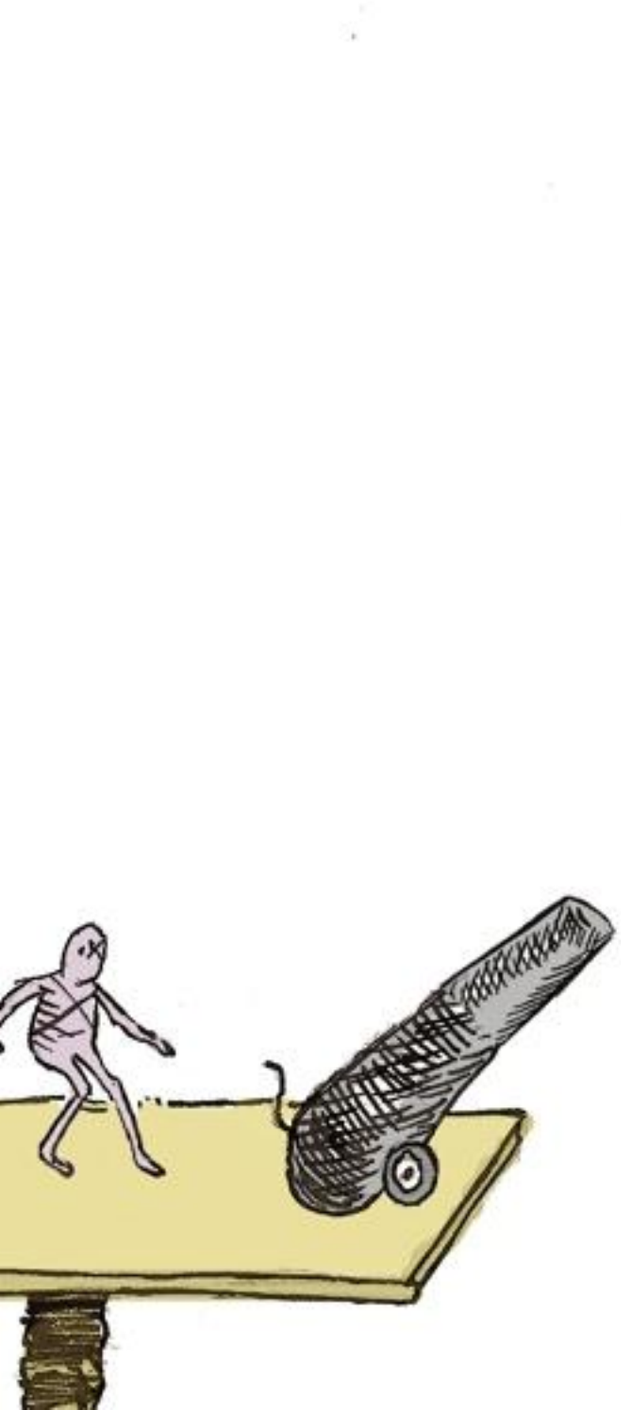
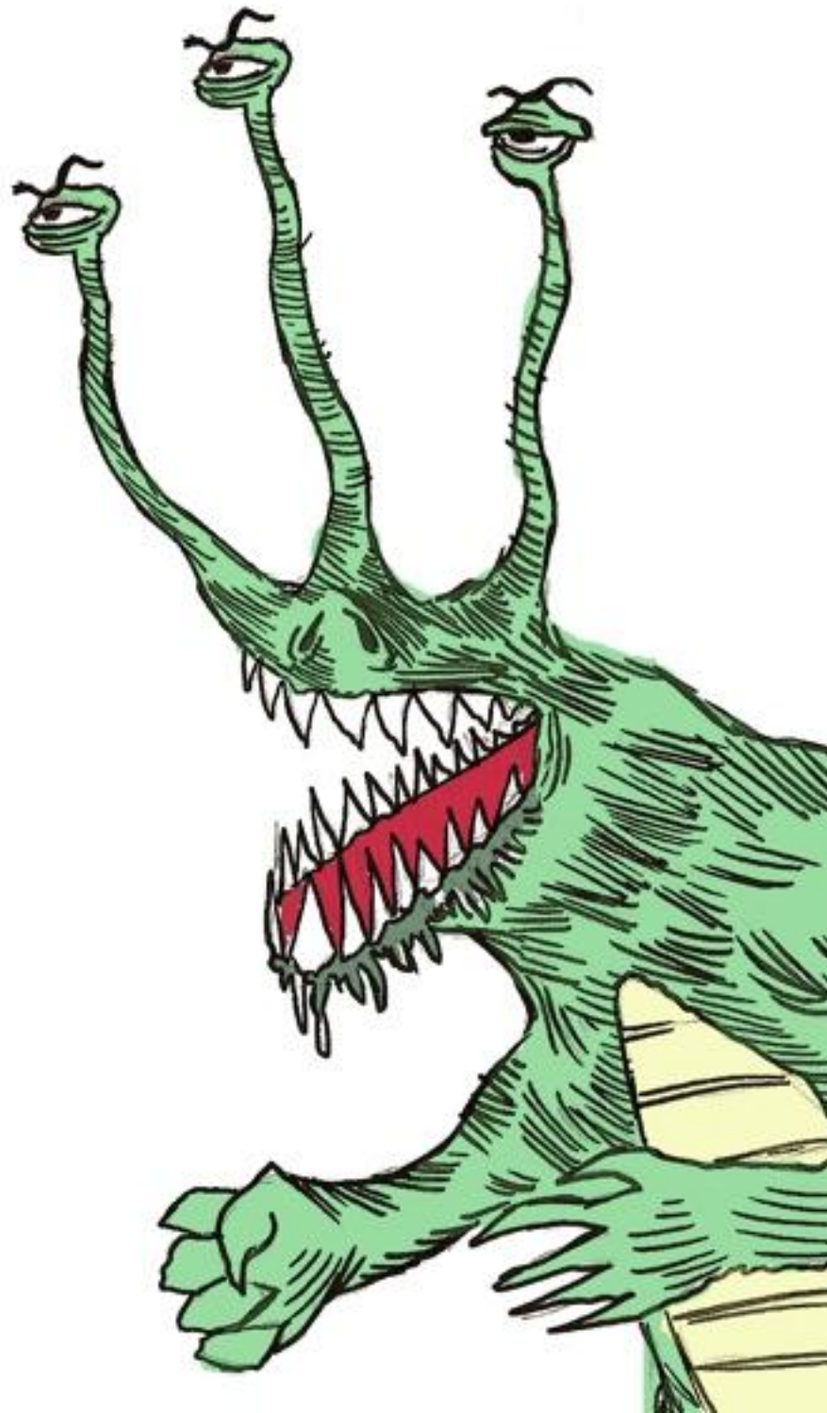
Games for Learning Institute





Games for Learning Institute

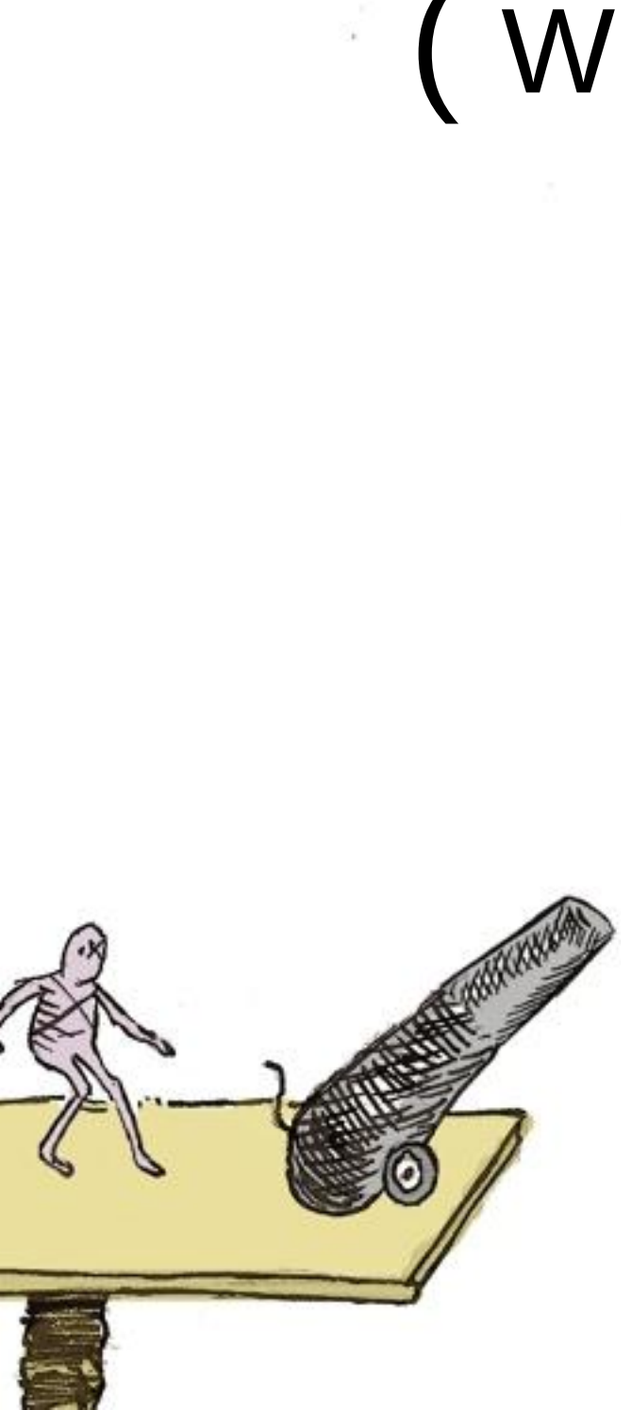
(What I learned at the

Games

for

Learning

Institute



)

Collaborators

- Ken Perlin
- Bruce Homer
- Catherine Milne
- Katherine Isbister
- Trace Jordan
- Joel Wein
- Carl Skelton
- Mary Flanagan
- Chuck Kinzer
- Andy Phelps
- Miguel Nussbaum
- Paul O’Keefe
- Yan Wang
- Ruth Schwartz
- Jon Frye
- Yoo Kyung Chang
- Lizzie Hayward
- Tsu-Ting Huang
- Helen Zeng
- Charles Hendee
- Murphy Stein
- Juan Barrientos

13 faculty at 9 Universities

Comprised of 13 faculty (at 9 institutions), specializing in STEM Education, Science of Learning, Educational Technology, Psychology, Game Design, Computer Science, and Software Engineering. Funded by Microsoft Research.

NYU (Ken Perlin, Jan Plass, **Co-Directors**, Cath Milne)

NYU Poly (Katherine Isbister, Carl Skelton, Joel Wein)

CUNY Graduate Center (Bruce Homer)

Columbia (Steve Feiner)

Teachers College (Chuck Kinzer)

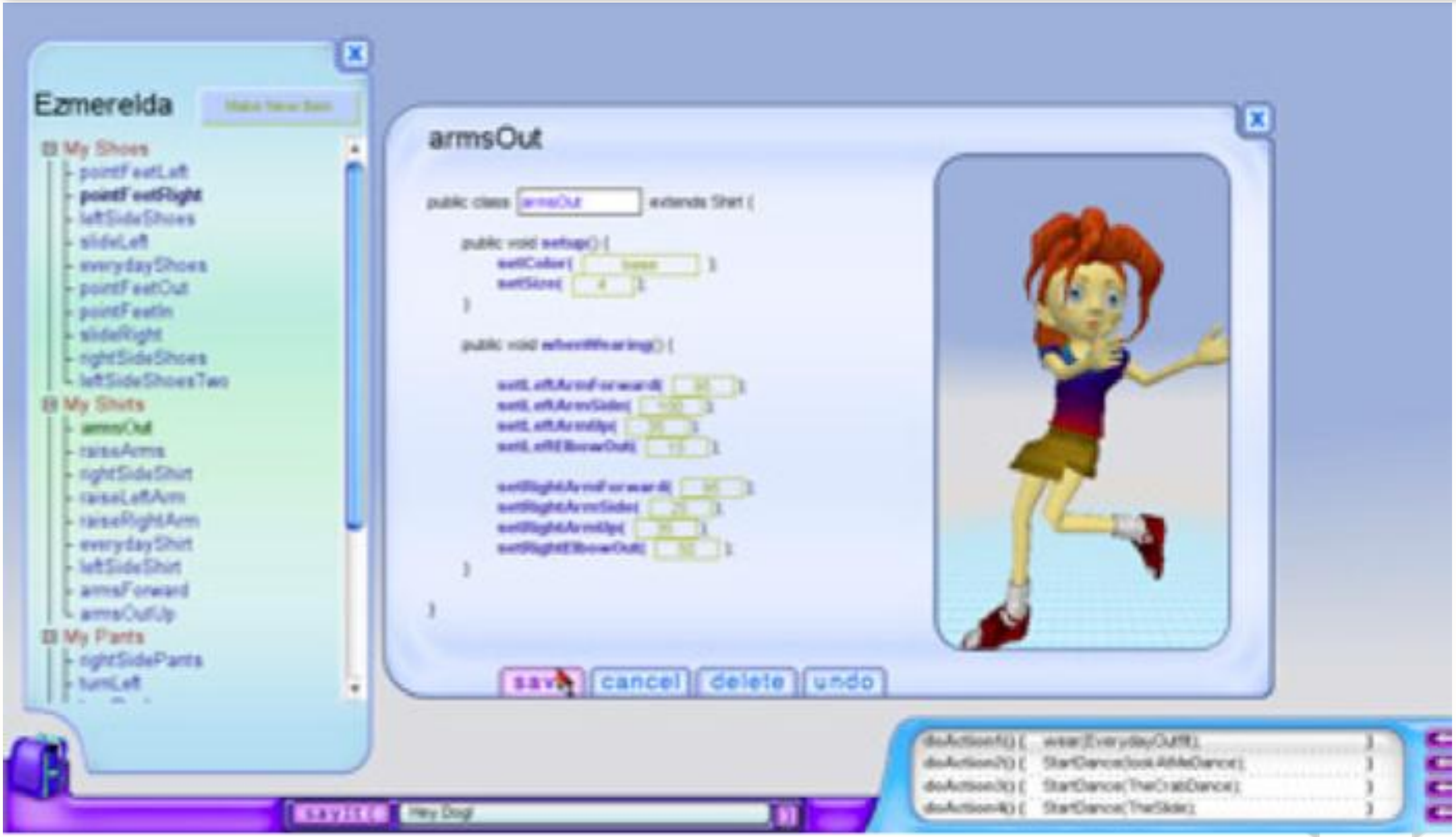
Parsons School of Design (Colleen Macklin)

Dartmouth (Mary Flanagan)

Rochester Institute of Technology (Andy Phelps)

Catholic University of Chile, Santiago (Miguel Nussbaum)

Computational Thinking



Lots of collaborators/partners

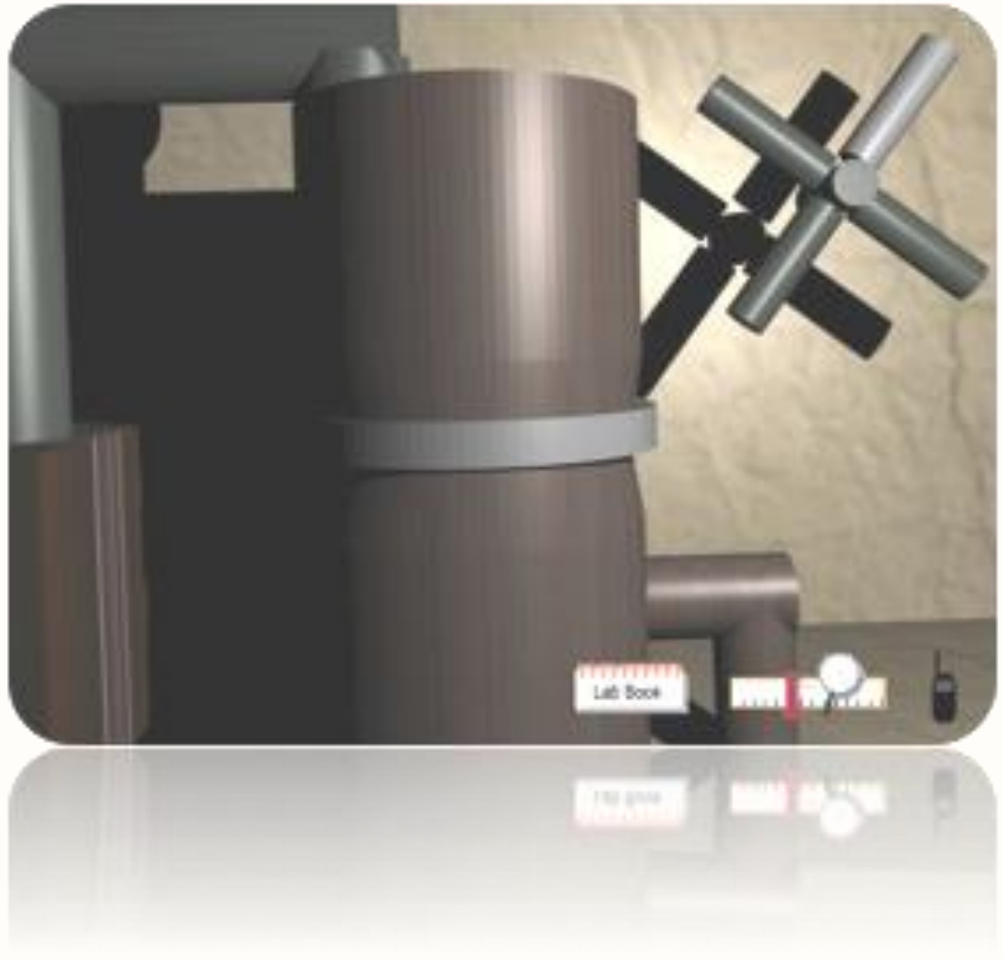
Collaborators

- Board of Advisors
- Faculty from NYU, New York City, National, International
- Network of Middle and High Schools in New York City
- Organizations offering After-School r
- Media Developers & Broadcasters
- Museums

Science learning games

Adventure Game for Science Learning

- Strong Narrative
- Science Problems Embedded



Simulation games

AR Simulation Game for Science Learning

- Geo-Located Hot Zones
- Authentic Scientific Data fe

Games to practice math skills

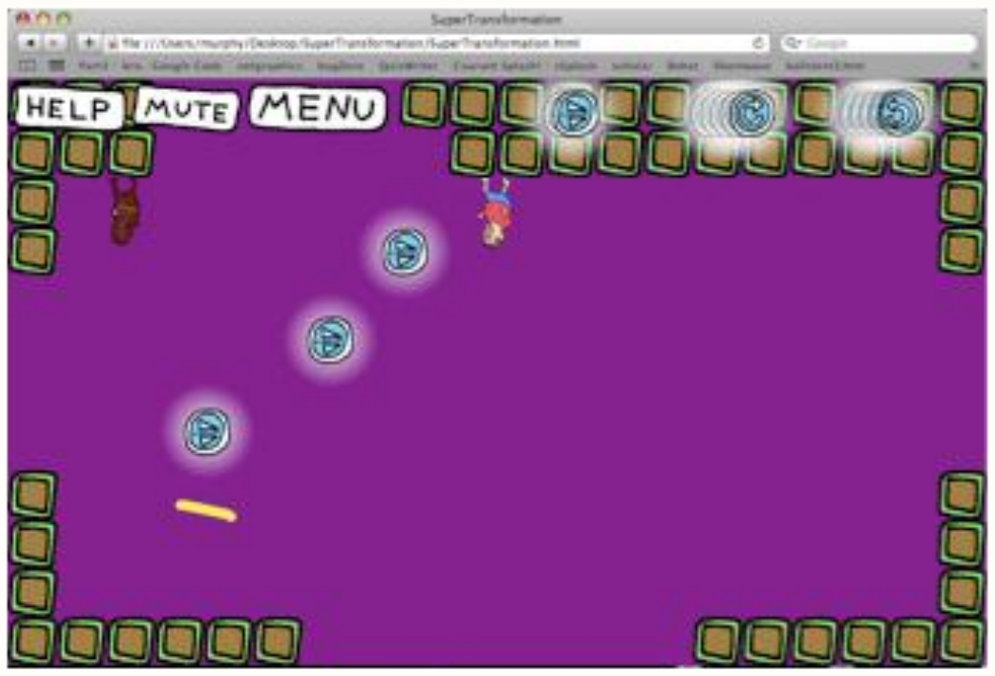
Games and Learning

- Math Skills: Factor Reactor

Games to practice math skills

Games and Learning

- Math Skills: Supertransformation!



