprenticeship
Design Thinking/LESSON 2

CITIZEN SCHOOLS

UNDERSTANDING THE PROBLEM

Restate the Problem in your own words.

What is success?

Describe the device and the lunch bag at the end of a successful test. How do you know if the test was successful?

What can hold you back?

What are your constraints? How much time do you have? What can you use to build your device? What is stopping you from getting the bag into the trash?

Why is this a problem?

Why does the bag need to be thrown away? What would happen if the device couldn't transport the bag into the trash?

Do you understand the problem now?

Now that you understand the problem, move on to Idea Generation

Apprenticeship
Design Thinking/LESSON 2

CITIZEN SCHOOLS

GENERATING IDEAS

Look at the examples of transporting items around an object without touching the ground. Now try to come up with 2-3 more that you have seen before.

How is transportation that doesn't touch the ground used in the real world?

How do your examples demonstrate transportation around an object without touching the ground?

What does it mean to transport an item around an object without touching the ground?

How can these concepts be applied to your device?

Now Think About Your device!

LET'S THINK OF IDEAS!!

On the back of this paper, draw, describe, show a brain tree, or use whatever method you like to generate ideas to create a device to carry your bag beyond the wall and into the trash.

Got your ideas?

Now that you have your ideas, you can move on to evaluating and comparing your solutions!

Apprenticeship
Design Thinking/LESSON 2

CITIZEN SCHOOLS

Evaluating and Comparing

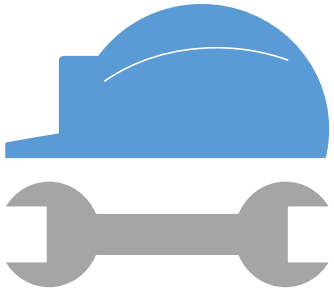
Look at your Design ideas!

What are the pros and cons of each?

Which design do you think fits in the constraints and will carry the bag the best? Why do you think this design is the best? Justify your choice with 2 each of strengths and flaws.

Prediction?

On a scale of 1-10(ten being the best) how well do you predict your design will carry the bag to the trash?

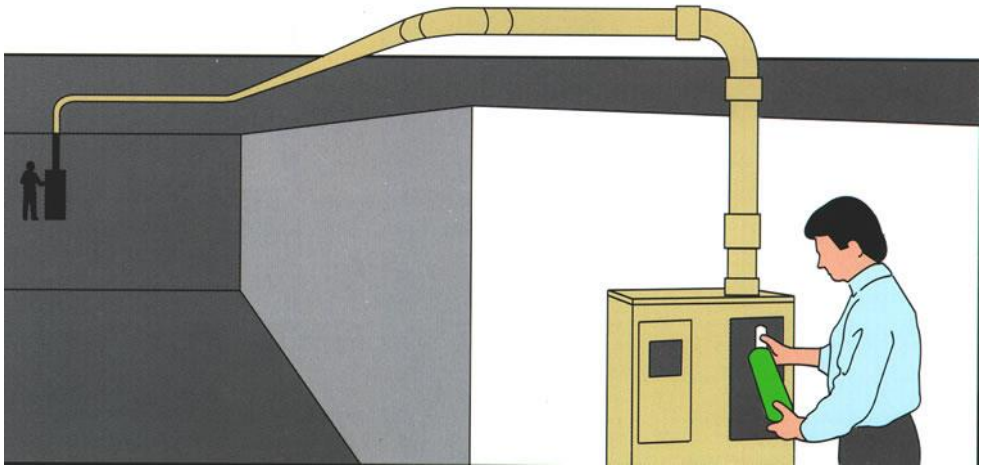


Build and Test It!!!

Were you able to construct Your design as planned?

On the same 1-10 scale, how close did your bag get to the trash? Did your device perform as expected? Why or why not? If you could do it over what, if anything, would you do differently?

Draw your final result.



3 EGG DROP: EXIT TICKET NAME:

This lesson focuses on designing your solutions to the problem.

