

**Microsoft® Technology Associate
Certification Exam Review Kit:**

98-374 Gaming Development Fundamentals

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Microsoft Technology Associate Certification Exam Review Kit:

98-374 Gaming Development Fundamentals

About This Exam Review Kit

Microsoft Technology Associate Certification Exam Review Kit: 98-374 Gaming Development Fundamentals

Exam Review Kit Description

- This Microsoft Technology Associate (MTA) Certification Exam Review Kit contains a series of 20 review lessons intended to reinforce concepts in preparation for the *MTA Certification Exam: 98-374 Gaming Development Fundamentals* and serve as a resource and guide for teachers and faculty to create their own additional student learning experiences.
- It is assumed that students taking an MTA certification exam have completed or are currently taking academic courses, have job experience that addresses the exam objective domain, or both.
- The Exam Review Kits:
 - Are intended to supplement (not supplant) existing academic courses
 - Are not intended to serve as foundational content for academic courses
 - Are tied directly and closely to the objective domain of each individual MTA certification exam
 - Are platform-specific or -agnostic in accord with the objective domain of each MTA certification exam
- Each certification exam evaluates approximately 20 objectives; this Exam Review Kit includes 20 review lessons each with 50 minutes of learning activities.
- The materials for each review lesson include a trainer prep guide, lesson delivery materials, student in-class and post-class activities, and additional learning resources.

Audience

- This Exam Review Kit is intended for students attending high schools and two-year colleges and technology workers who are preparing for the MTA Certification Exam: 98-374 Gaming Development Fundamentals and seek to prove introductory knowledge of and skills with game development.
- It is recommended that exam candidates be familiar with the concepts of and have hands-on experience with the technologies described here, either by taking relevant training courses or by working with tutorials and samples available on MSDN. Although

minimal hands-on experience with the technologies is recommended, job experience is not assumed for these exams.

- Candidates for this exam are in the process of expanding their knowledge and skills in the following areas:
 - Understanding basic game design concepts and components
 - Understanding game hardware, including input and output devices and networks
 - Working with XNA®
 - Understanding graphics
 - Planning for game state
 - Drawing objects
 - Understanding animation
 - Animating and transforming graphic objects
 - Working with collisions

Student Prerequisites

This course requires that you meet the following prerequisites:

- It is assumed that students taking an MTA certification exam have completed or are currently taking academic courses, have job experience that addresses the exam objective domain, or both.

Exam Review Kit Outline

This Exam Review Kit provides lessons that reinforce previous learning in the objectives of the MTA Certification Exam: 98-374 Gaming Development Fundamentals. Each of the 20 teaching plans in this collection is intended to be used in a single 50-minute review session.

The following table provides the lesson breakdown with MTA Exam Objective mapping.

Lesson No: Lesson Name	Mapping Exam OD
Lesson 1: Understand Game Design	1.1. Differentiate among game types. This objective may include but is not limited to: console, Xbox®, MMORPG, mobile games, PC games

	<p>1.2. Differentiate among game genres.</p> <p>This objective may include but is not limited to: fantasy, sports, role playing, card, board, First Person Shooter</p> <p>1.3. Understand player motivation.</p> <p>This objective may include but is not limited to: quests, tasks, activities, how to win, game goals</p> <p>1.4. Design the user interface.</p> <p>This objective may include but is not limited to: UI layout and concepts, asset management, game state, gamer services</p> <p>1.5. Understand components.</p> <p>This objective may include but is not limited to: differentiate between tool creation and game programming, understand artificial intelligence (AI)</p> <p>1.6. Capture user data.</p> <p>This objective may include but is not limited to: save and restore user data, save and restore game state, handle input states, store data, manage game state</p> <p>1.7. (A and B) Work with XNA.</p> <p>This objective may include but is not limited to: understanding the architecture of an XNA game; using built-in XNA tools; work with XNA hierarchy (initialization, update loop, drawing)</p>
Lesson 2: Understand Hardware	<p>2.1. Choose an input device.</p> <p>This objective may include but is not limited to: mouse, keyboard, Kinect™, console, mobile</p>

	<p>2.2. Choose an output device.</p> <p>This objective may include but is not limited to: screen, television, hand-held devices, sound (local speakers, surround sound systems)</p> <p>2.3. Work with the network.</p> <p>This objective may include but is not limited to: set up Web services, TCP, UDP, basic management; plan for areas without access to Internet</p> <p>2.4. Manage game performance.</p> <p>This objective may include but is not limited to: CPU vs. GPU, reach vs. HiDef, graphics networking performance</p> <p>2.5. Understand the different game platforms.</p> <p>This objective may include but is not limited to: console, PC, mobile; compare memory management</p>
<p>Lesson 3: Understand Graphics</p>	<p>3.1. Understand rendering engines.</p> <p>This objective may include but is not limited to: DirectX®, video and audio compression, display initialization, resolution (full screen, Vsync, and windowed)</p> <p>3.2. (A and B) Plan for game state.</p> <p>This objective may include but is not limited to: scene hierarchy engine, gametime to handle frame rate variations, understanding games' main loop (input/update/render), graphics pipeline; understanding the flow of a game, loading, menus, save-load, configuring options (video, audio, keyboard)</p>

