

Partner School's Maths Competition

Theta World

Week 2 - Data Ride

Introduction:

Finally - the Summer school holidays! You and your mates are going to Theta World to burn some hard-earned pocket money.



Last year you went to Theta World and you missed out on some of the rides and attractions, due to waiting times. Being an organised maths fun land, Theta World have published data on waiting times, so you can work out the best way to navigate the park.

Your ultimate goal is to get through your favourite rides during the day in as little time as possible.

There are many rides and attractions at Theta World, but the first six you want to go to are the Rollercoaster, Haunted House, Ferris Wheel, Cha-Cha, Pendulum ride and Meet the Lions.

Meet the Lions is only available between 9am and 1pm, and unfortunately, the week you want to go, the Tower of Terror is closed all week for planned maintenance.

This week's challenge has two tasks that you must compete (Task A and B) and two bonus tasks (Task C and D).

You may wish to use software like Microsoft Excel to help you with these tasks.

Check out this video tutorial on using averages in Excel:

<https://youtu.be/jeRgLGndvpk>

You can download the data required for tasks A and B here:

<https://tinyurl.com/MathCompData>

Good luck!

Hint: Be careful which type of averages you use 😊

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Task A:

Of all the six rides and attractions that you want to go to, across the 10 days of data, which has the shortest **mean** waiting time? (*Data in above link, page 1*)

TIP: You will need to include/workout **all the times** available for each ride and attraction to calculate the **mean** waiting times!

Task B:

Of all the six rides and attractions that you plan to go on, which one has the **largest** difference in wait time across the 10 days? (*Data in above link, page 1*)

TIP: The difference between wait times is the **Range**!

Bonus Task C:

