


PRACTICAL CREATIVITY

Raph Koster
GDC Next 2014



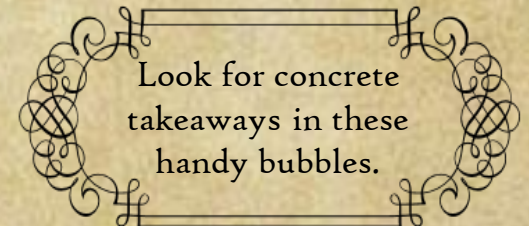
Preface



Wherein we discuss
the notion of innovation

❧ Creativity and newness

- There are many angles from which to approach creativity.
 - *I'm going to focus on innovation specifically: new games altogether.*
- New in mechanic.
 - *I'm going to spend most of my time on mechanics.*
- New in theme.
- Innovation can be big or small. Innovation does *not* imply success.



❧ What is creativity?

- Serendipitous collisions of elements typically not associated with one another.
- The crossing of contexts, moving things into new infrastructure.
- Making the familiar unfamiliar.
- Almost never “the creation of something truly new.”
- Also not “randomness” or mere “personal expression.”
- Usually an expression of a “scene.”





Substrate



Wherein we lay groundwork

⌘ A hierarchy

A game

A reskin or clone

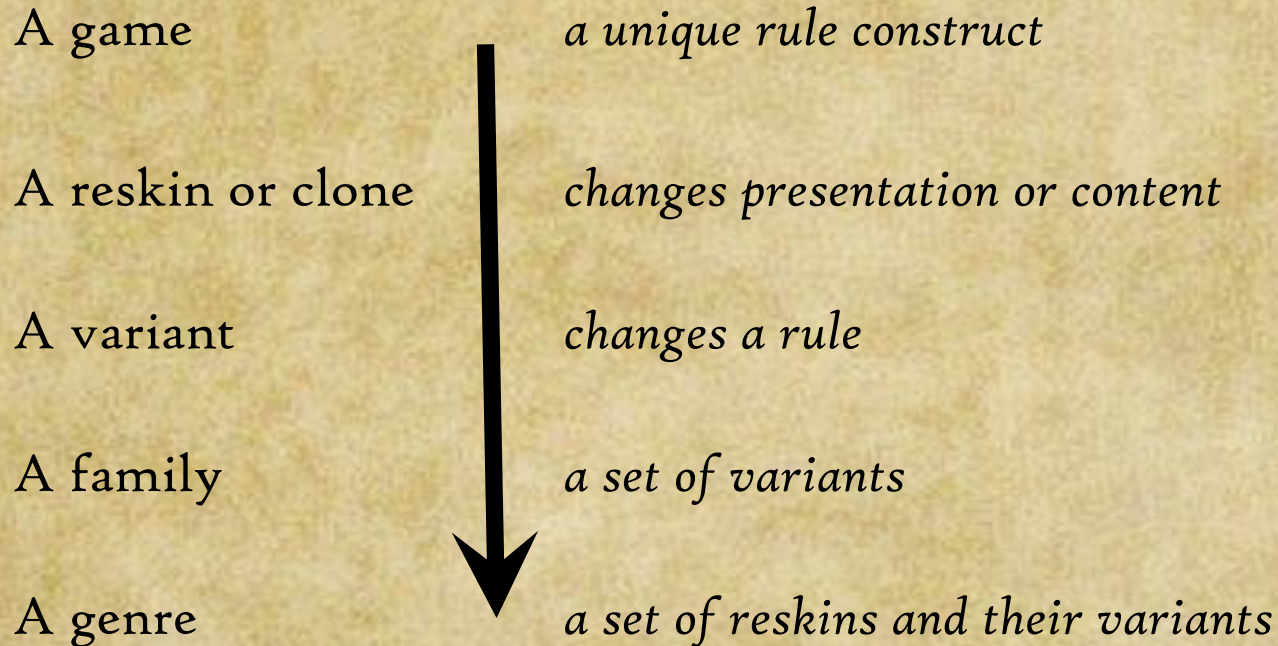
A variant

A family

A genre



⌘ A hierarchy



⌘ A hierarchy

A game

Straight poker

A reskin or clone

A variant

Wild cards

A family

Stud poker

A genre

Poker



Run this same
exercise for your
favorite game
genres.



⌘ A hierarchy

A game	Straight poker	Castle Wolfenstein
A reskin or clone		Spear of Destiny
A variant	Wild cards	Doom
A family	Stud poker	Deathmatch
A genre	Poker	First person shooters



3 A simple reality

- The vast majority of our creative work is done within genres, with simple variants at best.
- The creation of new games is *vanishingly rare* in videogames.
 - *Tabletop*, on the other hand, does it quite frequently.
 - *When we do see it, it tends to be at the casual game end of the spectrum.*
- I'm going to talk a lot about completely new games, but you can use these same techniques for smaller-scale innovation too!



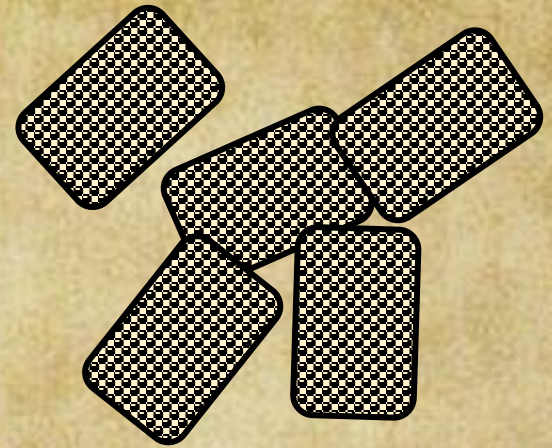
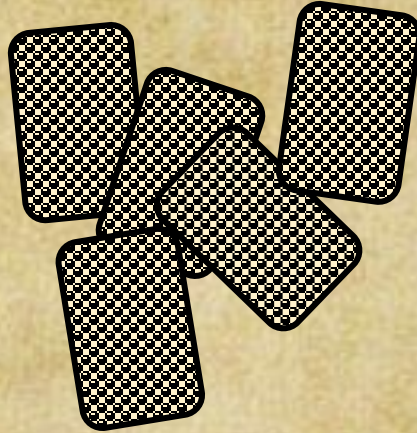
⌘ Atomization and abstraction

