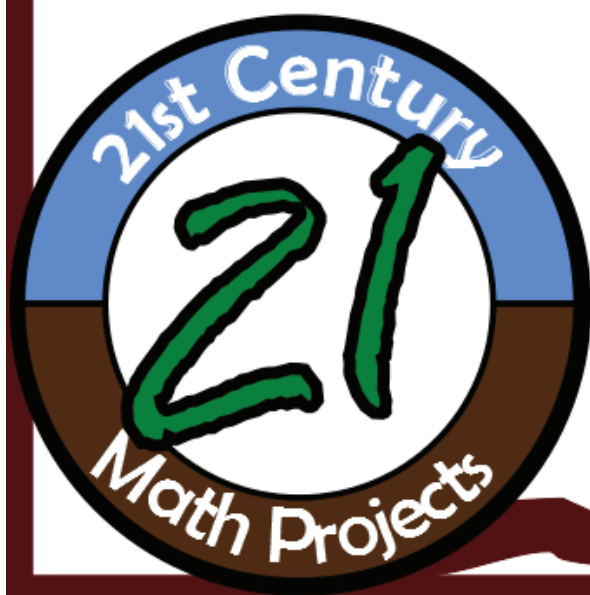


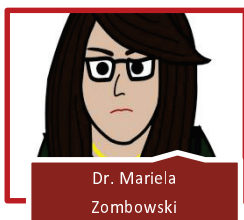
ZOMBIE APOCALYPSE



ZOMBIE APOCALYPSE



The end is near. After an ill-fated Justin Bieber concert, guests from all around the world were unknowingly bitten by individual carrying the Zombie Virus. These guests returned to their homes and proceeded to transform into brain-eating Zombies. This has spread the virus and the Zombie population has erupted.



Dr. Mariela Zombowski

We are sending you the notes of the most renowned expert on infectious diseases, Dr. Mariela Zombowski. Yesterday, while buying a sandwich at Panera Bread, she was bitten by a Zombie. We are scrambling to process information about her transformation and we hope with your help she can be returned to the lab, as human as possible.

Many of her notes are incomplete, but she was working on predictive models for the spread of the virus through population, the speed of the Zombie Virus transformation and promising research for potential antidotes. We hope you can make sense of it and file a full report within 72 hours.

- United Nations Center for Disease Control

*If you are reading this, I've likely become a **Zombie**. Do not trust that the rules of "Zombieland" will keep you safe. The **Zombies** have seen this film and know how to take advantage of the rules. They have all new tricks. The only hope is an antidote.*

*Preliminary data has been collected for **Zombie Population** of each world region. I believe that an antidote will be needed before 80% of a population is infected. If a region reaches the threshold, a quarantine will be necessary as it will be too dangerous for rescue efforts at this time.*

Region	Total Population	80% Threshold
Africa	1,022,000,000	
Asia	4,252,000,000	
Europe	732,000,000	
Latin America & Caribbean	580,000,000	
Northern America	351,000,000	
Oceania	36,000,000	

Name _____

Date _____

Period _____



Zombie Population Day-by-Day

Region	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Africa	12	86	675	5,128	48,304	
Asia	15	1,302	7,155	48,332	5,132,495	
Europe	16	975	9,448	67,219	9,432,030	
Latin America & Caribbean	4	32	194	2,890	46,240	
Northern America	21	869	5,207	51,007	6,721,882	
Oceania	8	564	4,300	61,559	6,549,214	

Predictions... The 80% threshold will be reached in so many days...

Region	Exponential Model	80% Threshold will be reached in...
Africa		
Asia		
Europe		
Latin America & Caribbean		
Northern America		
Oceania		

Thoughts for Report...

Where's the most drastic need for antidote resources?

If an antidote is not ready for 48 hours, what areas should be quarantined?

