

## Using Rollercoaster Tycoon to Address 8<sup>th</sup> Grade Technology Standards



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## Teaching Guide Overview



Congratulations! You are about to revolutionize your classroom and reinforce curriculum in ways that you never imagined possible! This guide describes how to successfully integrate the video game Roller Coaster Tycoon into your 8<sup>th</sup> grade technology classroom. The hard part is already over as you have taken the first step toward intergrading video games into your classroom by reading this guide.

Video games have been fascinating young and old minds alike for more than two decades now. They provide a mentally stimulating, fun, ever changing experience that keeps players coming back for more. If only students took such an interest in schoolwork! Well now they can, as you will learn through this guide to bridge the gap between gaming for fun and gaming for education purposes. So fasten your seat beat, put your tray tables in the upright and locked position, and get ready to supercharge your classroom in ways never seen.

### Roller Coaster Tycoon

Roller Coaster Tycoon is a simulation/strategy game released in 2003 for the XBOX gaming platform and was produced by Atari. The game is rated “E” for everyone and is for 1 player, offline play only. It is also available for the PC platform.



### Using Roller Coaster Tycoon in the Classroom

Roller Coaster Tycoon is a simulation/strategy game that challenges players to design, manage, and maintain a theme park. Players control every aspect of the park including layout, ride construction, ticket & food prices, staffing, finances, and research and development. Consequently, there are numerous ways to integrate the game into curriculum to enhance students engagement, and interest. For example, business teachers could utilize the game to

enhance lessons on advertising and consumer research. Mathematic teachers can focus on the financial end of running a theme park, which includes ticket & concession prices, receiving loans for acquisition of new land for expansion, and maintaining a yearly budget.

This guide will focus on using Roller Coaster Tycoon to reinforce the technological design and problem-solving loop as gamers will be given a game scenario in which a theme park as issues that need to be solved. Players will need to work their way through the design loop in order to identify, analyze, and solve a particular scenario.

### **The Advantages of Teaching using the Roller Coaster Tycoon Game**

Utilizing a game such as Roller Coaster Tycoon for teaching the design loop and construction technology to 8<sup>th</sup> graders, provides both teachers and students with an exciting, engaging, and versatile educational experience. When designed and implemented effectively, this video game and can breathe life into dull curriculum and create a level of excitement and interest not seen with traditional instructional methods. By actively engaging learners, this video game enables students to assume a larger role in their own education. Players are continuously making choices that effect their advancement within the game based on information and clues discovered while playing. Success requires players to focus on short term goals while working toward are more comprehensive larger goals throughout the game. Development of these critical and logical thinking skills is necessary for advancement within the game. Players that play the game aimlessly might enjoy the experience, but they will not progress in the game unless they develop and execute a plan of attack based on information derived from the game. One final advantage of teaching with this game is that students will not necessarily consider the experience educational. As a result, they may be more receptive to trying something new and will embrace the experience.



## **Goals and Objectives**

The goal of this guide is to provide teachers with a ready-made comprehensive manual that can guide them through the integration of the Roller Coaster Tycoon game into the classroom. By harnessing the excitement and enthusiasm created with this game, students will be provided with a highly engaging means of developing critical and logical thinking skills.

## **New Jersey Core Curriculum Content Standards for Technological Literacy**

The following standards are the cornerstone of Technology Education in New Jersey. All lesson and activities are based off these standards as they provide a guide to content throughout the discipline. This gaming guide was designed to address the following two core content standards 8.1 and 8.2

### **Standard 8.1 Computer and Information Literacy**

All students will use computers applications to gather and organize information and solve problems. Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:

#### **A. Basic Computer Skills and Tools**

1. Use appropriate technology vocabulary.
2. Use common features of an operating system (e.g., creating and organizing files and folders).
3. Demonstrate effective input of text and data, using touch keyboarding with proper technique.
4. Input and access data and text efficiently and accurately through proficient use of other input devices, such as the mouse.
5. Create documents with advanced text formatting and graphics using word processing.
6. Create a file containing customized information by merging documents.
7. Construct a simple spreadsheet, enter data, and interpret the information.
8. Design and produce a basic multimedia project.
9. Plan and create a simple database, define fields, input data, and produce a report using sort and query.
10. Use network resources for storing and retrieving data.

11. Choose appropriate electronic graphic organizers to create, construct, or design a document.
12. Create, organize and manipulate shortcuts.

