Reasoning and Problem Solving
Statistics – Year 6

About This Resource

This resource is aimed at Year 6 Expected and has been designed to give children the opportunity to consolidate the skills they have learned in Summer Block 3 – Statistics.

The questions are based on a selection of the same 'small steps' that are addressed in the block, but are presented in a different way so children can work through the pack independently and demonstrate their understanding and skills.

Small Steps

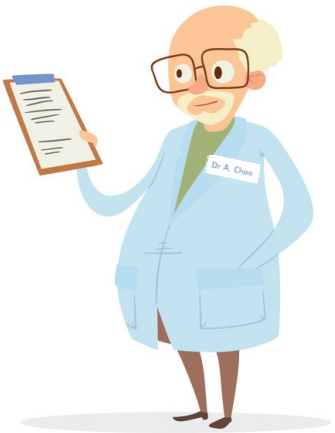
Read and interpret line graphs
Draw line graphs
Use line graphs to solve problems
Circles
Read and interpret pie charts
Pie charts with percentages
Draw pie charts
The mean

National Curriculum Objectives

Mathematics Year 6: (6G5) Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Mathematics Year 6: (6S1) Interpret and construct pie charts and line graphs and use these to solve problems
Mathematics Year 6: (6S3) Calculate and interpret the mean as an average

Did you like this resource? Don't forget to review it on our website.

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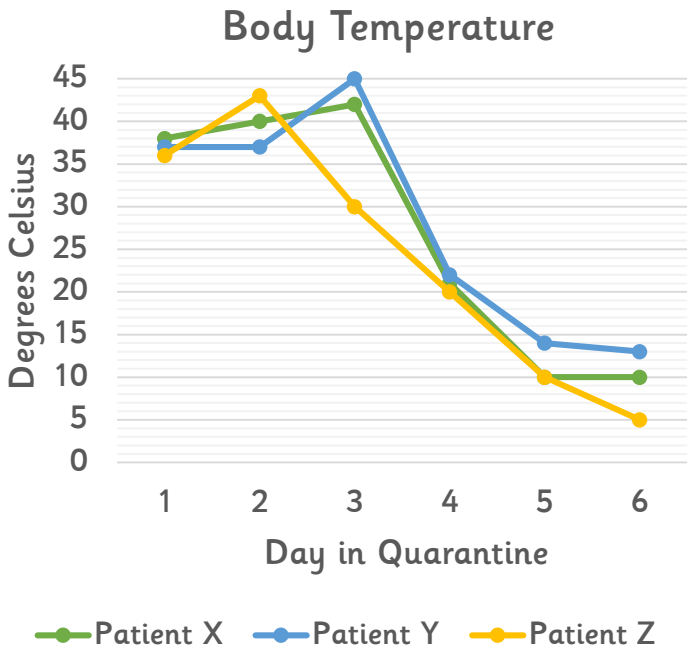
You work amongst some of the greatest scientists in the world at the internationally renowned Sneezums Research Centre of Pathogenic Virology.

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?

