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Lecture 5

Nondigital Prototypes

Review: Prototypes

- An *incomplete* model of your product
  - Implements small subset of the final features
  - Features chosen are the most important **now**

- Prototype helps you visualize **gameplay**
  - Way for you to test a new game mechanic
  - Allows you to tune mechanic parameters
  - Can also test (some) user interfaces

Software Prototypes

- **Gameplay Prototype** (2/27)
  - Throw-away prototype (not in final submission)
  - Does not have to be on device
  - Should demonstrate core gameplay

- **Technical Prototype** (3/11)
  - Evolutionary Prototype (part of final submission)
  - Should be on a device except in extreme cases
 - Should demonstrate important mobile challenge

Mobile Prototypes

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Next Week: Nondigital Prototype

- No software involved at all
  - Board game
  - Card game
  - Something different?

- Goal is to **model gameplay**
  - How? Nondigital/digital is very different
  - Model will be far removed from final result
 - What can we hope to learn from this?

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Understanding Game Progression

- Level design about *progress*
  - Sense of closeness to goal
  - Choice of "paths" to goal (**dilemma challenge**)
  - Path choice can relate to play style and/or difficult

- Easier to design if *discrete*
  - Flow-chart out progression
  - Edges are mechanic(s)

- But game state values are **continuous** (sort of)

Mobile Prototypes

Discrete Progression

- Design is **discretization**
  - Impose flow chart on state
  - Each box is an equivalence class of game states

- **Spatial Discretization**
  - Contiguous zones
  - **Example**: past a doorway

- **Resource Discretization**
  - Range of resource values
  - **Example**: build threshold

Mobile Prototypes

Spatial Discretization

Paper Prototyping
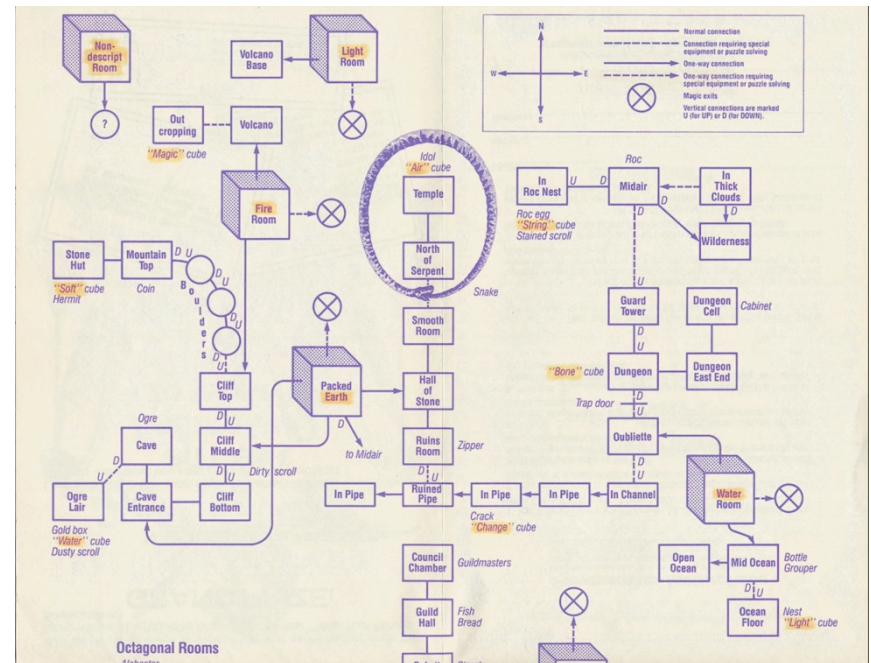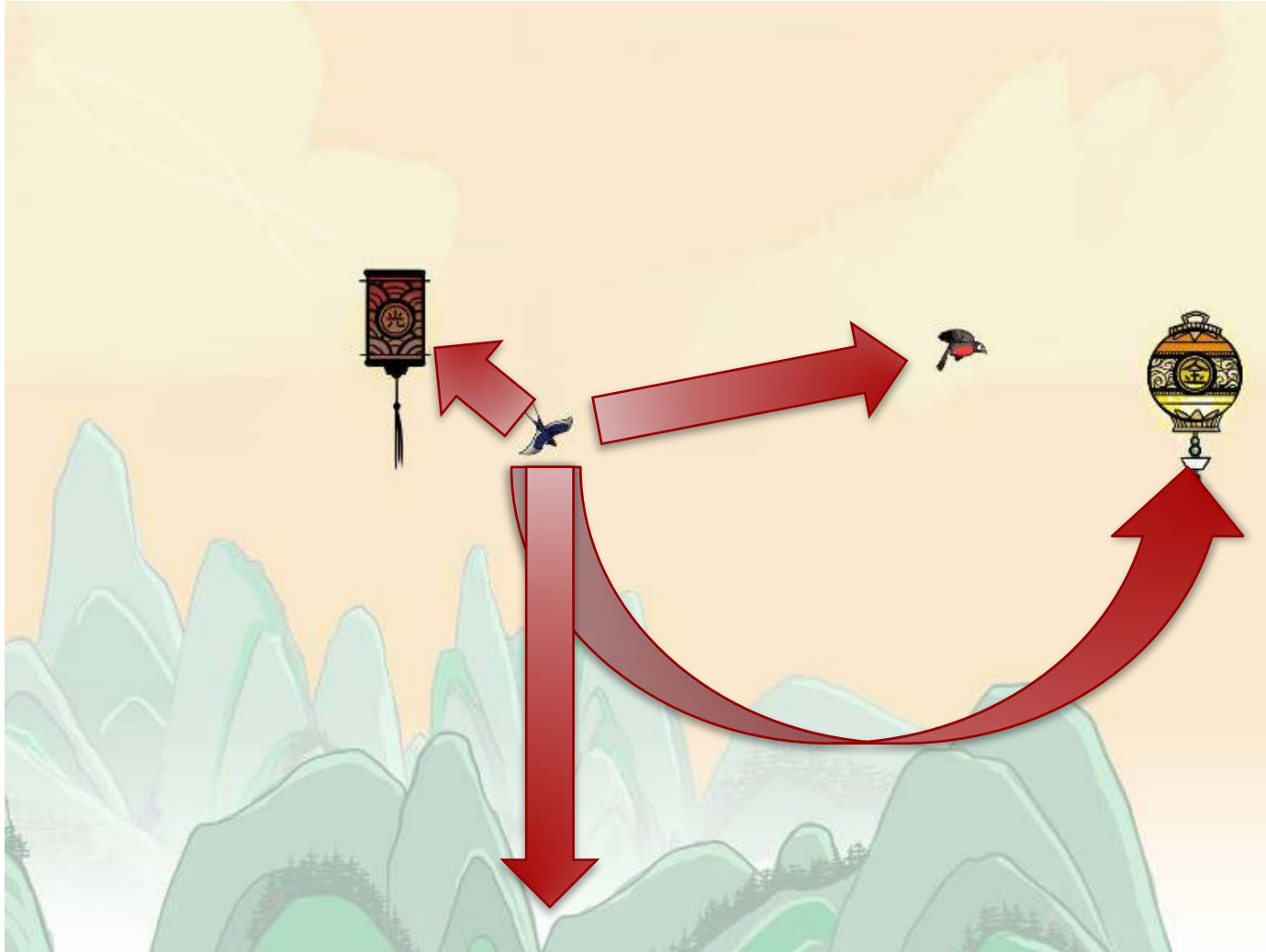
Discretization and Turns

- Discretization requires *turns*
  - Represent a unit of action
  - When done, game "at rest"

- Turns can be **multistep**
  - Multiple actions in a turn
  - Evironmental interactions

- Turns can **alternate**
  - between other players
  - with a gamemaster
  - not at all (one player?)