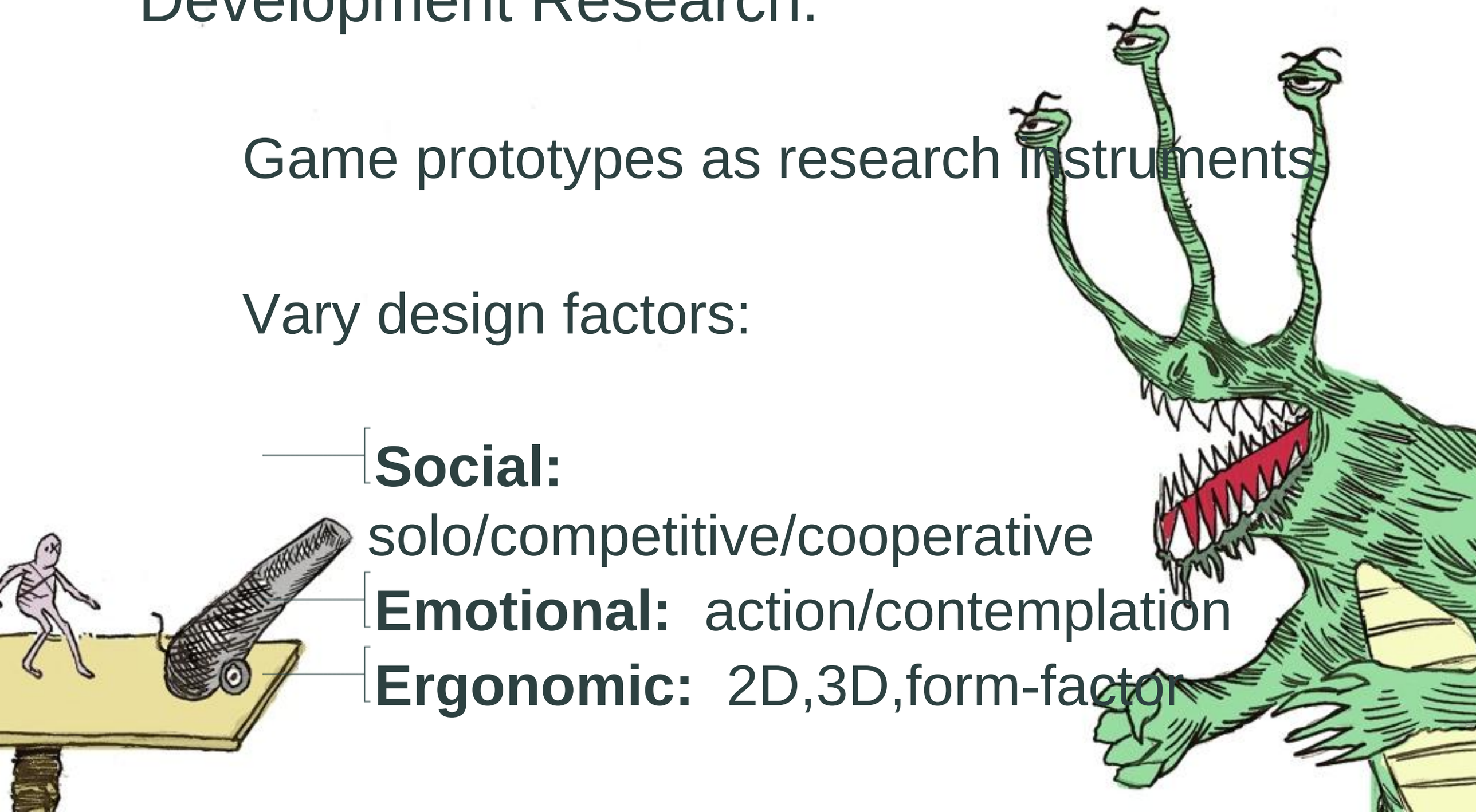
Games are research instruments!

Development Research:

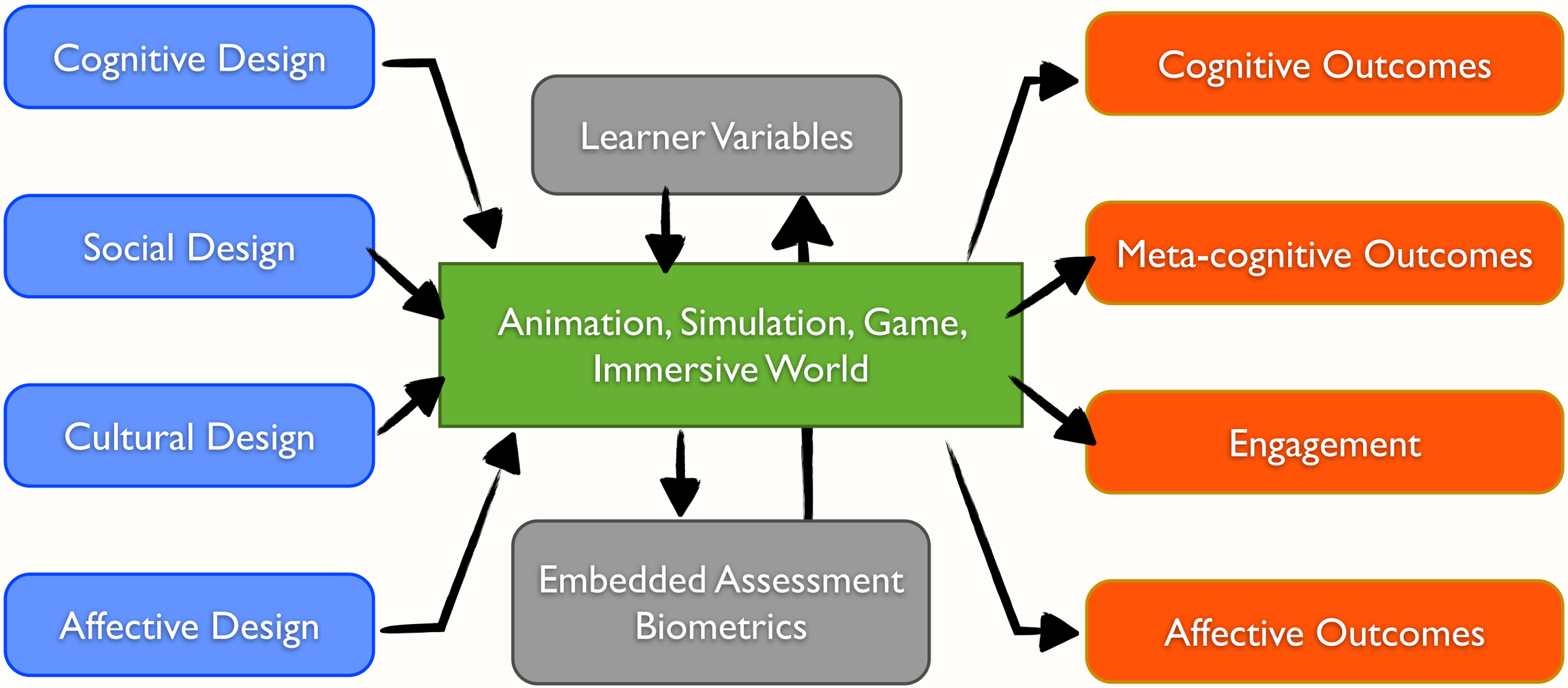
Game prototypes as research instruments

Vary design factors:

- **Social:** solo/competitive/cooperative
- **Emotional:** action/contemplation
- **Ergonomic:** 2D,3D,form-factor

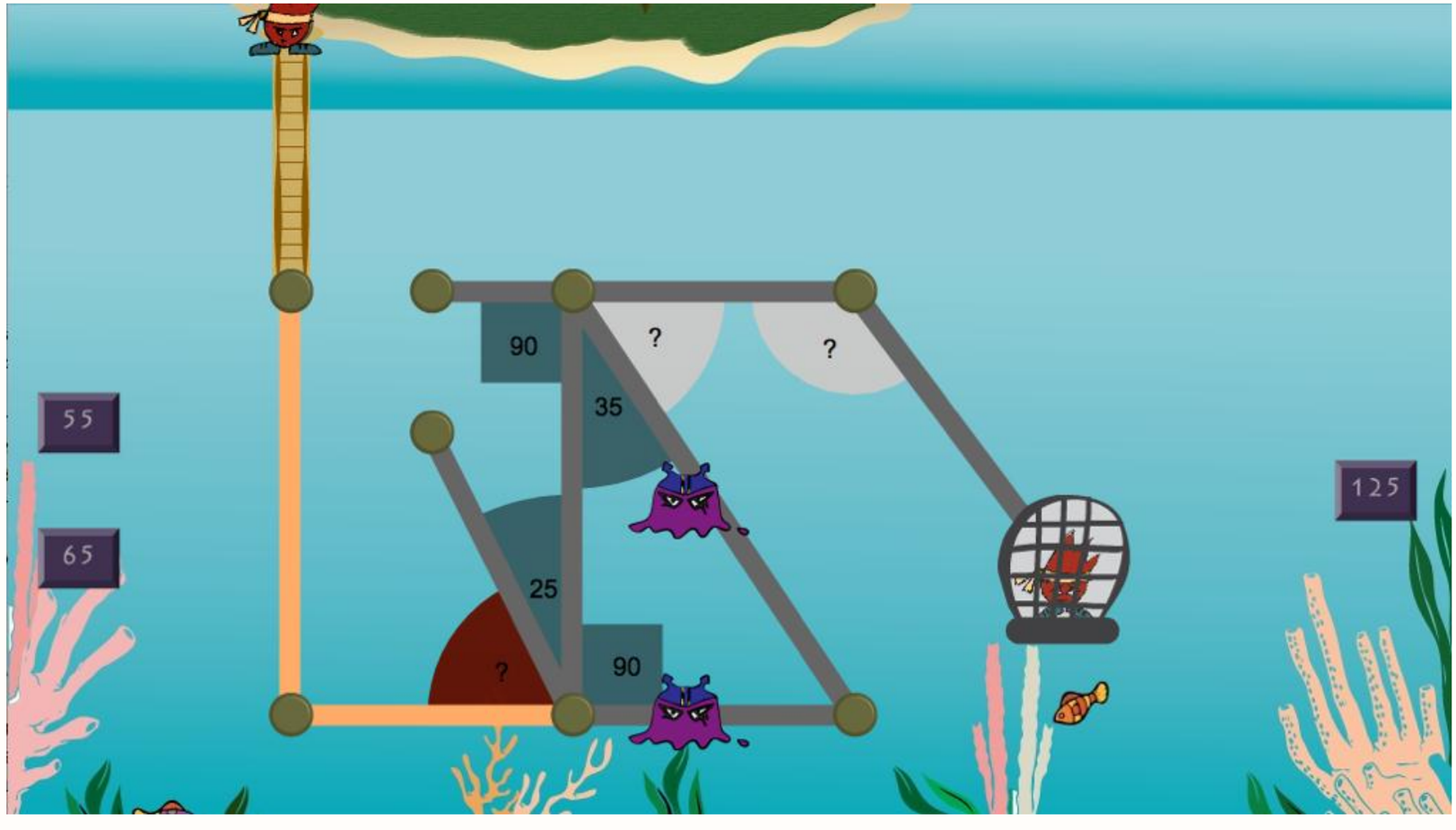


From game design to learning

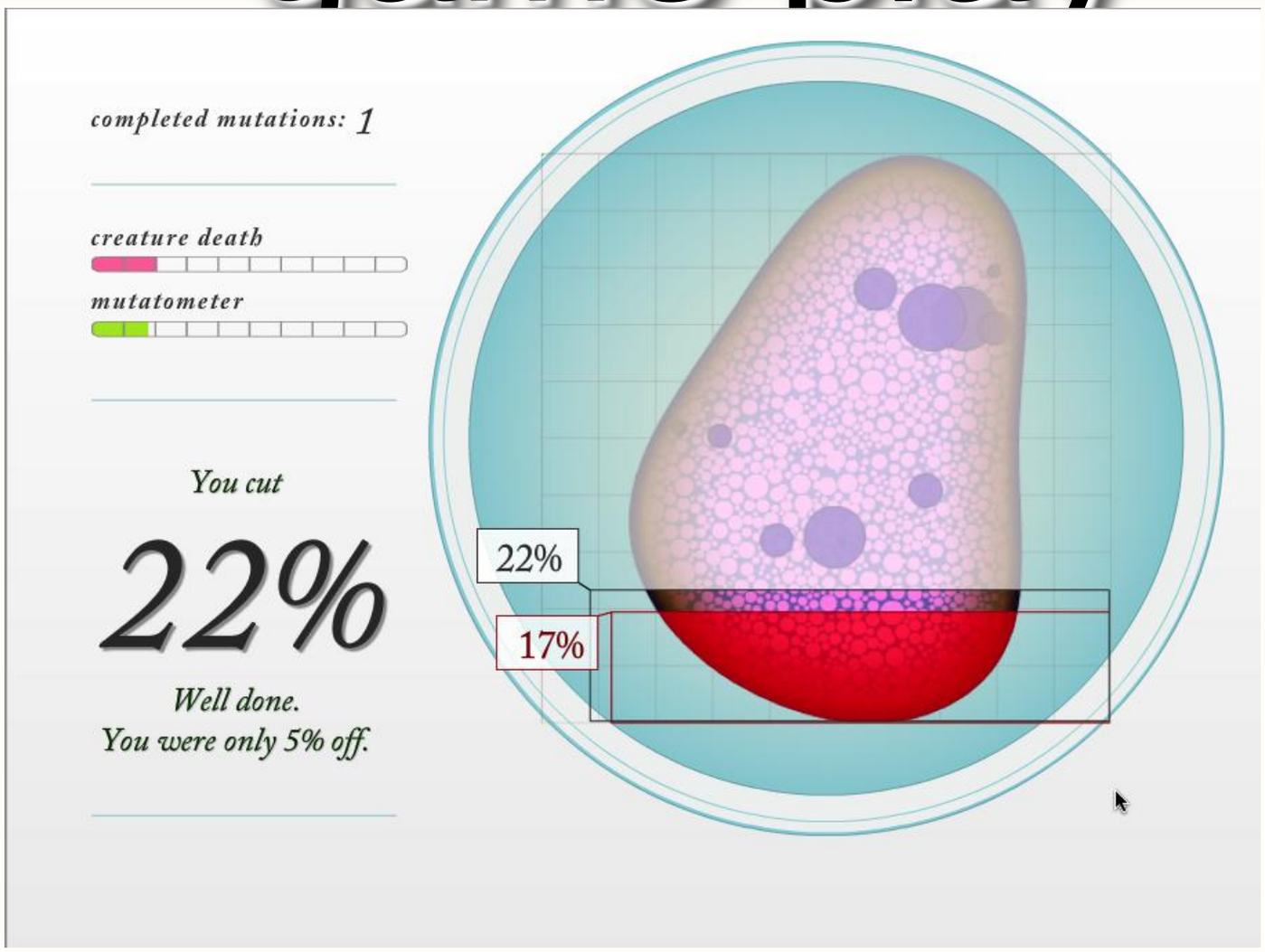


“Learning Mechanics”

- Learning Mechanics Research
  - Two learning mechanics:
    - Solve missing angles by selecting correct number
    - Better: Solve missing angles by identifying correct rule



Example: The math **is** the game play



TEACHING ESTIMATION:
G4LI game prototype by Mary Flanagan,

Social body language

Movement-Based Play : (NYU Poly)

- A Controlled Comparison of Movement Ba
  Games
- In-school study with low/medium/high movement
  Wii games.
- Players rated emotions after each round.
- Video coded for manipulation check.

Results

- Higher arousal/energy when
  more movement.
- Same amount of positive fee
  in all conditions.

Not just grammar -- literature.

Not just grammar -- literature.

"Computer science doesn't just need a grammar. It needs a literature."

-Marvin Minsky

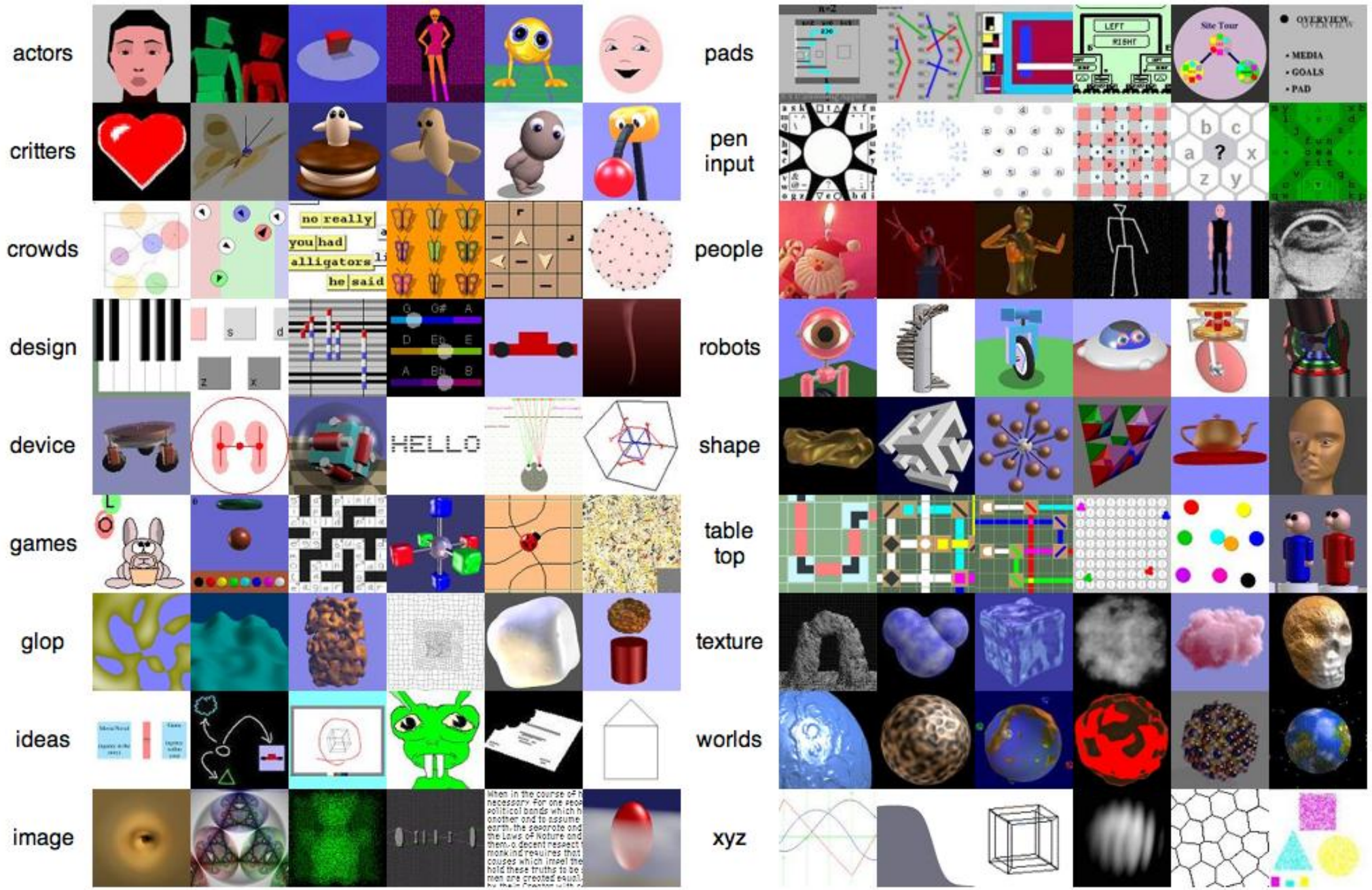
Plastic dinosaurs!

