

OBJECTIVE

understand animation 4.3

WORK WITH COLLISIONS

SCENARIO: Bonnie Kearney is enjoying her video game design class. In the current unit, the professor is teaching animation collisions. Her next XNA® game design assignment requires that she monitor closely any collisions in the game world. The game is an animated bicycle race in which the user has to avoid the other bicycles and obstacles on the track.

- 1. Considering the odd shape of the dirt bike with a rider, what is the best way to detect a collision with another rider?**
 - a. Use a pixel-by-pixel comparison.
 - b. Use a bounding rectangle and look for any intersection of the two rectangles.
 - c. Use the (x,y) coordinates of each image and look for any matches.
- 2. What is the best way to detect a collision with an obstacle on the track?**
 - a. Use a pixel-by-pixel comparison.
 - b. Use a bounding rectangle and look for any intersection of the two rectangles.
 - c. Use the (x,y) coordinates of each image and look for any matches.
- 3. When is the best time to use a pixel-by-pixel comparison?**
 - a. When the objects are similar in size.
 - b. After a collision of bounding rectangles has been detected.
 - c. Constantly, throughout the animation.

HINT



When testing for collisions, it is sometimes necessary to sacrifice accuracy for improved performance.

Answers

1. Considering the odd shape of the dirt bike with a rider, what is the best way to detect collision with another rider?
 - a. **Use a pixel-by-pixel comparison.** The program should first look for an intersection of the bounding rectangle, but due to the irregular shape, the program needs to do a more detailed comparison.
2. What is the best way to detect collision with an obstacle on the track?
 - b. **Use a bounding rectangle and look for an intersection of the two rectangles.**
3. When is the best time to use a pixel-by-pixel comparison?
 - b. **After a collision of bounding rectangles has been detected.** The pixel-by-pixel comparison is very resource-intensive.

Essential details

- When a detailed comparison is needed, use the bounding rectangle to identify the collision and follow up with a **pixel-by-pixel comparison**.
- **Pixel collision** involves comparing pixel-by-pixel to see if any of the pixels contain color (part of one object is touching another).
- Think about what should happen when a collision occurs? Do the colliding images link? Do they bounce away in opposite directions? Do they change size or speed?
- A solid understanding of the **fundamentals of physics** is necessary to make a realistic animation.
- A **sprite** is a small bitmap image often used in animated games and sometimes used as a synonym for icon.

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/>

