

Blow everything up

jQuery plugins and events to let you blow up
everything you could ever want

Tuesday, June 5, 2012

Hi there, I'm Ben Lavender, and I'm a nerd from around here. There are three tracks at bar camp, and Matt asked me to give an example of a talk from the third track, which is a technical track. It may or may not be appropriate for everyone here, stay with me, its short, and things will explode.



Tuesday, June 5, 2012

So I thought about what I could show you, and I was really taken by John's squid. And his trex up top, of course, which makes everything better, but I loved this squid, and thought there was something missing. And then I realized, like everyone here already has, that this squid would be a lot better if it could blow things up.

So I'm going to show you some plugins I wrote to make that happen, and I'm going to show you why making actual plugins instead of some random javascript is easier, faster, and better, and how to use jquery events to make them talk together in a safe way.

4 jQuery plugins

- Be a tentacle
- Get whacked by a tentacle
- Explode into bits
- 8-bit explosion

Tuesday, June 5, 2012

4 jquery plugins. jQuery, if you don't know, is a javascript library that's used on almost every web site you visit.

So far for barcamp's website, I've made 4 jquery plugins, all of which involve destruction, and I'm pretty excited about them.

The first one we're going to talk about is making the squid attack windows with its tentacles.

Step 0



to thecrew ▾
so what i would need for what we talked about:
squid eyeball separated from the squid, so that i can make it smack a
animated squid arms--4-8 frames per action, as in the style of the
attached pterodactyl
people to be in windows, perhaps with little 'smack' assets. i'll
animate them if they have frames.
lastly i desperately need--and FOR BARCAMP--little happy/proud
dinosaur images for bhuga.net/cv/

Share all images

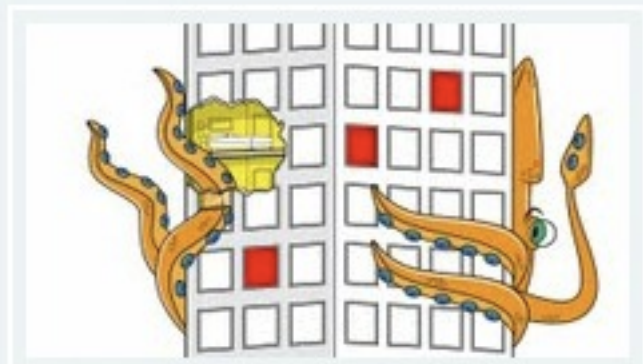
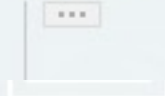


Hey Ben,

Here are the pngs for the Squid arm and the eyeball. I've included a jpeg as well of what
let me know if you need any adjustments.

Alyson is working on the images to fill in the windows and she should send them over to

On Sun, Jun 3, 2012 at 3:13 PM, Alyson Kilday <a.sage.k@gmail.com> wrote:



Squid-Window-Slaps.jpg
157K [View](#) [Share](#) [Download](#)



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tentacle1.png
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Tuesday, June 5, 2012

step zero for this is to beg and plead with your talented designers to make you squid animation frames. They're going to do a better job, and everyone wants them to do stuff because they're awesome, so just get unashamed about it and start begging.

i paid a guy \$20 on reddit once to animate a pterydactl, but it was not as good as what john's done here. take quality where you can get it, folks!

The result



Tuesday, June 5, 2012

if you've made enough of a fool of yourself, you'll get some nice art back like this; i've turned it sideways for the purposes of the slide.

With this in tow, we're ready to start actually coding.

Step 1: extend jQuery

```
30 $.fn.tentacleAttack = (opts) ->
31   @on 'attack', =>
32     if !@data('animating')?
33       # no opts sent: ATTACK!
34       @data 'animating', true
35       self = @
36       interval = setInterval ->
37         animateFrame.call self
38         , 40
39       @trigger 'attacking'
40       @data 'attackInterval', interval
```

Tuesday, June 5, 2012

Step 1 is to write a jquery plugin. A plugin is anything that extends jquery.fn and returns the keyword this, represented by this nice @-symbol in coffeescript. Since everything in jquery itself already returns itself, it's pretty easy to do if your plugin is written in terms of jquery.

Note that the main thing this plugin does is respond to an event: attack. So if we tell this to attack later, it'll do it, but tentacleAttack is just a setup function.

