


# OBJECTIVE

## understand animation 4.2

### TRANSFORM OBJECTS

**SCENARIO:** Bonnie Kearney is enrolled in a college class on video game design. The professor is reviewing the basic concepts of 2-D scaling and object rotation. The students have been assigned to create a game in which images appear randomly on the screen and slowly fade into the background while spinning. Users win points if they click the images before they disappear.

- 1. How can Bonnie make an image fade into the background?**
  - a. Change the opacity of the object until it becomes transparent.
  - b. Create multiple images of various sizes and cycle through the images.
  - c. Reduce the scale size of the image until it gets to zero.
- 2. What technique should Bonnie use for rotating the image?**
  - a. Create multiple images of various sizes and positions in rotation.
  - b. Change the rotation value in the *Draw()* method.
  - c. Identify the center point of the object and use with the rotation value in the *Draw()* method.
- 3. How can Bonnie detect if the user clicked a sprite before it disappeared?**
  - a. Create a *MouseEvent* object to capture the *Click* event. Check the *(x,y)* coordinates to see if it intersects any of the sprites.
  - b. Check every pixel on the screen because the sprites are rotating and fading at the same time.
  - c. Store an array of the locations of all sprites on the screen and compare it to the mouse click value.

HINT

*It is important to set the correct position for the origin of your image if you are using rotation or movement.*

## Answers

1. How can Bonnie make an image fade into the background?
  - c. **Reduce the scale size of the image until it gets to zero.** The speed must be tested to ensure that the user has time to click it.
2. What technique should Bonnie use for rotating the image?
  - c. **Identify the center point of the object and use with the rotation value in the *Draw()* method.**
3. How can Bonnie detect whether the user clicked on a sprite before it disappeared?
  - a. **Create a *MouseState* object to capture the *Click* event. Check the (x,y) coordinates to see if it intersects any of the sprites.**

## Essential details

- **Rotating** an object will turn the object on one or more axes. By moving the points in 3-D space, the object will spin.
- **Scaling** an object will make the object larger or smaller. This is done by moving the points in the object closer together or farther apart, to scale down or scale up.
- **Frames per second (FPS)** is a value that represents the number of frames drawn each second of the animation.
- **Forming** is the process of putting together texture elements to create a background or terrain using primitives.
- **Deforming** occurs when something happens, such as an explosion, that causes the animation to break apart the texture. The image becomes distorted.

### FAST TRACK HELP

- **Animating a Sprite** <http://msdn.microsoft.com/en-us/library/bb203866.aspx>
- **App Hub** <http://create.msdn.com/en-US/>
- **Riemer's 2D & 3D XNA®** <http://www.riemers.net/>