	<p>3.3. Draw objects.</p> <p>This objective may include but is not limited to: using bitmaps, sprites, vector graphics, lighting, blending, text, textures, 3D geometry, parallax mapping, and different shaders; 2-D vs. 3-D; creating a sprite font</p>
Lesson 4: Understand Animation	<p>4.1. Animate basic characters.</p> <p>This objective may include but is not limited to: movement, lighting, projections, frames per second (FPS), shaders, apply filters to textures, sprite animation, generate objects from user indexed primitives, matrices, understanding keyframes, motion between keyframes</p> <p>4.2. Transform objects.</p> <p>This objective may include but is not limited to: forming, deforming, moving, point distances, planes, interpolation; frames per second (FPS); translation, scale, rotation</p> <p>4.3. Work with collisions.</p> <p>This objective may include but is not limited to: per pixel and rectangle collisions, collision detection, collision response, fundamentals of physics simulation.</p>

Exam Review Kit Materials

The following materials are included in this Exam Review Kit:

- Trainer Preparation Guides: A plan for teacher and student activities in reviewing the learning objectives and providing the key points that are critical to the success of the in-class review experience
- Lesson Presentations: A Microsoft PowerPoint® presentation to structure a classroom lecture and discussions
- In-class Activities: A student activity for applying the knowledge and skills reviewed in the lesson
- Post-class Activities: An additional student activity for out-of-class review

- In- and Post-class Activity Answer Keys: Solutions to Activities
- Additional learning resources: Various resources to expand reviewing and learning opportunities
- Student Study Guides are available at:
http://www.certiport.com/Portal/desktopdefault.aspx?page=common/pagelibrary/MTA_study_guides.html

Software Requirements

The following software is suggested for this series of review lessons:

- Microsoft Visual Studio® 2010 with XNA Game Studio
- PowerPoint 2010
- Additional software may be required for individual lessons, as listed in the lesson materials within each module.

Acknowledgments

About the Authors



Peggy Fisher

Peggy teaches computer science, including courses in programming (C#, Microsoft Visual Basic, and Java) and web design with Microsoft Expression Studio, at Indian Valley High School (IVHS), a rural high school in central Pennsylvania. Prior to beginning her teaching career, Peggy worked for a large insurance company near Philadelphia. She started as a job coordinator, moved to development, became a systems analyst and manager, and then was promoted to director. She has been at IVHS for the past eight years and truly enjoys her new career. Peggy also teaches part time at Pennsylvania

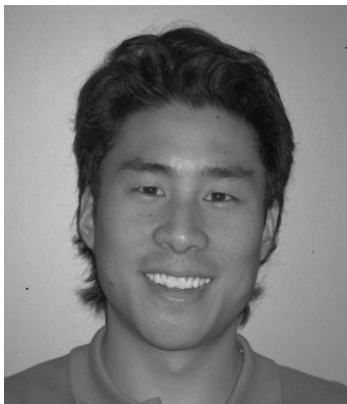
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Deborah Moerland

Deb teaches a variety of courses in computer science and mathematics at Chelsea High School in Chelsea, Michigan. Topics include programming (Visual Basic®, C++, and Java), multimedia, game design, robotics, networking, web design, algebra, and geometry. In addition to teaching at the high school, Deborah teaches online courses for the Art Institute of Pittsburgh Online, American Public University, Lansing Community College, and the Ultimate Medical Academy. She has a Master's degree in Educational Technology and Instructional Design from Michigan State University and a

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Pat Yongpradit

Who actually gets to live out their dream job? Pat Yongpradit does . . . he teaches computer science at Springbrook High School in Silver Spring, Maryland. He has developed technology curricula at the local, state, and national levels, has presented at multiple national conferences (ISTE, SIGCSE, CSTA, NBC's Education Nation), and is a 2010 Microsoft Worldwide Innovative Educator. Pat's current projects include helping students create video games for social causes and promoting women in technology. His goal as a teacher is to develop students that dream and create technology that will improve our world. He is also the author of the *Software Development Fundamentals MTA Exam Review Kit*. His favorite quote is: "The man who finds a job he loves will never work a day in his life."



Patricia Phillips

Patricia taught computer science for 20 years in Janesville, Wisconsin. She served on Microsoft's National K-12 Faculty Advisory Board and edited the Microsoft MainFunction website for technology teachers. For the past five years, she has worked with Microsoft in a variety of roles related to K-12 curriculum development and pilot programs, including Expression Studio web design, XNA game development, and MTA Certification Exam Review Kits. She is currently the editor of the Computer Science Teachers Association newsletter, the *Voice*.

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Rodrigo teaches computer science at Penn High School in Mishawaka, Indiana. He has 11 years of teaching experience, including college-level technology in-service courses. Rodrigo also provides staff training with interactive whiteboard technology as well as Microsoft Office. In 2011, Rodrigo was recognized by the National Center for Women and Information Technology (NCWIT) for encouraging female students in computer science. His goal in teaching is to make students and teachers become more responsible effective digital citizens.

A special thanks to the editorial and production team:

Project Manager: Pernille Halberg, Microsoft Corporation

Production Manager: Diane Kohnen, S4Carlisle Publishing Services

Technical Editor: Dr. Dante Ciolfi, Worldwide Business

Copyeditor: Susan McClung