Mobile Prototypes

Discretization and Reaction Time

- Allow opponent to **interrupt**
  - Action that reacts to yours
  - Played after you act, but before action takes an effect
  - Core mechanic in *Magic:TG*

- Make play **asynchronous**
  - Players still have turns
  - But take turns as fast as can
  - Conflicts resolved via speed
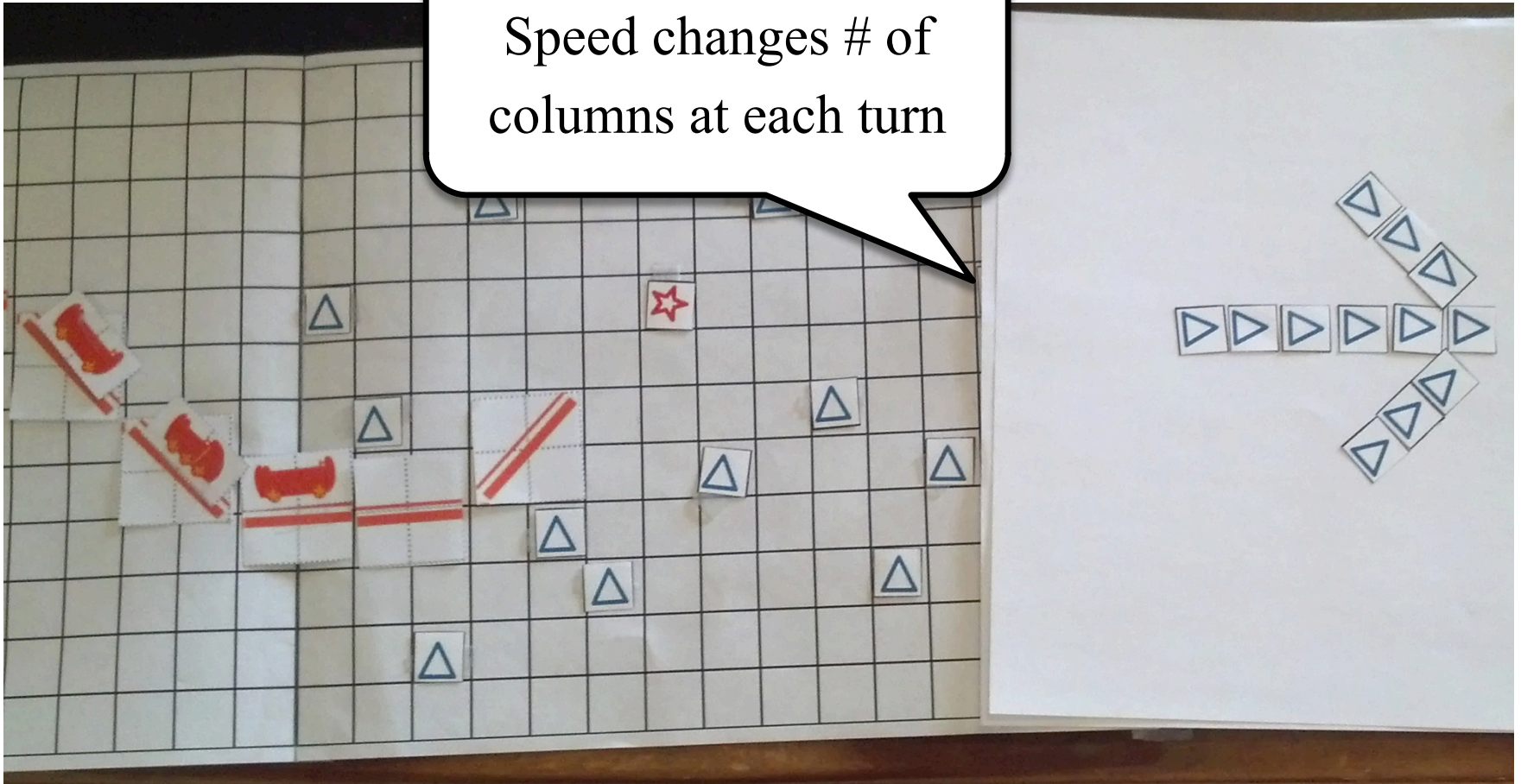 - Often need a referee for aid
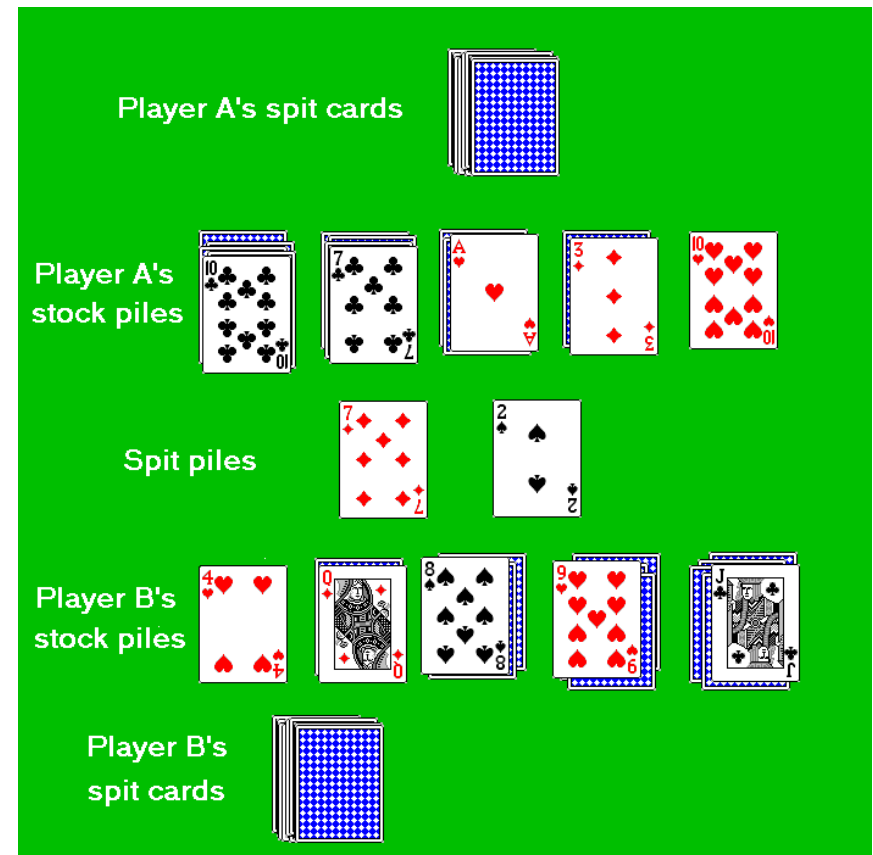
Reaction Time: *Runaway Rails*
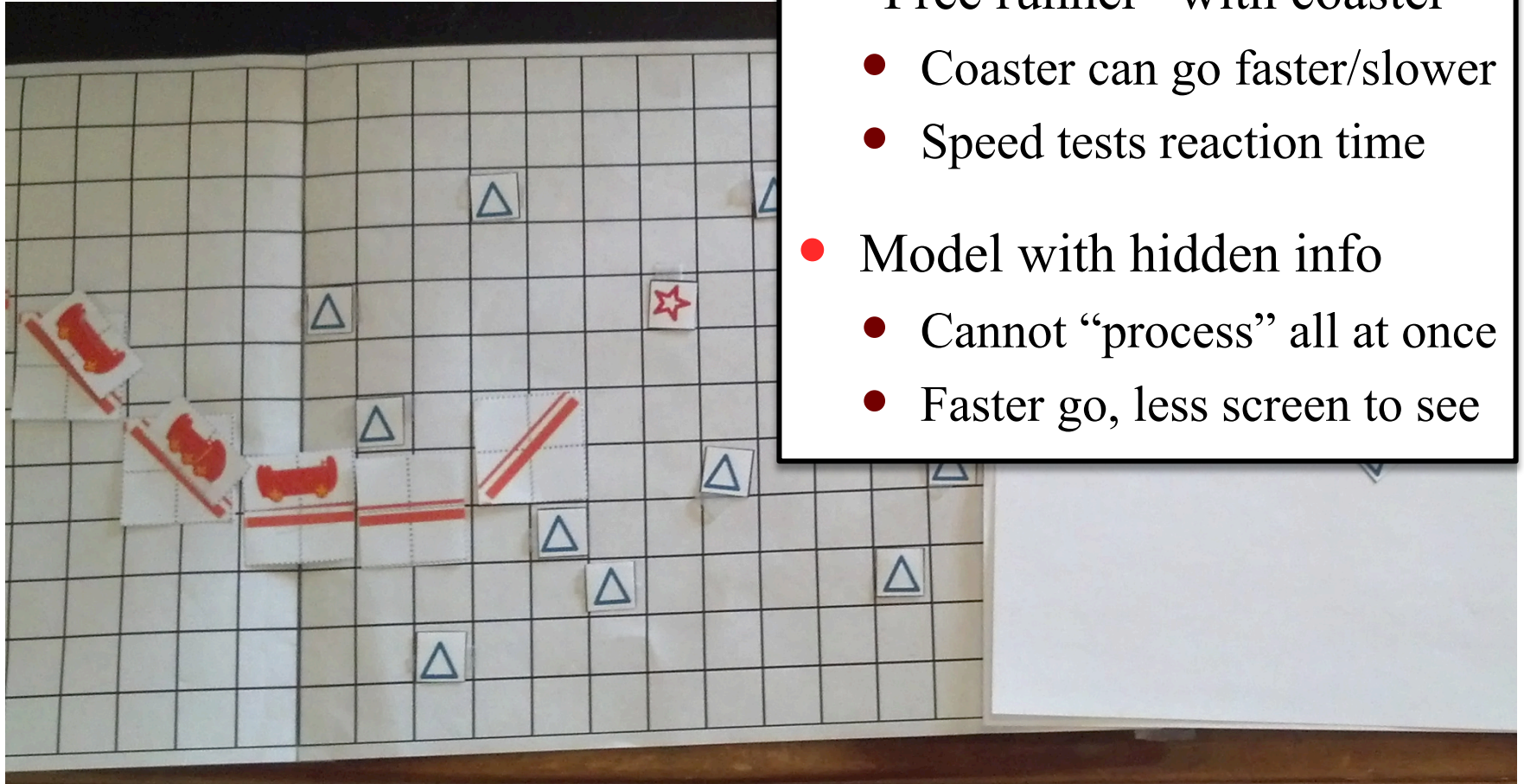
- "Free runner" with coaster
  - Coaster can go faster/slower
  - Speed tests reaction time

