

Roll the Zine is a board and card game focused zine and a love letter to creativity, gaming and DIY culture. It's an exploration of media, imperfection and putting something out there.

This month we celebrate International RNG Day. Randomness is at the DNA of gaming: rolling dice, drawing cards and spinning a roulette wheel are all iconic actions that have thrilled players for centuries. How game designers balance pure randomness with player agency defines the games they design.

In this issue, you'll learn about input/output randomness, math research on dice that don't tie, how randomness increases replayability, how Rallyman lures players into taking risks and more.

Welcome to a journey into the randomverse. May the odds be ever in your favour.

Welcome along the journey. You can find all Roll the Zine issues from zine.hamatti.org. You can subscribe via RSS to get new issues fresh to your reader.

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ROLL THE ZINE
OCTOBER 2026 #7

INTO THE RANDOMVERSE

into the randomverse

Happy International Random Number Generation Day (rngday.com)!

RNG Day, ran by game designer Sophie Houlden, has been celebrated since 2019 on a random day each year.

I We often need numbers that are Random, for everything from games to encryption. RNG Day is an opportunity to learn more about Random Number Generation, and to have fun with it!

Sophie told me the origins of the day was a *random* idea: with so many different annual celebrations like *Talk Like a Pirate Day* and *Towel Day*, it would be fun to have one that is on a random day every year. I have to add one of my favourite fun days to the list that I learned about recently: *Crisp Sandwich Day* we celebrate this month on October 25th.

Like so many great ideas, a fun idea becomes even better when other people take the idea and make it their own. Last year, I built a feature to my personal website that gives the reader a random blog post from my archive and this year, it was immediately clear to me I'll celebrate it with a randomness focused Roll the Zine issue that you are now reading.

If you want to add randomness to your reading experience, pick up your favourite d20 and give it a roll. For anything outside 3–15, reroll, otherwise open the page that corresponds your roll. Keep rolling and reading until you've enjoyed all the random articles.

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Page number dice: Delapouite / game-icons.net / CC BY 3.0



What's next for Roll the Zine?

I started Roll the Zine in January to find a new creative outlet and it's been a lot of fun writing. Each of the first 7 issues have been very different from each other both in themes and in styles. It's been a lot of fun experimenting and learning.

My goal with this first year has been two-fold: discover what I want to write and learn the tools to write, publish and distribute zines. Looking back at the first zine and now this one, a lot of learning has happened.

After a relatively stressful July deadline and

an August issue I wasn't quite happy with, I skipped September and instead spent two months working on this one. It felt good so moving forward, I'm aiming to do an issue every two months instead of monthly to give myself more time to dig deeper.

Next issue will come out in December with a focus on games played on a 5x5 grid. I have recently fallen in love with them as a single mousepad with the grid and a small box of pieces gives a surprisingly varied game pool. Perfect for travelling!

Do you want to contribute?

I would also like to have more community contributions: comments, articles, letters, art, you name it.

Did something in this (or any of the previous) issue spark a thought you'd like to share? Write it down and send it my way. I'm happy to publish those in future issues.

If you have something related to next issue's topic (see above) and you're interested in sharing a longer piece (like Matt's Rallyman article on pg. 12–13), get in touch and tell me

what you'd like to share and we can have a chat about it before you write it.

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I'm interested in sharing all sorts of board game related writing to readers who enjoy games. I would love to share your opinions and views as well!

Check out Of Dice and Meeples

Of Dice and Meeples (<https://tekeli.li/of-dice-and-meeples/>) is a board game zine APA with articles and zines by various authors (like myself and Matt) and if you wanna read more about board gaming from different people, you should check it out.



choosing the starting player

```
int getRandomNumber()  
{  
    return 4; // chosen by fair dice roll.  
              // guaranteed to be random.  
}
```

xkcd 221 / <https://xkcd.com/221/>
shared with permission (<https://xkcd.com/about/>)

As the joke in the above xkcd comic by Randall Munroe and the articles in this zine illustrate, it's not only about **what** we use to randomise that makes a difference but also **when** and **how**.

You could have players roll the same dice and how that affects the impact of randomness to the game outcomes, player agency and enjoyment will differ a lot. Or you could have one player roll dice and another pick a card from a deck and these two methods can lead to exactly the same experience.

