

Take Apart Project



Project Description:

What's Inside?

- Students will use tools to take apart an every day houseware to discover what is inside.
- Students will explore, organize and document the parts of their object.
- Students will select the most unique part from their object to explore and consider its purpose, complexities and role within the system of the object.

We use housewares and gadgets every day to help make life easier, more efficient and more enjoyable. If we stop and consider how these objects are made and how they work, it requires us to think about objects in a new way. Have you ever wondered what the inside of a hair dryer looks like? I decided to create a project where students would have the opportunity to find out.

I used everyday gadgets to introduce the Parts, Purposes and Complexities activity with a second grade class at Park Day School. This PPC activity helped the students prepare for my Take Apart Project. The students were learning about immigration at this point of the year. I decided to connect this project to their curriculum by researching famous immigrant inventors, particularly inventors of familiar, everyday objects.

In order to build on our original PPC activity, I decided to stay focused on housewares and everyday gadgets so I could continue to circle back to our earlier discussions, ideas and concepts.

When I introduced the housewares, I emphasized that all of these objects were invented to fulfill a need. I also highlighted the fact that someone found a way to conceptualize, design and create a new object to fulfill this need - sometimes a need that we didn't even know we had.





Nuts and Bolts

I went to a thrift store to look for housewares that were designed in such a way that they could be easily taken apart. I specifically selected non-electronic items, knowing that the insides would be much more interesting to dissect and investigate. I pre-loosened as many of the outer screws and bolts to help streamline the take apart process.

Tools were placed in a central location so all students had easy access to them. The classroom teacher and I circulated during each work session and assisted students as needed.

The Take Apart Project spanned over three one hour sessions:

- Take Apart #1: Outside/Inside
- Take Apart #2: The Most Interesting Part
- Take Apart #3: Organize and Show:
How Do Parts Work Together?

I used Project Zero principles to guide the planning and design of the Take Apart Project. My Throughline represents our overarching goal for the project. The Understanding Goals represent the overarching questions that guided us throughout the project. The Understanding Performances are the specific learning outcomes from the Take Apart Project.

Throughline:

How will the experience of taking apart and tinkering with an everyday houseware affect a student's understanding of the relationship between parts and systems?

Understanding Goals:

- What does the inside of my object look like?
- What is the most interesting part from my object and how does it help my object work?
- How do the parts work together to make my object function?

Understanding Performances:

- Students will take apart a houseware using standard tools.
- Students will explore, organize and document the parts of their object.
- Students will examine one part and its role within the system.

THINGS COME APART

Todd McLellan



Tools:

Screwdrivers:
flat head, Phillips head,
jeweler's, hex; various
sizes and lengths

Power screwdriver

Pliers

Wire cutters

Wrenches

Materials:

Poster board, used as
placemat for object/parts

Recording sheets

11"X17" white paper

Pencils

Gallon-sized ziptop bags

Boxes to transport/store
housewares

Take Apart #1:

I introduced the students to the book, Things Come Apart: A Teardown Manual for Modern Living by Todd McLellan.

The author disassembled and photographed the parts and materials inside everyday objects, ranging from simple a flashlight to a chainsaw. Each part is carefully arranged so the viewer can appreciate the number, size and variation of each part. The photographs of these dissected objects provided the perfect way to kick off this project. I selected a few pages to share and discuss with the students before I introduced our activity.

After a review of the tools, including the names, the purpose of each tool and tool safety, students were introduced to the take-apart task and recording worksheet. Students worked together with their partner to explore their object, drawing the inside as well as what they imagined what was inside on their worksheet.

As the students began taking their objects apart, the room was filled with excited shouts as they discovered what was inside. After all of the groups had taken their objects apart, we stopped and had everyone participate in a "gallery walk" so the students could see what the other objects and parts looked like.





"When me and Max were doing stuff we were like, Why is this thing here? It doesn't need to be here. And then when we were adventuring around, we saw Orla and Linden's and they had this big screw in theirs!"

Our wrap-up discussion for this first session focused on three key questions:

- What did you discover?
- What surprised you?
- What are you wondering about now?

Even though most groups were able to get the majority of their object taken apart, it was clear that we needed to have more time at the beginning of the next session to make sure everything was taken apart before we moved on to the next task.