## **B. Application of Productivity Tools**

### **Social Aspects**

1. Demonstrate an understanding of how changes in technology impact the workplace and society.
2. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
3. Explain the purpose of an Acceptable Use Policy and the consequences of inappropriate use of technology.
4. Describe and practice safe Internet usage.
5. Describe and practice "etiquette" when using the Internet and electronic mail.

### **Information Access and Research**

6. Choose appropriate tools and information resources to support research and solve real world problems, including but not limited to:
  - On-line resources and databases
  - Search engines and subject directories
7. Evaluate the accuracy, relevance, and appropriateness of print and non-print electronic information sources.

### **Problem Solving and Decision Making**

8. Use computer applications to modify information independently and/or collaboratively to solve problems.
9. Identify basic hardware problems and demonstrate the ability to solve common problems.
10. Determine when technology tools are appropriate to solve a problem and make a decision.

## **Standard 8.2 Technology Education**

All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the design world as they relate to the individual, society, and the

environment. Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students will:

### **A. Nature and Impact of Technology**

1. Describe the nature of technology and the consequences of technological activity.
2. Describe how components of a technological product, system, or environment interact.
3. Describe how one technological innovation can be applied to solve another human problem that enhances human life or extends human capability.
4. Describe how technological activity has an affect on economic development, political actions, and cultural change.
5. Explain the cultural and societal effects resulting from the dramatic increases of knowledge and information available today.

### **B. Design Process and Impact Assessment**

1. Demonstrate and explain how the design process is not linear.
2. Use hands on activities to analyze products and systems to determine how the design process was applied to create the solution.
3. Identify a technological problem and use the design process to create an appropriate solution.
4. Describe how variations in resources can affect solutions to a technological problem.
5. Select and safely use appropriate tools and materials in analyzing, designing, modeling or making a technological product, system or environment.

### **C. Systems in the Designed World**

1. Explain technological advances in medical, agricultural, energy and power, information and communication, transportation, manufacturing, and construction technologies.
2. Explain reasons why human-designed systems, products, and environments need to be monitored, maintained, and improved to ensure safety, quality, cost efficiency, and sustainability.

3. Explain the functions and interdependence of subsystems such as waste disposal, water purification, electrical, structural, safety, climatic control, and communication.

### **Where the Game fits into the Curriculum**

Prior to implementation of this teacher's guide, students will have had an introduction to the material to that is being supported throughout the game. First and foremost, the students will need to know and be able to list and explain the eight steps that make up the technological design and problem-solving loop. Secondly, students will need to be able to identify the parts that make up a technological system. Lastly, student will need too be able to define the term infrastructure, and be able to identify and group together different kinds of technological systems that makeup up our different types of infrastructure. transportation, communication, construction, etc.

### **What Teachers Need to Know Before Beginning**

Before you can utilize Roller Coaster Tycoon in your classroom, you must become a quasi expert in the game. You will have to develop a working understanding of the game so you are better equipped to answer questions and more importantly pose questions to the students that will be playing the game. First you should play the game a minimum of 4 hours or until you feel comfortable enough with the menu layout, game control, game play icons, and saving/loading procedures to help students playing the game. Once you have a solid understanding of the game, you can go through the lessons in this guide as a student not a teacher. You will need to complete each assignment making sure to make a note of any problems or ideas that are specific to your individual classroom needs. After completing the assignments, make any necessary changes or address any issues that have come up and you are ready to begin.

### **Hardware Requirements**

Ideally every student in the room will have access to their own Xbox, TV, controller, and copy of Roller Coaster Tycoon. However, if your school (like most) doesn't have XBox's budgeted into the curriculum, copies of this game can be purchased for the PC platform in which case you will need a computer and copy of the game for each student. If you are using the PC version, the system requirements can be found below.

**Minimum Requirements**

System: Pentium-90 or equivalent  
Ram: 16 MB  
Video Memory: 1 MB  
Hard Drive Space: 50 MB

**Recommended Requirements**

System; Pentium-200MMX or equivalent  
Ram: 32 MB  
Video Memory: 2 MB

**Lessons Overview**

Each lesson will require 4-6 class days to complete depending on the number of consoles available and if the students are working in groups or not. The teacher will begin the unit by walking the class through the tutorial provided at the beginning of the game. The tutorial covers general game navigation as well as accessing submenus and performing common functions such as saving/loading games, construction of rides/attractions etc. The tutorial will take approximately 20 minutes to complete with the class. Upon completion of the tutorial, students will be provided with a controller reference guide for use throughout the lesson (appendix 1). The students are now ready to complete the tutorial on their own. At this point the teacher will break the class down into groups (if necessary) depending on the available hardware. The remainder of day one will be set aside for the completion of the game tutorial. Students that complete the tutorial early may proceed to explore and play the game.