Step 2: animate

```
3 animateFrame = ->
4   position = @css('background-position').split " "
5   pos = parseInt position[1]
6   if @data 'skipframe'
7     @data 'skipframe', @data('skipframe') - 1
8     @removeData('skipframe') if @data('skipframe') == -1
9   else if !(@data 'withdrawing')
0     pos -= @data 'offset'
1     if pos == (@data('frames') - 1) * @data('offset') * -1
2       @data 'withdrawing', true
3       @data 'skipframe', 3
4       @trigger 'attacked'
5   else
6     pos += @data 'offset'
7     if pos == 0
8       @trigger 'withdrawn'
```

Tuesday, June 5, 2012

The next step is the nitty-gritty of animating. It's not that hard, and takes up a bit of room, and i'm not going to spend any time on it here, except to note this line:

Step 3: tell your friends

```
if pos == (@data('frames') - 1) * @data('offs  
  @data 'withdrawing', true  
  @data 'skipframe', 3  
  @trigger 'attacked'
```

Tuesday, June 5, 2012

The last line of this bit tells us that we're sending a trigger, 'attacked', when we've reached the last frame of the animation. This is very important, because this is going to be the best way to tell other interested jquery plugins that it's time to explode.

Step 4: Test

It's time to alt-tab

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So we should have a functioning squid attack animation now, great. Let's check it out:

Plugin 2: Get whacked

```
41 $.fn.isVillainous = (who) ->
42   @click =>
43     who.one 'attacked', =>
44       @trigger 'explode'
45       @hide()
46     who.trigger 'attack'
47     setTimeout =>
48       @fadeIn()
49     , 5000
```

Tuesday, June 5, 2012

So this next plugin is all about setting up a villain to get whacked by a squid tentacle, and it's quick and easy. So easy that I included it in the same file as the tentacle plugin. This is the whole thing.

In english, this says, 'when i click on something i've declared to be villainous, instruct a squid to attack it, and tell me when it's done. I'll destroy myself in response and re-add myself so that I can explode again in 5 seconds'

See how it triggers 'attack' on the squid tentacle that should be attacking it?

See that nice 'attacked' event, telling us the squid has finished animating, and its time for us to explode? I went ahead and added an explode trigger to that, even though it won't do anything yet. That's another reason to use triggers: if that were a function, and we tried to attack a villain too early, our javascript interpreter would find an error for an undefined function. Terrible.

Plugin 3: Explode already

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This is the hardest plugin, because this is *barcamp*, so it's not like we can just show an image of an explosion. We write real plugins here.

Trajectory of a projectile

From Wikipedia, the free encyclopedia



This article **needs additional citations for verification**. Please help [improve this article](#) by adding citations to reliable sources. Unsourced material may be [challenged](#) and [removed](#). (March 2012)

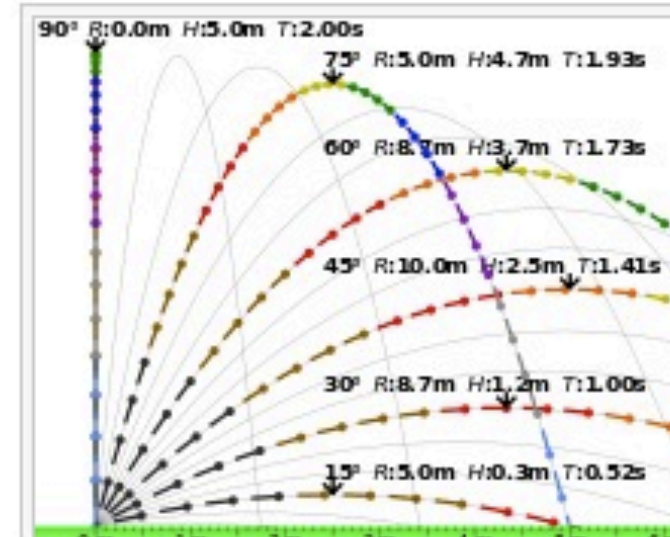
In [physics](#), the **ballistic trajectory of a projectile** is the path that a thrown or launched [projectile](#) will take under the action of [gravity](#), neglecting all other forces, such as [friction](#) from air resistance, without [propulsion](#).

The [United States Department of Defense](#) and [NATO](#) define a [ballistic trajectory](#) as a trajectory traced after the propulsive force is terminated and the body is acted upon only by gravity and [aerodynamic drag](#).^[1]

The following applies for ranges which are small compared to the size of the Earth. For longer ranges see [sub-orbital spaceflight](#).

Contents [\[hide\]](#)

- 1 Notation
- 2 Conditions at the final position of the projectile
 - 2.1 Distance traveled
 - 2.2 Time of flight
 - 2.3 Angle of reach
- 3 Conditions at an arbitrary distance *x*
 - 3.1 Height at *x*
 - 3.2 Velocity at *x*
 - 3.2.1 Derivation
- 4 Angle required to hit coordinate (*x*,*y*)
- 5 Trajectory of a projectile with air resistance
- 6 See also
- 7 References
- 8 External links



Trajectories of projectiles launched at different angles with the same speed of 10 m/s in a vacuum and a field of 10 m/s². Points are at 0.05 s intervals (the length of the arrows is linearly proportional to their speed. *t* = time of flight, *R* = range and *H* = highest point of trajectory).