- Model with hidden info
  - Cannot "process" all at once
  - Faster go, less screen to see

Mobile Prototypes

Reaction Time: *Runaway Rails*

Speed changes # of columns at each turn

Mobile Prototypes

What Can We Do Discretely?

- **Evaluate emergent behavior**
  - Allow player to commit simultaneous actions
  - Model interactions as "board elements"

- **Model player cost-benefit analyses**
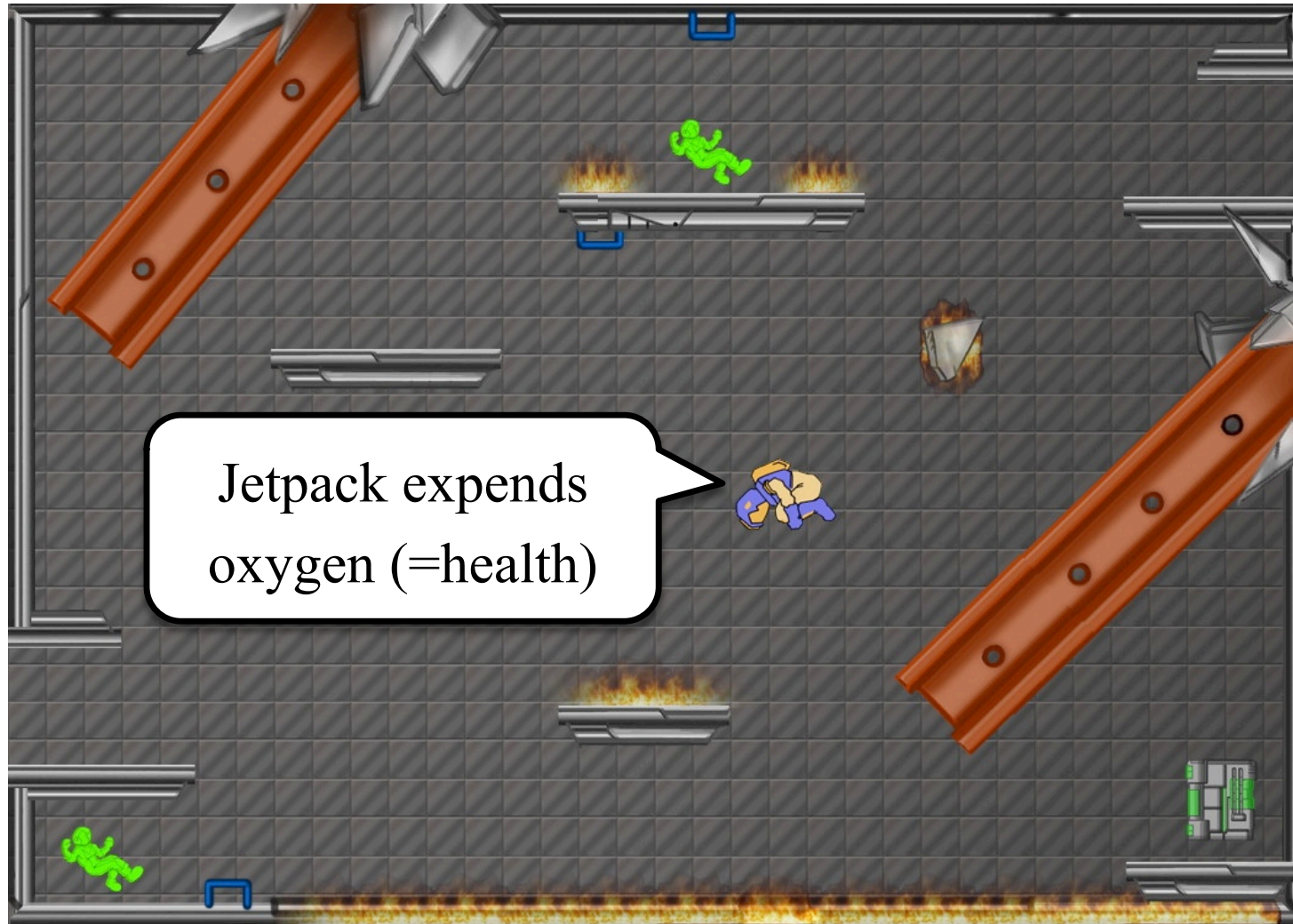 - Model all resources with sources and sinks
  - Focus on economic dilemma challenges

- **Test player difficulty/usability**
  - Ideal for puzzle games (or puzzle elements)
  - Can also evaluate unusual interfaces

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What Can We Do Discretely?

- **Evaluate emergent behavior**
  - Allow player to commit simultaneous actions
  - Model interactions as ...

- **Model ... ent analyses**
  - Model ... ources with sources and sinks
  - Focus on economic dilemma challenges

- **Test player difficulty/usability**
  - Ideal for puzzle games (or puzzle ele...
  - Can also evaluate unusual interfaces

