



### Collaboration Team

---

Andrii  
Sagaidak

Royden  
Luckey

Sam  
San Nicolas

Trevor  
Shibley

# The Problem

- ❖ Students and instructors sometimes fail to communicate
- ❖ Some students have difficulty asking questions out loud
- ❖ Students may poorly measure their own understanding
- ❖ Instructors may not be able to judge if the class is struggling until after exams are over

# The Research: Interviews

- ❖ Many students have questions in class



# The Research: Interviews

- ❖ Not all students ask their questions in class



# The Research: Contextual Inquiry & Observation

- ❖ Instructors don't know if students have questions





# Who has a question???







# The Research: Interviews

- ❖ Students don't recall each topic they found difficult...



# The Research: Interviews

❖ ...so they study everything...



# The Research: Interviews

❖ ...if time permits



# The Research

- ❖ Many students have questions in class
- ❖ Not all students ask their questions in class
- ❖ Instructors don't know if students have questions
- ❖ Students don't recall each topic they found difficult
- ❖ Reviewing every slide is the most common study method

# The Tasks

## Instructors

- ❖ Lesson Planning
- ❖ Judging Student Understanding
- ❖ Community Driven Questions
- ❖ Data-Driven Curriculum

## Students

- ❖ Study Planning
- ❖ Asking Questions
- ❖ Community Driven Questions

# The Tasks

## Instructors

- ❖ Lesson Planning
- ❖ Judging Student Understanding
- ❖ Community Driven Questions
- ❖ Data-Driven Curriculum

## Students

- ❖ Study Planning
- ❖ Asking Questions
- ❖ Community Driven Questions

# The Tasks

## Instructors

- ❖ Lesson Planning
- ❖ Judging Student Understanding
- ❖ Community Driven Questions
- ❖ Data-Driven Curriculum

## Students

- ❖ Study Planning
- ❖ Asking Questions
- ❖ Community Driven Questions

# The Tasks

## Instructors

- ❖ Lesson Planning
- ❖ Judging Student Understanding
- ❖ Community Driven Questions
- ❖ Data-Driven Curriculum

## Students

- ❖ Study Planning
- ❖ Asking Questions
- ❖ Community Driven Questions



# The Tasks

## Instructors

- ❖ Lesson Planning
- ❖ Judging Student Understanding
- ❖ Community Driven Questions
- ❖ Data-Driven Curriculum

## Students

- ❖ Study Planning
- ❖ Asking Questions
- ❖ Community Driven Questions

# The Tasks

## Instructors

- ❖ Lesson Planning
- ❖ Judging Student Understanding
- ❖ Community Driven Questions
- ❖ Data-Driven Curriculum

## Students

- ❖ Study Planning
- ❖ Asking Questions
- ❖ Community Driven Questions

# The Tasks

## Instructors

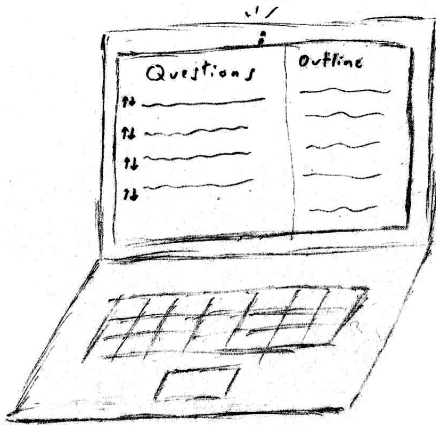
- ❖ Lesson Planning
- ❖ Judging Student Understanding
- ❖ Community Driven Questions
- ❖ Data-Driven Curriculum

## Students

- ❖ Study Planning
- ❖ Asking Questions
- ❖ Community Driven Questions

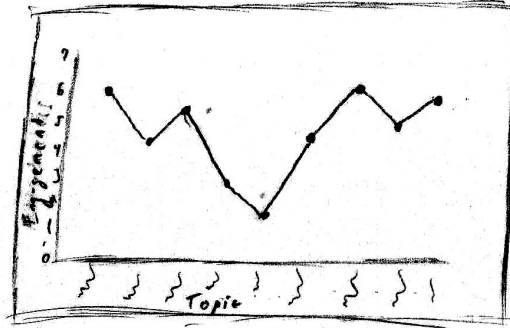
# Design 1: Passive Student Tracking In-Class

## Data Collection



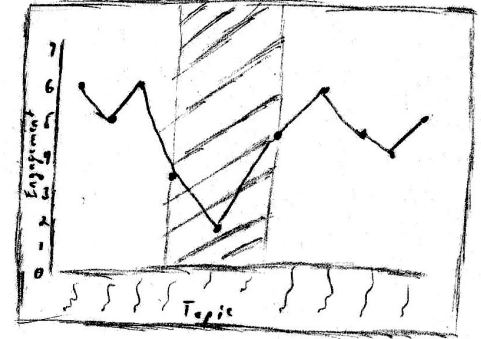
We have passively tracked student understanding

## Data Visualization

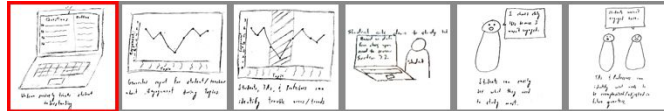


Generates report for student/teacher about Engagement during Topics

## Data Analysis

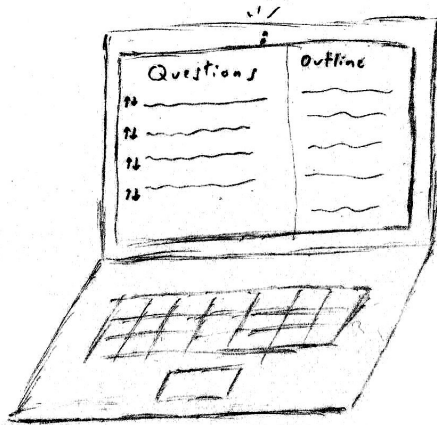


Students, TAs, & Professors can identify trouble areas/trends



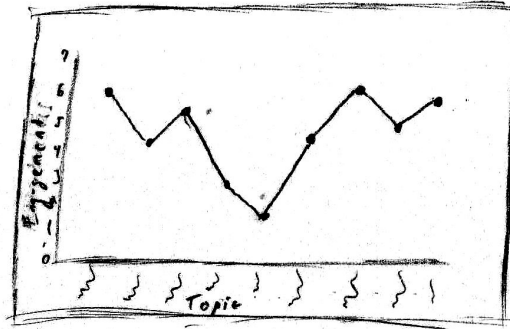
# Design 1: Passive Student Tracking In-Class

## Data Collection



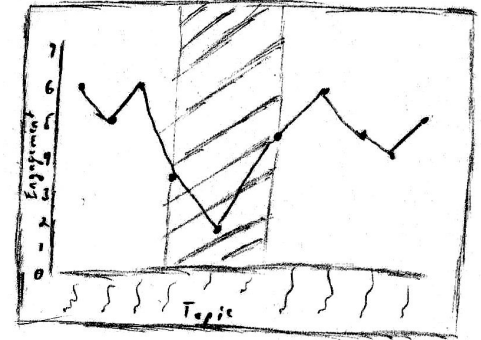
We have passively tracks student on deep thinking