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Day 11

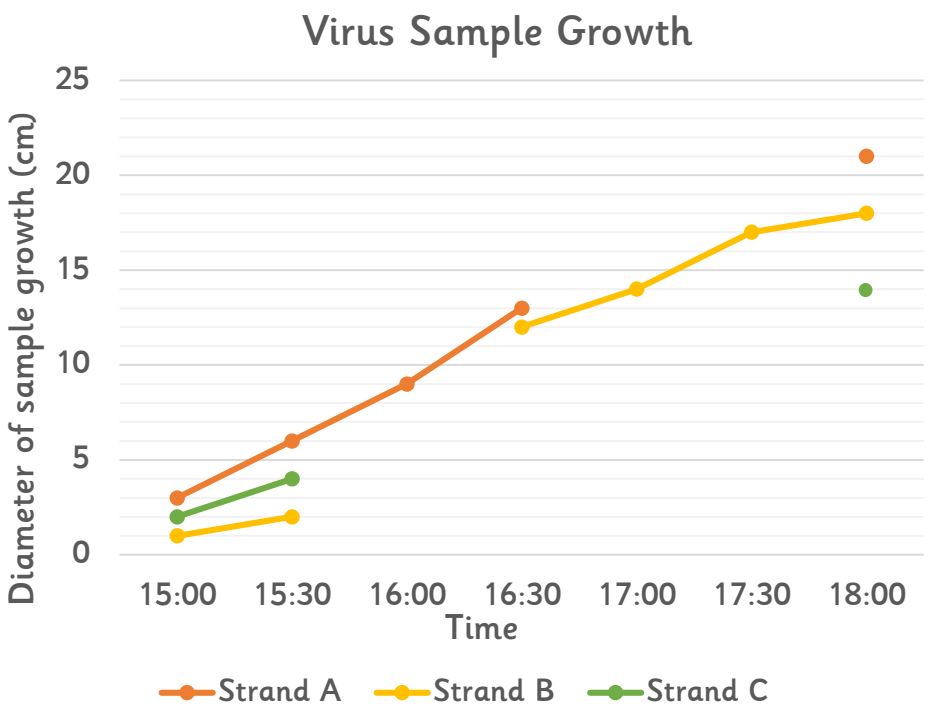
While monitoring the viruses in their petri dishes, I have noticed something extraordinary – they are growing at an incredible rate! Unfortunately, so are the number of patients; whatever this is, it is remarkably contagious. These findings will aide us greatly in developing the vaccination, and not 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.

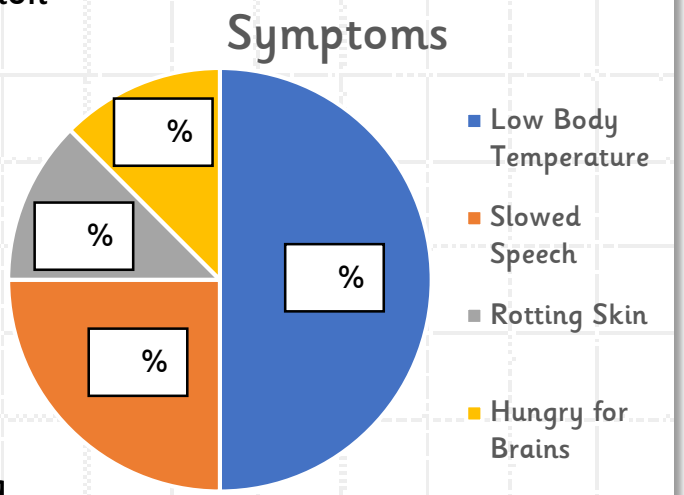


Day 17

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.

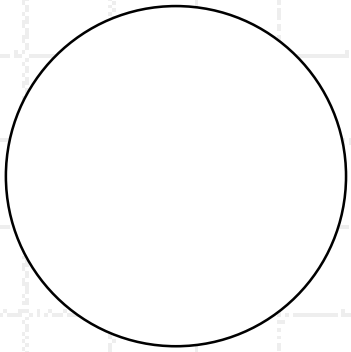
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Day 24

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!