3.1 WHAT WERE THE BIGGEST PROBLEMS YOU FACED WITH THE EGG DROP?

3.2 HOW WELL DID YOU EGG PROTECTOR WORK?

3.3 WHAT WOULD YOU DO DIFFERENTLY IF YOU WERE TO DO THIS AGAIN?

3.4 HOW DID YOUR MATERIALS AVAILABLE AFFECT YOUR DESIGN?

3.5 WHY DO YOU THINK DRAWING PICTURES AND WRITING INSTRUCTIONS IS IMPORTANT IN DESIGN?

Apprenticeship
Design Thinking/LESSON 3

CITIZEN SCHOOLS

UNDERSTANDING THE PROBLEM

Restate the Problem in your own words.

What is success?

Describe the egg at the end of a successful test. How do you know it was successful?

What can hold you back?

What are your constraints? How much time do you have? What are your materials? How many eggs do you have to test with?

Why is this a problem?

What is special about an egg that requires protection? What would happen if it isn't protected?

Do you understand the problem now?

Now that you understand the problem, move on to Idea Generation

Apprenticeship
Design Thinking/LESSON 3

CITIZEN SCHOOLS

GENERATING IDEAS

Look at the examples of protection given. Now try to come up with 2-3 more that you have seen before.

How is protection used in the real world?

How do your examples demonstrate protection?

What does it mean to protect?

How can these concepts be applied to your egg?

Now Think About Your Egg!

LET'S THINK OF IDEAS!!

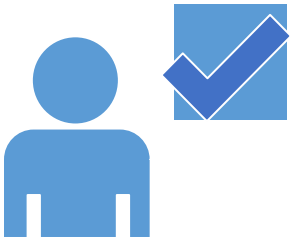
On the back of this paper, draw, describe, show a brain tree, or use whatever method you like to generate ideas to protect your egg.

Got your ideas?

Now that you have your ideas, you can move on to evaluating and comparing your solutions!

Apprenticeship
Design Thinking/LESSON 3

CITIZEN SCHOOLS



Evaulaing and Comparing

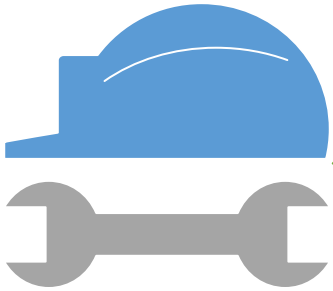
Look at your Design ideas!

What are the pros and cons of each?

Which design do you think fits in the constraints and will protect the egg the best? Why do you think this design Is the best? Justify your choice with 2 each of strengths and flaws.

Prediction?

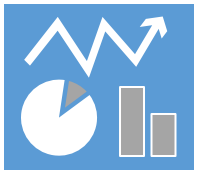
On a scale of 1-10(ten being the best) how well do you predict your design will protect the egg?



Build and Test it!!!

Were you able to construct your design as planned?

On the same 1-10 scale, how well did you protect the egg? Did it perform as expected? Why or why not? If you could do it over what, if anything, would you do differently?



Draw your final result.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4 DISPLAYING INFO: EXIT TICKET NAME:

This lesson focuses on designing your solutions to the problem.

4.1 WHAT METHOD DID YOU CHOOSE TO DISPLAY LUNCH INFORMATION?

4.2 WHO WOULD UPDATE THE INFORMATION EACH DAY?

4.3 HOW DID YOU MAKE THE INFORMATION EASY TO UNDERSTAND?

4.4 HOW DID YOUR MATERIALS AVAILABLE AFFECT YOUR DESIGN?

4.5 WHAT WOULD YOU DO DIFFERENTLY NEXT TIME? WHY?

Apprenticeship
Design Thinking/LESSON 4

CITIZEN SCHOOLS

UNDERSTANDING THE PROBLEM

Restate the Problem in your own words.

What is success?

What would students know if your design is successful? What is success when sharing information?

What can hold you back?

What are your constraints?
How much time do you have?
What are your materials?
How often can you test your design?
What causes people to misunderstand information?

