

Motivating Investigations of Probability With Russian Egg Roulette

Fred Peck – University of Montana

Matt Roscoe – University of Montana

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Overview

1. Video Introduction to Jimmy Fallon's Russian Egg Roulette
2. Generate Questions
3. Investigate and Answer Questions in Small Groups
4. Present Results of Investigation to Large Group
5. Discuss "Open Questions" and Extensions
6. Discuss How to Use Russian Egg Roulette in K-16 Education
7. Video Conclusion of Jimmy Fallon's Russian Egg Roulette

https://www.youtube.com/watch?v=cRbqf_2JN4E



Discuss: What probability questions does the video prompt you to ask?
Share: Write one question to be shared on the piece of paper at your table.

Some questions that have been asked...

- How many different games are possible?
- How long is the average game?
- What is the probability that a game of Russian Egg Roulette that the winner ends the game without having an egg cracked on his or her head?
- Is there any advantage to going first in Russian Egg Roulette?
- How does the probabilistic nature of the game change if the mixture of raw to hard boiled eggs changes?
- How does the probabilistic nature of the game change if the number of eggs used is different?
- How does the probabilistic nature of the game change if the game ends when all raw eggs are cracked on someone's head?
- Who would you rather be, Jimmy or Anna, at this point in the game?

Engaging in probability problem solving...

In the Russian Egg Roulette video, Higgins comments to Jimmy Fallon, "...two raw, three cooked...the odds are in your favor..." Explore the mathematics of Higgins' statement. Is it true that the odds are in favor of Jimmy Fallon winning the dual? Construct a mathematical response that you are prepared to defend...

Possibility:

① (J-Hard, A-Hard, J-Hard)

$$\frac{3}{5} \cdot \frac{1}{2} \cdot \frac{1}{3} = \frac{1}{10} \text{ Jimmy wins}$$

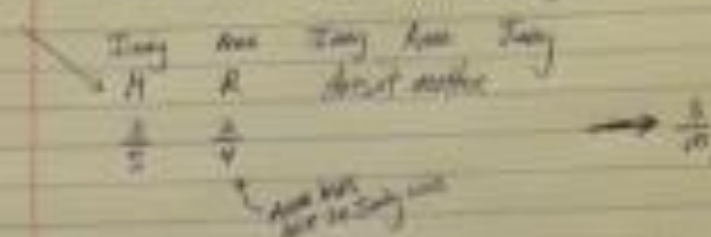
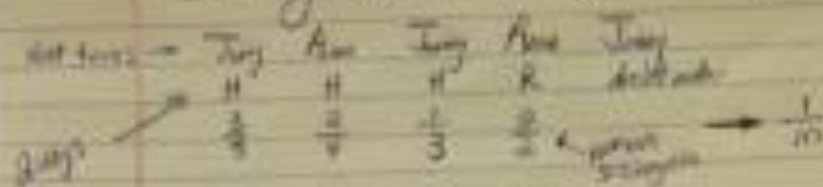
② (J-Hard, A-~~Raw~~)

$$\frac{3}{5} \cdot \frac{1}{2} = \frac{3}{10} \text{ Jimmy wins}$$

$$\frac{1}{10} + \frac{3}{10} = \frac{4}{10} = 40\% \text{ chance Jimmy wins}$$

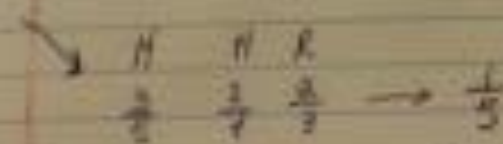
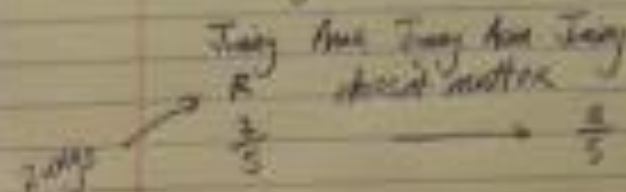
5 eggs left (2 red, 3 blacklined)

Jenny wins the entire game at this point



$$\frac{4}{10} \quad \text{40\%}$$

Jenny loses at this point



$$\frac{2}{5} \quad \text{40\%}$$

Jenny loses

What unanswered questions remain?

Let's think about teaching probability...

- What opportunities for teaching probability does Russian Egg Roulette provide?
- What content standards could be addressed using Russian Egg Roulette?
- What practice standards could be addressed using Russian Egg Roulette?

7.SP.C

Investigate chance processes and develop, use, and evaluate probability models.

7.SP.C.6

Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.

7.SP.C.8

Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

HSS-CP.A.3

Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.

CCSSM Practice Standards

- Make sense of problems and persevere in solving them
- Construct viable arguments and critique the reasoning of others
- Reason abstractly and quantitatively
- Model with mathematics
- Attend to precision
- Use appropriate tools strategically
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

A video conclusion...

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Thank you!

Fred Peck

University of Montana

frederick.peck@umontana.edu

Matt Roscoe

University of Montana

matt.roscoe@umontana.edu