



# Designing User Experiences for Internet-Connected Devices

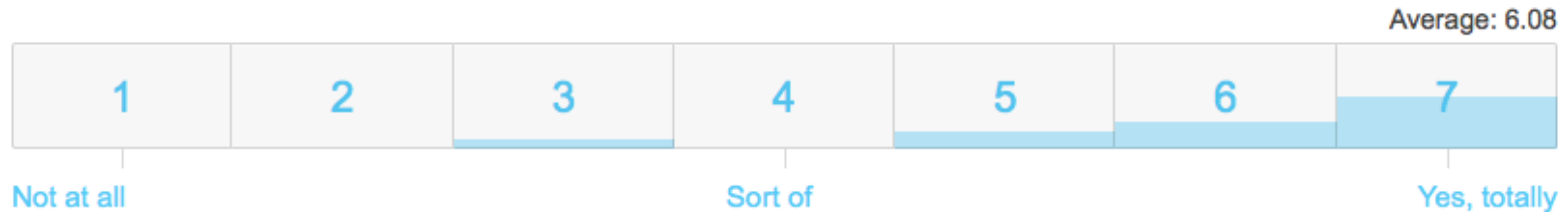
Dr. Daniel Ashbrook

# Today

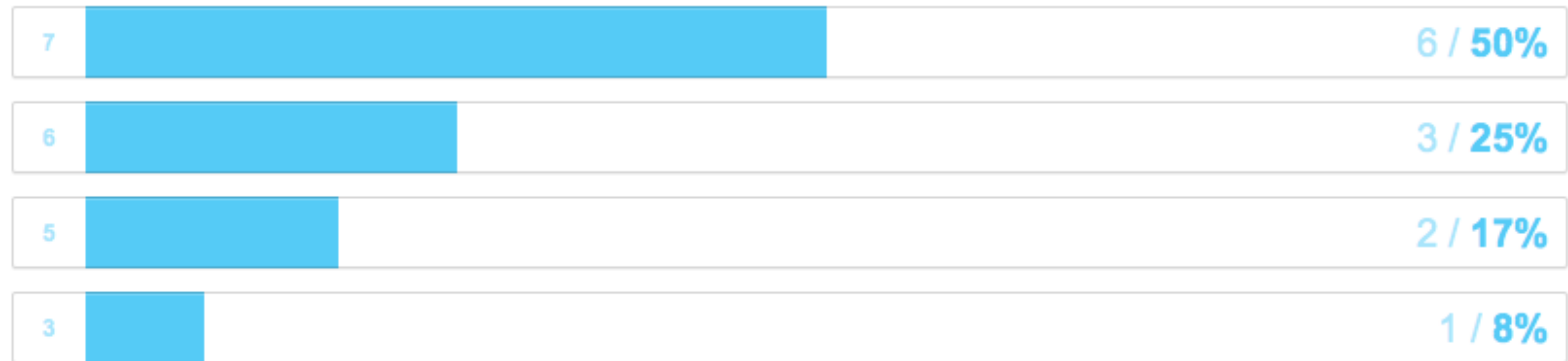
- GP1
  - How's it going?
  - Reminder: document for extra credit for the Instructable!
- Grading progress
- Results from survey

# Survey results

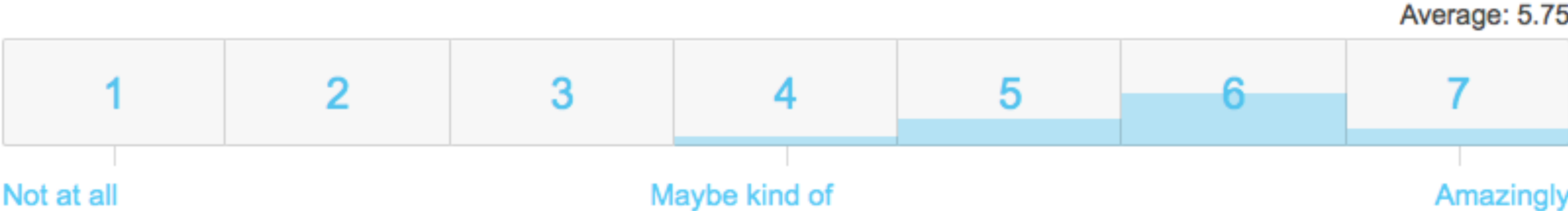
# Are you learning what you want to learn?