Not that different from CS 3152

New issues for mobile games

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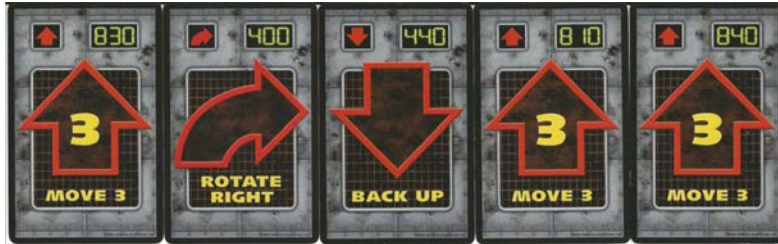
Discretizing Resources
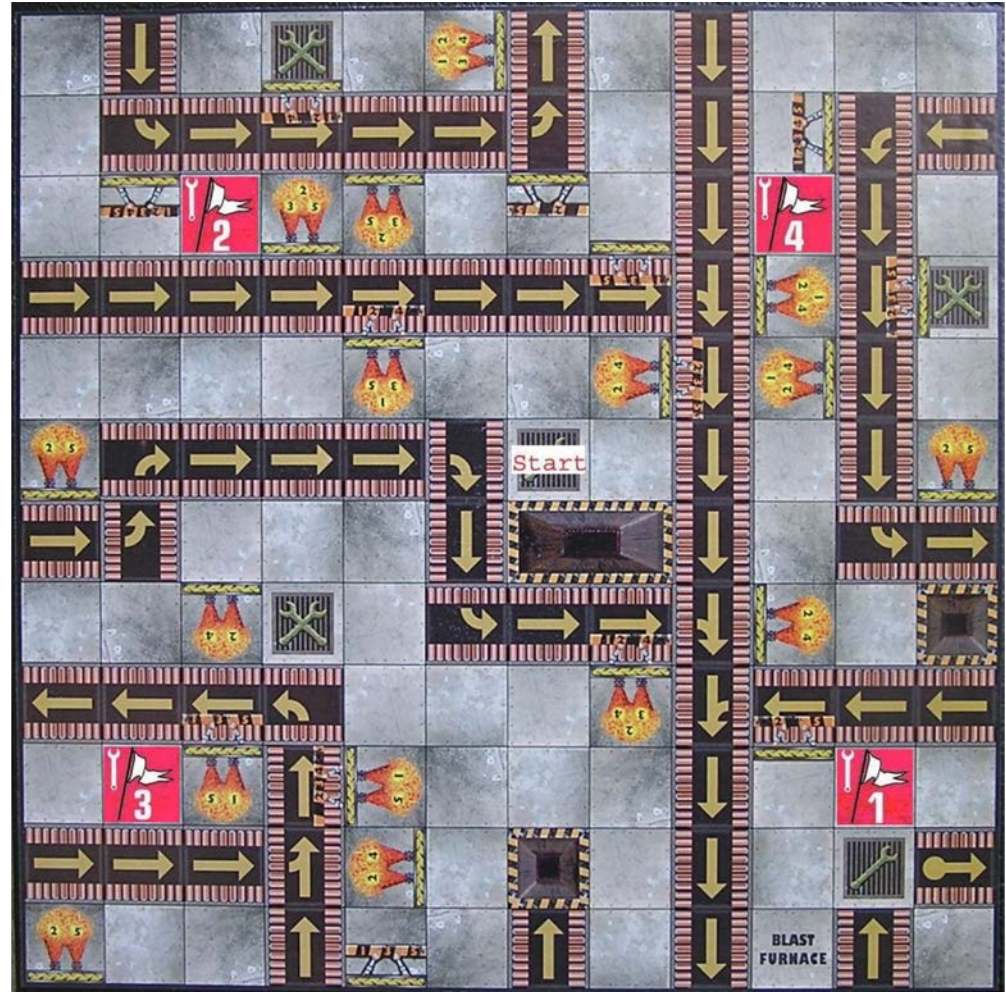
Gameplay Modeling

Discretizing Resources

Gameplay Modeling

Interactions: *RoboRally*

- Player "programs" robot
  - Picks 5 movement cards
  - Committed to that choice

- After each card
  - Obey board elements in order
  - Check robot collisions

- Move = board elements
  + cards + collisions

Gameplay Modeling

Usability Analysis

- **Unusual user-interfaces**
  - Recall that actions correspond to inputs
  - Some inputs are not simple buttons
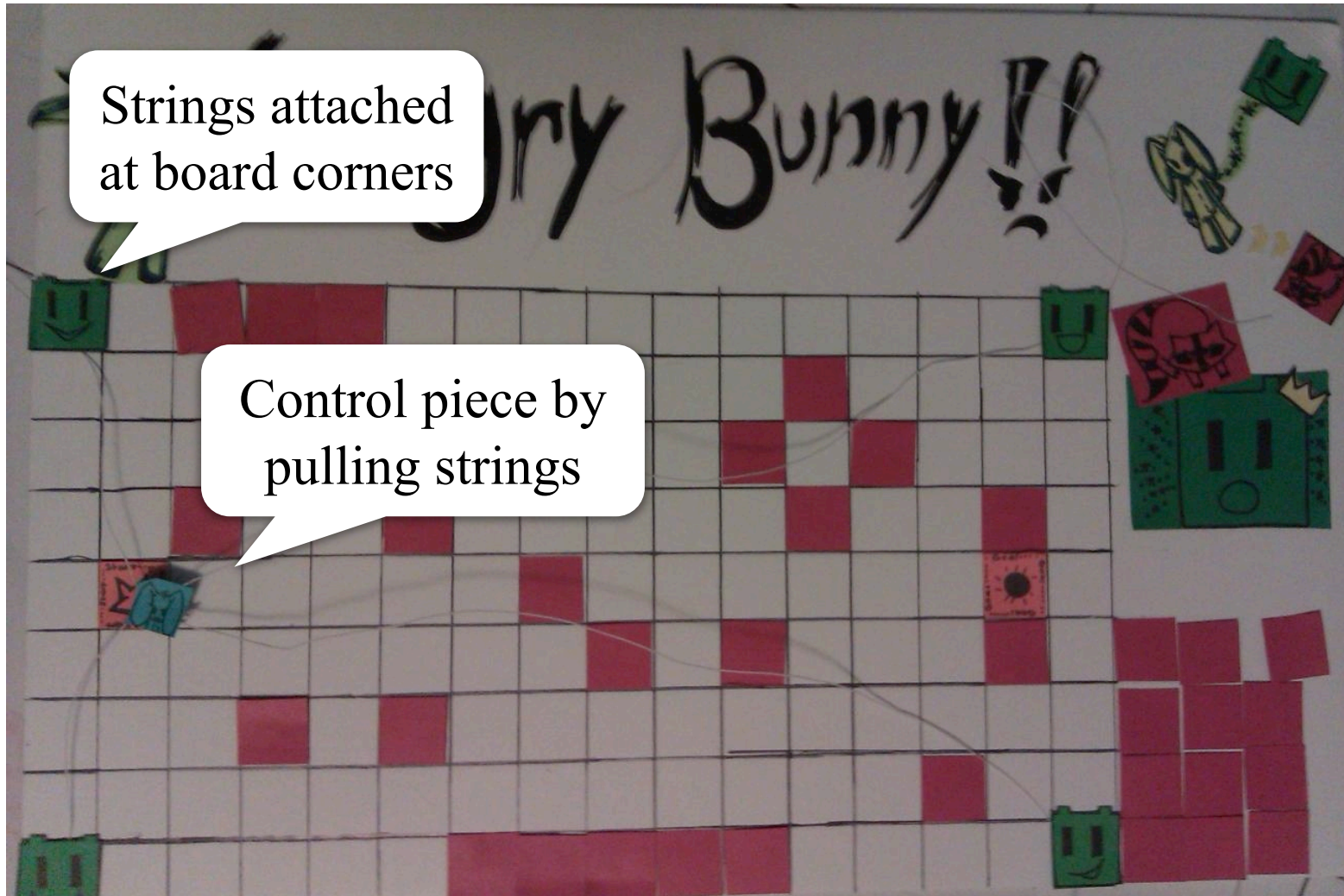 - Example: touch gestures, motion controls

- **Puzzle-style games**
  - Create a game with module elements (e.g. cards)
  - Laying out levels creates a new game level
  - Allows you to quickly change and test levels

Mobile Prototypes

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Usability Testing: *Angry Bunny*