Plastic dinosaurs!

Plastic dinosaurs!

Plastic dinosaurs!

Keep a notebook.

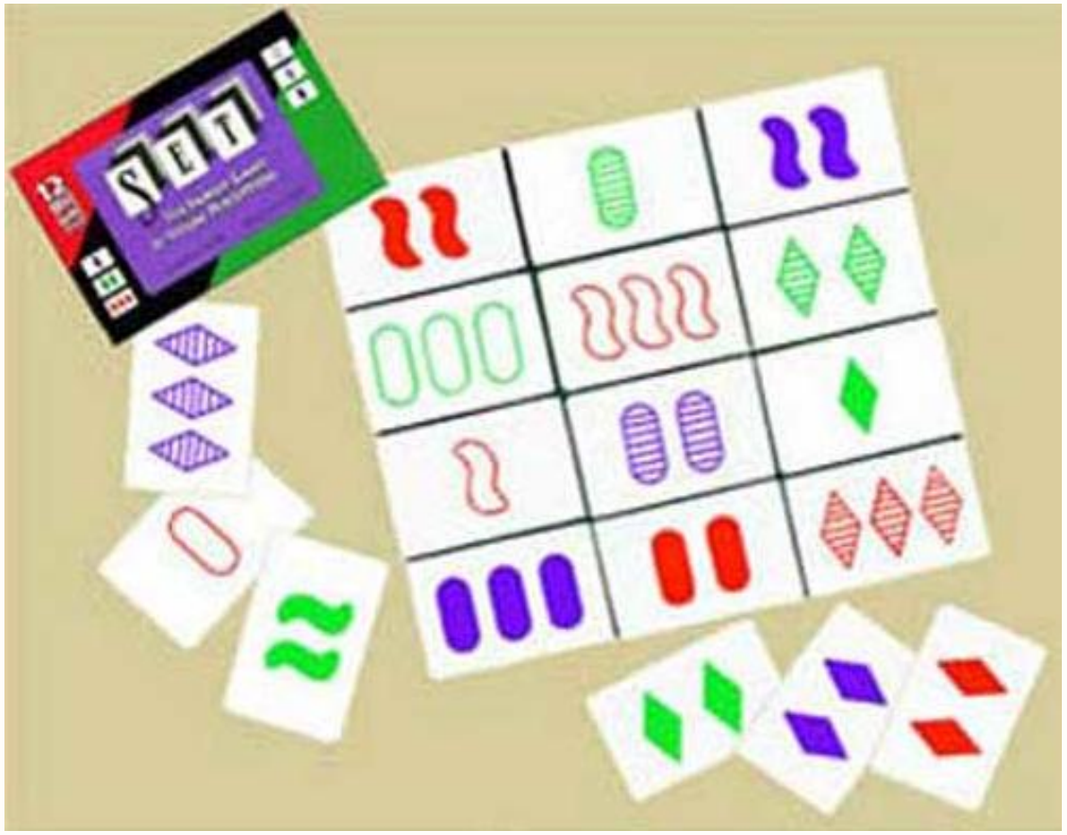


Quick sketch for “math **is** the game play”

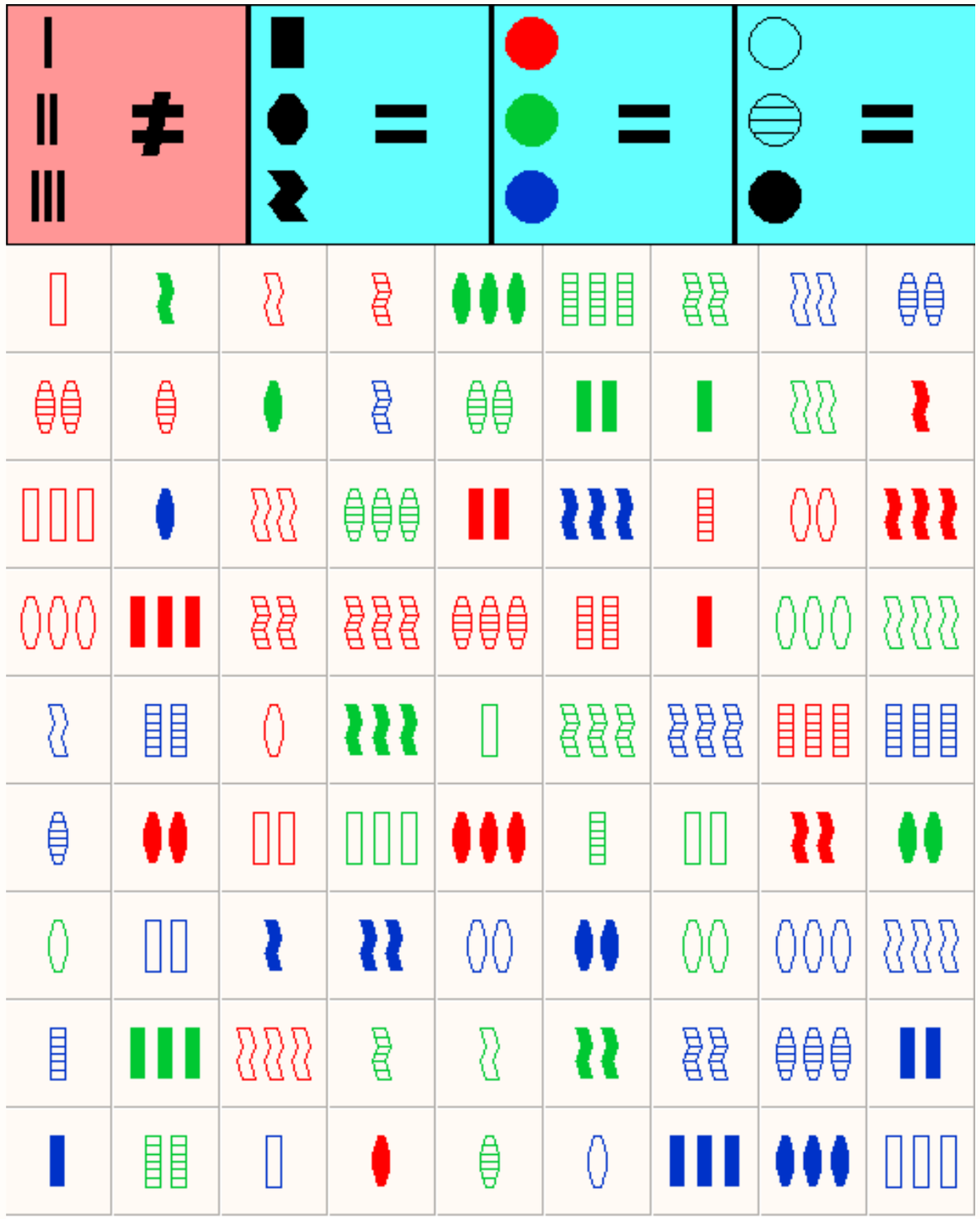
42-33	3-0	98-93	4-2	72-67
96-92		60-54	68-65	44-40
12-6	48-48	74-72	92-91	21-13
24-18	15-10		36-27	82-81
76-70	98-97		8	12-11

