COSC 442:
Mobile Educational Game Development

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Relevant Topics

- Edutainment, educational software, educational games
- Artificial intelligence (AI)
- Human-computer interaction (HCI)
  - User-centered design (UCD)
- Mobile computing

Educational software

- Why develop it?

Educational software

- Why develop it?
- Software for educational purposes
  - Course delivery
  - Content management
  - Educational games
  - Edutainment

Gus wants a jug!

Gus wants a hug!

Image taken from: www.education.com

Animals1

- Garlic
- Giraffe
- Girl

- Goat
- God
- Boat

- Sharpener
- Sheep
- Ship

- Car
- Cow
- Cat

- Donkey
- Deer
- Dog

- Turkey
- Treasure
- Turtle

Image taken from:
www.eslprintables.com

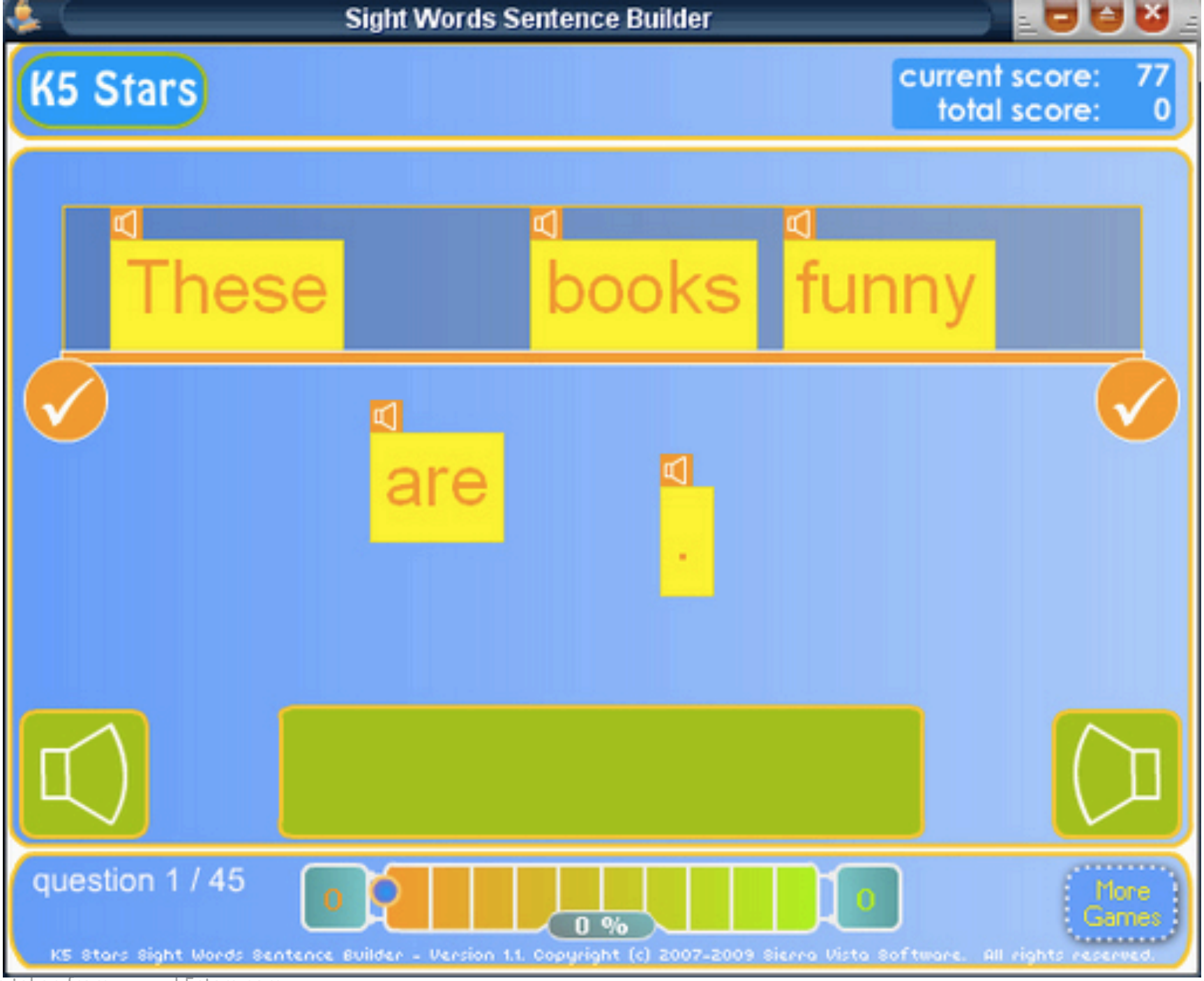


Image taken from: www.k5stars.com

Fractions

Match the fractions with their pictures.

- 2/3
- 5/6
- 3/4

Menu

Your Name

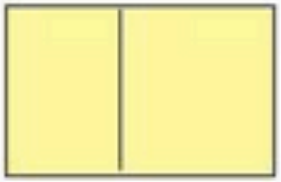
Five Take Two

Five Take Two!

Here are 5 blocks.

Put 2 blocks in the toybox.

How many blocks are left?