## Data Visualization

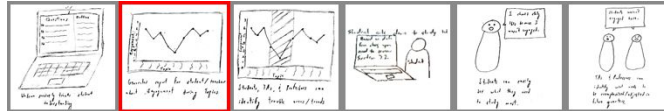


Generates report for student/teacher about Engagement during Topics

## Data Analysis

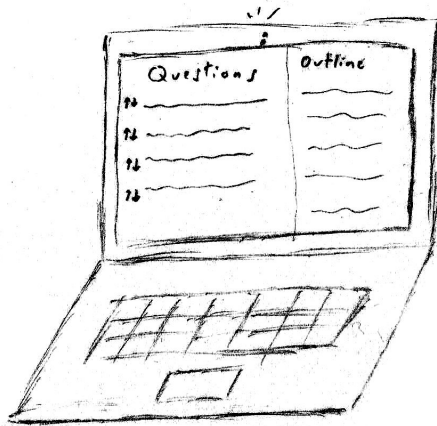


Students, TAs, & Professors can identify trouble areas/trends



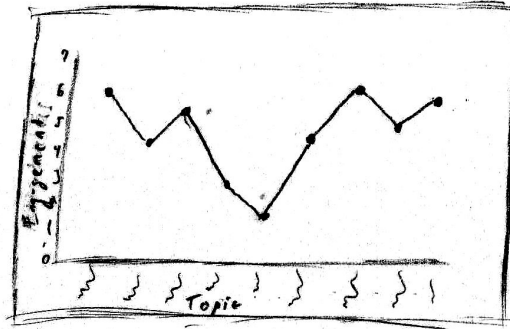
# Design 1: Passive Student Tracking In-Class

## Data Collection



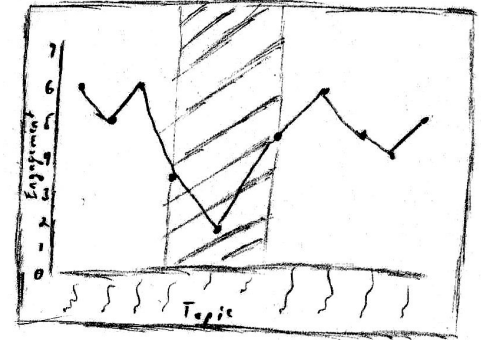
We have passively tracks student on deep thinking

## Data Visualization

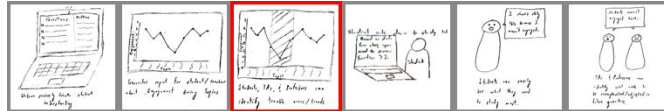


Generates report for student/teacher about Engagement during Topics

## Data Analysis

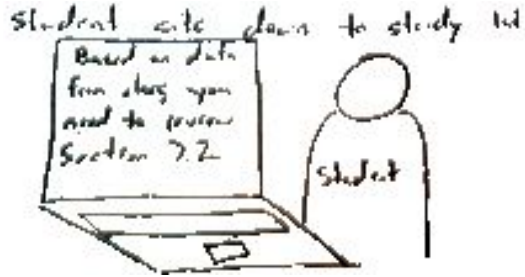


Students, TAs, & Professors can identify trouble areas/trends



# Design 1: Passive Student Tracking In-Class

## Study Suggestions

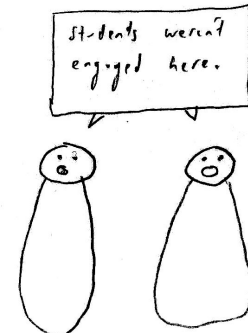


## Study Planning

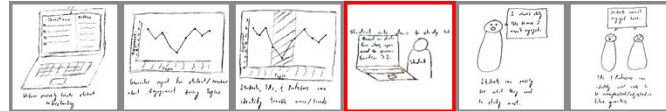


Students can easily see what they need to study most.

## Curriculum Planning



TAs & Professors can identify what needs to be reemphasized/adjusted in future quarters.



# Design 1: Passive Student Tracking In-Class

## Study Suggestions

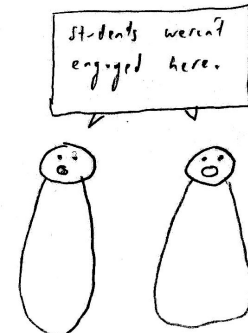


## Study Planning

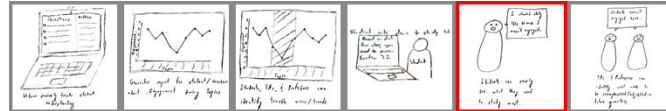


Students can easily see what they need to study most.

## Curriculum Planning



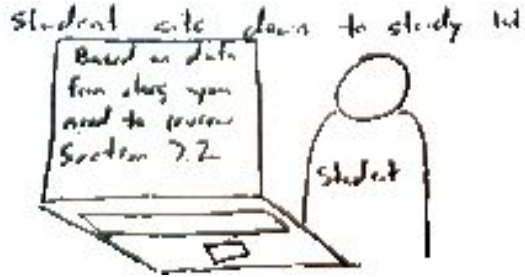
TAs & Professors can identify what needs to be reemphasized/adjusted in future quarters.





# Design 1: Passive Student Tracking In-Class

## Study Suggestions

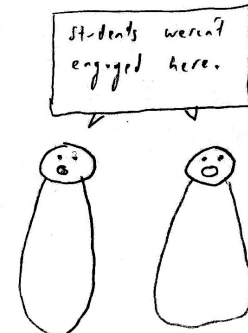


## Study Planning

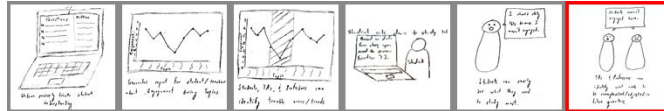


Students can easily see what they need to study most.

## Curriculum Planning



TAs & Professors can identify what needs to be reemphasized/adjusted in future quarters.



# Design 2: Out-of-Class Student Performance

## Data Collection

Q01) What is the closest answer to:  
 $E = mc^2$  for  $m$

a) \_\_\_\_\_  
 b) \_\_\_\_\_  
 c) \_\_\_\_\_

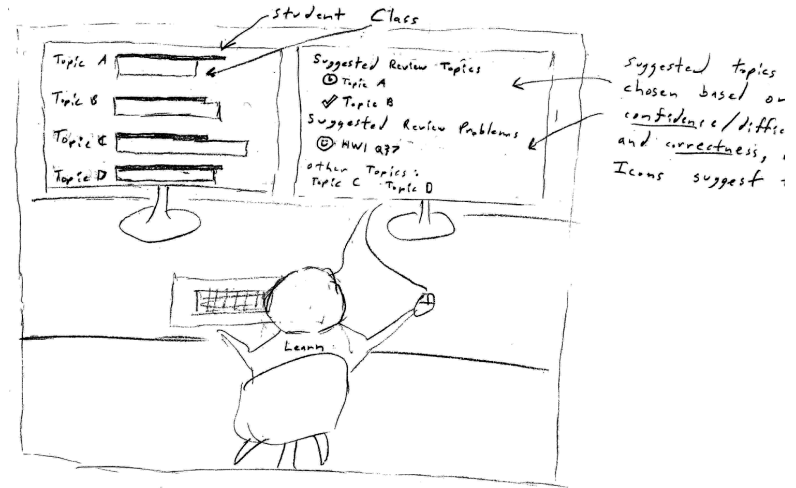
Relative Difficulty:  Easy  Medium  Hard  Absurd