Mash-ups

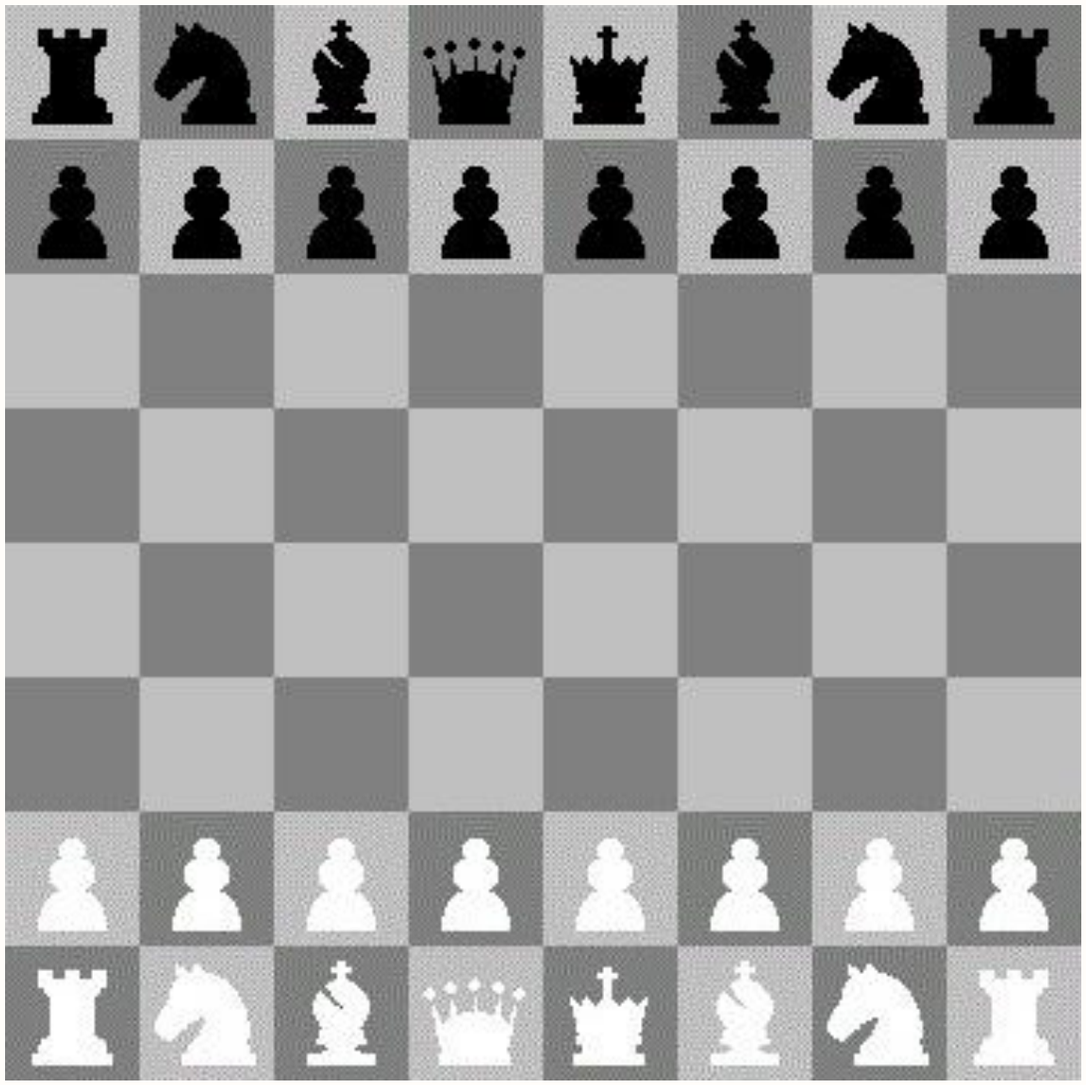
+



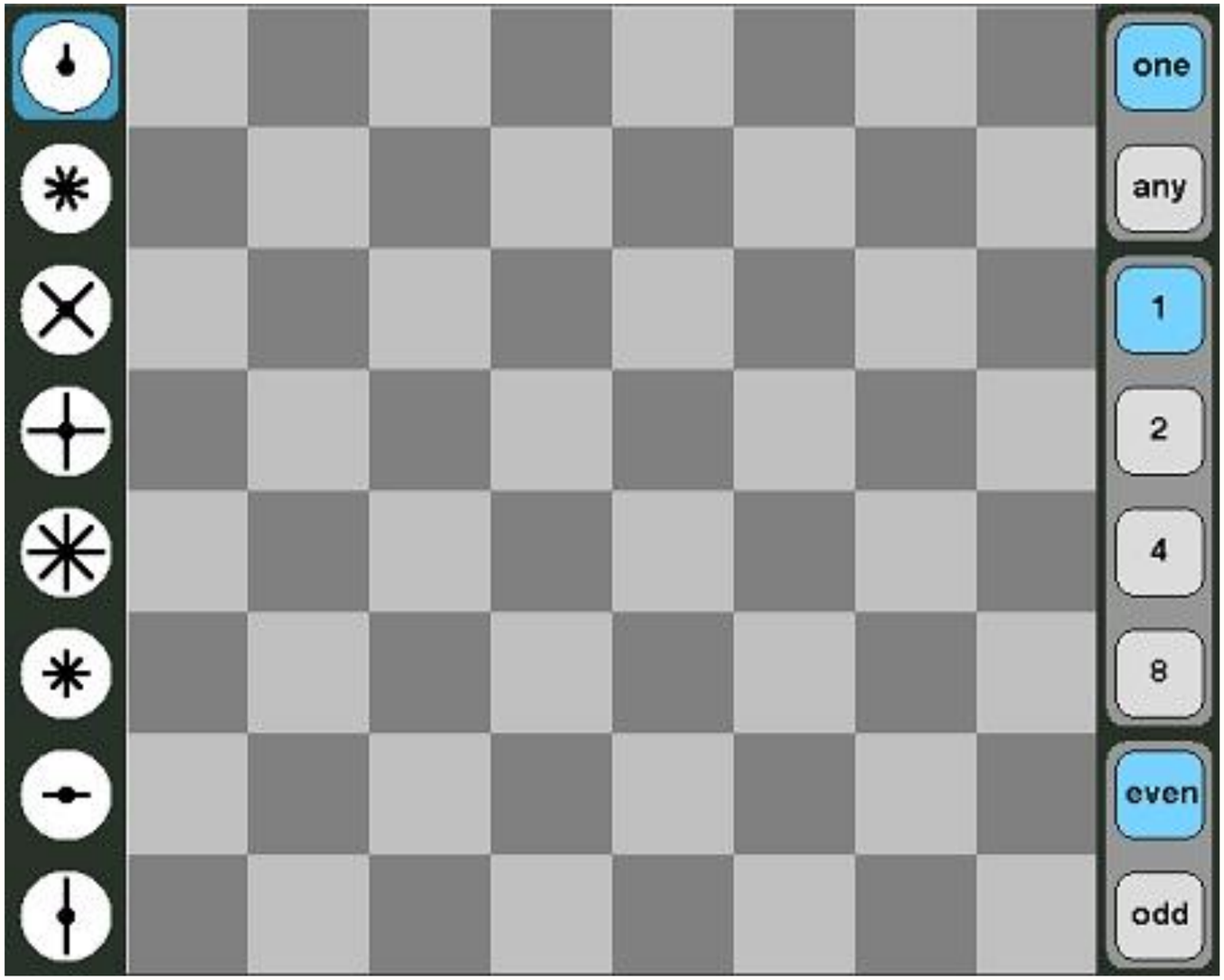
Mash-ups



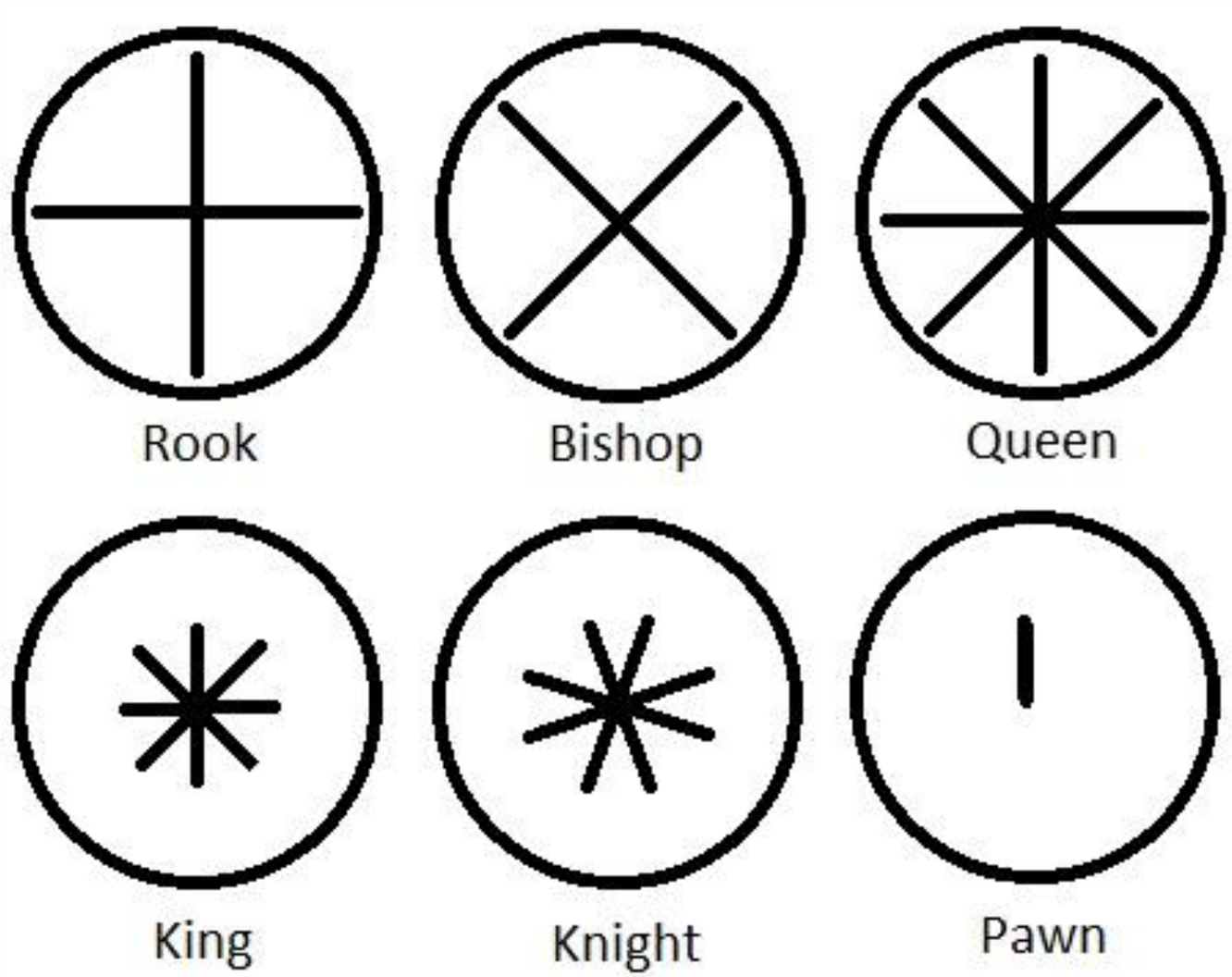
Computational thinking about chess



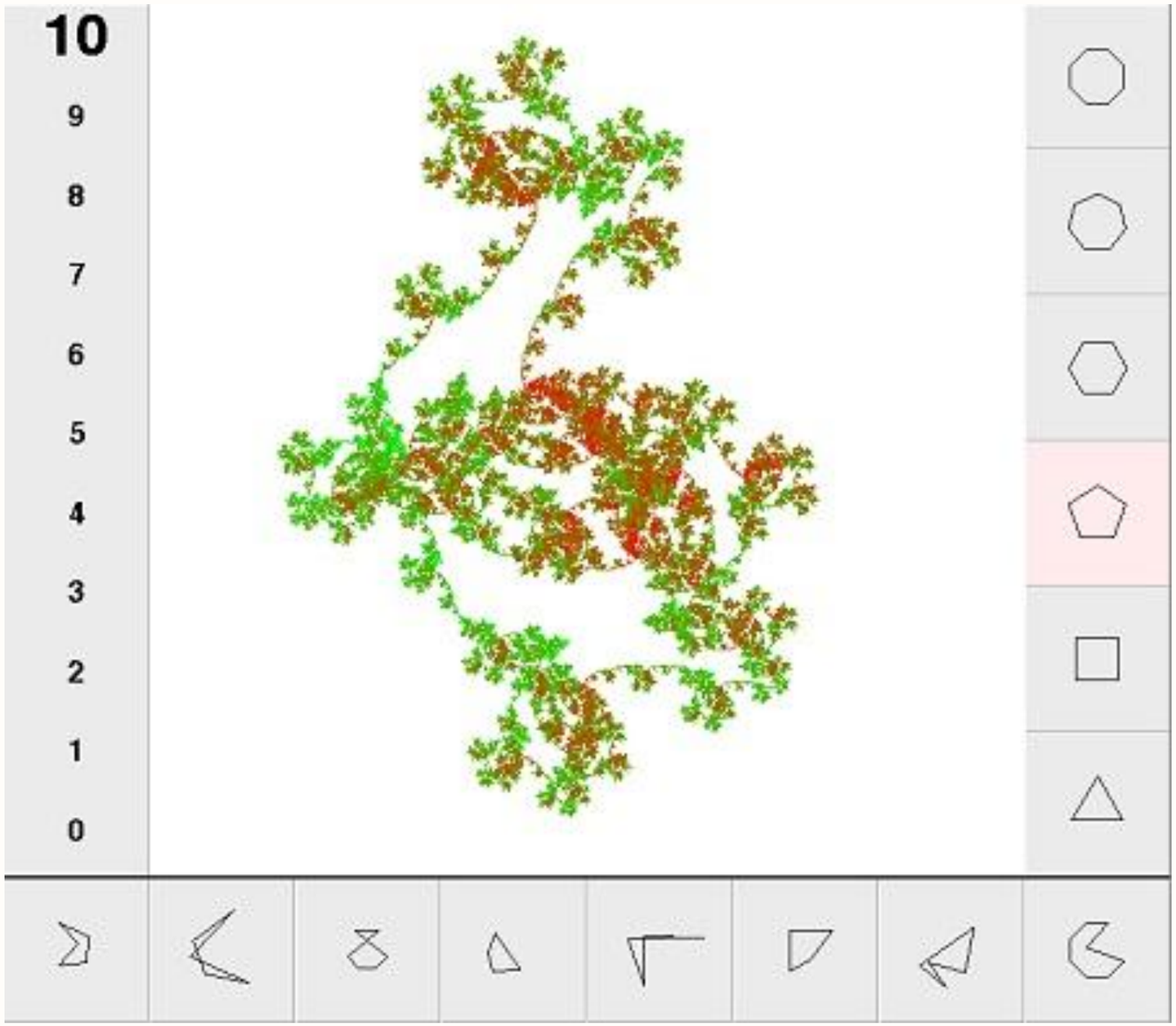
Create your own game rules…



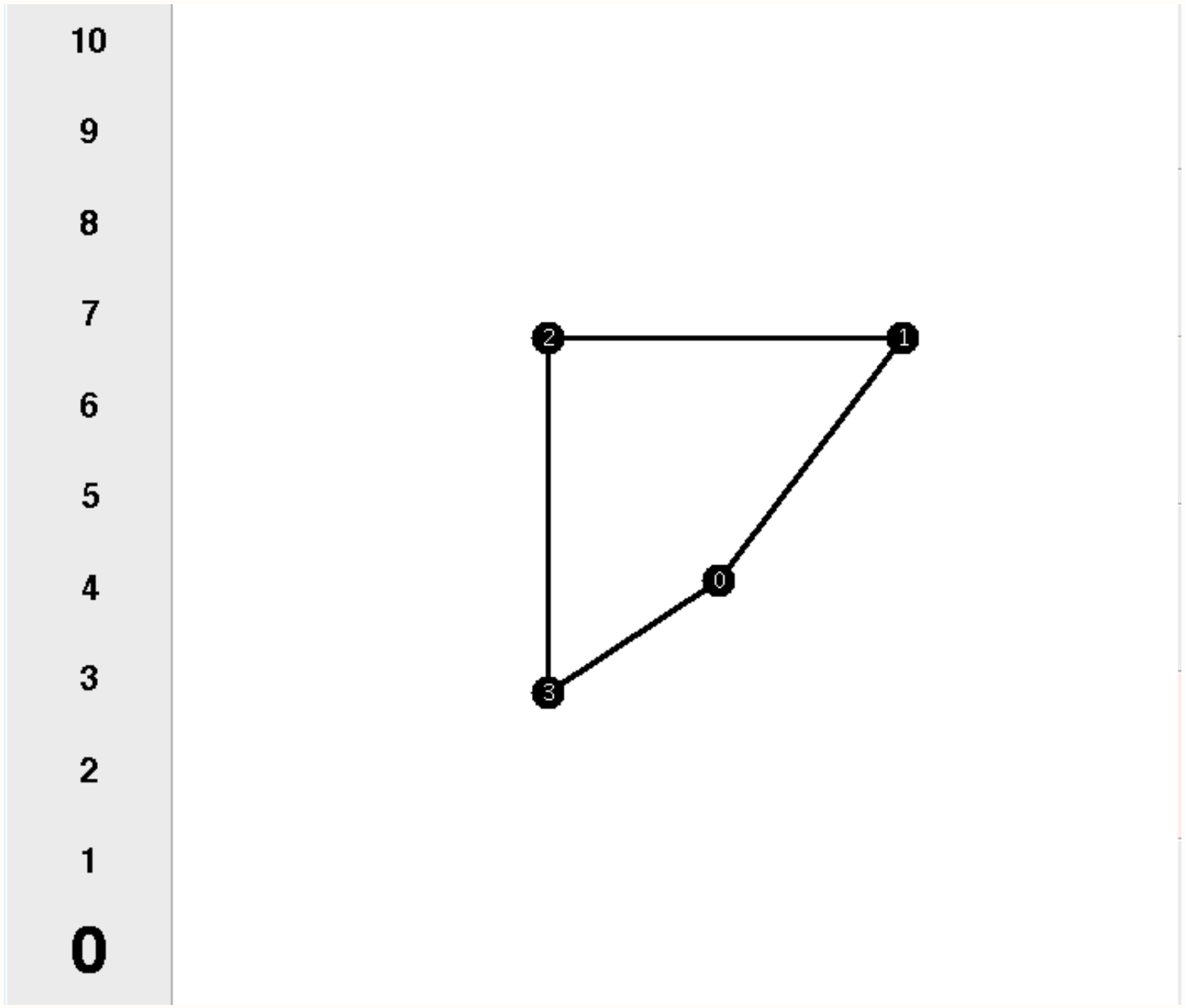
Lots of possible games!



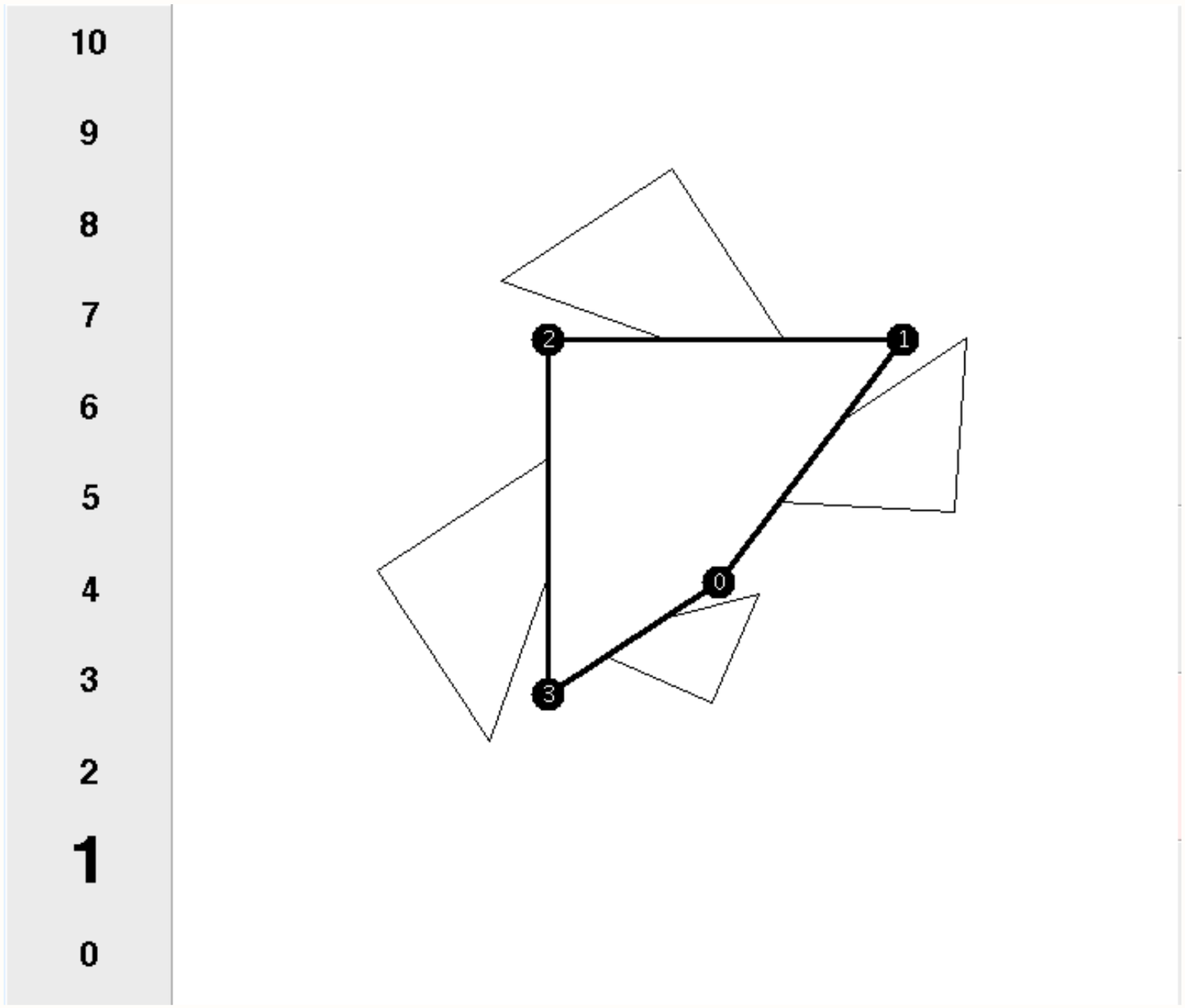
Explore by constructing.



Fractal construction kit



Fractal construction kit



Fractal construction kit

10

9

8

7

6

5

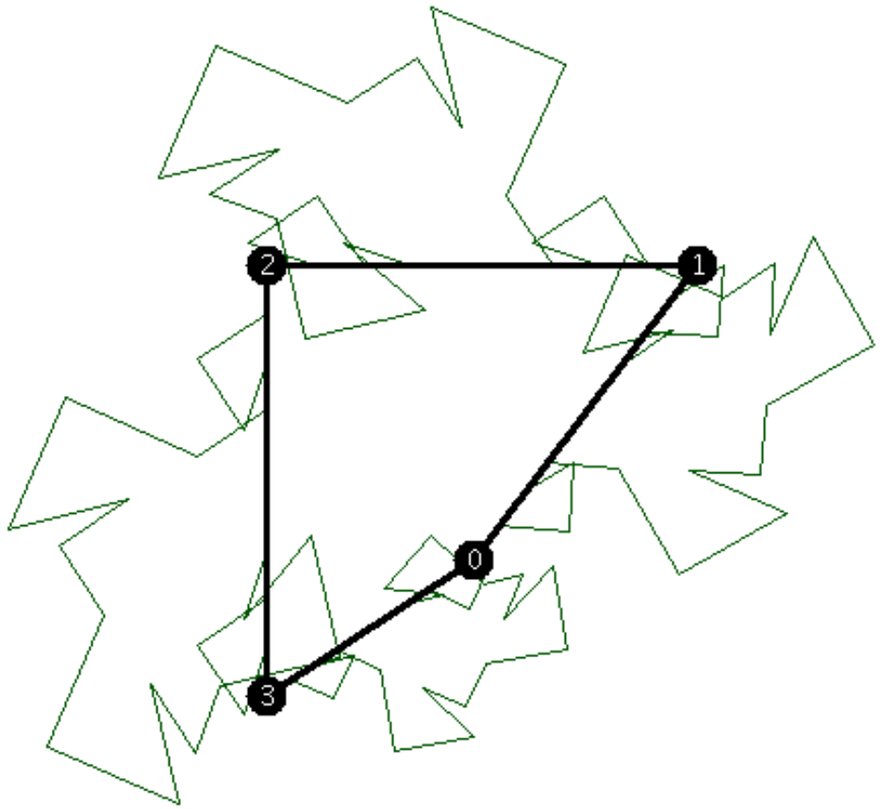
4

3

2

1

0



Fractal construction kit

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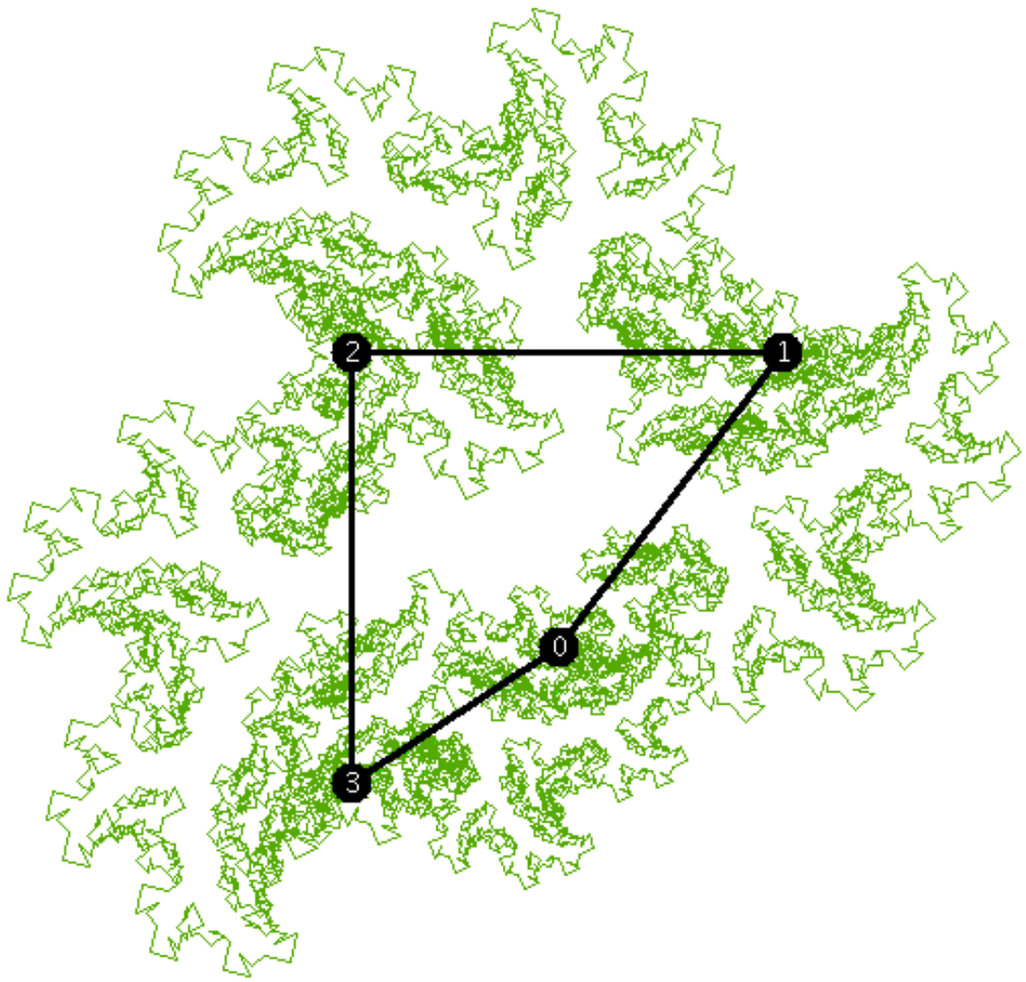

