Please fill in the rows. Sit in the middle.

Make a friend - one on each side of you ☺

User Interaction Models

Prof. Lydia Chilton
COMS 4170
31 January 2022

Type in zoom

TA sections are **all** assigned on Slack

- Make your TA is your first point of contact.

- Homework question? Post on slack or **Ask your TA**.
- Participation question? **Ask your TA.**
- Can I go over my homework? **Ask your TA**.
- I messed up X on my homework. Can I turn it in again? **Task your TA**.

- If you aren't assigned to a TA section, email me.
- Sorry, you cannot switch TA sections.

Participation Accounting – for everybody

- Add to the top of your HW2 Main (Due Tuesday@11:59pm)

- *"1/31 Participation: I said old information designs were more symmetrical than new designs"*
- Or
- *"1/31 – no participation"* (or just omit entirely)

Margaret Liu

- MSCS student
- Took Professor Smith's UI design class last fall
- Studied Computer Science and Studio Art at Vassar College
- Interested in human computer interaction, designing user interfaces
- Love traveling, playing golf, designing, and watching TV…
- I'm very excited to meet everyone!

Megha

- MSCS student
- Took UI Design with Prof. Smith and Advanced Web Design with Prof. Lydia last semester, loved both courses!
- Anime fan and currently waiting for the next episode of Demon Slayer
- Super excited to meet you all during lectures & OH

Sandy

- MSCS Student
- Took UI Design with Prof Smith and Adv Web Design Studio with Lydia- Loved both classes and developed cool products with William(also a TA)!
- Barnard '21, majored in CS and Psych
- Currently working with Prof. Feiner on a climate change inspired AR project
- Favorite design podcasts: UI Breakfast, New Layer
- Art enthusiast: favorite artists are Frida Kahlo and Berthe Morisot(coming from an almost art history minor:))
- Favorite sports: Soccer and F1
- Can't wait to meet and support you all!

Lord

- Senior in SEAS majoring in CS
- Previously TA'd for Brian Smith's UI Design :) and took UI Design & Advanced Web Design Studio with Lydia (...amazing)
- Software Engineering & Product Management experience
- Recent Binges: Emily in Paris, Cowboy Bebop, Attack on Titan, Power (all really good)
- Really into streetwear, hip hop, anime, museums
- From Washington Heights, New York
- Super excited for this semester!

Esme

- Junior majoring in CS and Econ-Stats at Barnard
- From Beijing, China
- Product Management and Entrepreneurship experience; econometrics research
- Took UIDesign in Fall 2020 and became very interested in UIUX and HCI
- Things I do in my free time: skiing and cooking
- Very excited to work with everyone :)

User Interaction Models

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31 January 2022

Type in zoom

Interfaces **display information** in a way that helps users **accomplish a goal**.

Pine text-based email client
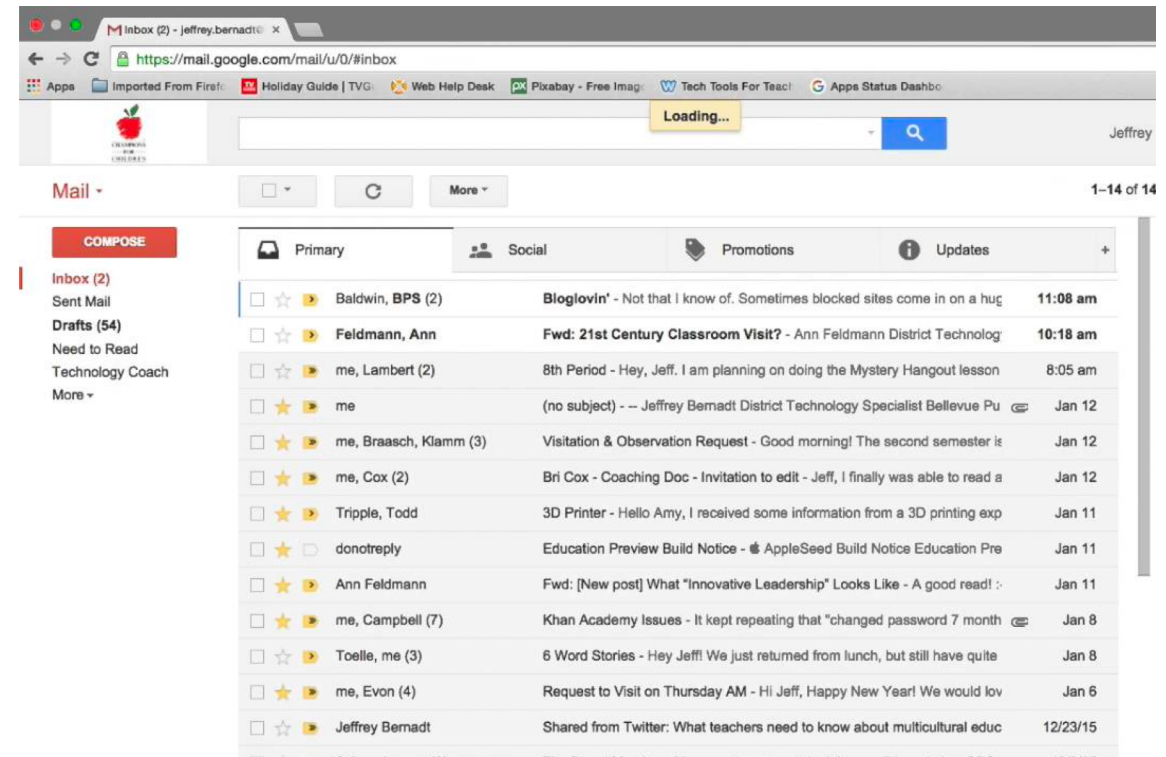
GMail

What is the primary goal of this interface?
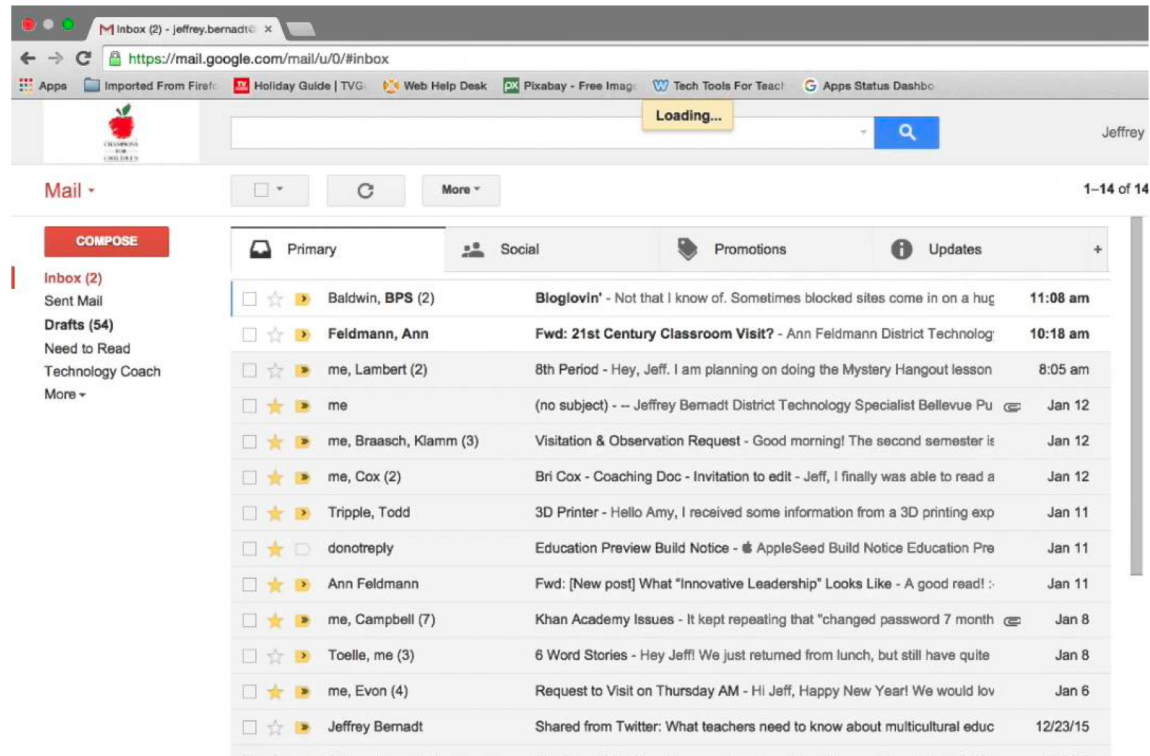
To read and respond to all email.

What is the primary goal of this interface?

amazon prime

| Books ▾ | [search] | 🔍 | Shop Valentine's Day Deals |

Departments ▾   Browsing History ▾   Lydia's Amazon.com   Today's Deals   Gift Cards   Registry   Sell   Help

EN 🌐 ▾   Hello, Lydia **Account & Lists** ▾   **Orders**   **Prime** ▾   🛒 **Cart** ¹

Books   Advanced Search   New Releases   Amazon Charts   Best Sellers & More   The New York Times® Best Sellers   Children's Books   Textbooks   Textbook Rentals   Sell Us Your Books   Best Books of the Month   Kindle eBooks

Popular in Books
Award Winners
Bargain Books
Best Books of the Month
Best Books of 2017
Books in Spanish
Children's Books
Deals in Books
Top 20 Lists in Books

More in Books
100 Books to Read in a Lifetime
Amazon Book Review Blog
Amazon Books on Facebook
Amazon Books on Twitter
Amazon First Reads

The Craft of Research, Third Edition
Wayne C. Booth, ...Gregory G. Colomb...
Paperback
★★★★½ 384

A Manual for Writers of Research Papers, Theses...
Kate L. Turabian, Wayne C. Booth...
Paperback
★★★★½ 753

Academic Writing for Graduate Students...
John M. Swales, Christine B. Feak
Paperback
★★★★½ 128
$25.65 ✓prime

The Craft of Research, 2nd edition
Wayne C. Booth, Joseph M. Williams...
Paperback
★★★★½ 384

A Manual for Writers of Research Papers, Theses...
Kate L. Turabian, Wayne C. Booth...
Paperback
$18.00 ✓prime

To buy a book.

Users interact with a system to accomplish a goal
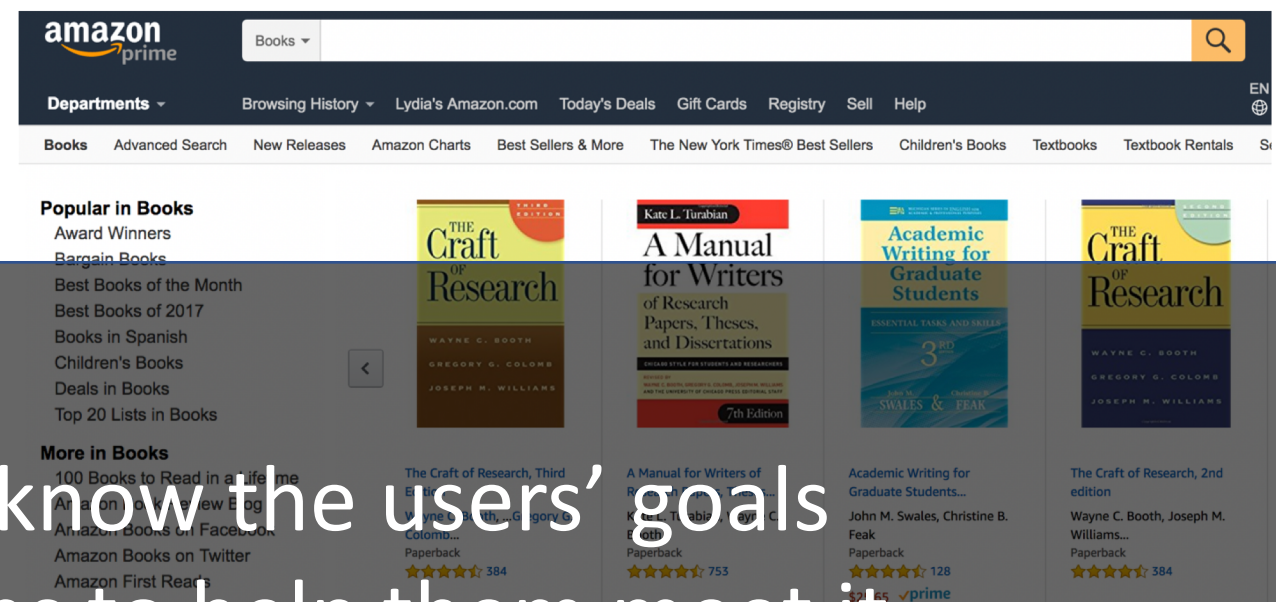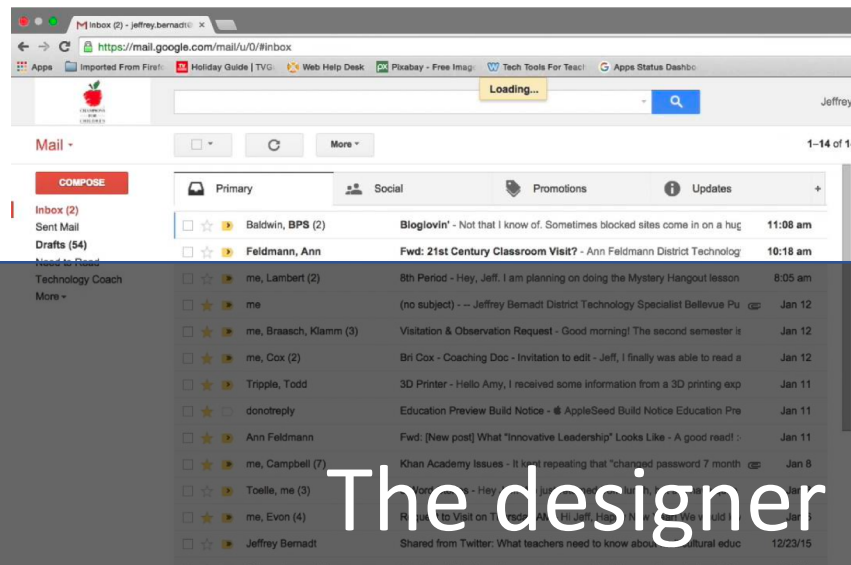
The designer must know the users' goals and create interactions to help them meet it.

