RANDOM IS THE ENEMY:
COLLATING COLLECTIBLE CARD + BOARD GAMES

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GAME DEVELOPERS CONFERENCE
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Game Design Experience

- Designed over 3,000 individual game pieces for licensed games including Marvel, DC, WWE, TMNT, Star Trek…

- Won 6 Origins Awards for my game design work, currently nominated for my 7th

- 12 years experience balancing competitive metagames

- Designed (published) miniatures games, board games, role-playing games for past 17 years

Collectible collation

- Collation in collectible games is designing the fun of opening booster packs.

- Many games today still have collations that lead to unnecessary frustration.

- Collation is often an afterthought in game design.

- Every new game company must rediscover how to do proper collations from scratch, because everyone keeps their methods secret.

Why so secret?

- There are good reasons to keep the actual collations secret.

- There is less reason to keep the proper **methods** to create collations secret.

Basic Collation Terminology

- Rarity (3-5 levels)
  - Common
  - Uncommon
  - Rare
  - Super Rare

- Packaging (3 groups)
  - Booster
  - Brick *(Box)*
  - Case

Brick

Three Collation Methods

- Random

- Backstop
  - Random, but if you don't get a super rare after opening several boosters, you will.

- Fixed *(Packout)*
  - Items are not random, and in fact carefully chosen to maximize fun, but players still perceive it as random.

Let's collate!

- We're going to collate the exact same set using two methods and compare the results.
  - Random Collation
  - Fixed Collation with a packout

- This set we're making has 50 total items divided into 4 rarities (16-14-12-8), and 4 items each booster.

Random Collation

	Common	Uncommon	Rare	Super Rare			
Booster breakdown	2	1	2/3	1/3		4	Total # of items per booster
# of items in each rarity	16	14	12	8		50	Total # items in set

Random Collation

	Common	Uncommon	Rare	Super Rare		
Booster breakdown	2	1	2/3	1/3	4	Total # of items per booster
# of items in each rarity	16	14	12	8	50	Total # items in set

	Common A	Common B	Common C		
Common breakdown	3/4	2/3	7/12	2	Total # of commons per booster
# of commons in each group	6	5	5	16	Total # commons in set

What does a packout look like?

Booster #	Common (1-16)		Uncommon (17-30)		Rare (31-42)	Super Rare (43-50)	
1	6	12	20		36		
2	1	14	18			43	
3	16		28	30	31		
4	4	14	17		35		
5	8	15	27			45	Brick #1
6	12		19	24	41		
7	7	10	26		32		
8	2		22		42	49	
9	13	16	30		37		
10	6	9	23		33		Case #1
11	1	12	20			48	
12	2	11	29		39		
13	5		19	25	36		
14	3	10	21		38		
15	7	13	22			46	Brick #2
16	5		23	27	35		
17	4	11	26		40		
18	2	15	24			44	
19	3	4	18		34		
20	8	9	21		33		
21	1	14	28			50	
22	12		19	20	42		

What do the numbers mean?

13

37

30

49

	Common		Uncommon		Rare	Super Rare
Items in rarity:	1-16		17-30		31-42	43-50
Booster #						
1	6	12	20		36	
2	1	14	18			43
3	16		28	30	31	
4	4	14	17		35	
5	8	15	27			45
6	12		19	24	41	
7	7	10	26		32	
8	2		22		42	49
9	13	16	30		37	
10	6	9	23		33	
11	1	12	20			48
12	2	11	29		39	
13	5		19	25	36	
14	3	10	21		38	
15	7	13	22			46
16	5		23	27	35	
17	4	11	26		40	
18	2	15	24			44
19	3	4	18		34	
20	8	9	21		33	
21	1	14	28			50
22	12		19	20	42	

Brick #1

Brick #2

Case #1

3 Ingredients to Make a Packout

- Key numbers
  - 6 total: 3 numbers you're given and 3 numbers to find

- Constraints
  - Minimize the negative experiences

- Bonuses
  - Create surprise and delight in booster opening

Packout Ingredient #1: 3+3 Key Numbers

What you are given

- # of items per booster →
- Total # of items in set →
- Price per booster →

What you find

- Booster breakdown
- # of items in each rarity
- Cost to Collect

Packout Worksheet: Find the other key numbers

	Common	Uncommon	Rare	Super Rare			
Booster breakdown	1.92	1.12	0.64	0.32		4	Total # of items per booster
# of items in each rarity	16	14	12	8		50	Total # items in set
Price per booster	$5.99						

Not good!