Fractal construction kit

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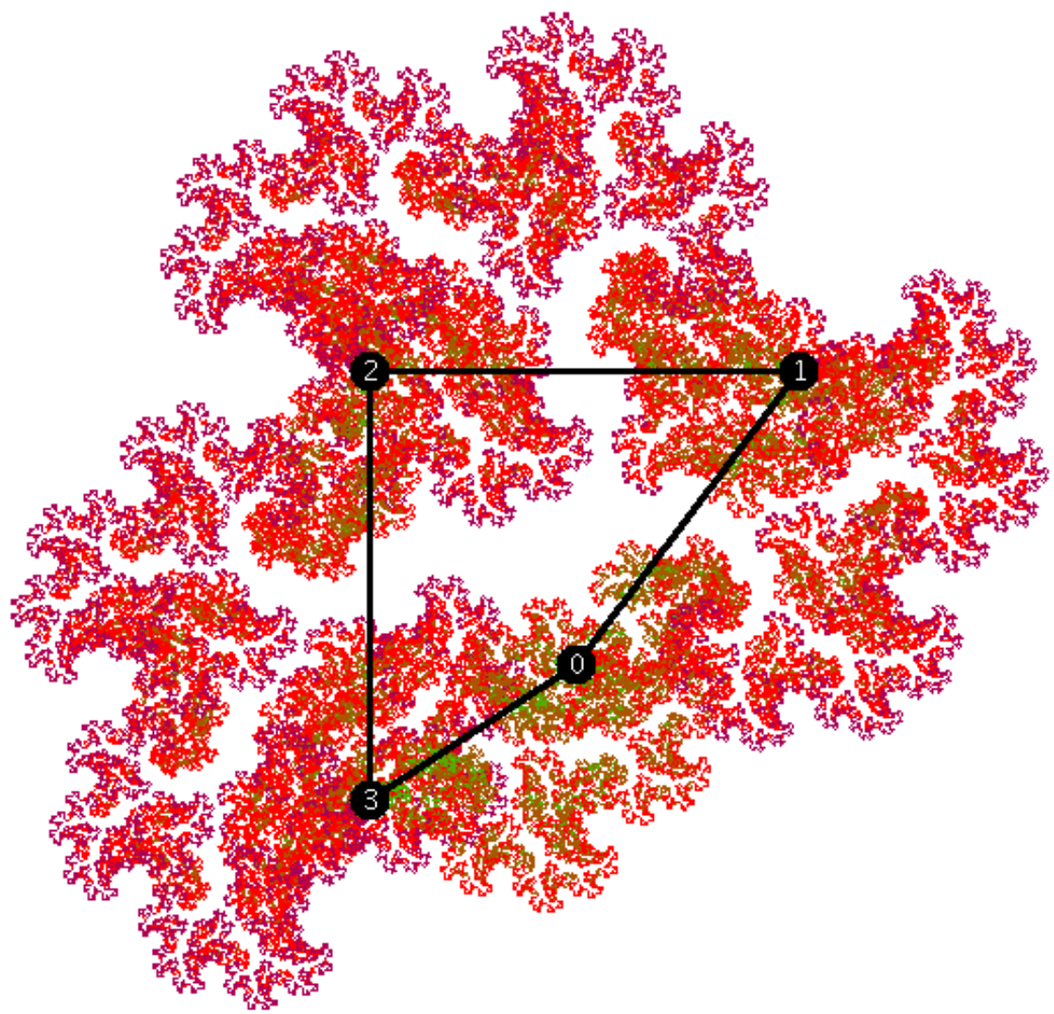
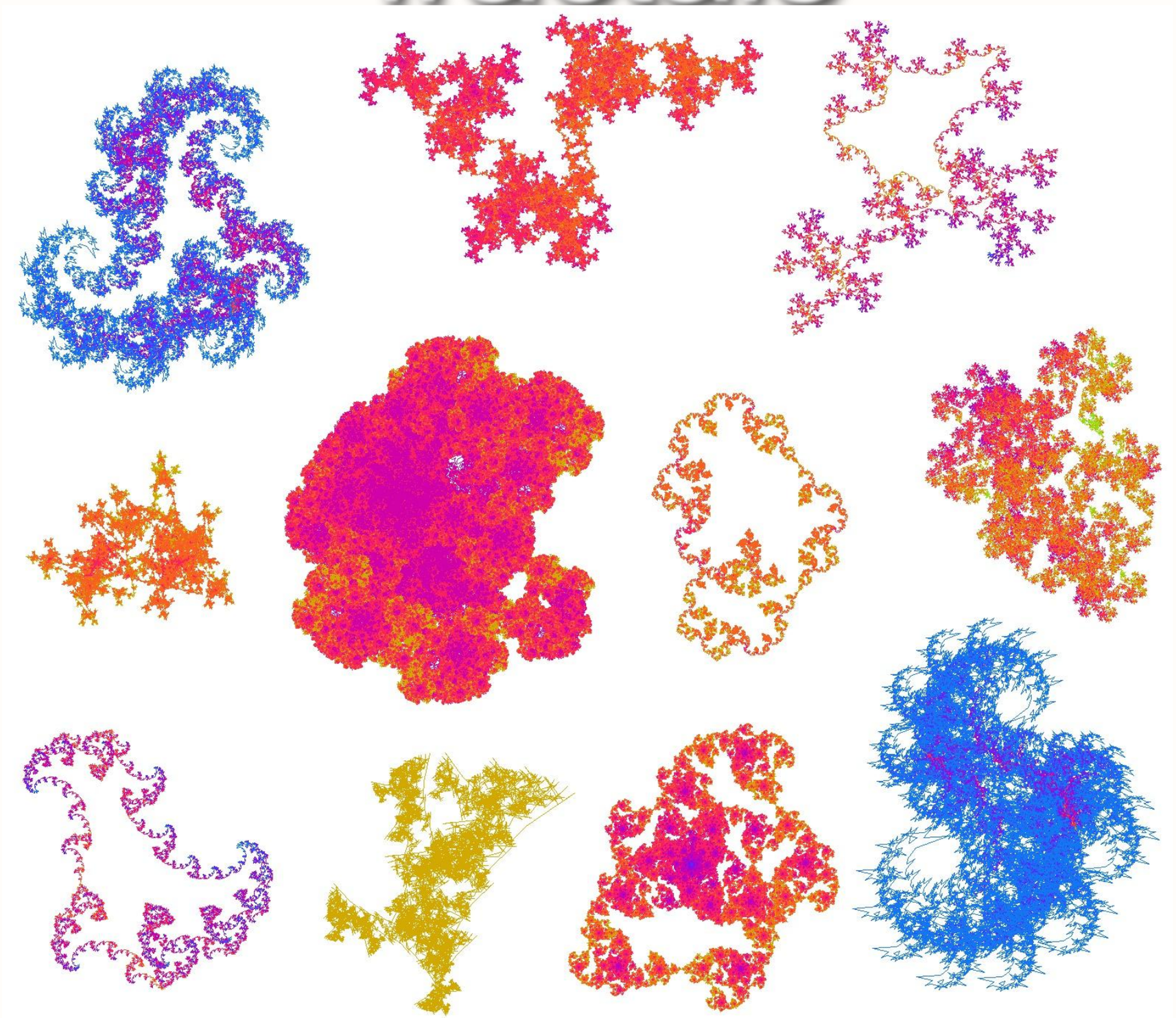
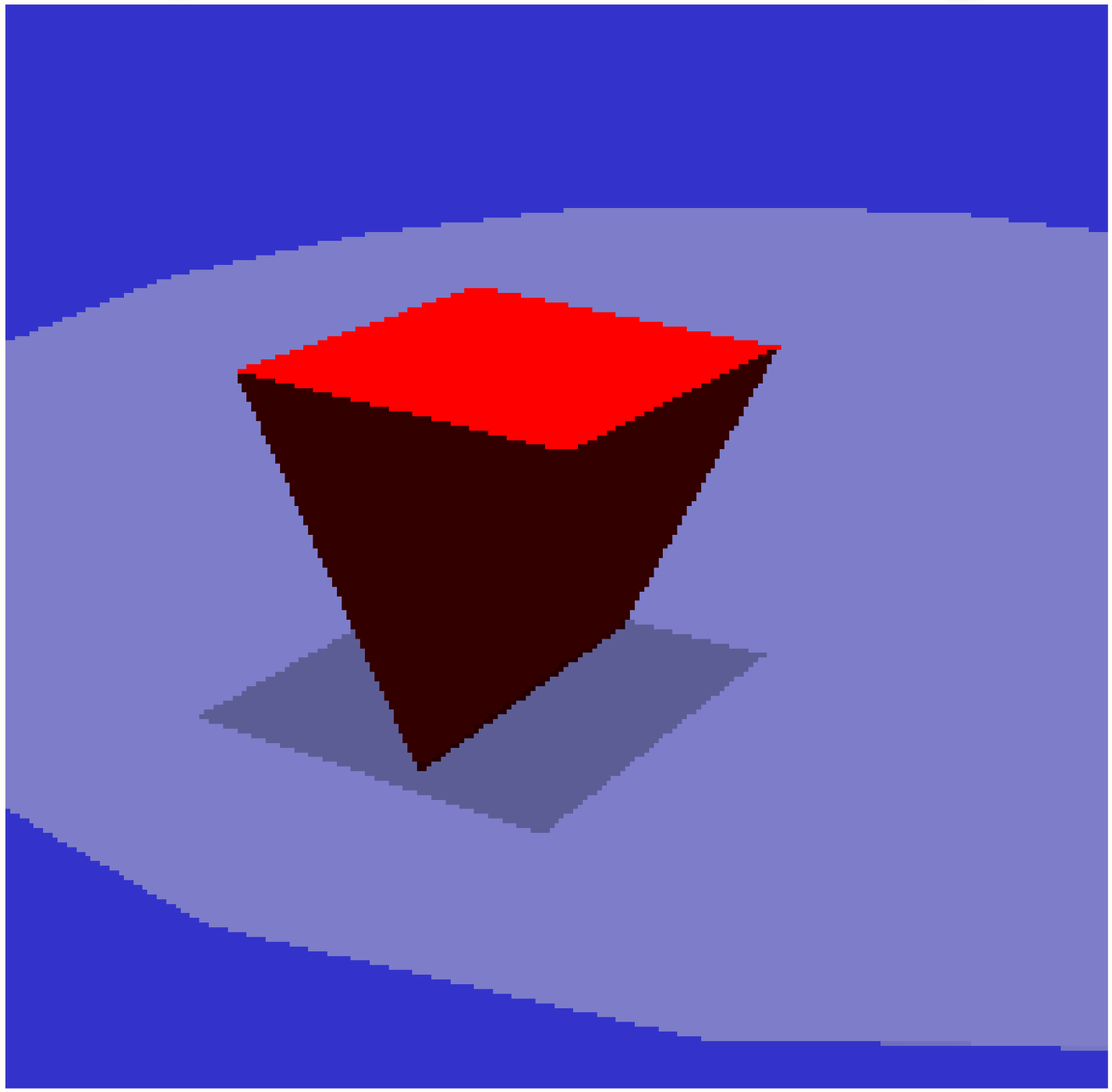


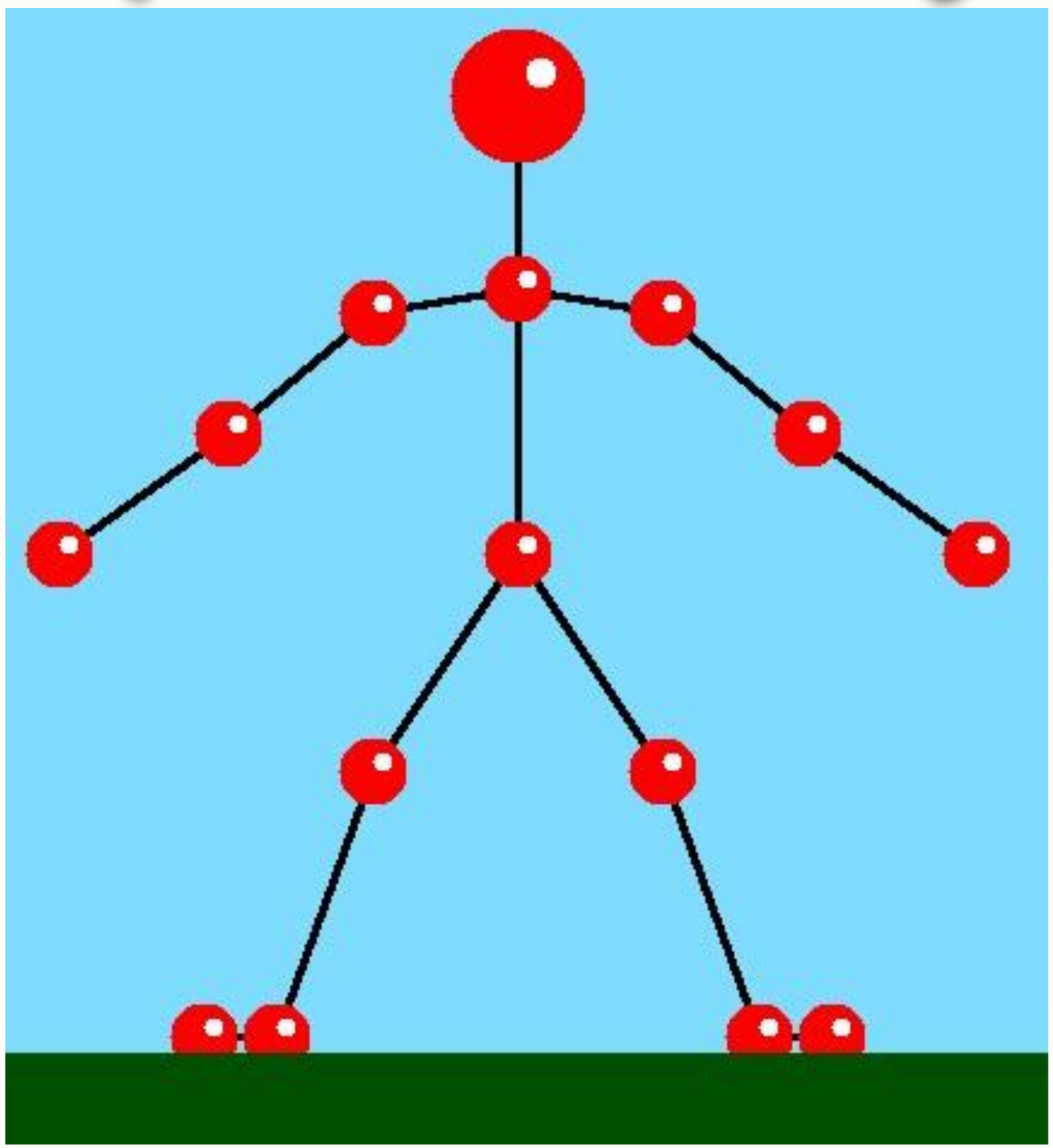
Examples of constructed fractals



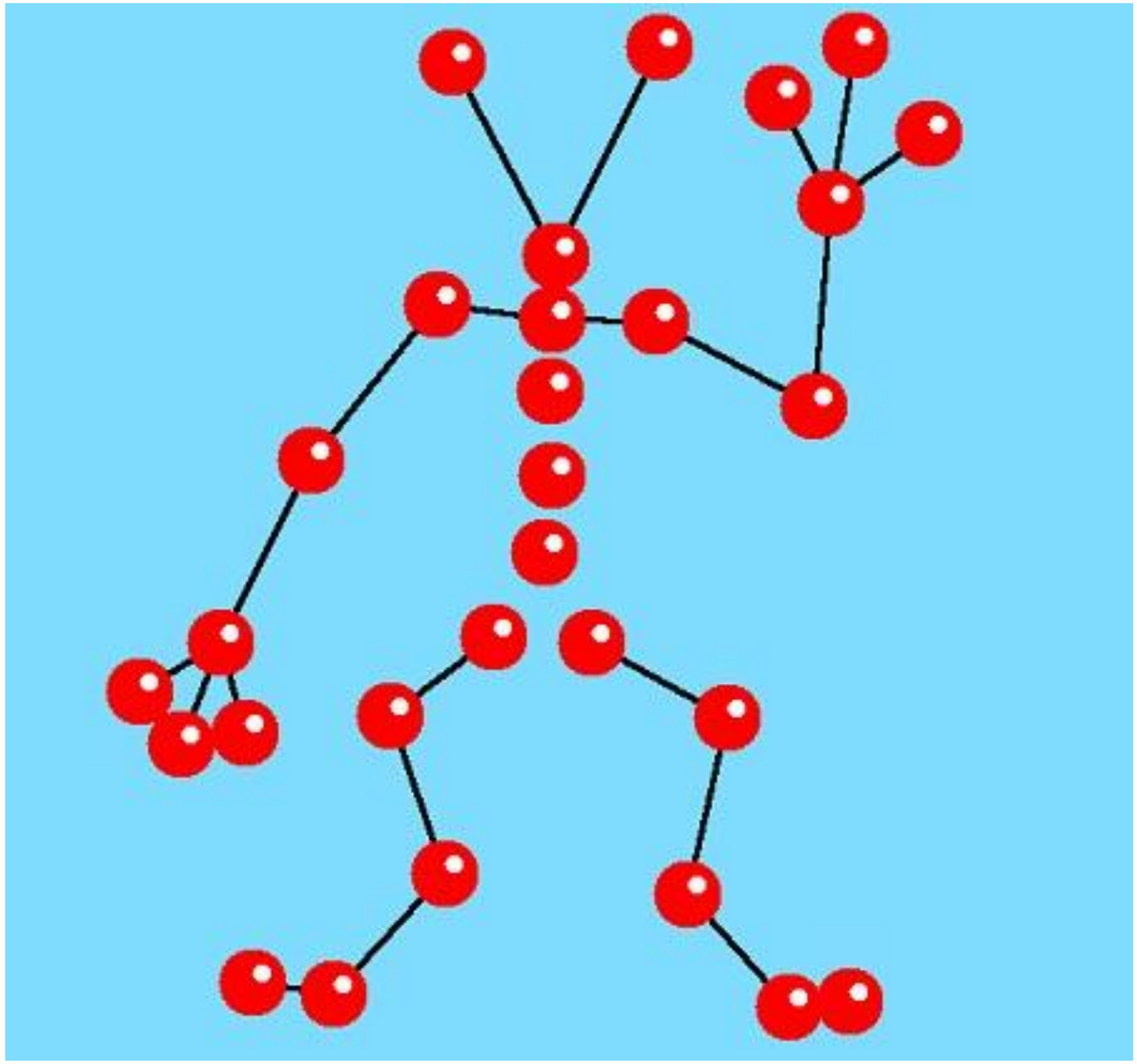
The importance of personality



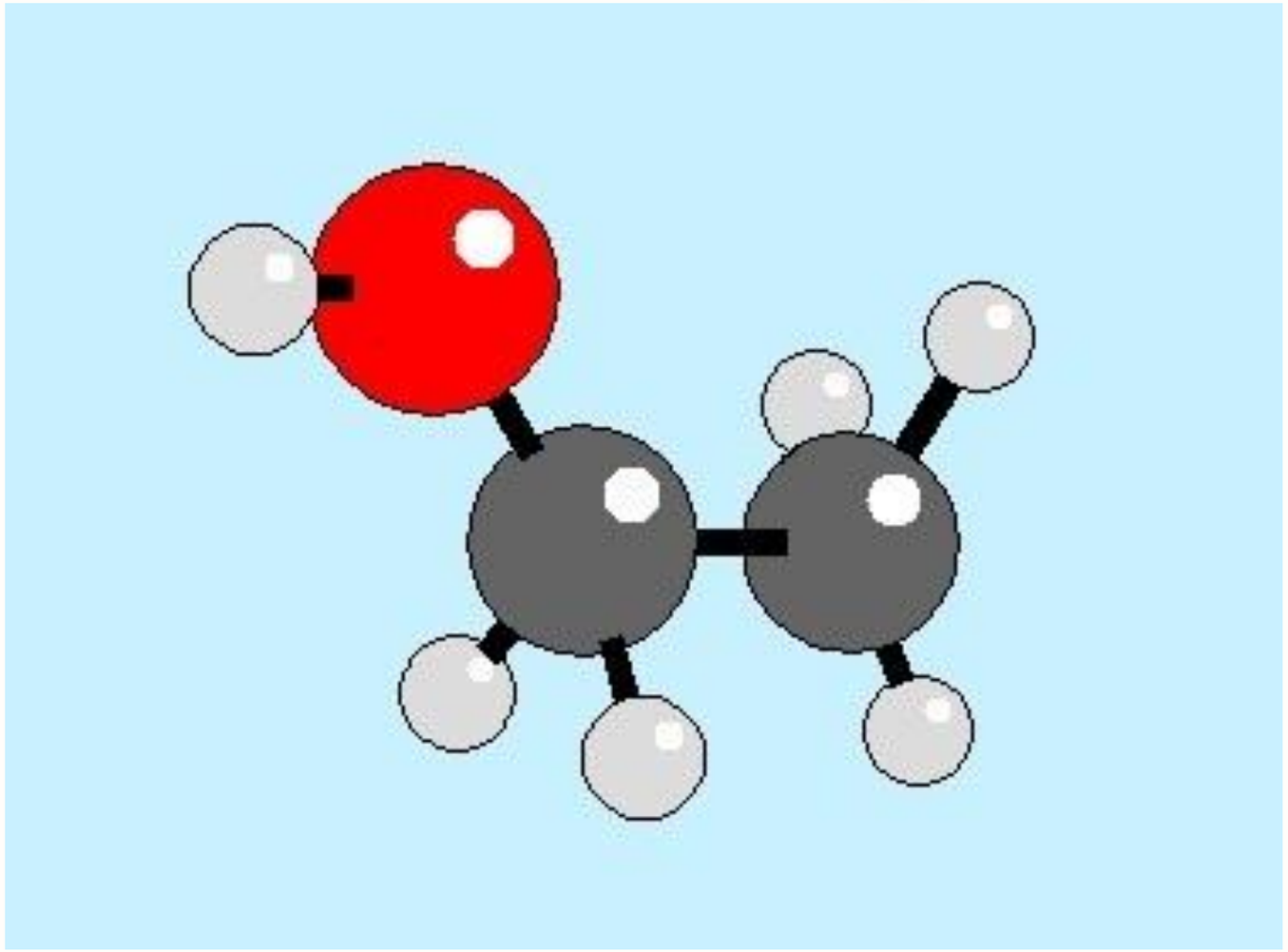
Construction kits with personality

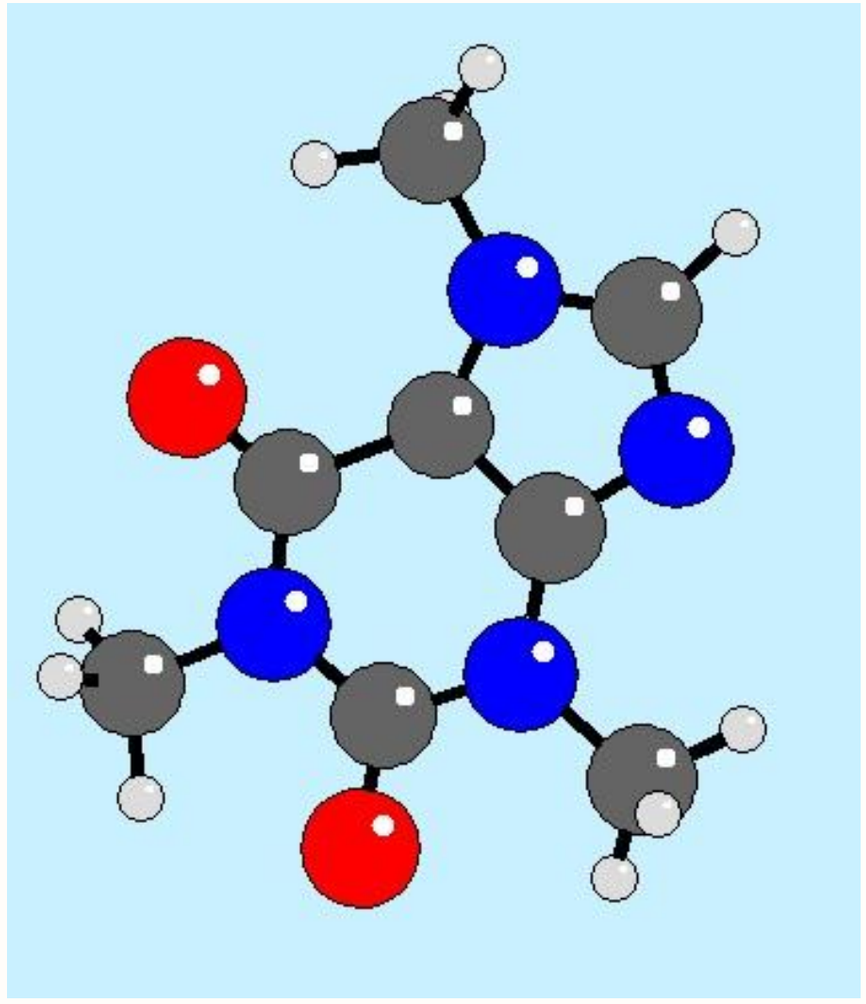


Construction kits with personality.