Modeling Movement Controls

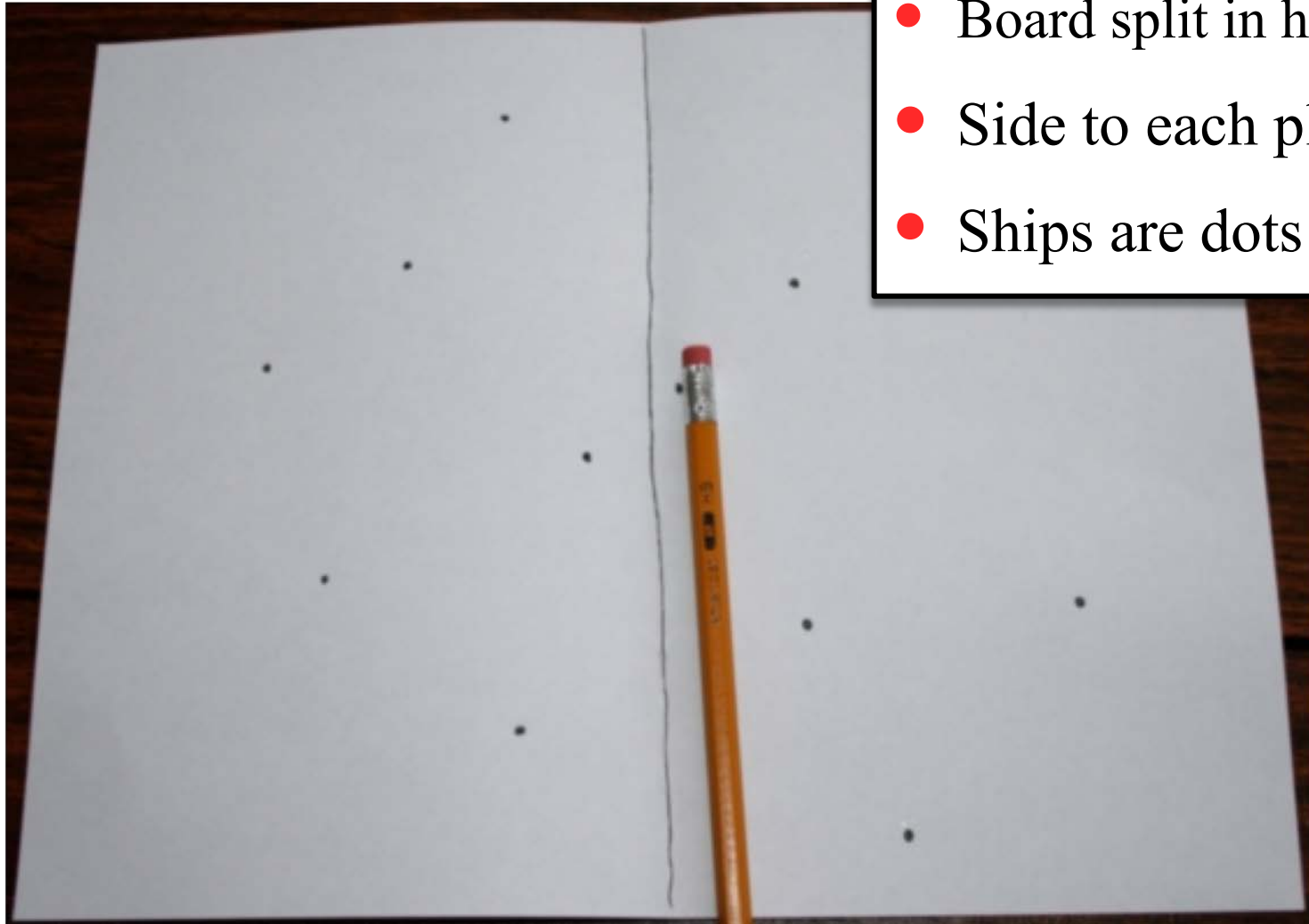Mobile Prototypes

Modeling Gestures

- Usability includes custom touch gestures
  - How accurate is player gesture?
  - How repeatable is the gesture?
  - How much screen does it require?

- Test out gestures with a writing tool
  - Write directly on the game board
  - Put a transparency over the game board

- Does not help with multi-touch (**solution?**)

Mobile Prototypes

Example: Space War

- Board split in half
- Side to each player
- Ships are dots

Mobile Prototypes
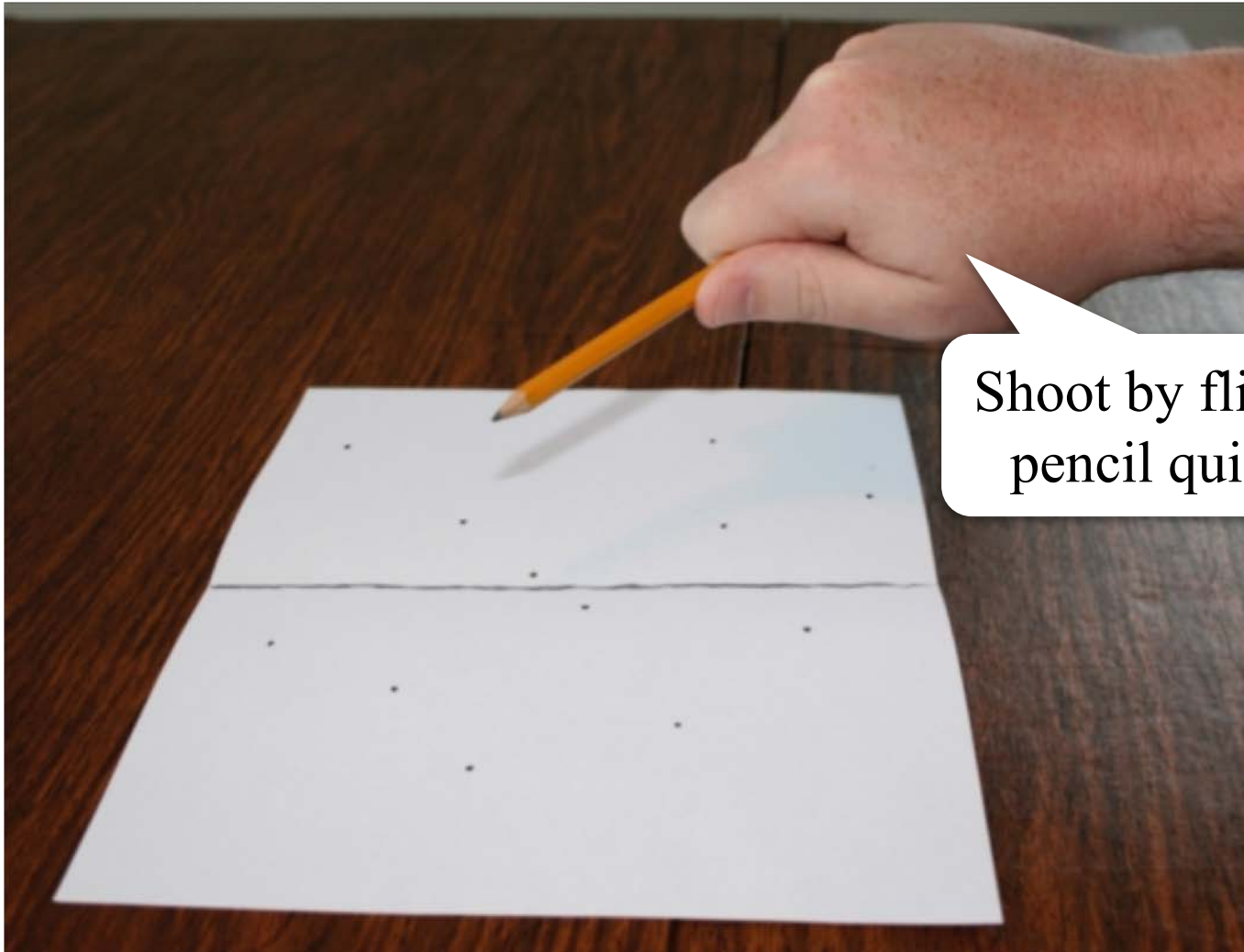
Example: Space War
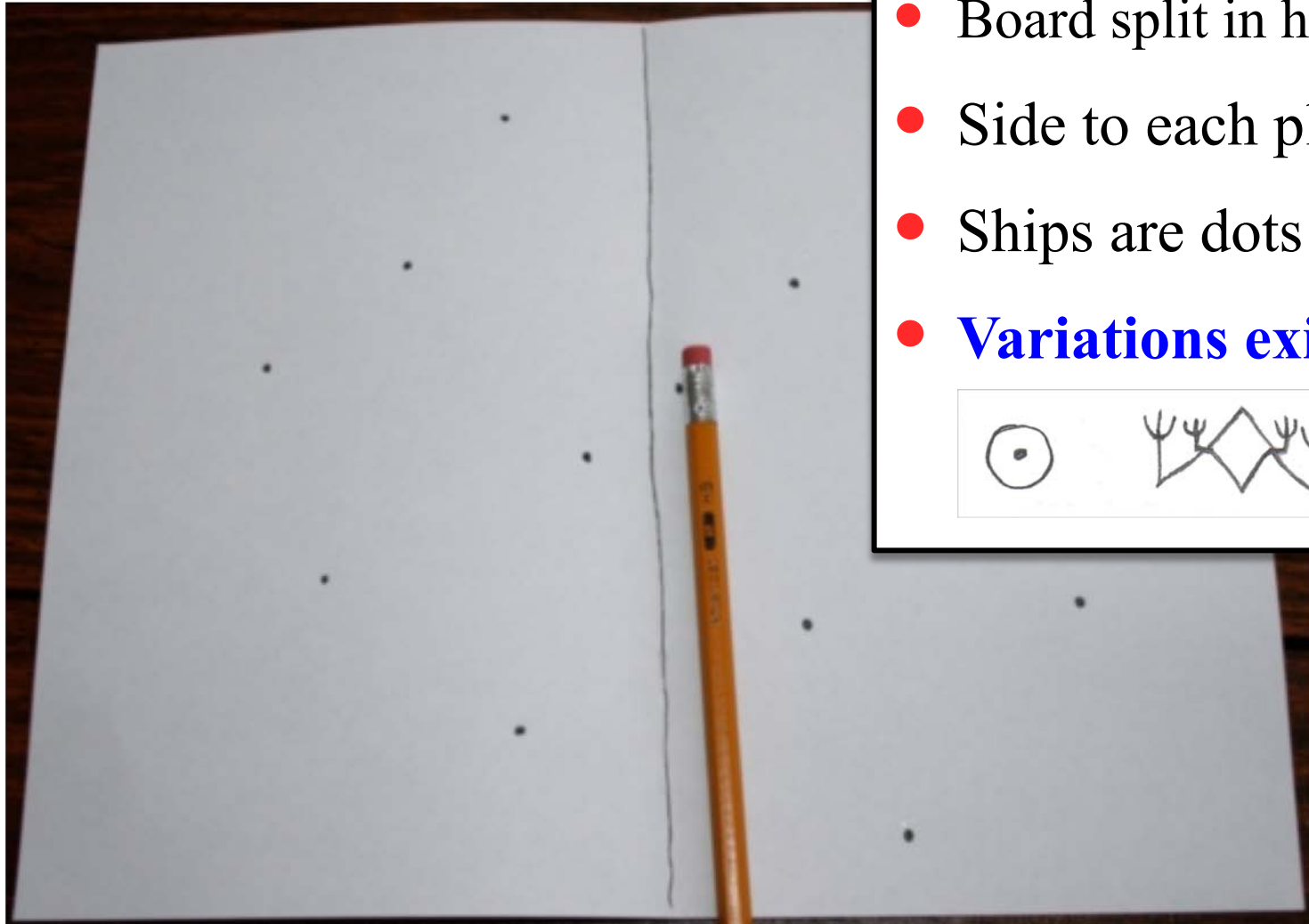
- Board split in half