Confidence in Answer: ?      !  
Maybe certain

Submit

Students only have to click two radio buttons

## Study Planning



# Design 2: Out-of-Class Student Performance

## Data Collection

Q01 What is the closest answer to:  
 $E = mc^2$  for       

a)         
 b)         
 c)       

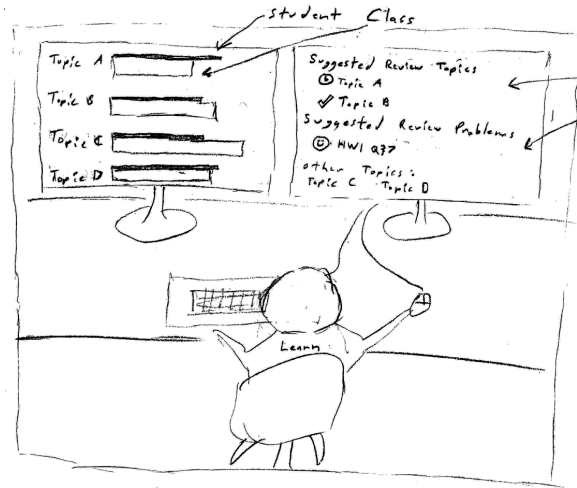
Relative Difficulty:  Easy  Medium  Hard  Absurd

Confidence in Answer: ?      !  
© TeacherTrack  Maybe  certain

Submit

Students only have to click two radio buttons

## Study Planning

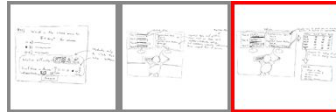
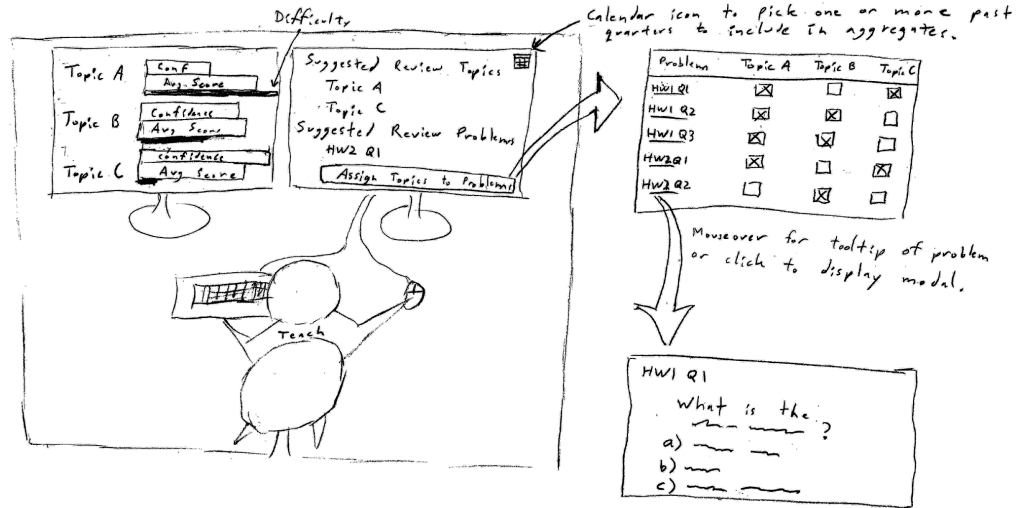


Suggested topics chosen based on confidence/difficulty and correctness. Icons suggest...



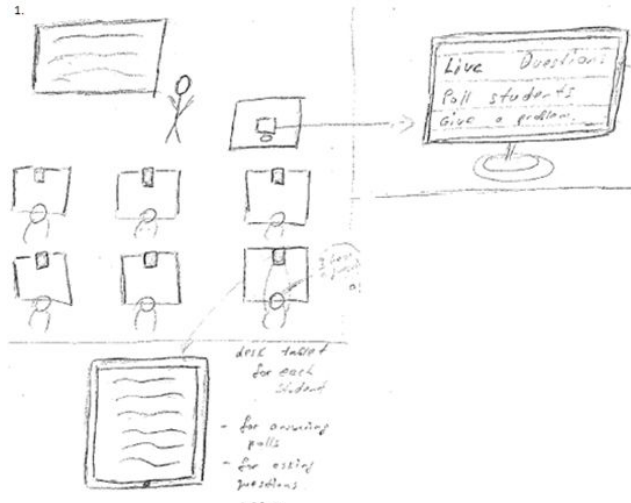
# Design 2: Out-of-Class Student Performance

## Lesson & Curriculum Planning

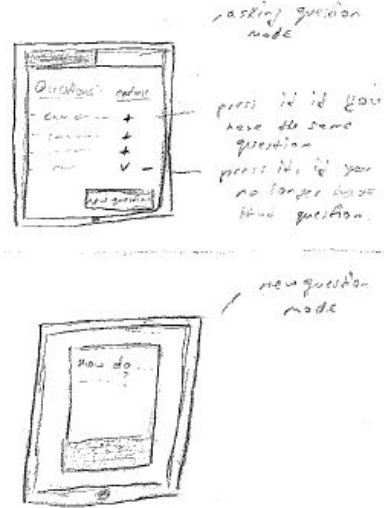


# Design 3: Community-Driven Questions

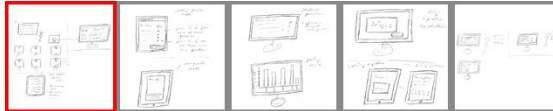
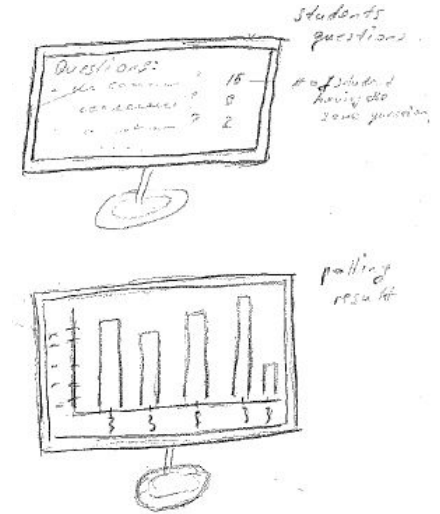
## Ask Questions Anonymously