- Look for core small bits
 - *Games are made of smaller games*
- Break down and compartmentalize the game
 - *Treat each input as a game, each subsystem as a game*
 - *Once you think modularly, you can replace modules at will*
- Build your mechanics library
 - *Going back to simple games (80s classics, mobile games, etc) is the best way*
- Distance yourself from the core problem
 - *Find ways to reframe your simulation problem in fresh language*

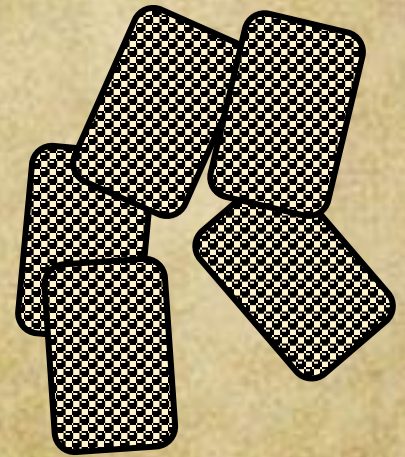
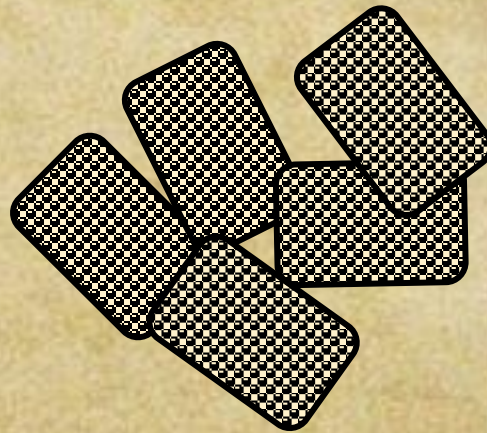


Seeing systems

Take a deck of cards
and lay them all face
down in four groups.



Flip over the cards in
a given group in any
order you like.



You can only move
to the next group
when you find an
ace.

☞ Seeing systems

Take a deck of cards
and lay them all face
down in four groups.

Flip over the cards in
a given group in any
order you like.

You can only move
to the next group
when you find an
ace.

gone
home

❧ A pattern library

- Set packing.
- Time limits.
- Guessing.
- Binary search.
- Neighbor count.
- Movement rate.
- Pickups.
- Stats.
- Graph traversal.
- Optimal path.
- Threes optimization.
- Exponentiality.
- Repeated move chains.
- Player judging.
- Memory.
- Equipment.
- Markets.
- Triadic relationships.
- Open draw pile.
- Race tracks.
- Diminishing returns.
- Hidden information.
- Token state changes.
- Knapsack problem.
- Wild cards.
- Combos.





Systemic innovation



To wit: the nitty as well as the gritty.

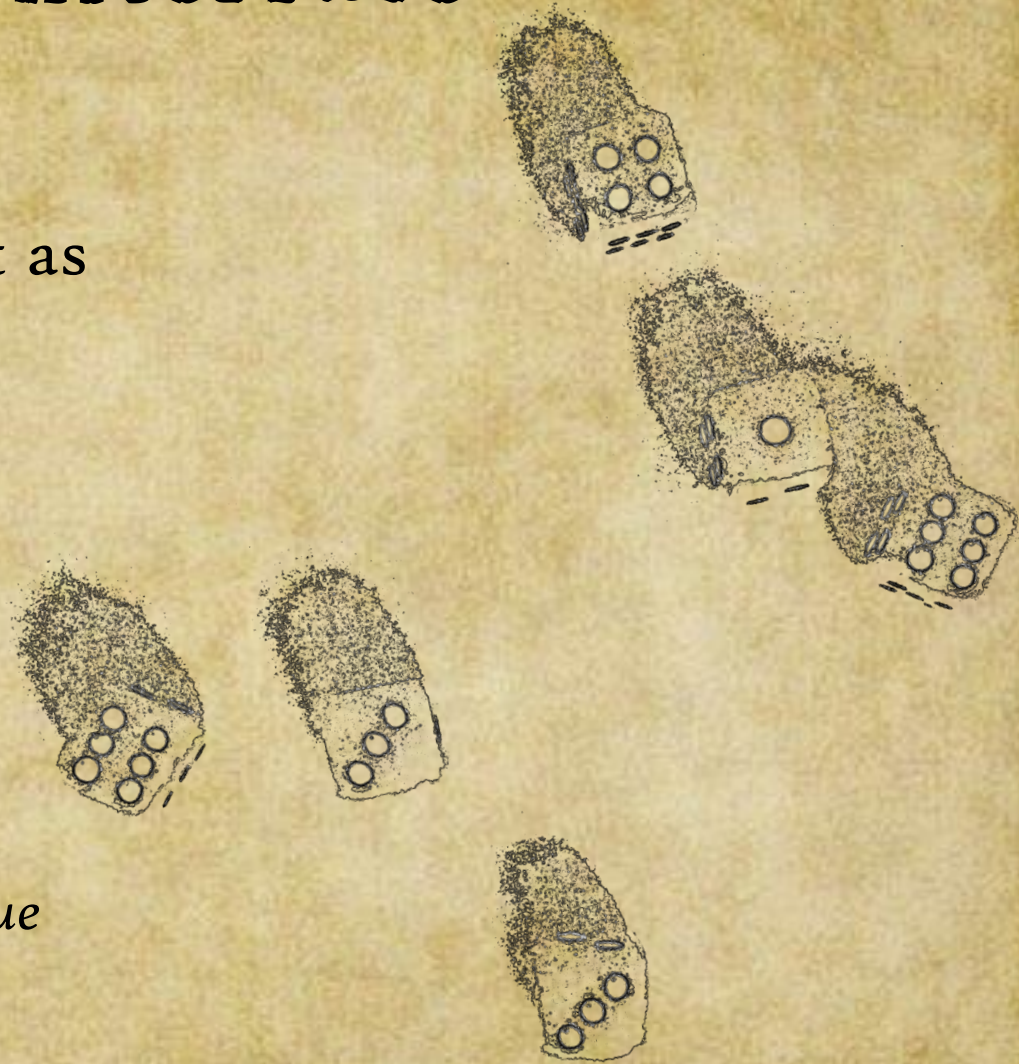
3 Context replacement

- Creativity usually isn't about *ex nihilo* creation.
- Instead, it's about moving known bricks around and connecting them in unexpected ways.
 - Remember, if games are made of games, then even a tiny thing is a possible brick.
- The biggest tool for doing this is *pushing your known brick dramatically out of context*.