The most important part is how the randomness fits the player expectations (eg. very random party games vs very deterministic competitive games) and the style and tone of the game. If you're designing a game, exploring all sorts of methods and figuring out what best fits your game will have a large impact in player satisfaction.

I personally like randomness in games because it levels the playing field a bit. It

doesn't mean that games with lots of randomness are less skill intensive necessarily because when implemented well, it can mean that you need to understand the game deeply to be able to make good decisions on your feet.

Instead of the game becoming about learning and memorising strategies up front, it becomes more about understanding the underlying principles and interactions and applying those. I'll be the first one to admit that I'm not very good at that in any game but I enjoy the challenge.

Sometimes the luck of the draw is not in your favour. **That's perfectly fine.** Gaming isn't that serious. When it happens, you give it a laugh and congratulate your friend for winning and move on to the next game.

Exposing yourself to the element of randomness can be a humbling experience that is a welcome reminder that games are about having fun and spending time with friends — not about winning.

Most games start with someone going first. To decide who goes first, you can use a variety of different methods to randomly choose (like Go First Dice, see pg. 4–5) but many board games have their own, thematic ways to choose the first player.

Let's first look at a few generic randomised solutions.

A common way is to roll a die or two or draw cards from a deck and let the biggest number go first. If there are ties at the top, roll again until a winner comes out.

While I generally don't enjoy bringing mobile devices to the gaming table, there are apps that help choosing a starting player. One of them is **Chwazi** that's available for Android, iOS and as a web application. Everyone touches the screen with their finger and the app picks one of the fingers.

Other apps that use a similar "everyone touches the screen" mechanic are **Start Player** and **Select Who?**

These apps are very handy: they are quick and random and can be used for any kind of game.

My favourite mechanism is a thematically appropriate question for the game.

Cleocatra (BGG: 290131) is a cat and Egypt themed area control game where the first player is *who last hugged a cat or other pet*.

Parks (BGG: 266524) is a game about

exploring national parks and the player *who most recently took a hike* will go first. **Space Parks** (BGG: 243358) is a follow up game by the same designer where the first player is the *whoever stargazed most recently* — I'm happy it wasn't asking for people to go on space hikes or the games would never start.

Gloom (BGG: 12692) is a story-telling game where the players aim to make their characters stories miserable so it's fitting that the player *who's had the worst day* goes first.

In the wonderful **The Great Dalmuti** (BGG: 929), every position matters, not just the first. Each player draws a card from the deck and players chance their seats to follow the order of card values to denote their place in the hierarchy.

Seven Prophecies (BGG: 260568) is a trick-taking card game and to get to go first, you must have had a recent *prophetic dream*.

Cat Blues: The Big Gig (BGG: 414351) rewards players who listen to jazz music by letting the one who most recently *listened* to jazz become the first bandleader.

These types of first player selection criteria are definitely not very fair or random but I love them because I appreciate the type of creativity that goes into them.

"BGG: XXXX" after a game is the game's Board Game Geek ID. You can find the game by going to the URL <https://boardgamegeek.com/boardgame/> and add the corresponding ID to the end of the URL.



dice with no ties

Imagine four players starting a game and they need to figure out an order for who goes first, second, third and fourth. There are a lot of ways to solve this problem but here at the Roll the Zine headquarters, we love dice so players would each roll a d6. They could tie. That's not fun.

In 2010, game designer James Earnest asked mathematician Eric Harshberger if he could design a set of 4 dice that would never tie. From that research, Go First Dice were designed and more progress had been made on the research ever since.

The title of this article, **Dice with no ties** is simply that because it rhymes and I felt okay doing that because the wiki states that while the research started as a goal for deciding the first player, it quickly evolved to consider permutation-fair dice.

There are three levels of fairness at play when designing for these requirements.

Go-First Fairness: Each die has equal chance of rolling the highest number

Place Fairness: Each die has an equal chance of being 1st, 2nd, 3rd and 4th (and so on for higher player counts).

Permutational Fairness: Each possible ordering of N has an equal chance.

