



**MOREY'S PIERS AMUSEMENT OPERATIONS BUSINESS MATH
SELF GUIDED WORKSHOP
GRADES 5-12**

Core Curriculum Standards:

Dear School Days Participant,

Congratulations on your decision to participate in the Education Extravaganza Workshop Program, and specifically, the Amusement Operations Business Math self-guided workshop! This workshop has been designed to provide you with an applied math experience, offering insight into many of the day to day calculations and business math decisions made in an amusement park setting.

Morey's Piers, like many amusement /water parks is a seasonal business. This means that the company does not operate all year like a traditional business would. Seasonal businesses have a smaller window of opportunity to generate revenue (aka "Make Money"), which means that a company has to be efficient, maximizing the amount of money it makes during a short period of time. Payroll is one of the biggest expenses that an amusement park has. In order to maximize revenue, amusement parks must continuously monitor efficiency and payroll to ensure a profitable season.

Educators:

There are five (5) sections of the workshop. The first four (4) sections are identified by an attraction name. The fifth section provides a challenging summary analysis for advanced students. Sections 1-4 are structured to include questions of various difficulty levels which are identified as **Basic** thru **Advanced Complex**. The questions are designed to build upon each other, allowing the student to apply prior learning and information from one section to the next. Teachers can elect to assign their students questions of a specific difficulty level or range so as to offer a differentiated instruction experience. Section 5 of the workshop can be completed during your visit or as a post-trip lesson plan back in the classroom.

Students can work individually or in groups and should be encouraged to share information and learning in order to complete the workshop.

The Glossary of Amusement Operations Terms and Assumptions provides interesting information that will be critical for the student to complete the self-guided workshop.

The Glossary of Amusement Operations Terms and Assumptions can be used in coordination with a pre-visit lesson plan including the creation of flash cards for the terms and assumptions. Prior to your visit, students should be asked to research the current New Jersey Minimum Hourly Wage and record this information in the space provided. This information will be necessary to complete the *Complex* and *Advanced Complex* questions in the workshop.

Students:

Please complete as many questions as you can for each attraction/section below. Questions range in difficulty from *Basic* to *Advanced Complex*. Ask your teacher(s) which questions you should complete during your visit to Morey's Piers.

Please review the Glossary of Terms and Assumptions prior to answering any questions. You may need to refer back to the Glossary section of this handbook during your participation in the workshop.

Feel free to use a calculator to answer questions in the workbook, but always remember it is NEVER safe or permitted to hold or use any loose articles, such as a calculator or cell phone, while riding any attraction.

GLOSSARY OF AMUSEMENT OPERATIONS TERMS and ASSUMPTIONS

Attraction: Amusement ride.

Cost Per Ticket: Tickets are a form of admission to all attractions. For this workshop, the cost per ticket is \$1.10

Tickets to Ride: Each attraction is assigned a ticket value. This represents the number of tickets required to ride the attraction. Tickets to Ride are posted on a sign at each attraction.

Ex. The Sea Serpent requires 8 Tickets to Ride.

Total Ticket Cost: How much money it costs to ride an attraction. $\text{Cost Per Ticket} \times \text{Tickets to Ride} = \text{Total Ticket Cost}$

Ex. The Sea Serpent requires 8 Tickets to Ride. The Cost Per Ticket is \$1.10. The Total Ticket Cost is: $8 \times \$1.10 = \8.80 .

New Jersey (NJ) Minimum Wage: \$_____ per hour. (Google "Current NJ Minimum Wage" and fill in the blank. You will need this information to complete the workshop)

Queue Line: A roped or fence off area next to an attraction where guests stand and wait before loading onto an attraction.

Minimum Height Requirement: The minimum height (inches) that a guest must be in order to ride an attraction.

Load: Getting seated and secured into an attraction ride vehicle.

Unload: Leaving the ride area after an attraction has come to a complete stop.

Theoretical: Tested beliefs or outcomes, commonly regarded as correct, that can be used to predict future performance.

Run Time: The amount of time (minutes/seconds) that an attraction will physically move from start to finish.

Load Time: The theoretical amount of time (minutes/seconds) it should take to move guests from the queue line and secure them into the ride vehicle seats.

Unload Time: The theoretical amount of time (minutes/seconds) it should take for guests to exit the ride area following the end of Run Time.

Cycle Time: $\text{Load Time} + \text{Ride Time} + \text{Unload Time} = \text{Cycle Time}$

Ex. 1 minute Load Time + 2 minutes Ride Time + 30 seconds Unload Time = 3 min 30 sec Cycle Time

Theoretical Capacity: The maximum number of guests that can ride the attraction per hour.

Staffing Level: The number of employees required to operate an attraction. Each attraction has a Minimum and Maximum staffing level which is determined by the anticipated hourly guest attendance at the ride throughout the day.

Efficiency: A percentage of number of guests who actually ride an attraction in an hour when compared to its theoretical hourly capacity.

Ex. 80 guests actually ride an attraction in one hour. The theoretical capacity for the attraction is 100 guests per hour. During that hour, the attraction is operating at 80% efficiency.

Revenue: The amount of money an attraction can generate: **(Capacity x Total Ticket Cost)**

Ex. 100 riders per hour x \$8.80 Total Ticket Cost = \$880.00

Payroll: The amount of money paid to employees to work at an attraction.