Take Apart

Names: Noah Eliza

Object: hair dryer

What is this object used for?
Drying wet hair

Draw what your object looks like on the outside:





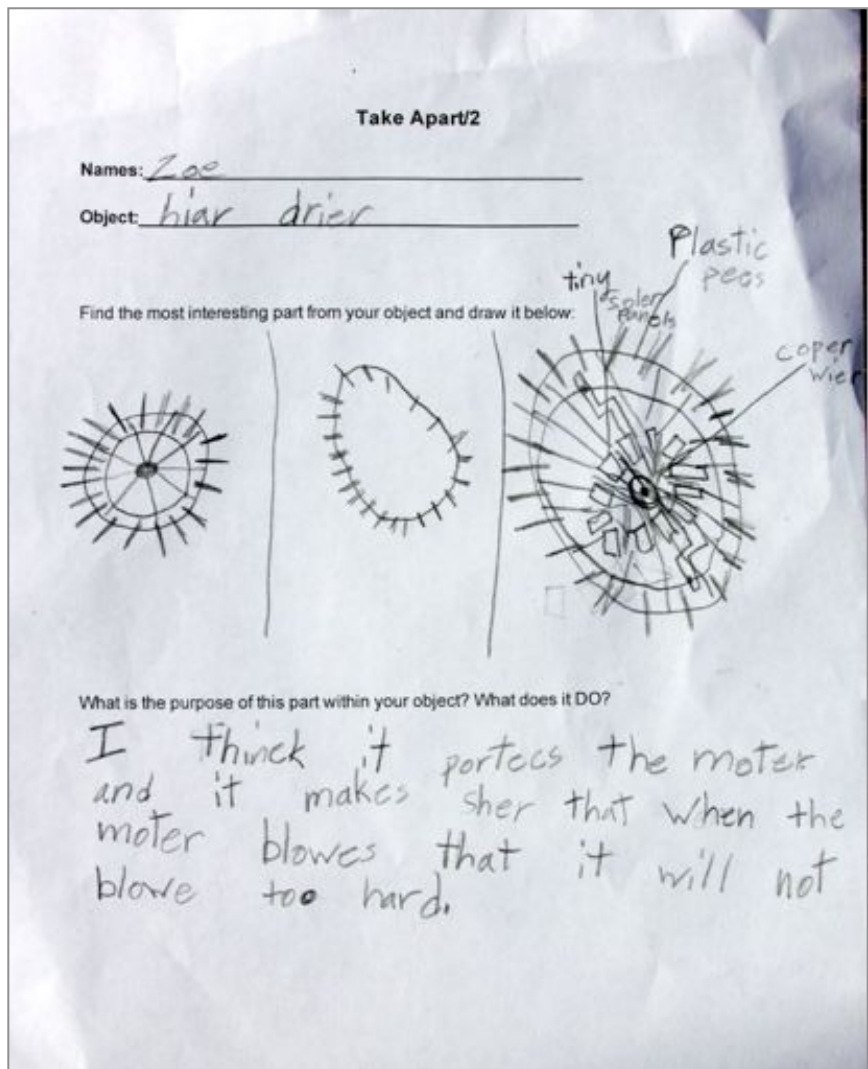
Take Apart #2:

The students were eager to get back to their objects so I used this opportunity to share a few more photographs from the Things Come Apart book. The photographs helped remind the students of the unfinished task at hand as well as the curiosity about what was happening next.

For this second session, I wanted students to have the opportunity to finish dissecting their object and examine the parts more closely. The main focus of this session was for students to select the most interesting part from their object to draw and write about.

Our Housewares:

- 1 hand mixer
- 3 blow driers
- 1 rice steamer
- 1 coffee maker
- 1 electric pencil sharpener
- 1 toaster



Their final task for this session was to arrange all of their parts Todd McLellan-style on their poster board placemats. Later, I photographed each group's layout.

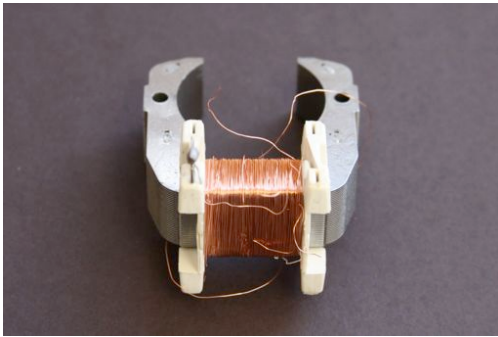


Blow Dryer



Hand Mixer

During our wrap-up discussion, students shared their interesting part, why they selected it and what purpose this part has within the object. Students could pick their own part; they did not have to select the same part as their partner.



