# Content and Form: How one manipulates the other



DAY 4 / GROUP B:

AN EYE TRACKING STUDY

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# Content and Form:

## heating4Eyetracking.html (from E. Kreyszig, Ch. 1)



# 1 Heating an Office Building (Newton's Law of Cooling)

## Background

Suppose that in Winter the daytime temperature in a certain office building is maintained at $70^{\circ}F$. The heating is shut off at 10 P.M. and turned on again at 6 A.M. On a certain day the temperature inside the building at 2 A.M was found to be $65^{\circ}F$. The outside temperature was $50^{\circ}F$ at 10 P.M. and had dropped to $40^{\circ}F$ by 6 A.M.

## Problem

What was the temperature inside the building when the heat was turned on at 6 A.M.

## Physical Information

Experiments show that the time rate of change of the temperature $T$ of a body $B$ (which conducts heat well, as, for example, a copper ball does) is proportional

# Design Challenge heating4Eyetracking.html



- Yesterday you learned how to markup math in technical documents. Reflect upon the usability issues elicited by our eyetracking experiment especially for the math part with a similar document on Monday.
- How can we make working with the document more usable and maybe even enable a good user experience? Think about what interactions would be nice and supportive.
- Think wild!

- Groups of 4 students
- 30min
- Present and explain your ideas, maybe with a paper prototype?

# Possible Issues



In our first eyetracking experiment we noted the following:

1. A lot of cross-referencing (What was the meaning of the symbols in a formula? E.g. „T“?)

2. Some structure referencing (Looking for problem again, for example)

3. Similar, but different symbols were confusing (e.g. ${}_6C^{12}$ or ${}_6C^{12}$ ?)

4. Directing focus onto math?

# Task heating4Eyetracking.html



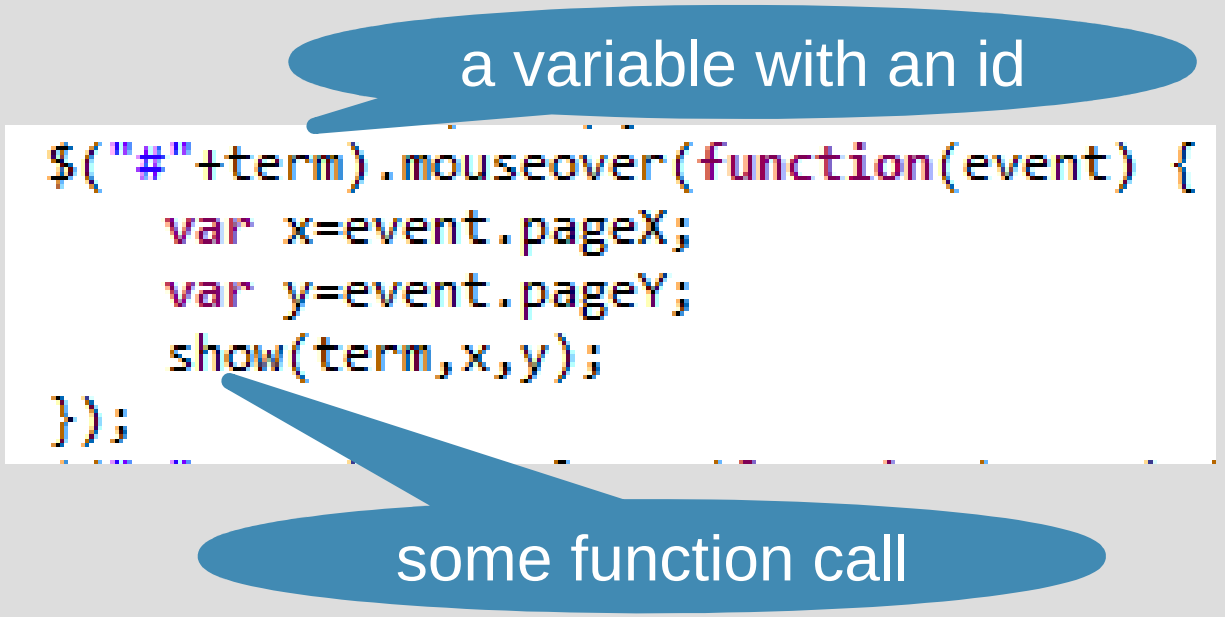
- Complete the annotations so that we have interactions all around.
- Think about the color scheme: is it already fitting?

- Groups of 4 students
- 30min
- We need one document afterwards → integration or organization

# Events



- https://api.jquery.com/category/events/mouse-events/



# A Definition Service



```
26          tank contains 1000 <span id="gal">gal</span> of water i
```

```
<div id="lexicon">
    <div for="brine">Brine is another word for salt water.</div>
    <div for="lb">This is a weight unit. 1 lb=500g</div>
    <div for="gal">This is a volumen unit. 1 gal=3785.41ml</div>
</div>
```

```
annotate('gal');
```

Event handling!

