

## Reasoning and Problem Solving – Statistics – Year 6



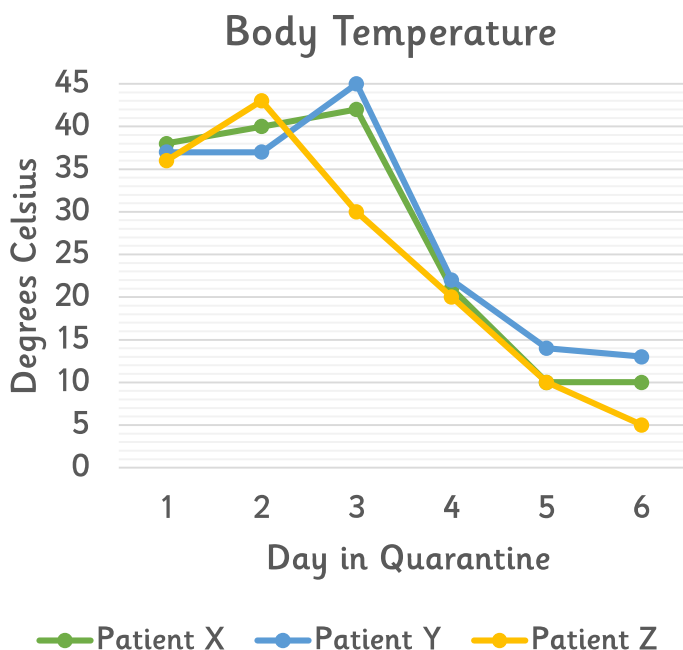
You work amongst some of the greatest scientists in the world at the internationally renowned Sneezums Research Centre of Pathogenic Virology.

The team, led by Dr A. Choo, study viruses that cause ill effects on the population, and create cures to save lives. The team have been hard at work creating an effective vaccine to cure a horrible virus that causes a zombie-like state. You must help Dr Choo and his team complete the research notes and finish developing the vaccine before the virus takes over the country.



### Day 6

The three affected patients are in quarantine. Their symptoms are worsening at an extremely alarming rate. It remains to be seen what the ultimate effects of this virus will be. We are hard at work developing a vaccination but at present there is not much we can do other than continue to monitor symptoms and examine the samples we have taken.



1a. What symptom has Dr Choo measured in this graph?

1b. What are the lowest and highest temperatures recorded?

1c. When did each patient start to show a decrease in body temperature?

Day 11

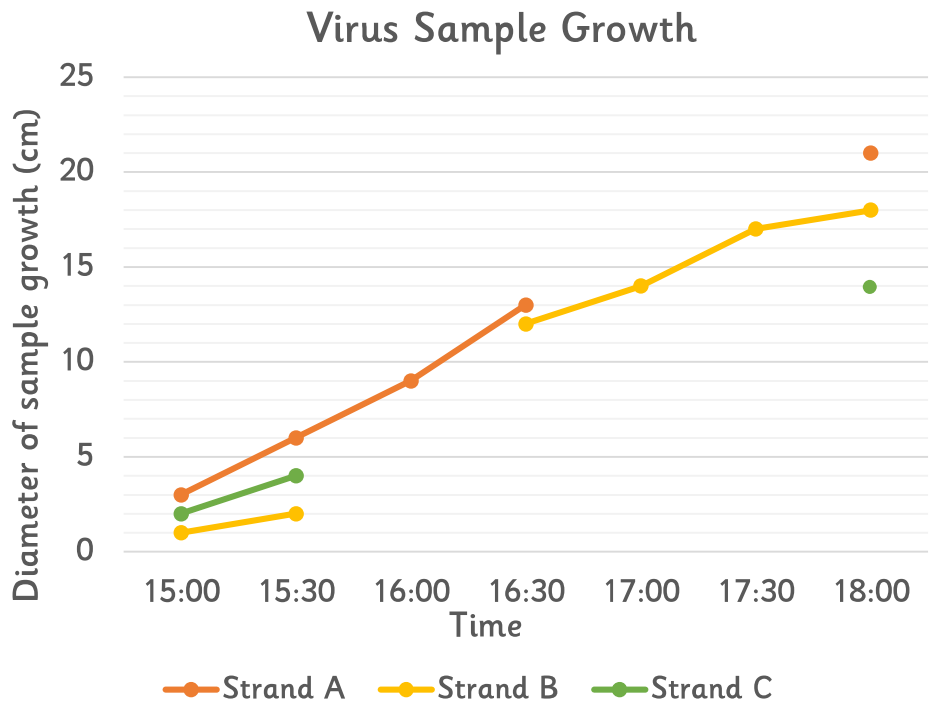
While monitoring the viruses in their petri dishes, I have noticed something extraordinary – they are growing at an incredible rate! Unfortunately, so are the number of patients; whatever this is, it is remarkably contagious. These findings will aid us greatly in developing the vaccination, and not a moment too soon – our quarantine ward here at the lab is already nearly full!

2. Complete the graph to show the following:

Strand A showed no change between 5pm and 6pm.

Strand B showed the greatest change between 4pm and 4:30pm, after a 30 minute plateau.

Strand C increased steadily between 3pm and 6pm.