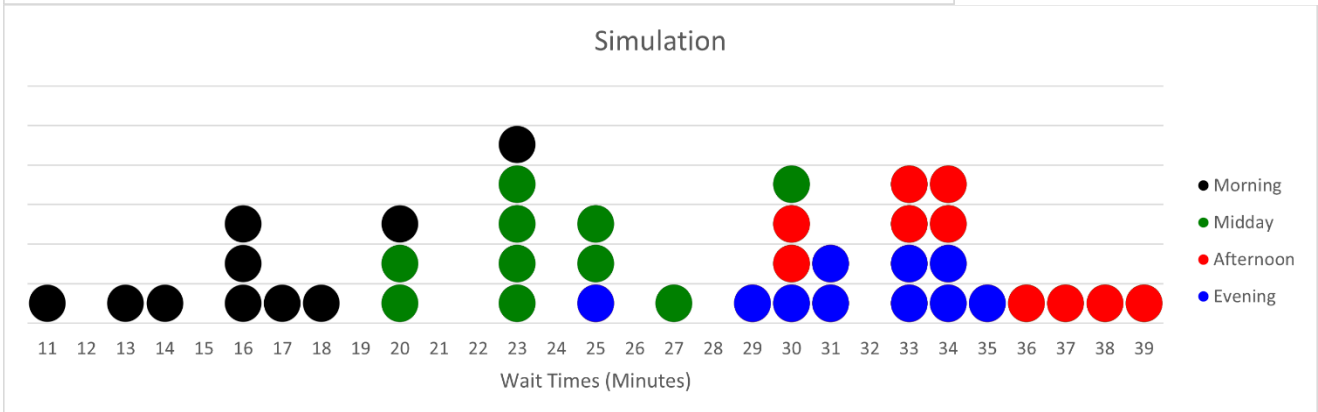
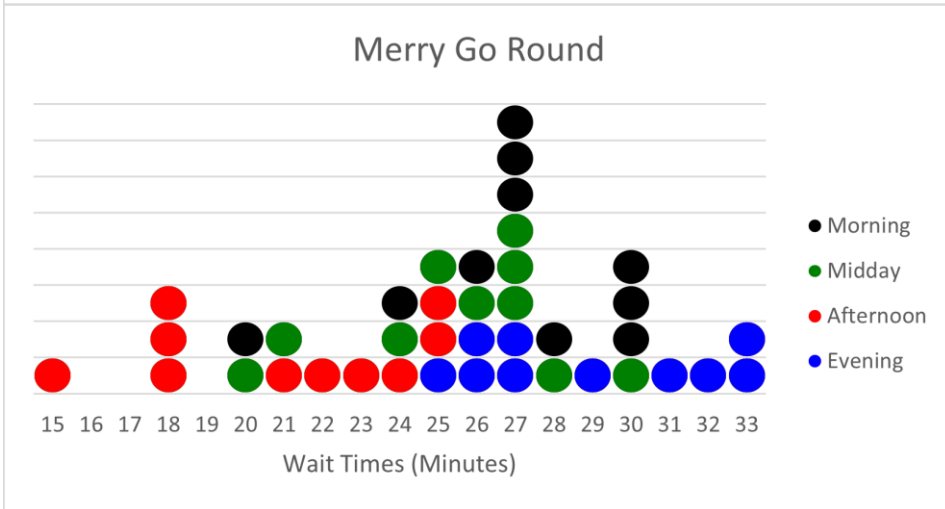
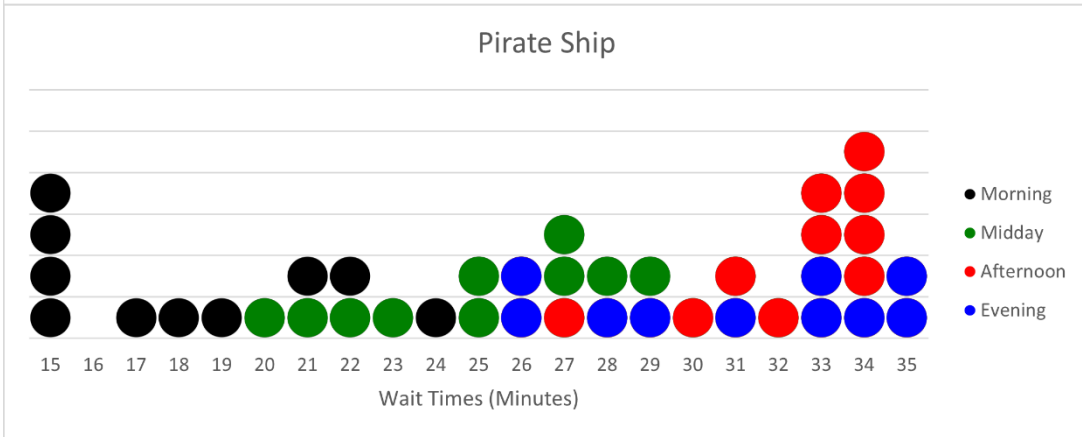
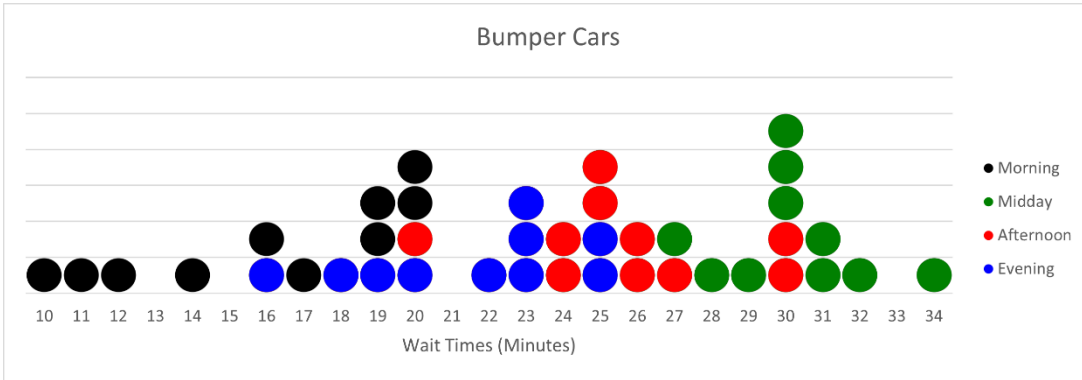
Theta World have created the following dot plots (*see Bonus Task C Dot plots, Page 3*) showing the wait times over **10 days**. Now it's your turn to work out the **shortest wait time** and determine how to fit the Bumper Cars, Pirate Ship, Merry Go Round and Simulation into your busy schedule.

