

**COOPER  
HEWITT**

***BEAUTIFUL USERS***

**TEACHER  
RESOURCE  
PACKET**



Smithsonian Design Museum

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# COOPER HEWITT DESIGN K-12

January 2015

Dear Educator,

Thank you for registering for Design Field Trips! This exciting 90-minute program is designed to present Cooper Hewitt, Smithsonian Design Museum's compelling content to your class(es) through an interactive tour and hands-on workshop.

You have selected to focus your Design Field Trip on *Beautiful Users*, an exhibition that highlights the significant role of the user in design. With the guidance of a Design Educator, your students will critically explore everyday examples of products, spaces, and interfaces that illustrate how designers today are shifting their philosophy from designing *for* people to designing *with* people. During the workshop, students will construct their own design that fits the need of a user based on a unique scenario.

This packet provides several resources on how to how prepare for your museum visit, and what to do after, including pre-visit activities and post-visit ideas to continue integrating design thinking connections into your classroom.

We enjoy receiving feedback from teachers about their experience with the program. Within a month of your museum visit you will be e-mailed a brief survey. Thank you in advance for taking time to provide your feedback so that we can continue to offer a high-quality program for all -12 schools.

Sincerely,



Kimberly Cisneros  
School Program Manager



James B. Reyes  
Education Assistant

## PREPARING FOR DESIGN FIELD TRIP

During your Design Field Trip, the Design Educator assigned to your group will need your support in helping students stay on task. You must remain with the group at all times with the Design Educator. Please review the following museum guidelines and share them with your chaperones and students.

### ARRIVAL & DEPARTURE

- Please arrive 10 minutes before your scheduled start time to check in; you will be greeted at the main entrance (91<sup>st</sup> Street between Fifth and Madison Avenues)
- Non-NYC teachers with a cash payment, please remit to the Visitor Experience Desk
- Coat check will provide large bins to quickly store and retrieve coats and backpacks
- Please call your bus in advance to meet you in front of the main entrance, and exit through the main entrance).

## MUSEUM RULES AND POLICIES

- Please do not touch the objects or lean on the walls; view the objects at a safe distance
- Use only pencils for taking notes or sketching; pens are not permitted
- Food, drinks, and chewing gum are NOT permitted in the museum
- All items entering and leaving the museum are subject to inspection
- Please remain with your assigned group at all times
- Please leave all backpacks and large purses on the bus or at the coat check
- Photography without flash is welcomed; no tripods or selfie-sticks, please

## TAKE AN ACTIVE ROLE

### TEACHER & CHAPERONES

The classroom teacher and chaperones are essential to the success of a group's visit; they can enhance the success of the tour and the amount of learning that can take place by showing active interest in the objects while supervising student behavior.

- Please ensure that you and your group of students (10 students or fewer per chaperone) stay together during your time in the museum (this includes the Shop)
- You and the group chaperones are responsible for keeping track of each student in your group, and for students' proper behavior of their groups (including their respect of museum rules and policies)
- If you have questions, ask a museum staff member for help

### STUDENTS

- Students will be encouraged to share their ideas and work in teams
- Students must stay with their chaperones at all times while in the museum and Shop
- Please do not allow students to touch anything unless signs, museum staff members, or designated volunteers let you know it's okay



## FOR MORE INFORMATION

Please visit our website at [www.cooperhewitt.org/education/school-programs](http://www.cooperhewitt.org/education/school-programs)

## DESIGN THINKING CONNECTIONS

The following pages include pre- and post-Design Field Trip activities. The pre-visit activities are suggestions for how to help your students prepare for their trip; they are designed to introduce students to concepts that will be discussed during the program. The post-visit activities are suggestions for how to extend your students' thinking beyond the 90-minute program and reinforce your classroom curriculum. For teachers who would like additional ideas, we recommend our free Educator Resource Center (ERC), which offers 400 design-focused lesson plans (available at: <http://dx.cooperhewitt.org/lesson-plans/>).