	Common	Uncommon	Rare	Super Rare		
Booster breakdown	1.92	1.12	0.64	0.32	4	*Total # of items per booster*
# of items in each rarity	16	14	12	8	50	*Total # items in set*

Price per booster	$5.99

Rare + Super Rare

0.96

Ok, we fixed that…

	Common	Uncommon	Rare	Super Rare		
Booster breakdown	1.56	1.40	0.72	0.32	4	Total # of items per booster
# of items in each rarity	16	14	12	8	50	Total # items in set

Price per booster	$5.99

Rare + Super Rare

1.04

Uncommon issues!

	Common	Uncommon	Rare	Super Rare		
Booster breakdown	1.56	1.40	0.72	0.32	4	Total # of items per booster
# of items in each rarity	16	14	12	8	50	Total # items in set

Price per booster	$5.99

Rare + Super Rare

1.04

Cost to Collect

Common	**$61.44**
Uncommon	**$59.90**
Rare	$99.83
Super Rare	$149.75

Cost to Collect

Ok, we're finally good...

	Common	Uncommon	Rare	Super Rare		
Booster breakdown	1.93	1.03	0.72	0.32	4	*Total # of items per booster*
# of items in each rarity	16	14	12	8	50	*Total # items in set*

Price per booster | $5.99

Rare + Super Rare
1.04

Cost to Collect

Common	$49.57
Uncommon	$81.68
Rare	$99.83
Super Rare	$149.75

Cost to Collect

Still could be better!

	Common	Uncommon	Rare	Super Rare		
Booster breakdown	1.93	1.03	0.72	0.32	4	*Total # of items per booster*
# of items in each rarity	16	14	12	8	50	*Total # items in set*

Price per booster $5.99

Rare + Super Rare
1.04

Cost to Collect

Common	$49.57
Uncommon	$81.68
Rare	$99.83
Super Rare	$149.75

Cost to Collect Differences

Uncommon to Common	$32.11
Rare to Uncommon	$18.15
Super Rare to Rare	$49.92

Cost to Collect
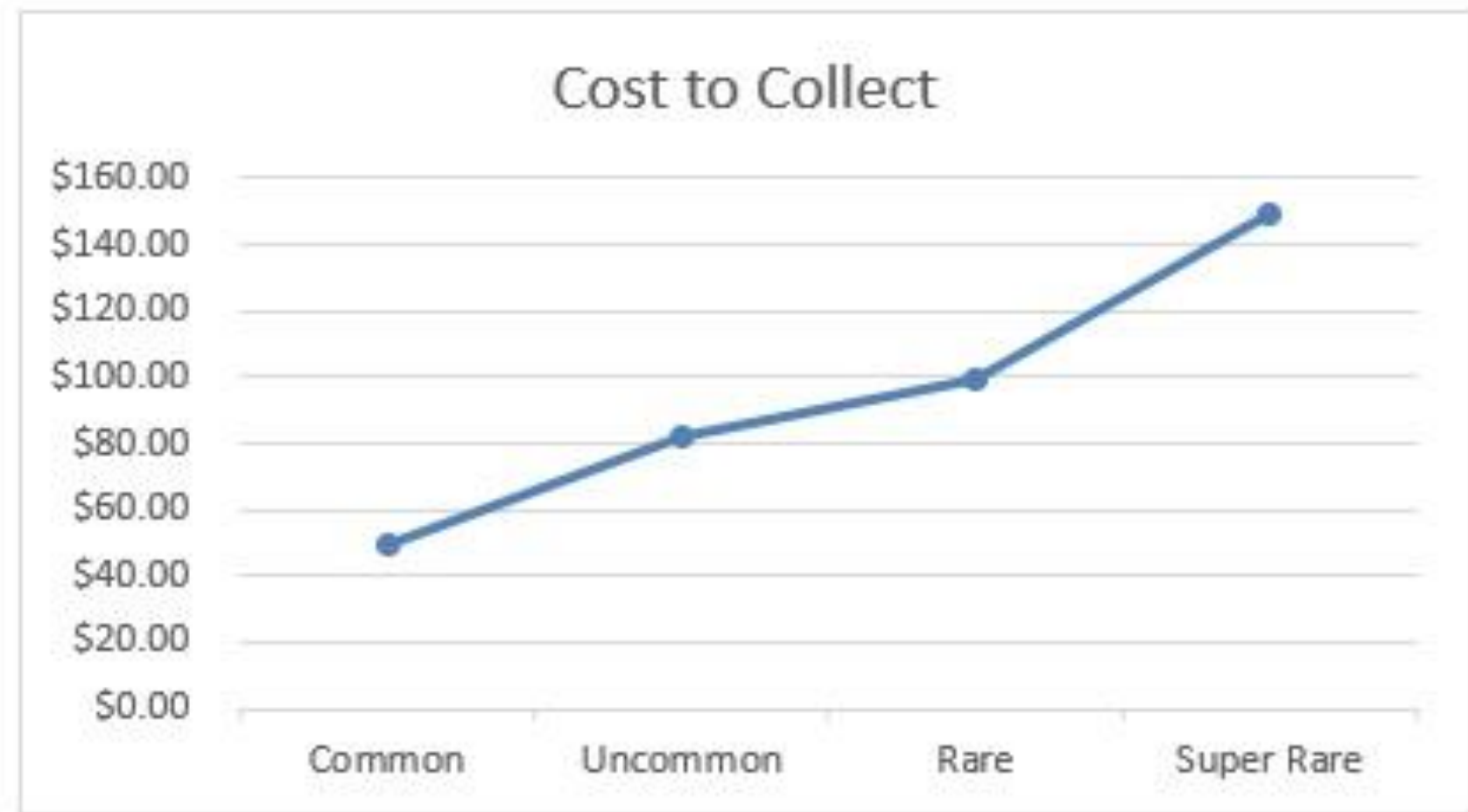
The best booster breakdown

