

```

public class Key extends Actor
{
    private boolean isDown;
    private String key;
    private String sound;
    private String upImage;
    private String downImage;

    /**
     * Create a new key linked to a given keyboard key, and
     * with a given sound.
     */
    public Key(String keyName, String soundFile, String img1, String img2)
    {
        sound = soundFile;
        key = keyName;
        upImage = img1;
        downImage = img2;
        setImage(upImage);
        isDown = false;
    }

    /**
     * Do the action for this key.
     */
    public void act()
    {
        if (!isDown && Greenfoot.isKeyDown(key)) {
            play();
            setImage(downImage);
            isDown = true;
        }
        if (isDown && !Greenfoot.isKeyDown(key)) {
            setImage(upImage);
            isDown = false;
        }
    }

    /**
     * Play the note of this key.
     */
    public void play()
    {
        Greenfoot.playSound(sound);
    }
}

```

```

public class Piano extends World
{
    private String[] whiteKeys =
        { "A", "S", "D", "F", "G", "H", "J", "K", "L", ";", "", "\\ " };
    private String[] whiteNotes =
        { "3c", "3d", "3e", "3f", "3g", "3a", "3b", "4c", "4d", "4e", "4f", "4g" };

    private String[] blackKeys =
        { "W", "E", "", "T", "Y", "U", "", "O", "P", "", "]" };
    private String[] blackNotes =
        { "3c#", "3d#", "", "3f#", "3g#", "3a#", "", "4c#", "4d#", "", "4f#" };

    /**
     * Make the piano. This means mostly, apart from defining the size,
     * making the keys and placing them into the world.
     */
    public Piano()
    {
        super(800, 340, 1);
        makeKeys();
        showText("Click 'Run', then use your keyboard to play", 400, 320);
    }

    /**
     * Create the piano keys (white and black) and place them in the world.
     */
    private void makeKeys()
    {
        // make the white keys
        for(int i = 0; i < whiteKeys.length; i++) {
            Key key = new Key(whiteKeys[i], whiteNotes[i]+".wav", "white-key.png", "white-key-down.png");
            addObject(key, i*63 + 54, 140);
        }

        // make the black keys
        for(int i = 0; i < blackKeys.length; i++) {
            if( ! blackKeys[i].equals("") ) {
                Key key = new Key(blackKeys[i], blackNotes[i]+".wav", "black-key.png", "black-key-down.png");
                addObject(key, i*63 + 85, 86);
            }
        }
    }
}

```