- Side to each player

- Ships are dots

- **Variations exist**

Mobile Prototypes

Gestures in Space War

Shoot by flicking pencil quickly

Mobile Prototypes

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Gestures in Space War

Shot must start on player's ship

Mobile Prototypes

Gestures in Space War

Must be a quick flick
(**judgment call**)

Mobile Prototypes
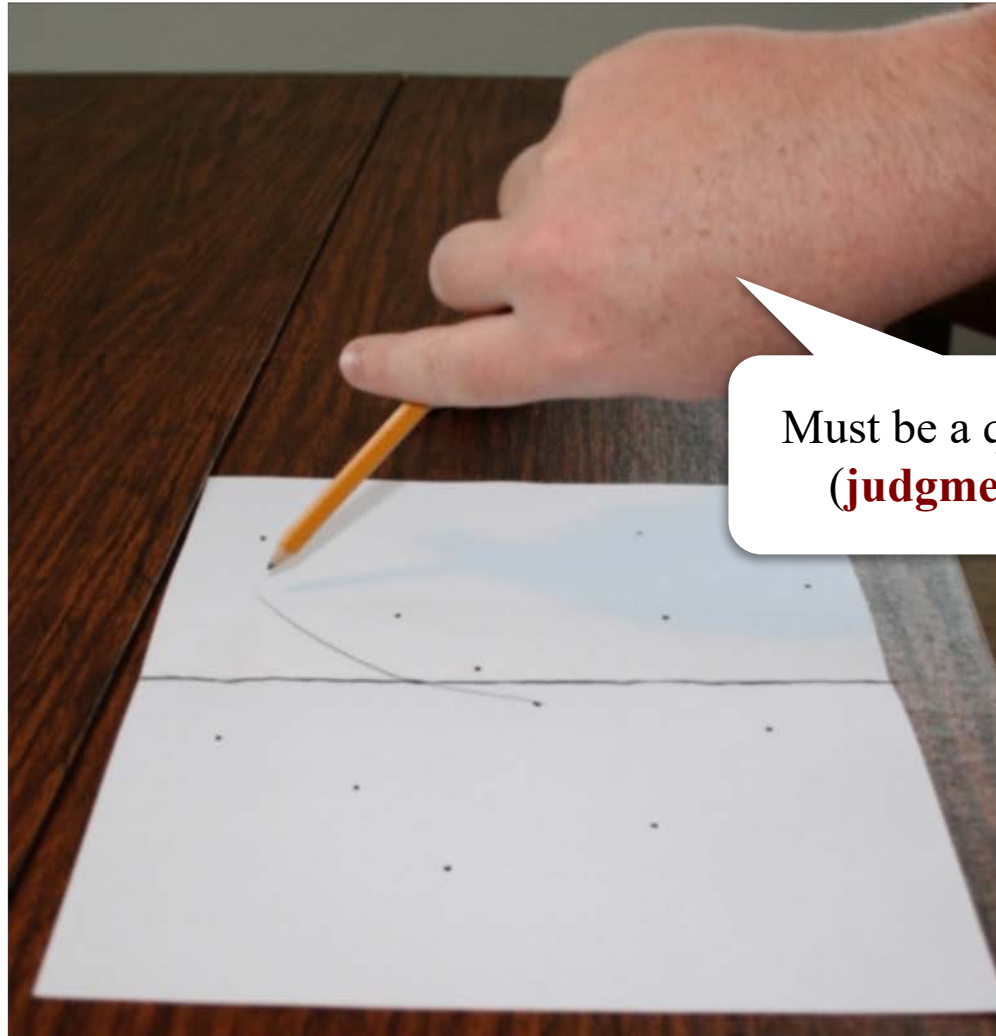
Processing Laser Fire

Mobile Prototypes
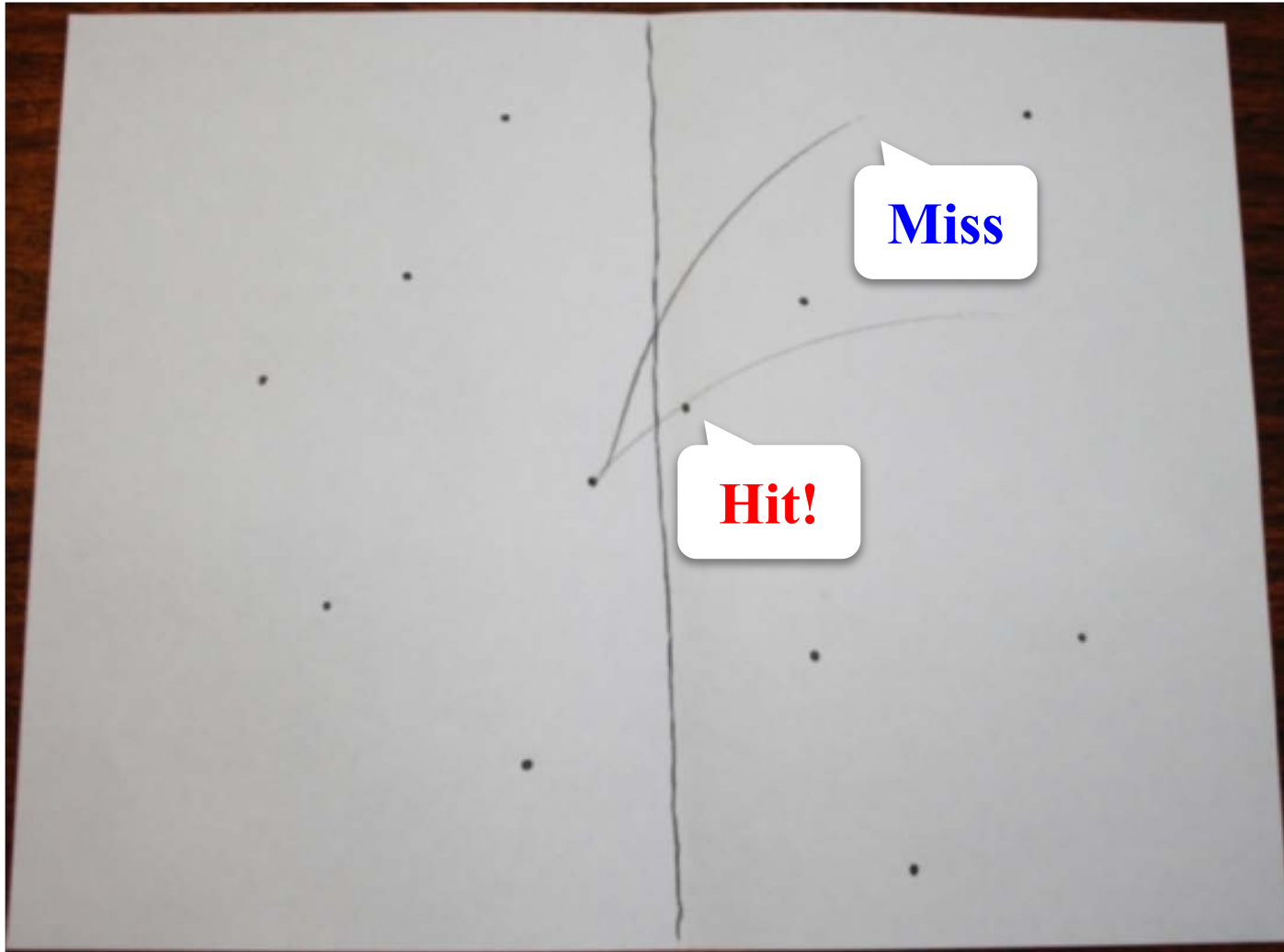
Space War Rules

- Players alternate turns shooting
  - **Remember**: Must start at active ship
  - Friendly fire usually ignored
  - Variations allow limited ship movement

- Successful hit destroys a ship
  - Variations may need multiple hits

- Continue until one side has no ships
  - Or paper is too messy to play anymore

Mobile Prototypes

Experiential Prototypes