To read and respond to all email.

To buy a book

Large goals must be broken into smaller goals

Goal: Buy a book

Subgoals:

1. Find it

2. Add to cart
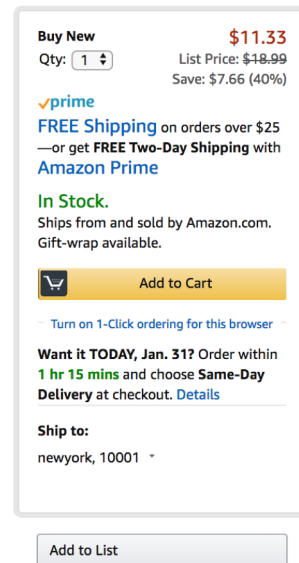
3. Enter payment info
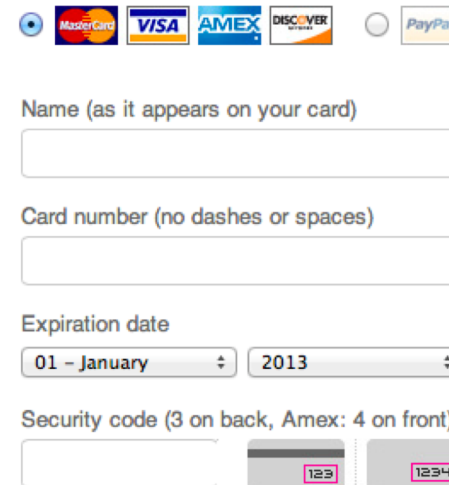
4. Place order
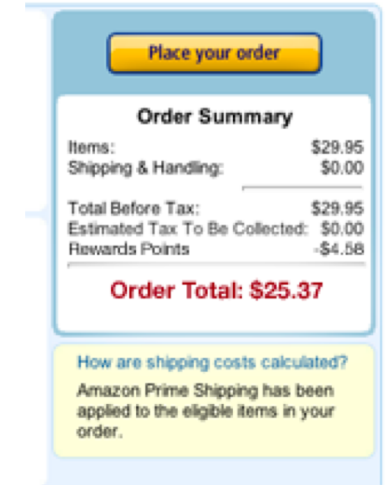
Goal: Buy a book

Subgoal: Search for book

Interaction: Type its name, click on it

Goal: Buy a book

Subgoal: Add to cart
Interaction: Click "Add to Cart" button

Goal: Buy a book
Subgoal: If they are done with cart, checkout
Interaction: Click "Proceed to checkout" button

Goal: Buy a book

Subgoal: Enter payment information
Interaction: Click, type, move cursor, click "Continue"

Goal: Buy a book
Subgoal: If the information is correct, place order
Interaction: Click "place your order"

The designer must know the users' goals create the subgoals and interactions to meet it.

Goal: Buy a book

Subgoal:	Find it	Add to cart	Enter payment info	Place order
Interaction:	Type, click	click	Type, click, point	Click
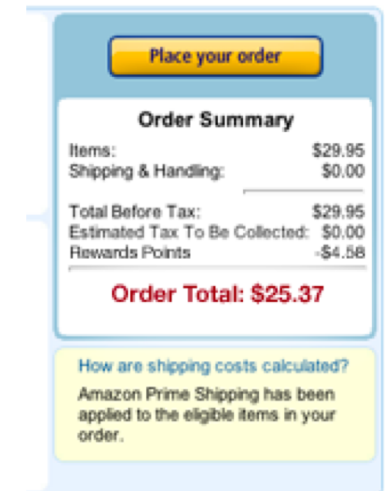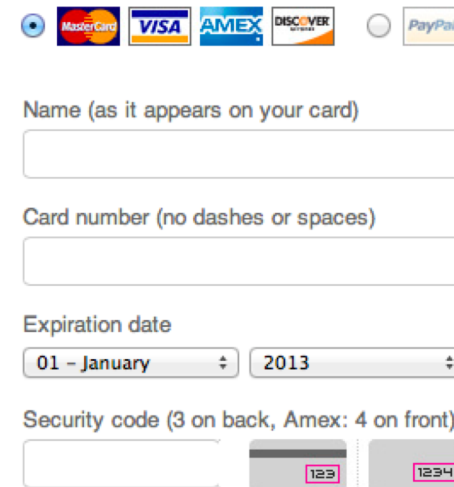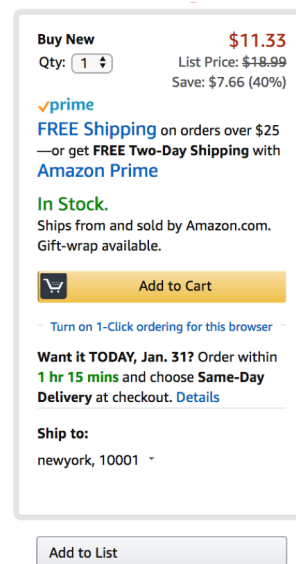
The designer must know the users' goals

But sometimes on Amazon,
I don't have a goal.

I'm just browsing.

Are these sites "just for browsing"?

No. Although people do browse,
The primarily goal is to find something.

The designer must know the users goals and
Create interactions that help them meet it.

Low-level Interactions

Interaction:
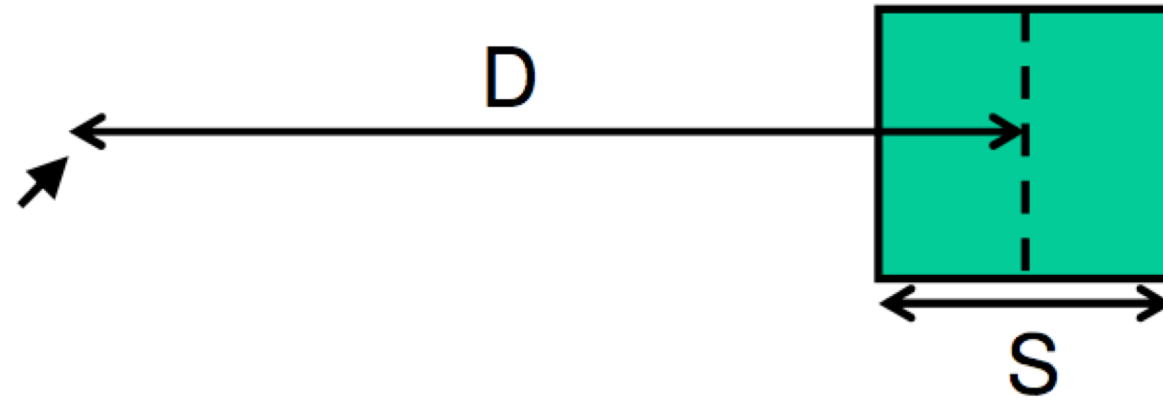# Moving + Clicking

Which button is faster to click?

Which button is faster to click?

Which button is faster to click?

A   B
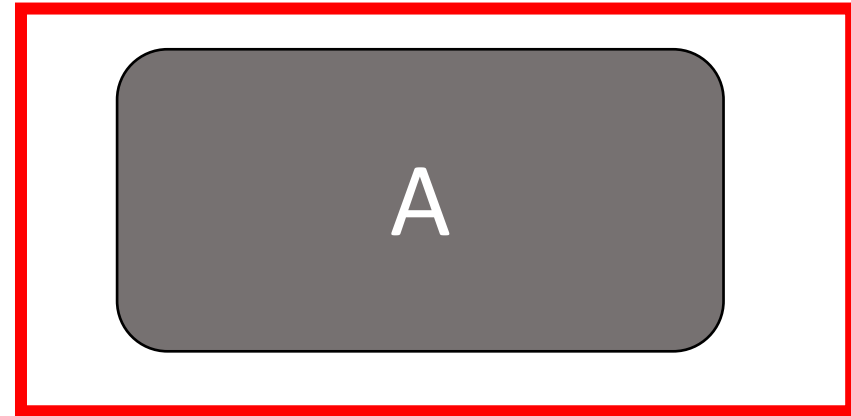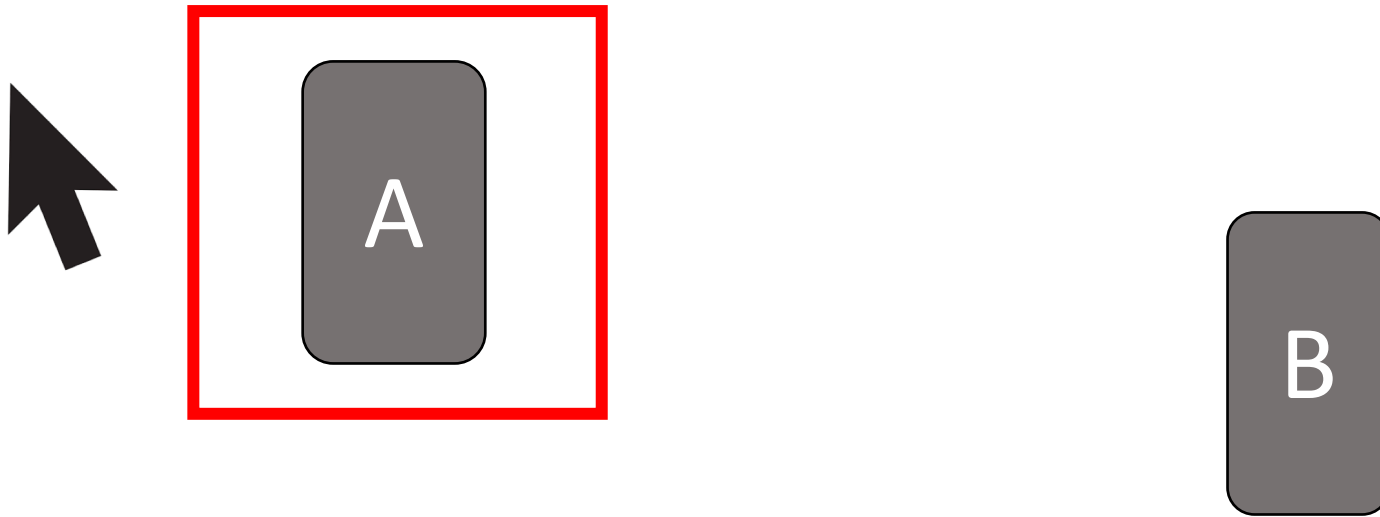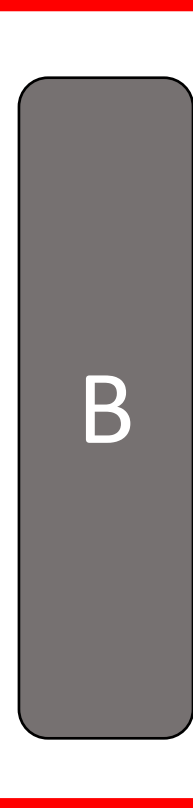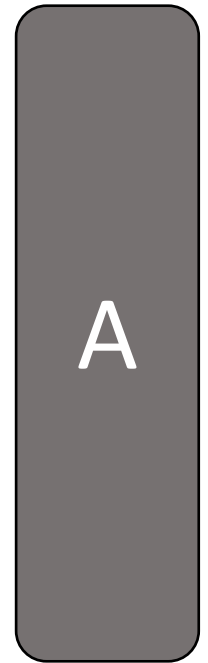
Fitts's Law

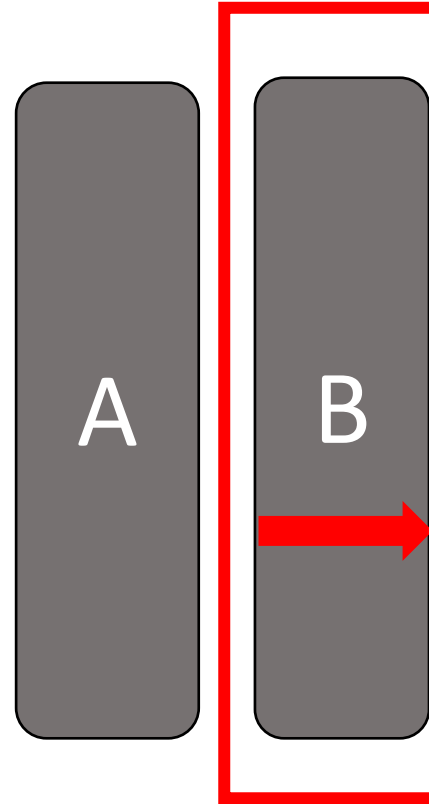Time to move your pointer to a target $= a + b * \log\left(\dfrac{2D}{S}\right)$

Using Fitts' law, why is A faster to click?
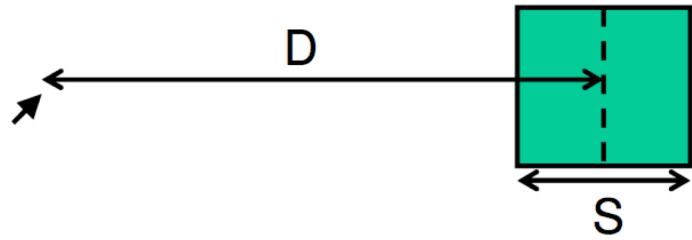
$$= a + b * \log \left(\frac{2D}{S} \right)$$