	Common	Uncommon	Rare	Super Rare		
Booster breakdown	1.75	1.21	0.72	0.32	4	Total # of items per booster
# of items in each rarity	16	14	12	8	50	Total # items in set

Price per booster: $5.99

Rare + Super Rare
1.04

Cost to Collect

Common	$54.87
Uncommon	$69.12
Rare	$99.83
Super Rare	$149.75

Cost to Collect Differences

Uncommon to Common	$14.25
Rare to Uncommon	$30.72
Super Rare to Rare	$49.92

Cost to Collect
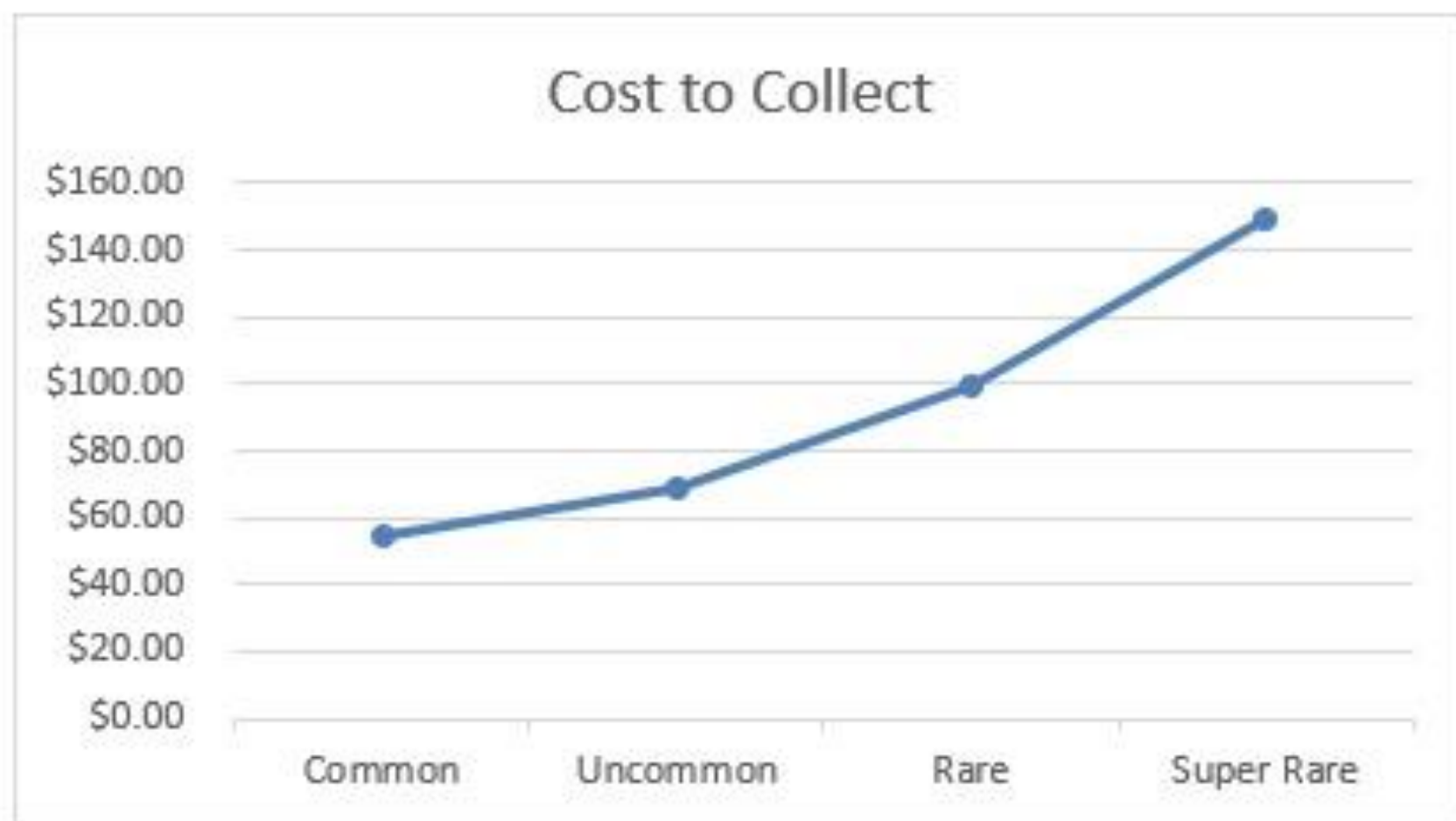
Packout Ingredient #2: Constraints