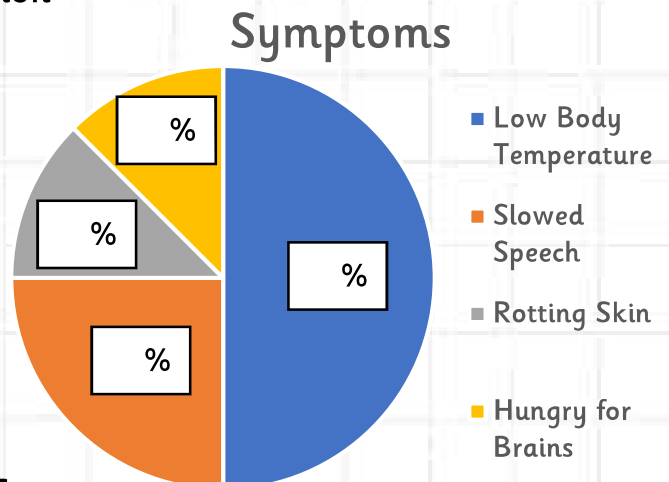
Day 17

The health of all 200 of our quarantined subjects continues to decline dramatically. We have been tracking the four most common symptoms in hopes of finding a clue to the cure, but have had no luck yet!

3a. How many people have reported each symptom on the pie chart?

3b. Which symptoms are the most and least reported?

4. What percentage of subjects are showing each of the symptoms? Fill in the values on the pie chart.



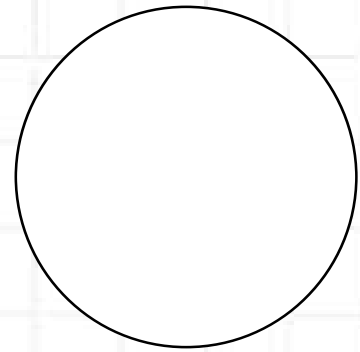
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### Day 24

Quarantine is now filled to capacity. Unfortunately, most of our patients seem to be on the cusp of the advanced stages of infection. We have been testing the trial vaccines as quickly as possible, and are seeing some promising results!

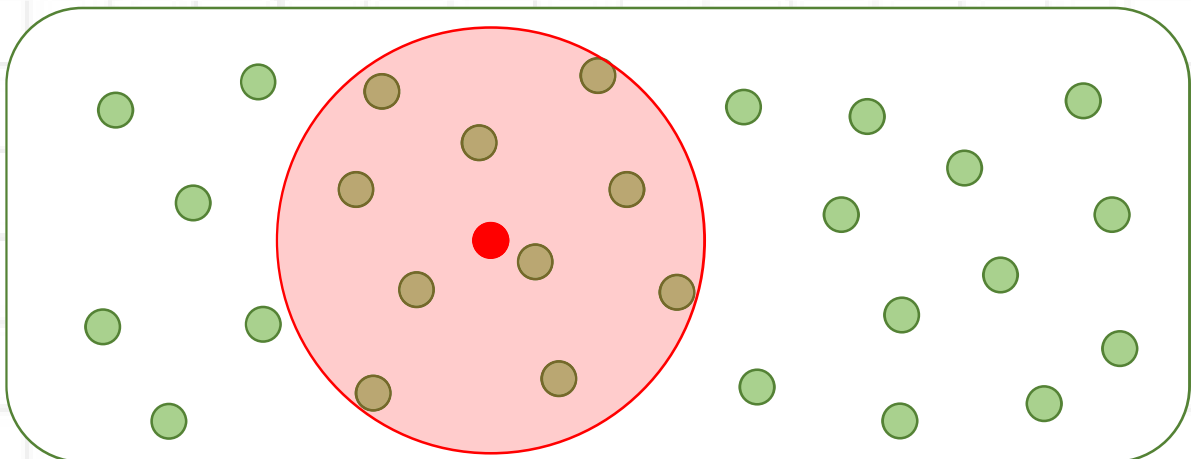
5. Work out the missing information and create a pie chart using the data in the table. Add a title and key to the chart.

Vaccine Strand	Positive test results	Convert to degrees
1	15	$15 \times 4 = 60^\circ$
2		
3		$\text{---} \times 4 = 40^\circ$
4	40	
5		$\text{---} \times 4 = 20^\circ$
Total		$\text{---} \times 4 = 360^\circ$



### Day 26

Breakthrough! One of the lab assistants accidentally dropped a vial of the promising Vaccine #4 while walking through the quarantine ward. Symptoms began improving almost immediately on nearby patients! This has been a very hopeful day, indeed!



This is a representation of the room in the quarantine ward. Each green circle represents 5 patients. The red circle shows where the vial was dropped. The radius of the drop zone is 4.6 metres.

6a. What is the diameter of the area reached by the vaccine?

6b. How many people showed improvement after the accident?

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### Day 28

News of our work has spread like wildfire – every single quarantined patient has been given the vaccine and has shown a full recovery. There do not appear to be any lasting effects from the virus – a truly incredible effort from the team!

The next step is to design mobile vaccination stations to supply the rest of the country with the vaccine.

7a. Fill in the missing information.

	North County	South County	East County	West County	Mean:
Capital cities	122,532	119,593	124,005	121,687	
Surrounding towns	19,882	39,528	53,385	74,667	
Rural communities	6,747	4,332	8,100	7,667	
Mean:					

Dr A. Choo must use these averages to determine roughly how many people, equipment and vaccines he will need to send in order to serve each area. The laboratory has been given a budget to create three different sized stations.

7b. Which set of averages from the table would be most useful in designing the mobile vaccination stations? Why?

7c. Using the table, how many people does each size of mobile vaccination station need to prepare to cater to?

Dr Choo and the Sneezums Laboratory team thanks you for your contribution to such a brilliant breakthrough. The country is safe from a potential disaster thanks to the vaccine you helped develop with your careful calculations!



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