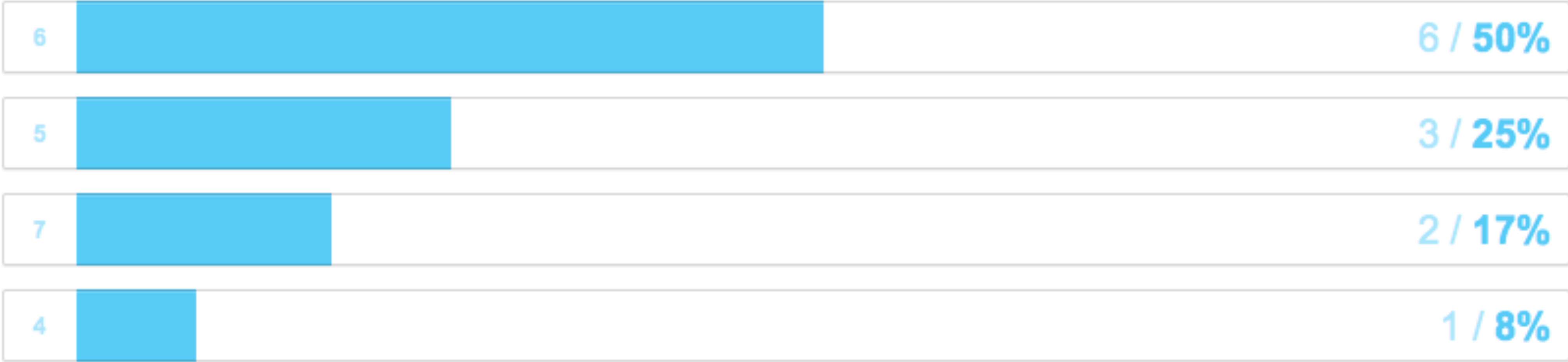
► Hide detail



# Are the skills you're learning useful to you, or will they be?



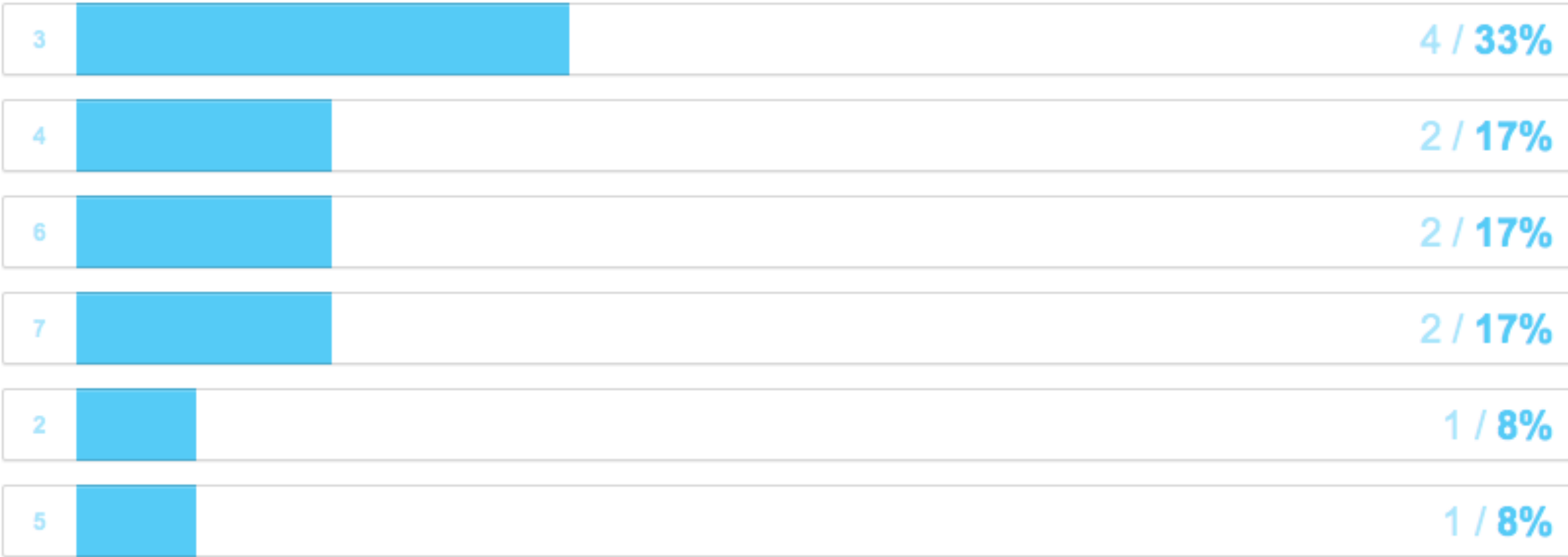
► Hide detail



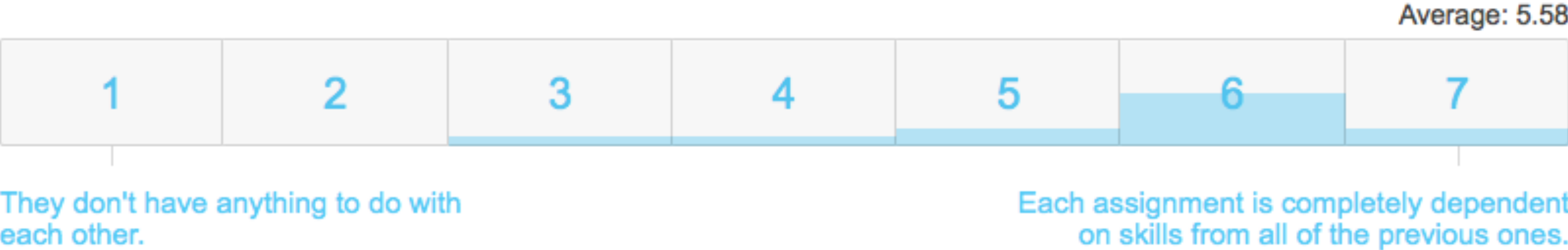
# How hard is the workload?



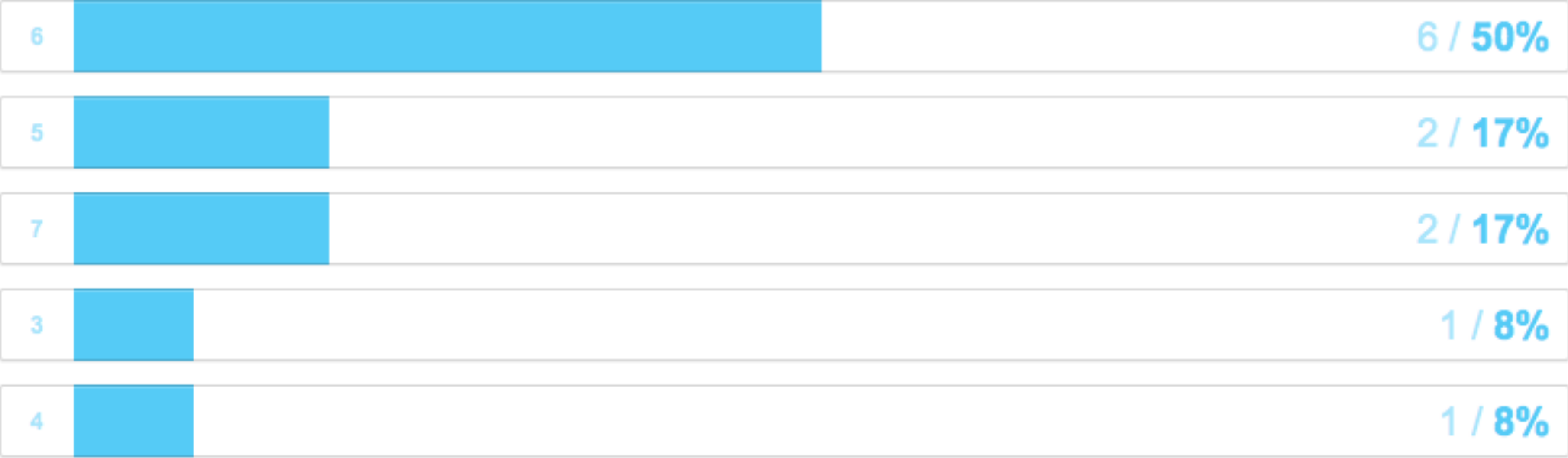
► Hide detail



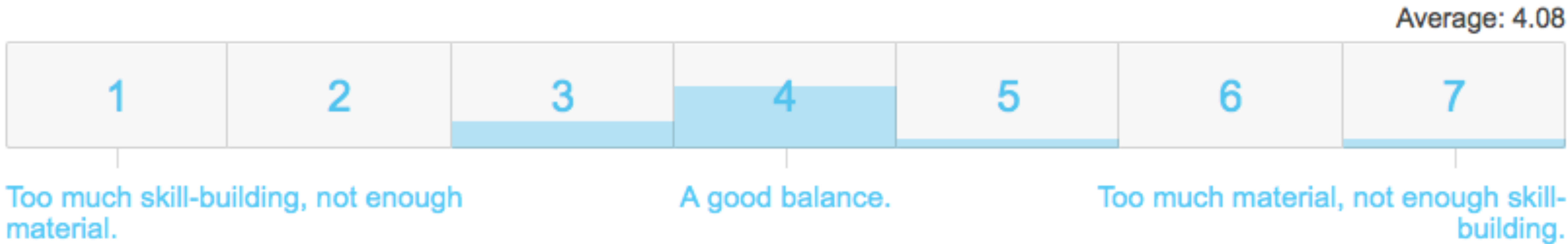
# How is the skill progression from assignment to assignment?



