

OBJECTIVE

understand animation 4.1

ANIMATE BASIC CHARACTERS

SCENARIO: Dean Halstead is a programmer who works for Tailspin Toys. Recently, the company has decided to enter the online game marketplace with some small educational applications for children.

Dean's new assignment is to create a game that includes a maze with an animated hamster. A math problem is shown, and the hamster (player) must navigate the maze to the piece of cheese that has the correct answer.

During the design phase, Dean came up with a few questions.

1. How should the mouse move?


- a. Because most young children can use the arrow keys, use these keys to direct the mouse.
- b. Have the hamster move forward when the space key is pressed, move left when the L key is pressed, and move right when the R key is pressed.
- c. Program the hamster to move randomly around the maze until it finds the right slice of cheese.

2. For this type of game, what type of lighting can Dean use to make it more interesting?

- a. Use directional light that comes from only one side.
- b. Lighting is not useful in this type of animation.
- c. Point light in the area directly around the mouse.

3. How can Dean make the hamster move faster with the use of a special keyboard command?

- a. Determine the time it takes to get across the screen at the normal 60 frames per second (FPS), and then add a speed factor that can be increased when the user presses a certain key.
- b. The hamster can have only one speed.
- c. Reduce the hamster's size to make it move faster.

HINT 

Animation can be a series of sprites shown in succession or movement caused by changing the x,y coordinates.

Answers

1. How should the mouse move?
 - a. **Because most young children can use the arrow keys, use these keys to direct the mouse.**
2. For this type of game, what type of lighting can Dean use to make it more interesting?
 - c. **Point light in the area directly around the mouse.** Point light can add a level of difficulty to the game for more advanced levels.
3. How can Dean make the hamster move faster with the use of a special keyboard command?
 - b. **Determine the time it takes to get across the screen at the normal 60 frames per second (FPS), and then add a speed factor that can be increased when the user presses a certain key.**

Essential details

- Every graphic (**sprite**) is placed on the screen using a bounding rectangle in a 2-D animation, and then a texture is applied to the shape.
- **Frames per second (FPS)** is the speed at which animation is displayed.
- A single sprite sheet can help minimize the number of images needed in an animation.
- The **projection matrix** defines the camera's field of view.
- XNA® uses **shader**-based rendering to convert vertex data into pixels.
- XNA uses a **texture** coordinate to map a coordinate on a texture to a vertex of a primitive.
- **Keyframes** combine a timer and interpolation to determine the location of objects.

FAST TRACK HELP

- **XNA Game Studio**
<http://msdn.microsoft.com/en-us/library/cc178930.aspx>
- **Animating a Sprite**
<http://msdn.microsoft.com/en-us/library/bb203866.aspx>
- **App Hub**
<http://create.msdn.com/en-US/>