## Upvote Questions

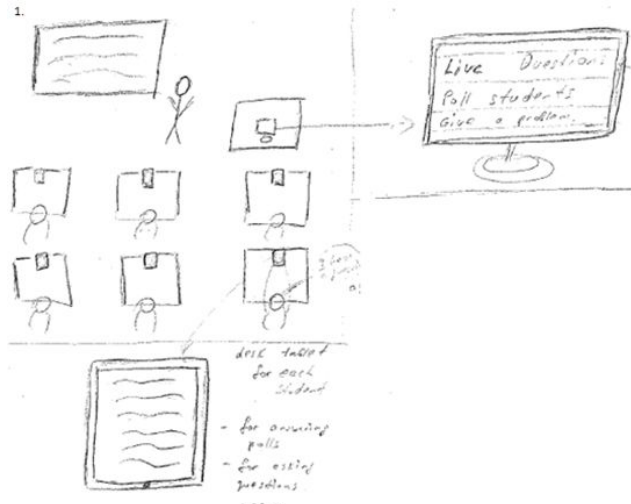


## View Top Questions

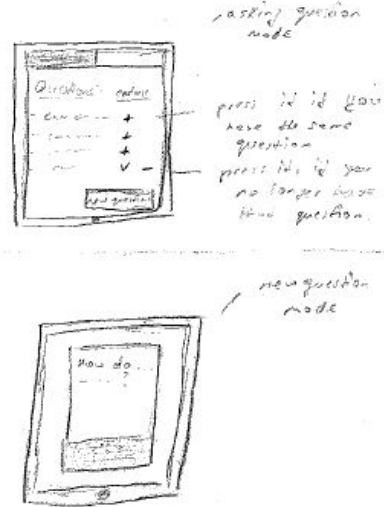


# Design 3: Community-Driven Questions

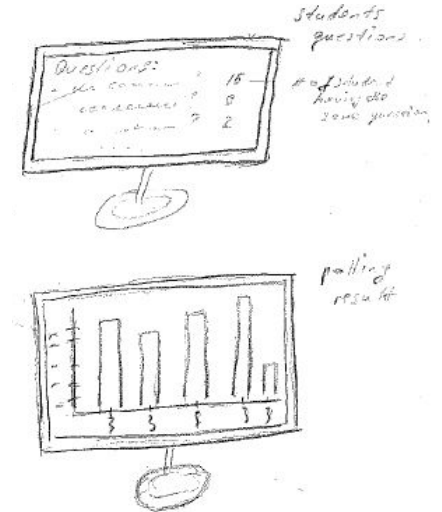
## Ask Questions Anonymously



## Upvote Questions

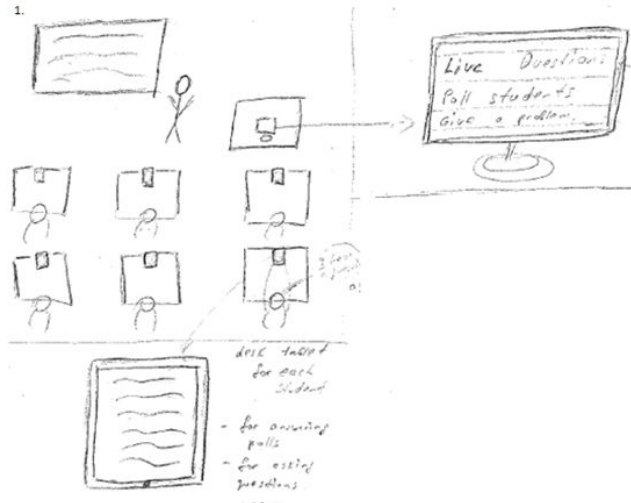


## View Top Questions

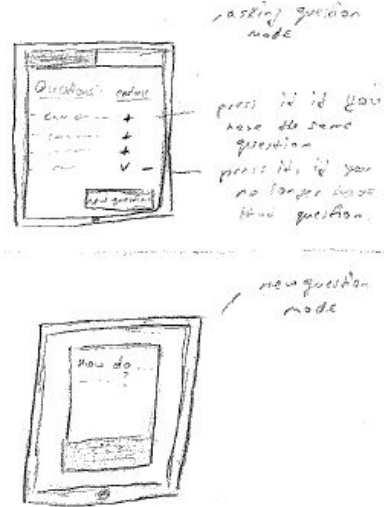


# Design 3: Community-Driven Questions

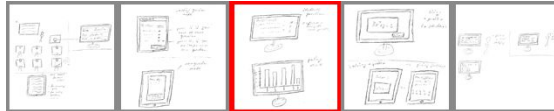
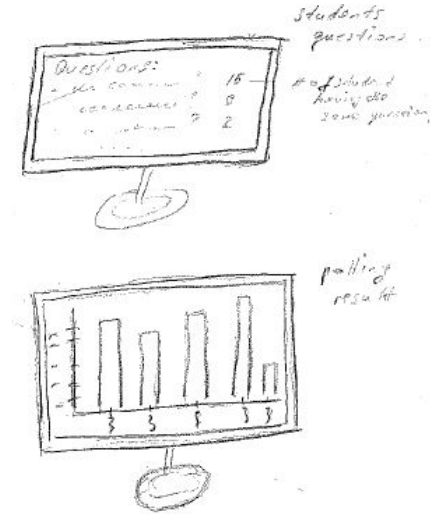
## Ask Questions Anonymously



## Upvote Questions

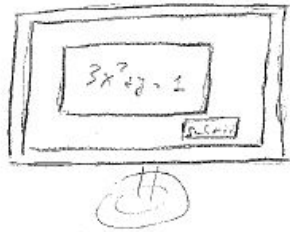


## View Top Questions



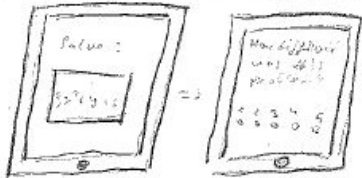
# Design 3: Community-Driven Questions

## In-Class Exercises



solving  
= problem  
to students

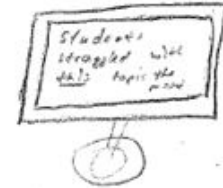
solving a problem → giving feedback



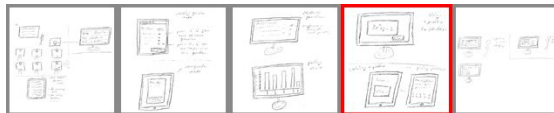
## Data-Driven Studying



- student  
a home  
studying



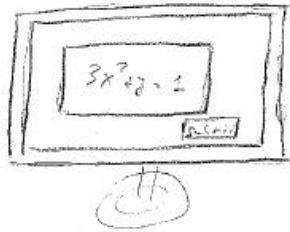
problem  
TA  
planning  
next teaching  
class





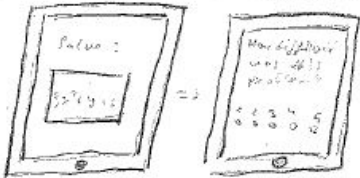
# Design 3: Community-Driven Questions

## In-Class Exercises

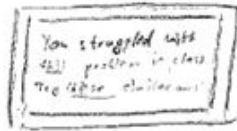


solving  
a problem  
to students

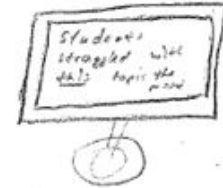
solving a problem → giving feedback



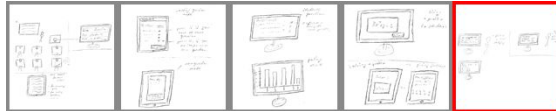
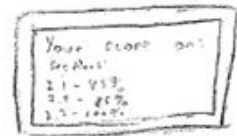
## Data-Driven Studying