Notation

In the equations on this page, the following variables will be used:

- *g*: the [gravitational acceleration](#)—usually taken to be 9.81 m/s² near the Earth's surface
- *θ*: the angle at which the projectile is launched

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So the first thing I did was refresh my memory on the physics of ballistic projectiles....

Step 1: determine explosion path

```
arc = (what) ->
  t = ((new Date).getTime() - start) / 1000
  gravity = 9.8
  x = startX + i0pts.v * Math.sin(i0pts.angle)
  y = startY + (i0pts.v * Math.cos(i0pts.angle)
  what.css('left', "#{x}px")
  what.css('bottom', "#{y}px")
```

Tuesday, June 5, 2012

which results in this nice function, part of our plugin, to determine where a piece of exploding debris is at a given time after the start of an explosion.

Step 2: jQuery again

```
77 $.fn.explode = (opts = {}) ->
78   @on 'explode', =>
79     startX = opts.startX || @offset().left
80     startY = opts.startY || @offset().top + (@height() / 4)
81     total = count
82     while total -= 1
83       element = images[randBetween 0, images.length].clone()
84       __explode.call element,
85         v: randBetween opts.minV, opts.maxV
86         angle: randBetween opts.minAngle, opts.maxAngle
87         startX: startX
88         startY: startY
89         rotateSpeed: randBetween opts.minRotate, opts.maxRotate
```

Tuesday, June 5, 2012

Hopefully this jQuery stuff is getting routine now:

extend jquery.fn, add a trigger. boom.

Finally! Kaboom!

Time to alt-tab again

Tuesday, June 5, 2012

And with that done, we can now finally test our first explosion.

Step 3: Add sound

```
@on 'explode', =>
  startX = opts.startX || @offset().left
  startY = opts.startY || @offset().top + (@height() / 2)
  total = count
  if opts.sound?
    $("#sound-#{opts.sound}").get(0).play()
  while total > 0
```

Tuesday, June 5, 2012

After I added those explosions, I decided it needed sound, so I added some. These are pretty easy.

Final kaboom

alt-tab again

Tuesday, June 5, 2012

So this is what you get after you add sound and fix a few physics bugs:

Problem:

```
2 $ ->
3 asteroid = $('#scumbag-asteroid')
4 asteroid.explode
5   sound: 'explosion'
6   images: [
7     'img/scumbag-hat.png'
8     'img/rock.png'
9     'img/triceratops-skull.png'
10  ]
11 asteroid.isVillainous($('#.tentacle3'))
```

Tuesday, June 5, 2012

The problem with all of this is that it's a pretty heavy process to come up with the images and sound that will explode out of a bad guy, and to come up with more squid animations for them.

We've only got 3 explosions for all of this. They're good, but I want more.



Tuesday, June 5, 2012

Everyone remembers galaga, right? it's that arcade game that comes bundled with ms pac man in every bar ever.



Tuesday, June 5, 2012

You'll remember it now, because it looks like this when you die, and you die a lot in this game. I wanted a plugin with an explosion this simple.

Another plugin...

```
1 $.fn.galagable = (opts = {}) ->
2
3   if $('audio#galaga').size() == 0
4     sound = $("<audio id='galaga' preload='auto'><source src='sounds/explosion.mp3' /><source src='sounds/explosion.ogg' />")
5     $('body').append(sound)
6
7   sound = $('audio#galaga')
8
9   @each ->
10    self = $(@)
11    self.on 'galaga' =>
12      width = self.width()
13      self.css 'backgroundImage', 'none'
14      self.stop()
15      self.html "<img src='img/galaga_explosion.png' width=#{width}/>"
16      sound.get(0).play()
17      setTimeout ->
18        self.remove()
19        , 2000
20
21  @
```

Tuesday, June 5, 2012

This should starting to be old hat by now. Extend jQuery, add a trigger...

Explode!

```
23 $('helicopter').galagable().click =>  
24   @trigger 'galaga'
```

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Now all we have to do to make something explode is to set it up to be galagable, then trigger the 'galaga' event on it. Couldn't be easier.

Exploding helicopters

alt-tab again

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So someone added these helicopters to the site. But there was a bug, because they didn't explode. So I fixed it.

}) ;

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So that's it for me tonight. Any questions?