



# **UNDERSTANDING THE ODDS: THE RELATIONSHIPS BETWEEN STATISTICS AND GAMBLING**

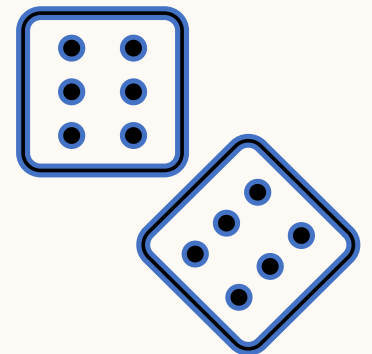
Kelsey Daschuk and Liam Hammond

# OVER-UNDER

## Rules

- The object of the game is to correctly guess whether the dice will roll a total that is either **less than 7**, **greater than 7**, or **equal to 7**.
- You can bet a single coin on one of the three possibilities.
- If your guess was correct, you can double or even quadruple your original bet!
  - If the sum of the two dice is less than 7 – rewards are 1:1
  - If the sum of the two dice is greater than 7 – rewards are 1:1
  - If the sum of the two dice is equal to 7 – rewards are 4:1

Let's get rolling!



1

2

3

4

5

6

7

8

9

11

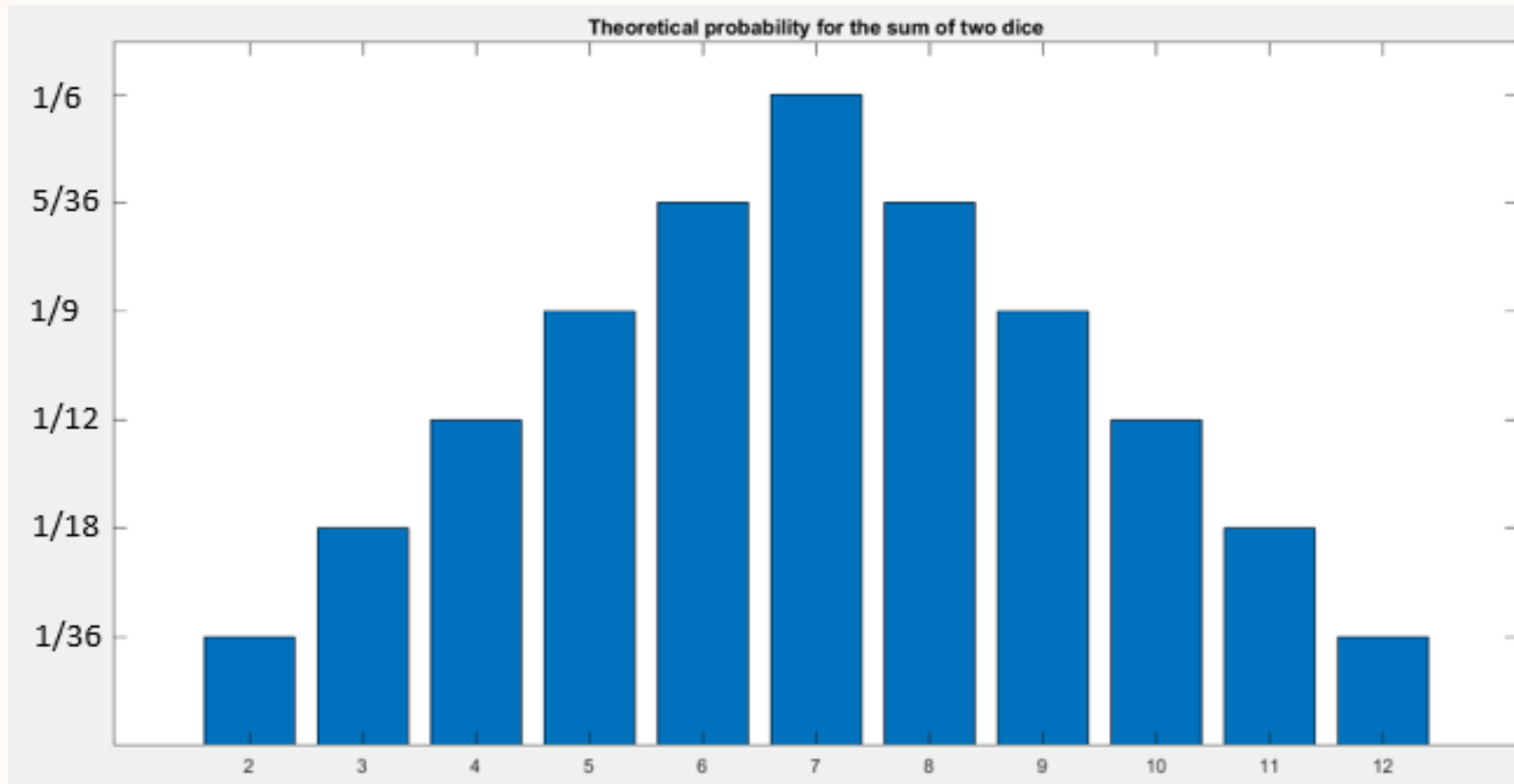
10

12

**WHICH NUMBER IS MOST  
PROBABLE TO BE ROLLED?**

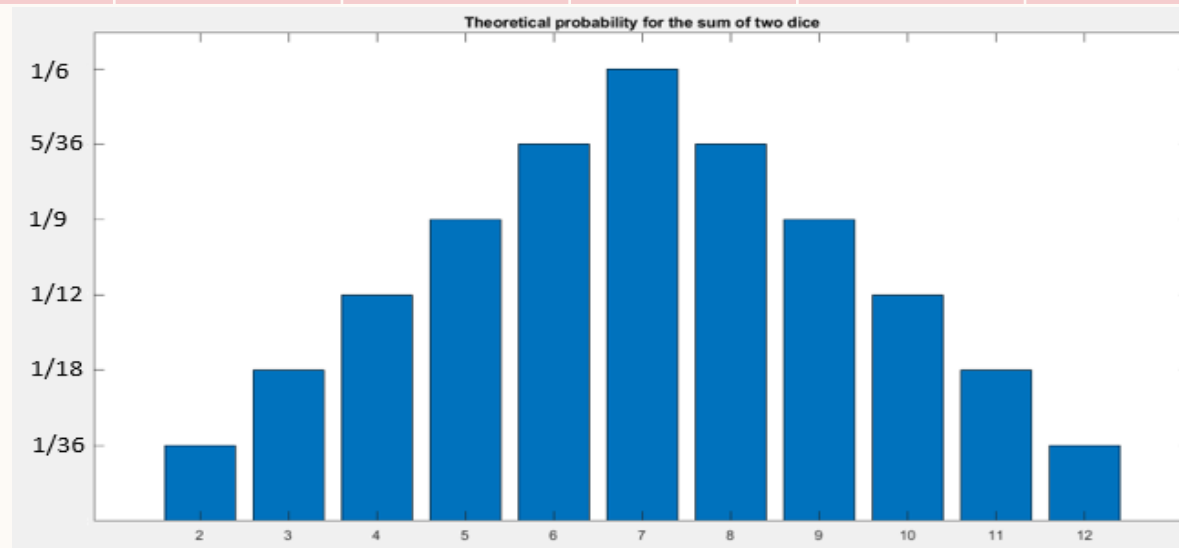


# THEORETICAL OVER-UNDER



# THEORETICAL PROBABILITY EXPLAINED

					1, 6					
				1, 5	2, 5	2, 6				
			1, 4	2, 4	3, 4	3, 5	3, 6			
		1, 3	2, 3	3, 3	4, 3	4, 4	4, 5	4, 6		
	1, 2	2, 2	3, 2	4, 2	5, 2	5, 3	5, 4	5, 5	5, 6	
1, 1	2, 1	3, 1	4, 1	5, 1	6, 1	6, 2	6, 3	6, 4	6, 5	6, 6
2	3	4	5	6	7	8	9	10	11	12

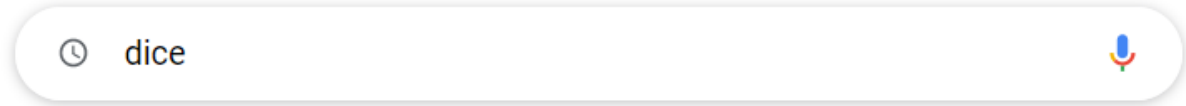


(Dice 1, Dice 2)

# WHAT IF WE ADDED ANOTHER DICE?

Google "dice" and as a table group pick any combination of 3 dice! Your goal is to answer the question:

What is the most probable number to be rolled?

The Google logo is displayed in its standard multi-colored font (blue, red, yellow, green, red).A screenshot of a Google search bar. The search bar is white with rounded corners. On the left, there is a clock icon and the text "dice". On the right, there is a microphone icon.

⌚ dice



# ADAPTING THIS LESSON

- Students create their own games with accompanying statistics
- Teachers provide games, students calculate statistics
- Students research a game of their choosing, share the game and the statistics with the class
- Game night – students share and play the games they've created/researched

# BENEFITS OF THIS ACTIVITY



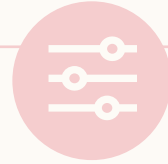
**SOCIAL  
LEARNING  
ENVIRONMENT**  
(WATHALL, 2016)

Students can collaborate and get creative.



**INQUIRY-  
BASED**  
(WATHALL, 2016)

Students can learn statistics conceptually, and apply knowledge across scenarios.



**DIFFERENTIATE**  
(WATHALL, 2016)

Activities involve student choice, and games have varying complexity.