Why is this a problem?

How do people learn new information?
What are barriers to learning new information?

Do you understand the problem now?

Now that you understand the problem, move on to Idea Generation

Apprenticeship
Design Thinking/LESSON 4

CITIZEN SCHOOLS

GENERATING IDEAS

Look at the three provided examples of how people share information. Now try to come up with 2-3 more that you have seen before.

How do people share information in the real world?

How do your examples share information?

What does it mean to understand information?

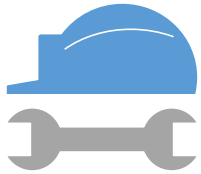
How can you apply these concepts to telling students the meal of the day?

Now Think About Your Information!

Got your ideas?

LET'S THINK OF IDEAS!!

On the back of this paper, draw, describe, show a brain tree, or use whatever method you like to generate ideas to share your information.



Now that you have your ideas, you can move on to evaluating and comparing your solutions!

Apprenticeship
Design Thinking/LESSON 4

CITIZEN SCHOOLS

Look at your Design ideas!

What are the pros and cons of each?

Which design do you think fits in the constraints and will share the meal of the day best? Why do you think this design Is the best? Justify your choice with 2 each of strengths and flaws.

Prediction?

Out of 10 students getting lunch, how many do you think will know the meal of the day because of your design? On a scale of 1-10, how easy is it to use your design?

Evaluating and Comparing

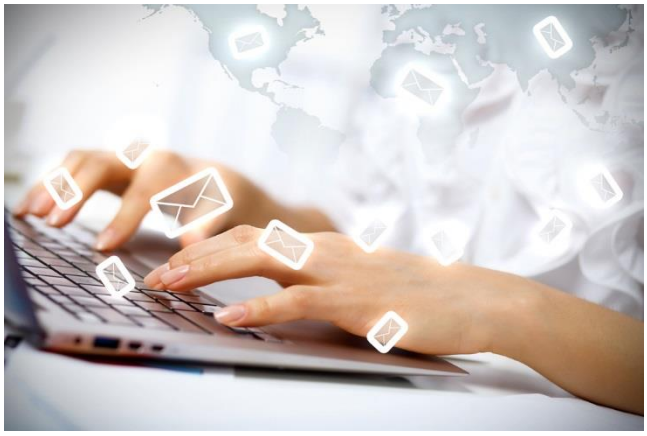
Build and Test It!!!

Were you able to construct your design as planned?

How many students found your design easy to use and understand? Why or why not? If you could do it over what, if anything, would you do differently?

Draw your final result.


EXIT



5 IDENTIFYING THE CHALLENGE: EXIT TICKET NAME:

This lesson focuses on designing your solutions to the problem.

5.1 SELECT THREE PROBLEMS FROM THE PREVIOUS ACTIVITY.

1)

2)

3)

5.2 WHY DID YOU CHOOSE THESE THREE PROBLEMS?

5.3 WHAT PART OF LUNCH TIME HAD THE MOST PROBLEMS?

5.4 WHICH OF THESE PROBLEMS DO YOU WANT TO SOLVE?

6 IDEA GENERATION: EXIT TICKET NAME:

This lesson focuses on designing your solutions to the problem.

6.1 BRAINSTORM AS MANY DIFFERENT SOLUTIONS TO YOUR PROBLEM AS YOU CAN.

6.2 WHICH OF THESE SOLUTIONS CAN YOU REASONABLY CREATE WITH YOUR RAFT KITS?

6.3 WHICH OF THESE SOLUTIONS IS YOUR FAVORITE? WHY?

7 DESIGN AND PROTOTYPING: EXIT TICKET NAME:

This lesson focuses on designing your solutions to the problem.

7.1 DRAW A FRONT-VIEW OF YOUR DESIGN.

7.2 DRAW A SIDE-VIEW OF YOUR DESIGN.

7.3 DRAW A TOP-VIEW OF YOUR DESIGN

8 CONSTRUCTION & TESTING 1: EXIT TICKET NAME:

This lesson focuses on building and testing your solutions to the problem.