Profit: The amount of money earned after expenses: **(Revenue – Payroll)**

Ex. An attraction generated \$100.00 of revenue in an hour. The attraction's payroll expense for that hour was \$15.00. The attraction's profit for that hour was: \$100.00 - \$15.00 = \$85.00

KIDDIE SWINGS ATTRACTION (Min Staffing Level (1), Max Staffing Level (2))

BASIC

- 1) What is the **Minimum Height Requirement** for the attraction: _____

BASIC

- 2) How many **Tickets to Ride** this attraction: _____
What is the **Cost Per Ticket**: \$ _____
What is the attraction's **Total Ticket Cost**: \$ _____

BASIC

- 3) There are 16 ride vehicles and 1 seat per ride vehicle. What is the maximum number of guests that can ride per **Ride Cycle**: _____

MODERATE

- 4) If the **Load Time** is 1 minute, and the **Run Time** is 2 minutes, and the **Cycle Time** 30 seconds, what is the **Unload Time**? _____

ADVANCED

- 5) Given the attractions **Cycle Time**, what is the **Theoretical Hourly Capacity** for the Kiddie Swings?

COMPLEX

- 6) What is the theoretical maximum **Revenue** (Capacity x Total Ticket Cost) at the Kiddie Swings per hour?
\$ _____

KITE FLYER ATTRACTION (Min Staffing Level (1), Max Staffing Level (2))

BASIC

- 1) What is the minimum height requirement for the attraction: _____

BASIC

- 2) How many **Tickets to Ride** this attraction: _____
What is the **Cost Per Ticket**: \$ _____
What is the attraction's **Total Ticket Cost**: \$ _____

BASIC

- 3) There are 12 ride vehicles and 2 seats per ride vehicle. What is the maximum number of guests that can ride per ride cycle: _____

MODERATE

- 4) If the **Load Time** is 1 minute, and the **Run Time** is 2 minutes, and the **Unload Time** is 30 seconds, what is the **Cycle Time**? _____

ADVANCED

- 5) Given the attractions **Cycle Time**, what is the **Theoretical Capacity** for the Kite Flyer? _____

COMPLEX

- 6) What is the theoretical maximum **Revenue** at the Kite Flyer per hour? _____

ADVANCED COMPLEX

- 7) The NJ Minimum Wage per hour is \$ _____. At maximum staffing, what is the maximum **Profit** (Revenue – Payroll) that can be generated per hour at the Kite Flyer? _____

MOBY DICK (Min Staffing Level (1), Max Staffing Level (2))

BASIC

- 1) What is the minimum height requirement for the attraction: _____

BASIC

- 2) How many **Tickets to Ride** this attraction: _____
What is the **Cost Per Ticket**: \$ _____
What is the attraction's **Total Ticket Cost**: \$ _____

BASIC

- 3) There is 1 ride vehicle and 24 seats per ride vehicle. What is the maximum number of guests that can ride per ride cycle: _____

MODERATE

- 4) If the **Unload Time** is 30 seconds, **Run Time** is 1 minute and 30 seconds, and the **Cycle Time** is 3 minutes, what is the **Load Time**? _____

ADVANCED

- 5) Given the attractions **Cycle Time**, what is the **Theoretical Capacity** for the Moby Dick? _____

COMPLEX

- 6) What is the maximum **REVENUE** that can be generated per hour at the Moby Dick?
\$ _____

ADVANCED COMPLEX

- 7) The NJ Minimum Wage per hour is \$ _____. At maximum staffing, what is the maximum **PROFIT** (Revenue – Payroll) that can be generated per hour at the Moby Dick? _____

SEA SERPENT (Min Staffing Level (3), Max Staffing Level (6))

BASIC

- 1) What is the minimum height requirement for the attraction: _____

BASIC

- 2) How many **Tickets to Ride** this attraction: _____
What is the **Cost Per Ticket**: \$ _____
What is the attraction's **Total Ticket Cost**: \$ _____

BASIC

- 3) There are 7 ride vehicles and 4 seats per ride vehicle. What is the maximum number of guests that can ride per ride cycle: _____

MODERATE

- 4) If the **Load Time** is 1 minute, **Run Time** is 1 minute and 45 seconds, and the **Unload Time** is 15 seconds, what is the **Cycle Time**? _____

ADVANCED

- 5) Given the attractions cycle time, what is the theoretical capacity for the Sea Serpent? _____

COMPLEX

- 6) What is the maximum **REVENUE** that can be generated per hour at the Sea Serpent?
\$ _____

ADVANCED COMPLEX

- 7) The NJ Minimum Wage per hour is \$_____. At maximum staffing, what is the maximum **Revenue** that can be generated per hour at the Sea Serpent? \$_____

ADVANCED COMPLEX

- 8) If the Sea Serpent operates at 85% efficiency with minimum staffing, 90% efficiency with 4 staff members, and 95 % efficiency at maximum staffing, at what staffing level will the ride be most **Profitable**? \$_____

STAFFING FOR MAXIMUM EFFICIENCY AND REVENUE (CRITICAL ANALYSIS – ADVANCED COMPLEX)

- 1) At maximum staffing which attraction, the Kite Flyer or Moby Dick, is most **Profitable** per hour?

- 2) It requires 11 staff members to operate all 4 attractions in this exercise at max staffing and efficiency. Assuming each reduction in a staff member results in a 25% reduction in efficiency, if you have five (5) staff members “call out” (not show up for work), which ride(s) would you take them from in order to have the least impact on **Profit**? Explain your answer:

- 3) At the Kiddie Swings, if you can load three quarters of the rides vehicles in 3 minutes and 30 seconds, but all of the ride vehicles in 4 minutes, which loading pattern will generate more revenue per hour? -

- 4) If you had to close a ride other than the Kiddie Swings due to staffing levels, which ride would you close to ensure the least amount of impact on combined hourly **Profit**? _____
- 5) If all four rides are operating at 95% efficiency with maximum staffing, what is the total combined **Profit** you will generate per hour? \$ _____