



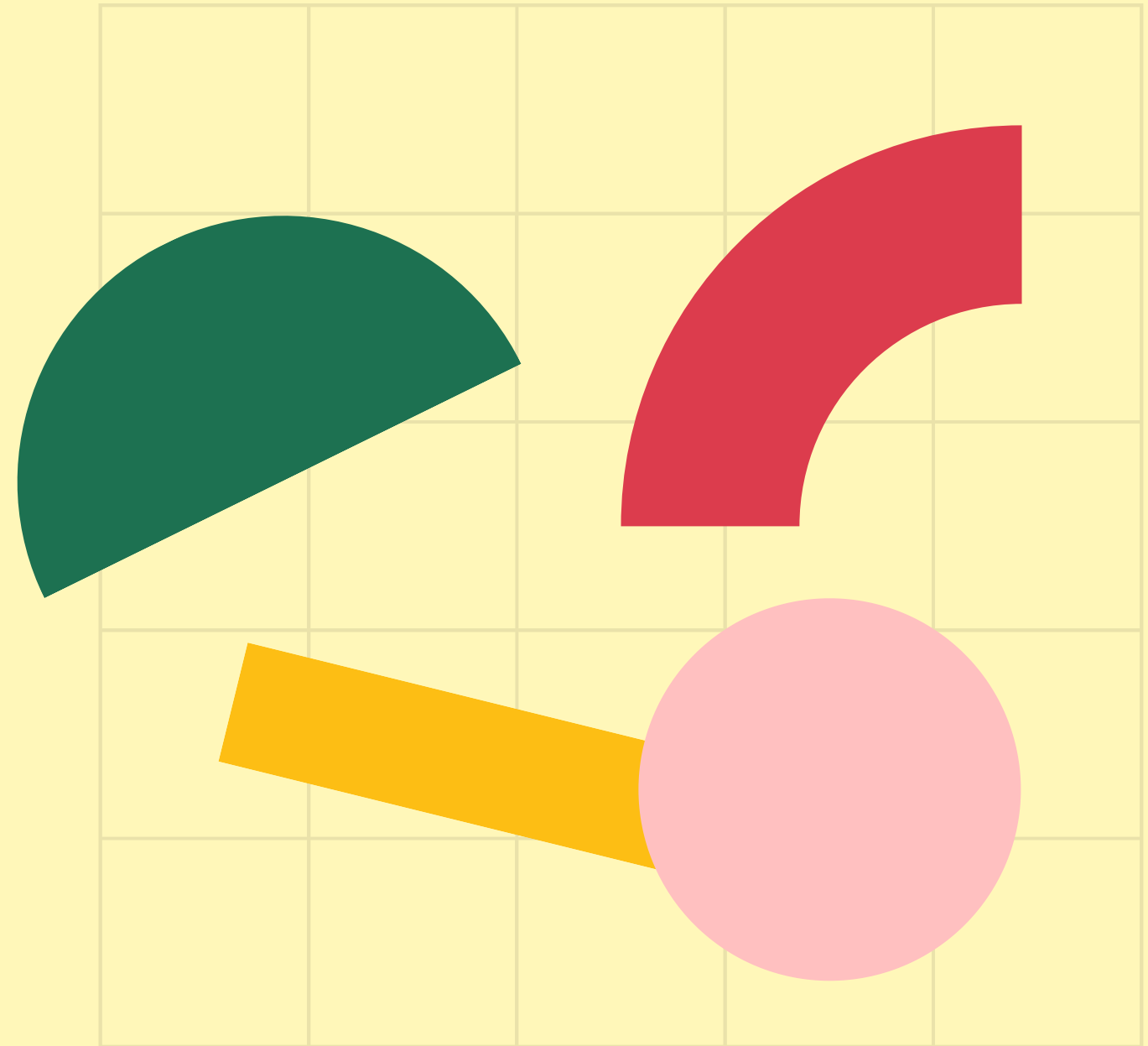
Leveling Up Our Functions

Advanced Functions

Unit Goals

what we'll cover

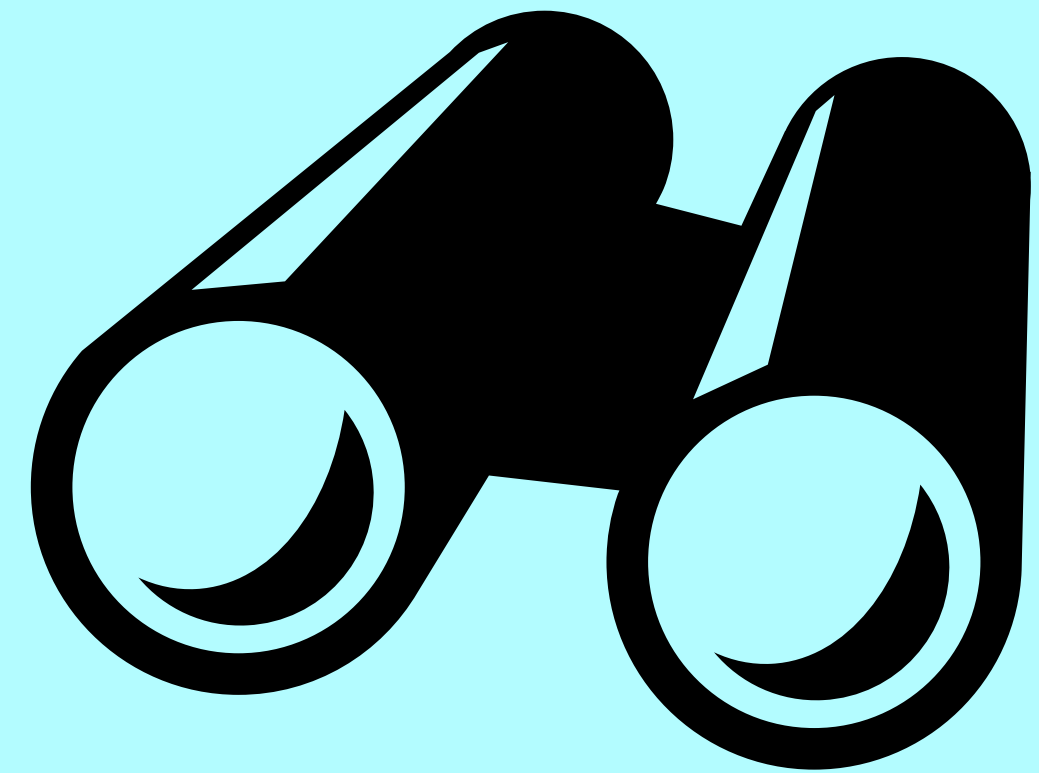
- scope
 - block
 - lexical
- function expressions
- higher order functions
- methods
- this



SCOPE


VARIABLE VISIBILITY

The location where a variable is defined dictates where we have access to that variable.



FUNCTION SCOPE

VARIABLE VISIBILITY



```
function helpMe( ){  
    let msg = "I'm on fire!";  
    msg; //"I'm on fire";  
}
```

msg is scoped to the
helpMe function

```
msg; //NOT DEFINED!
```

FUNCTION SCOPE

VARIABLE VISIBILITY

```
let bird = 'mandarin duck';
```

```
function birdWatch(){  
    let bird = 'golden pheasant';  
    bird; //'golden pheasant'  
}
```

```
bird; //'mandarin duck'
```

bird is scoped to
birdWatch function

BLOCK SCOPE

VARIABLE VISIBILITY

```
let radius = 8;
```

```
if(radius > 0){
```

```
    const PI = 3.14;
```

```
    let circ = 2 * PI * radius;
```

```
}
```

```
console.log(radius); //8
```

```
console.log(PI); //NOT DEFINED
```

```
console.log(circ); //NOT DEFINED
```

PI & circ are
scoped to the
BLOCK

LEXICAL SCOPE

VARIABLE VISIBILITY



```
function outer() {  
  let hero = "Black Panther";  
  
  function inner() {  
    let cryForHelp = `${hero}, please save me!`  
    console.log(cryForHelp);  
  }  
  
  inner();  
}
```

FUNCTION EXPRESSIONS

FUNCTIONS ARE OBJECTS



```
const square = function (num) {  
  return num * num;  
}  
square(7); //49
```


HIGHER ORDER FUNCTIONS

Functions that operate on/with other functions.

They can:

- accept other functions as arguments
- return a function



FUNCTIONS AS ARGUMENTS

```
function callTwice(func) {  
    func();  
    func();  
}  
  
function laugh() {  
    console.log("HAHAHAHAHAHAHAHAHAHAHAHA");  