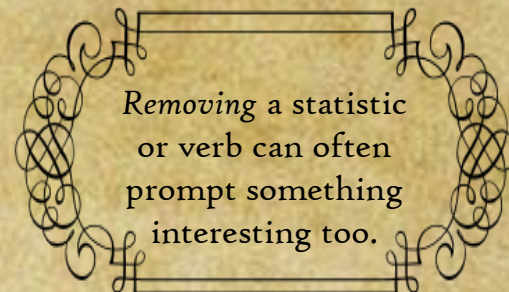


⌘ A die is an interface

- We usually think of it as a *probability device*.
- But it can also be
 - A *token with hit points*
 - A *countdown device*
 - An *indicator of state*
 - An *indicator of max value*
 - A *brick you build with*



❧ Add a statistic



- By far the simplest (perhaps saddest) means of innovation.
- A new stat, however, implies a new rule, which means at minimum you have created a variant.
- Time to complete: possible time attack mode.
- Number of moves: possible efficiency subgame.
- Attack strength rating: possible divergent strategies.



Change a dimension

Fighting game

Moves

Movement

Rock paper scissors

3 attacks

None

Karate Champ

13 attacks, 4 defense

2d axis

Karateka

6 attacks, 2 stances, bow

Side scrolling

Battle Arena Toshinden

> 50 attacks, 2 stances

2 independent 2d axes

Bushido Blade

8 weapons, 3 stances,
many moves

2d plane



Work in the materials

Working analog for
digital concepts
forces context
switching.

The tools of
game
systems are
mathematical
relationships.

Find ways to
work with
these.



3 The Pangrammatic Fox



*The quick brown fox, they claim, jumped the lazy dogs, over and more, forever
Cycling mad her quota'd alphabets, leveling Zipf, an indexed joker wild.*

*Unlucky vixen, pangram beast, spending q's and hoarding j's, the thrifty ditzy wench!
Why futz phonemes fro and to, when flow twixt verbs and jokes, the cogs of status quo,
Delights us so? Books bursting free the japes, glyphs, queries, catalexis, zeugmas woven
From words quotidian, to dazzle, vex, pry, illumine, beckon! Why judge letters equal?*

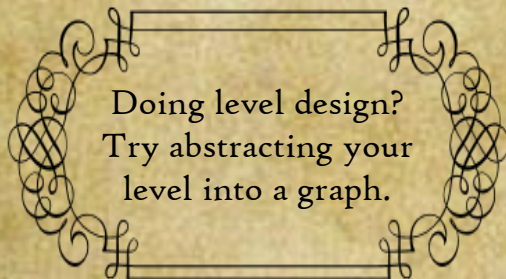
*Math must be seizing Reynard's mind, values coffling waxing jabber, equations poking
Til nothing's left except a pangrammatic sieve, quibbling z's and k's; hortatory, just, and swift.*



⌘ Force constraints



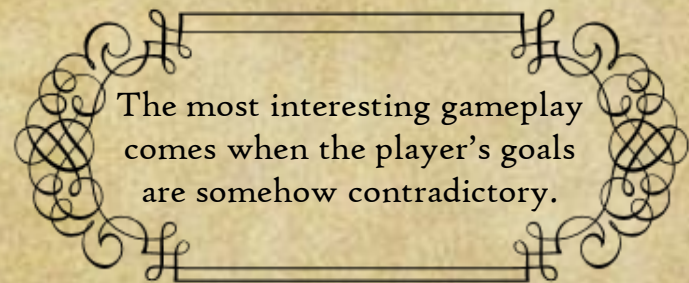
- Specific types of pieces prompt a mechanic
 - *Think of Tetris without the tetrominoes!*
 - *In this case, three sizes of pieces forces me to think about possible rulesets that can encompass them.*
- A topology prompts a mechanic.
 - *Try to force a hex grid onto a game that lacked any.*



➤ Add a verb or goal.

- Take a simple sidescrolling shooter.
- Add “rescuing.”
 - *You get the classic Defender.*

- Take a platformer.
- Add “fast.”
 - *You get speedruns.*



- Take enough goals, and you get a sandbox game.



❧ Change input mappings

- Swap an analog input for a binary one.
 - *For example, change a joystick into a button press and you might get Soccer Physics.*
- Swap a simple input for a complex one.
 - *Change a button press into motion control and invent the Wii.*
- Swap an instant action for a timed one.
 - *Make hold time matter and invent the “charge up.”*
- Add more controls to a unitary action.
 - *Atomize the controls and you might get QWOP.*