- Understand which booster opening experiences excite your players, and which leads to negative experiences.
- Examples of constraints:
  - Minimize unnecessary duplication
  - Ensure every booster is unique, and every CU set is unique
  - Minimize missing items in brick/case
  - Eliminate "spikes" of too few or too many items for each rarity
  - Ensure desirable items are as widely distributed as possible
  - Ensure that every booster has a "tier 1" character
  - Constrain by point values / other game information

Example of Constraints (from a real packout)

- Common:
  - Every booster has a different 3 item set
  - Every brick has no more than 1 missing item and no more than 3 of the same item, and 3x happens no more than twice
  - Every case has no more than 1 4x and no more than 3 7x, and nothing below 4x or above 7x

- Uncommon:
  - Every brick has no more than 4 missing items and nothing above 2x
  - Every case has between 4x and 6x of each item

- Rare:
  - Every brick has between 12 and 16 missing items and nothing above 2x, and 2x happens no more than 3 times
  - Every case has every item, and no more than 1x singleton, and no more than 4x of any item.

- Super Rare:
  - Every booster has a different 2 item set of this rarity
  - Every brick has no duplicates, and between 24-27 missing items
  - Every case has no more than 2 missing items, and no more than 2 3x

- Chase:
  - No duplicates at any level, between 10-11 per case

- Foils:
  - Every item has a foil version
  - There are 2-3 foils per booster
  - **You must repeat everything to the left (with different, lower numbers) for all foils in the set, collating them across boosters, bricks, and cases**

- Overall:
  - No repeats within boosters (even normal and foil versions of same item)
  - The total number of missing items in each brick across all rarities is between 55 and 62 **(Also do this for foils)**
  - The total number of missing items in each case across all rarities is between 8 and 11 **(Also do this for foils)**
  - Each brick has a "value" in terms of rare items in it, scaled to their rarity, of between 29.7 and 33.
  - Each case has a "value" in terms of rare items in it, scaled to their rarity, of between 123.9 and 127.9.

Over 30 constraints, each improving consumer experience in different ways.

Packout Ingredient #3: Bonuses

- Extra game items, paired or unpaired: ==Objects – Infinity Stones==
- A-B mechanics that pair items: ==Secret Identity civilians==
- Parallel sets in booster: Foils, Large-size figures
- Split slots: 2 variants, each at half rarity
- Complete set in every case
- Themed boosters
  - All of the original ==Avengers in one pack==
  - "Godpacks" of several high-rarity items together

We've made a packout!