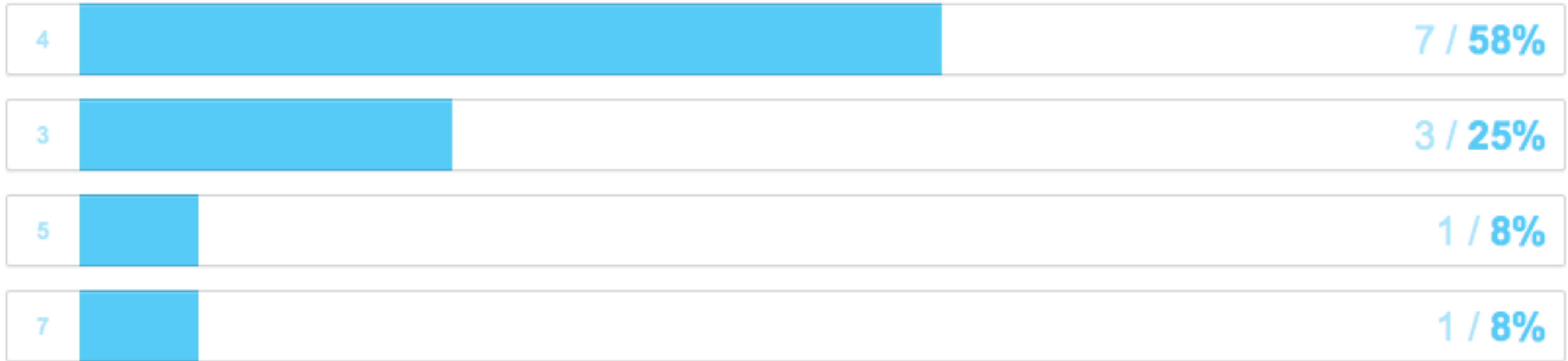
► Hide detail



# How do you feel about the balance between lecture material and skill learning?

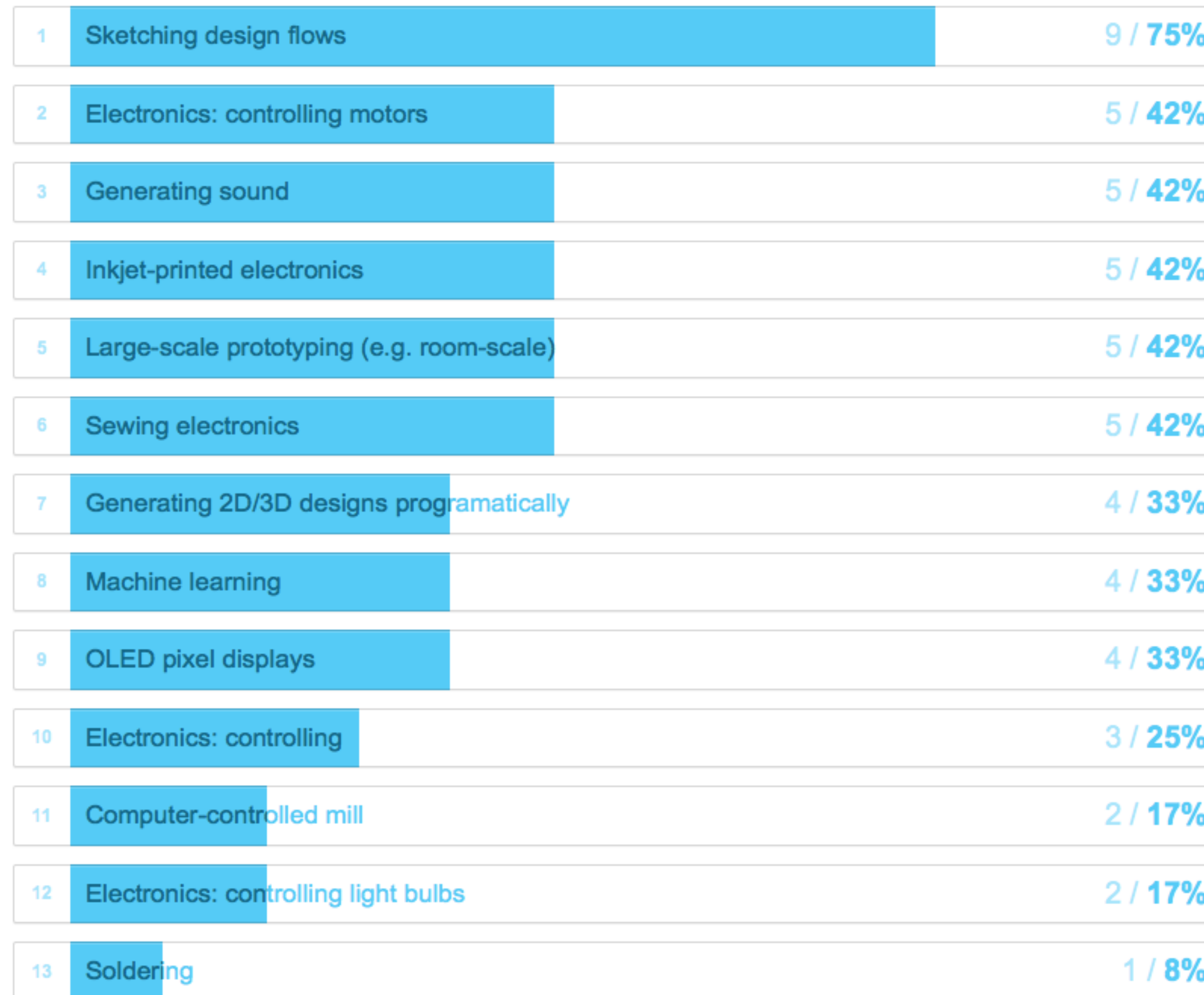


► Hide detail





# What other skills would you like to learn in the class?



# Today

- GP1
  - How's it going?
  - Reminder: document for extra credit for the Instructable!
- Grading progress
- Results from survey
- Sketching
- In-class exercise

# Sketching

# SKETCHING

---

- **Doing Sketching**
  - Stock up on sketching and mockup supplies
  - Use the language of sketching
    - Everyone can sketch; you do not have to be artistic
    - Most ideas are conveyed more effectively with a sketch than with words
    - Sketches are quick and inexpensive to create; they do not inhibit early exploration
    - Sketches are disposable; there is no real investment in the sketch itself
    - Sketches are timely; they can be made just-in-time, done in-the-moment, provided when needed
    - Sketches should be plentiful; entertain a large number of ideas and make multiple sketches of each idea
    - Textual annotations play an essential support role, explaining what is going on in each part of the sketch and how