❧ Why input mappings works



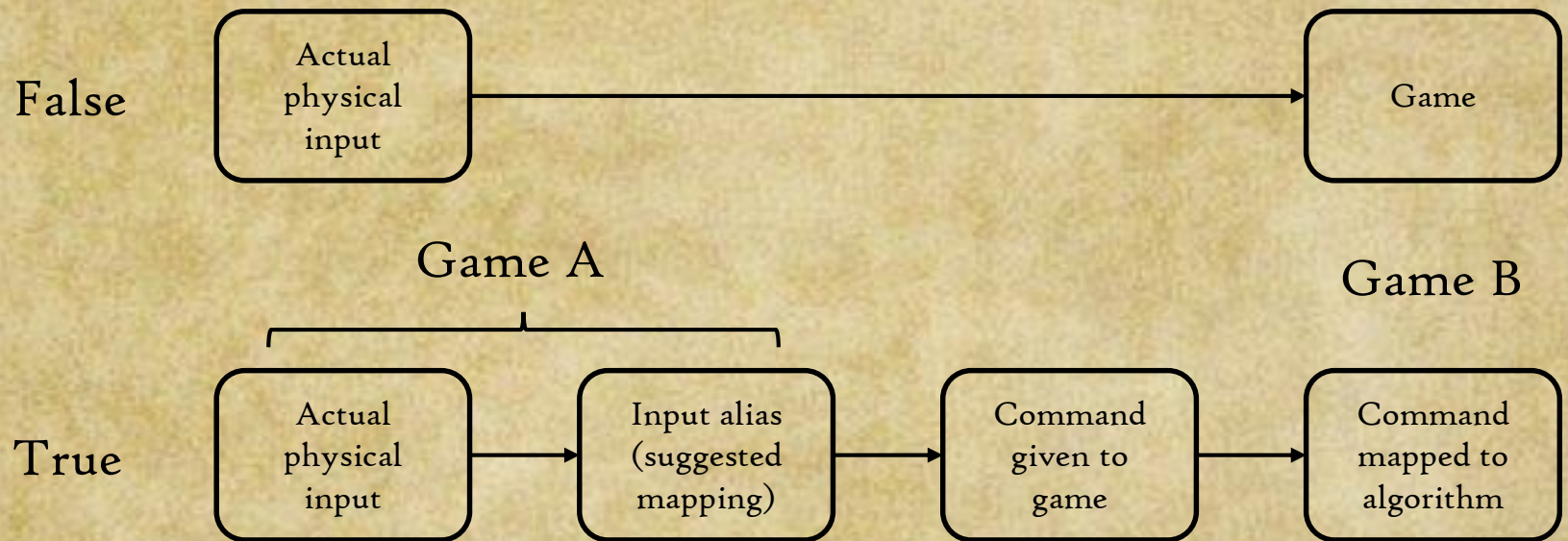
❧ Why input mappings works



❧ Why input mappings works



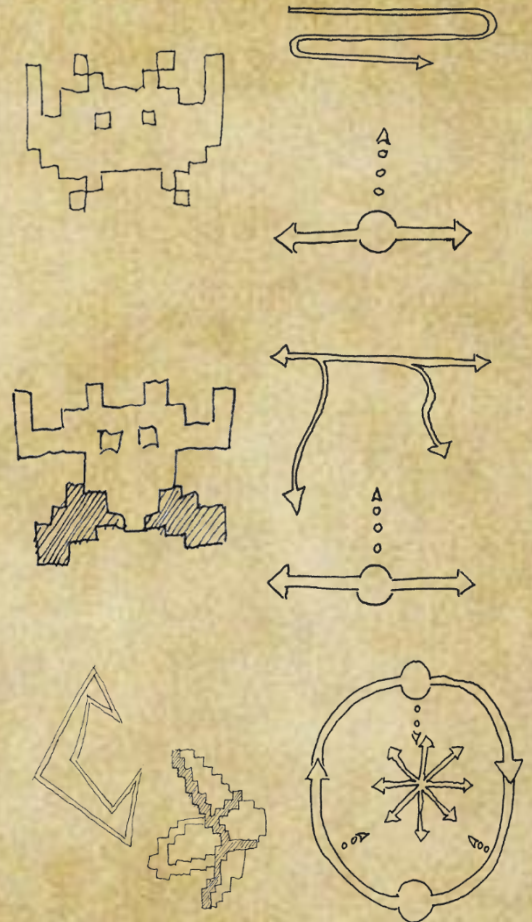
❧ Why input mappings works



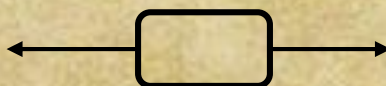
Change topologies



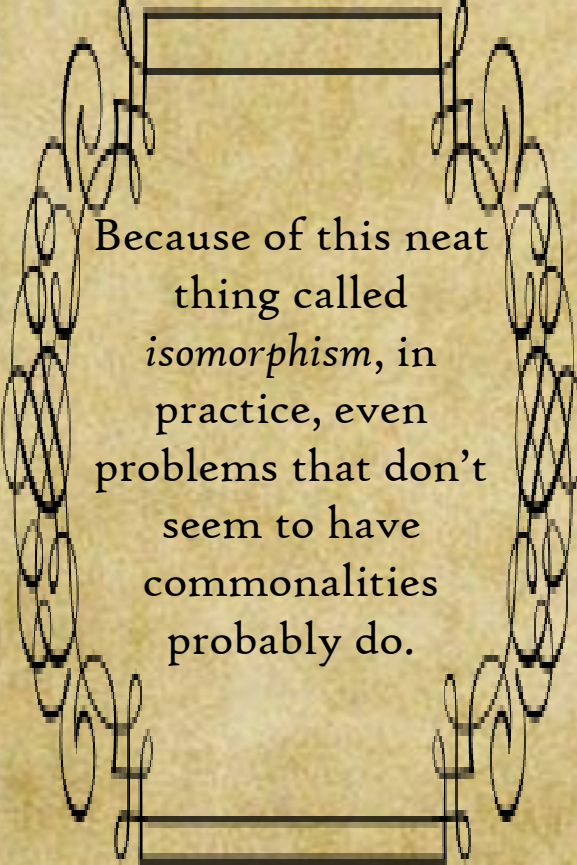
- A lot of game evolution is driven simply by changing the shape of the graph.
 - *Blokus to Trigon or Gemblo*
 - *Wrapping a game on a torus or visually bending a plane.*



§ A meets B



⌘ A meets B



Because of this neat thing called *isomorphism*, in practice, even problems that don't seem to have commonalities probably do.

- Find disparate systems that, when abstracted, share broad topological commonalities. Then mash them together.
 - *Breakout meets Space Invaders*
 - *Joust meets Mario*
 - *Lemmings meets Canabalt*
 - *Twister meets TicTacToe*
- Try this with things that don't have commonalities!
 - *Blackjack meets Robotron!*



❧ Simulate using an oddity

- Can you do territory... with cards?
- Can you health... with territory?
- Can you do aim... with tokens?
 - Can you do 3d... with 1d?
- Can you do jumping... with dice?

Select a non-optimal simulation method
intentionally and see what emerges!