D is small.
Thus the time is lower.
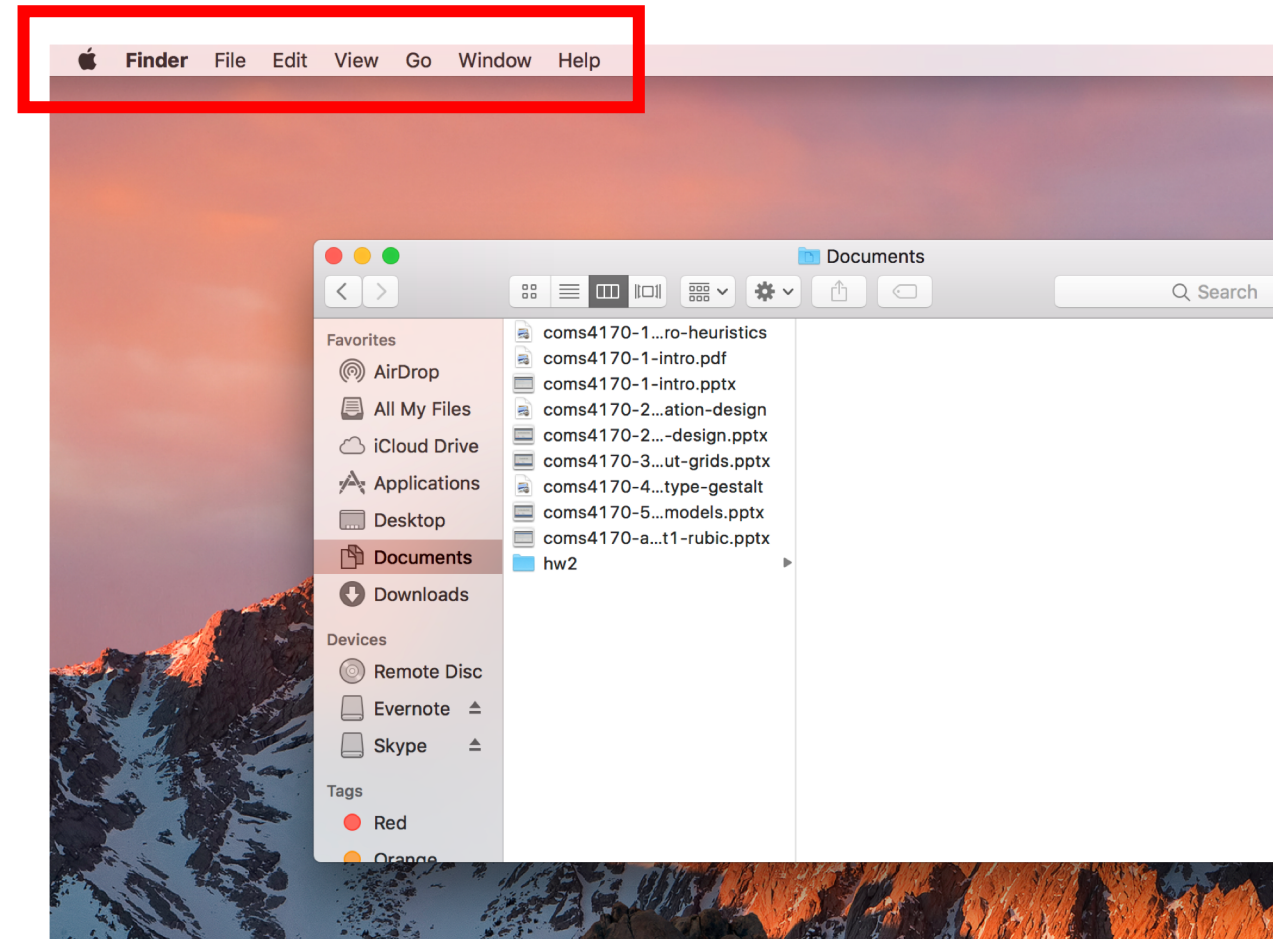
A

B
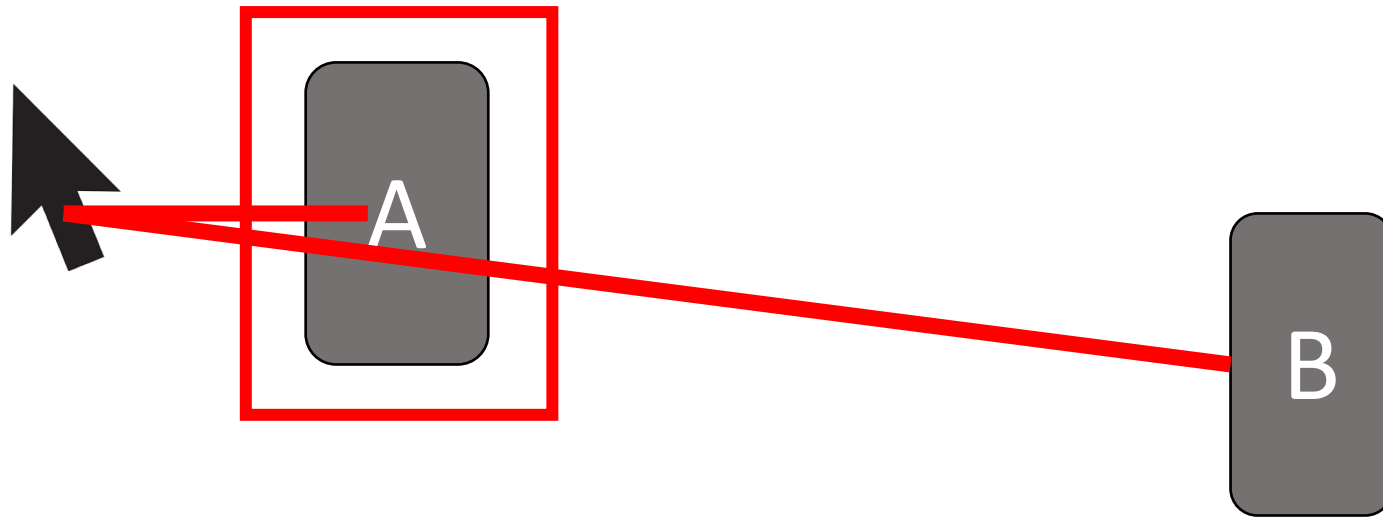
Using Fitts' law, why is A faster to click?
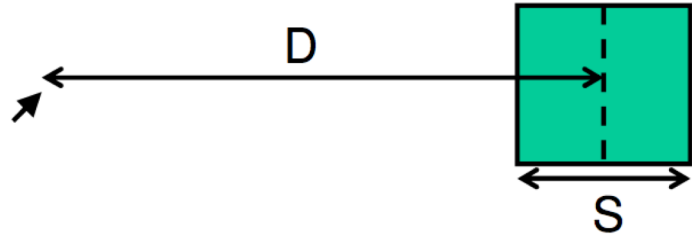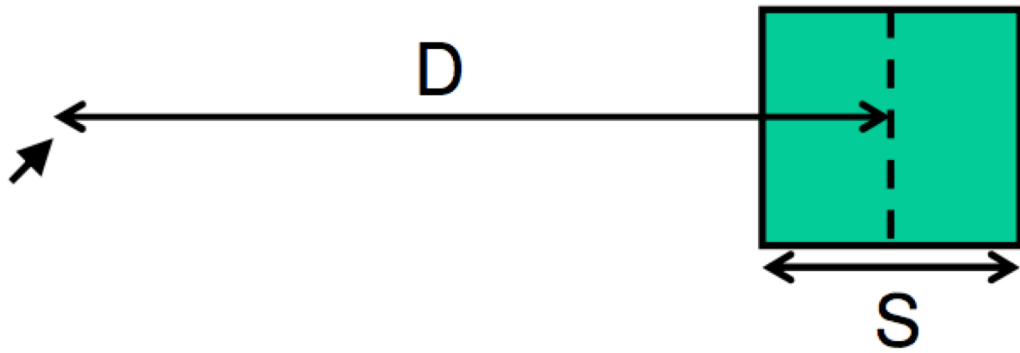
$$= a + b * \log \left(\frac{2D}{S} \right)$$

S is bigger.
Thus the time is lower.

A

B
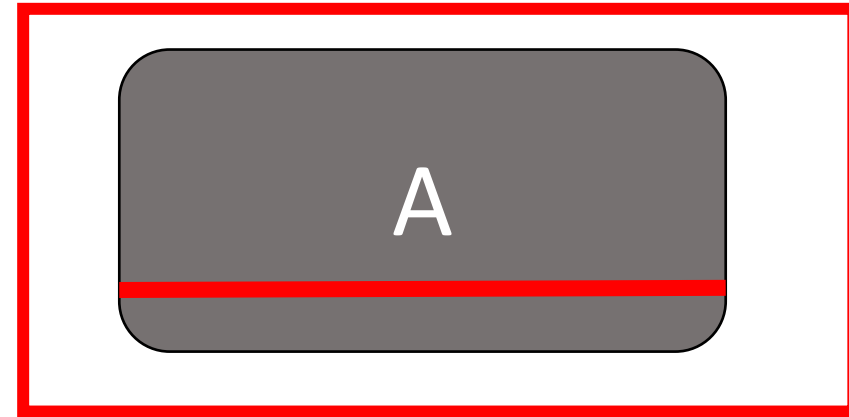
Using Fitts' law, why is B faster to click?

D

S
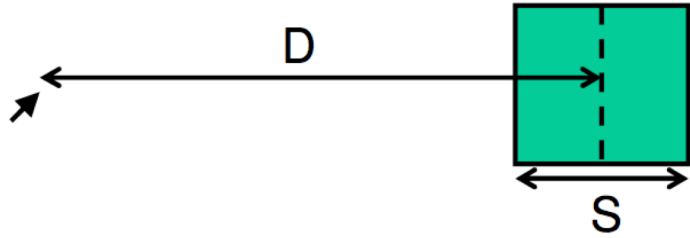
$$= \quad a + b * \log \left(\frac{2D}{S} \right)$$

S is bigger (infinite).
Thus the time is lower.

A

B

This is why did iOS designs the menu to touch the edge of the screen
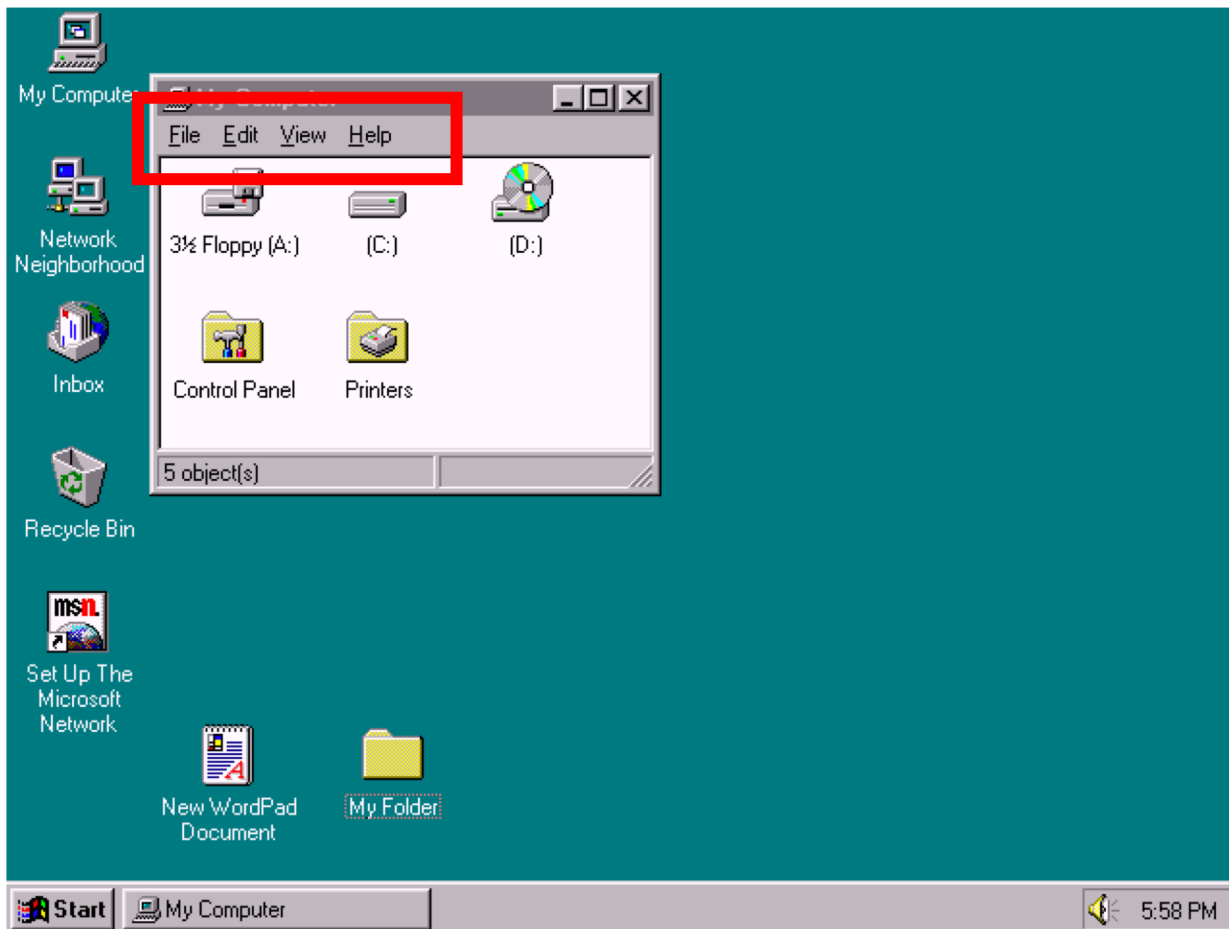
Fitts's Law: What are a and b?