In addition, there's a requirement that each subset of dice will have the same fairness than the full set. So if a set of 4 dice is permutational fair when rolled all together, the same should be true for each subset of 3

or 2 dice from that set of 4.

Eric worked with Robert Ford to discover the original solution that was a set of 4 12-sided dice (I own a set of those!) with numbers 1 through 48:

Die 1: 1, 8, 11, 14, 19, 22, 27, 30, 35, 38, 41, 48
Die 2: 2, 7, 10, 15, 18, 23, 26, 31, 34, 39, 42, 47
Die 3: 3, 6, 12, 13, 17, 24, 25, 32, 36, 37, 43, 46
Die 4: 4, 5, 9, 16, 20, 21, 28, 29, 33, 40, 44, 45



Some solutions are theoretically interesting but less practical. They use dice of different sizes for different players. I'm not a fan of those because if you bring in a d20 and some d36 to the table, you have to explain some very challenging math to convince people it's fair.

Growing the player count increases the size of the dice significantly. A favourite of mine from the larger sizes is Paul Meyer's 5d60 for 5 players since d60 is at the upper limit of an actually usable die size and they are all the same size as each other.



to beat everyone who turned up on the start line. The art of racing is to win as slow as possible, after all.

Rallyman is sometimes referred to as a puzzler rather than a racer, because of all the questions it asks of you and your dice. The top players know when to push their luck and when not to. Dice in Rallyman can be assessed on a space-by-space basis, or all at once, and only when going 'Flat Out' and rolling everything do you get rewards that make your future turns easier, and your stage times quicker.

There's a rule of thumb that says for every three safe and three dangerous dice, your likelihood of a crash is 16.5%. For each safe die you add or remove, change the odds by 5% accordingly, and for each dangerous die by 10% instead. This quick ballpark number is great for weighing up whether you want to chuck a handful of dice at once, and naturally, when the objective of a turn is to not roll three hazards and crash, having full control over when to stop rolling dice is certainly a smart choice - it is impossible to roll a third hazard if you stop rolling when you get your second.

But every time you do, a voice at the back of your head goes "I bet you could have rolled it, no problem. Probably missed out on a nice chunk of time there. You should totally go Flat Out next time..."

Do you listen to that voice? All things being equal, the fastest times can only occur when you go Flat Out on every single turn and defy all those odds, but you don't have to do that to win. You just have to be a single second quicker than your fastest opponent. If they've been easing off into corners to give them a safer entry, you should ease off too. If they've been having shorter turns and rolling fewer

dice, you should do so too. And if you can spot an opportunity to squeeze out a few seconds here and there, they might start having to risk more and more in an effort to keep pace, or overtake you, and that's when the mistakes creep in.



Everyone has their limit when it comes to risk. I tend to go Flat Out when I know I shouldn't, simply because it feels great to pull it off. When I almost inevitably crash as a result, I tend to go Flat Out again to try to recoup some of my losses, only to crash again. Strange things can happen in Rallyman, but that isn't a winning strategy, believe me.

What is a winning strategy? Knowing what to do and when to do it, I suppose, but that's tricky to sum up neatly in a game with so many variables. I guess my advice is that whenever you find a way to reduce the risk on your turn by swapping out dangerous dice for safer alternatives, don't then start to feel overconfident and increase the risk by adding dangerous dice back in, forgetting that by the time you've grabbed them all and chucked them into the dice tray, their odds to produce a crash have ballooned up towards 50-50.

But then that's Rallyman, isn't it? You either crashed or you didn't.

image on previous page: Riccardo Serra / BGG
image on this page: Stéphane Bourdeau / BGG



Could have. Should have. Didn't.

guest post by Matt Elliott, @frankcavil@mastodon.scot

The odds of a crash during your turn in a game of Rallyman (BGG: 60435) are 50-50. Ish. While the result is always "you either crashed or you didn't", it's the journey to get there where all the nuance is found, and as someone who has been playing the game almost religiously for 6 years you'd think I'd be all too familiar with that nuance, but no, I'm not.

For those who haven't played Rallyman there are some things you need to know. Firstly, ending your turn in a higher gear, and therefore at a faster speed, is usually more preferable than not. Secondly, there are two kinds of dice, 'safe' and 'dangerous'. Both are d6, the former having a 1 in 6 chance of rolling a hazard, the latter doubling the chance to 1 in 3. And finally, seeing three hazards in your turn results in a crash, and you don't need me to tell you that crashing in motorsport isn't ideal.