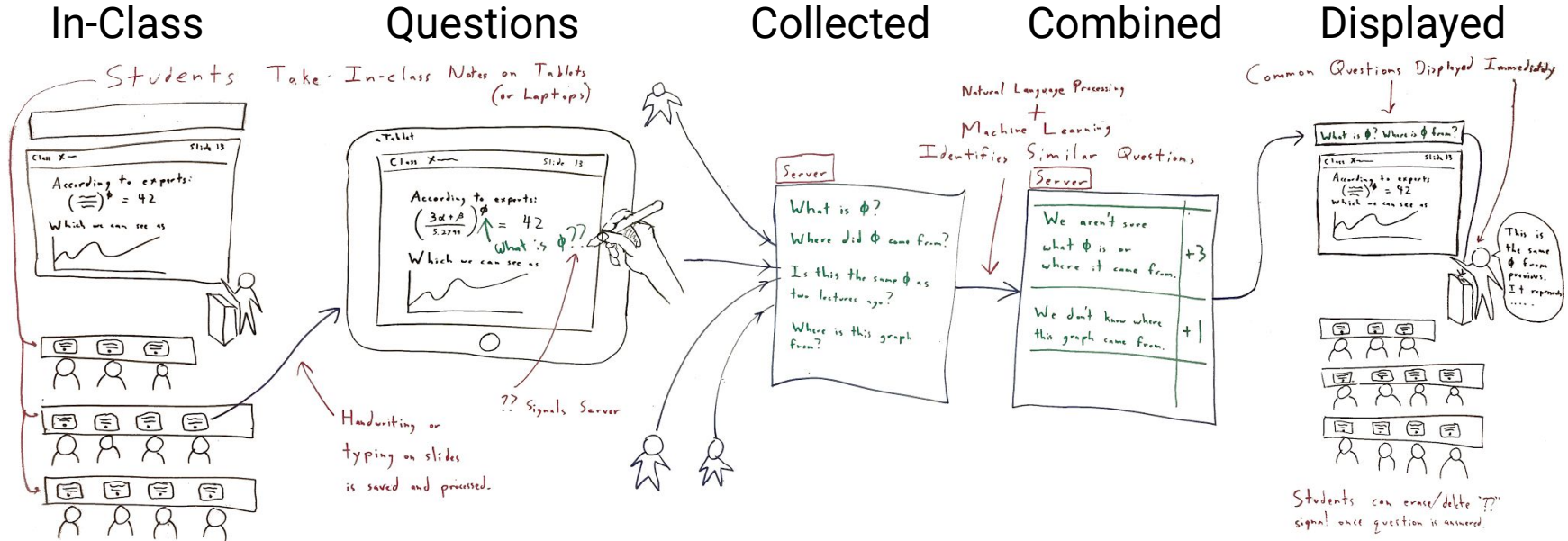
- student  
a home  
studying



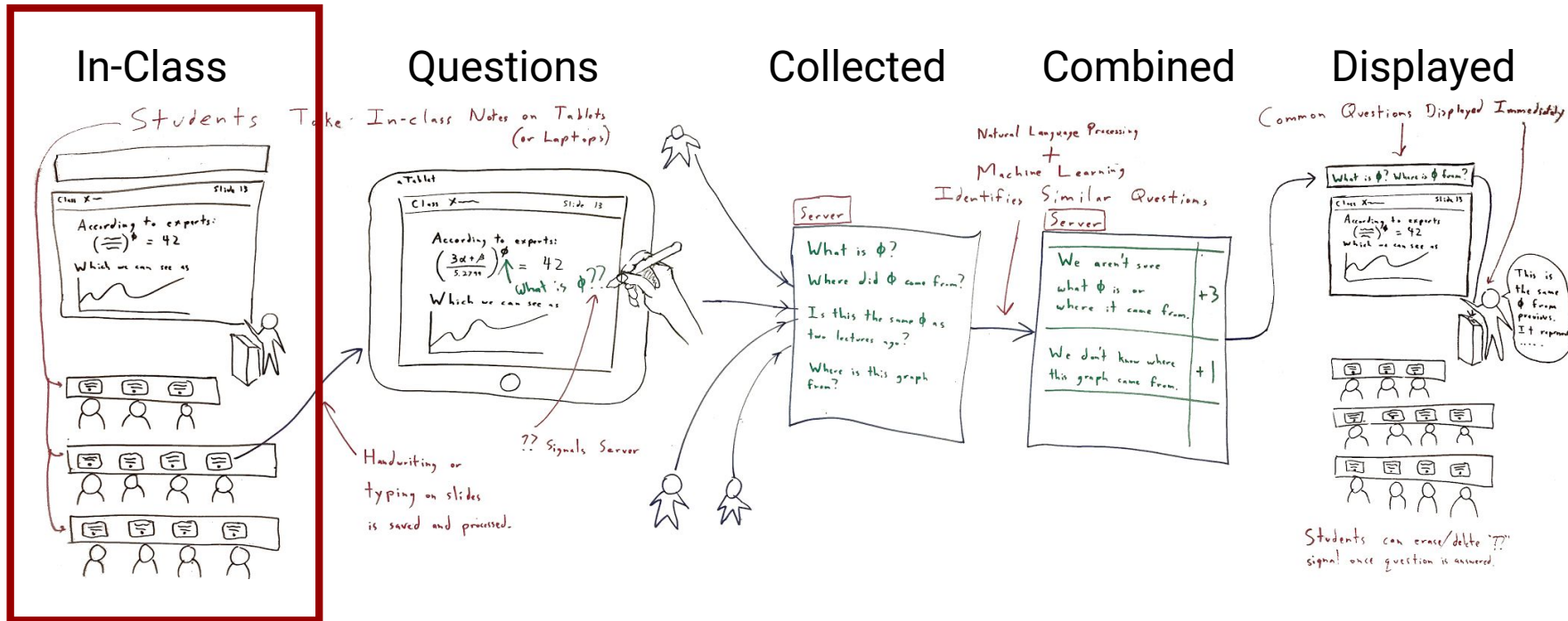
problem  
TA  
planning  
next teaching  
class