BONUS GAME TIME

NORMAL GAME TIME

LESS GAME TIME

Change Game

Module: Maths P-K
Question: 10736
B60C20080515

0 / 1 Correct

OK

Image taken from: www.edalive.com

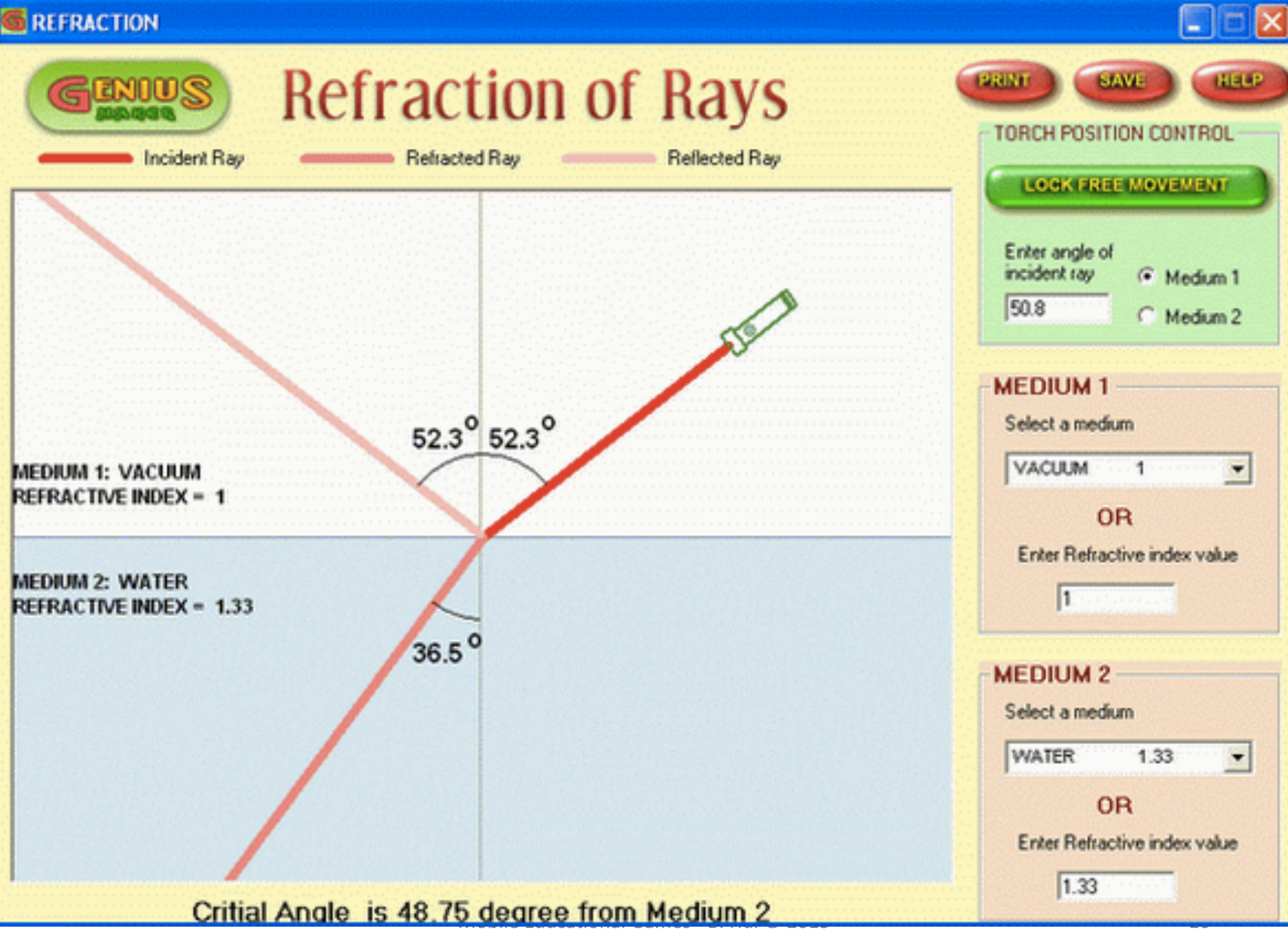


Image taken from: www.goldenstar.com