# SKETCHING

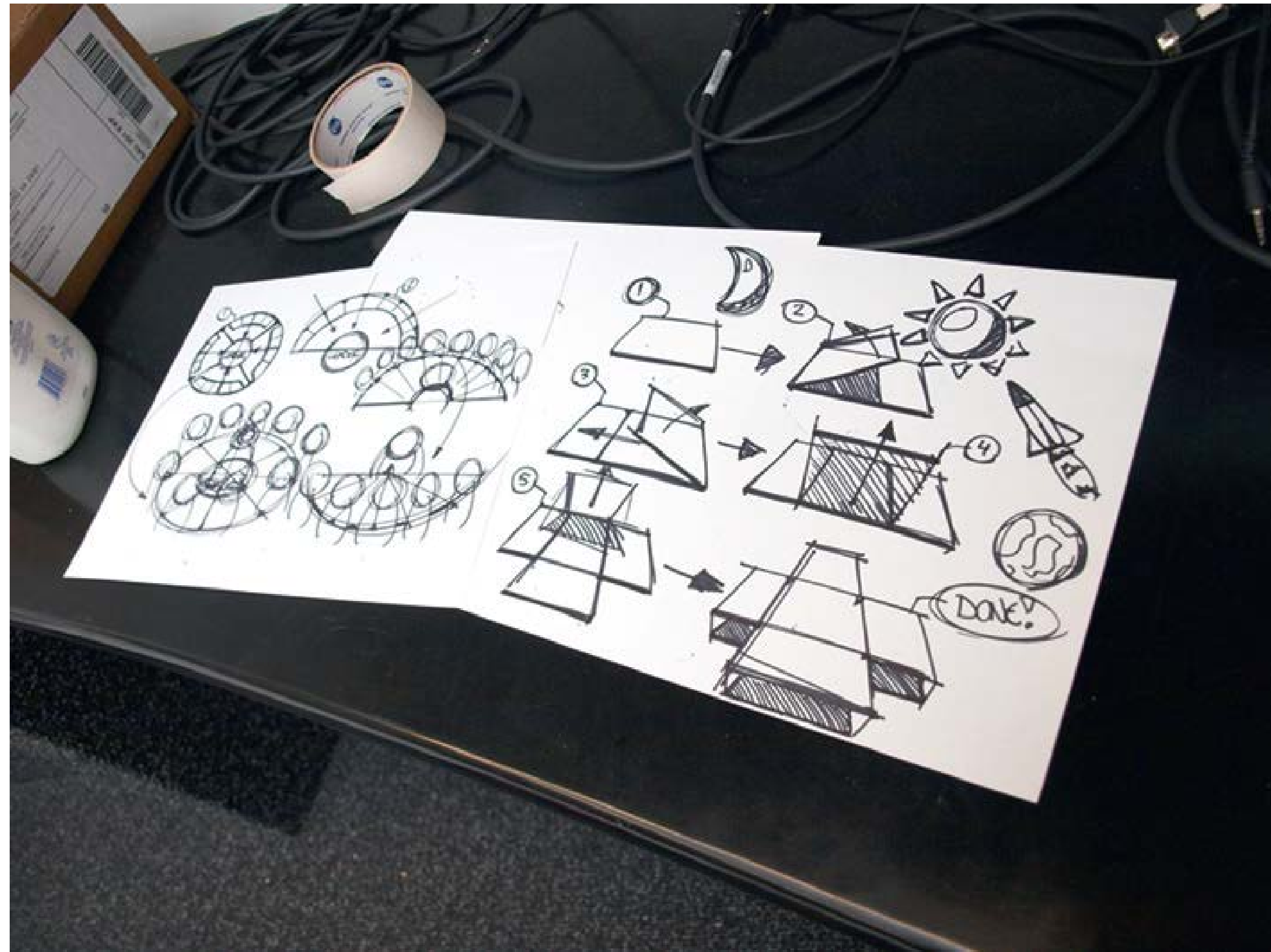


Figure 7-8

*A sketch to think about design (photo courtesy of Akshay Sharma, Virginia Tech Department of Industrial Design).*

# SKETCHING

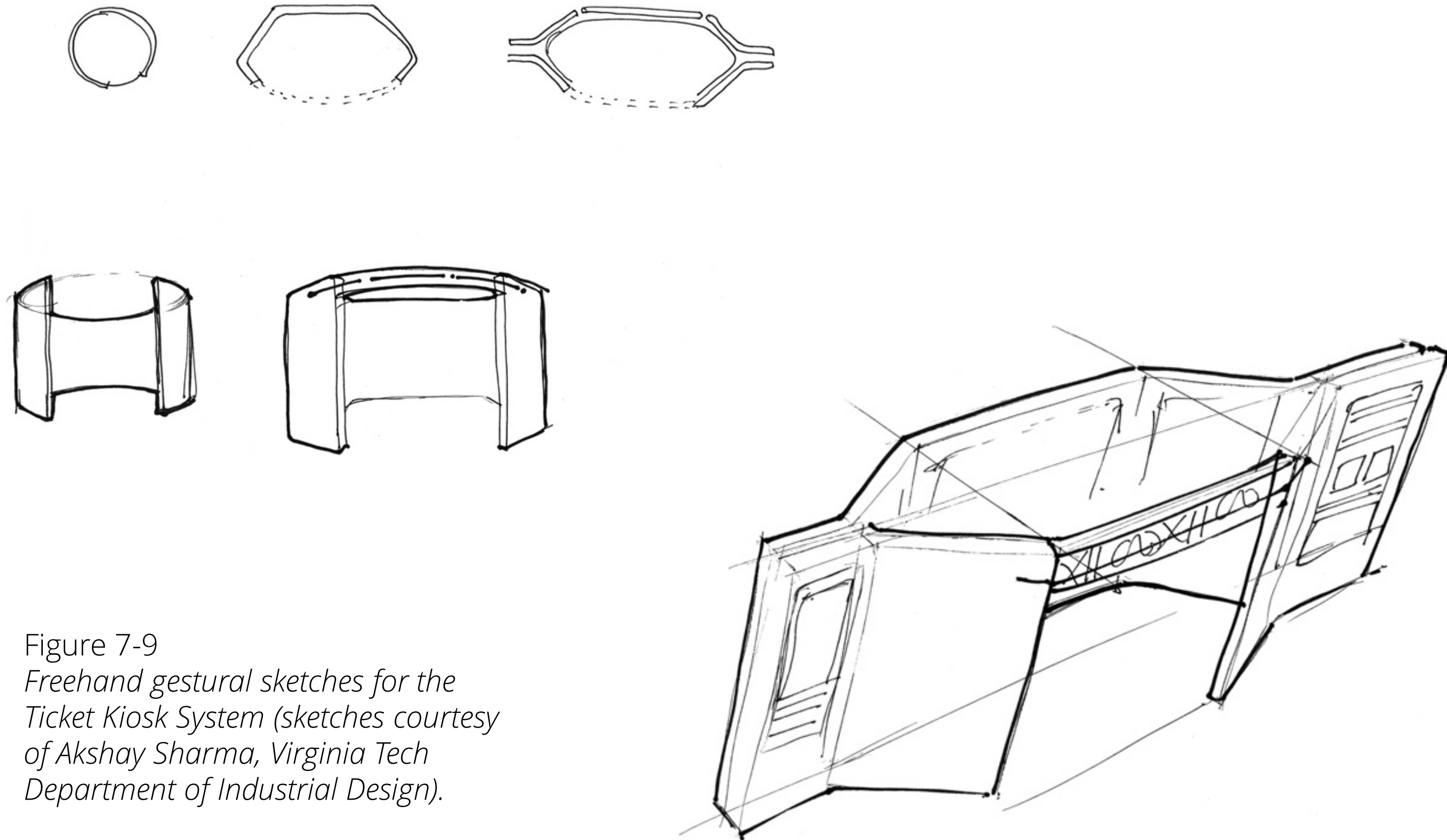


Figure 7-9  
*Freehand gestural sketches for the  
Ticket Kiosk System (sketches courtesy  
of Akshay Sharma, Virginia Tech  
Department of Industrial Design).*



