

# Tutorial

## a. Arrays

## b.Sound

### Araray review and exercise

#### Review if needed:

1. [W3School's tutorial on arrays](http://www.w3schools.com/js/js_arrays.asp) ([http://www.w3schools.com/js/js\\_arrays.asp](http://www.w3schools.com/js/js_arrays.asp))
  - (only until "Using the JavaScript Keyword new")
2. [W3School's tutorial on While Loops](http://www.w3schools.com/js/js_loop_while.asp) ([http://www.w3schools.com/js/js\\_loop\\_while.asp](http://www.w3schools.com/js/js_loop_while.asp))
  - (only through the first two examples - up to (not including) do/while)

#### Short exercises

1. [array 1](http://www.w3schools.com/js/exercise.asp?filename=exercise_arrays1) ([http://www.w3schools.com/js/exercise.asp?filename=exercise\\_arrays1](http://www.w3schools.com/js/exercise.asp?filename=exercise_arrays1))
2. [array 2](http://www.w3schools.com/js/exercise.asp?filename=exercise_arrays2) ([http://www.w3schools.com/js/exercise.asp?filename=exercise\\_arrays2](http://www.w3schools.com/js/exercise.asp?filename=exercise_arrays2))
3. [array 3](http://www.w3schools.com/js/exercise.asp?filename=exercise_arrays3) ([http://www.w3schools.com/js/exercise.asp?filename=exercise\\_arrays3](http://www.w3schools.com/js/exercise.asp?filename=exercise_arrays3))
4. [array 4](http://www.w3schools.com/js/exercise.asp?filename=exercise_arrays4) ([http://www.w3schools.com/js/exercise.asp?filename=exercise\\_arrays4](http://www.w3schools.com/js/exercise.asp?filename=exercise_arrays4))
5. [while 0](http://www.w3schools.com/js/tryit.asp?filename=tryjs_loop_while_cars) ([http://www.w3schools.com/js/tryit.asp?filename=tryjs\\_loop\\_while\\_cars](http://www.w3schools.com/js/tryit.asp?filename=tryjs_loop_while_cars))
6. [while 1](http://www.w3schools.com/js/exercise.asp?filename=exercise_while1) ([http://www.w3schools.com/js/exercise.asp?filename=exercise\\_while1](http://www.w3schools.com/js/exercise.asp?filename=exercise_while1))
7. [while 2](http://www.w3schools.com/js/exercise.asp?filename=exercise_while2) ([http://www.w3schools.com/js/exercise.asp?filename=exercise\\_while2](http://www.w3schools.com/js/exercise.asp?filename=exercise_while2))
8. [while 3](http://www.w3schools.com/js/exercise.asp?filename=exercise_while3) ([http://www.w3schools.com/js/exercise.asp?filename=exercise\\_while3](http://www.w3schools.com/js/exercise.asp?filename=exercise_while3))
9. [while 4](http://www.w3schools.com/js/exercise.asp?filename=exercise_while4) ([http://www.w3schools.com/js/exercise.asp?filename=exercise\\_while4](http://www.w3schools.com/js/exercise.asp?filename=exercise_while4))

## Challenges

Next we'll add sound to enrich an application. Feel free to use a copy of your H06 (the bouncing ball) as a "starting template" instead of the one provided here. Either will work for the sound challenges below.

**For these challenges**, please open an account for yourself on [freesound.org](http://freesound.org). **Explore** the hundreds of thousands of sounds they have there (contributed by users), and find and download some good sounds you can:

- use as a "start-up" sound when your application starts,
- use for a background sound,
- Sound for when ball bumps into a wall.

Save them to a folder in your application.

Next, we will explore the HTML 5 <audio> element.

**Template:** Use the starting template to begin your challenge coding:

1. Download your start-up and back-ground sounds from freesound.org (or from wherever you like!) into a subdirectory of today's project directory named 'resources'.
2. Create an HTML `<audio>` element with 'controls' inside the `<aside>` element on your main html page. Have it load the background sound which you stored in your resources directory. Run your browser page to see that it is working.
  - Hint: Look here ([https://www.w3schools.com/html/html5\\_audio.asp](https://www.w3schools.com/html/html5_audio.asp)) to see how to use the audio element.
  - Note: You probably don't actually need to include the type attribute on the source element in Chrome.
  - Different audio file formats: such as .mp3, .ogg, .wav files all work in Chrome. .aif files do not.
  - Note: You could have also specified a full URL if you have one for a sound on the web and don't want to store it locally.
3. Now lets create an HTML 5 audio element directly in our JavaScript code. Load the sound when the application loads.

```
let variable_name = new Audio(audio_uri); // where audio_uri is either a path name or a web address
```

  - Browsers won't let you start playing a sound without using interaction. So, create a `<input>` element of type 'button' on the 'nav' side panel. Use it to toggle between playing and pausing the sound. Note: audio elements have a `.play()` and a `.pause()` method, a `.loop` property that takes a boolean (true or false) value, and a `.volume` attribute taking values in [0,1]. Try looping it just to see how that works.
4. Now start/stop the animation with the toggle button, too, by starting and stopping the interval timer callbacks to your draw function. The background sound and the animation should play and stop together.
5. Now for the bounce: play another audio element whenever the ball hits a wall.
  - Does it work when the ball hits two walls one right after the other? Why not?
  - Audio elements have a `.currentTime` property that you can set to 0 after pausing in order to start the sound from the beginning again.

### Bonus Round

6. Get a total of 4 sounds to use for bouncing, and put them in an array. Play a different one of the sounds for each wall