$$\text{time} = a + b * \log \left(\frac{2D}{S} \right)$$

Time to move the pointer: Fitts's Law
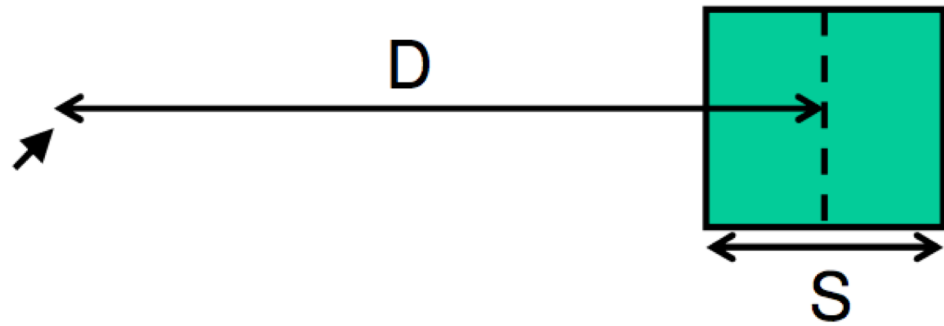
D

S

Buttons on the edges are fast to get to because they have infinite size

Time to move your pointer to a target

$$= a + b * \log\left(\frac{2D}{S}\right)$$
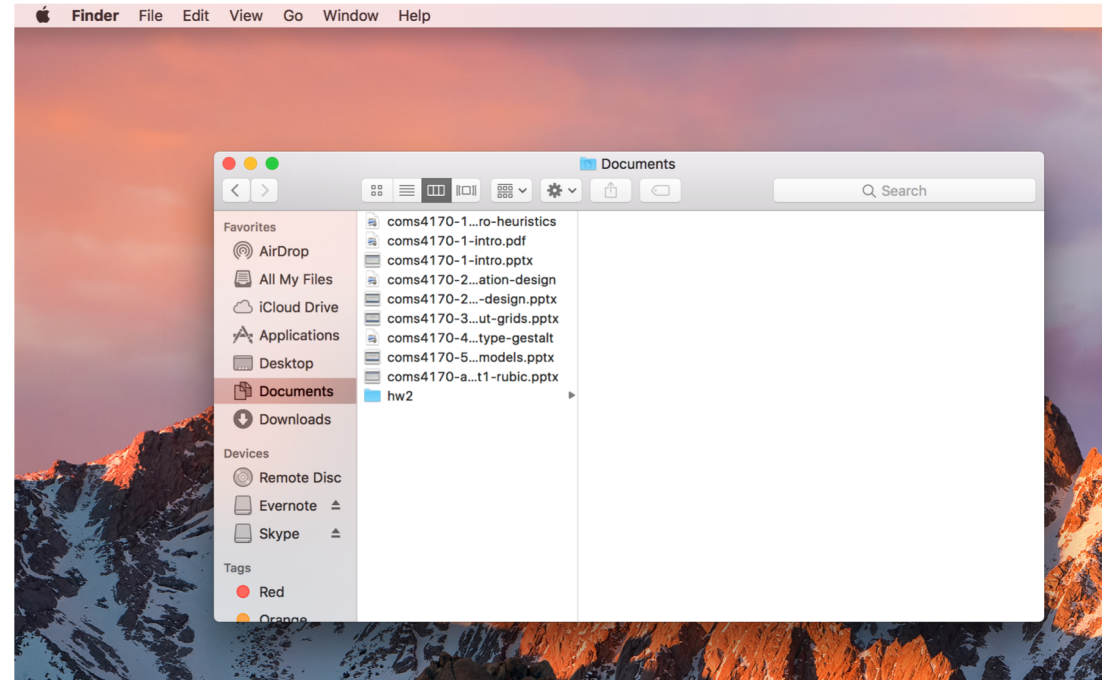
More moving + clicking:
Tunneling Menus
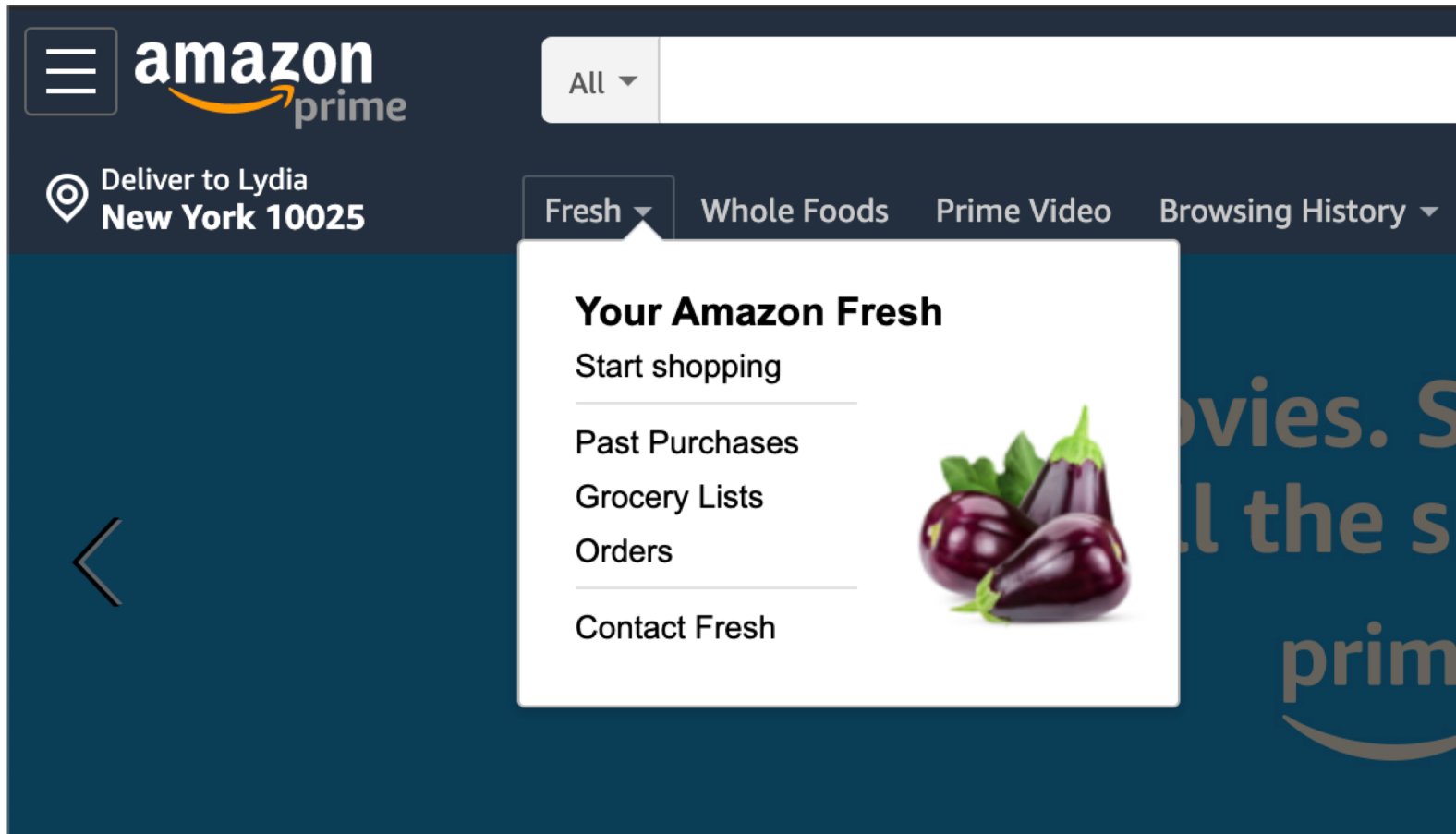
More moving + clicking:
Cascading Tunnel Menus
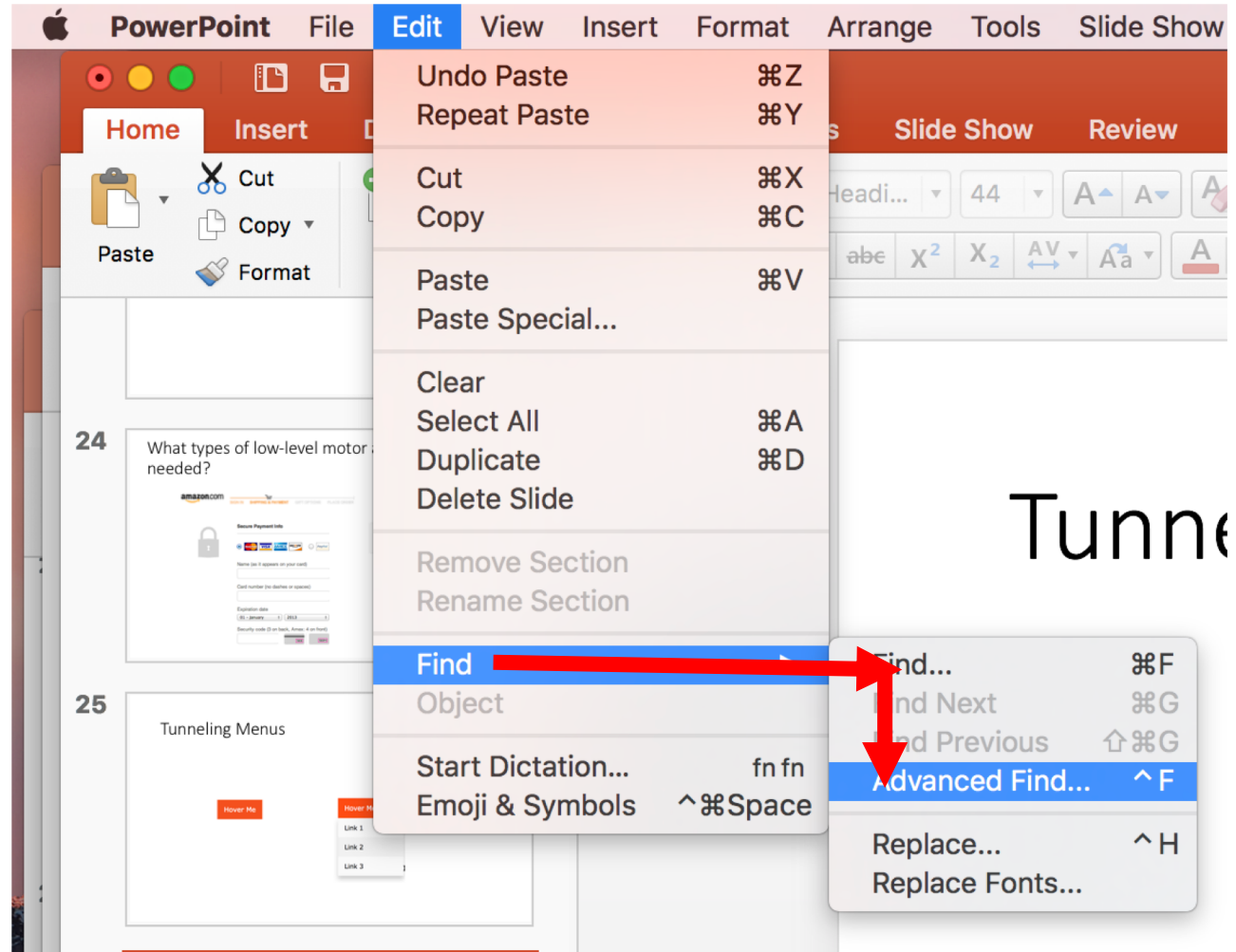
More moving + clicking:
Cascading Tunnel Menus fix
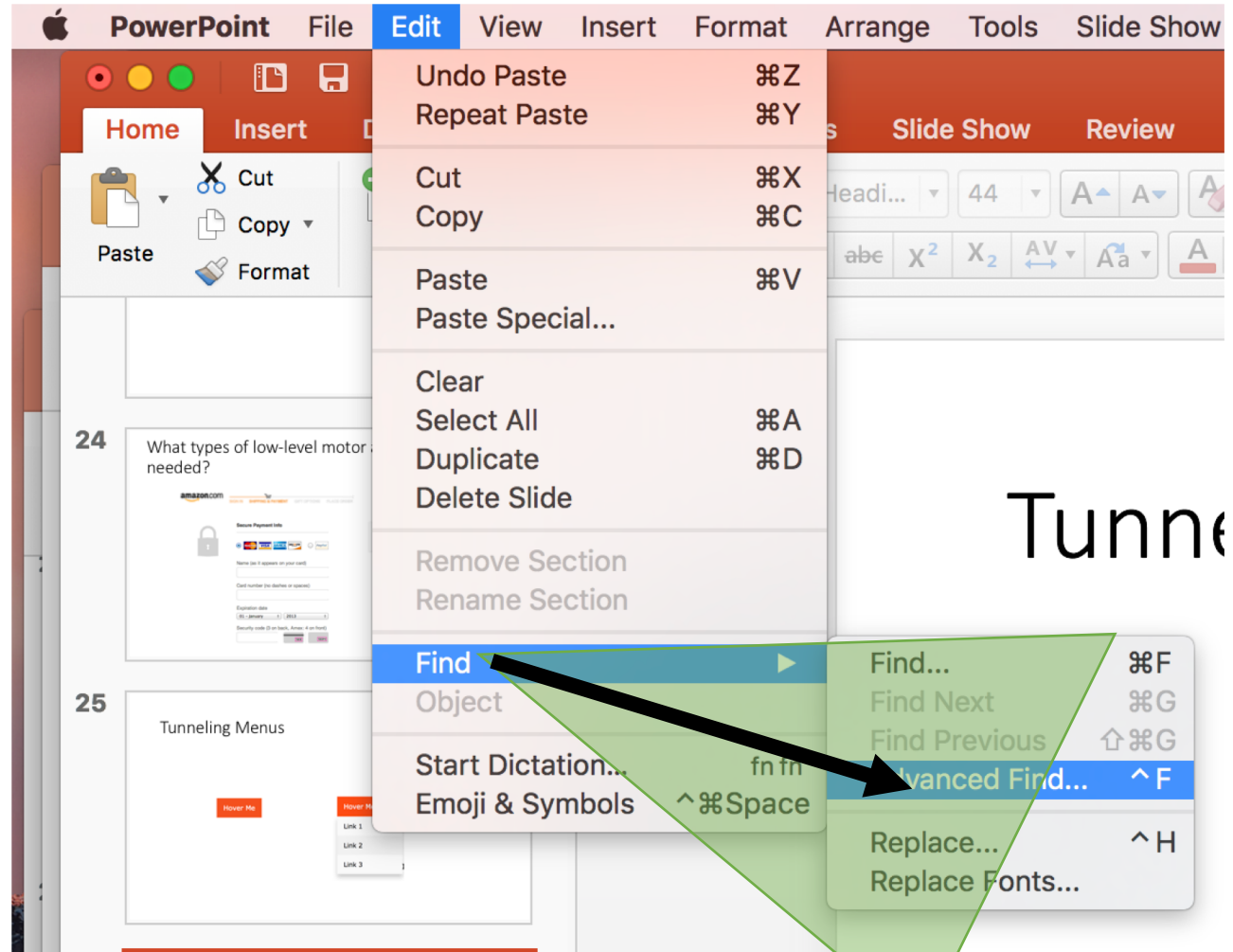
What are all the low-level interactions are needed to accomplish this subgoal?