This is the defining phase …

# A Definition Service

```
function annotate(term){
    $("#"+term).mouseover(function(event) {
        var x=event.pageX;
        var y=event.pageY;
        show(term,x,y);
    });
    $("#"+term).mouseleave(function(event) {
        hide(term);
    });
}
```

Now the event-handling …

```
<div id="lexicon">
    <div for="brine">Brine is another word for salt water.</div>
    <div for="lb">This is a weight unit. 1 lb=500g</div>
    <div for="gal">This is a volumen unit. 1 gal=3785.41ml</div>
</div>
```

```
<span id="gal">gal</span>
```

```
rn};
+"']").html();
    x=x+10;
    y=y-40;
    $("#"+term).after($('<div id="hoverText">'+def+'</div>'));
    $('#hoverText').css('position','absolute')
                   .css('left',x)
                   .css('top',y)
                   .css('background-color','blue')
                   .css('color','white')
                   .css('display','block');
}
function hide(term){
    $("#"+term).removeClass('hover');
    $('#hoverText').remove();
}
```

# Eye Tracking: Measures



- Eye tracking is an observation method to learn
  - where a person is looking (at any given time)

    → Point-of-Gaze (Location)
  - in which order a person is looking

    → Order of fixations

    → Efficiency of task solving (# of fixations)
  - how long a person is looking at one spot

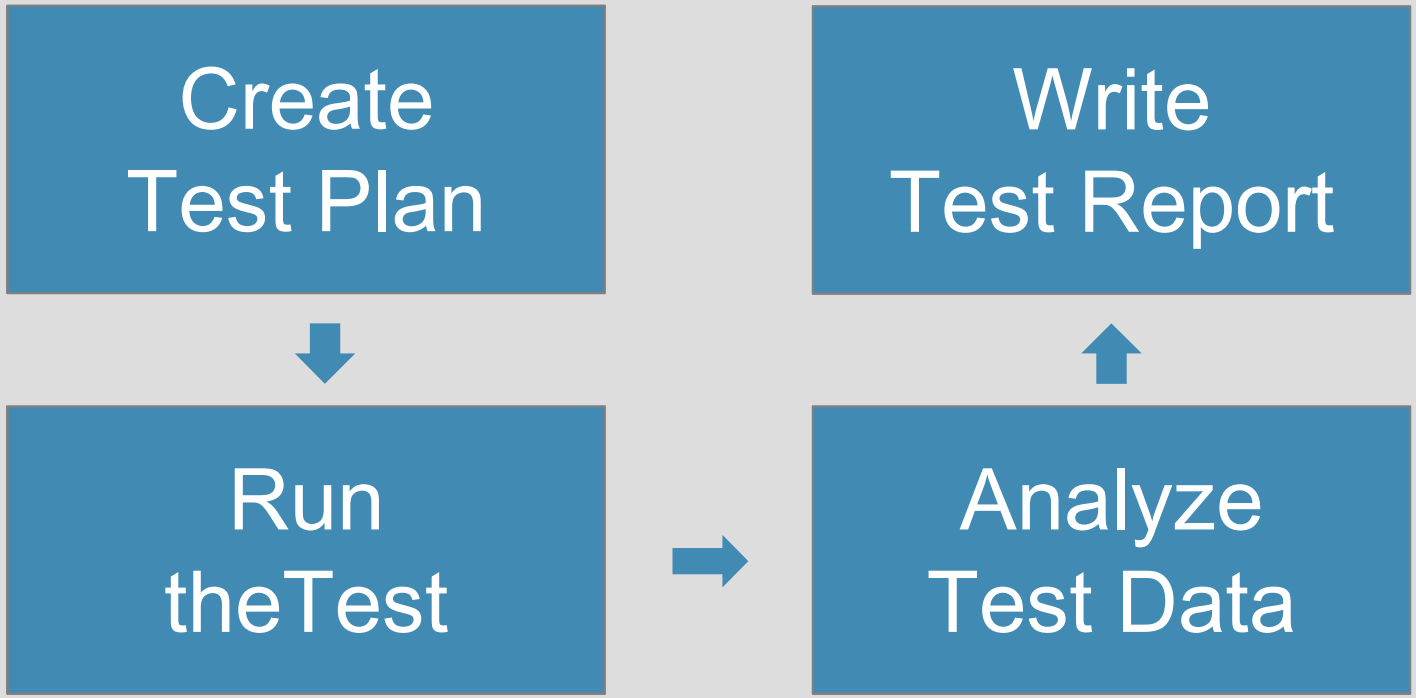
    → Fixation

    → Duration of fixation

see [Poole&Ball: Eye Tracking in HCI and Usability Research: Current Status and Future Prospects]

# Structure of a UX Test





# UX Testing



Main principle:

## User Advocacy

| From | | To |
|---|---|---|
| Our design | → | Their goals |
| Features & Ideas | → | Task validation |
| What we want | → | What they need |
| Our opinion | → | What they do (observed behavior) |

# Creating a Test Plan

- We start with a list of user stories for understanding our goals:
  1.
  2.
  3.

- User Story:

„As a <role> I want to <goal> to <utility>“, e.g.

„As a teacher
I want to invite students to meetings for them to confirm or reject
to organize my own time management“

# UX Test Plan

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| Task Name | User Story (concrete goal) | Scenario (very concrete context) | Ideal Response (optimal handling) | Assets & Metrics |
|---|---|---|---|---|
| | | | | |
| | | | | |