Booster #	Common (1-16)		Uncommon (17-30)		Rare (31-42)	Super Rare (43-50)
1	6	12	20		36	
2	1	14	18			43
3	16		28	30	31	
4	4	14	17		35	
5	8	15	27			45
6	12		19	24	41	
7	7	10	26		32	
8	2		22		42	49
9	13	16	30		37	
10	6	9	23		33	
11	1	12	20			48
12	2	11	29		39	
13	5		19	25	36	
14	3	10	21		38	
15	7	13	22			46
16	5		23	27	35	
17	4	11	26		40	
18	2	15	24			44
19	3	4	18		34	
20	8	9	21		33	
21	1	14	28			50
22	12		19	20	42	

Brick #1 · Brick #2 · Case #1

Random Collation

	Common	Uncommon	Rare	Super Rare		
Booster breakdown	2	1	2/3	1/3	4	Total # of items per booster
# of items in each rarity	16	14	12	8	50	Total # items in set

	Common A	Common B	Common C		
Common breakdown	3/4	2/3	7/12	2	Total # of commons per booster
# of commons in each group	6	5	5	16	Total # commons in set

Random Collation Results

	Common		Uncommon	Rare	Super Rare
	1-16		17-30	31-42	43-50
1	9	11	23	40	
2	16	13	26	39	
3	9	10	30	43	
4	2	5	29	32	
5	13	12	18	31	
6	11	7	21	46	
7	7	8	26	33	
8	11	11	29	35	
9	14	13	23	46	
10	7	10	24	42	
11	8	7	29	37	
12	5	6	17	36	
13	5	3	20	39	
14	12	15	20	35	
15	6	1	24	32	
16	6	2	27	50	
17	4	3	22	32	
18	4	1	24	41	
19	8	10	21	43	
20	13	14	22	34	

Random Collation Results

	Common		Uncommon	Rare	Super Rare
	1-16		17-30	31-42	43-50
87	2	5	18	33	
88	7	9	25	41	
89	9	9	27	42	
90	9	10	18	38	
91	9	8	26	42	
92	9	7	30	35	
93	12	14	28	36	
94	3	1	26	38	
95	4	2	27	39	
96	6	4	24	50	
97	10	10	22	33	
98	8	11	22	37	
99	10	7	17	34	
100	9	8	26	42	
101	13	15	27	34	
102	1	6	28	37	
103	6	4	29	40	
104	13	14	23	41	
105	10	10	25	36	
106	14	14	22	32	

Random Collation vs Packout (Fixed)

	Common		Uncommon	Rare	Super Rare
	1-16		17-30	31-42	43-50
87	2	5	18		33
88	7	9	25		41
89	9	9	27		42
90	9	10	18		38
91	9	8	26		42
92	9	7	30		35
93	12	14	28		36
94	3	1	26		38
95	4	2	27		39
96	6	4	24		50
97	10	10	22		33
98	8	11	22		37
99	10	7	17		34
100	9	8	26		42
101	13	15	27		34
102	1	6	28		37
103	6	4	29		40
104	13	14	23		41
105	10	10	25		36
106	14	14	22		32

	Common		Uncommon	Rare	Super Rare
	1-16		17-30	31-42	43-50
87	12		20, 24		46
88	4	9	19		33
89	8	15	18		42
90	3	16	29		49
91	2	11	22		39
92	5		23, 25		36
93	2	10	17		45
94	6	16	22		35
95	1	6	28		31
96	7	14	19		50
97	13		18, 30		41
98	1	3	27		32
99	7	12	20		48
100	9		21, 24		38
101	15	16	23		33
102	8	13	26		43
103	2	11	25		34
104	5	15	19		35
105	3	14	17		44
106	5		27, 28		37