- Some prototypes do not test gameplay
  - They test an experience or feeling
  - You determine if the feeling is enjoyable
  - Then go back and design gameplay for that

- Be very *careful* with this!
  - A very advanced design technique
  - Can easily end up with worthless prototype
  - Have only seen a few successes at this

Experiential Prototype: *Aeronautical*

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The Experience of Threat

Mobile Prototypes

Most Important Thing: *Progression*

- Do not want a **one-level** game
    - Major problem with "flick" games in this course
    - Endless runners also have this problem

- We want some evidence of a **progression**
    - What is an easy level?
    - What is a medium level?
    - What is a hard level?
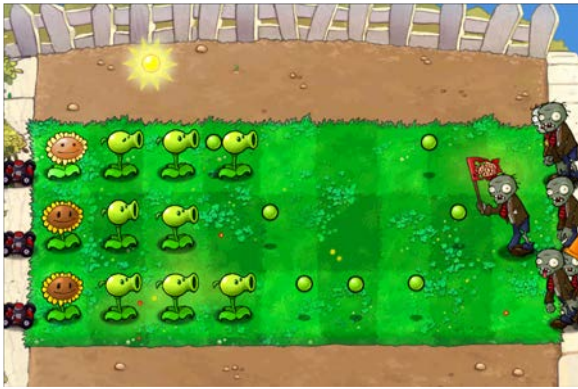
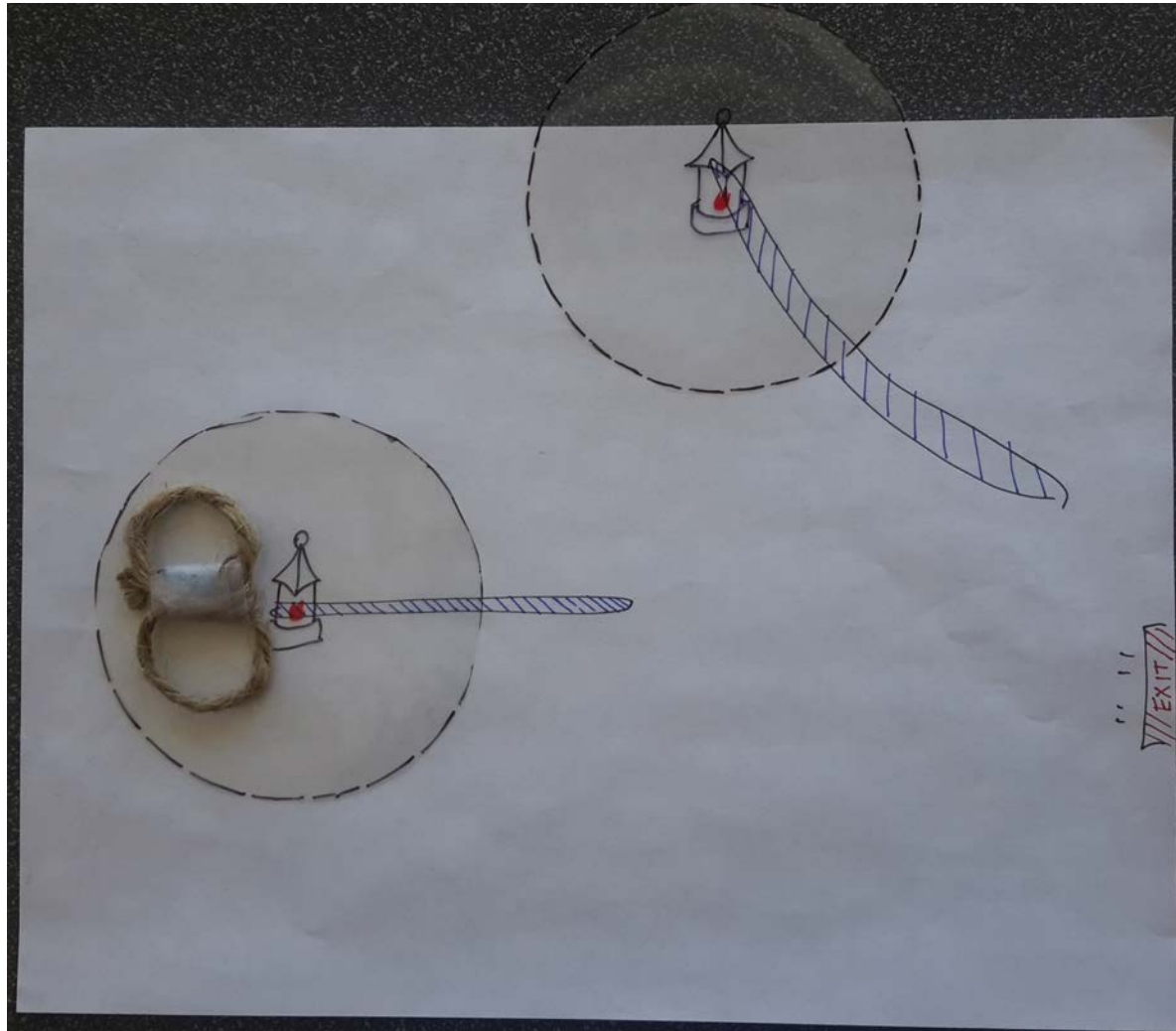- Your prototype should be *reconfigurable*