# SKETCHING

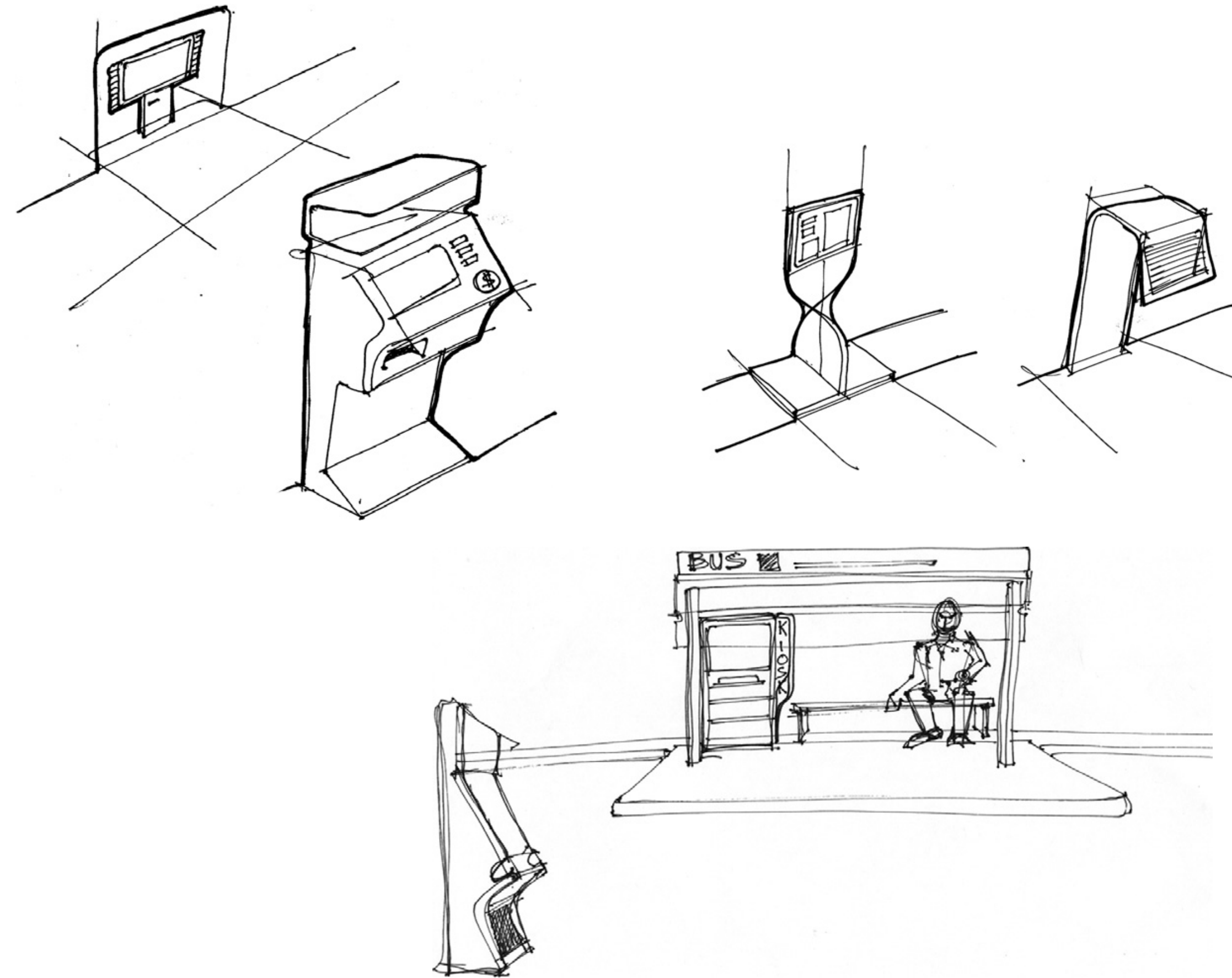


Figure 7-10  
*Ideation and design exploration sketches for the Ticket Kiosk System (sketches courtesy of Akshay Sharma, Virginia Tech Department of Industrial Design).*

# SKETCHING

---



Figure 7-11  
*Designers doing sketching (photos courtesy of Akshay Sharma, Virginia Tech Department of Industrial Design).*



# SKETCHING

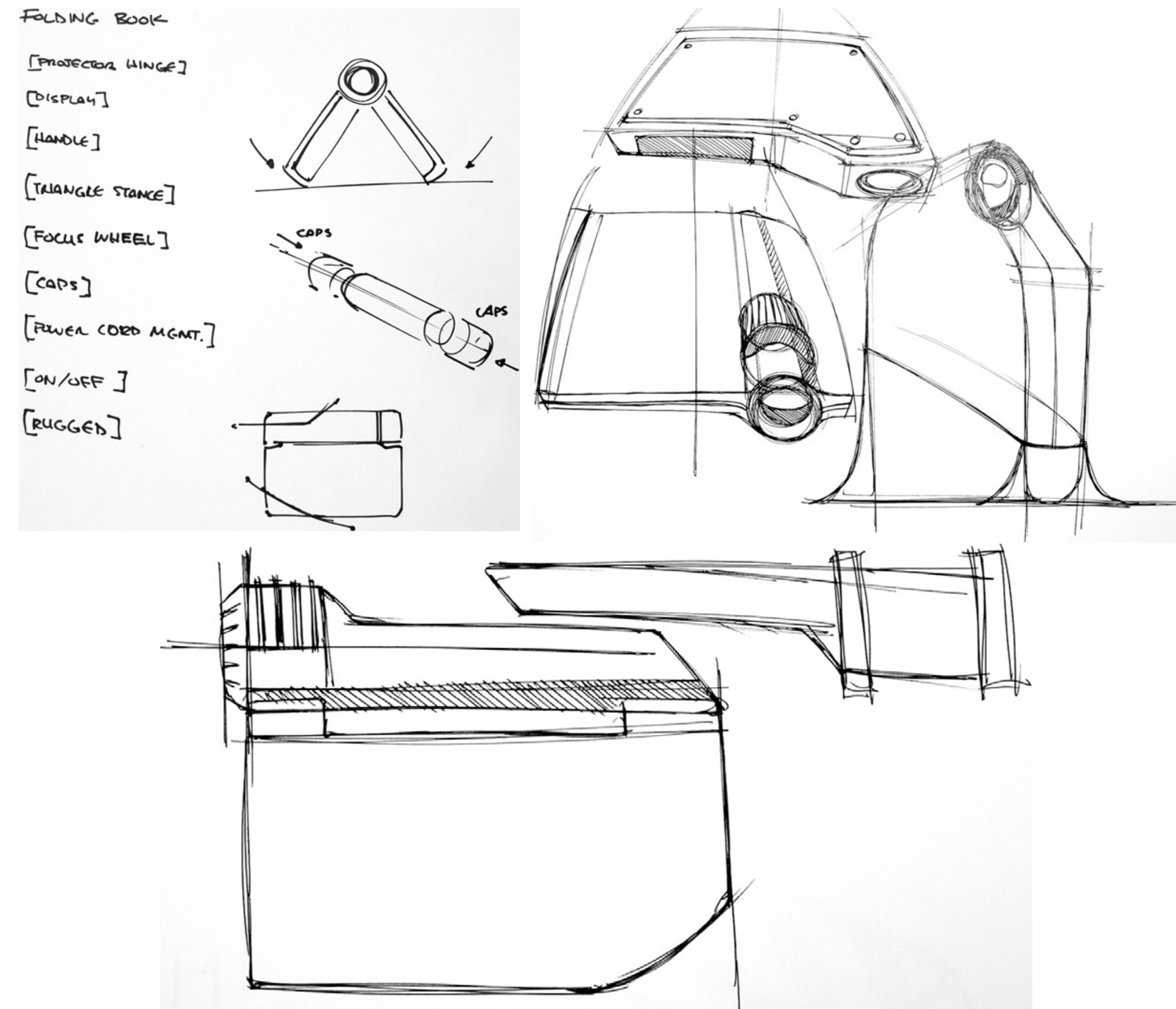


Figure 7-12  
Early ideation sketches of K-YAN (sketches courtesy of Akshay Sharma, Department of Industrial Design).