In a perfect race your turns would see you both 'move fast' and 'move far', but often the smarter play is to focus on one or the other, for trying to achieve both will likely see you rolling more dice, which will definitely see you increasing the chances of a crash.

The community hosts monthly challenges in a couple of places, pitting folks who've never met each other face to face in a battle for the fastest times, and if you ask nicely, some players will spill their secrets...

It is not uncommon to learn that, for example, two players can find themselves at the same part of the track in the same amount of time, but having gotten there with different probabilities of a crash, all because of their driving style. I refer to this kind of thing with the question "Is it better to finish one turn in 20 seconds, or two turns both in 10?" There's no right answer, for we need to know what the next turn has in store, which could be just about anything depending on what kind of event you're racing in, but it gets you thinking.

Often you'll see players - myself included - end their turns in as high and as fast a gear as possible, which is great for the time, but the very first thing they'll need to do on the next turn is often to slam on the brakes to obey a speed limit, and the harder you stomp on that brake pedal, the more Brake dice you'll use, and they're 'dangerous' dice, so your odds of losing control quickly increase to point where it is possible to crash before you've even gotten going, undoing your chances of a win in an instant.

Instead, a more cautious, considered approach is going to allow for turns with a lower probability of failure. Biding my time, like the tortoise versus the hare, is the optimal strategy in many cases, especially when I don't have to set stage records, but just have

It's a question that is more interesting than beneficial: there are a ton of existing different solutions for choosing who to go first (see pg. 3). But it's an interesting challenge and a set of such dice is a beautiful discussion starter when brought to the gaming night or other decision making situations.

One of the researchers in the space, James Grimer answered this beautifully:

“The fun is five players have one die each and they all roll them. They all have something to do.”

That's what many people love about board games: agency to take actions, special relationships with their dice (just ask Wil Wheaton) and a die being a tangible game piece to interact with.

That's why I love my Go First Dice set.

The research problem is all but solved. Last month, Harshbarger commented for CBC:

“Definitely the door's open that someone else could walk in with a brand new theory and say, 'well this is what I did,'" said Harshbarger. "That's pretty much what happened with Paul. He came out of the blue.”

In the Numberphile's video, James Grimer goes through the history of the solutions and it's fascinating to see the different starting points different researchers have approached the problem, coming up with new types of solutions like having different number of sides leading to solutions that require smaller sized dice.

While we don't specifically need these types of dice to solve the problem of first player on a casual gaming night, you never know what kind of new innovations the methods invented to solve the problem bring out.

Sources:

Eric's site:
http://www.ericharshbarger.org/dice/go_first_dice.html

Go First Dice wiki:
<http://gofirstdice.ericharshbarger.org/doku.php>

Numberphile's video:
<https://www.youtube.com/watch?v=5q32heFz1bs>

Eric Harshbarger - The Latest Improvements With "Go First Dice" at G4G15 :
<https://www.youtube.com/watch?v=bzjEeCJQb-c>

Photo of Go First Dice by myself

Previous page's 3D rendering of Paul Meyer's 5d60 by Carl Hoff

This new type of dice guarantees no tie when deciding who goes first, Catherine Zhu / CBC / <https://www.cbc.ca/radio/asithappens/dice-mystery-board-game-9.7328614>



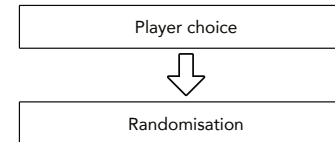


DIE OF THE MONTH



output randomness

On the opposite edge of the spectur is **output randomness**. It refers to the type of randomness that takes place *after* player decisions.



A classic example of this is Risk (BGG: 181). In Risk, you choose which of your armies attack opponent's armies in adjacent areas and then roll dice to see the outcomes of the battles.

When discussing Risk's combat mechanics, I can't skip Shogun (BGG: 20551) which has a very similar mechanic but instead of rolling dice, it uses a custom cube tower into which you throw in the cubes participating in battle and only some of them end up falling through the bottom, giving a cool visual way of modeling battlefield outcomes.