GROWTH RESEARCH

Four of my assistants have been infected. Although I miss their friendship, it has allowed for first-hand research. I've determined that the **Zombie Virus** has multiple strands of varying strengths and it can be denoted as an exponential function. The total amount of micrograms/milliliters (ranging from 0-10,000) of the Virus and the strand of the virus can be determined with a blood test - so long as the **Zombie** doesn't eat your brain.

$$(\text{strand of virus})^t = (\text{amount of virus}), \text{ in } t \text{ days}$$

***My preliminary research shows that when the Virus reaches a concentration of...

10 mcg/ml.....general irritability

50 mcg/ml.....headaches, muscle aches

100 mcg/ml.....upright, joint less walking

500 mcg/ml.....signs of brain eating tendencies



Zombie Virus Growth by Strand

Z-Strand	Zombie Alpha	Zombie Beta	Zombie Gamma	Zombie Delta
	2.2^t	$8.4^{t/2}$	1.5^{2t}	1.1^{10t}
1 Day				
2 Days				
3 Days				
4 Days				
5 Days				
6 Days				

Thoughts for Report...

Which strand grows the fastest?

Which has greater influence on the growth of the virus the base or the exponent?

THE ANTIDOTE



There is no way to determine how long an ordinary person has been infected with the **Zombie Virus**, but with my subjects I've been able to experiment with **Anti-Zombie Inverse Serums** which have shown promising results. I've used a special element that I call **LOG** (in varying iterations) and it has reversed the **Zombification** process.

If a person has had the **Zombie virus** for 4 days, it will take 4 doses for the serum to have full effect.

*** These antidotes were developed to counteract 6 days of the virus.

Antidote name	Zombie Alpha 2.2^t	Zombie Beta $8.4^{t/2}$	Zombie Gamma 1.5^{2t}	Zombie Delta 1.1^{10t}
$\log_{2.2}(100)$	Ineffective	Ineffective	Ineffective	Ineffective
$\log_{2.2}(113)$	Promising (6 doses)	Ineffective	Ineffective	Ineffective
$\log_{1.1}(304)$		Ineffective	Ineffective	Ineffective
$0.1(\log_{1.1}(304))$		Ineffective	Ineffective	Promising (6 doses)
$0.5(\log_{1.5}(130))$				
$2(\log_{8.4}(593))$				

The development of the antidote has had surprising results. I can predict the result of the final two antidotes on Beta and Gamma.

What would be a theoretical antidote and prescription for **Zombies Epsilon, Zeta and Eta**?

	Zombie Epsilon	Zombie Zeta	Zombie Eta
Strand	3.5	7.1	e
Amount of Virus (mcg/ml)	150	230,636	62
Equation			
Days (Doses Needed)			

*** Note for report, educating healthcare professionals to determine correct dosages is paramount.

Z-DAY



***Please note in this final page of notes, Dr. Mariela Zombowski likely was undergoing her own personal Zombie Transformation. While it is clear she set out an optimistic plan for recovery, her work is incomplete.

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*There is still hope. If the antidotes are manufactured and distributed... yum... brain... yum I'm hungry... stop it! What are you writing, Mariela?! Where was I? Brain taste... NO! Below there are three models for recovery depending on the estimated **Zombie Population** at the time of the antidote development. The longer it takes, the more significant plan will be needed.*

If the antidote is manufactured by...

	Day 6	Day 7	Day 8
Estimated Zombie Population	293,752,650	789,300,000	6,283,000,000
Recovery Strategy	Intensive	Aggressive	Aggressively Intensive
Predictive Model			
Number of Days Until less than 1,000 people infected			

Day 9... it ends. Now where did that brain go?

REPORT

Dr. Mariela Zombowski,

Please understand that the timetable for completing your research is extremely short. In your report, please include your recommendations in regards to the following issues.

- i. A Plan of Action in dealing with the current epidemic crisis. What world region should aid first be rendered? What areas can wait? Please provide your detailed opinion along with data to support your decisions.
- ii. Information regarding the growth of the virus. Which viruses grow faster and how can it be predicted?
- iii. How can an antidote be created? What do healthcare workers need to know in order to prescribe the correct dosage?
- iv. In the event we survive, what realistic safeguards can be put in place to ensure there is greater preparedness in future zombie outbreaks?

We anxiously await your findings.

- The United Nations Center for Disease Control

***Complete a report that meets these specifications and be prepared to present it in front of a panel. Data and details are important. If you do not turn this in on time or do not meet all the requirements you risk destroying the world.