Image taken from: www.edubuntu.com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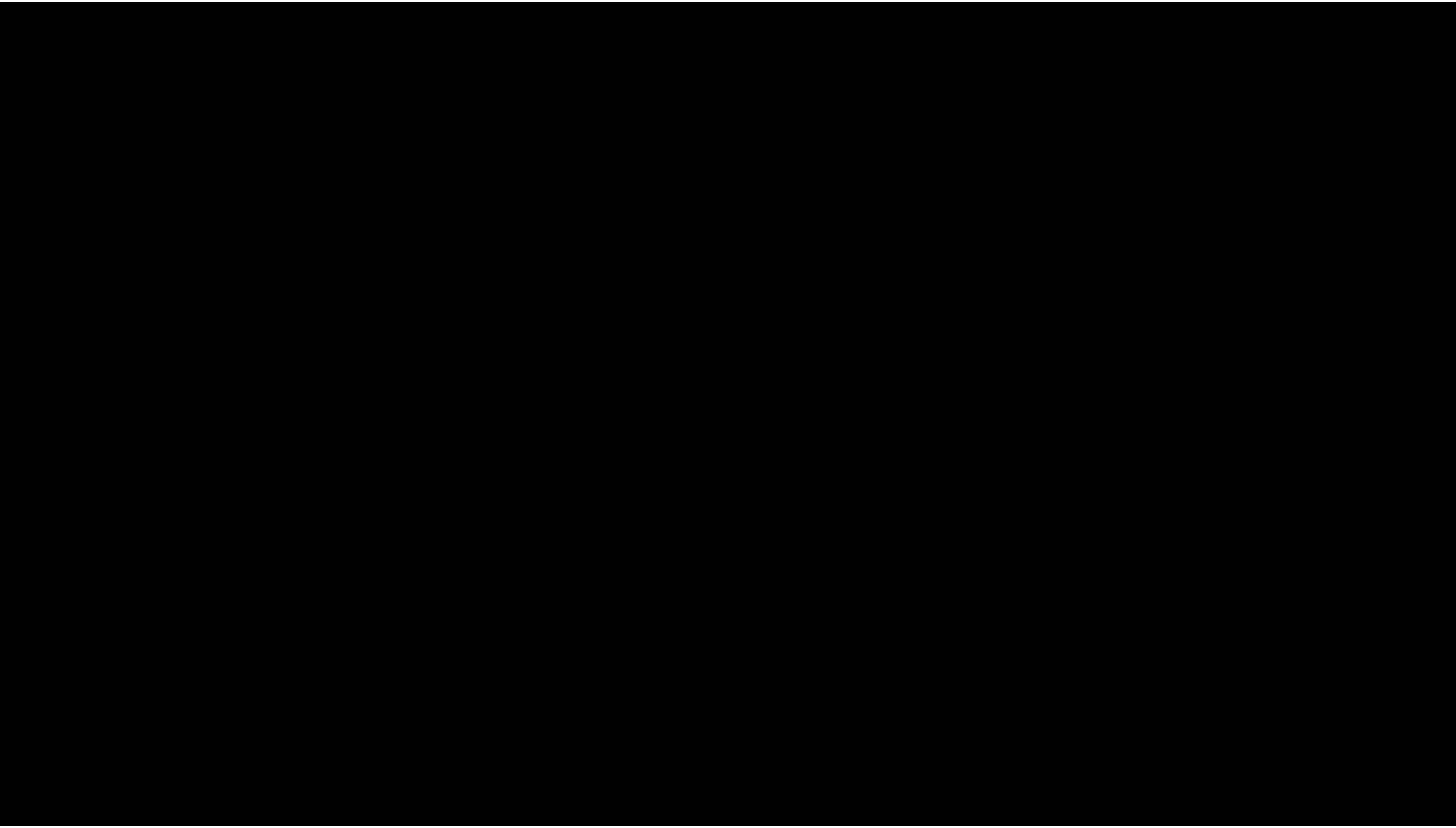
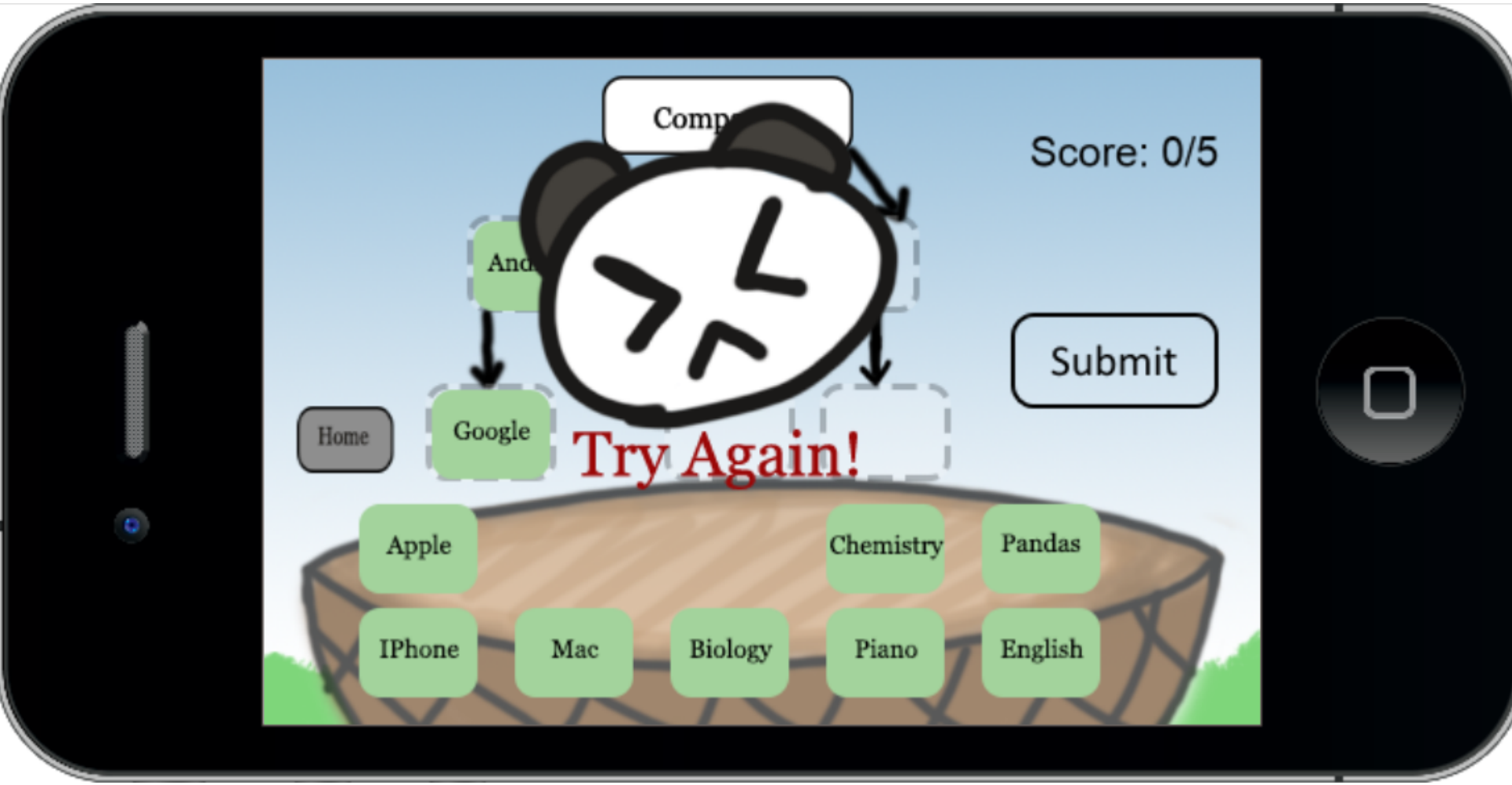
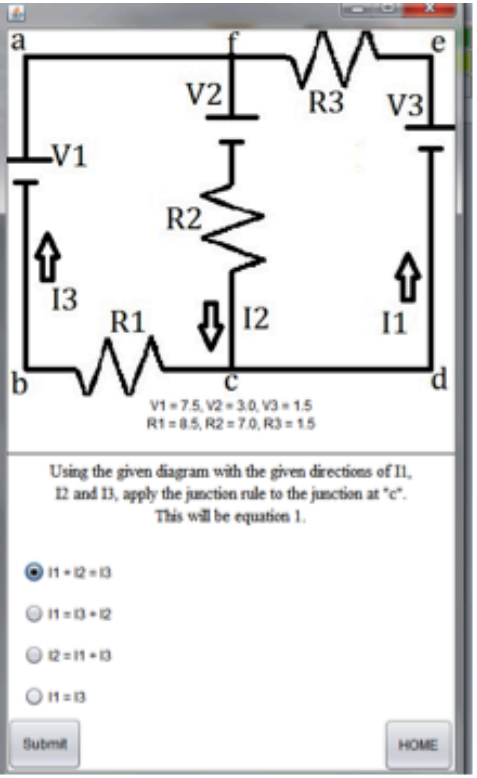
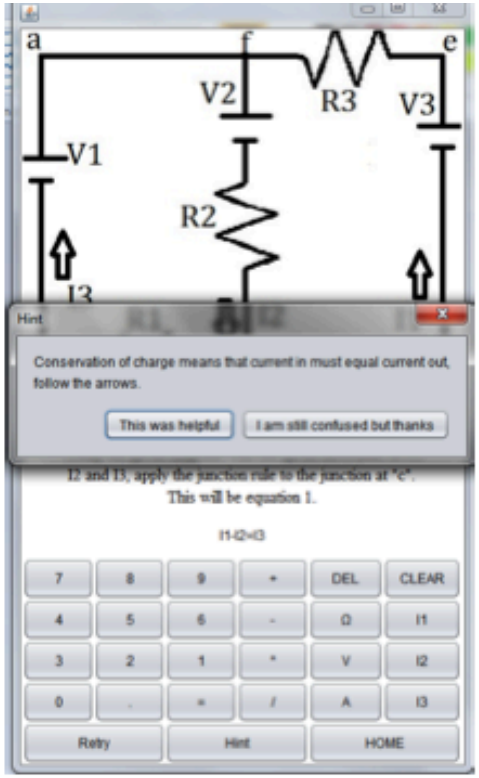
Score: 0