# SKETCHING

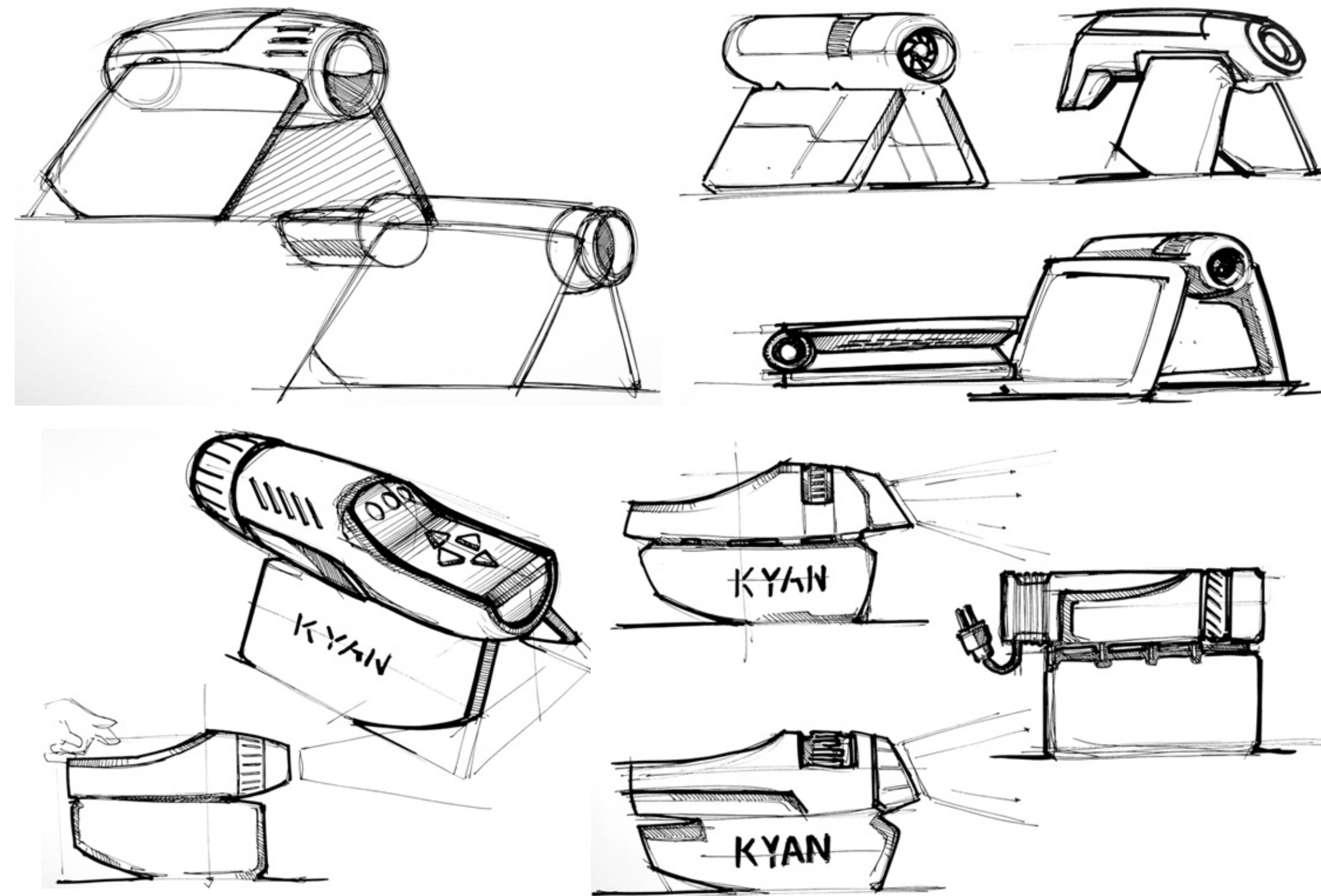


Figure 7-13  
Mid-fidelity exploration sketches of K-YAN (sketches courtesy of Akshay Sharma,  
Virginia Tech Department of Industrial Design).



# SKETCHING

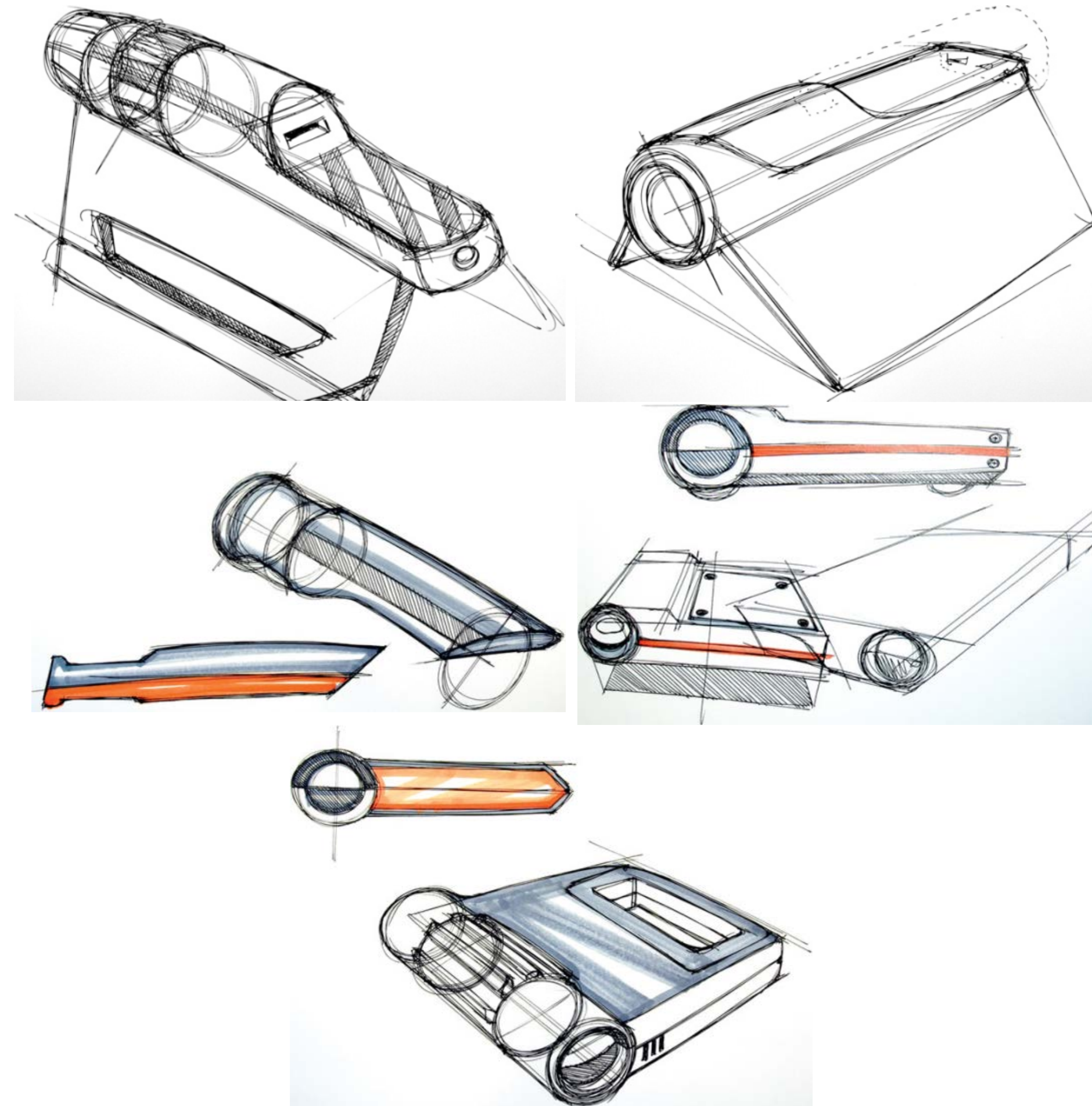


Figure 7-14  
*Sketches to explore flip-open mechanism of K-YAN (sketches courtesy of Akshay Sharma, Virginia Tech Department of Industrial Design).*