Each subsequent day will begin with a short class discussion of the previous lesson. The teacher will facilitate the discussion by posing questions, but the students should carry the conversation and dictate the direction based on their day one experiences with the game. Furthermore, the teacher should address any problems or concerns that the class may have experienced.

Once the tutorial is completed, the teacher will introduce and walk the students through the first activity. The teacher will start the first game scenario entitled Forrest Frontiers and will demonstrate to the class how the scenario aspect of the game works. The teacher will not show the students how to complete the scenario, as there are an infinite number of ways to do so. Instead, teacher will show the class where to access crucial information necessary for completing that particular scenario as well as future ones. The purpose of the activity is to give the students an exercise aimed at acclimating them to the scenario feature of the game and to reinforce

concepts introduced with the first tutorial. The class will have 1 ½ class periods to work on the scenario, at which time the class will complete a reaction worksheet (appendix 2) to be turned in and discussed as a class the following day.

Upon completion of the discussion the teacher will introduce the first lesson, clarifying the scope and time constraints associated with the particular scenario and field any questions that may arise. Students will then begin the scenario as the teacher will step back and provides support and guidance as needed.

## Lesson One

Lesson one will begin with students working on the Dynamite Dunes scenario. This scenario requires students to design and construct an entry-level theme park. Emphasis will be placed on the park layout, design and construction. Ticket prices, vendor prices, and all other financial information will be identical for each student/group to create consistency for the variables that will not be the focus of this lesson. Students will to pay careful attention to park-goer's needs and wants relating to how the park is laid out and how satisfied the patrons are. Students will need to take into account feedback from the guests and computer, reacting to each suggestion in the best way they see fit.

## Lesson One Goals and Objectives

- Students will create a custom theme park with a minimum of 650 guests and park rating of 600 within 3 years (game time)
- Given a problem, student will be able to plug it into the technological design and problem-solving loop, and create a viable solution.

### Standards addressed:

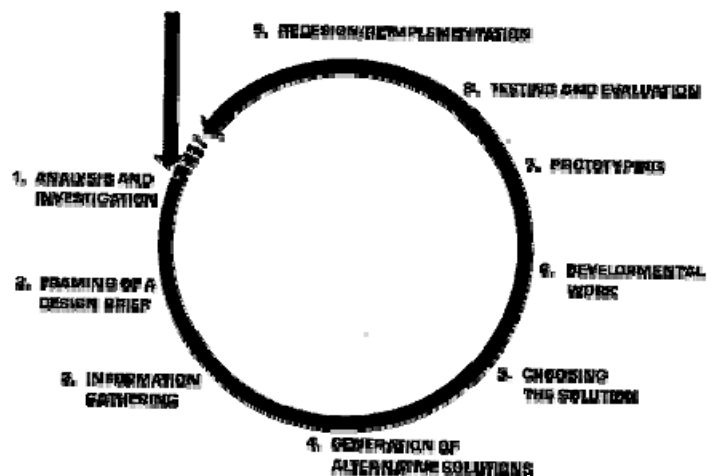
#### Standard 8.1-

B. 1, 8,10

#### Standard 8.2 –

A. 2

B. 1,2,3,4



### ***Lesson One Setup***

The lesson will be introduced to the class on a large projector screen. Prior to the scenario introduction, the teacher will review the technological design and problem-solving loop making sure to cover each step and how the process will be applied to the game scenario. Once complete, the teacher will show the class how to set up and begin the Dynamite Dunes scenario, covering loading and saving procedures, as well the scenario objective. Before the class begins tell the class how long you have allotted for them to complete the lesson.



***Lesson One Activity/Game play***

- Load the Dynamite Dunes scenario
- Begin preliminary construction of theme park including two rides, a bathroom, and concession stands.
- Set admission and ride prices to predetermined values (see appendix 3)
- Open Park to visitors.
- Continue development of theme park.
- When one year of game time has passed, select three random guests in the park and read their comment/reactions to your park.
- Taking into consideration the feedback from each guest, students will pause/save the game and fill a Design Loop worksheet (appendix 4) for a problem/concern of one park guest.
- After completing the worksheet, students will resume game play and implement the solution derived from the worksheet.
- After two year have passed the students will again pause the game this time they will fill out a evaluation form (appendix 5)
- Students will then select three more random guests from the park and get feedback from them.
- Taking into consideration the feedback from each guest, students will pause/save the game and fill a Design Loop worksheet (appendix 4) for a problem/concern of one park guest.
- After completing the worksheet, students will resume game play and implement the solution derived from the worksheet.
- After two year have passed the students will again pause the game this time they will fill out a evaluation form (appendix 5)
- Students will continue to develop their park until the scenario goal has been met.