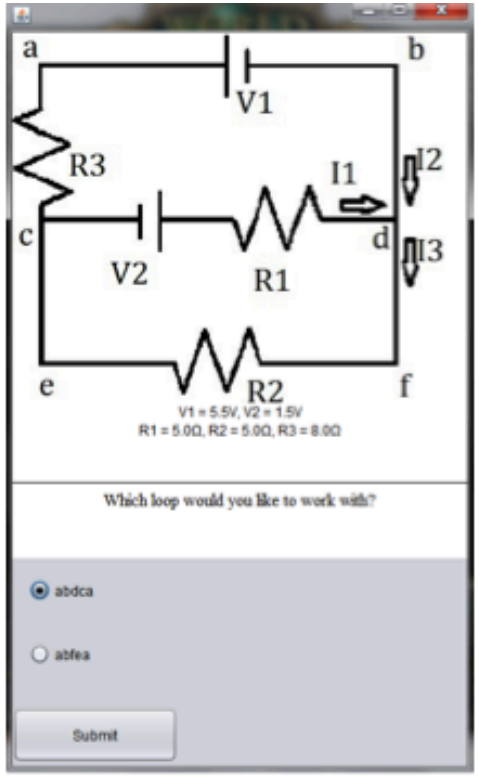

Comp
Score: 0/5
And
Submit
Home
Google
Try Again!
Apple
Chemistry
Pandas
IPhone
Mac
Biology
Piano
English