## PRE-VISIT ACTIVITIES

### DIGEST THE LANGUAGE | ALL GRADES

*SUBJECTS: English, Art, Science | DESIGN PROCESS: Getting Ideas*

*ACTIVITY TYPE: Slideshow and discussion | 30 mins.*

Prior to visiting the museum, it would be helpful to familiarize students with design vocabulary. Using our slideshow as a guide, introduce students to the idea that everything we see and touch was made by a designer for specific functions and users. Each slide presents vocabulary and questions to help you lead a discussion around the selected examples. After, discuss objects in the classroom; examine what their purposes are, and interpret how they are intended to be used.

#### GUIDING QUESTIONS

- What do you think of when you hear the word “design?”
- Who are the users for each of these objects? What are their needs?
- What were the designers' solutions to those needs?

#### VARIATIONS AND EXTENSIONS

Take an informal or formal assessment and compare to final assessments after the post-visit activities.

#### MATERIALS AND RESOURCES NEEDED

If available, a projector and internet connection

Our “What is Design?” slideshow at [www.cooperhewitt.org/education/school-programs](http://www.cooperhewitt.org/education/school-programs)

#### VOCABULARY

See Cooper Hewitt's design vocabulary on Page 13 of the Teacher Resource Packet

#### STANDARDS

Common Core

English Language Arts R.1, 7, 9; SL.1, 2, 4; L.4, 6

Learning Standards for New York State



English Language Arts 1, 2, 4

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## **SIPPABLE, DRIPPABLE CUPS | GRADES K-5**

*SUBJECTS: English, Science | DESIGN PROCESS: Testing and Evaluating*

*ACTIVITY TYPE: Discussion with touchable objects | 45 mins.*

Inform your students that for the next 45 minutes they are investigators, and that their job is to examine a selection of cups and determine who they were designed for. Provide them with a variety (about 5) of cups to explore, such as a sippy cup, plastic cup, paper cup, mug, water glass, etc. The more variety, the better! Display all cups wherever they are most visible to your students, and allow them to pass the cups around. As students analyze the features of the cups and the reasoning behind them, they will begin to understand how designers anticipate needs by studying people. Be sure to emphasize the terms “designer” and “user” throughout the activity.

### **GUIDING QUESTIONS**

- Each of these five objects is a cup, and yet they are all different from each other. Why do you think they all look so different?
- What types of liquids go in each cup?
- What is each cup made of, and why did the designer choose that materials?
- Is the object comfortable to hold/use/etc.? Why or why not?
- If you were to change something about one of these cups to make it work better or make it easier to use, what would you change?
- Who is the typical user of the cups? Who is not the typical user?

### **VARIATIONS AND EXTENSIONS**

- Arrange students in groups and have them compare and contrast their shoes, analyzing the functions and appearances, and the reasons for the differences; look at other types of shoes available, and compare and contrast student and teacher shoes
- Have the students imagine and draw their perfect cup

### **MATERIALS AND RESOURCES NEEDED**

An assortment of different cups (5+)

### **VOCABULARY**

Design, designer, user, function, form, materials, needs

### **STANDARDS**

Common Core

English Language Arts R.1, 2, 7; SL.1

Learning Standards for New York State

English Language Arts Standards 1, 3

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## THE PERFECT FIT: INTRODUCTION TO ERGONOMICS | GRADES K-5

*SUBJECTS: English, Science | DESIGN PROCESS: Testing and Evaluating*

*ACTIVITY TYPE: Hands-on activity | 45 mins.*

Let your classroom become a site of investigation as your students explore the idea of user-centered design and ergonomics! Begin in the classroom with a comparison of the teacher chair and desk and those of the students. In pairs, students can measure the heights of the backs of the chairs, and the distance between the seats and the floor. One team can help measure the teacher's chair. Calculate the differences and discuss why there is such a difference in size. Find and discuss other differences, such as whether or not a chair is adjustable. Discuss how the chairs could be made more comfortable. Discuss how custodians who have to stack the chairs and clean the floors are, in a way, users of the chairs, as well as the buyers of the school furniture.