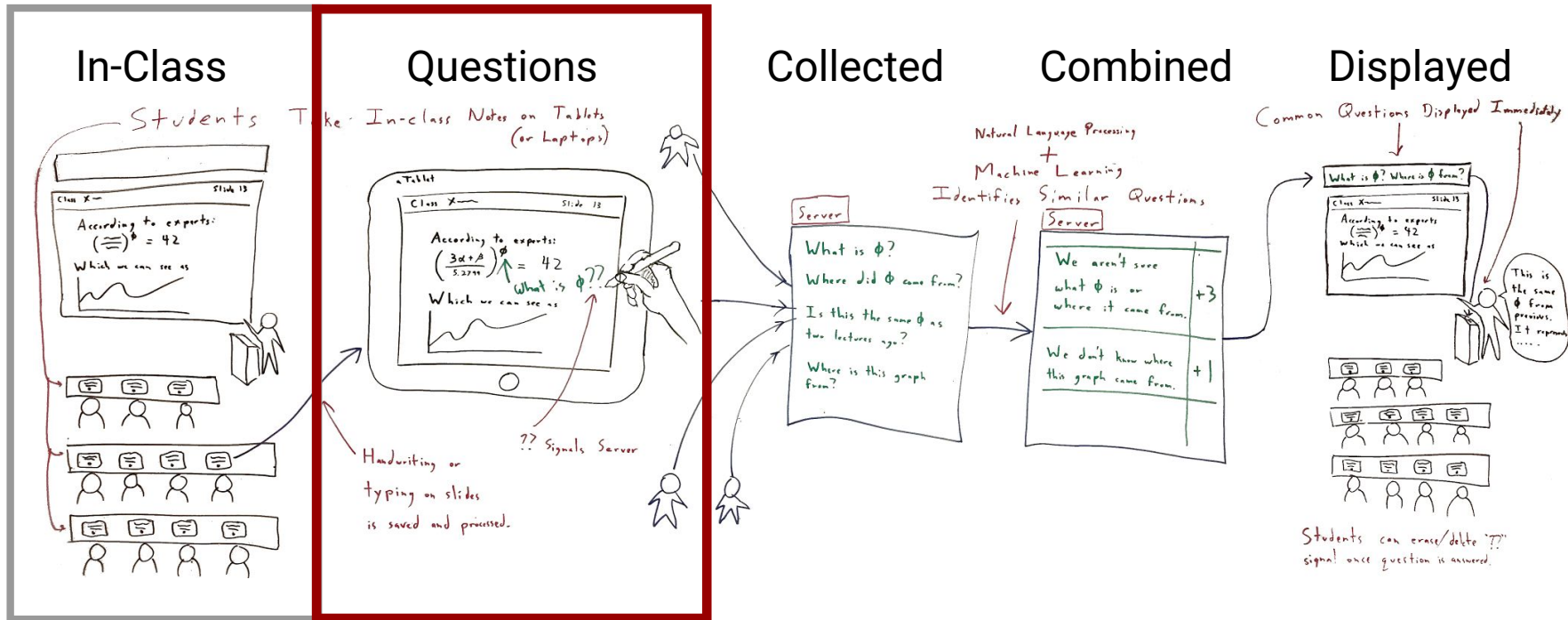
# Storyboard 1: Community-Driven Questions



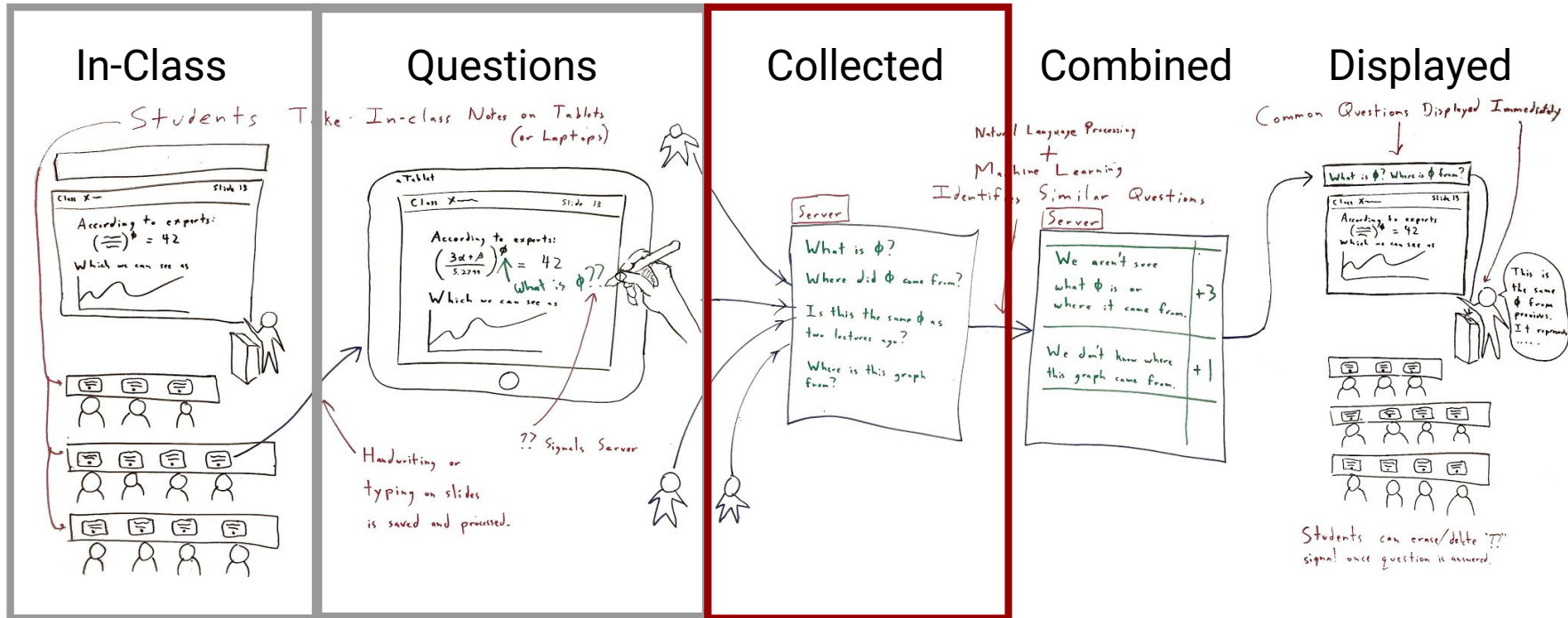
# Storyboard 1: Community-Driven Questions