Question 1: What is the **mode** wait time for each of the four rides across the **10 days** of data?

Question 2: Which of the four rides has the **shortest average wait time** for the **Morning, Midday, Afternoon** and **Evening** sessions across the **10 days**? For each ride you have selected, what is the **mean** wait time that you have calculated?

Question 3: If you could spend all day at Theta World, what is the fastest order to experience **ALL** four rides? You must go on one ride per time period (**Morning, Midday, Afternoon** and **Evening**).

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Bonus Task C – Dot Plots:



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Bonus Task D:

Great news – the Tower of Terror has reopened! Theta World have created stem and leaf plots (below) showing the wait times over **10 days**.

You and a group of friends are planning to go on all the rides at Theta World over two days, from 11am - 5pm. Together you have come up with two plans (Table D.2 & D.3, see page 5) that include a unique parade every day from 2pm to 2.30pm and a half an hour lunch break. While researching the Theta World website, your friend has found a table documenting the duration of ride/attraction (Table D.1, see below).

Question 1: Which plan below will allow you and your friends to complete all of Theta World's rides and attractions with the **lowest total of duration** and **mean wait time**? You must choose only **one plan**.

Question 2: What is the **total time** (in minutes) for your chosen plan?

Tower of Terror stem and Leaf Plot:

Tower of Terror wait times:							
Morning		Midday		Afternoon		Evening	
Stem	Leaf	Stem	Leaf	Stem	Leaf	Stem	Leaf
1	6 7 7 8 9	2	6 6 6 7	1	5 6 8 8 9 9	1	5 5 7 9 9
2	0 1 2 2 3	3	0 0 1 2 5 5	2	0 1 1 4	2	0 2 3 4 4

Table D.1

Ride Name	Ride Duration (minutes)	Ride Name	Ride Duration (minutes)
Meet the Lions	25	Ferris Wheel	15
Haunted House	25	Bumper Cars	15
Tower of Terror	15	Merry Go Round	10
Spin Coaster	15	Pirate Ship	15
Rollercoaster	20	Simulation	20
Cha-Cha	10	Pendulum Ride	15

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Table D.2 - Plan One:

Day One		
Midday (11am-1pm)	Afternoon (1pm-3pm)	Evening (3pm-5pm)
Ferris Wheel	Cha-Cha	Tower of Terror
Pirate Ship	Merry Go Round	Rollercoaster
Simulation	Lunch	Bumper Cars
	Parade	
Day Two		
Midday (11am-1pm)	Afternoon (1pm-3pm)	Evening (3pm-5pm)
Meet the Lions	Haunted House	
Pendulum Ride	Lunch	
	Parade	

Table D.3 - Plan Two:

Day One		
Midday (11am-1pm)	Afternoon (1pm-3pm)	Evening (3pm-5pm)
Meet the Lions	Bumper Cars	Rollercoaster
Pirate Ship	Ferris Wheel	Haunted House
Lunch	Parade	
Day Two		
Midday (11am-1pm)	Afternoon (1pm-3pm)	Evening (3pm-5pm)
Ferris Wheel	Pendulum ride	Tower of Terror
Simulation	Merry Go Round	
Lunch	Parade	

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Q&As:

Q1: Do I have to take travel time between rides into account?

A: No, the travel time is accounted for in the total ride time

Answer form here:

<https://survey.sparkchart.com/start/5q7nfabNLDwajQ4NwX44Xgs>