### GUIDING QUESTIONS

- How do our chairs accommodate a specific user?
- How does the design of the chair respond to the needs of custodians and the people who buy the chairs?
- Why are parts shaped the way they are?
- Why are parts/aspects sized or positioned the way they are?
- How is your school chair different from your chairs at home? Why are they different?
- What would your perfect school chair look like?

### VARIATIONS AND EXTENSIONS

- Arrange students in groups and have them compare and contrast the shoes they own, analyzing the functions and appearances, as well as the reasons for the differences
- Discuss and compare a selection of writing utensils
- Venture outside of the classroom and measure the height and width of staircases, doors, and windows; look at the placement of railings for staircases, and doorknobs; ask students why certain things are placed at the height that they are and are shaped the way they are

### MATERIALS AND RESOURCES NEEDED

Rulers, yardsticks and/or measuring tape

Paper and pencils for recording data

### VOCABULARY

Ergonomics, design solution, function, tool, user

### STANDARDS

Common Core

English Language Arts R.1, 1; SL.1, 2

Mathematics MP 2, 5, 6

Learning Standards for New York State

Mathematics, Science, and Technology Standards 1, 4, 6, 7



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## INEFFICIENCY AND INNOVATION | GRADES 6-12

*SUBJECTS: English, Science | DESIGN PROCESSES: Defining Problems and Getting Ideas*

*ACTIVITY TYPE: Empathy building and design challenge | 45 mins.*

Every once in a while we find ourselves tapping our foot, shaking our heads, or looking at the time, as we wait for something that is taking much longer than it should. Inefficiency can be frustrating. Ask your students where and when they have felt this. Perhaps it was a long wait at a restaurant, a disorganized set-up at a local deli or market, or a commute from an out-of-the-way location using public transportation. You can do this as a group discussion, or you can give your students time to think and then report back to the group. Sharing with the group will be important in sparking memories and ideas in each other. Push your students for details so that they can identify possible sources of the inefficiency. After a handful of ideas have been explored together in-depth, arrange your students in pairs or groups and challenge them to propose some solutions to a problematic system. Their goal is to design a better system so that no one else would have to go through a bad experience like they did. Groups should have some sort of visualization of their ideas; it can be illustrated, written, or represented with a system chart, with evidence of their ideas and restructuring of ideas.

### GUIDING QUESTIONS

- You have been waiting an hour for something that should have only taken five minutes. What are you feeling? How can you tell that someone is frustrated just by looking at them?
- When have you experienced that?
- What were some of the causes, or possible causes, of this inefficiency? Which of these were human error, and which were due to the system itself?
- How could you fix this so that the system could flow more efficiently?

### VARIATIONS AND EXTENSIONS

Focus on problems within the school, and submit proposals to the appropriate authorities for an authentic learning experience.

### MATERIALS AND RESOURCES NEEDED

Pencils and paper for brainstorming

### VOCABULARY

System, design, designer, design solution

### STANDARDS

Common Core

English Language Arts SL.1, 4

Learning Standards for New York State

Mathematics, Science, and Technology Standards 1, 7





## POST-VISIT ACTIVITIES

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### **GOLDILOCKS AND THE THREE OFFENDED BEARS | GRADES K-1**

*SUBJECT: English | DESIGN PROCESS: Defining Problems*

*ACTIVITY TYPE: Empathy building story discussion | 30 mins.*

The foundation of user-centered design is empathy. In order to design something that is helpful to the user, designers need to understand other people's experiences. This engaging story activity will help to build a foundation of empathy in your young learners.

Read a classic story like *Goldilocks and The Three Bears* out loud with the class. As you read, ask students to view the story from the perspective of the three bears. Regularly pause and ask the students how they would feel if they were one of the bears. Each time, also prompt them to offer a suggestion to Goldilocks that would help her not be so disrespectful to the people whose home it is.

#### **GUIDING QUESTIONS**

- How would the bears feel when they saw that someone went into their house when they weren't home?
- How would the bears feel when they saw that someone ate some of their dinner?
- How would the bears feel when they saw that someone was sleeping in their bedroom?
- What would you say to Goldilocks when you found her?
- What could Goldilocks have done differently that would have been more considerate?