}  
callTwice(laugh) //pass a function as an arg!  
// "HAHAHAHAHAHAHAHAHAHAHAHAHAHAHAHA"  
// "HAHAHAHAHAHAHAHAHAHAHAHAHAHAHAHA"
```

RETURNING FUNCTIONS



```
function makeBetweenFunc(min, max) {  
  return function (val) {  
    return val >= min && val <= max;  
  }  
}  
  
const inAgeRange = makeBetweenFunc(18, 100);  
  
inAgeRange(17); //false  
inAgeRange(68); //true
```


METHODS

```
const math = {  
  multiply : function(x, y) {  
    return x * y;  
  },  
  divide   : function(x, y) {  
    return x / y;  
  },  
  square   : function(x) {  
    return x * x;  
  }  
};
```

We can add functions as properties on objects.

We call them **methods**.

SHORTHAND




```
const math = {  
  blah: 'Hi!',  
  add(x, y) {  
    return x + y;  
  },  
  multiply(x, y) {  
    return x * y;  
  }  
}  
math.add(50, 60) //110
```

We do this so often that there's a new shorthand way of adding methods.

'THIS' IN METHODS

The keyword **this** is used to access other properties on the same object.



```
const person = {  
  first: 'Robert',  
  last: 'Herjavec',  
  fullName() {  
    return `${this.first} ${this.last}`  
  }  
}  
  
person.fullName(); // "Robert Herjavec"  
person.last = "Plant";  
person.fullName(); // "Robert Plant"
```


'THIS' IN METHODS

The value of **this** depends on the invocation context of the function it is used in.



'THIS' IN METHODS

SAME FUNCTION

```
const person = {  
  first: 'Robert',  
  last: 'Herjavec',  
  fullName() {  
    return `${this.first} ${this.last}`  
  }  
}
```

```
person.fullName();  
// "Robert Herjavec"
```

DIFFERENT RESULT???

```
const func = person.fullName;  
func()  
// "undefined undefined"
```


'THIS' IN METHODS

The value of **this** depends on the **invocation context** of the function it is used in.