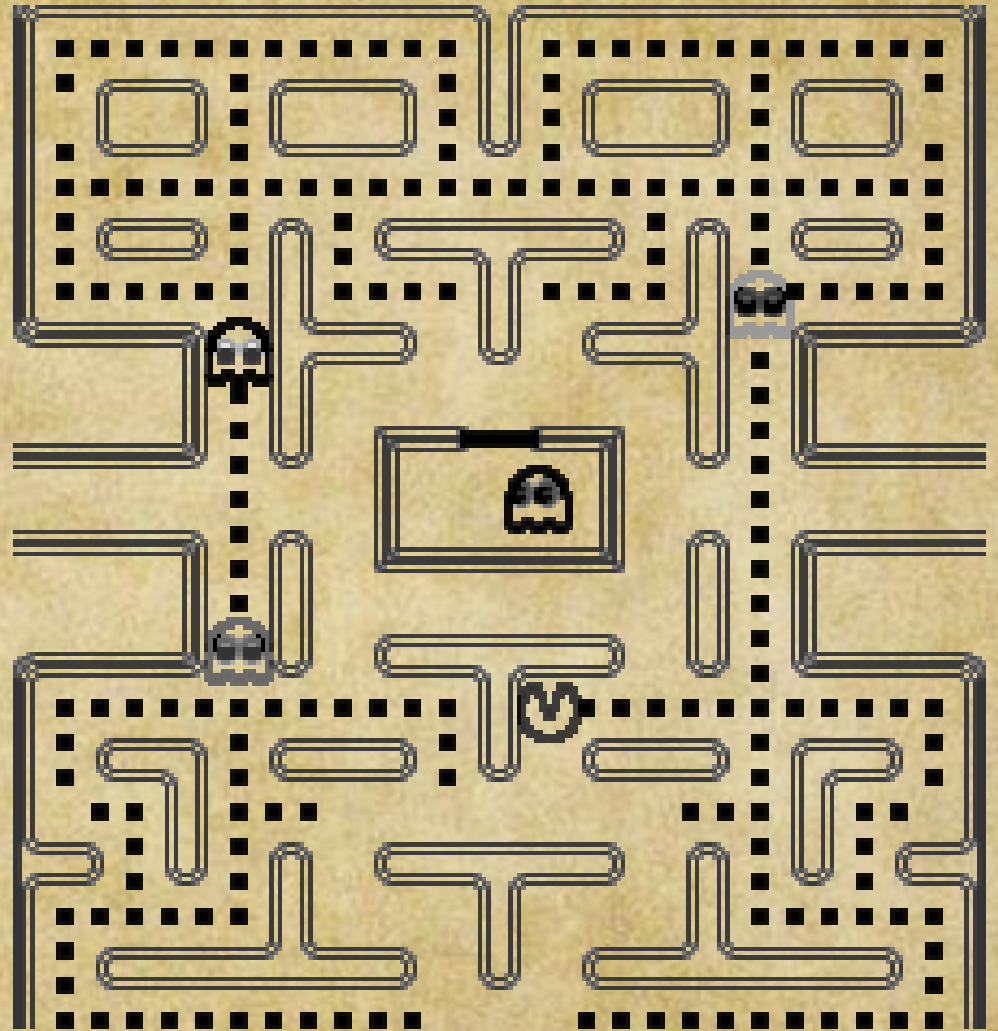
❧ Transplant skins

- The classic example is changing the first person shooter into a camera game.
 - *Shooter on rails becomes* Pokemon Snap.
 - *Adventure game with shooter combat becomes* Beyond Good and Evil.
- The key here isn't just reskinning. It's selecting a new *metaphor*.
 - *Your verb action remains the same.*
 - *This then opens the door to new rules and mechanics altogether.*



Transplant skins

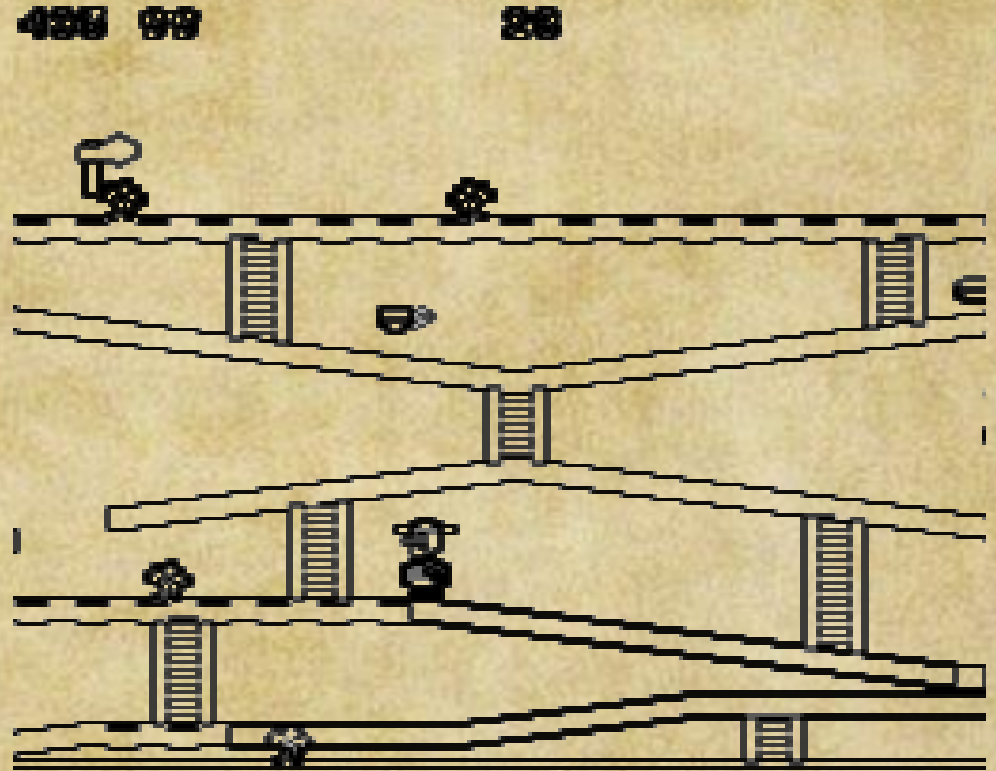
As mentioned previously, Pac-Man at heart is a game whose primary goal is “visit every node on the graph.”