8.1 HOW DID CONSTRUCTING YOUR DEVICE GO? WERE THERE ANY COMPLICATIONS?

8.2 WHEN TESTING YOUR DESIGN, DID IT WORK AS WELL AS YOU HOPED? EXPLAIN.

8.3 IS YOUR DESIGN SPACE FULLY CLEANED UP? (THIS SHOULD BE A SIMPLE YES)

8.4 HOW DID YOUR MATERIALS AVAILABLE AFFECT YOUR DESIGN?

8.5 WHAT WOULD YOU DO DIFFERENTLY NEXT TIME? WHY? PLEASE LIST ANY SUPPLIES YOUR TEAM WOULD LIKE TO REQUEST FOR NEXT WEEK'S CONSTRUCTION PERIOD.

9 CONSTRUCTION & TESTING 2: EXIT TICKET NAME:

This lesson is the final week of building your solutions to the problem.

9.1 DID YOU REDESIGN ANY PART OF YOUR PRODUCT BASED ON THE RESULTS OF YOUR TESTS? IF SO, WHAT DID YOU CHANGE AND WHY?

9.2 ARE YOU SATISFIED WITH YOUR FINAL PRODUCT? EXPLAIN.

9.3 IS YOUR DESIGN SPACE FULLY CLEANED UP? (THIS SHOULD BE A SIMPLE YES)

9.4 DID YOU HAVE A GOOD EXPERIENCE BUILDING YOUR DESIGN(S)? WHY OR WHY NOT? WHAT COULD HAVE MADE THE ACTIVITY BETTER?

10 Sharing Solutions: Exit Ticket Name:

This lesson is the final week of building your solutions to the problem.

10.1 Is your space fully cleaned up? (This should be a simple yes)

10.2 What is one piece of positive feedback you received about your design today?

10.3 If you could change one thing on your design, what would it be?

10.4 Write down what you know about our WOW!:

- When:
- Where:
- What:

10.5 Talking about the project amongst your peers should be a positive experience. Did you enjoy discussing solutions? Why or why not? What could have made the activity better?

Lesson 1

Batmobile image: http://www.carsguide.com.au/car-news/2016-batmobile-revealed-28553

Bucket image: http://www.lowes.com/pd_39130-1738-20000_0__?productId=3033026

Carrier truck image: http://www.eaton.com/Eaton/ProductsbyMarket/Government/Vehicles/FederalVehicles/GSAVehicles/VehicleCarrier/index.htm

Robot carrier image: http://www.engadget.com/2009/08/27/video-human-carrying-robot-bear-gets-cuteness-upgrade/

Lesson 2

Catapult image: http://zombiesymmetry.com/2014/08/08/back-in-the-day-my-highly-lethal-latin-class-projects/

Tube system image: http://www.lkgoodwin.com/more_info/eagle_air_lift/eagle_air_lift.shtml

Trashcan image: http://www.shutterstock.com/pic-133155233/stock-photo-a-trashcan-full-of-crumpled-paper.html?src=PS5DwrRy6S3EBRIUs8iKRA-1-1

Lesson 3

Eggs image: http://inhabitat.com/plant-based-beyond-eggs-taste-like-the-real-thing-without-environmental-or-ethical-impact/beyond-egg-plant-based-substitute/

Police image: http://www.wolfcomusa.com/

Airbag image: http://www.adina.com/newsg-D17.shtml

Net image: http://www.herculesslr.com/products/fall-protection/netting-guardrail/personnel-netting-sinco-adjust-a-net/

Lesson 4

Email image: http://www.starsandstripesmkt.com/wp-content/uploads/2014/12/Email-Marketing.jpg

Burger image: http://aht.seriouseats.com/images/2012/04/20120427-bk-japan-ringo-burger-product-shot.jpg

Meeting image: http://www.mountaingoatsoftware.com/uploads/blog/Executive_Standup_14455836Medium.jpg

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