A student chose this interesting part from the hand mixer.

The student's writing says:

It connects to a piece that makes the beaters spin.

Take Apart/2

Names: I. S. W. K.

Object: egg beater

Find the most interesting part from your object and draw it below:

What is the purpose of this part within your object? What does it DO?

I + connects to a piece
that makes the beaters spin.

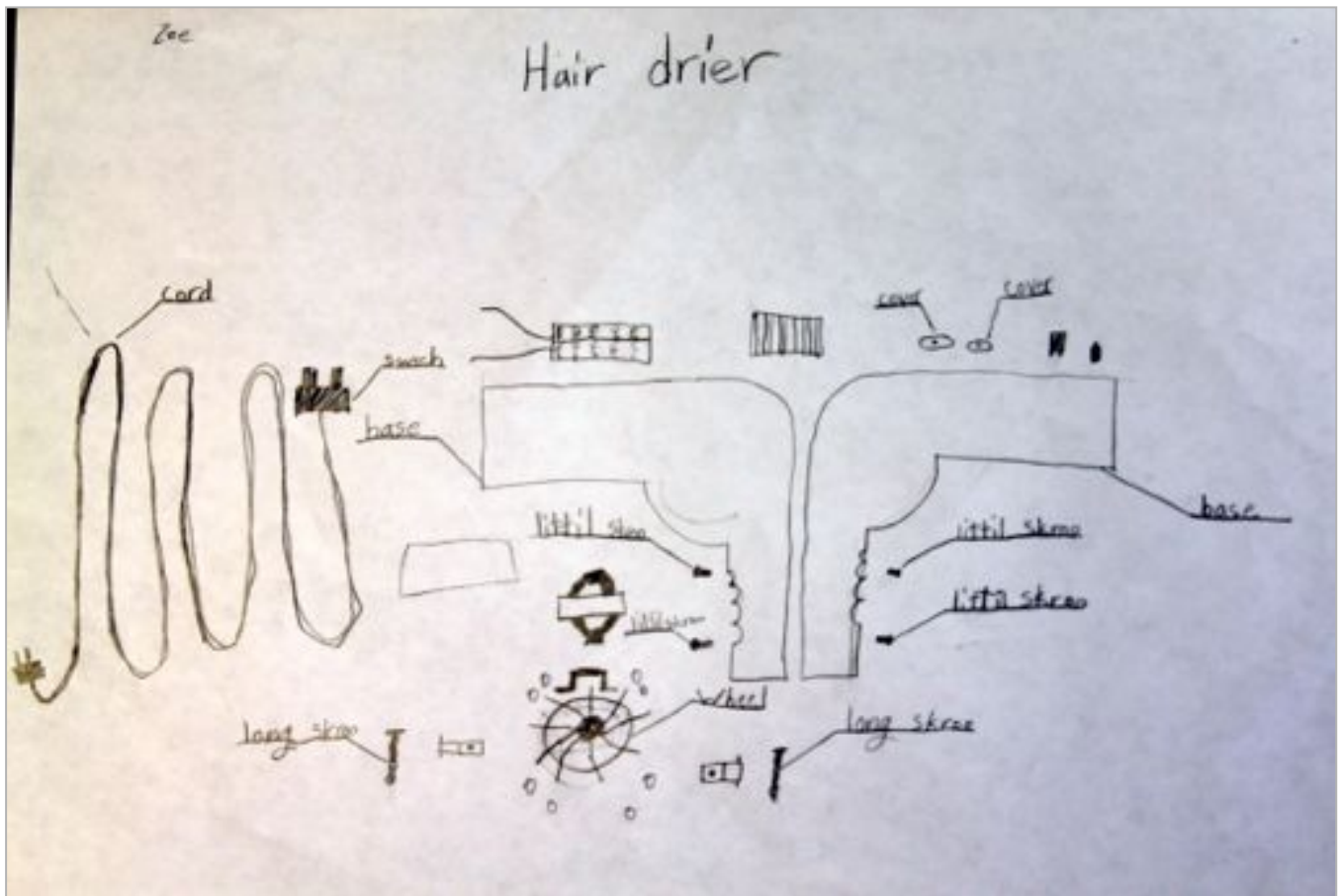
Take Apart #3:

Now that we had all of the objects dissected as far as we could, I asked the students to arrange their parts on their placements in such a way that it would show how the parts work together to make the object function/work. I gave each student a blank 11"X17" piece of paper to use to



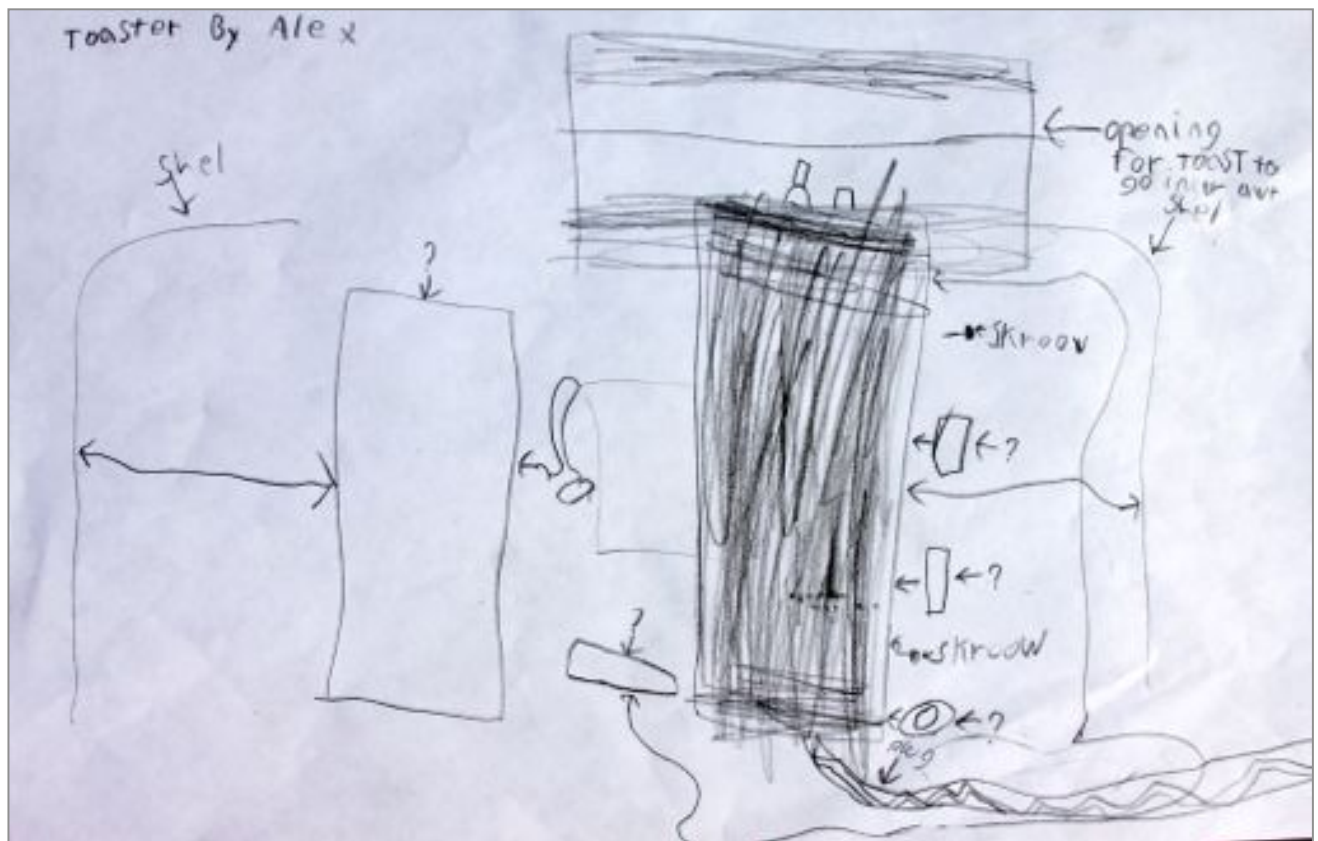
We discussed ways to symbolize energy/electricity (zigzag lines), to signify parts working together (arrows, plus signs) and direction and/or movement (arrows, wavy lines). Students were encouraged to add labels to their parts and notes to explain their thinking.

Some students began by first drawing all of the parts then labeling them.



This method created a challenge for these students. Since the objects were placed and labeled in this manner, students lost the flexibility to think about and move the parts to represent how they worked together.

Other students immediately arranged their parts to represent how they might work together, and began recording the parts a section at a time. By using this method, students were able to make adjustments and they worked through organizing the as they went through the parts.



