Math Link: Wrap It Up!

Math Link: Wrap It Up!

You are an amusement park manager who has been offered a job planning a new park in a different location.

a) Give your park a name and choose a location. Explain how you made your choice. State the population of the area around the park that you chose.

b) Choose a reasonable number of rides for your park. Assume that the fixed costs include $5000 in addition to maintenance and wages. Assume maintenance and repairs cost $400 per ride and that it takes eight employees to operate and supervise each ride. Conduct research and then decide:
• the number of hours that rides will be open
• the average hourly wage for employees

What might be the problem if you choose too few or too many rides?

c) Organize your estimates about operating expenses and revenues for the park. You can use the table in the Math Link on page 367 as a reference.

d) Write an expression to represent each of the following for the number of rides you chose:
• expenses per visitor
• revenue per visitor

e) For the number of rides you chose, how many visitors will be needed for the park to make a profit? Show all your work. Justify your solution mathematically.

f) Assume that you have now opened your park. You find that 0.1% of the people in the area come to the park per day, on average. Using this information, will your park earn a profit? If not, explain what changes you could make. Show all your work and justify your solution.

MathLinks 9, page 371

Suggested Timing
30–40 minutes

Blackline Masters
Master 1 Project Rubric
BLM 9–1 Chapter 9 Math Link Introduction
BLM 9–6 Section 9.1 Math Link
BLM 9–9 Section 9.2 Math Link
BLM 9–11 Section 9.3 Math Link
BLM 9–13 Chapter 9 Math Link: Wrap It Up!

Specific Outcomes
PR4 Explain and illustrate strategies to solve single variable linear inequalities with rational coefficients within a problem-solving context.

Planning Notes

As a class, read the instructions for MathLink: Wrap It Up! Clarify that in this activity students will demonstrate their understanding of how inequalities can be used to represent a situation and solve a related problem. Discuss the assessment criteria.

Students will need to organize all of the necessary information. They might use a table similar to that in the Math Link on page 367, as suggested in part c), or use one of their own design. Students may have trouble constructing an inequality to represent the situation. Help them by asking what has to be true in order for any business to make a profit. Encourage them to express an inequality verbally before trying to construct it algebraically. Once students realize that "revenue must be greater than expenses," then they can focus on writing an expression for each side of this inequality separately.

Some students might instead base their inequality on the idea that "revenue minus expenses must be greater than zero." This might be more difficult for students to use to generate an inequality for the situation because the revenue and expense terms are not on separate sides of the inequality sign.

Meeting Student Needs
• Students who are not confident in their ability to handle the MathLink: Wrap It Up! can first revisit the Math Links.

Answers

Math Link: Wrap It Up!

Check that student answers include:
• a description of the park, its location, and the area's population
• the total number of park rides
• the park's operating hours, and the employee hourly wage
• estimates for park revenue and expenses; can use table format
• algebraic expressions for expenses/revenue per visitor
• calculations showing the park's profit
• calculations, using "actual" attendance information, showing any changes needed for the park's profit

Assessment	Supporting Learning
Assessment *of* Learning	
MathLink: Wrap It Up! This chapter problem wrap-up gives students an opportunity to apply and display their understanding of using inequalities to solve problems. It is important for students to organize information. They must clearly show both how the problem can be represented with an inequality, as well as how solving the inequality can help analyse the situation. **Master 1 Project Rubric** provides a holistic descriptor that will assist you in assessing student work on this MathLink: Wrap It Up! Page 504 in this TR provides notes on how to use this rubric for the MathLink: Wrap It Up!	• You may wish to have students review the work they have completed in the Math Links in sections 9.1, 9.2, and 9.3 before they begin. • If students have not completed the Math Links, you may wish to provide them with **BLM 9–1 Chapter 9 Math Link Introduction**, **BLM 9–6 Section 9.1 Math Link**, **BLM 9–9 Section 9.2 Math Link**, and **BLM 9–11 Section 9.3 Math Link**. • You may wish to have students use **BLM 9–13 Chapter 9 MathLink: Wrap It Up!**, which provides scaffolding for the chapter problem wrap-up.

The chart below shows **Master 1 Project Rubric** for tasks such as the MathLink: Wrap It Up!
and provides notes that specify how to identify the level of specific answers for the project.

Score/Level	Holistic Descriptor	Specific Question Notes
5 **(Standard of Excellence)**	❑ Applies/develops **thorough** strategies and mathematical processes making **significant** comparisons/connections that demonstrate a **comprehensive** understanding of how to develop a complete solution ❑ Procedures are **efficient and effective** and may contain a **minor mathematical error** that does not affect understanding ❑ Uses **significant** mathematical language to explain their understanding and provides **in-depth** support for their conclusion	• provides a complete and correct solution
4 **(Above Acceptable)**	❑ Applies/develops **thorough** strategies and mathematical processes for making **reasonable** comparisons/connections that demonstrate a **clear** understanding ❑ Procedures are **reasonable** and may contain a **minor mathematical error** that may hinder the understanding in one part of a complete solution ❑ Uses **appropriate** mathematical language to explain their understanding and provides **clear** support for their conclusion	Demonstrates one of the following: • provides a complete response with weak communication or missing justification in one part of the question • provides a complete and correct response to all parts of the question except f); incorrectly uses 0.1% or is unable to determine changes needed to make a profit
3 **(Meets Acceptable)**	❑ Applies/develops **relevant** strategies and mathematical processes making **some** comparisons/connections that demonstrate a **basic** understanding ❑ Procedures are **basic** and may contain a **major error or omission** ❑ Uses **common** language to explain their understanding and provides **minimal** support for their conclusion	Demonstrates one of the following: • correctly completes parts a) to d), with an error in one of the expressions • provides a correct response to parts a), c), d), and e) based on an incorrect part b) • provides partially correct answers to all parts of the question
2 **(Below Acceptable)**	❑ Applies/develops **some relevant** mathematical processes making **minimal** comparisons/connections that lead to a **partial solution** ❑ Procedures are **basic** and may contain **several major mathematical errors** ❑ Communication is **weak**	Demonstrates one of the following: • correctly completes parts a) and b) and a significant, if not complete, part c) • provides a correct response to parts a) and b), with correct starts to any two remaining parts
1 **(Beginning)**	❑ Applies/develops an **initial start** that may be **partially correct** or could have led to a correct solution ❑ Communication is **weak or absent**	Demonstrates one of the following: • provides a correct initial start to two parts of the problem • correctly completes part a), identifies a population, and starts part b); communication may be weak