Theme Park Maths

Name _____

Class _____

Theme Park Maths

The scenario

A plot of land has become available and you have decided to build a brand new theme park.

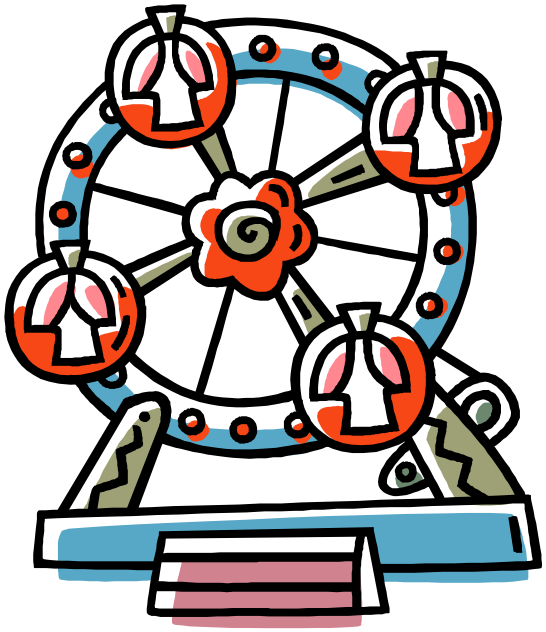
You have managed to secure a £500 000 loan from the bank.

During this activity you will have a range of tasks to complete, from building your theme park, to working out how much it costs to run and most importantly working out how much profit you can make.

Task 1

Your first task is to plan your park. The piece of square paper you will receive will be your park. You must carefully decide what sort of rides you are going to have. You also need to think about the other facilities visitors will need when they come to your theme park, for example, toilets, cafes, shops and paths between all the facilities and rides.

Many theme parks have different areas that are 'themed'. For example, you might like to have an African area, a wild west American area or a space area. Think carefully about what you would like to include in yours and make your park the best in the UK.



Task 1 – Setting up your theme park.

Your spending limit is £500 000. Design and draw your theme park on the squared paper. You must not go over your spending limit and **you must have** car parks, toilets, paths to connect all the items, cafes and shops for your visitors, not just rides.

Each attraction comes under a different category. Each category varies in price. Choose carefully from the prices and information page, making sure you have something which appeals to everyone.

Remember to keep a record of all of the different items you have included in your park. Create a table and keep a tally of each item. You will also need to include the total cost of each item and how much you have spent altogether to make sure you do not go over your budget. The table below is an example to get you started:

Item	**Tally**	**Total Cost**
Category 1 Ride	III	£150,000
Category 2 Ride	~~IIII~~	£125,000
Category 3 Facility	II	£16,000
Toilets	~~IIII~~ IIII	£9,000
Bins	~~IIII~~ ~~IIII~~ II	£600
Trees	~~IIII~~ ~~IIII~~ ~~IIII~~ III	£3,600
	TOTAL:	£304,200

Prices

Category 1 Attractions - £50,000 each. These attractions take up 12cm²

A rollercoaster

A water ride

A ferris wheel

Category 2 Attractions - £25,000 each. These attractions take up 6cm²

A bouncy castle

Dodgems

A Fun House

A haunted house

Merry-go-round

A Pirate Ship

Spinning Ride

Circus Tent

Train

£500,000

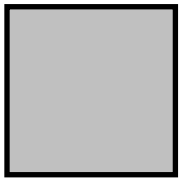
Category 3 Attractions - £8000 each. These attractions take up 4cm²

A Cafe

A Shop

Ice Cream Stand

Other facilities and attractions – These items are individually priced



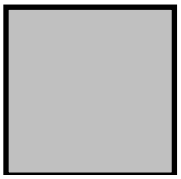
Path - £200 per 5cm length

Tree - £200 per square
(1 square per tree)

Lake - £1000 per square

Toilets - £1000.
4cm² per block of toilets

Rubbish Bin - £50
1cm² per bin



Car Park - £500 per square

Task 2: Running your theme park

To run your theme park, the following costs will apply to each item that you have every day. How much will it cost to run your theme park for one day?

Complete the table below for **YOUR** Theme Park. Once you have filled in the Total Costs per day for each item, you will need to add them all together to work out the **Total Operating Costs** per day for your entire theme park.