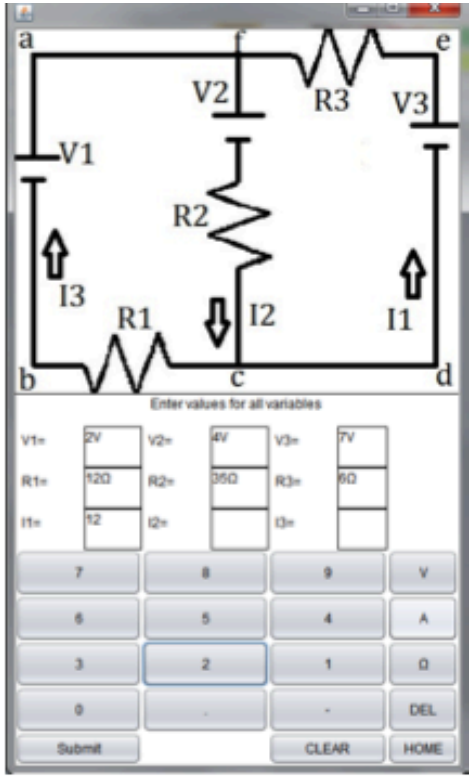
(a) Level 1



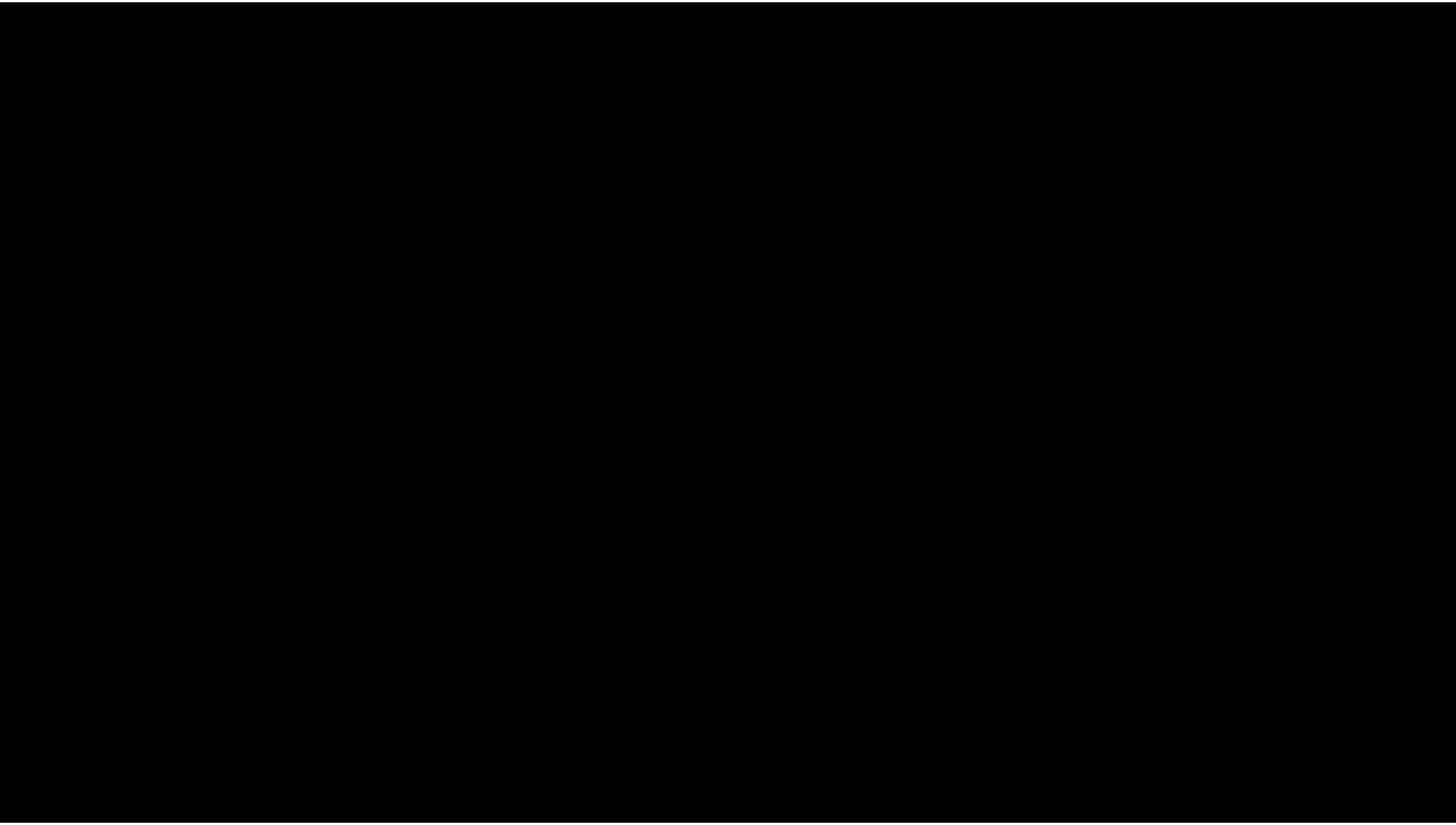
(b) Level 2

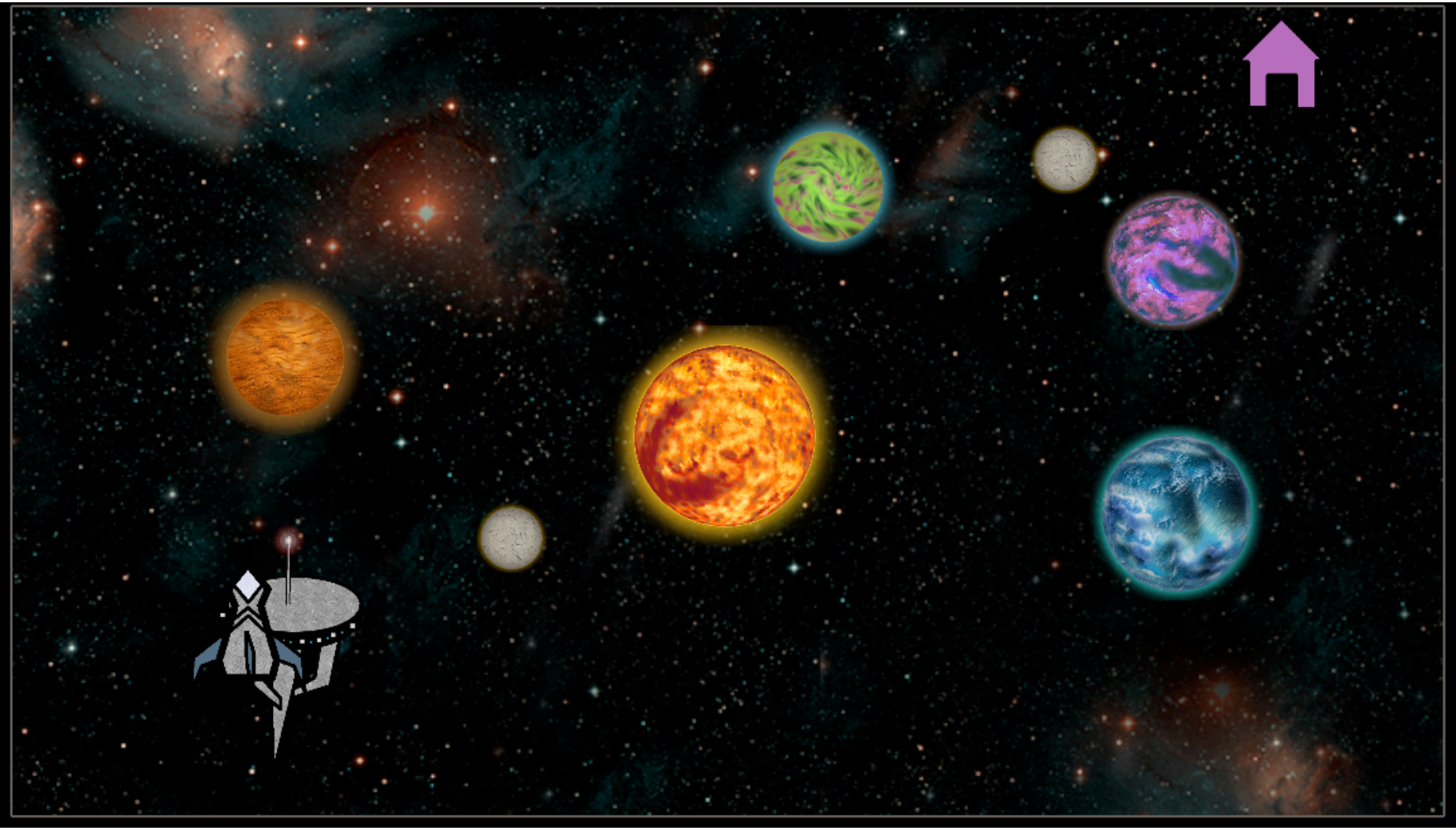


(c) Level 3



(d) Level 4






MATH ODYSSEY

GAME OVER

Score: 0

Time: 0:06

MENU

STATS

	Normal Mode	Challenge Mode
High score	0	0
All-Time Accuracy	0.00%	0.00%
Longest Life	0:00	0:00
Total Deaths	0	0
Deaths By Jumper	0	0
Deaths By Bird	0	0
Deaths By Crawler	0	0
Death By Boss	0	0

