



Minor Challenge Set #1

STEM Field: Software Engineering (Programming)

Level: Senior

Challenge Name: Build a Stopwatch with JavaScript

Project Cost: 0 USD

Materials Required:

- Laptop with internet access

Duration:

- The challenge takes approximately 1-2 hours to finish, however, the time guideline is an estimation only, and students and mentors can complete the tasks around their schedules.

Introduction:

In this challenge, you will build a simple stopwatch using JavaScript programming language. First, you will create the basic structure of the stopwatch, for example, the shape and size of the stopwatch, and add buttons such as “Start” and “Reset”. You will then create a display for the time, and add some functions to calculate how much time has passed.

This challenge will introduce you to some programming concepts such as variables, if-else loop, comments, and more.

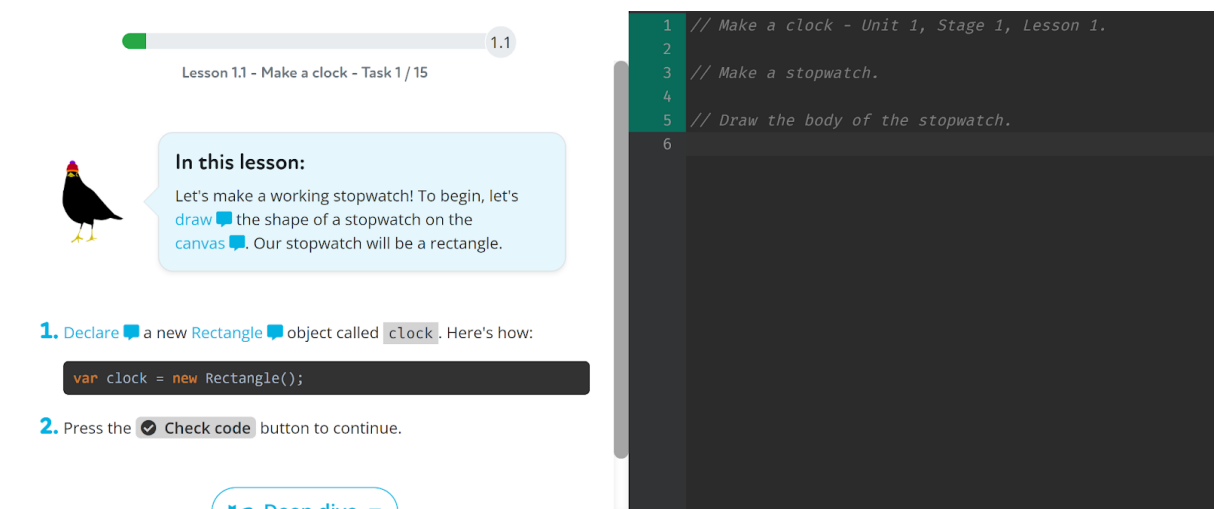
Instructions:

On your laptop, click on the link - <https://hourofcode.com/bbstopwatch>.

Press “continue” to get started.

Note: No registration is required.

An example of a lesson is shown below. You will write your code in the space provided on the right hand side.



Lesson 1.1 - Make a clock - Task 1 / 15

In this lesson:
Let's make a working stopwatch! To begin, let's draw the shape of a stopwatch on the canvas. Our stopwatch will be a rectangle.

1. Declare a new `Rectangle` object called `clock`. Here's how:


```
var clock = new Rectangle();
```
2. Press the ☒ Check code button to continue.