Chemistry construction games



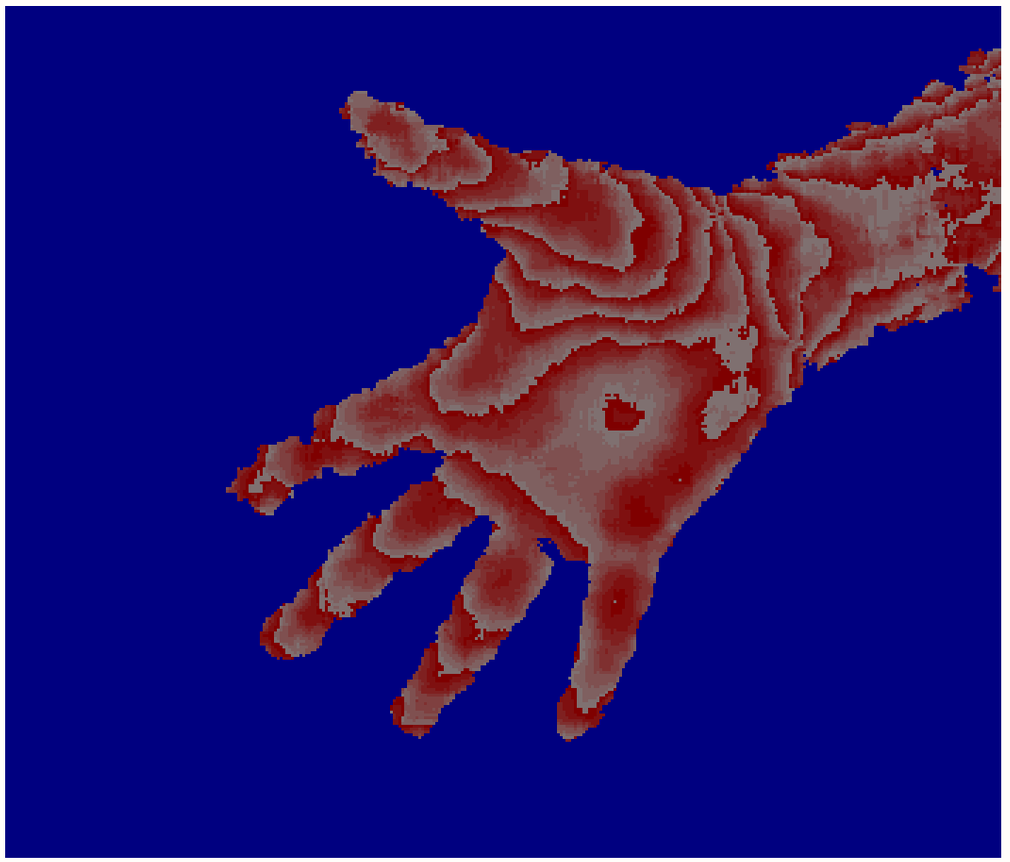


Evolving form factors

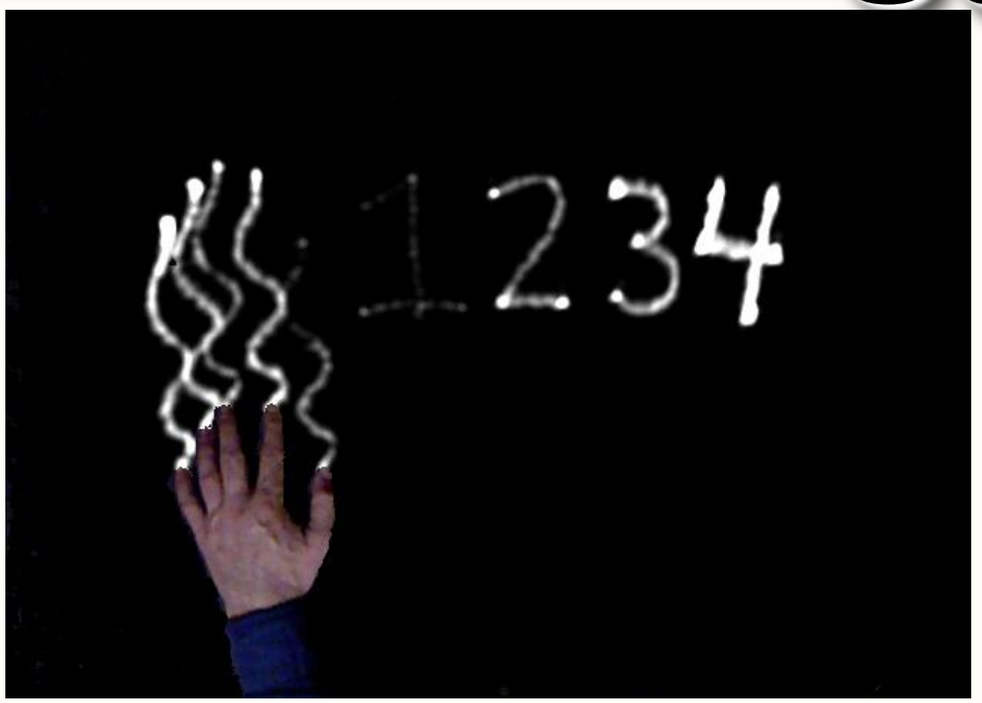
Evolving expectations

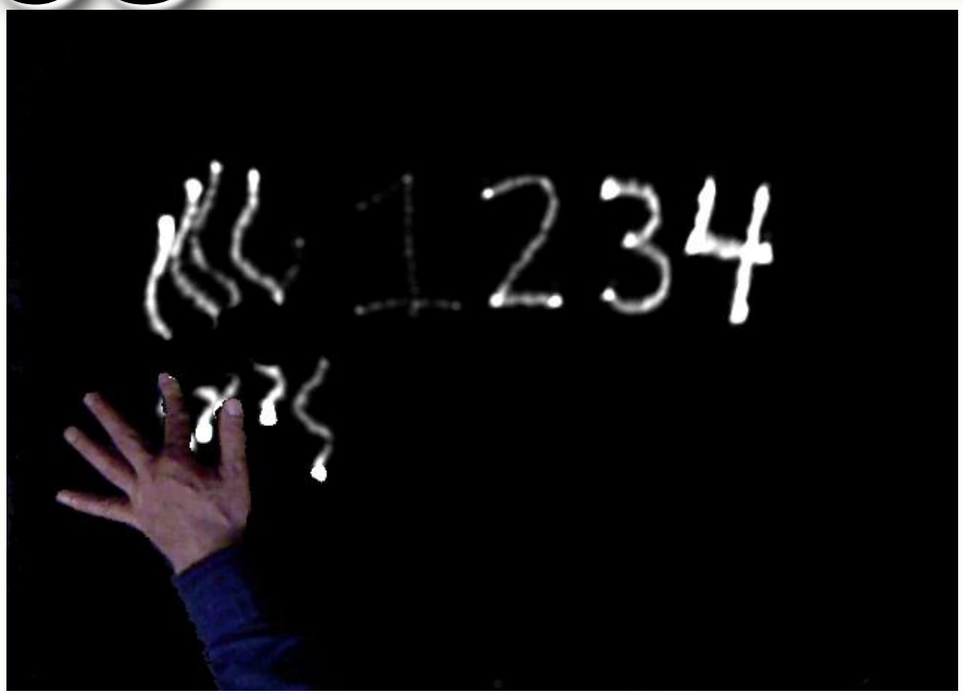
Use Microsoft Kinect…

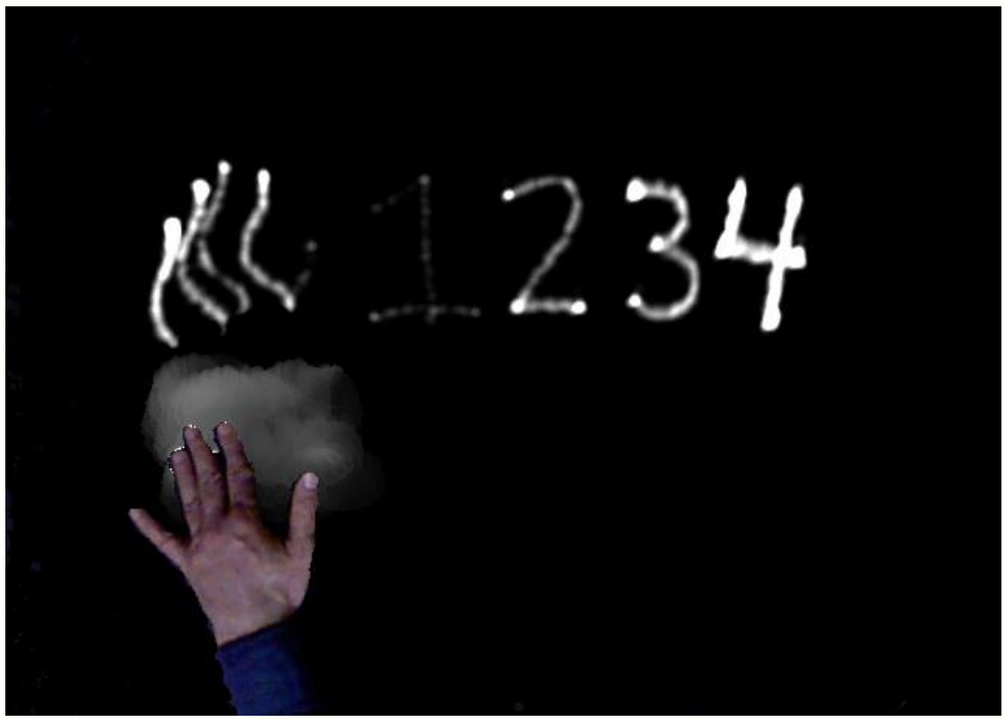
…but use it creatively



Fingerpaint games, on any surface





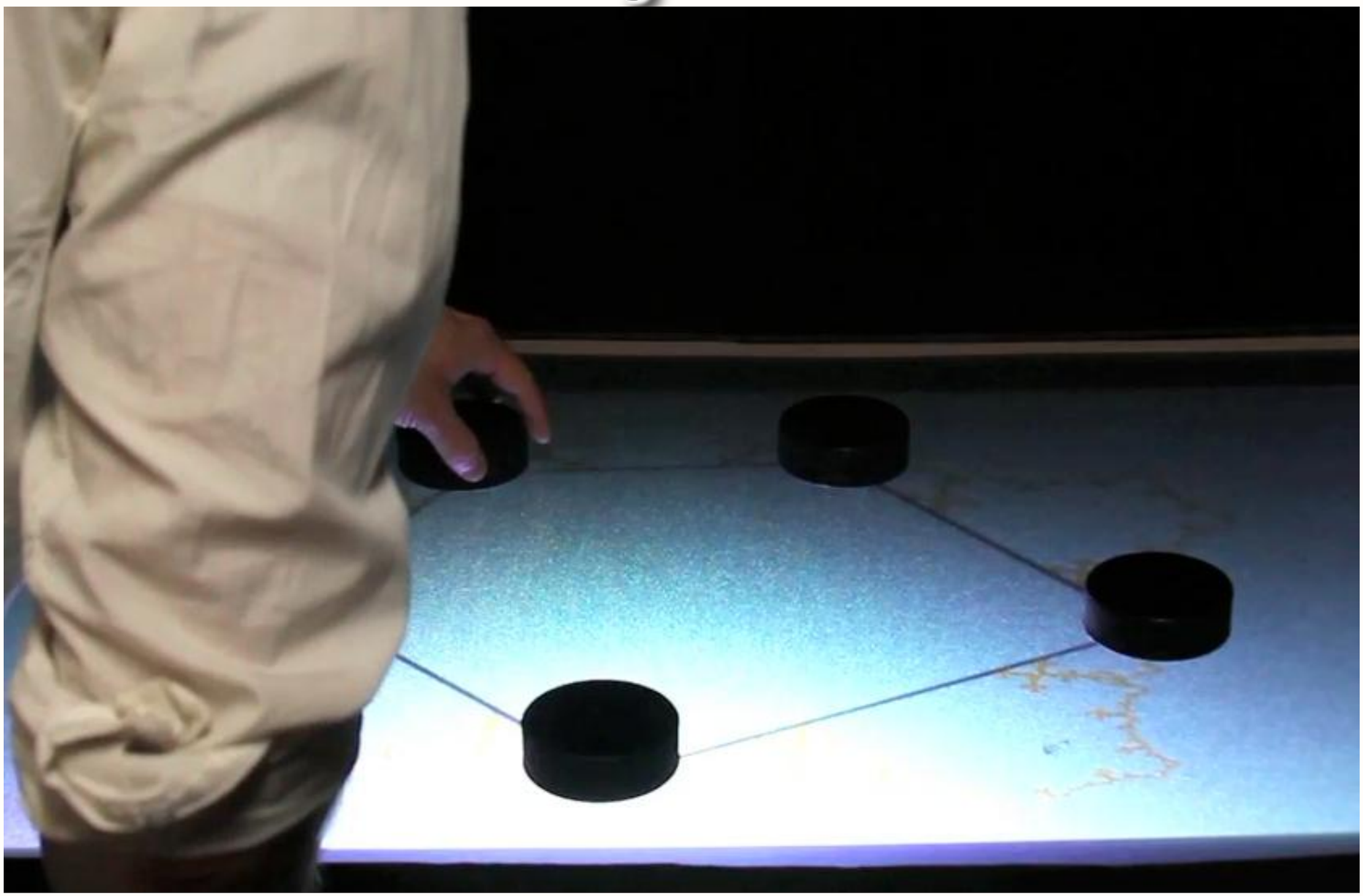


Games with everyday objects

Merve Keles, Murphy Stein, Xin Li, Senem Cinar