Mobile Prototypes

Easy

Paper Prototyping

Medium

Paper Prototyping

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Hard

Paper Prototyping

The Difficulty Curve

Easy

Medium

Hard

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Easy: Iridescence

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Medium: Iridescence

Paper Prototyping

Hard: Iridescence

Paper Prototyping
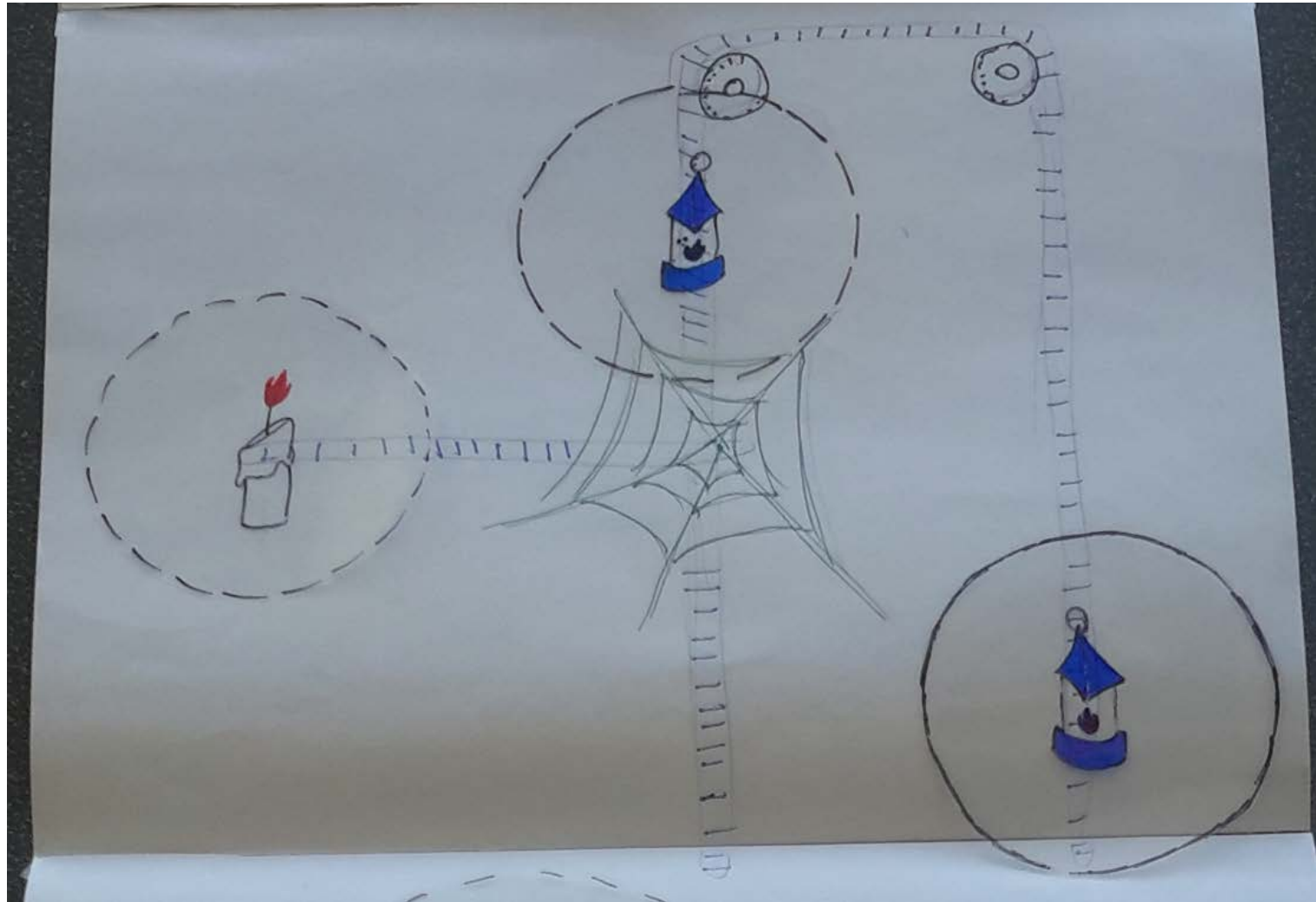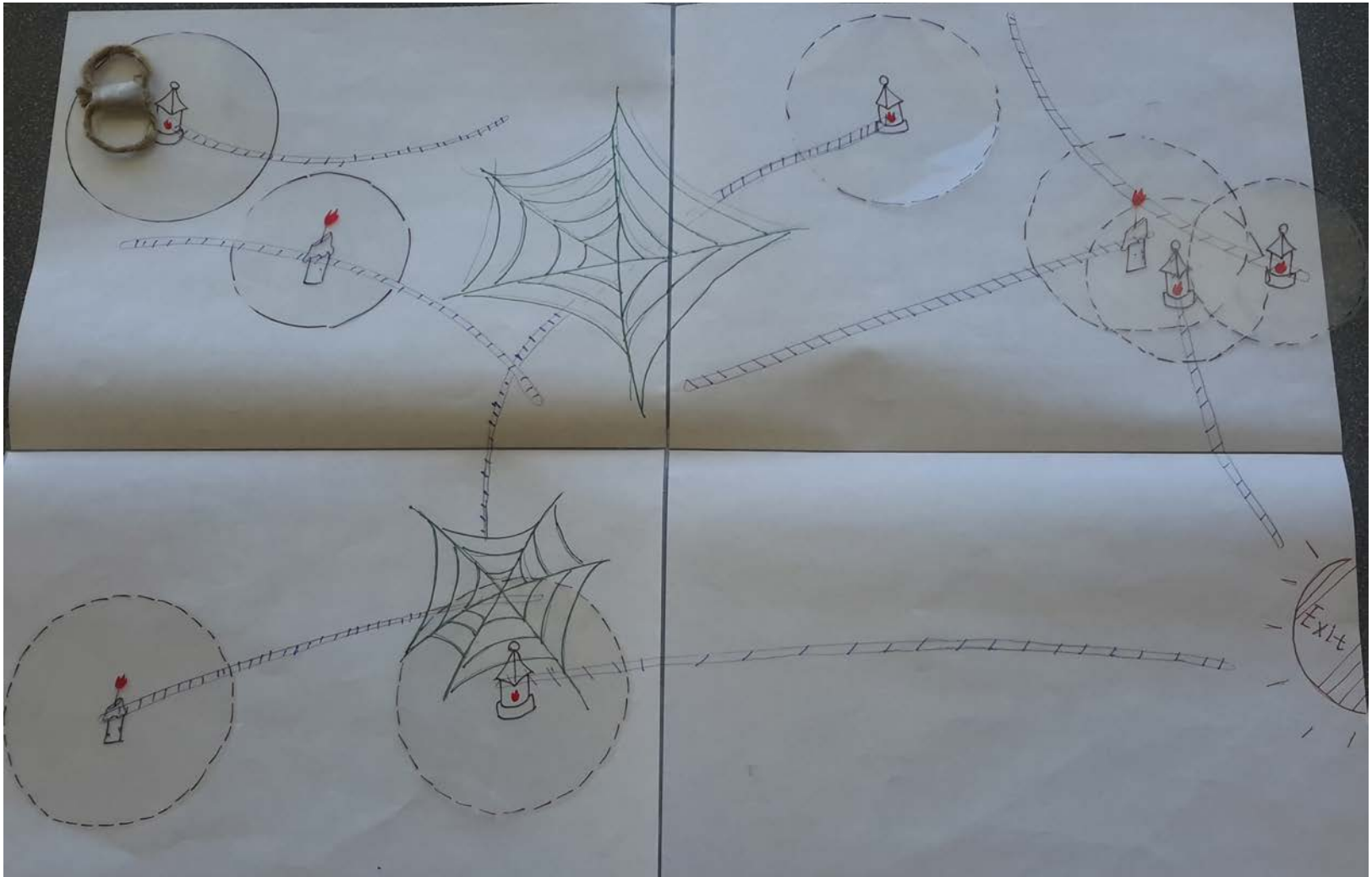
Reconfigurable Prototypes

Mobile Prototypes