Clear

MENU

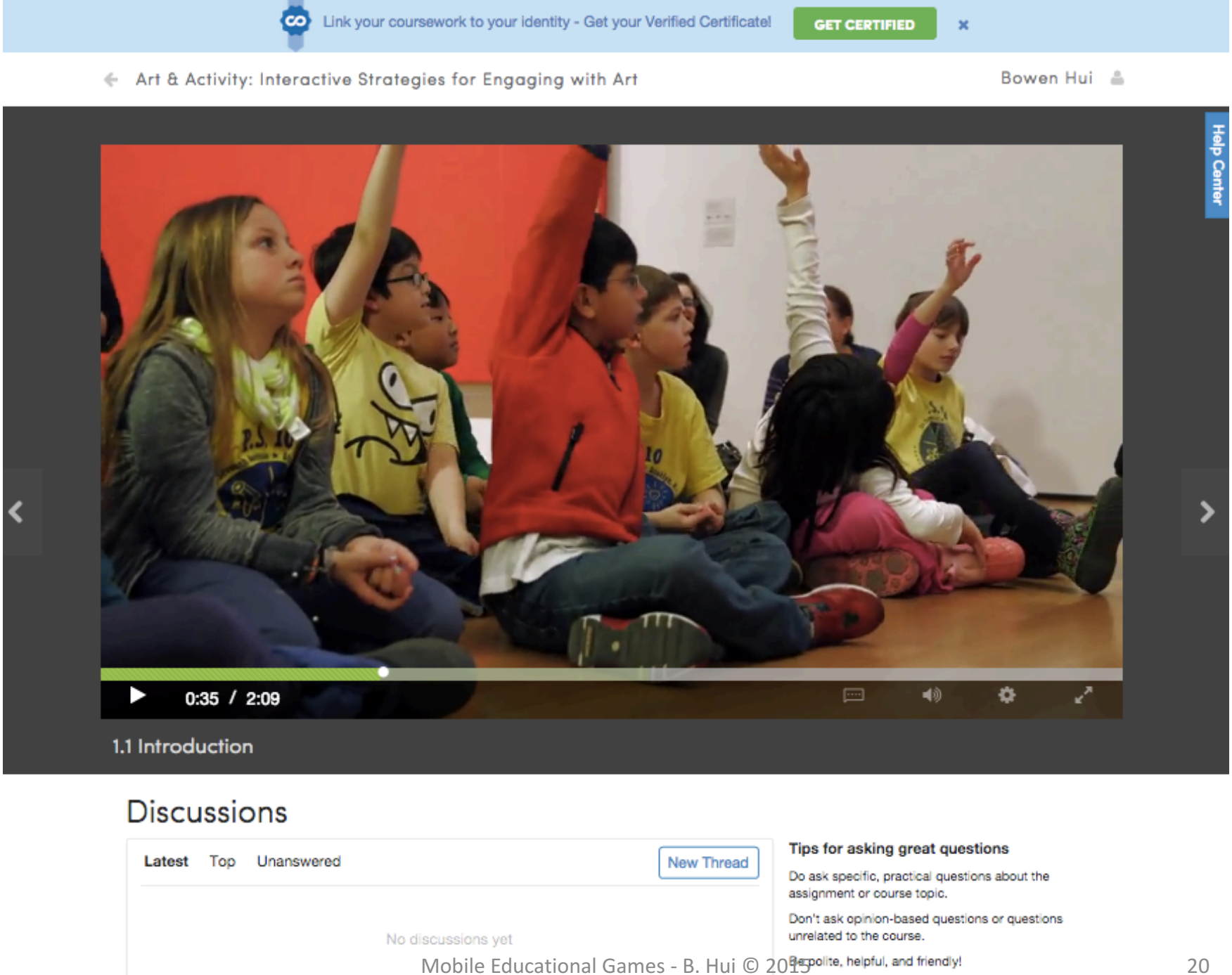
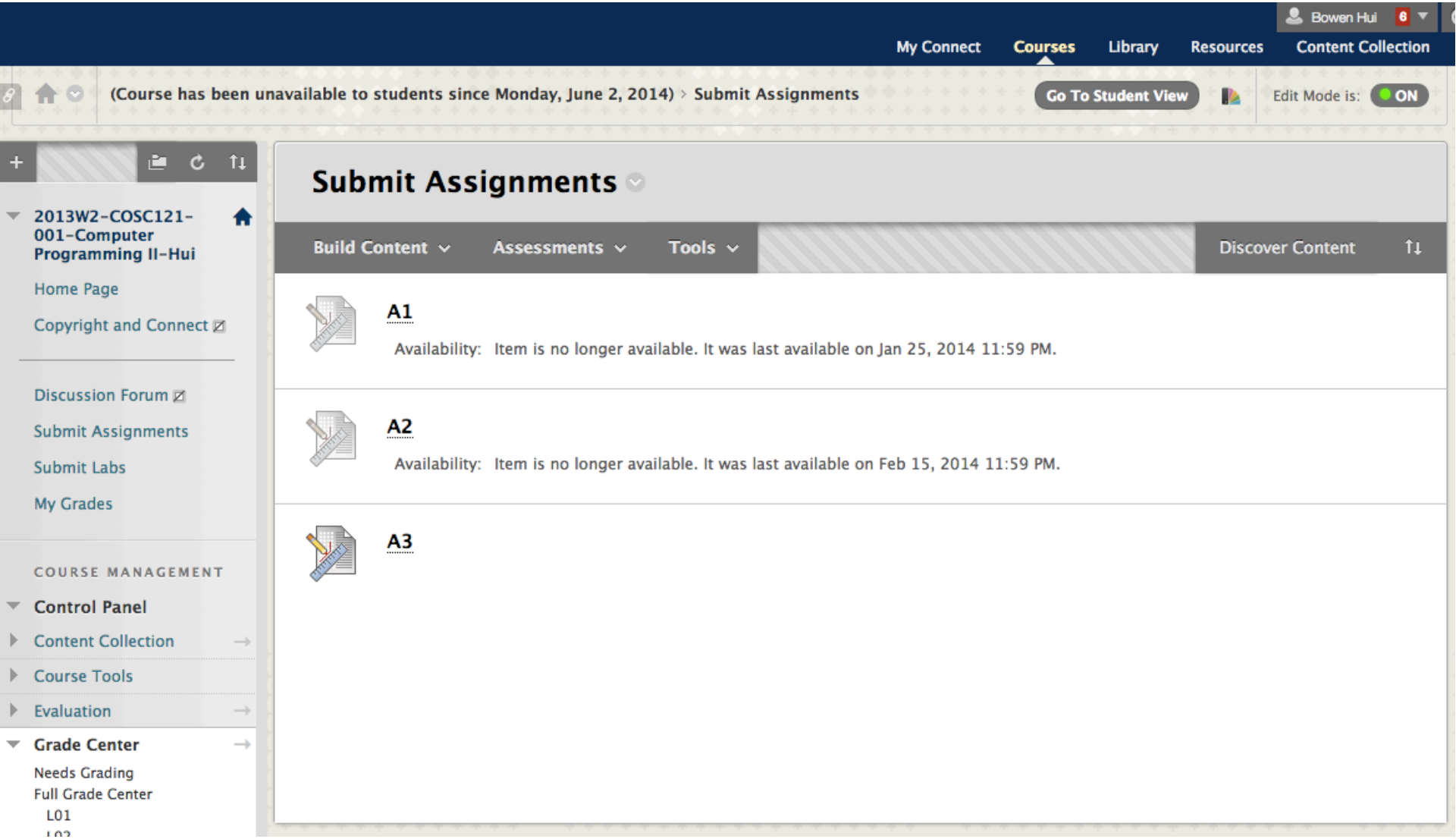