***Lesson One Follow-up/Debriefing***

At the conclusion of the lesson the teacher will briefly review the design loop before opening a discussion with the class. The discussion will be focused on the students experience in the Dynamite Dunes scenario, specifically on the problems they identified through investigation and research, the solutions they implemented, and how effective those solutions were. Primarily the students will direct the discussion, as they should be eager to share their experiences with the rest of the class. At the conclusion of the discussion, the class will take a short quiz on the technological problem solving and design loop.

### ***Lesson One Extensions***

- Individual presentations to the class covering the various techniques utilized to solve their individual park problems
- Discuss the lesson/assignment with their parents at home and write a short reaction paper about the conversation
- Research online forums and groups for tips and hints to better solve the given scenario



### **Lesson Two**

Lesson two will focus on design and construction technology. Students will need to use their experience with the technological design and the problem-solving loop to design and construct a custom roller coaster for the Bumbly Beach park scenario. The roller coaster will need to be designed in such a way that it fits the parks individual needs. These needs will include space, budget, consumer demand, safety, etc. Students will have to research the available land, types of roller coasters, and consumer demand before they can design and build their custom coaster. They will then use the design loop to create and evaluate and redesign their roller coaster.

### ***Lesson Two Goals and Objectives***

- Students will be able to use the problem-solving loop to help design evaluate and redesign a custom roller coaster.
- Student will construct a custom roller coaster with a set of constraints

#### **Standards addressed:**

##### **Standard 8.1-**

**B. 1, 8,10**

##### **Standard 8.2 –**

**C. 2**

**D. 1,2,3,4**



### ***Lesson Two Setup***

Lesson two will continue to build on and reinforce the problem-solving loop that was covered in lesson one. It will also develop reinforced previous lessons on what makes for good design. Furthermore, the students will develop an understanding of how the roller coaster fits into the infrastructure of the class. At the beginning of the lesson, the teacher will introduce and explain how the ride construction toolbar and menu works. Making sure the class is familiar with the icons and operation to ensure each student will be able to create a custom coaster.

### ***Lesson Two Activity/Gameplay***

- Students will load the Bumbly Beach park scenario.
- Students will use the design and problem-solving loop to design and determine which roller coaster will fit best giving the particular scenario
- Student will design and build a custom roller coaster.
- Once complete the roller coaster, students will need to set a ticket price for the coaster, aimed at providing the best value.
- Students will then wait 1 year (game time) to allow the roller coaster to be ridden and assessed by park goers
- After one year has passed, the class will need to get feed back from a minimum of ten park goers on their experience on the roller coaster, and complete the Design Loop Worksheet (appendix 4)
- Upon completion of the evaluation, students will then close the roller coaster down and make any changes they feel will make for a better ride using the problem solving loop.
- After waiting one year, the students will then poll another ten riders to see if they have improved the ride experience, and complete the Evaluation and Redesign Worksheet (appendix 5)

### ***Lesson Two Follow-up/Debriefing***

Upon completion of lesson two, the students will need to put together a presentation for the class covering the process of researching designing and building their coaster. The roller coaster should be shown during the presentation to give the class a visual representation of the final product. Emphasis should be placed on how the design loop helped to aid in the whole process. At the end of the presentation, the presenter will field any questions from the class.

***Lesson Two Extensions***

- Each student will write a review of another student's roller coaster, stating what he or she liked about it and what can be done to improve it.
- Each student will read the peer review written by another student and redesign in at home or in during extra class time.

## Teacher Resources

Roller Coaster Tycoon Game Guide

<http://guidesarchive.ign.com/guides/13462/>

News article introducing the next generation of Simulation game based off Roller Coaster Tycoon.

<http://www.dailygame.net/news/archives/005974.php>

Game Cheat Codes, useful for creating a desired effect or demonstrating.