Secure Payment Info

Name (as it appears on your card)

Card number (no dashes or spaces)

Expiration date

01 – January   2013

Security code (3 on back, Amex: 4 on front)

Every interaction takes time and effort, and is a potential source of error.

How could you improve this?
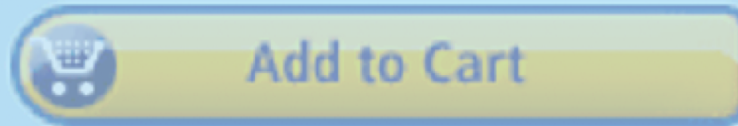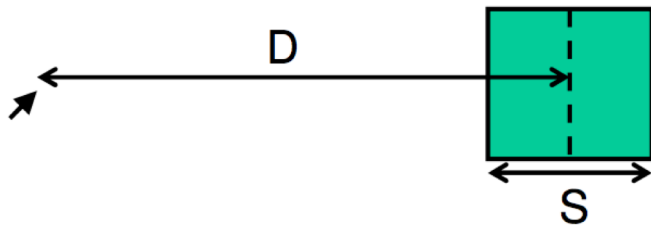
Low-level Interactions take time and effort. Minimize them because you do them a lot.

The Interaction Loop

Establish a goal: Buy a book.

What happens after you place an order?

To accomplish a goal, users must **execute** an operation and **evaluate** the result

The Seven Stages of Action

1. Form the goal

2. Plan the action
3. Specify the action sequence
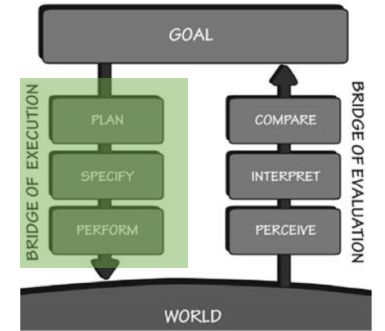4. Perform the action sequence

5. Perceive the state of the world
6. Interpret the perception
7. Compare the outcome with the goal

Goal Execution Step 1:
Plan the action
Specify the action sequence
Perform the action sequence

Goal Execution Step 2:

Plan the action

Specify the action sequence

Perform the action sequence

Goal Execution Step 3:

Plan the action
Specify the action sequence
Perform the action sequence

Goal Evaluation Step 1:
Perceive the State of the world
Interpret the perception
Compare the outcome with the goal

Goal Evaluation Step 2:

Perceive the State of the world

Interpret the perception

Compare the outcome with the goal

Goal Evaluation Step 3:

Perceive the State of the world

Interpret the perception

Compare the outcome with the goal

What's the users goal?   Post a tweet
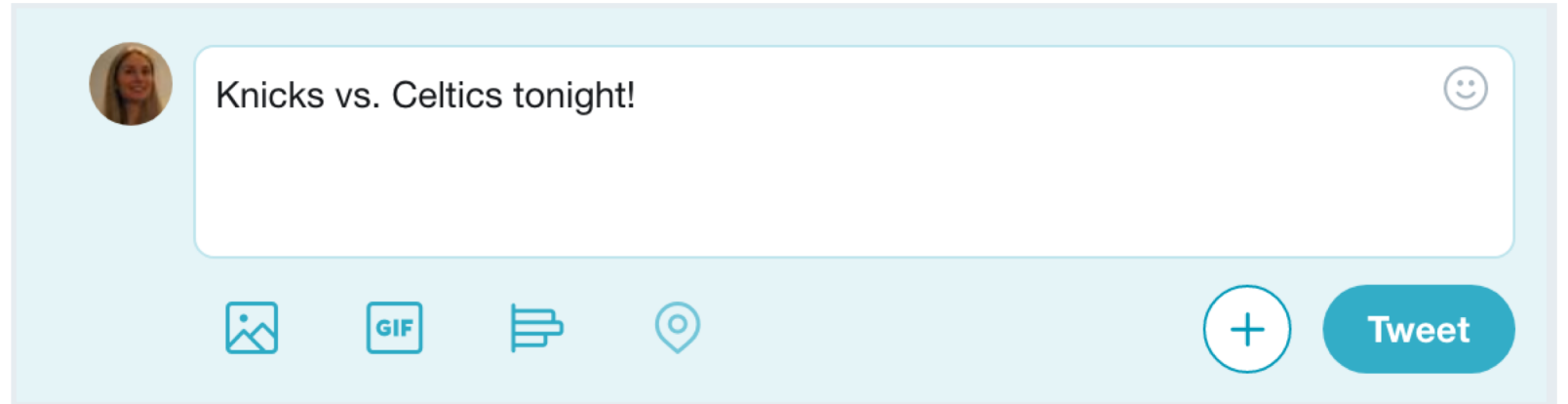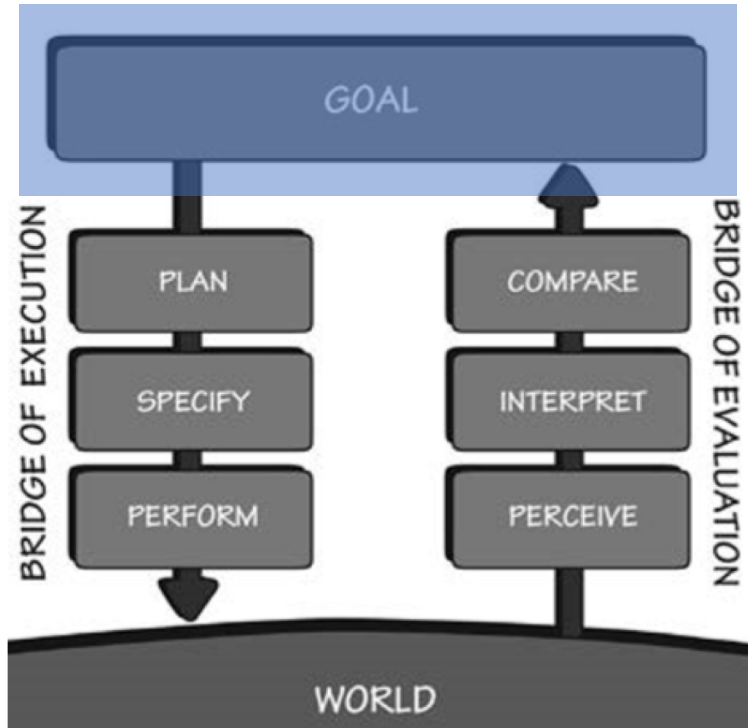
What does the execute?
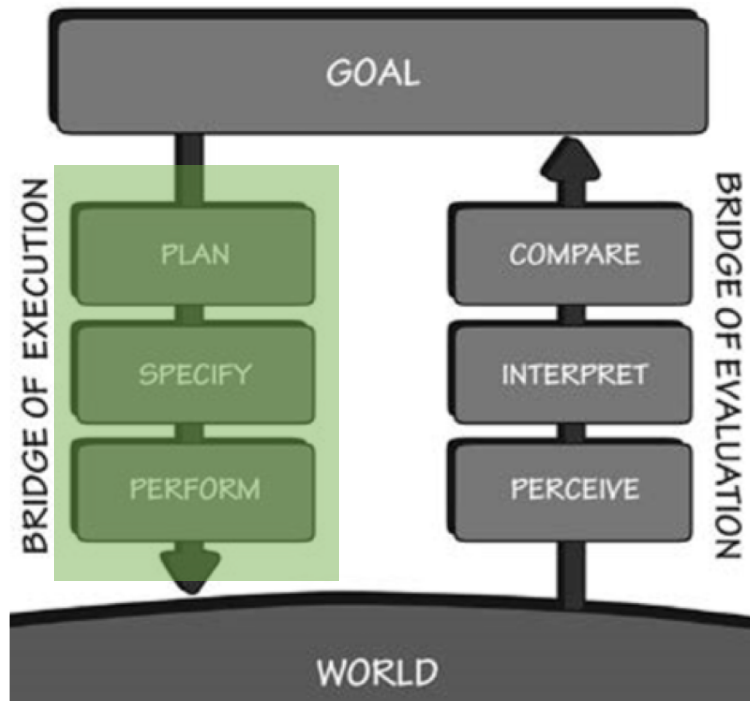
Put cursor in box
Type message
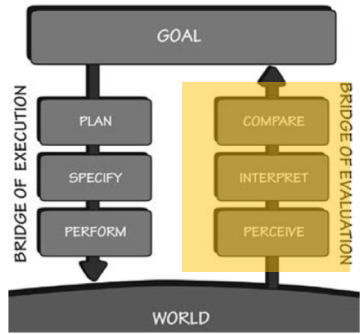Move mouse to button and click
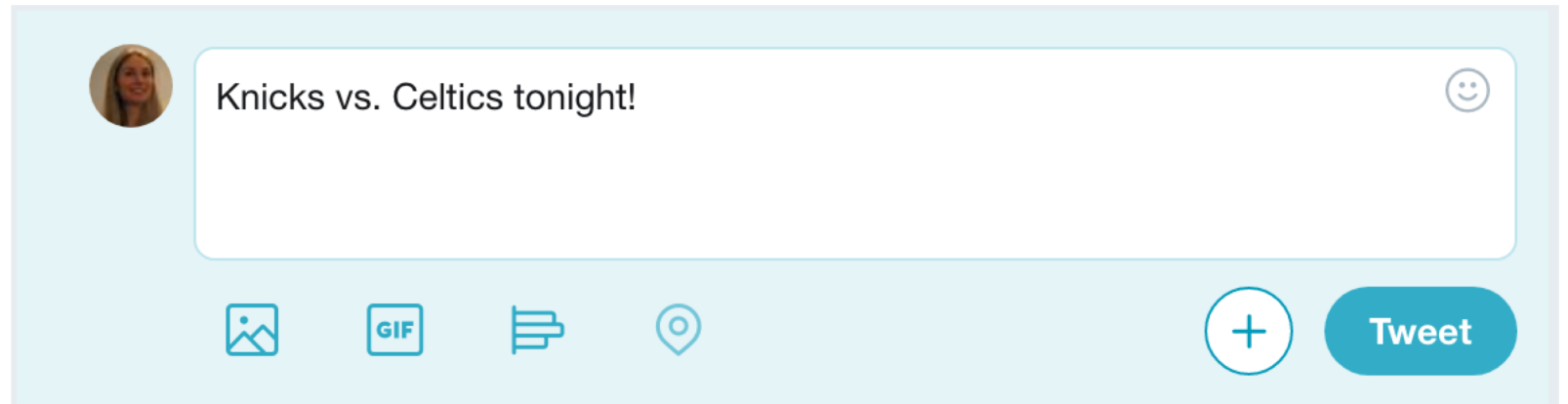
What does the user evaluate?