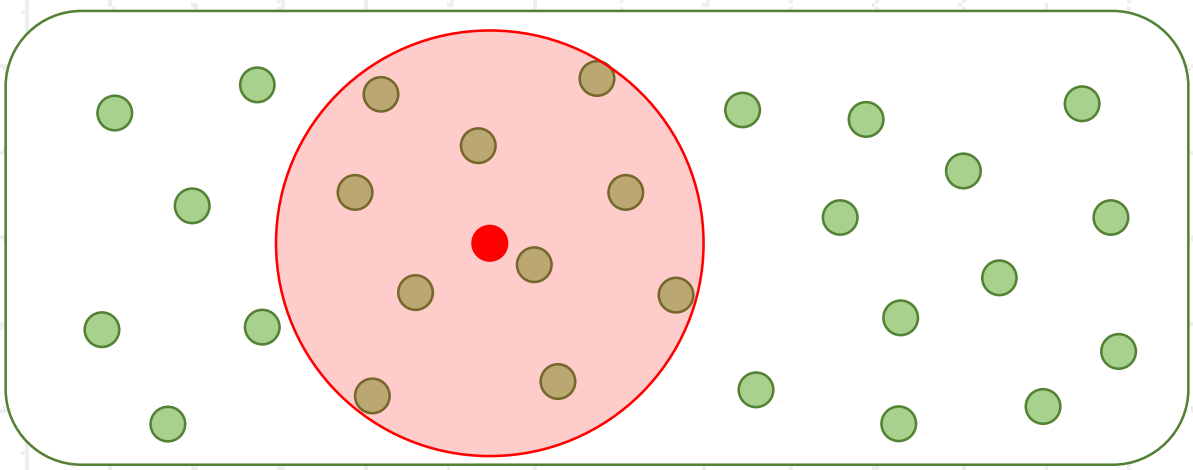
5. Work out the missing information and create a pie chart using the data in the table. Add a title and key to the chart.

Vaccine Strand	Positive test results	Convert to degrees
1	15	15 x 4 = 60°
2		
3		___ x 4 = 40°
4	40	
5		___ x 4 = 20°
Total		___ x 4 = 360°



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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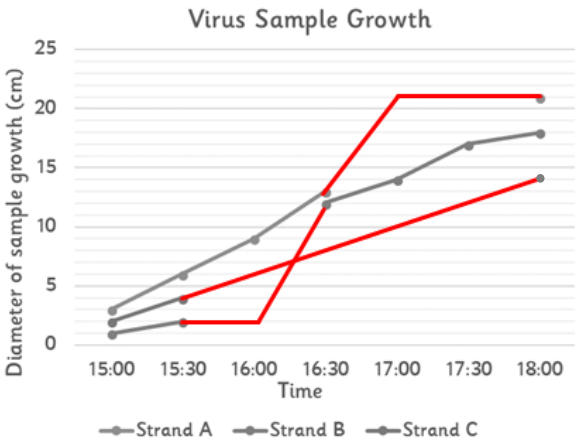
Reasoning and Problem Solving – Statistics – Year 6

1a. Body temperature

1b. Lowest: 5°C; Highest: 45°C

1c. Patient X and Y: day 3, Patient Z: day 2

2.



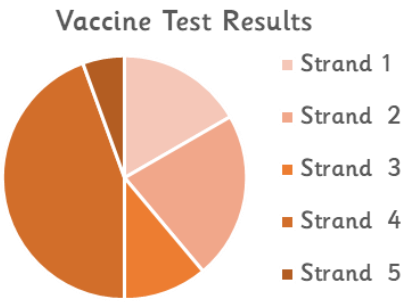
3a. Low body temperature: 100 people; slowed speech: 50 people; rotting skin: 25 people; hungry for brains: 25 people

3b. Most reported – low body temperature; least reported – rotting skin and hungry for brains.

4: Low body temperature – 50%; slowed speech – 25%; rotting skin – 12.5%; hungry for brains – 12.5%

5.

Vaccine Strand	Positive test results	Convert to degrees
1	15	60°
2	20	80°
3	10	40°
4	40	160°
5	5	20°
Total	90	360°



6a. 9.2m

6b. 50 people

7a.

	North County	South County	East County	West County	Mean:
Capital cities	122,532	119,593	124,005	121,687	121,954
Surrounding towns	19,882	39,528	53,385	74,667	46,865
Rural communities	6,747	4,332	8,100	7,667	6,711
Mean:	49,720	54,484	61,830	68,007	

7b. Finding the averages of the cities, towns, and rural communities would be most helpful when designing three different sized mobile stations.

7c. The largest station must cater to 121,954 people; the medium station must cater to 46,865 people; and the smallest station must cater to 6,711 people on average.

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