

TRAINER PREPARATION GUIDE 3.2B: PLAN FOR GAME STATE

Lesson Objective 3.2:

Plan for game state. *Topics:* 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).

Required materials to teach this lesson:

1. A workstation with Microsoft Office® installed
2. Microsoft Visual Studio 2010® and XNA® 4.0
3. Downloaded the project files.
4. 98-374-ENU-3.2B-LP
5. 98-374-ENU-3.2B-IC
6. 98-374-ENU-3.2B-IC_Key
7. 98-374-ENU-3.2B-PC

Preparation Tasks

Technical preparation activities:

1. Review the tutorials for the in-class activity.
2. Download the project file and extract it to its own directory: Download the CPModel_Sample.zip file from <http://msdn.microsoft.com/en-us/library/bb203933.aspx>.
3. **Vocabulary:**

fixed-step game loop: The fixed rate calls the update method a certain number of times per second. Usually, the PC and Xbox® call the update 60 times per second, while the Windows Phone® calls the update 30 times per second.

frame rate: The speed at which an image is refreshed on the screen. This is measured in frames per second. A game is either fixed-step (the default) or variable-step.

GameTime: an XNA class that has a snapshot of the game timing state expressed in values that can be used by variable-step (real-time) or fixed-step (game-time) games.

variable-step game loop: a game that calls its *Update* and *Draw* methods in a continuous loop and is not a fixed number or time.

XNA Content Pipeline: a set of content importers and processors, integrated into the development environment, which provides an easy and flexible way to import, load, process and use three-dimensional (3-D) models, textures, images, sounds, and other assets in your game.

4. **Additional readings and resources:**

MSDN®:

Exercise 2: Basic XNA Framework Game with Game State Management:

http://msdn.microsoft.com/en-us/wp7trainingcourse_2dgamedevelopmentwithxnalab_topic3

How Do I: Use XNA for Game State Management in a Windows Phone 7 Application?:

<http://msdn.microsoft.com/en-us/Video/gg258447>

XNA: Game Development—Loading Content Into Your Game (Video):

<http://channel9.msdn.com/Blogs/The-XNA-Show/XNA-Game-Development-Loading-Content-Into-Your-Game>

Other resources (books, e-reference):

The State of Things:

<http://www.xnadevelopment.com/tutorials/thestateofthings/thestateofthings.shtml>

Instructor computer setup:

1. Presentation computer with Microsoft Office installed.
2. Access to the Internet.
3. Projection system for demonstration purposes.
4. Visual Studio 2010 and XNA 4.0
5. Windows Phone Emulator

Instructional preparation activities:

1. Make copies of student documents available as needed.
2. Review the Lesson 3.2B documents.

Lesson Sequence (50 minutes)

Activating prior knowledge/lesson staging (5 minutes):

Direct the students to answer each question in the “Guiding Questions” section of the In-class Activity document or their class notes.

Guiding questions:

1. **What is a scene hierarchy engine and how does it work?** A scene hierarchy engine is another term for game state management. The *ScreenManager* class is a reusable component that maintains a stack of one or more *GameScreen* instances. It coordinates the transitions from one screen to another and takes care of routing user input to whichever screen is on top of the stack.
2. **What does save-load mean?** Save-load is used for maintaining the game state for the user. The data is saved and loaded back in when the user resumes game play.
3. **How do you determine the gamepad state?** *GamePadState currentState = GamePad.GetState(PlayerIndex.One);* This call to *GetState* retrieves a *GamePadState* object, which contains the information we need about the controller.

Lesson Activity (40 minutes):

1. Teacher instruction (15 minutes):

Use the included Microsoft PowerPoint® presentation to review the topic of planning for game state.

2. In-class activity (20 minutes):

Students are to complete the In-class Activity document 98-374-ENU-3.2B-IC.

3. Post-class activity (5 minutes):

Provide instruction for the post-class activity as needed. Establish a completion date.

Lesson review (5 minutes):

1. Discuss the guiding questions.
2. Instruct students to write and submit any questions they have or any topics about which they would like more assistance.
3. After class, look through the student responses and follow up with any student requiring additional help.