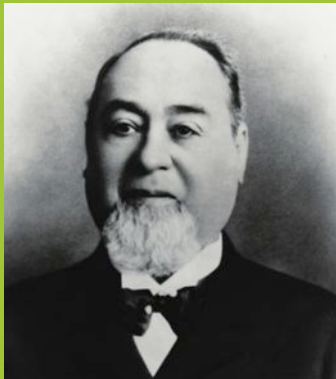
"I took apart something and I thought, What in the world? Why is that thing there? We were looking at it and we found paper. It was so weird! It was like a giant thing there, and a giant thing there and a giant thing there!"



When it came to choosing the most interesting part from their object, I had assumed students would automatically pick the most complex part from their collection. I quickly discovered that this was not true. When one of the students brought me the baggie with their selection for most interesting part, I was disappointed to see a part that looked like a small stick of gum. I assumed the student was not taking the assignment seriously. After listening to the student explain how incredulous she was to find this tiny stick of gum-shaped piece of paper in the heart of an automatic coffee maker, amongst so many metal parts, each with a clear purpose, I got it. The pure mystery of this part made it a compelling choice. It served as a reminder to me that no matter how carefully we teachers craft our questions, some students are going to interpret these questions differently.



Alexander Graham Bell, famous inventor of the telephone, was born in Scotland and became a naturalized US citizen in 1882.



Levi Strauss, inventor of the ubiquitous blue jeans, was born in Bavaria and became a US citizen in 1853.

Reflections:

I wanted to provide an opportunity for students to think about and explore everyday housewares in a new way. In addition to contemplating the idea behind the invention and design of these objects, I wanted the students to have the chance to take these objects apart and discover what was inside. Overall, I was impressed by the quality of the documentation, particularly the details in their drawings.

During the first session, the students were so excited to get started. Most students rushed through the drawing for the section picturing what the object looked like inside. I think that they could have benefited from an earlier session just observing, thinking about and drawing their objects.

Next time, I'll have the students generate a Word Bank for this project. There were many words that students used repeatedly (screw, wire, metal, etc.) and it would have made their documentation process easier and more accessible if they would have had this available.

The regular classroom teacher was my assistant throughout the project. Having an extra pair of hands was helpful when we discovered challenging parts inside some objects. It was also helpful to have the teacher record our wrap-up discussions after each session.

We made the best of the time I had, but 1.5 hour sessions would have ideal. If a teacher has the flexibility, I would suggest scheduling these work sessions over a series of consecutive days to maintain continuity and the level of enthusiasm.

Due to time restrictions, we were not able to explore some of the immigrant inventors as deeply as I would have liked.

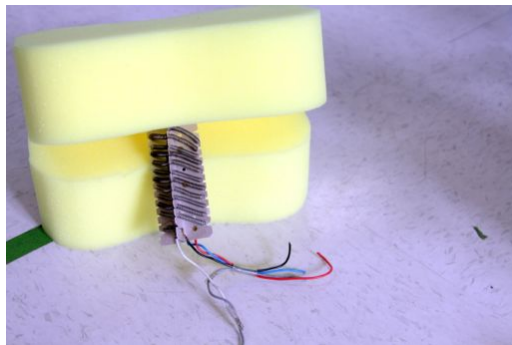
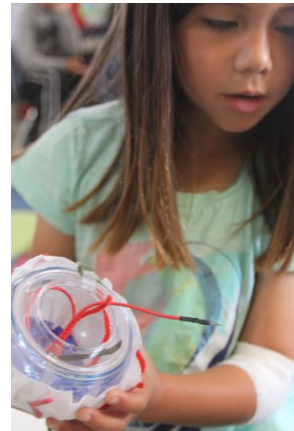
It would be wonderful to have a "take apart" area (table or station) in every classroom. Students of all ages enjoy taking things apart as well as putting things back together.

Parts 2.0

We were able to connect the learning from the Take Apart Project with the second grader's next topic of study - The Human Body. The *AbD* systems activities created a perfect bridge between the Take Apart activities and the new subject. As part of their study of the Human Body, students chose a specific body part or system to learn about and create using various materials. Students were encouraged to look at the parts we collected from the Take Apart Project to see if they could use one of these parts in the design and creation of their body part/system.



This student used wires from a blow dryer to represent blood vessels in the eye.



A coiled part from a heating element was used to represent the brain stem in this student's model of the brain.



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