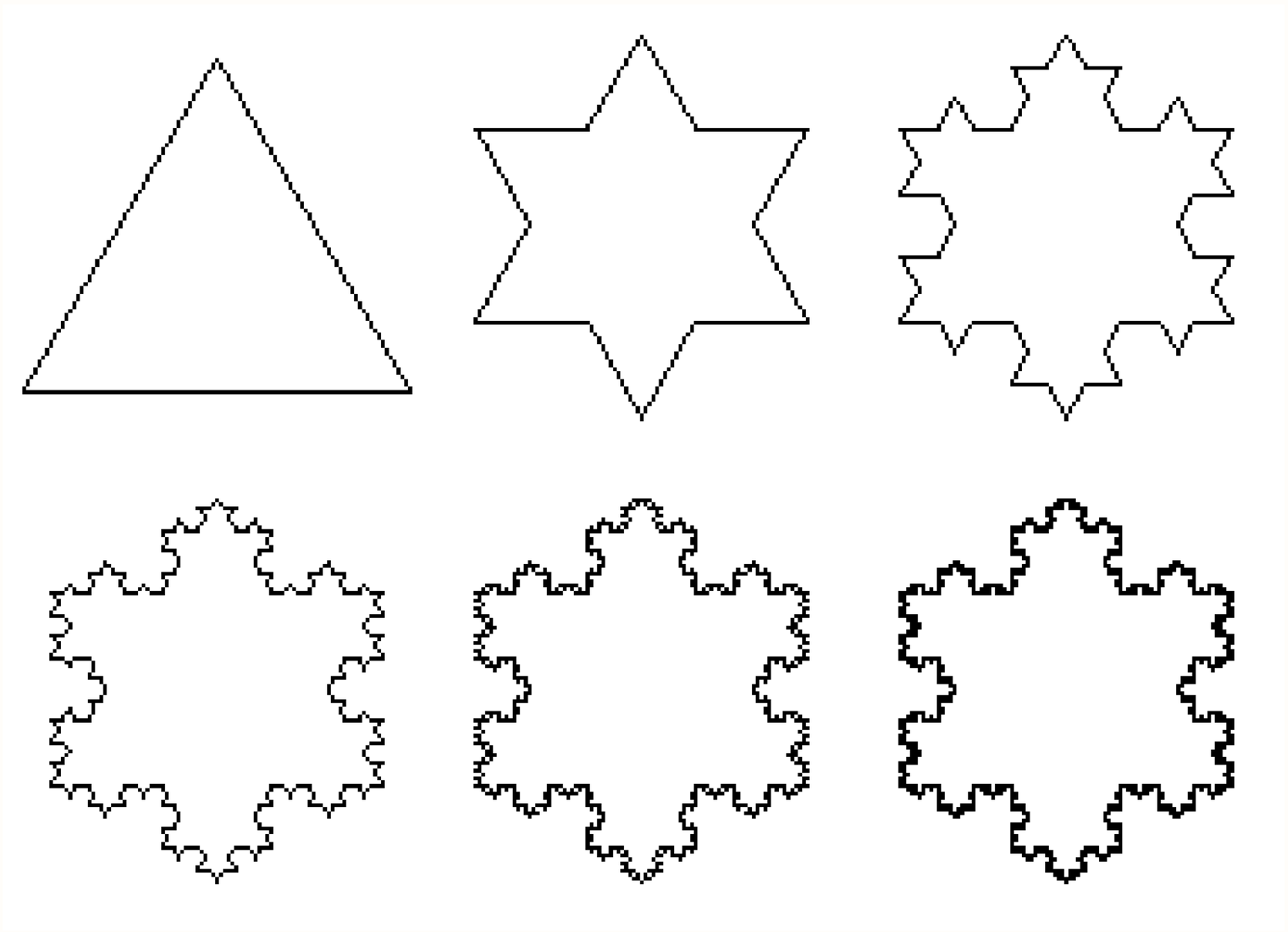
Games with everyday objects

Games with everyday objects

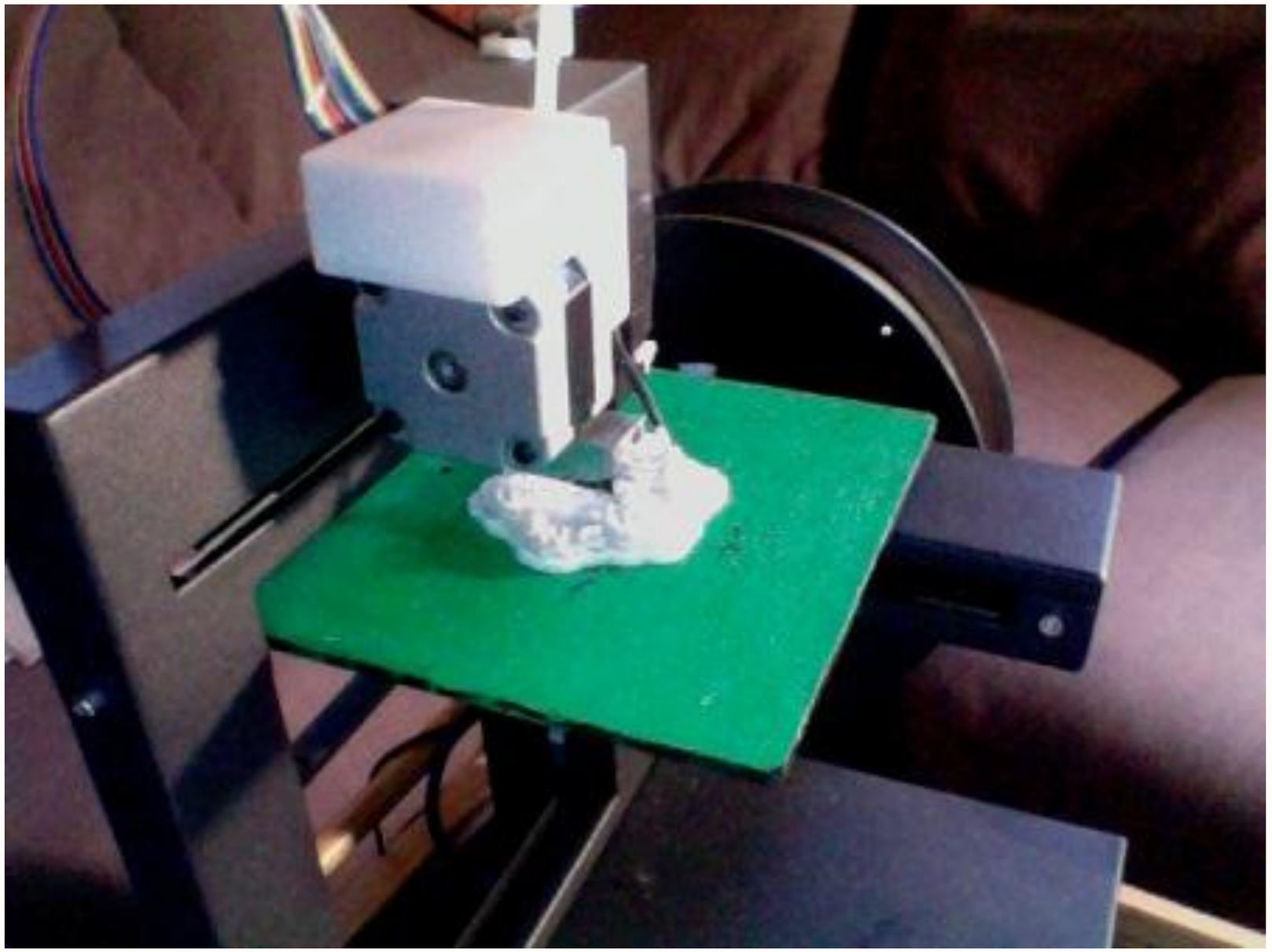


Games with everyday objects

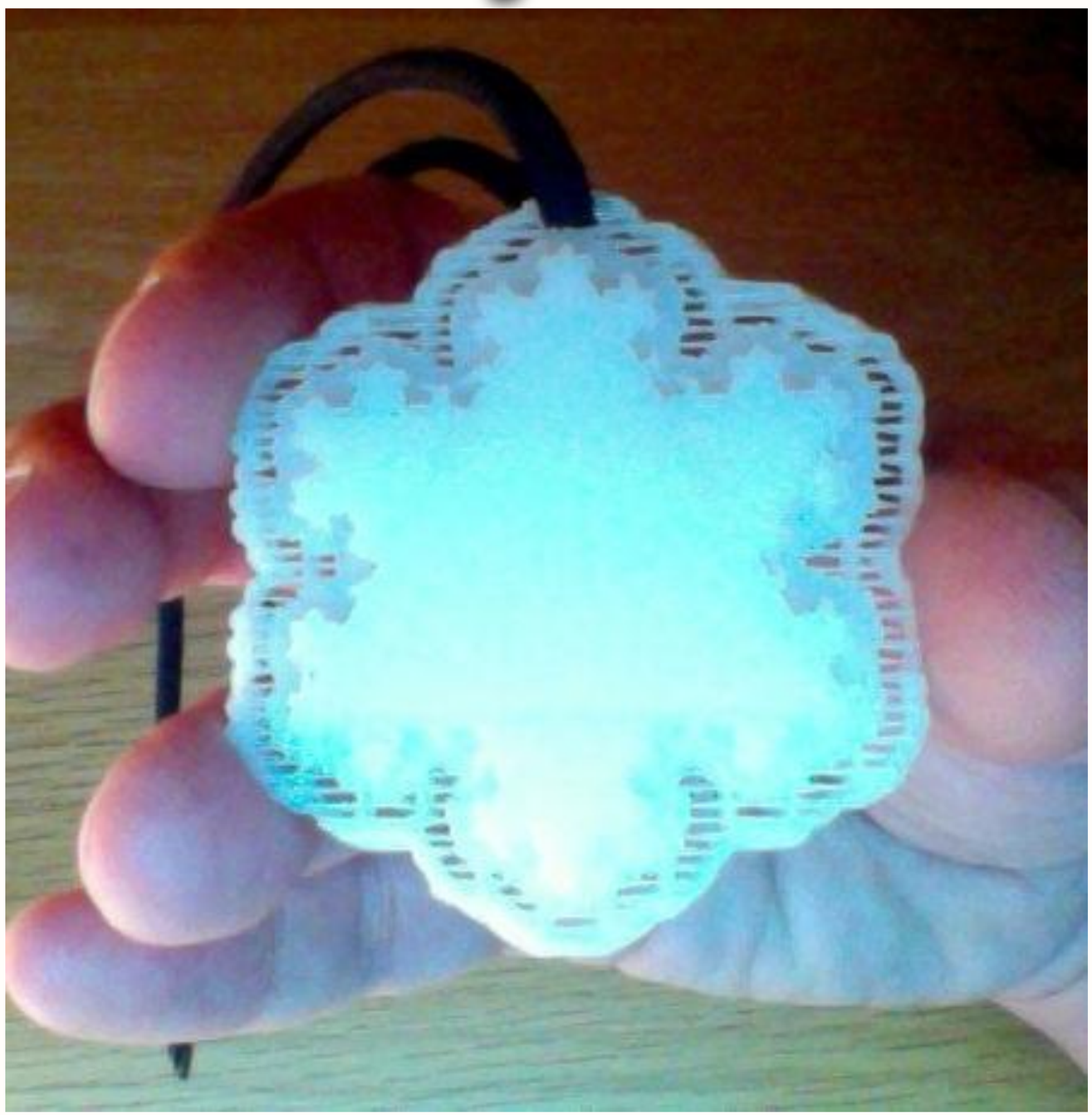
Eg: simple fractal rule



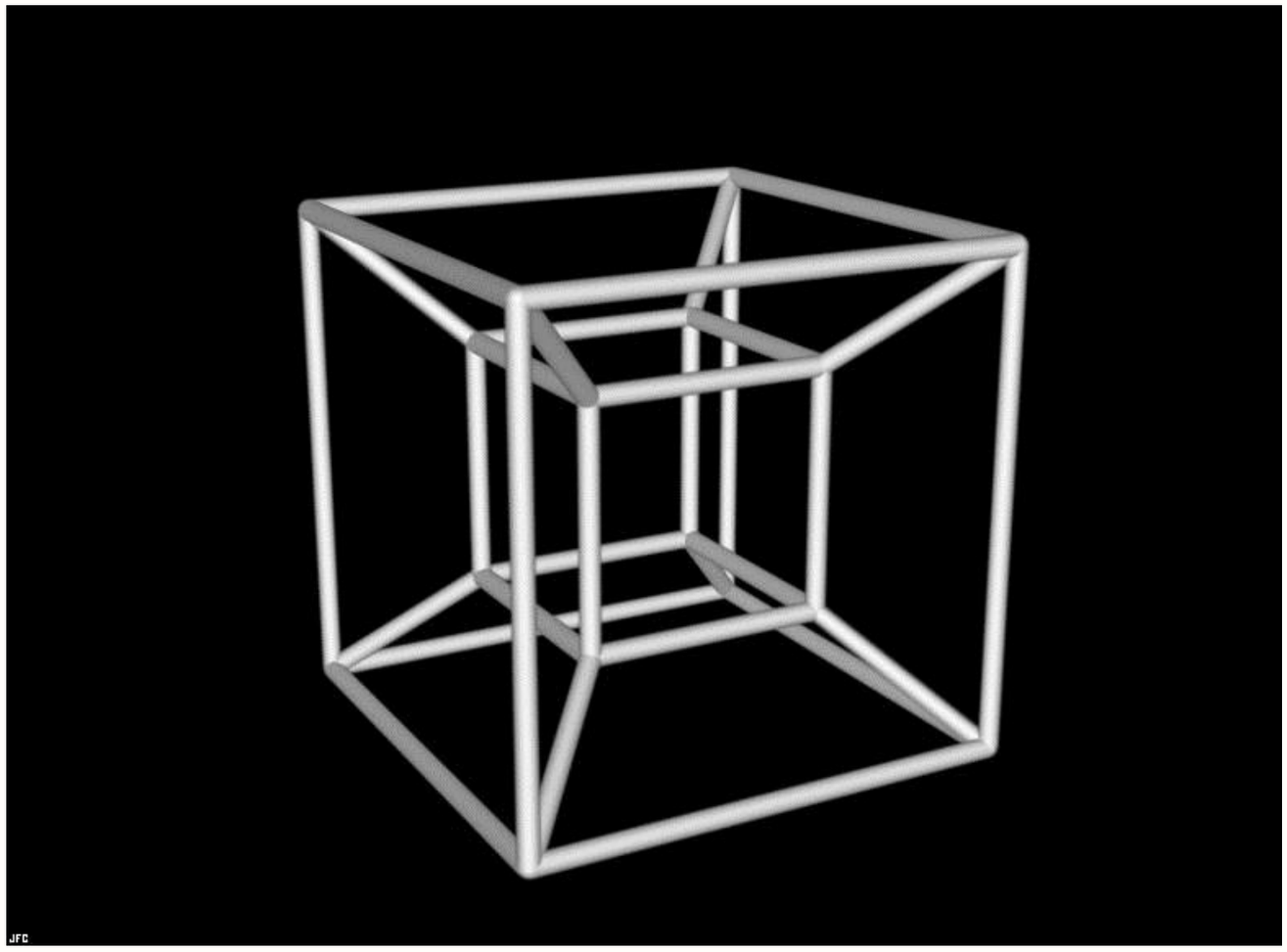
3D printing



Make your own game objects

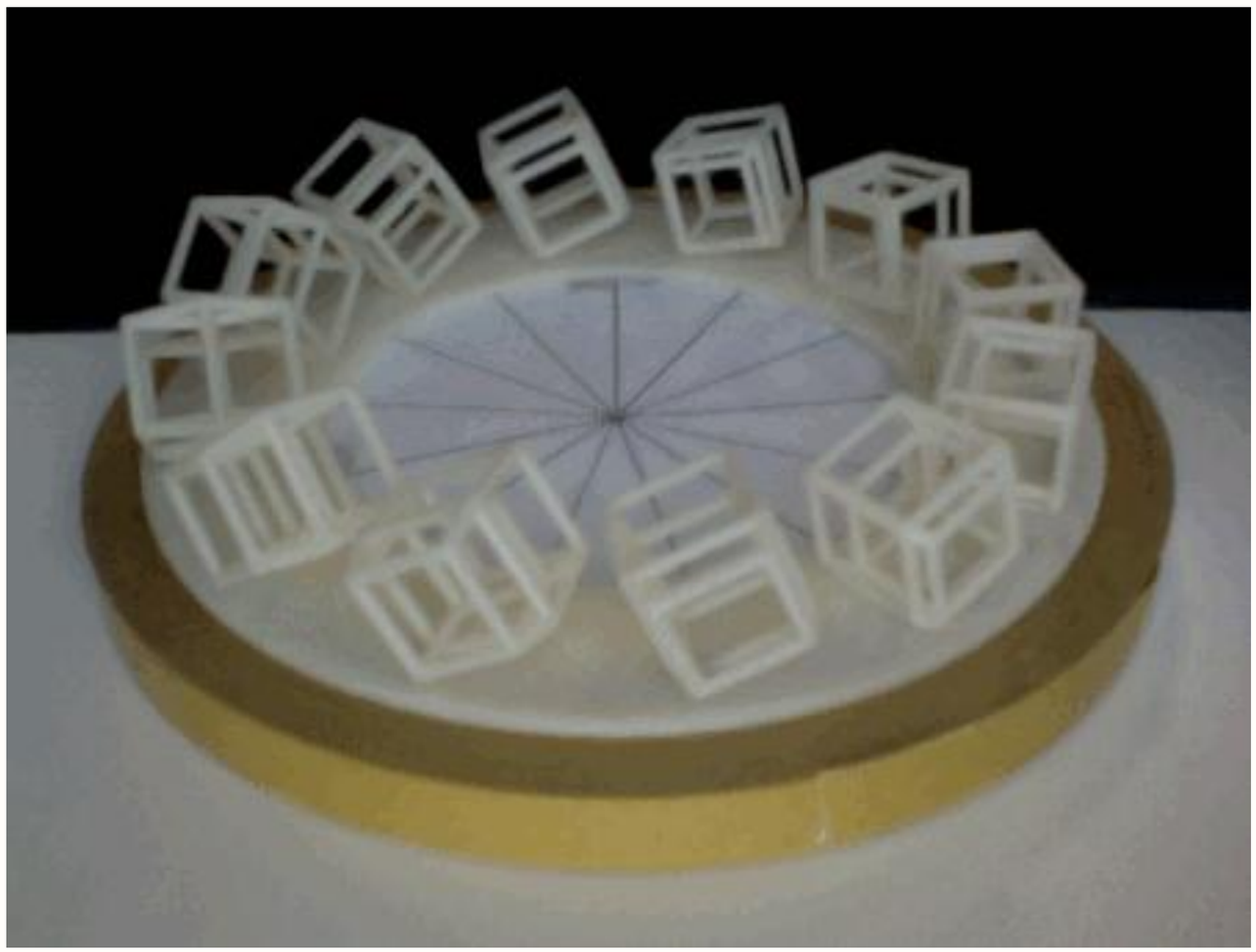


Math objects



Hypercube

can become real objects.