Did it get posted?
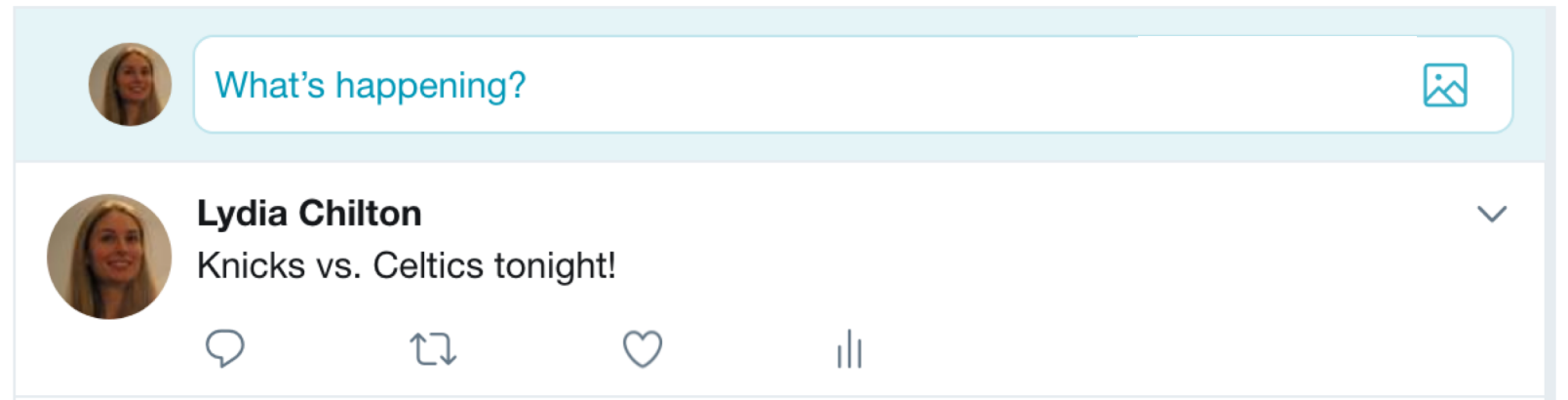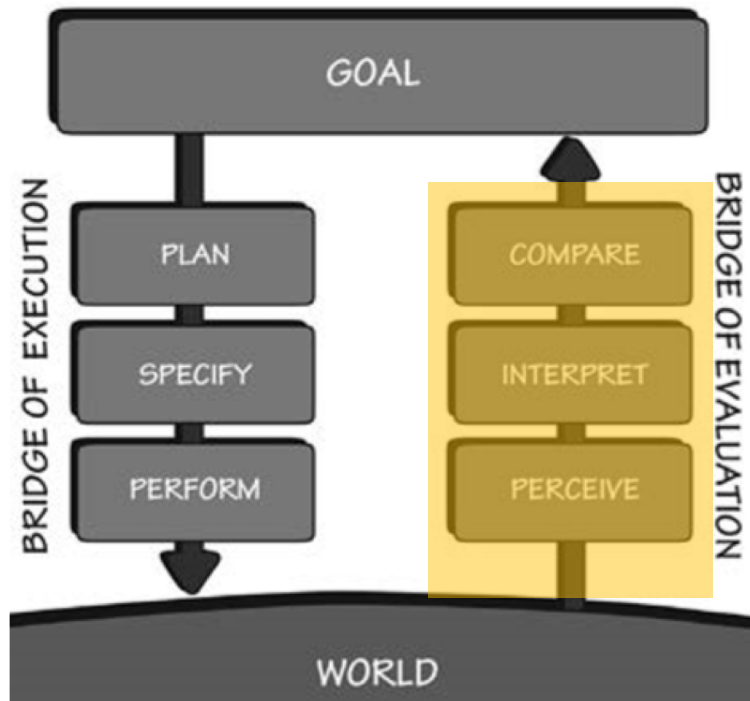
How does the user know?

It's my face.

It's my text.

It has new options.
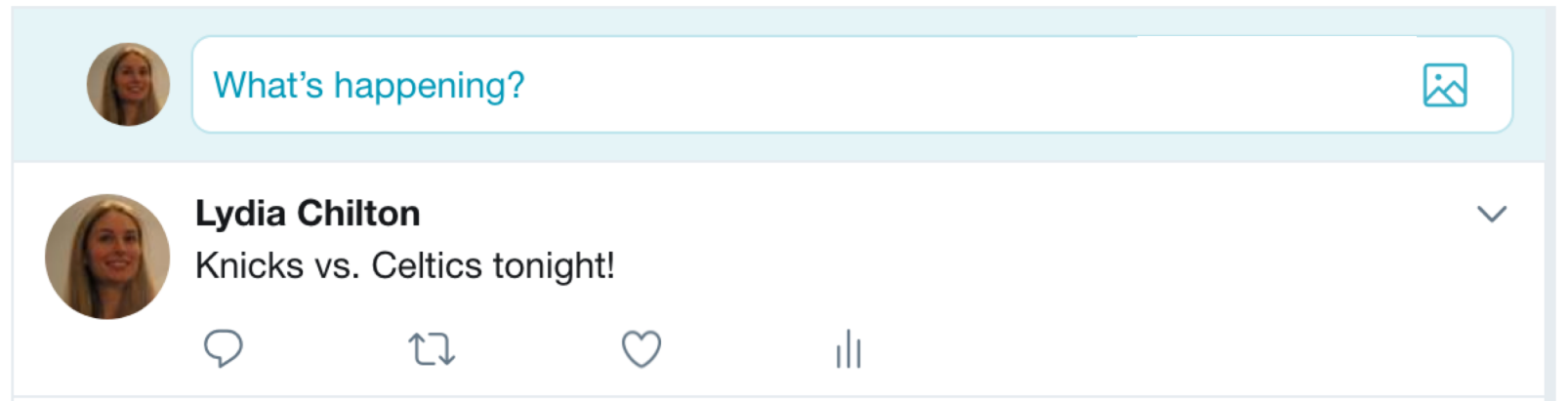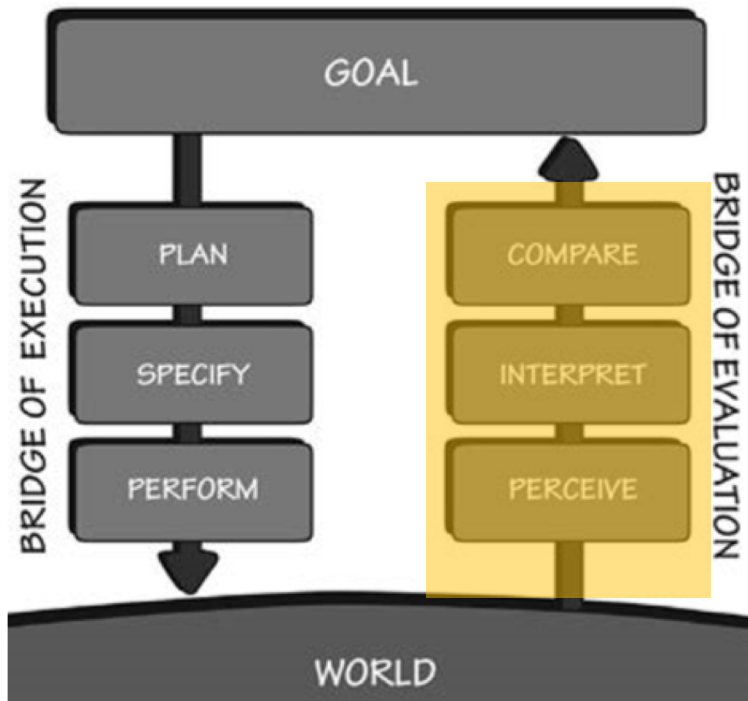
Goal: Perfect DDR score.

What's the users subgoal?   Step on the correct arrow at the correct time.
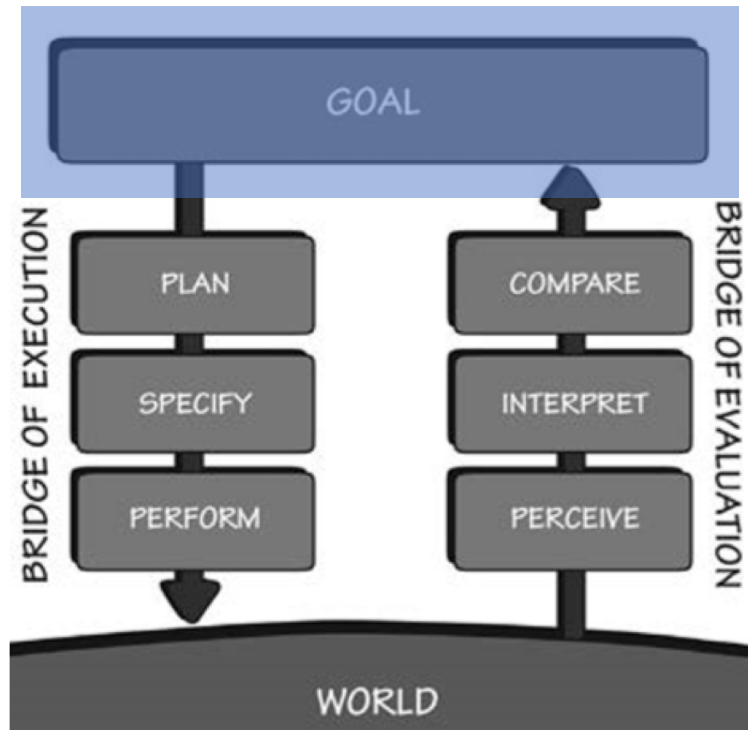
**Execution 1:
How does the user
plan the action?**
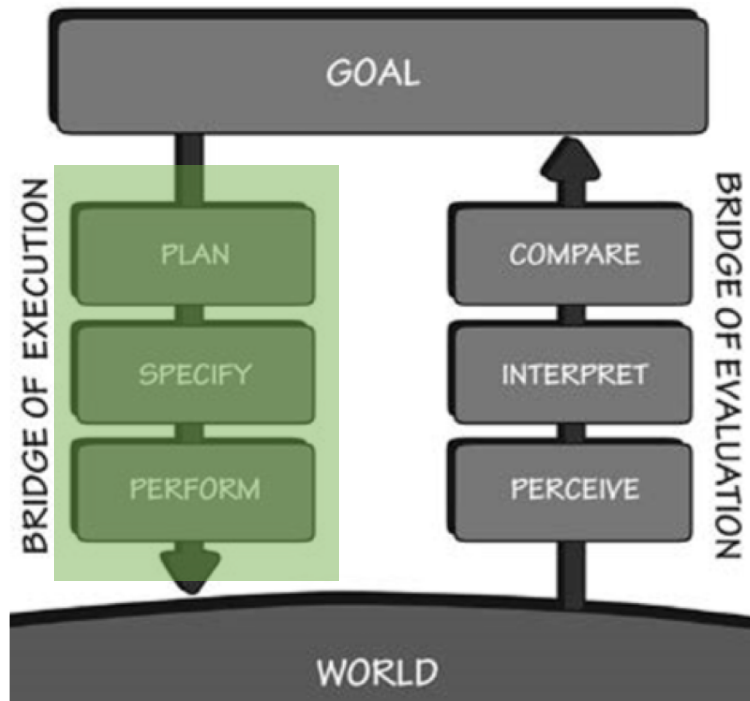
Look at the screen to see the correct arrow/timing

**Execution 2&3:
How does the user
execute the action?**

Lift your foot, move over arrow,
Place it at the right time
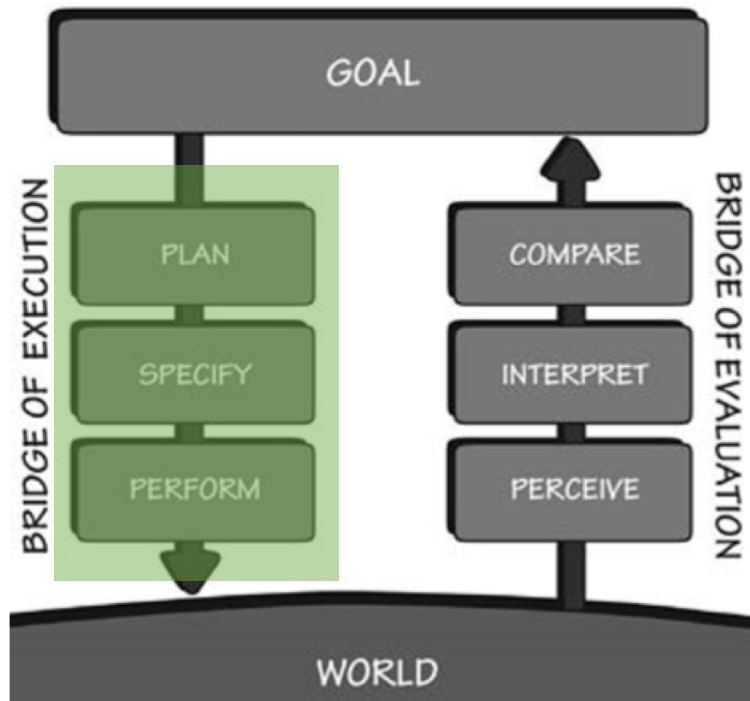
Evaluation:
How does the user evaluate the action?
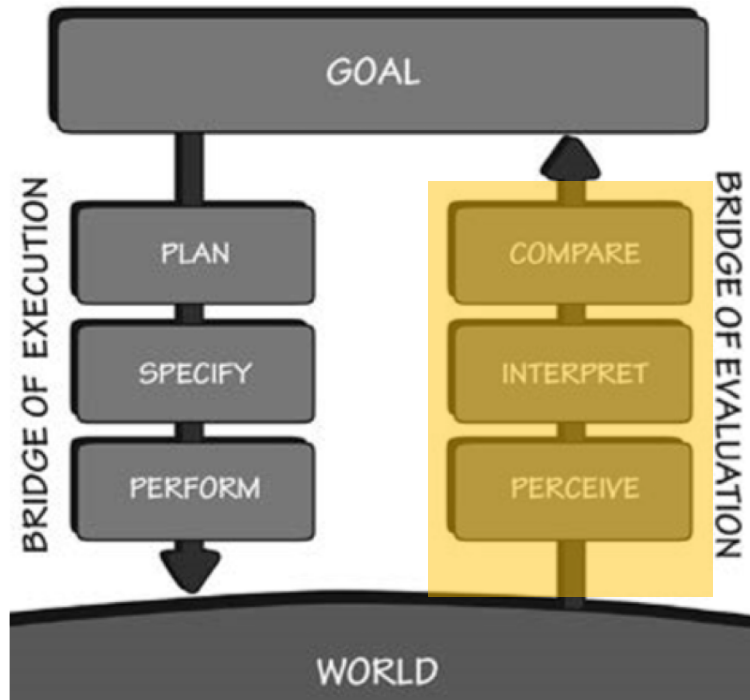
You can see the arrow flash
It tells you a grade