**PEAK INTEREST**

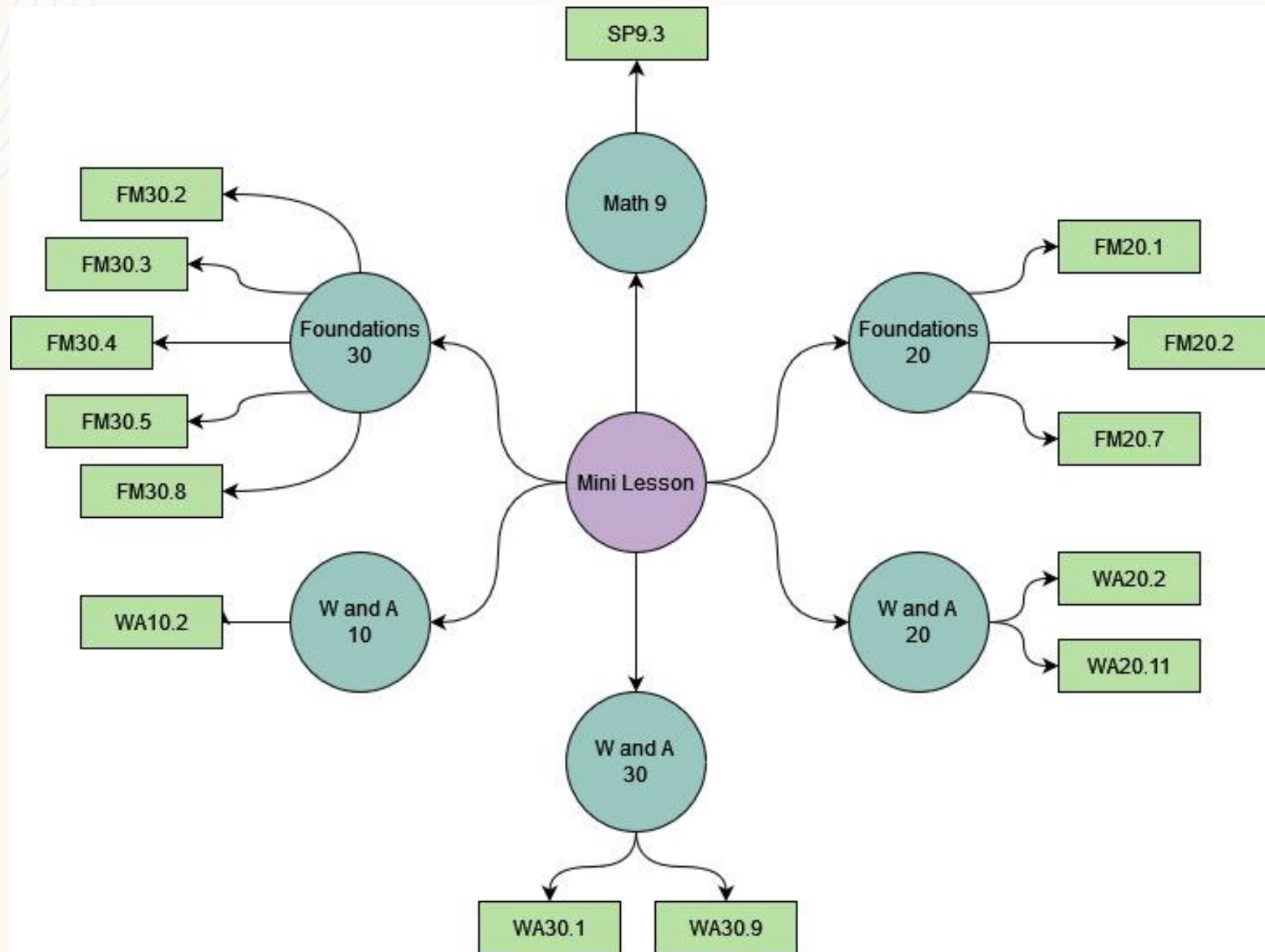
Exposure to where mathematics apply in the real-world.



**MATH IS FUN!**

Turn the tides on the idea that "math is boring" by having some fun!





# REFERENCES

Google Dice:

[https://www.google.com/search?q=dice&rlz=1C1CHBF\\_enCA876CA876&oq=dice+&aqs=chrome..69i57j0i67i650l6j69i60.1156j0j4&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=dice&rlz=1C1CHBF_enCA876CA876&oq=dice+&aqs=chrome..69i57j0i67i650l6j69i60.1156j0j4&sourceid=chrome&ie=UTF-8)

Over-under. (2023, March 27). In *Wikipedia*.

<https://en.wikipedia.org/wiki/Over%E2%80%93under>

Wathall, J. T. H., (2016). *Concept-based mathematics: Teaching for deep understanding in secondary classrooms*. Corwin.