Image taken from: www.coursera.org


Bowen Hui
My Connect
Courses
Library
Resources
Content Collection
(Course has been unavailable to students since Monday, June 2, 2014) › Submit Assignments
Go To Student View
Edit Mode is: ON
2013W2-COSC121-001-Computer Programming II-Hui
Home Page
Copyright and Connect
Discussion Forum
Submit Assignments
Submit Labs
My Grades
COURSE MANAGEMENT
Control Panel
Content Collection
Course Tools
Evaluation
Grade Center
Needs Grading
Full Grade Center
L01
Submit Assignments
Build Content
Assessments
Tools
Discover Content
A1
Availability: Item is no longer available. It was last available on Jan 25, 2014 11:59 PM.
A2
Availability: Item is no longer available. It was last available on Feb 15, 2014 11:59 PM.
A3

Multiple Purposes

- To test students on specific concepts
- To give students practice on exercises
- To teach students new concepts
- To act as a management tool for learning content

Multiple Purposes

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Which is harder to build well?

Multiple Purposes

- To test students on specific concepts
- To give students practice on exercises
- To teach students new concepts
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(most) educational games focus

Multiple Purposes

- To test students on specific concepts
- To give students practice on exercises
- To teach students new concepts
- To act as a management tool for learning content

our focus

Known Difficulties

- Educational but not fun

Known Difficulties

- Educational but not fun
  - Possible workarounds:
    - Incorporate scoring and time limits
    - Design for (self or multiplayer) competition
    - Provide context / larger goal
    - Consider a social aspect and cooperation strategies

Known Difficulties

- Educational but not fun
- Fun but no learning value

Known Difficulties

- Educational but not fun
- Fun but no learning value
  - Possible workarounds:
    - Start with learning goal
    - Gamify existing educational content

Known Difficulties

- Educational but not fun
- Fun but no learning value
- Design issues

Known Difficulties

- Educational but not fun
- Fun but no learning value
- Design issues
  - Possible workarounds:
    - Get early user feedback
    - Iterative prototyping

Known Difficulties

- Educational but not fun
- Fun but no learning value
- Design issues
- Limited play

Known Difficulties

- Educational but not fun
- Fun but no learning value
- Design issues
- Limited play
  - Possible workarounds:
    - Larger database of exercises
    - Add levels
    - Allow for user-generated content
    - Allow for multiplayer competition

Human-computer interaction (HCI)

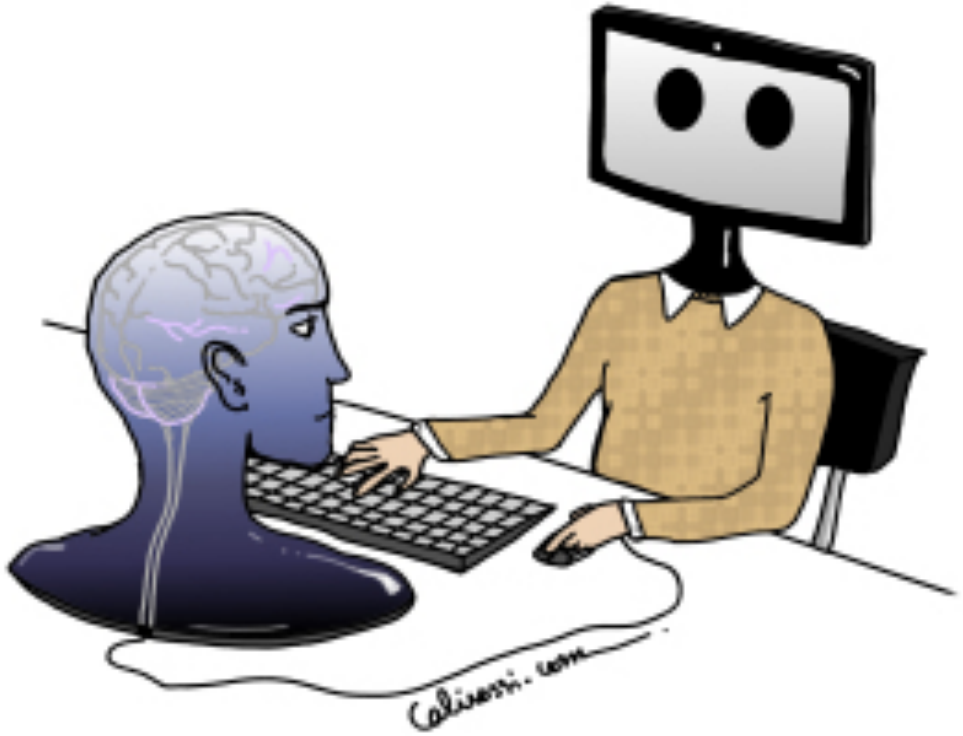
- What role does HCI play?

Human-computer interaction (HCI)

- What role does HCI play?
  - Involves student user
  - Involves computer
    - As a medium to transmit information from teacher
    - As an intelligent tutor
    - As a peer learner

Artificial intelligence (AI)

- What role does AI play?