Players can make choices to affect the probabilities but can never fully control the results. The players have to make choices between high risk, high reward and low risk, low reward options and build contingency plans to survive failures.

Output randomness can feel unfair: if you get a low roll and your opponent gets a high roll, it can be hard to justify their win. On the other hand, it can provide a way for a player to offload their negative feelings away from themselves to leave the gaming session on a better mood.

When contrasting board games with video games, the added transparency of board games can alleviate the problem. If the outcome is determined with a roll of a die, a player can feel assured of the probabilities of a fair dice roll but can never really know what happens in the algorithms of a video games — those games often lie because our intuition of probabilities is flawed.

A genre where output randomness is often rampant is worker placement games (see Roll the Zine #2). In Stone Age (BGG: 34635), players first assign their workers to various spots on the board and then for some of them, roll dice which determines how many resources they get.

Often in Stone Age, player needs to take some risks for better rewards. They might assign workers to purchase cards they cannot afford yet and hope that they roll well enough to gain those resources — or risk effectively losing a worker for the turn.

Footnotes and sources

[1] Martin Amos described poker in this way.

[2] Unless you count unpredictability of other player's choices randomness.

The Two Types of Random in Game Design by GMTK / <https://www.youtube.com/watch?v=dwl5b-wRLic>

Designing Marvel Snap by Ben Brode / <https://www.youtube.com/watch?v=HjhsY2Zuo-c>

Randomness in Games by Tristan Muntzinger / <https://www.youtube.com/watch?v=O2GAd5pVaBQ>

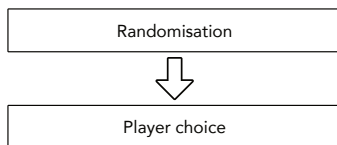
Board Game Design Day White, Brown, and Pink - The Flavors of Tabletop Game Randomness by Geoff



input randomness

An axis on which we can evaluate randomness is one with extremes on input and output randomness. Both of them can be varying levels of randomness but they have very different impact on the game play and the actions players take and how the randomness affects the outcomes.

Input randomness refers to randomisation that happens *prior* to player decisions. A simple example of this is a single roll of dice in Yahtzee (BGG: 2243). You roll the dice first (let's ignore rerolls for the sake of this example) and then you choose which score to assign those values to.



There's a lot of randomness in rolling a set of 5 dice but once they've been rolled, the player knows exactly what outcome their decisions result in.

Input randomness can provide the excitement and replayability that randomness brings to games while maintaining a higher level of agency and strategic thinking for the player.

Marvel Snap designer Ben Brode describes input randomness by explaining that it puts players into novel situations they haven't been in before and requires them to think on your feet instead of relying on pre learned steps.

Input randomisation can happen in a variety of stages in the game.

In a game like Codenames (pg. 7), the board and positions are randomised once at the start of a game and after that, it's all wobbled through the prism of personality¹. Another great example is Onitama where the input randomness comes in the form of which move cards are included in the game but after that, there's no other randomness².

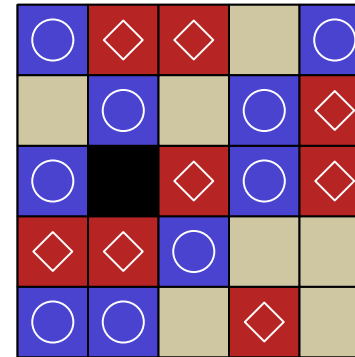
In a game like Roll for It (BGG: 129090), input randomness happens on every turn and players need to adjust their plan all the time. A series of bad rolls can completely foil your previous long-term plans.

Some games have both. In Draftosaurus (264055), you pull your dinosaurs from a bag at the beginning of a round and then place them according to rules set by rolling a die each turn. Sometimes, the combination of the two can completely take away any agency you have.

From the perspective of an individual player, one can make an argument that the result of another player's decision is input randomness for you as the game state has been changed in a random way.

Some games allow you to affect the odds of your input randomness. In a deck building game like Dominion (BGG: 36218), you buy new cards and trash (remove from deck) old ones to increase the odds of drawing the hand you need.