#### **VARIATIONS AND EXTENSIONS**

Try a similar approach with any other story! Ask questions that put your students in the shoes of a character and ask what their response would be in the situation.

#### **MATERIALS AND RESOURCES NEEDED**

A copy of the classic story *Goldilocks and the Three Bears*

#### **VOCABULARY**

Empathy

#### **STANDARDS**

Common Core

English Language Arts RL.K.1-3, 10; RL.1.1-3, 9

Learning Standards for New York State

English Language Arts Standards 1, 3, 4

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## DESIGN FOR EXTREME PHYSIQUES | GRADES 2–8

*SUBJECTS: English, Science | DESIGN PROCESSES: Defining Problems and Getting Ideas*

*ACTIVITY TYPE: Design challenge and empathy building | 1 hour*

Think back to the part of the exhibition that focuses on measurements of the human body and how designers use this information to inform their designs. Now think about the “extreme physiques” presented in this section: Arnold, the muscular figure; the conjoined twins; the woman with a bionic arm; and the alien who is a head and chest with a fake human body. What challenges might each of these “extreme physiques” have as they go about their day? Brainstorm some challenges for each body type. For a fun experiential investigation, have your students act out some of these challenges as Arnold or as conjoined twins! To be Arnold, bulk up quickly with scrunched-up newspaper and masking tape. To be conjoined, find a partner and join up with tape or ribbon. Some possible tasks to try: sitting in a chair; fitting through a small door; typing on a computer; fitting into an athletic uniform; etc. Have your students document the challenges, and brainstorm possible solutions as they encounter them. Debrief their experiences and design solutions at the end.

### GUIDING QUESTIONS

- What obstacles does this extreme physique create for you?
- How could you redesign a chair for your new body? A doorway? A computer station?
- What extreme user do you have in your community?

### VARIATIONS AND EXTENSIONS

Think of other extreme physiques to experiment with! Invent your own or be a superhero/villain for an hour

### MATERIALS AND RESOURCES NEEDED

Newspaper, masking tape, ribbon (optional)

### VOCABULARY

User-centered design, form, needs

### STANDARDS

Common Core

English Language Arts R.1, 2; L.6

Learning Standards for New York State

Mathematics, Science, and Technology Standards 1, 7



## LIFEHACKS: OBJECT MODIFICATIONS FOR DAILY LIFE | GRADES 6–8

SUBJECT: English, Math, Science | DESIGN PROCESS: Defining Problems through Evaluating

ACTIVITY TYPE: Design challenge | 45 mins.

Think back to the part of the exhibition “Revenge of the User,” which featured ways in which users modified existing products to fit their needs. These fall under the category of “lifehacks,” shortcuts to make day-to-day experiences easier. Use the design process to lead your students through creating their own lifehack. The design process is essentially a four-step cycle:



1. Defining problems
2. Getting ideas
3. Prototyping and making
4. Testing and evaluating

Each of these four steps spiral into each other; they are not necessarily linear, and there is no one definite solution. Define the problem by using guiding questions to spark ideas on what your students could try to improve. Some potential challenges are how can you make holding a pen or pencil more comfortable, how can you find a way to hold your pens and pencils in your desk without a pencil case, how would you improve your backpack, etc. Have your students brainstorm some design solutions in drawing and writing, then provide them with prototyping materials to modify their object. Have them test and evaluate the effectiveness of their solution. Allow your students to share their work with the class. Ask them what problems their hack solved, and how they could hack it further, or improve their design.

### GUIDING QUESTIONS

- Have you done your own lifehack? Maybe you’ve found a shortcut to school, modified your clothing, or improved a toy, etc
- What minor obstacle do you encounter every day that you want to find a way around?
- What gets in your way a lot that could be kept away, but needs to be accessible?

### VARIATIONS AND EXTENSIONS

Have students choose something such as their backpack, locker, or a desk at home and have them hack some storage solutions, and submit before and after photographs for assessment.