Artificial intelligence (AI)

- What role does AI play?
  - Make *things* "smarter"
    - What things?
    - How? (See weeks 8, 9, 10)

Artificial intelligence (AI)

- What role does AI play?
  - Make *things* "smarter"
    - What things?
    - How? (See weeks 8, 9, 10)

- Related areas:
  - Intelligent interfaces
  - Intelligent tutoring systems

Interdisciplinary Aspects

- Content planning
- Display of information
- Engaging the learner
- Helping the learner
- Adapting to the learner's needs

Interdisciplinary Aspects

- Content planning
  - Relevant exercises
  - Appropriate and timely feedback
  - Coherent and organized content
- Display of information
- Engaging the learner
- Helping the learner
- Adapting to the learner's needs

Interdisciplinary Aspects

- Content planning
- Display of information
  - Clear, consistent, easy to follow, easy to discover
  - Age and skill appropriate (e.g., wording, graphics)
  - Minimize cognitive load
- Engaging the learner
- Helping the learner
- Adapting to the learner's needs

Interdisciplinary Aspects

- Content planning
- Display of information
- Engaging the learner
  - Age and culture appropriate
  - Makes learner want to keep using the software
- Helping the learner
- Adapting to the learner's needs

Interdisciplinary Aspects

- Content planning
- Display of information
- Engaging the learner
- Helping the learner
  - Step-by-step guidance
  - Know when to offer help
  - Know what kind of help to offer
- Adapting to the learner's needs

Interdisciplinary Aspects

- Content planning
- Display of information
- Engaging the learner
- Helping the learner
- Adapting to the learner's needs
  - Level of difficulty
  - Amount of guidance and feedback

Mobile computing

- Mostly hardware issues:
  - Processing power
  - Networking and bandwidth
  - Power consumption
  - Data storage and security
- Potential:
  - Portability
  - Productivity
  - Reduced cost

Mobile devices

Image from http://www.securedgenetworks.com/

Coupled with wearable devices

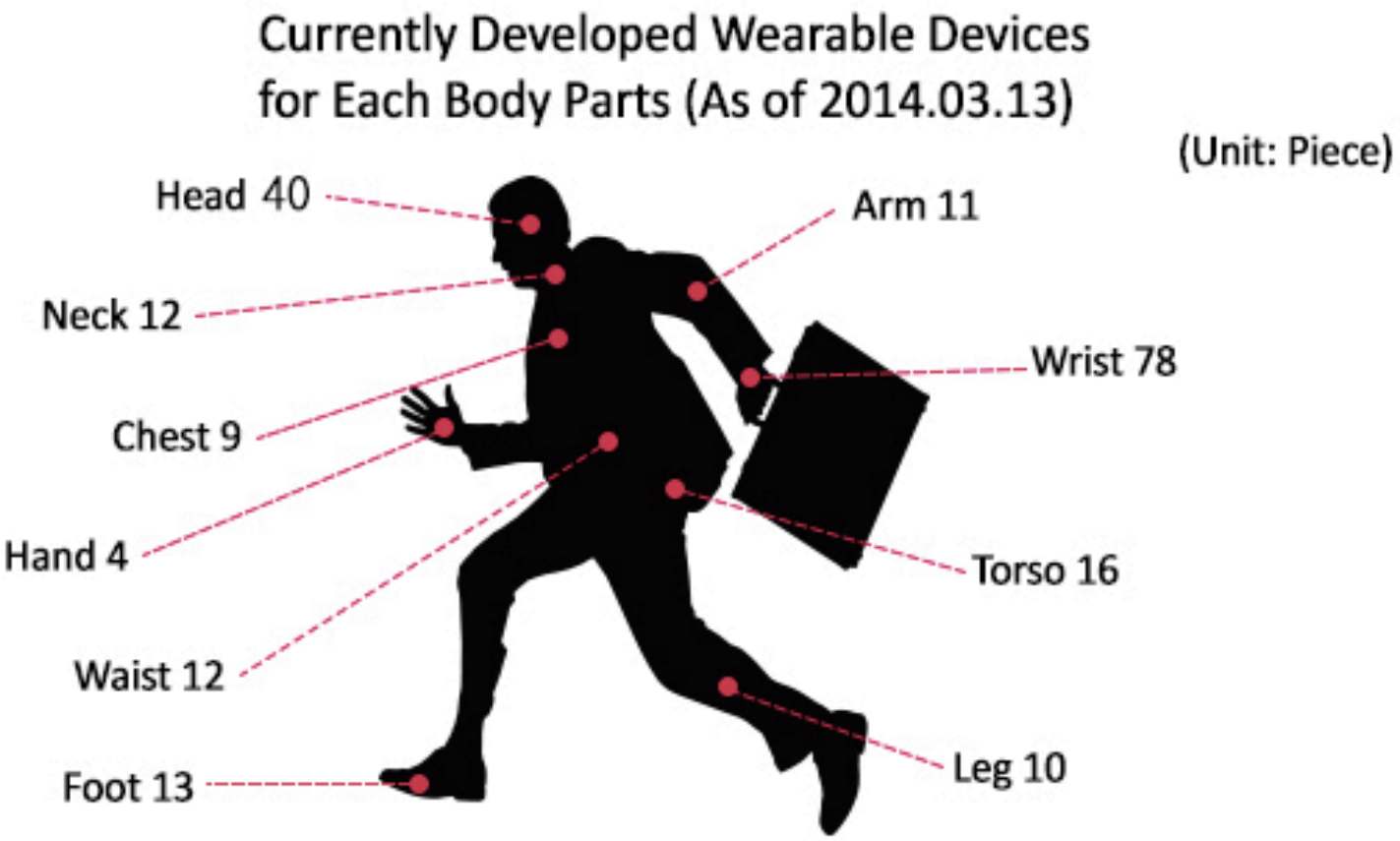


Image from http://lgdnewsroom.com/

Major limitations

- Limited power
  - Specific app functions
  - “Light” computing (no serious AI)
- Limited screen real estate
  - Less information
  - Fewer icons
- Can they really scale?

Summary

- Interdisciplinary field
- Wide range of existing educational software
- Success of these applications vary
- Biggest hurdle:
  - Balance between fun and learning value