What's the users goal?   To set the alarm for 9:07am
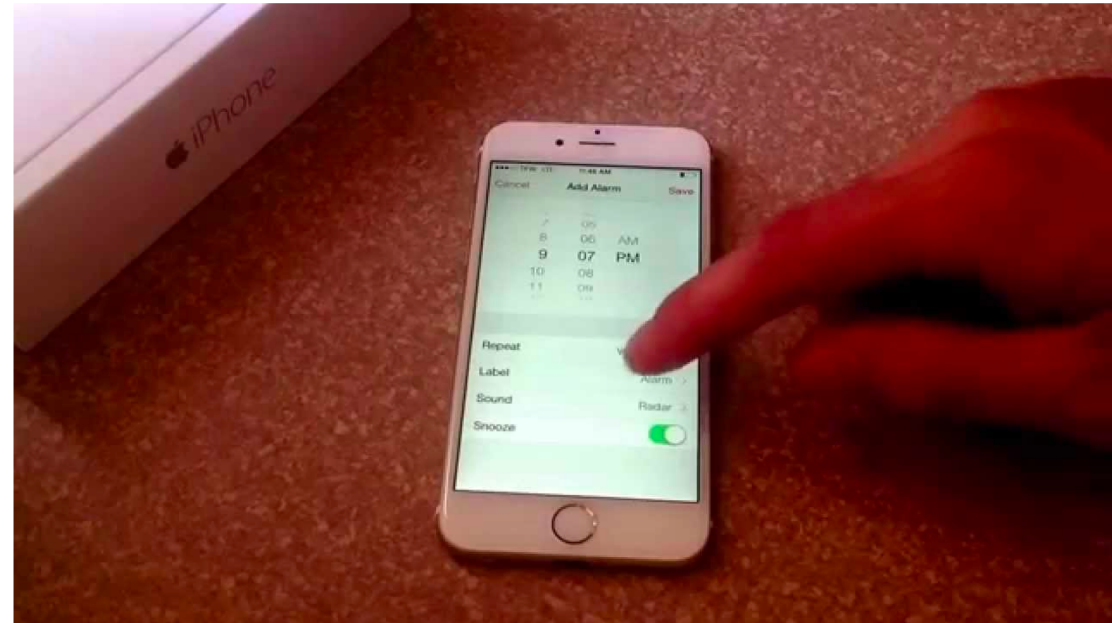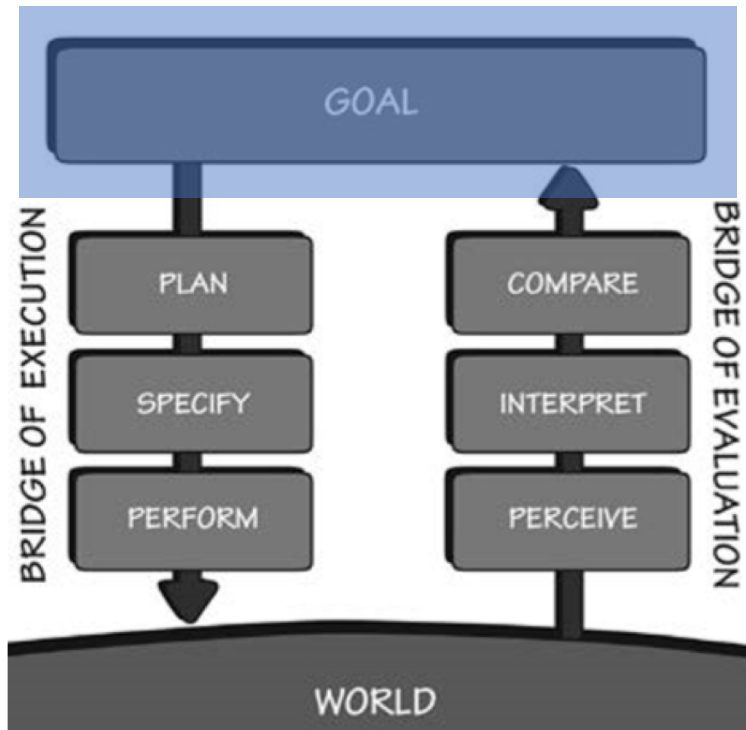
Execution?

Move the wheel to the time
Switch it to "on"
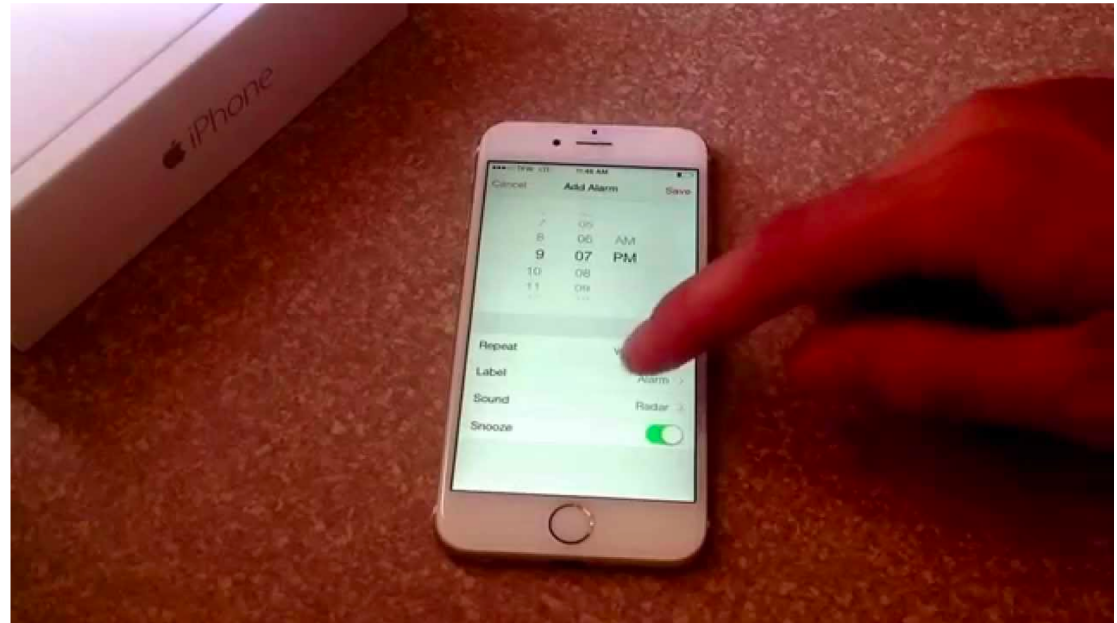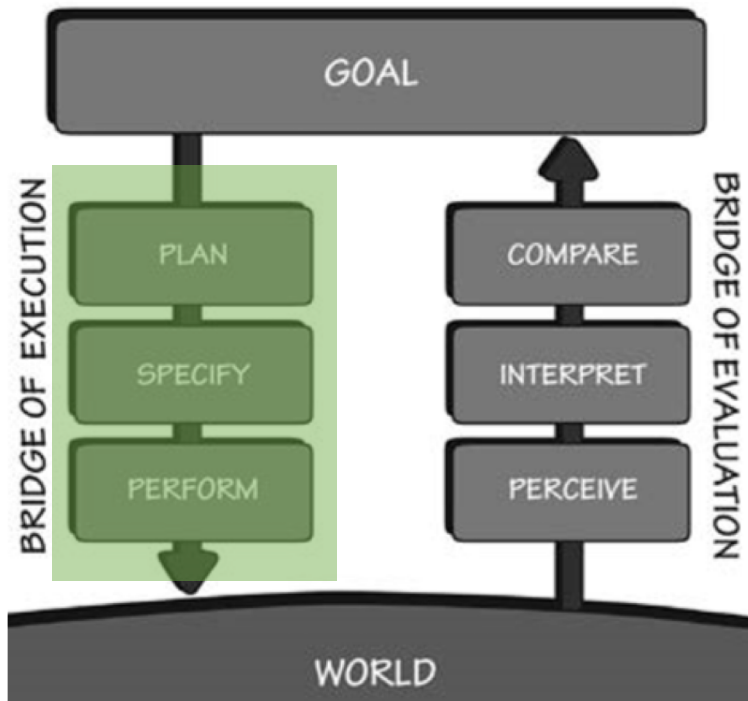
Evaluation?

Turns to an alarm screen
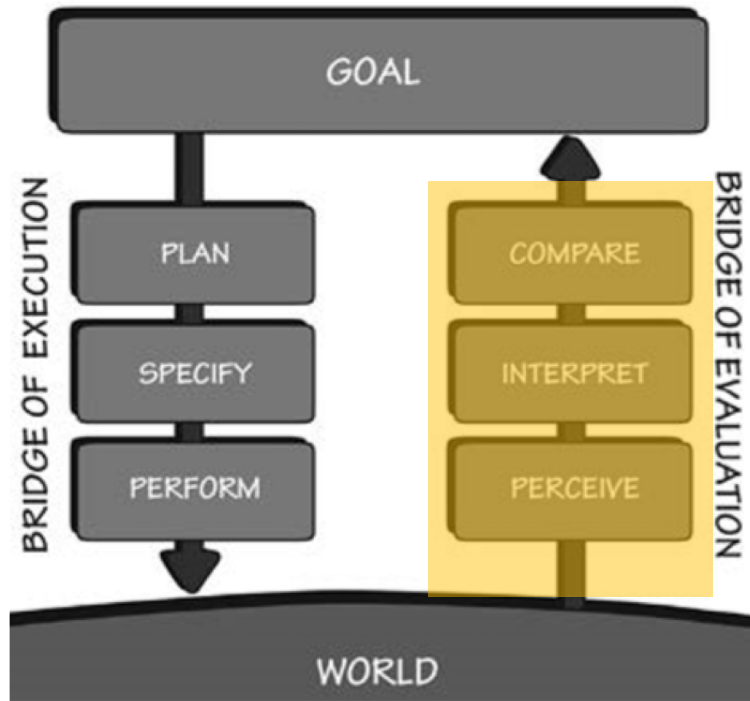
Programing interactions in JavaScript?

HTML

```
31  <body>
32
33      <button id="counter" class="btn btn-primary">Counter (0)</button>
34
35  </body>
36
```

counter.html

file:///Users/lydiach
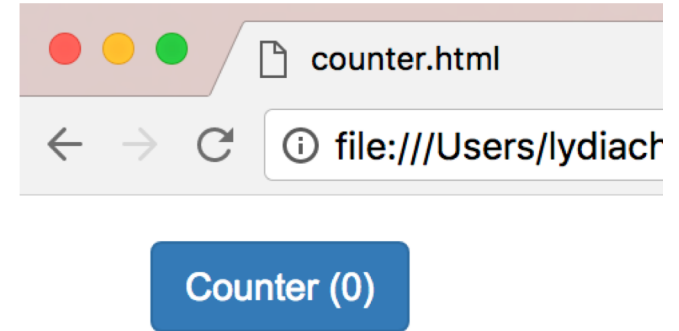
Counter (0)

JavaScript

```
25
26  $(document).ready(function(){
27      $("#counter").click(function(){
28          alert("foo")
29      })
30  })
31
```

counter.html

file:///Users/lydiachilton/Documents/hw4/counter.html

Counter (0)