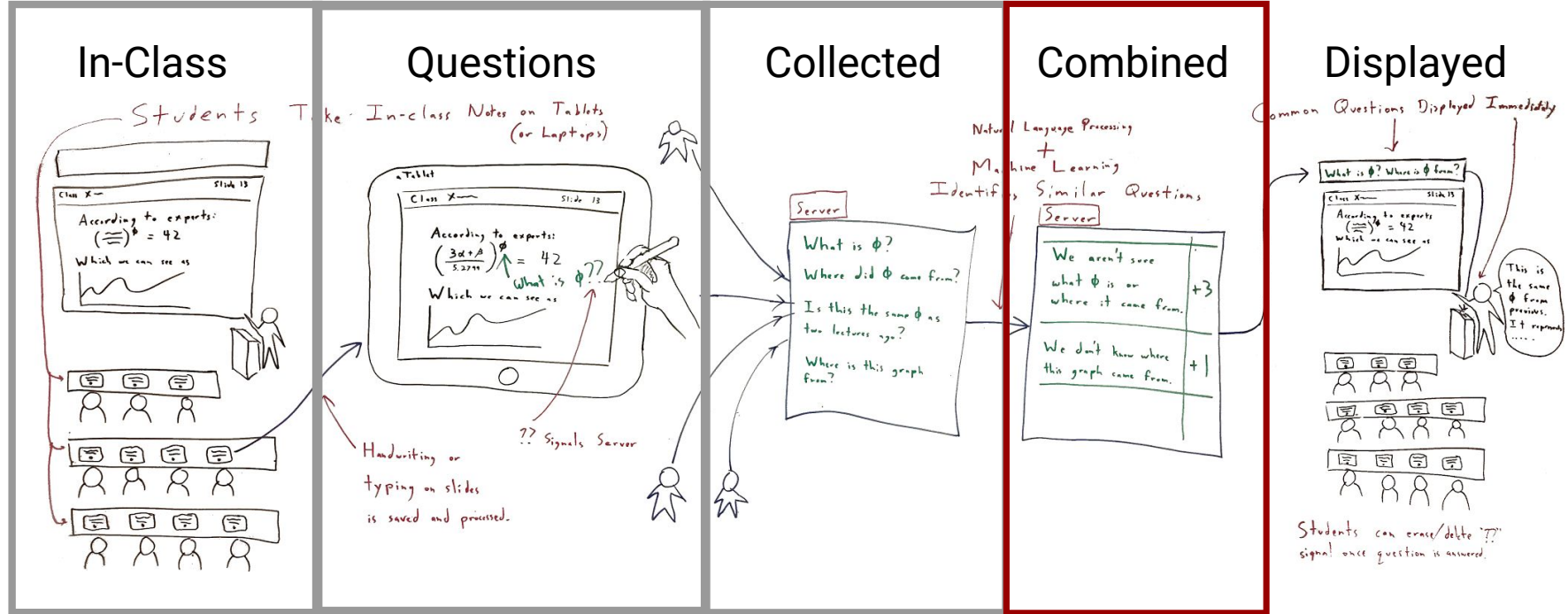
# Storyboard 1: Community-Driven Questions



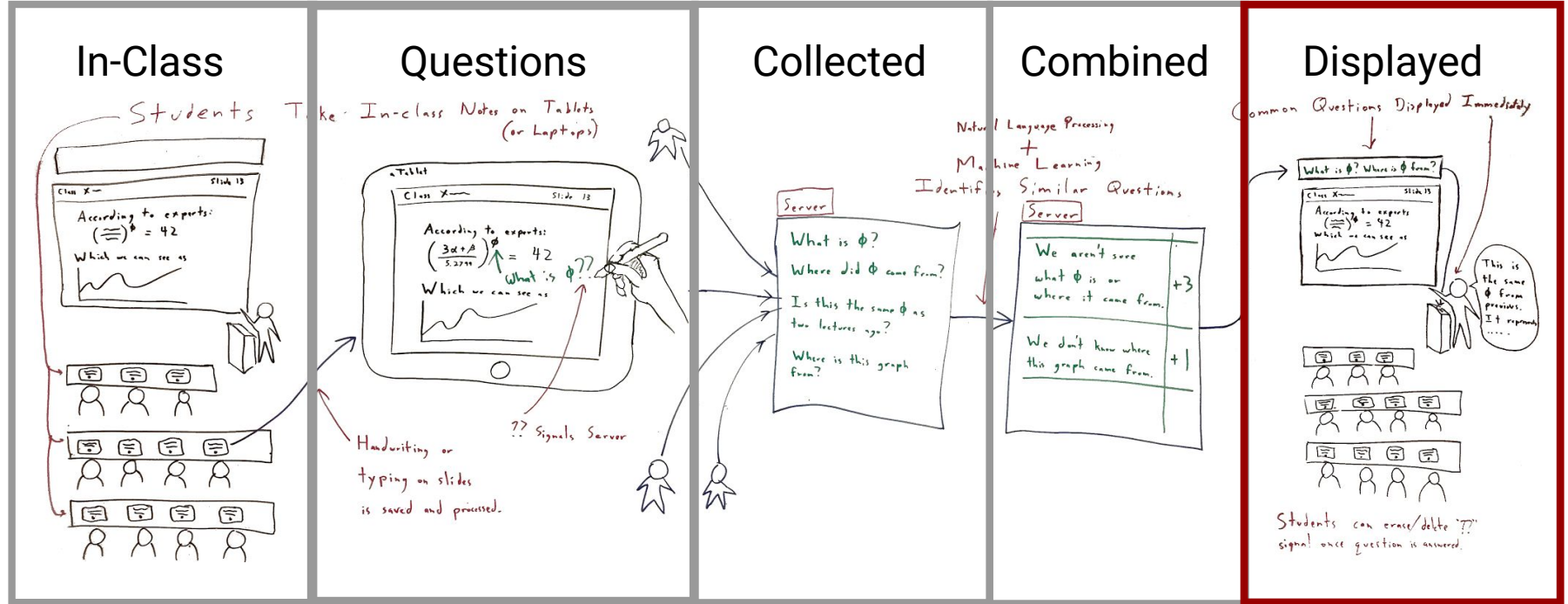
# Storyboard 1: Community-Driven Questions



# Storyboard 1: Community-Driven Questions



# Storyboard 1: Community-Driven Questions



# Storyboard 2: Study Planning

In-Class

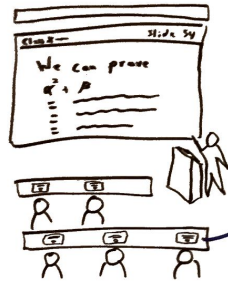
Notes+Questions

Include Ratings

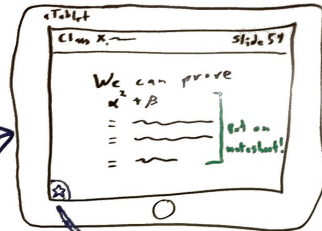
To Plan

Studying

Take notes on slides in class.

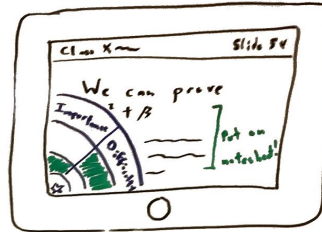


Add notes.



Tap to expand rating menu.

Rate slide to review later.

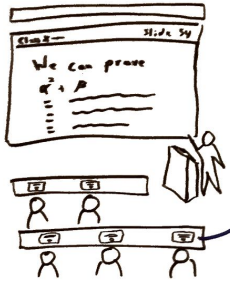




# Storyboard 2: Study Planning

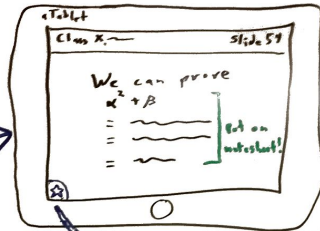
In-Class

Take notes on slides in class.



Notes+Questions

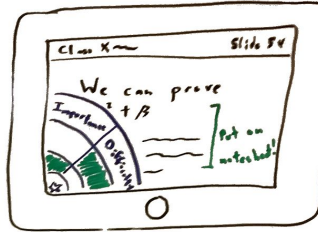
Add notes.



Tap to expand rating menu.

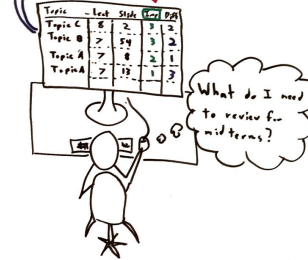
Include Ratings

Rate slide to review later.