Transplant skins

The 8-bit classic *Miner 2049er* also involved visiting every node on the graph: you had to paint the girders.

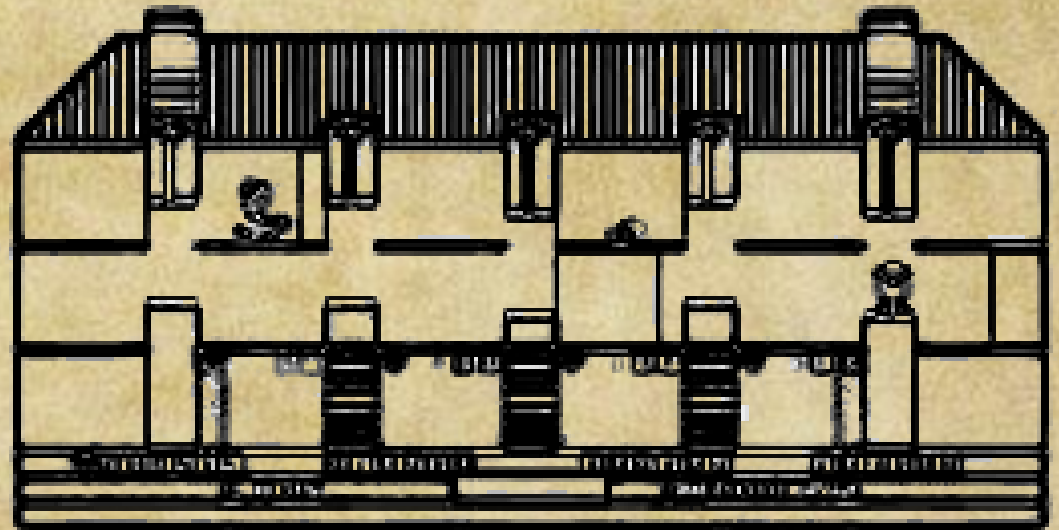
Because it was a platformer, the “jump” verb also came into play.



❧ Transplant skins

In the 8-bit game *Bristles*, instead of “eating” the metaphor was “painting.” You had to paint all the walls of a house.

This then created a “paint over” mechanic naturally out of the metaphor.



Transplant skins

Now mix in the
changing of graph
topology as well,
and with a little
change to a
triangular graph
and atomic
movement we get
 Q^* Bert.

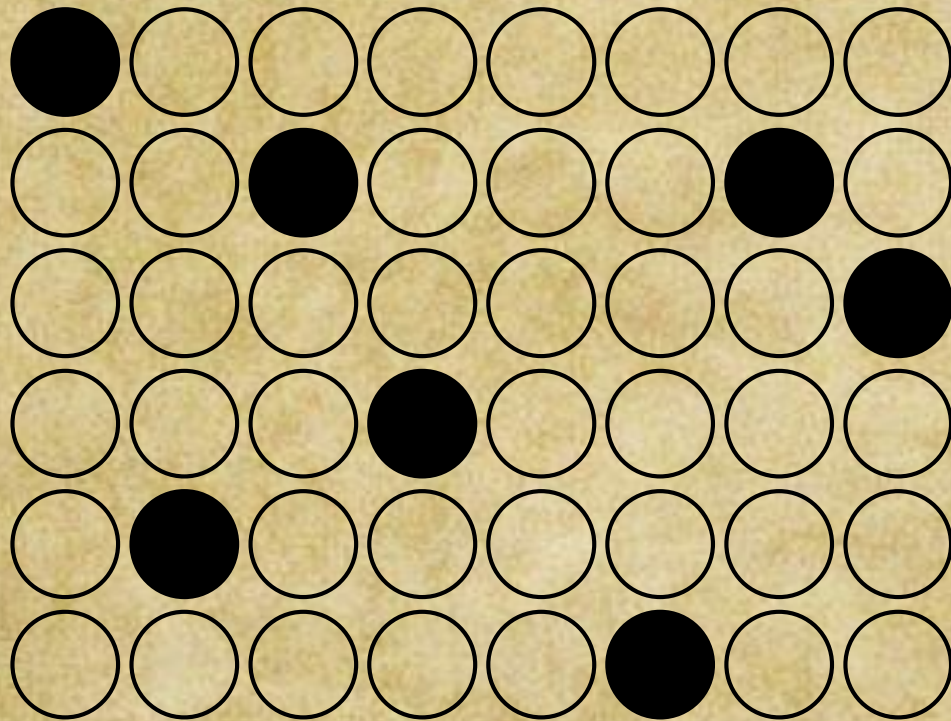


3 Merge a mechanic

- “Visit every node on the graph” is *Pac-Man*.