# SKETCHING

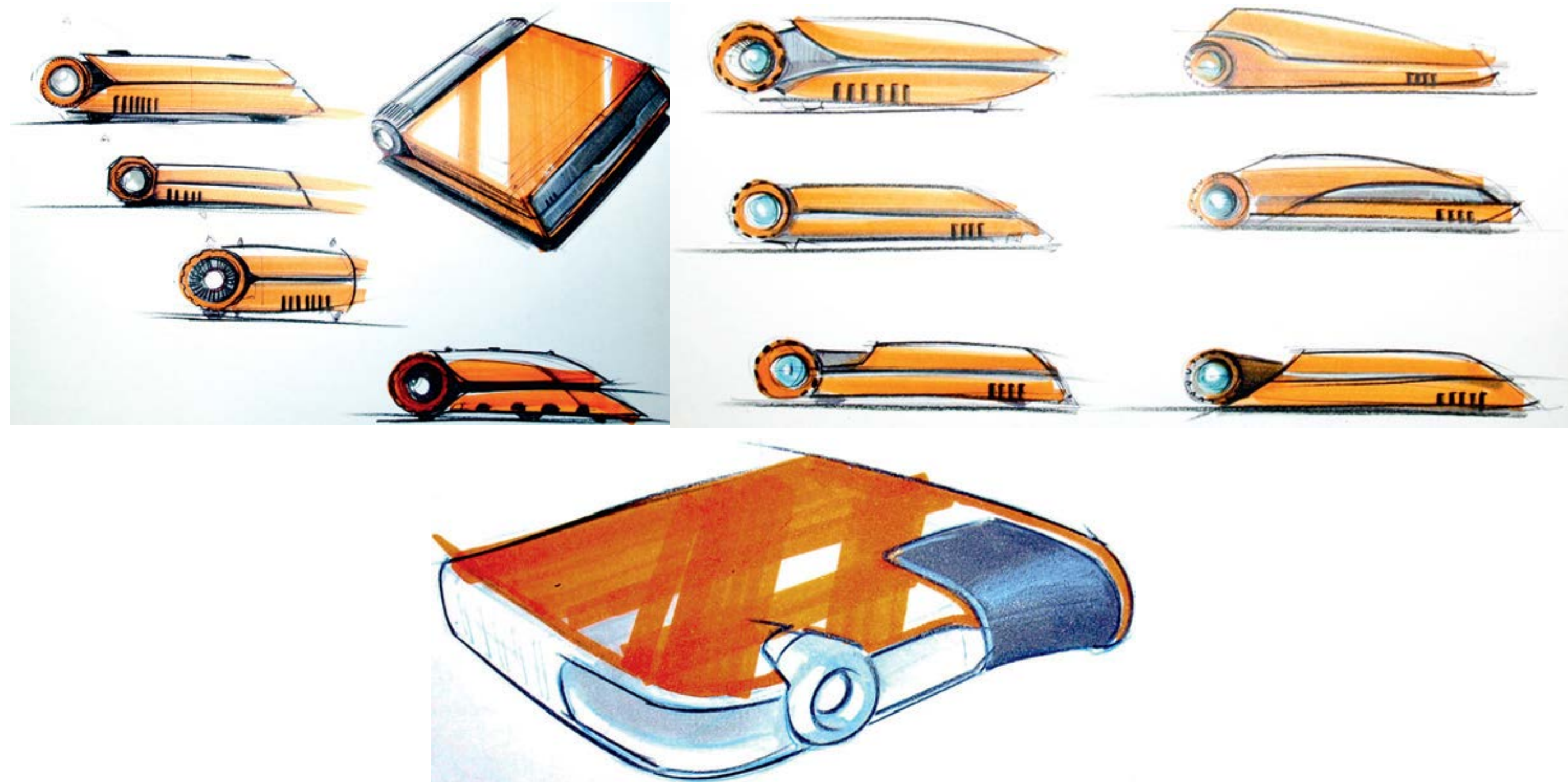
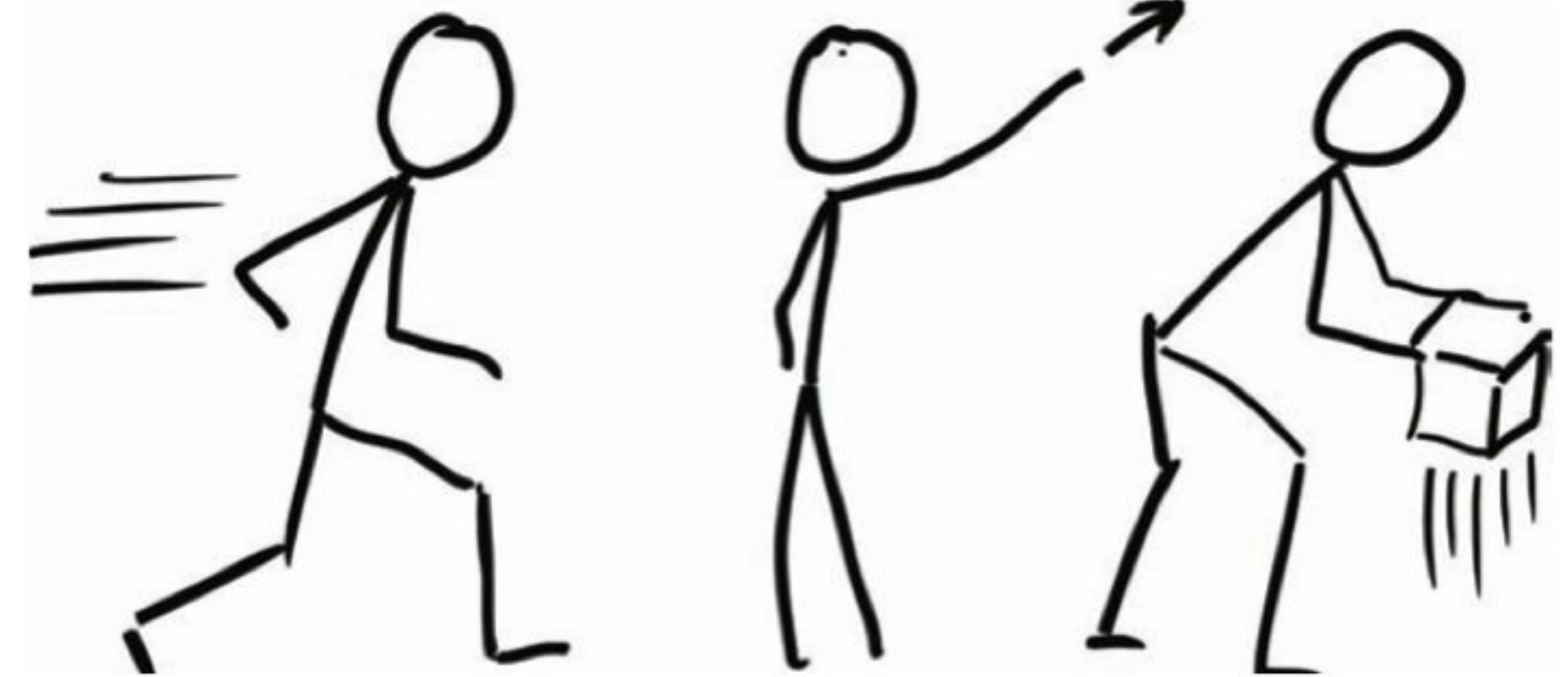
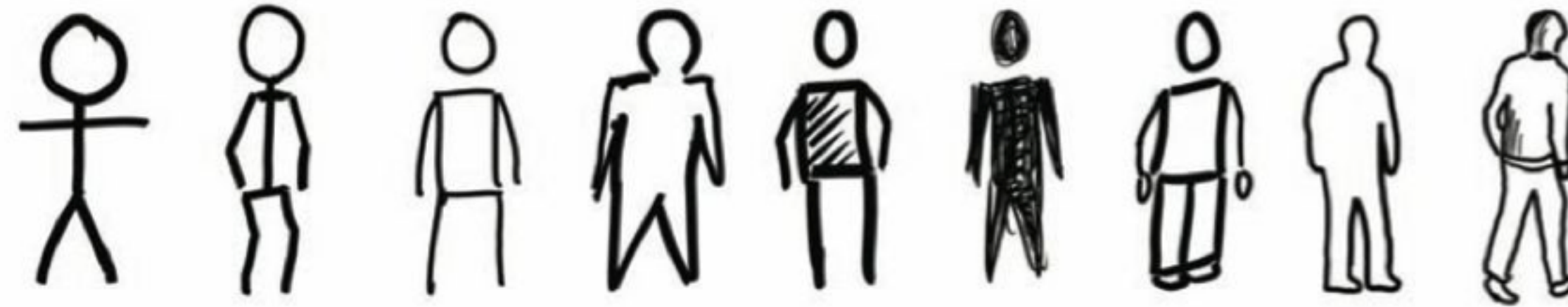