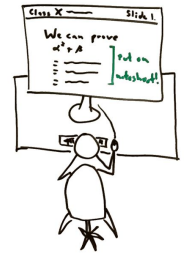
To Plan

Click on topic to jump to annotated slide.  
Reorder list by lecture, topic importance, or difficulty.



Use past ratings to study efficiently.

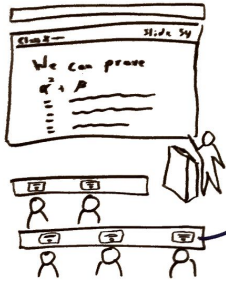
Studying



# Storyboard 2: Study Planning

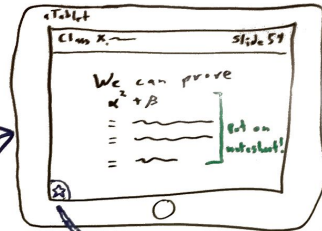
In-Class

Take notes on slides in class.



Notes+Questions

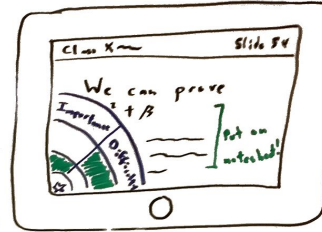
Add notes.



Tap to expand rating menu.

Include Ratings

Rate slide to review later.



To Plan

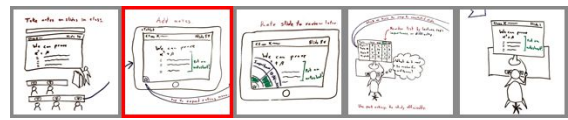
Click on topic to jump to annotated slide.  
Reorder list by lecture, topic importance, or difficulty.

Topic	Lect	Slide	Imp	Diff
Topic C	2	3	2	1
Topic B	5	4	3	2
Topic A	7	8	2	1
Topic D	7	12	1	2

What do I need to review for midterms?

Use past ratings to study efficiently.

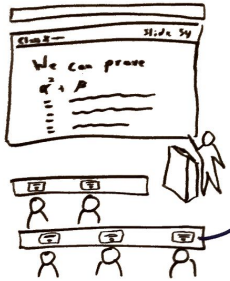
Studying



# Storyboard 2: Study Planning

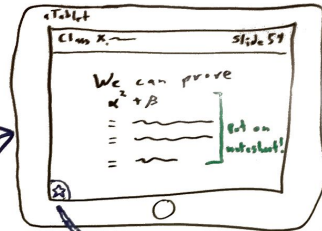
In-Class

Take notes on slides in class.



Notes+Questions

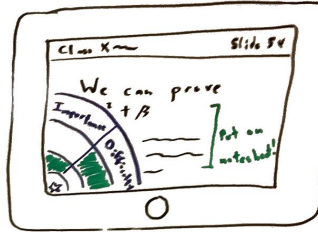
Add notes.



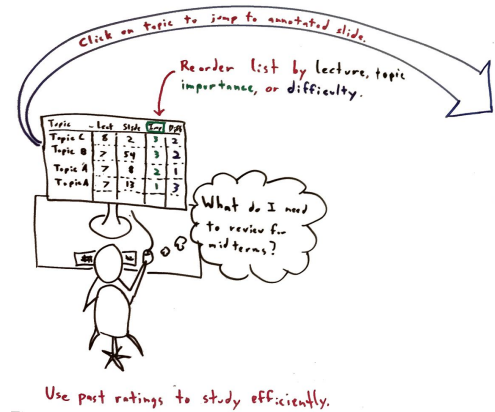
Tap to expand rating menu.

Include Ratings

Rate slide to review later.

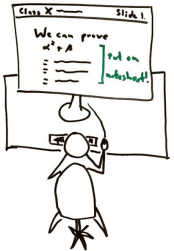


To Plan



Use past ratings to study efficiently.

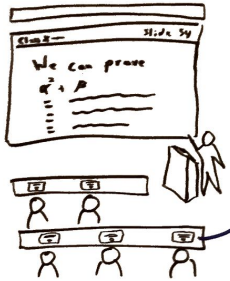
Studying



# Storyboard 2: Study Planning

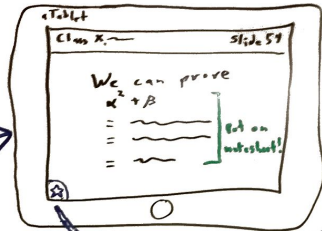
## In-Class

Take notes on slides in class.



## Notes+Questions

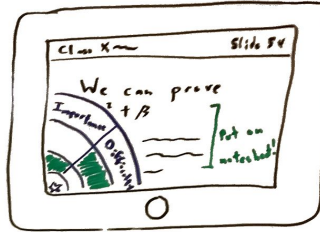
Add notes.



Tap to expand rating menu.

## Include Ratings

Rate slide to review later.



## To Plan

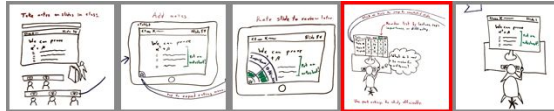
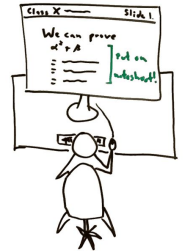
Click on topic to jump to annotated slide.  
Reorder list by lecture, topic importance, or difficulty.

Topic	Lect	Slide	Imp	Diff
Topic C	8	2	3	2
Topic B	7	54	3	2
Topic A	7	8	2	1
Topic A	7	12	1	2

What do I need to review for midterms?

Use past ratings to study efficiently.

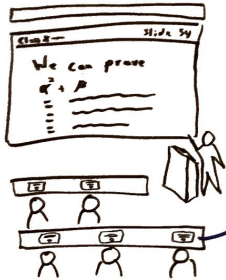
## Studying



# Storyboard 2: Study Planning

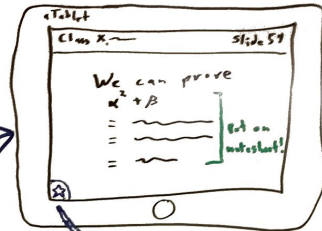
## In-Class

Take notes on slides in class.



## Notes+Questions

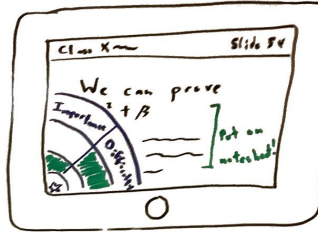
Add notes.



Tap to expand rating menu.

## Include Ratings

Rate slide to review later.



## To Plan

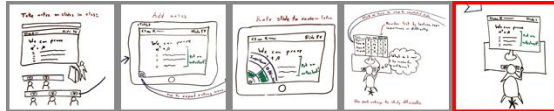
Click on topic to jump to annotated slide.

Rearrange list by lecture, topic importance, or difficulty.



Use past ratings to study efficiently.

## Studying



# Summary

- ❖ External constraints affect design
- ❖ Where you start doesn't have to determine where you end
- ❖ Shrinking design focus can increase user base
- ❖ Diversity of ideas made for a better project



**Questions?**