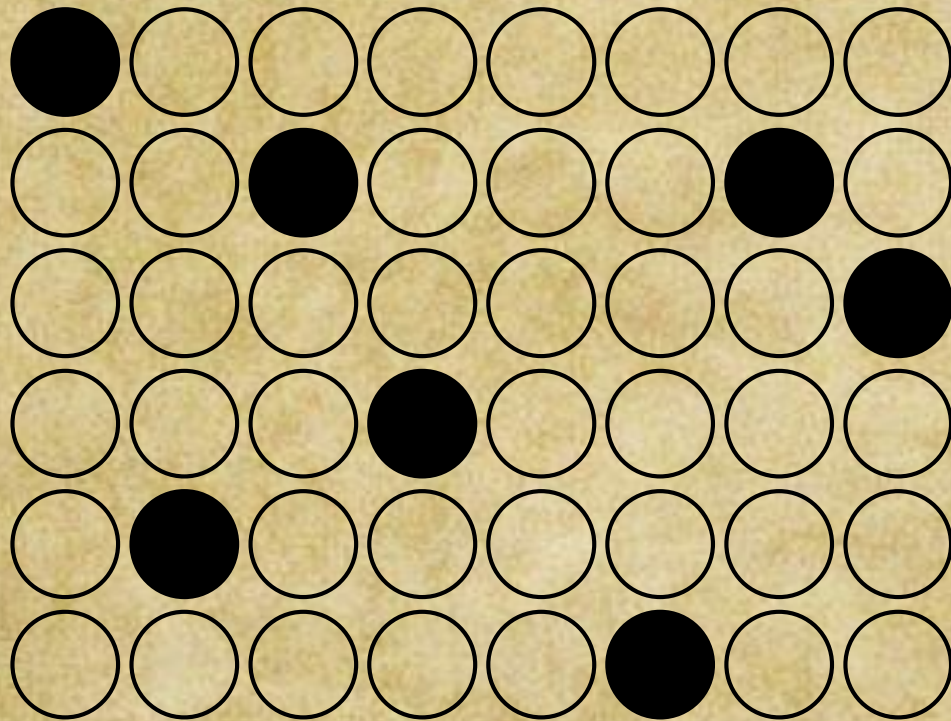
Merge a mechanic



- “Visit every node on the graph” is *Pac-Man*.
- But if you mark only certain nodes as ones you must visit, it changes into a game of “pick up objects” as in *Lode Runner* or *Jumpman*.



3 Merge a mechanic



- “Visit every node on the graph” is *Pac-Man*.
- But if you mark only certain nodes as ones you must visit, it changes into a game of “pick up objects” as in *Lode Runner* or *Jumpman*.
- Make the locations hidden information, and you invented the “secrets” system.





Art



On reaching for the ineffable

⌘ Working with theme

- To echo “ludonarrative dissonance” for a moment, it’s a bad idea to ask “What is the game about?”

More fruitful is to ask these questions:

1. WHAT IS THE DRESSING ABOUT?
2. HOW DOES THE PLAYER DO THAT?
3. WHAT IS THE MECHANIC ABOUT?
4. AND HOW DOES THE PLAYER DO THAT?



3 An RPG

- *What is the game system about?* Popping XP bags for advancement and loot, all of which make me able to pop larger XP bags.
- *What is the goal in the game system?* To reach the maximum power level.
- *What is the game's experience about?* The journey from beginner to powerful hero.
- *What is the goal of the game experience?* To make the player feel powerful.



❧ Top down: experience first

- You ask yourself, what is the feeling I want to capture?
 - *A game about interstellar politics! Great, but what is interstellar politics **about**? Compromise? Power? Dynastic relationships?*
- Break down the verbs and scenarios.
 - *Negotiate. Persuade. Conquer. Détente. Alliance.*
- Identify mechanics that have analogous actions.
 - *For example, in a game about politics, you may want to use a flipping mechanic to pair up with persuasion.*
- The risk, however, is that you then fill in with generic mechanics.
 - *As do 99% of videogames on the market.*
 - *Also, isn't "interstellar politics" kind of... dull?*



❧ Model an unusual system

- In other words, tell a story that isn't often told.
 - *Nobody has replicated the inner workings of a tree.*
 - *Nobody has modeled the stages of grief.*
 - *Nobody has made a game about the sense of taste or molecular gastronomy.*
 - *We make games with physics systems, but not chemical reactions.*
 - *There's a game about hole punchers to be had.*
 - *First person koosh toy.*
 - *Typesetting: the shooter.*
 - *The life and times of a bubble wand.*
 - *Why are there no games about gluing?*



❧ Bottom up: system first

- You work with the mathematical side, and end up with an interesting topology or mechanic. Now what?
- Systems fit inside one another, fractally, like concentric rings.
 - *What system is this merely a component in?*
 - *What does this analogize to? Does it feel like flipping, conquering, territory, power generation, graph traversal? Find a metaphor for it: “persuading” perhaps.*
 - *What larger system involves “persuading?” Politics? Romance? Arbitration? Law?*
- Move back and forth between the system and the theme.
 - *Have a firm idea of what it’s **about** at each end.*
 - *Discard what doesn’t work as you go.*



Meeting in the middle

- “Why isn’t there a romance game yet?”
 - Romance novels are about two people who help each other
 1. Become aware of a personal flaw
 2. Overcome that flaw
 - They are non-competitive; it’s a mutual victory.
- Create a co-op game.
 - You each have a hidden secret.
 - You have a mutual, public goal.
 - You can only move the other player’s stats.
 - So you have to understand and then be generous with love.





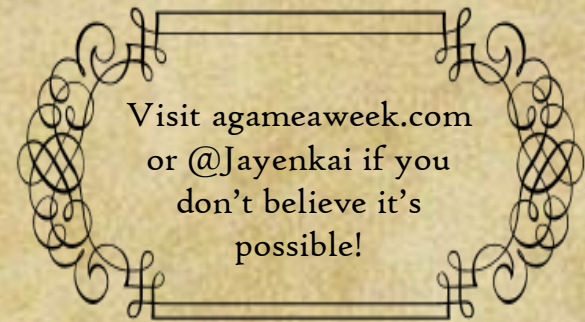
Life habits



Being a catalogue of divers customs

3 A habit

- Be creative *habitually*.
 - A song *a day*.
 - A game *a week*.
 - A thousand words *a day*.



- Setting aside the time and making it not just a routine but a ritual.



☞ Be messy

- A disordered environment encourages making random connections.
 - *And random connections cause serendipitous connections.*
 - *So does periodically just rearranging your environment to promote unfamiliarity.*
- And allow some noise in your environment.
 - *Recommended amount is 70 decibels*
 - *85dB is too loud, 50dB is too low.*



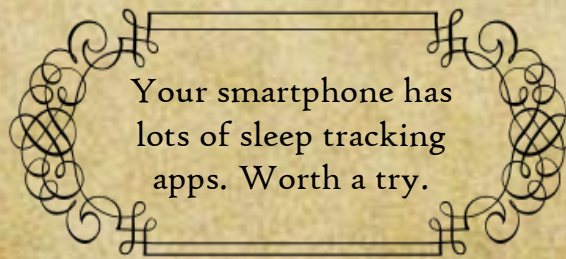
Exercise

- Exercise stimulates free association thinking.
 - *And provides cognitive benefits in general.*
- Even getting up periodically is good for you – try setting an alarm to make you stand every hour for a little while.
- Try regular walks or bicycle rides – something that doesn't necessarily demand high cognitive load.