Figure 7-15  
*Sketches to explore emotional impact of form for K-YAN (sketches courtesy of Akshay Sharma, Virginia Tech Department of Industrial Design).*

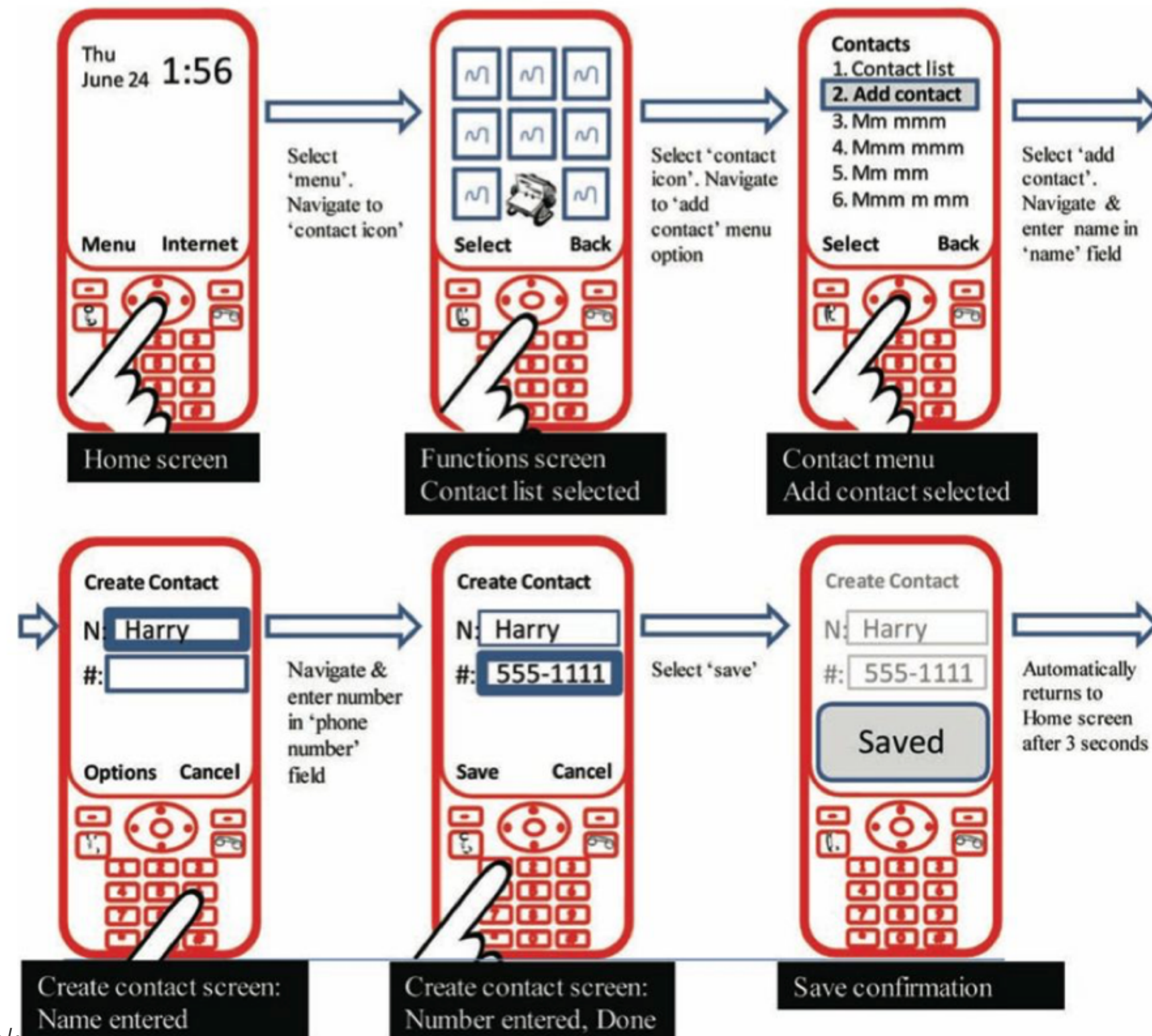


# Be simple



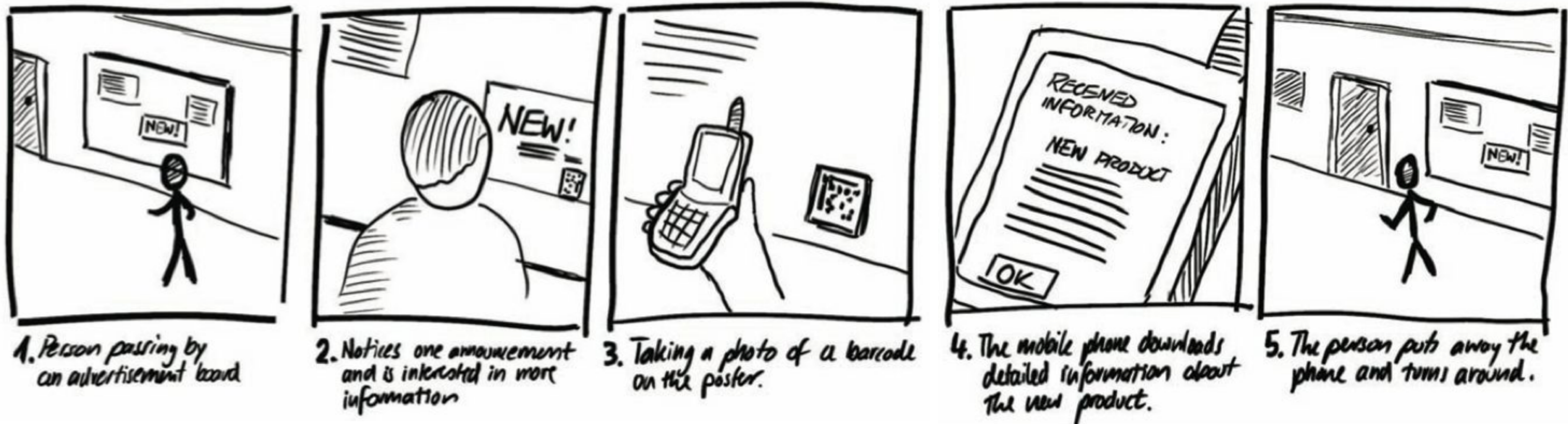


# Sequential storyboarding





# Narrative storyboarding



# Sketching exercise



# What to do

1. Pick an item from [iotlist.co](http://iotlist.co)
2. Read about it, watch videos, find its docs
3. What is the *main problem* it is solving?
4. What are the components of its solution (see concepts)?
5. Sketch the flow of how it solves its main problem
6. Now do steps 2–5 for your ambient display

# Concepts so far

## Challenges in designing ubicomp systems

- Revealing interaction possibilities
- Directing actions
- Establishing connections
- Providing feedback
- Avoiding and correcting mistakes
- Managing privacy and security

## Shadows & avatars

- Information shadow links object to its origin
- Avatar is one or more representations of a service

## Proxemics

- Intimate: 0–1.5'
- Personal: 1.5–4'
- Social: 4–12'
- Public: 12'+

## Ubicomp principles

- invisibility
- manual override
- feedback
- adaptability

## Ecology design framework

- Consistent design
- Continuous design
- Complementary design