3D printed hypercube zoetrope

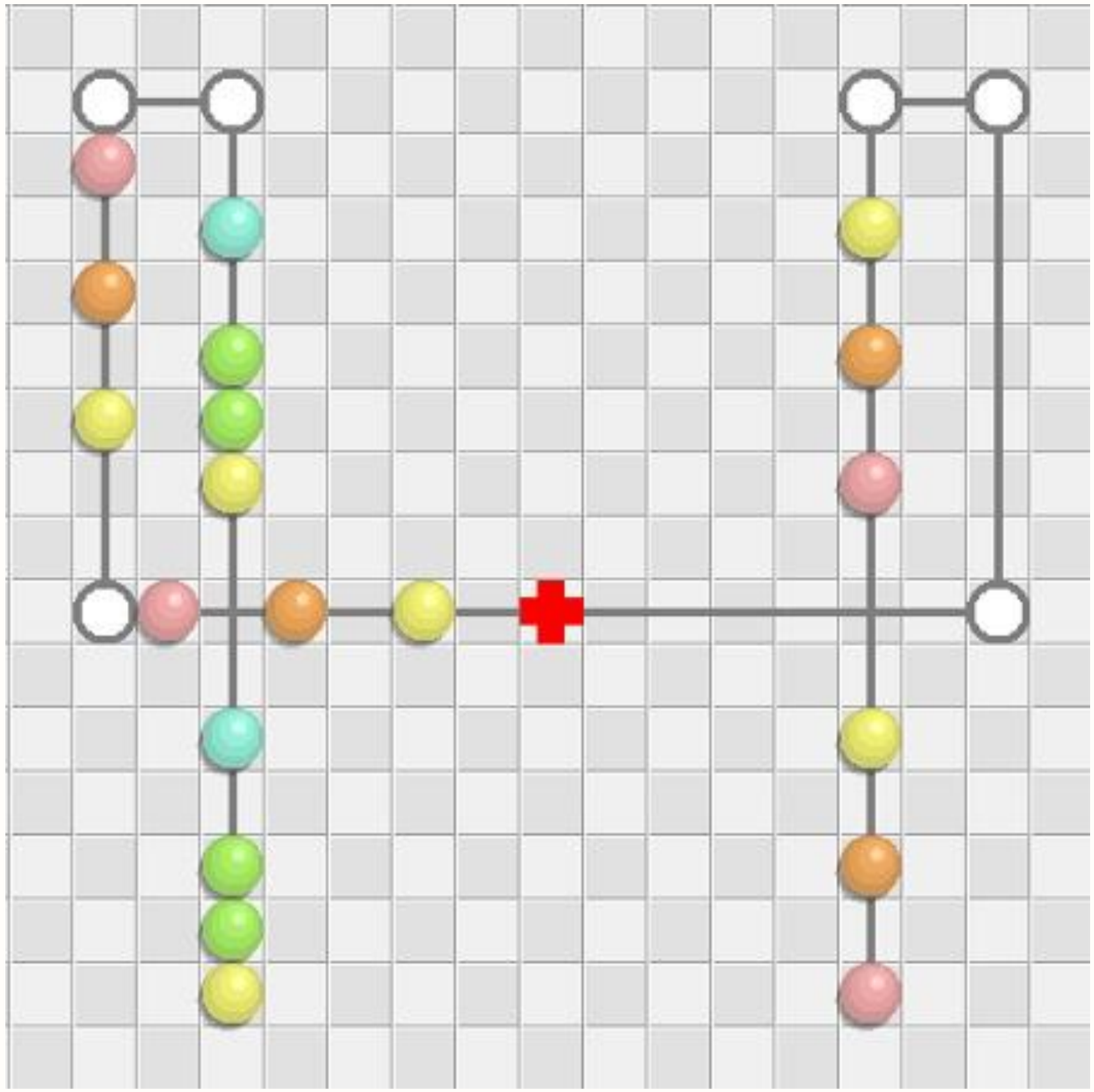
Game characters

Character in a learning game

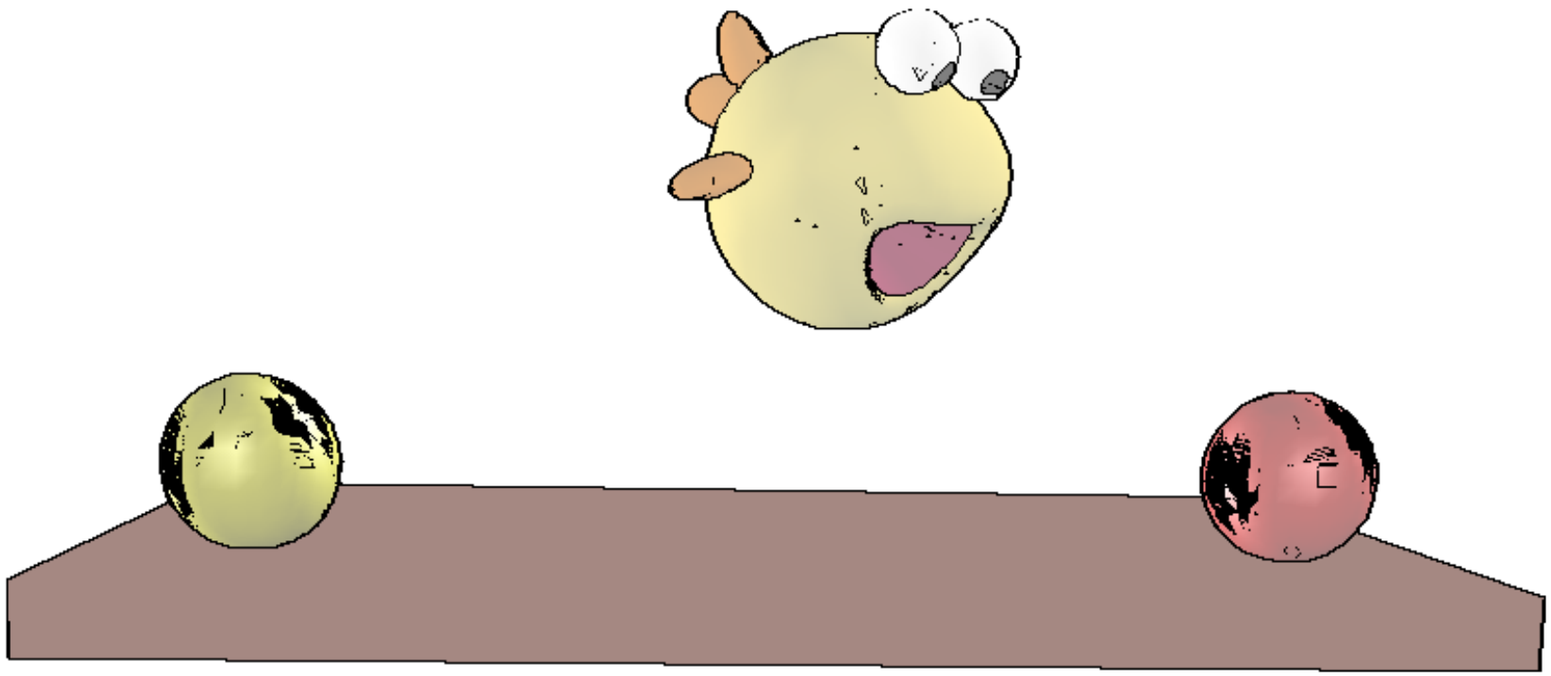
can become real too.

3D printed zoetrope

Collaborative music



Collaborating to tell a story



happy/unhappy:	**h**	u
say ah/eh:	**a**	e
say ooh		o
sneer		s
look at a ball:	**1**	2
bounce red ball		0
bounce yellow ball		9
grow		g
left/right:	l	r
forward/back:	f	b

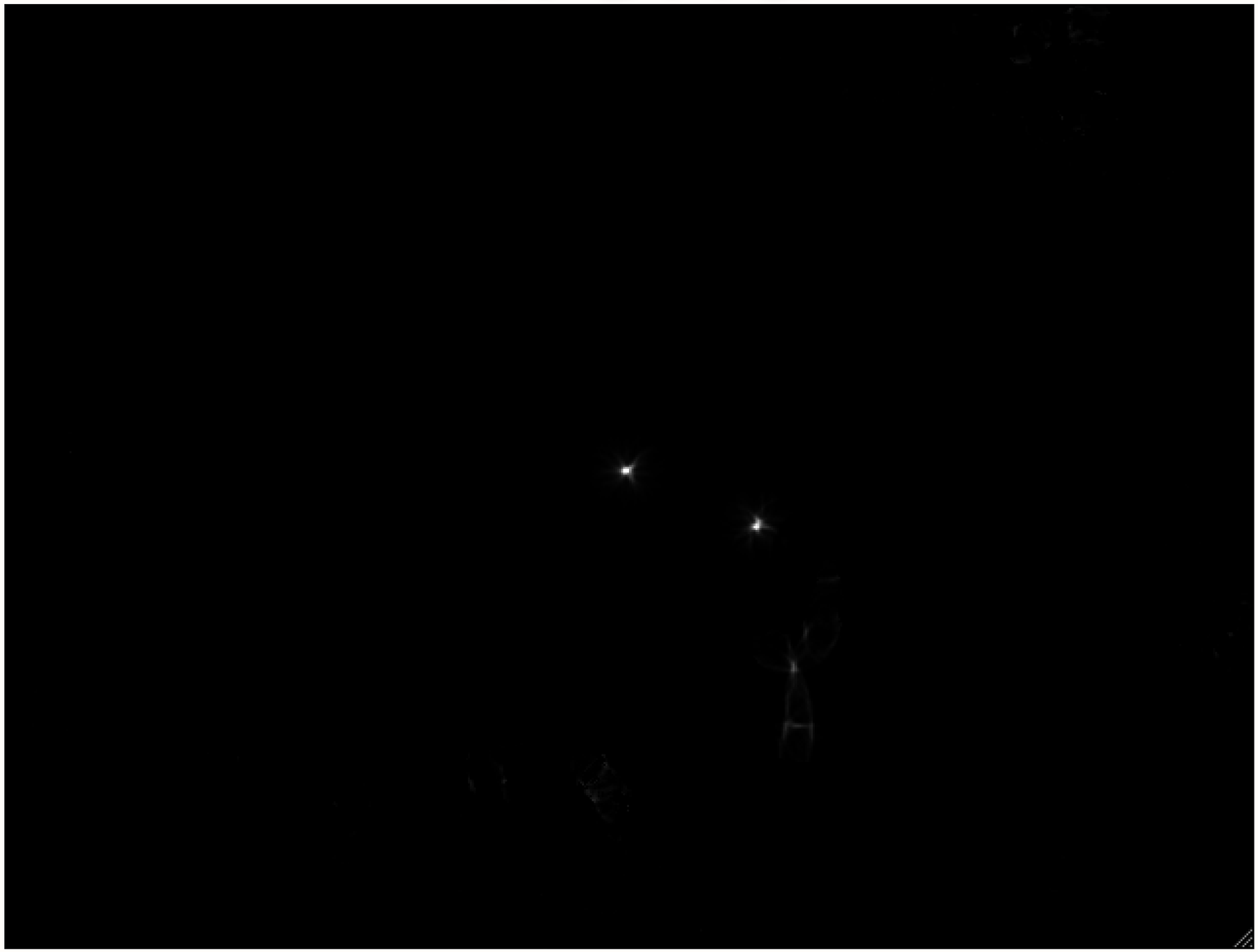
Bringing it all into our world

Bringing it all into our world

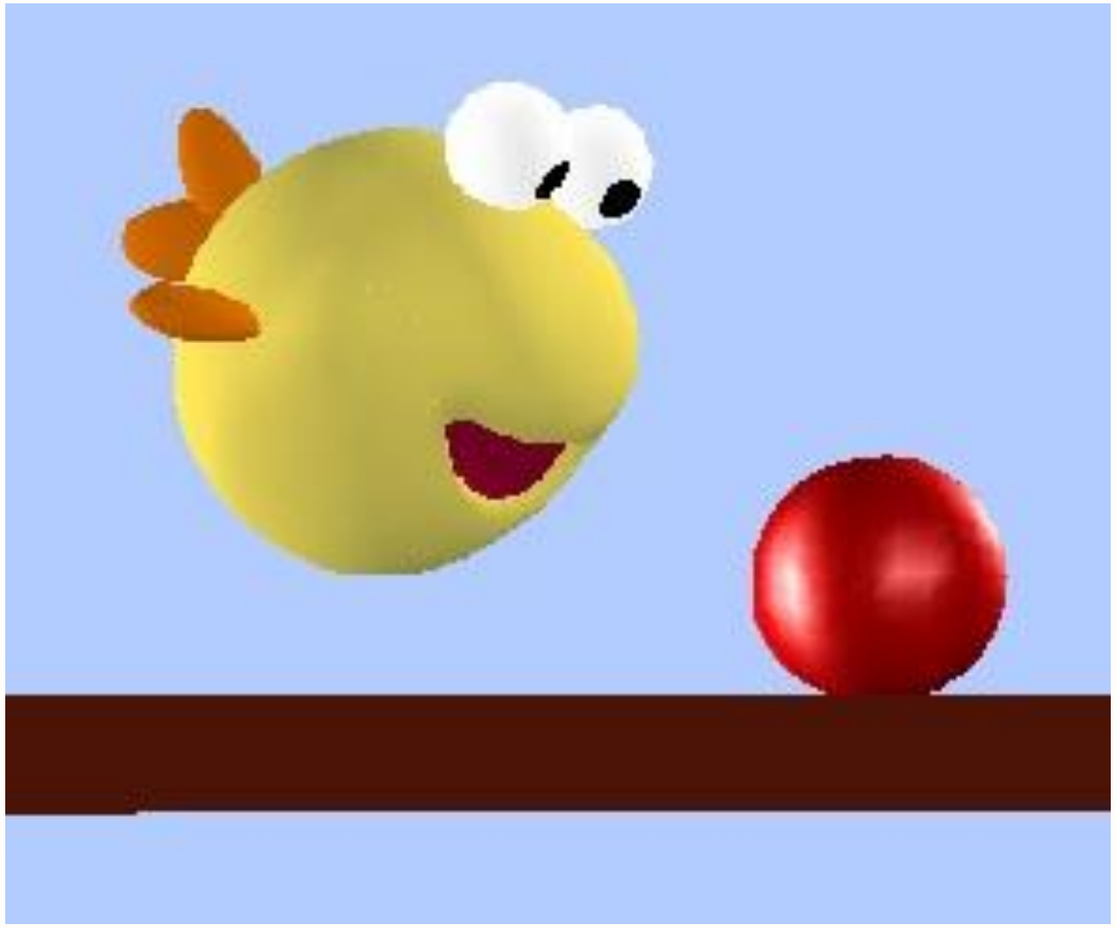
Bringing it all into our world

Bringing it all into our world

Bringing it all into our world



Bringing it all into our world



Bringing it all into our world

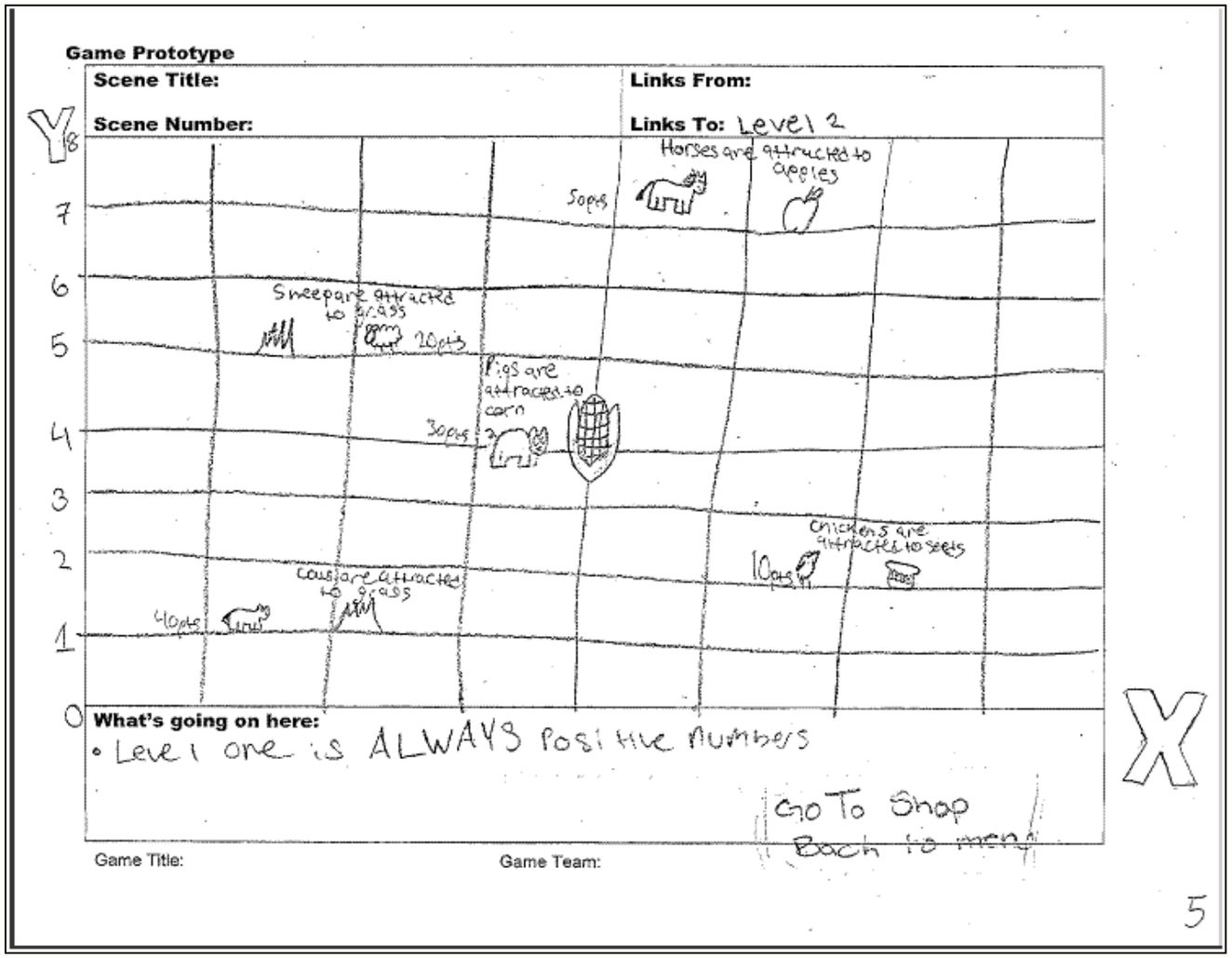
Design groups from the Urban Assembly school

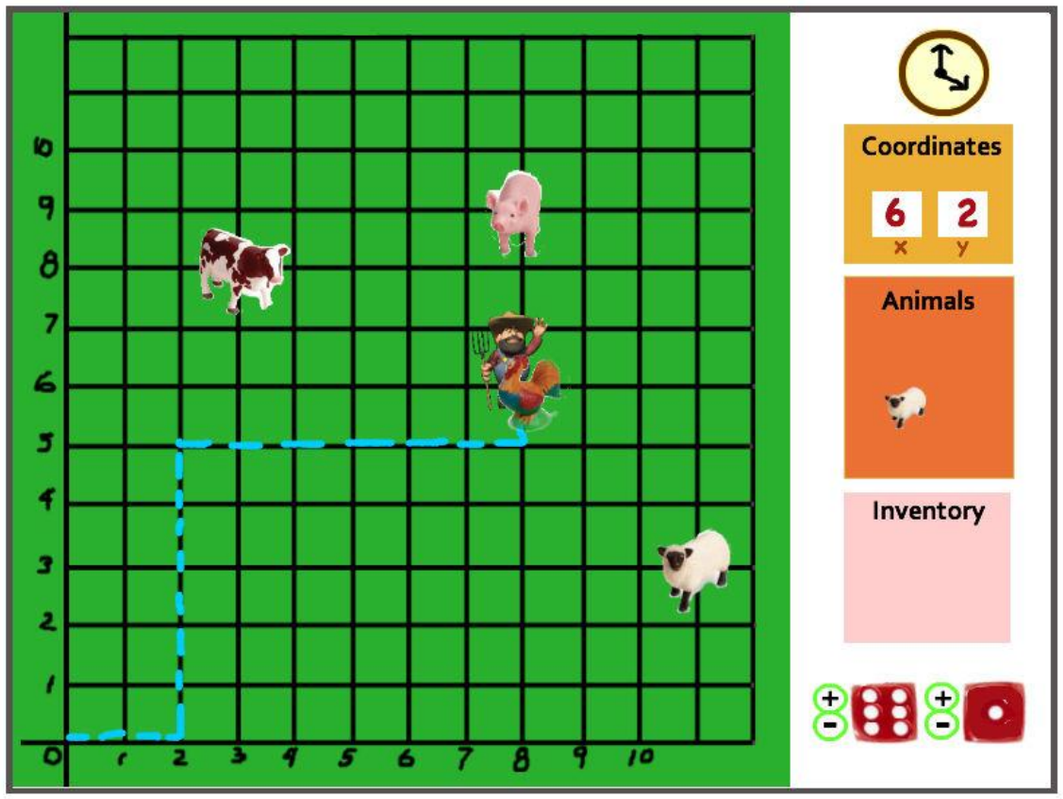
Lyanna, Taylor, Alex Nicole, Lanisha

Symphonie, Giselle, Jasmine, Jordan, Kyeana

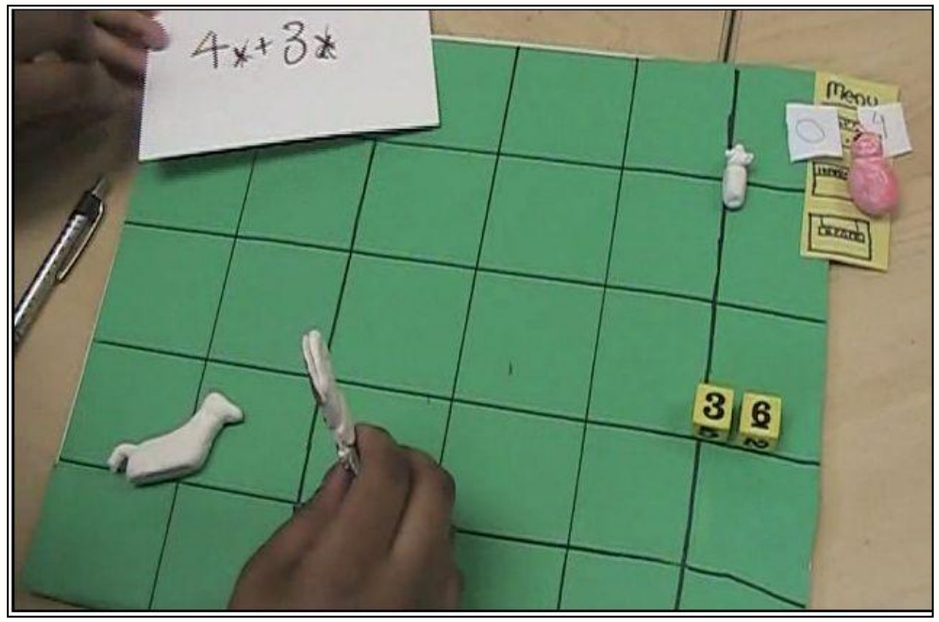
Natea, Anna, Javeen, Cheyenne

Farm Animals (Early Designs)





Early prototyping and testing



Digital Prototype

1st Playable Productions

Computational literacy

Play is the key to learning.