Codenames and combinatorics



Codenames (BGG: 178900) randomises gameplay by combining two ways:

1. for each round, you randomly pick 25 words out of 400 into a 5x5 grid
2. for each round, you pick one of 40 key cards (shown on the left) in one of its 4 directions for 160 different options. (Youtuber CodeSlate did the math¹ to show that there are 420 689 412 000 possible cards if you run out of random options with the 160 options).

Combinatorics is a fascinating area of mathematics that explores for example how many ways you can organise things. The fact that things grow really fast even at lower number of individual items is handy for this kind of input randomness (see pg. 10) to increase replayability.

A traditional French suit deck of cards is a great example of this: give a deck a shuffle and it's likely you ended up with an order of cards that has never been witnessed before — with just 52 cards. Similarly, there will never be two games of Codenames that are the same, making it a wonderful party game.

Codenames also deals with the type of randomness that — for a better or worse — doesn't allow a ton of strategy*. A game of chess has a massive amount of potential games but there are strong strategies for openings and finishes you can study which

means that a lot of potential game states are never good.

For a party game, more randomness is good. For a strategy game, less so (although Magic the Gathering creator Richard Garfield has good arguments for the opposite view²).

Another aspect of randomisation is that you rarely play with the exact same play group and exact same teams. Introducing human creativity and different interpretations of word associations adds positive chaos to the mix.

* Unless you and your team learn all 160 possible key card positions by heart, see ¹ for explanation. And like with card counting and casinos, this will likely get you kicked out of the game night as well.

[1] How to win Codenames in one turn every time by CodeSlate / <https://www.youtube.com/watch?v=UYCgGDSUnB0>
[2] Finding the right mixture of luck and skill with Richard Garfield by Board Game Design Lab / https://www.youtube.com/watch?v=_eoK4Aw2PFY



behind the scenes with Sophie Houlden

The best things in the world happen because someone wanted to start something for the enjoyment or benefit of the community at whole.

On April 23rd 2019 Sophie Houlden tweeted¹: "It turns out there is no International Random Number Generation Day yet, so I'm making one." That tweet put into motion something wonderful, a chain of effects that has led to you reading this zine today.

Every year, the next year's date is selected randomly by utilising a cool variety of different randomising methods like rolling dice, building pseudo-random generators through code, head-to-head tournaments and physical spinners.

Sophie told me their favourite method of randomisation is good old dice: they come in many shapes and forms and are flexible to combine for randomising

across variety of distributions. They are also wonderfully tangible which is my favourite aspect of them as well. You can feel them in your hand and especially nice quality dice make a lovely sound as they bounce off each other.

They also mentioned something I hadn't heard about: how Cloudflare uses lava lamps to generate random numbers for encryption². It's a great example of how varied the options are.

As a board gamer myself, the first things that comes to mind when someone mentions "randomizer", I immediately think dice and cards and it's cool to read about things very much outside of that box.

Sophie is a game designer themselves and I wanted to learn more about their journey to game development and to introduce them and their work to you.

Their story is old as time: they liked video games and eventually started to make their own, learning the skills needed as they progressed.

There's this certain divide between people who enjoy randomness in games and those who enjoy determinism. As I discussed randomness with Sophie, they mentioned how they discovered the joys of randomness and how it brings positive surprises in mechanics and story.

Their love for dice and gaming shines through their work. **Dice the Demiurge**³ is a wonderful incremental dice solo game that I recommend you to check out. The art and world building are

beautiful and immersive and thanks to the randomness of dice, every journey is different.

If you ever need a digital dice app when you've lost your dice, **Sophie's Dice**⁴ can help you solve your randomisation problems.

Recently, Sophie's been designing **Fly Jinx**, a print and play board game that is available via their Patreon⁵. Give Sophie your support!

Big thanks to Sophie for creating the most random celebration of the year and answering my questions to provide the readers of this zine a peek behind the scenes.

[1] <https://x.com/mxSophieH/status/1120539243699474432>

[2] <https://www.cloudflare.com/learning/ssl/lava-lamp-encryption/>

[3] <https://sophiehoulden.com/dicethedemiurge/>

[4] <https://sophiehoulden.com/dice/>

[5] <https://www.patreon.com/cw/SophieHoulden>