### MATERIALS AND RESOURCES NEEDED

Miscellaneous prototyping tools (paper, aluminum foil, binder clips, tape, staples, rubber bands)

<http://www.ikeahackers.net/>

### VOCABULARY

Design challenge, design solution, function, prototype

### STANDARDS

Common Core

English Language Arts R.1, 2; L.6

Learning Standards for New York State

Mathematics, Science, and Technology Standards 1, 7



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## **MOTOR SKILL CHALLENGE | GRADES 9–12**

*SUBJECT: English, Science | DESIGN PROCESS: Testing and Evaluating*

*ACTIVITY TYPE: Empathy building and design challenge | 45 mins.*

People of different ages have different abilities. Think of how often kindergarteners ask for help with basic tasks like opening jars, or how the same task could be difficult for an older person who is suffering from arthritis. It can be hard to understand these difficulties without experiencing something similar ourselves. This empathy-building activity will place your students in the shoes, or rather, gloves, of someone who faces motor skill obstacles. In this activity, your students will first attempt a simple task on their own; then, they will try the same task with a thick winter glove on. This will mimic the motor difficulties someone might have, such as arthritis. Challenges could include opening jars, holding a mug, cutting paper or string with scissors, and typing on a keyboard or phone. Organize your room into stations according to how many thick winter gloves you have available (you could also try layering gloves), and have a selection of tasks at each station. Ideally every student would have a chance to try something with the gloves. As a class, discuss their experiences in the gloves and brainstorm some possible solutions, or even existing solutions. Have students take a few minutes to think about what tasks they sometimes find challenging, and challenge them to come up with a design solution.

### **GUIDING QUESTIONS**

- How do you think people with arthritis feel as they go through their day?
- How challenging do you think it is to have limitations on your motor skills?
- What might be the emotional impact of having difficulty with basic physical tasks?
- What unique challenges do you have? What would help you with this task?

### **VARIATIONS AND EXTENSIONS**

After your students brainstorm solutions, you can provide them with basic structural and connector tools (like paper, aluminum foil, rubber bands, tape, etc.) to experiment with prototypes.

### **MATERIALS AND RESOURCES NEEDED**

Thick winter gloves (or multiple layered gloves)

Items to manipulate: a twist-off jar, buttons, shoelaces, a mug, keyboard, phone, scissors, something to cut (paper or string)

Paper and pencils for sketching

### **VOCABULARY**

empathy, design solution

### **STANDARDS**

Common Core

English Language Arts SL.1-4

Learning Standards for New York State

Mathematics, Science, and Technology Standards 1, 6, 7

English Language Arts Standard 1



**VOCABULARY**

<b>Design</b>	To make an object that solves a problem
<b>Design challenge</b>	A difficulty or challenge that can be solved through design
<b>Design process</b>	The steps that you take to solve your challenge: <ol style="list-style-type: none"> <li>1. Defining problems</li> <li>2. Getting ideas</li> <li>3. Prototyping and making</li> <li>4. Testing and evaluating</li> </ol>
<b>Design solution</b>	The way, idea, or answer to a design challenge or problem
<b>Designer</b>	A person who creates a new object, idea, or plan
<b>Empathy</b>	The ability to understand what another person is feeling without adopting that emotion as your own.
<b>Ergonomics</b>	The science of designing products to optimize them for human use. Human characteristics, such as height, weight, and proportions are considered, as well as information about human hearing, sight, temperature preferences, and so on
<b>Form</b>	The shape and structure of an object
<b>Function</b>	The way something works, or a purpose of an object <i>e.g., the function of a paper clip is to fasten things together</i>
<b>Materials</b>	The items you are using to represent your ideas
<b>Needs</b>	What the user must have in order to use the design successfully
<b>Prototype</b>	An original model on which something is patterned
<b>Solution</b>	The way, idea, or answer to a problem. There can be more than one
<b>System</b>	A group of related parts that work together
<b>Team</b>	A group working together on a common goal or activity
<b>User</b>	A person who operates or experiences the design
<b>User-centered design</b>	An approach to design that considers the needs of the user throughout the design process

For additional information please visit our website

<http://www.cooperhewitt.org/education/school-programs/>

Or contact us at [chtours2@si.edu](mailto:chtours2@si.edu)

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