Packout: Bonus #1

9	13	16	30	37

Packout: Bonus #1

9	Captain America	Hawkeye	Iron Man	Thor

Packout: Bonus #2

175	Black Widow	Vision	Scarlet Witch	Hulk

Packout: Bonus #3

8	2		22	42, 49

42

49

Time Stone

Packout: Bonus #4

11	1	12	20	48

12   20
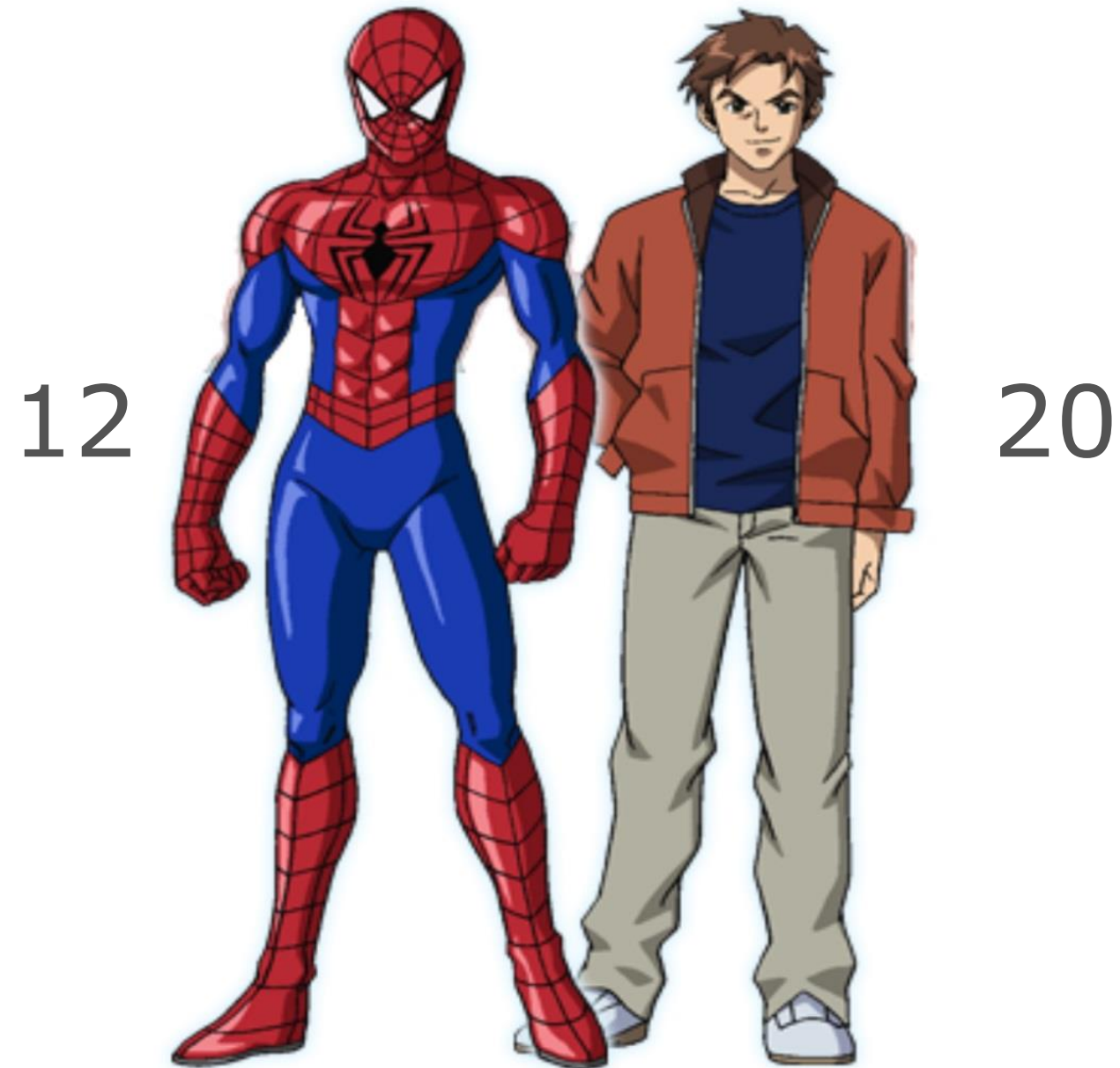
Packout: Bonus #5

Rare	Super Rare
31-42	43-50
	47
33	
31	
	44
38	
41	
	37, 43
32	
34	
	46
40	
33	
42	
	49

47

49

Final Thoughts

- You can't accidentally have good collation. You need work to make it happen.

- Fixed collations like packouts allow you to craft specific game experiences and seed them in the larger collation.

- If your game isn't using a form of fixed collation, consider it.

- Why is random the enemy?

Contact me

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- Check out my future book on collectible collations