⌘ Sleep

- Even minor shortfalls of sleep cause a massive cognitive deficit.
- Try tracking your sleep, and ensure you get 7-8 hours a night.
 - *Most critical is reaching the right threshold of time spent in REM sleep.*
- Often a nap will help solve tough problems.



☞ Serendipity: take notes!

- The habit of note-taking is super-common among creative people.
- Carry some way to take notes with you at all times.
 - *Don't trust your memory!*
- It seems to matter that it be done by hand, for some reason.
 - *Pen and paper – or tablet and stylus.*
- Make note of interesting connections, new systems, fresh relationships.



3 Take risks

- Fear of failure is a major creativity killer.
 - *Assume that most creative attempts will FAIL. This is the norm.*
 - *Every new idea that works is a victory.*
- Stay away from people who are overly negative about failures.
 - *Treat failure as a learning experience.*
 - *Keep failures around, they are usually useful building blocks.*
- Brainstorming under classic rules is bad because it lacks risk.
 - *It's been found that instead, allowing criticism actually generates **more** ideas.*

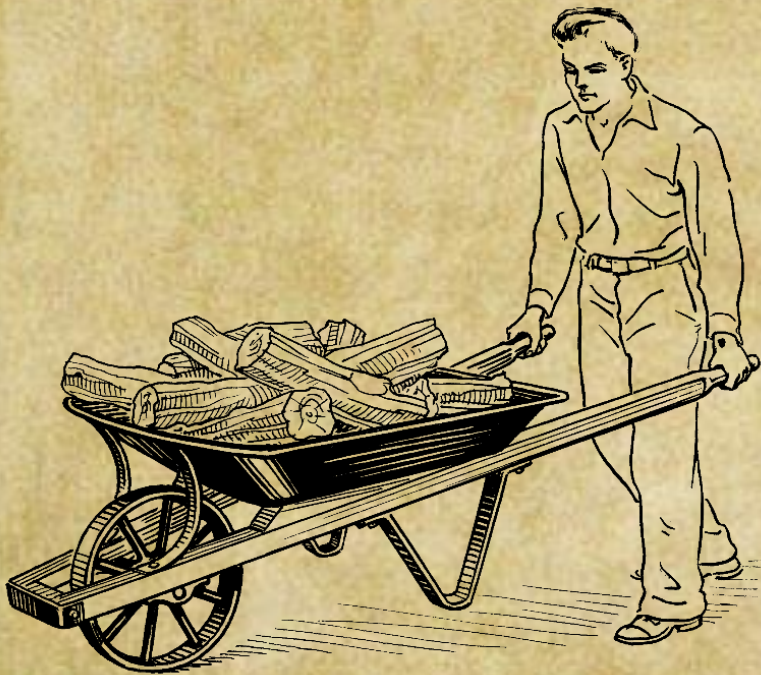


☞ Positive mood works better

- The myth of the angsty creative is a false myth.
 - *It is true that they often have had traumatic experiences... but so has everyone!*
- Positivity and happiness are more strongly correlated with successful creative ideas.
- So is being relaxed... try a warm shower!



Think about users not yourself



- One of the easiest ways to force a context switch is to position your mind's eye outside of your own head.
 - *Play “the movie” of the user experience in as much detail as you can.*
- A classic example: try visualizing a wheelbarrow right now.
 - *A common test of creativity, this is about diving into detail; more creative people usually “see more” of the wheelbarrow.*



Read voraciously

- The world is an incredible source of systems and relationships.
- Most top designers read voraciously.
 - *SimCity* came from urban planning; *SimEarth* from the Gaia hypothesis.
 - Miyamoto likes to garden: *Pikmin*, *Mario*!
 - *Ultima Online* was based on MIT robot experiments.
 - Sid Meier once made a procedural Bach music generator.
- No field is out of bounds.

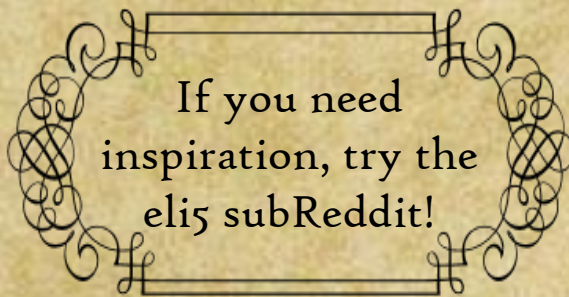


❧ Avoid homogeneity

- It's great to have a team of reliable familiar people. But don't stick solely to that team.
 - New people means new ideas to collide with and remix.
- A team that is overly homogenous will tend to have similar ideas.
 - As if there weren't other reasons to diversify in hiring, this is an excellent practical reason to do so.
- Travel is a fantastic way to force yourself out of context.
 - Different cultures, languages, and customs force a distant perspective on you.




☞ Explain things to other people



- It can be hard to get distance on a system.
- The process of “explaining it like I’m five” can be incredibly revealing to you, the explainer.
 - *It forces an abstract level of modeling on you.*





On success



In which we discuss the point

❧ Practical creativity: downsides

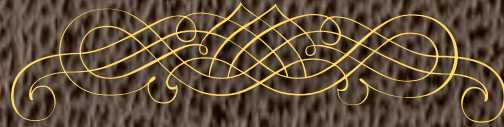
- Creative people are usually perceived as worse leaders!
- Usually it's *second* movers who define genres and cash in.
 - *Usually because they execute best.*
 - *And games aren't well protected under IP law.*
- It's risky.
 - *Even with these tips, you should still expect a high fail rate.*



❧ So why be creative?

- It gives you room for other careers.
 - *Many of the top designers and creative in games have found these skills to be transferable.*
- It's fun.
- It's how you leave a mark on games and the industry.
- If you do it well enough, you can in fact own a blue ocean.
- It buys you a following, which is critical in this day and age.





Be a stranger to the familiar.
Learn to atomize and abstract.
Build a diverse pattern library.
Move patterns between contexts.
Give yourself constraints.
Change dimensions, topologies, and inputs.
Pursue unconventional metaphors.
Address deeper meaning.
Always be working.
Always be failing.