This page says:

foo
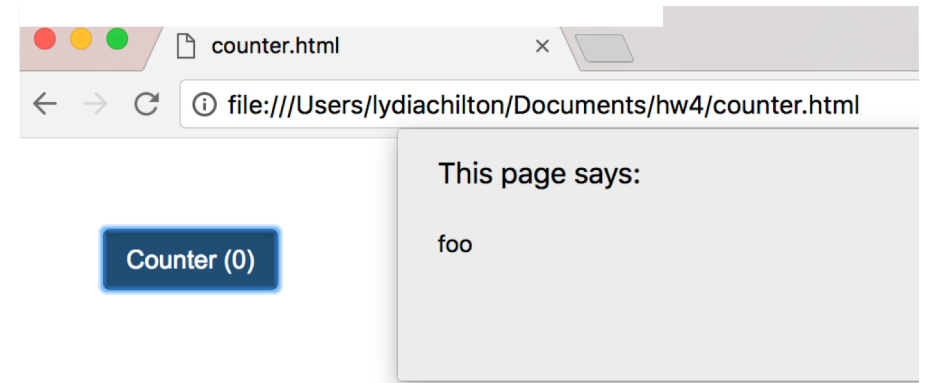
Summary

Users interact with a system to accomplish a goal
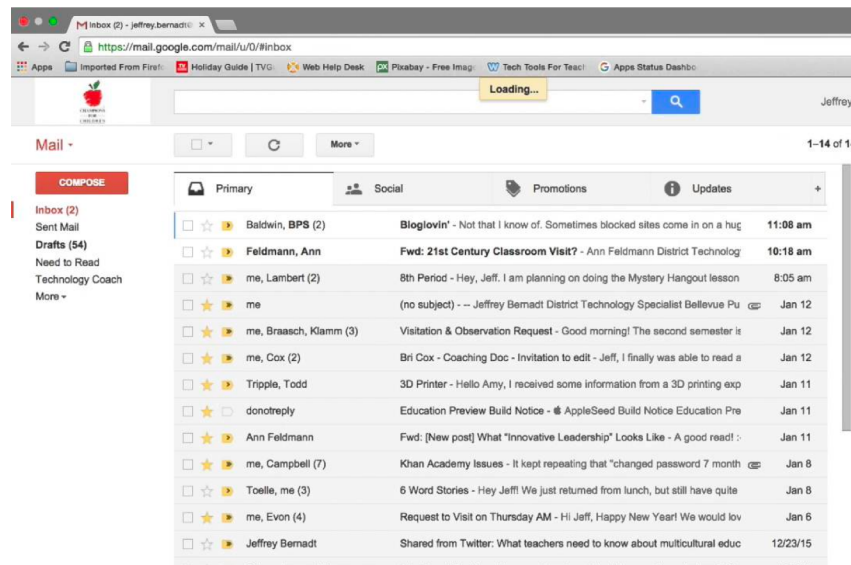
To read and respond to all email.
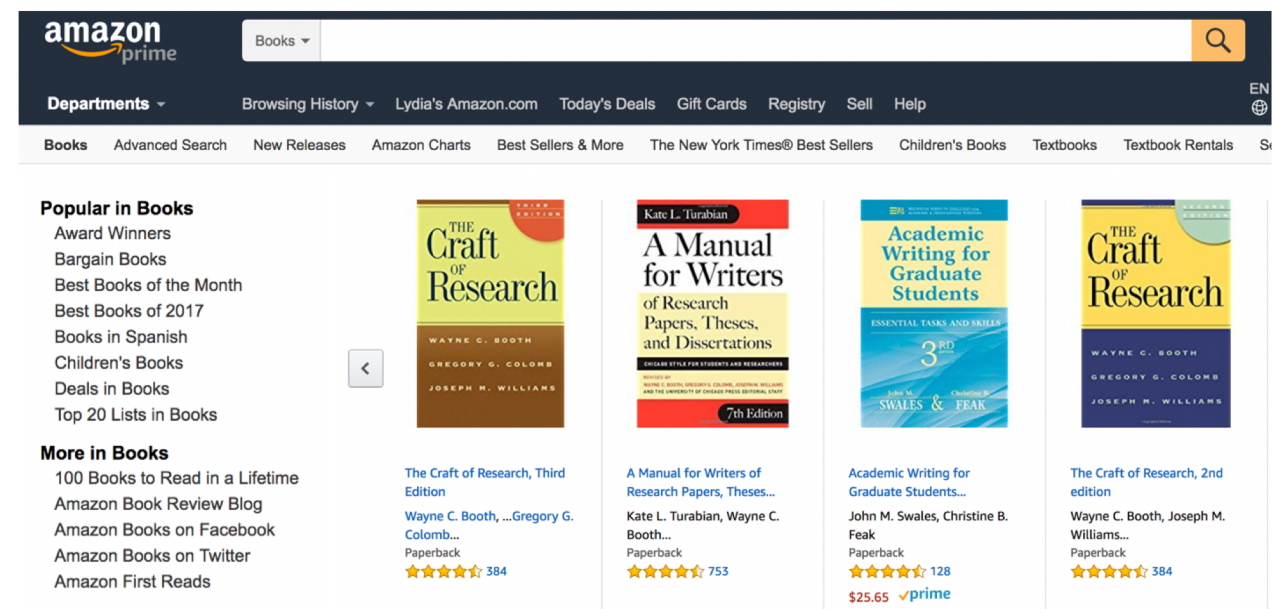
To buy a book

The designer must create the subgoals and interactions to help them accomplish it.

Goal: Buy a book

Subgoal:	Find it	Add to cart	Enter payment info	Place order
Interaction:	Type, click	click	Type, click, point	Click
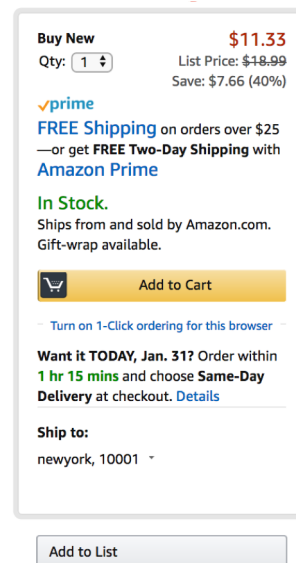
Time to move to a target : Fitts's Law

D

S
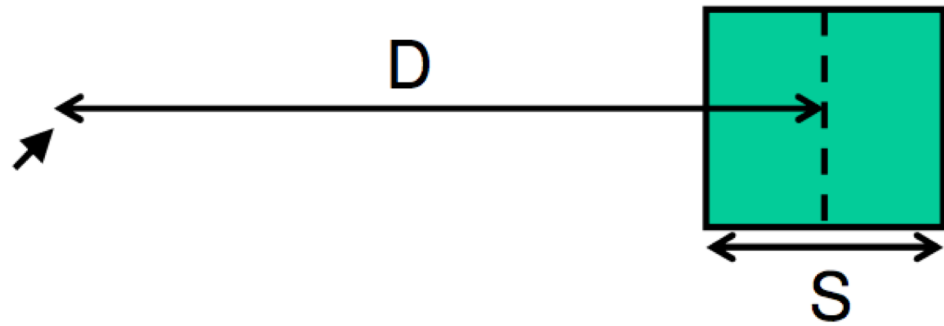
Time to move your
pointer to a target

$$= \quad a + b * \log \left(\frac{2D}{S} \right)$$

Buttons on the edges are fast
to get to because they have
infinite size

Low-level interactions take time and effort. Minimize them because you do them a lot.
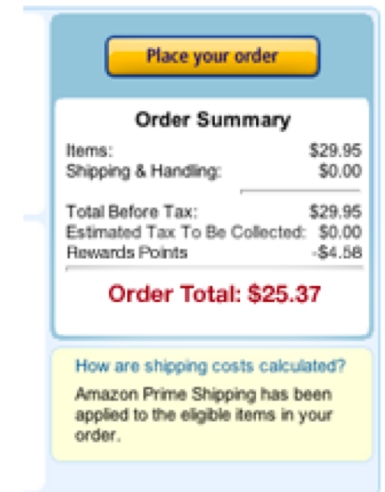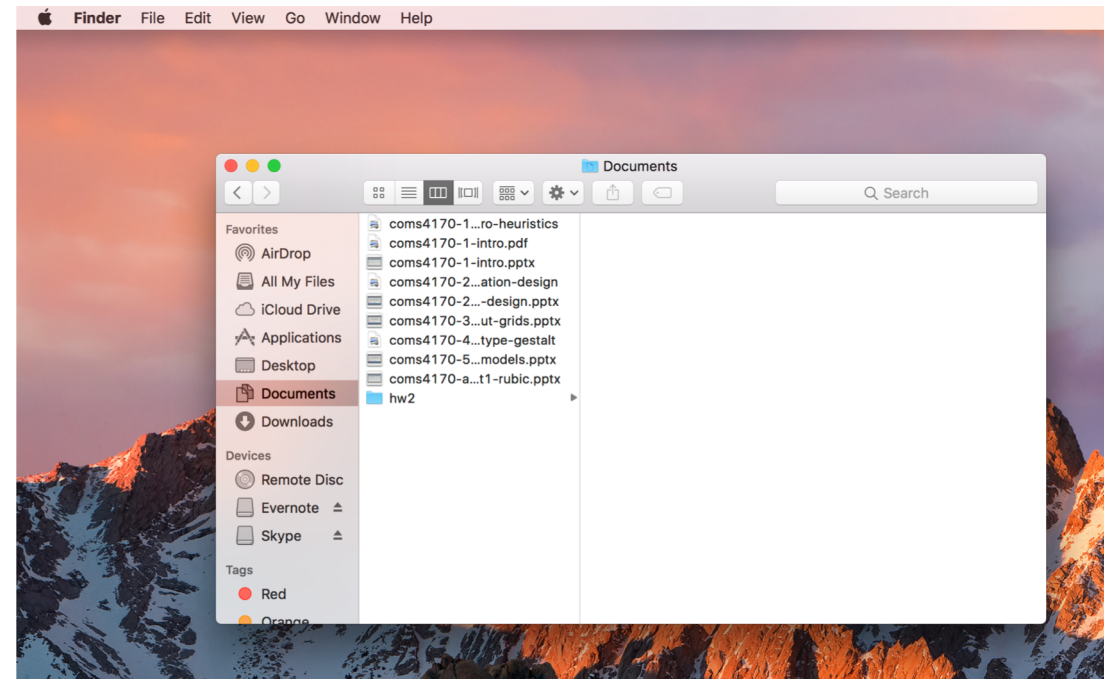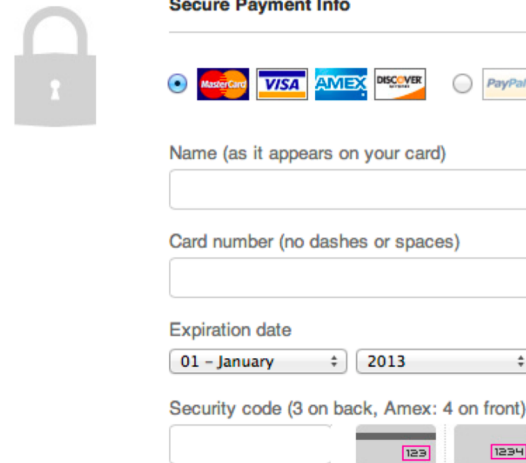
Secure Payment Info

Name (as it appears on your card)

Card number (no dashes or spaces)

Expiration date

01 – January   2013

Security code (3 on back, Amex: 4 on front)

Move
Click
Move
Click
TypeTypeTypeType
Move
Click
TypeTypeTypeType
Move Tunnel
Click
Move Tunnel
Click
TypeTypeTypeType

Know the users' goals and design interactions as: execution and evaluation
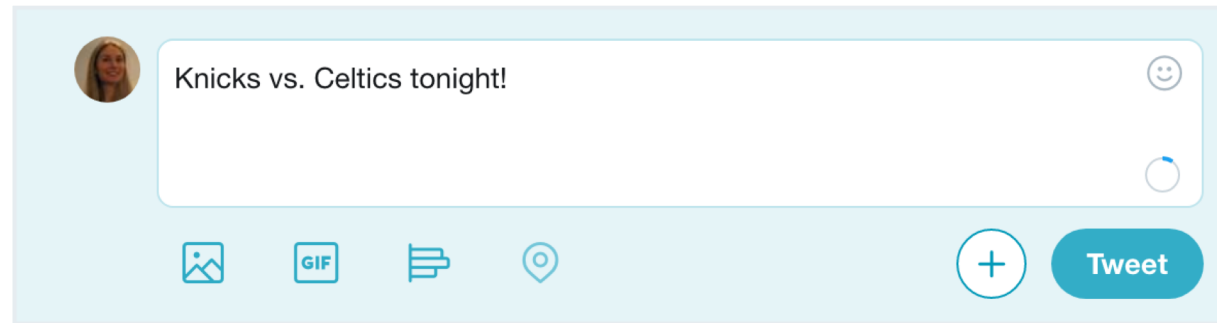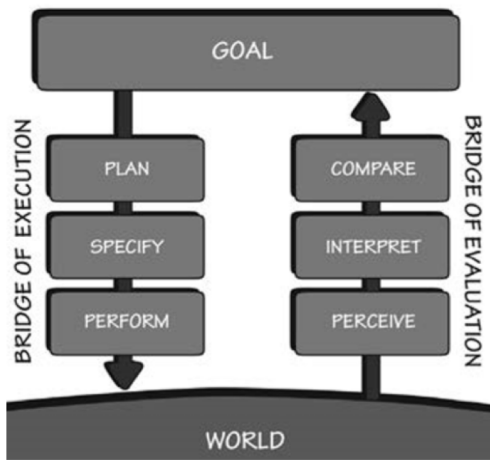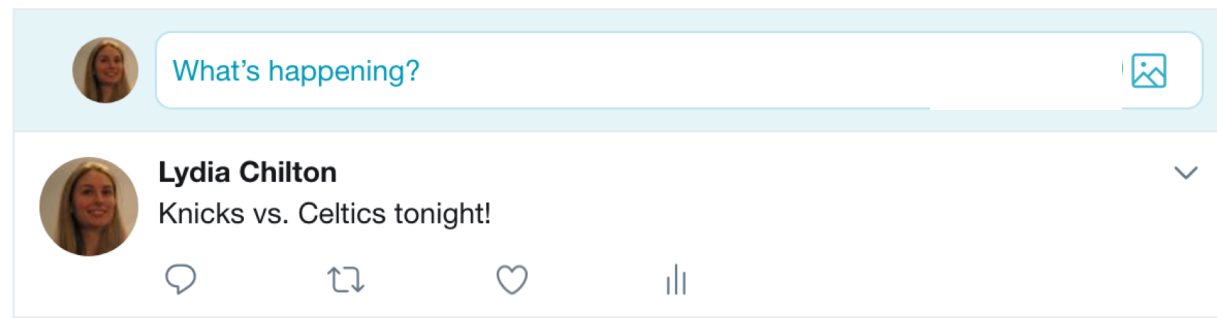

Execution

Plan the action

Specify the action sequence

Perform the action sequence

Evaluation

Perceive the state of the world

Interpret the perception

Compare the outcome with the goal