<http://www.consolecheatcodes.com/pc/rollercoastertycooncheats.html>

Numerous Roller Coaster Tycoon group pages thorough Yahoo

<http://games.dir.groups.yahoo.com/dir/1600334233>

## References

NJ Core Curriculum Content Standards for Technological Literacy

[http://www.state.nj.us/njded/cccs/s8\\_tech.htm](http://www.state.nj.us/njded/cccs/s8_tech.htm)

National Educational Technology Standards <http://cnet.iste.org/>

## Appendix 1

If you run the game on Xbox, use this reference guide for controller functions.

### Rollercoaster Tycoon Control Reference for Xbox

<b>Button</b>	<b>Function</b>
Y	Message Location
X	Management Menu
A	Select
B	Construction Menu
White	Bulldoze/Modify Ride or Attraction
Back	Close Window
Start	Pause Menu
Right Thumb Stick	Smooth Pan Left/Right/Up/Down
Left Thumb Stick	Move magnifying glass
Left Thumb Stick Button	Magnifying Glass Toggle ON/ OFF

## Appendix 2

Name \_\_\_\_\_

Date \_\_\_\_\_

### Forest Frontier Scenario Reaction Form

**Upon completion Forrest Forest scenario please answer the following question and be prepared to discuss them in class.**

How would you rate your understanding of the game control and functionality after completing the initial tutorial and the Forest Frontier scenario?

What was the most difficult part of complete this scenario and why?

Explain your experience working on the scenario. What were some problems you encountered and how you go about working through those problems?

### Appendix 3

#### Lesson One Admission and Ride Fees

<b>Park Admission</b>	<b>\$5.00</b>
<b>Merry Go Round</b>	<b>\$1.00</b>
<b>Ferris Wheel</b>	\$1.50
<b>Haunted House</b>	<b>\$1.00</b>
<b>Concession Stands</b>	<b>\$1.50</b>
<b>Souvenirs</b>	<b>\$2.50</b>
<b>Wooden Roller Coaster</b>	<b>\$3.00</b>
<b>Steel Roller Coaster</b>	<b>\$3.00</b>

## Appendix 4

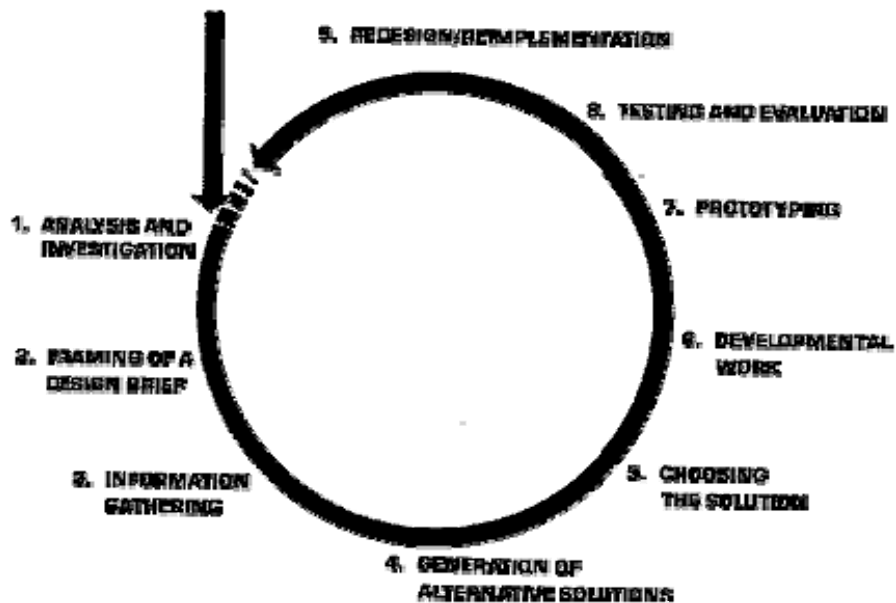
Name \_\_\_\_\_

Date \_\_\_\_\_

### Design Loop Worksheet

After speaking with parks guests, fill in each step of the design process as you move along making sure to pause the game as you fill out each step. Work must be completed on a separate sheet of paper. Please attach any sketches or screenshots.

1. Identification of the Problem
2. Investigation and Research
3. Generation of Possible Solutions
4. Choosing a solution
5. Developmental Work
6. Prototyping Construction
7. Testing
8. Evaluation & Redesign (will be filled out on separate form - Appendix 5)



## Appendix 5

Name \_\_\_\_\_

Date \_\_\_\_\_

### **Design Loop Evaluation and Redesign Worksheet**

Write a one page evaluating your solution to the problem posed by your park guest. Did your solution effectively solve the problem? Did you completely solve the problem? If could do it over again what would you do differently and why?