

Farkle

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Facebook rules

- Player rolls six dice
- Results of roll scored according to next slide
- If roll worth zero points (player **farkles**) then player's turn over
- Otherwise, dice not contributing points (and some but not all dice contributing points) **may** be rerolled
- Player **must** reroll dice unless roll worth ≥ 300 points

Example

This rule not present in street version of farkle

- Results of second roll scored according to next slide
- If second roll worth zero points (player **farkles**) then turn over and player loses all points arising in first roll
- Player continues rerolling dice not contributing points until she farkles or accumulates ≥ 300 points and chooses to end turn, banking points accumulated
- Player gets another turn if all six dice contribute points

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Scoring first roll

- Combination 1, 2, 3, 4, 5, 6 (in any order) called a **straight**
- A straight worth 1500 points
- Combination of the form x, x, y, y, z, z (in any order, x, y, z distinct) called **three-pair**
- Three pair worth 750 points
- Each die showing 1 worth 100 points, each die showing 5 worth 50 points, except...
- Three 1s worth 1000 points, with each additional 1 worth 1000 points
- Three x s worth $100x$ points ($x \neq 1$) with each additional x worth $100x$ points

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Scoring subsequent rolls

- Subsequent rolls scored in same way as first, except. . .
- Dice rolled previously and retained cannot contribute to combination formed by subsequent roll
- So straight and three-pair not possible in subsequent rolls, since require six dice

- The fewer dice rerolled, the greater the probability of farkling

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Example

- Suppose first roll results in 2, 2, 3, 4, 4, 6
- Worth zero points, so turn over

Example

- Suppose second roll results in 1, 1, 1, 2, 3, 4
- Worth 20 points (three 1's)
- Suppose third roll results in 1, 1, 2, 3, 4, 5

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Example

- Suppose you roll 1, 1, 1, 1, 1, 1
- You can choose to keep 1, 1, 1, 1, 1 and reroll the 1
- Or you can choose to keep 1, 1, 1, 1 and reroll the 1, 1, 1
- Or you can choose to keep 1, 1, 1 and reroll the 1, 1, 1, 1
- Or you can choose to keep 1, 1 and reroll the 1, 1, 1, 1, 1
- Or you can choose to keep 1 and reroll the 1, 1, 1, 1, 1, 1
- Or you can choose to reroll all 6 dice
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Example

- Suppose first roll results in 2, 2, 3, 4, 4, 6
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Example

- Suppose first roll results in 1, 1, 3, 4, 5, 6
- Worth 250 points, so player must re-roll some dice
- Could retain 1, 1, 5 or could retain 1, 1 or

- The fewer dice rerolled, the greater the probability of farkling

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Example

- Suppose first roll yields 1, 2, 2, 2, 6, 6
- Worth 300 points
- Could end turn, banking 300 points
- Could also reroll 6, 6, hoping for more 1s and 5s
- **Caution:** probability of farkling with two dice somewhat high! (calculated later)
- Could also reroll 1, 6, 6
- Probability of farkling lower with three dice
- ... but retaining three 2s (worth only 200 points) takes them out of circulation
- Better to reroll 2, 2, 2, 6, 6

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- Suppose first roll yields 1, 1, 1, 1, 5, 6
- Worth 2050 points!
- Player should retain 1, 1, 1, 1
- Risk-adverse players should also retain 5 and end turn
- Adventurous players might reroll 5, 6 (hoping for more 1s and 5s)
- If both dice show 1 or 5 player gets another turn
- If neither die shows 1 or 5 player loses everything

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education	same county	same state	different state	abroad	total
no degree	2247	470	254	98	3069
high school	3842	1074	712	145	5773
some college	3319	1020	707	112	5158
bachelor's	2072	760	667	182	3681
graduate	913	383	461	118	1875
total	12,393	3707	2801	655	19,556

Calculate probability that randomly selected individual

- 1 moved to different state given that she has only high school diploma
- 2 does **not** have graduate degree given that he moved within same state
- 3 moved abroad **and** has only bachelor's

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