



## Animation

*JavaScript can be used for animating images on a web page*

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## The Plan

An animation is the rapid display of a series of still images ... like cartoons

There are three steps to animation

- 1) Place first still image(s) on web page
- 2) Prefetch the series of images and store them
- 3) Setup a timer to cycle through the images

`new0.gif, new1.gif, new2.gif, new3.gif`

Smooth motion requires 30 times/sec display



## Creating GIFs

GIF files for animation are progressively different ... make them w/Photoshop

- The series should all have the same size
- Begin with an initial GIF and build all others from it
- Getting the motion to be smooth may take a bit of fiddling

Animated GIFs – GIFs that automatically cycle use a special format and software

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## 1. Place Still Image(s)

Placing the image uses a standard `<img src=...>` tag

```

<html><head><title>Test Page</title></head>
<body>

<script language="JavaScript"> Code here
</script>
</body>
</html>

```



## The document.images

When HTML draws a page, the images go in an array: **document.images**

- Recall, arrays are names w/ indexes, like A(1)
- Each element of **document.images** array holds one image
- Pictures are put into **document.images** in the order encountered on page build ... so for Test Page, **document.images[0]**↔new0.gif
- Changing the **.src** property of the array changes the picture

But the images must be prefetched first



## 2. Prefetch Images I

"Prefetch" means to get the images and save them in (our own) array so they are handy to assign to doc.im

- We must declare an array (and probably an index variable, too):

```
var i, pref = new Array(4);
```

- Then we set it up to hold images:

```

for (i=0; i<4; i++) {
  pref[i] = new Image;
}

```

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## Prefetch Images II

Once the array is declared and setup, get the images and assign them to the .src field of the array:

```
for (i=0; i<4; i++) {
  pref[i].src = "new" + i + ".gif";
}
```

Notice that the names of the images, `new0.gif`, `new1.gif`, `new2.gif`, `new3.gif` are constructed using the index variable

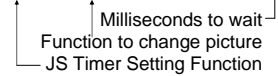


## 3. Change Image

Once Web page is drawn, nothing happens unless you cause an event

- To animate a series of stills you must cause the computer to "wake-up" and change to the next image 30 times a second
- Set a timer to cause the wake-up

```
setTimeout("animate()", 30);
```



## Animate Function

`animate()` must advance the frame counter, update the image and schedule the next timer ...

```
var frame=0, timeID;
function animate(){
  frame=(frame+1)%4; //advance
  document.images[0].src
    = pref[frame].src; //update
  setTimeout("animate()", 30);
}
```



## Watch It Go

Initial image

Prefetch

Show a frame

```
<h1>My</h1>

<script language="JavaScript">
var i, pref = new Array(4);
var frame=0;
for (i=0; i<4; i++){
  pref[i] = new Image;
}
for (i=0; i<4; i++){
  pref[i].src="new" + i + ".gif";
}
setTimeout("animate()", 2000);
function animate(){
  frame = (frame+1)%4;
  document.images[0].src=pref[frame].src;
  setTimeout("animate()", 30);
}
</script><h1>Page</h1>
```



Start action



## Watch It Go

```
<h1>My</h1>

<script language="JavaScript">
var i, pref = new Array(4);
var frame=0, timerID;
for (i=0; i<4; i++){
  pref[i] = new Image;
}
for (i=0; i<4; i++){
  pref[i].src="new" + i + ".gif";
}
setTimeout("animate()", 2000);
function animate(){
  frame = (frame+1)%4;
  document.images[0].src=pref[frame].src;
  if (frame == 0)
    timerID = setTimeout("animate()", 2000);
  else
    timerID = setTimeout("animate()", 30);
}
</script><h1>Page</h1>
```



## Demonstration



## Summary

Animation requires a 3 step process

- 1) Place the initial image(s)
- 2) Prefetch the series of images that will be the animation
- 3) Setup the animation function to draw the next item in the series

When creating your own GIFs make sure that the sizes are all the same