Costs			
Item	**Staff Costs**	**Electricity/Maintenance/Repairs**	**Total Costs per day**
Category 1 Ride	£40 a day	£50 a day	
Category 2 Ride	£30 a day	£30 a day	
Category 3 Facility	£20 a day	£20 a day	
Toilets	£5 a day	£5 a day	
Bins	£31.50 a week	£5.25 a week	
Trees	£91.25 a year	None	
		TOTAL OPERATING COSTS:	

Draw a table to record your costs. Complete this on squared paper.

Task 3 – Entry Fee

Decide on a price per person to enter your theme park.

How much money does it cost to open your park each day? _____

How many visitors do you think you will have each day? (remember it's a brand new park and not many people know about it yet!)

Make an estimate: _____

Share your plan with a partner, you must not tell them anything about your park. Using the criteria below, decide on the appropriate **price category** entry fee for your park. Remember, it will need to be a best fit.

Price Category 1 - £20 per person.
- Four or more category 1 rides
- 10+ rides in total
- 6+ category 3 facilities
- A well set out park with carefully placed bins, toilets and paths.

Price Category 2 - £15 per person.
- Two or more category 1 rides
- 7+ rides in total
- 4+ category 3 facilities
- Some consideration to where bins, toilets and paths are placed.

Price Category 3 - £10 per person
- One or more category 1 rides.
- 5+ rides in total.
- 2+ category 3 facilities.
- Some errors in where bins, toilets and paths are placed which may lead to unhappy customers.

Decide on the entry price and enter it here £ _____

Task 4 – How much do you make on the entry fee?

Calculate how much you make each day based on the entry fee you set on the previous page.

Day	Number of visitors	Gate Takings	Day	Number of visitors	Gate Takings
1	50		**16**	89	
2	75		**17**	104	
3	66		**18**	130	
4	49		**19**	209	
5	61		**20**	143	
6	67		**21**	99	
7	102		**22**	111	
8	110		**23**	206	
9	87		**24**	350	
10	21		**25**	300	
11	24		**26**	278	
12	67		**27**	453	
13	66		**28**	294	
14	98		**29**	367	
15	109		**30**	359	

Task 5 – Profit and Loss

Each visitor to your theme park will spend:

- £4 at each café you have _____
- £3 at each shop you have _____
- £1 at every ice cream stand you have _____

Work out your total profit from the gate takings, cafes and shops. Now take away your total costs that you have already worked out and find your profit or loss for each day.

Day	Income					Total Costs (2)	Profit (1- 2)
	Gate Takings	Cafe	Shop	Ice Cream	Total (1)		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
						Sub-total:	
11							
12							
13							

14							
15							
16							
17							
18							
19							
20							
						Sub-total:	
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
						Total Profit / Loss:	

How much money do you have in the bank after the first month? You need to think about the money you have left from your initial loan.

_____

£500,000

Task 6 – Finding your First Season Profit

Your monthly profit increases by 10% each month for next 5 months. Calculate you profit for the rest of the year that your park is open for.

Month 1 Profit _____

Month 2 Profit _____

Month 3 Profit _____

Month 4 Profit _____

Month 5 Profit _____

Month 6 Profit _____

First Season Profit _____

Total in the bank at the end of the first season _____

Task 7 – Making improvements

It is the end of your first season and your park has made _____ profit. You can now invest 50% of the profit to try and improve your park.

You can now make a number of improvements to your park. This can be done in two ways:

Making Improvements to your park

1) Clearing land you already have
   - £10000 per square to clear land where there is a category 1 or 2 attraction/facility
   - £5000 per square to clear land where there is a category 3 facility
   - £1000 per square to clear a toilet, path, car park, lake or tree.

OR

Buying extra land
   - £3000 per new square.

2) Advertising

You can advertise in three different ways

Leaflet
These will cost you £10000. However, you will increase your attendance by 10% a day

Radio
This will cost you £15000. However, you will increase your attendance by 20% a day

TV
This will cost you £25000. However, you will increase your attendance by 30% a day

Decide what improvements you wish to make and record them clearly showing what you have spent and what you have left. Remember you can only spend 50% of the profits you made last year.