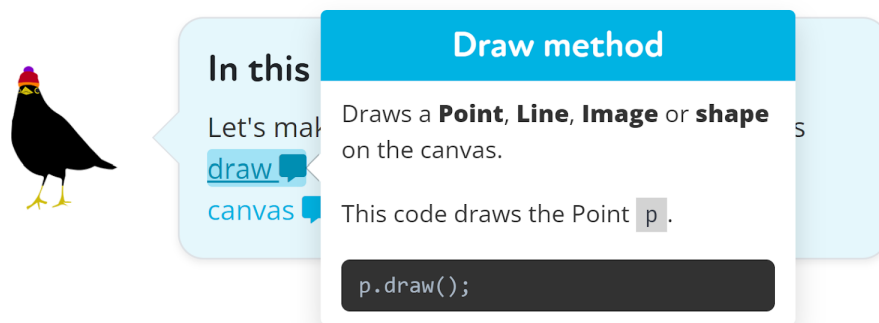
Deep dive


```
1 // Make a clock - Unit 1, Stage 1, Lesson 1.
2
3 // Make a stopwatch.
4
5 // Draw the body of the stopwatch.
6
```

In the space provided, you can see there are statements that start with two forward slashes (`//`). This means the statement is a comment. When writing a program, it is a good habit to write comments that briefly describe the purpose of the code. This makes it easier for another person to read and understand what your code does. It also helps you if you need to review the functionality of your code later on.

For this challenge, you will not need any previous knowledge of writing code in JavaScript. You can follow the instructions on the left hand side to complete the program.

You can click on the  symbol to see an example of the code you should write to complete the task.

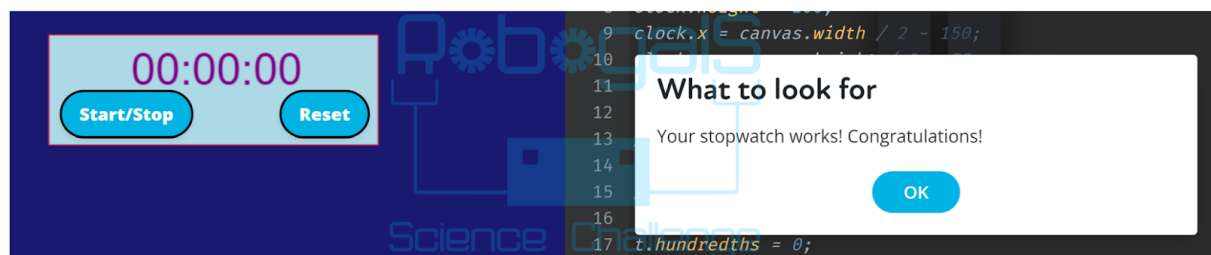


You can also click on the  button to learn more about the functions of the code or the object you used in the program.

If you need help, click on the  button for a hint to complete the lesson.

When you have successfully created a stopwatch and completed all the lessons, you will see a screen similar to the figure below. Click on the different buttons on your stopwatch to test how they work.

Don't forget to take a screenshot of your completed lesson to submit with the reflection questions later on!



Extension

Make Pong is another game you can code with JavaScript. Click on the link <https://hourofcode.com/kanopong> to launch the interactive lesson.

Follow the instructions and complete the lessons to build another game in JavaScript!

Reflection Questions:

- Are there any improvements you would make to this challenge?
- Can you list 3-5 real-life examples where JavaScript is used as the preferred programming language?
- What problem did you encounter while completing this lesson?
How did you overcome it?
- In task 5, you declare a variable for an empty object `t`, as shown in the code below. Can you describe what a variable does, and why do we need to use a variable in this case?

```
var t = {};
```

- In task 9, you are introduced to the `if` statement. In your own words, what is the purpose of the `if` statement?

Submission Guidelines:

- Submit a photo of your completed lesson. Include a short summary that addresses the reflection questions.

Note: Remember, if you want to upload pictures of your Minor Challenge that also include you, please check if it is OK with your parent or guardian first.

- The submission form is on the Minor Challenges page:
<https://sciencechallenge.org.au/index.php/minor-challenges/>
Fill out the details and make sure you upload your submission.

Learn More! Resources:

- Build another game in JavaScript - <https://hourofcode.com/kanopong>

Bibliography:

- *Hour of Code: Stopwatch* (no date) *Blackbird*. Blackbird. Available at: <https://app.blackbirdcode.com/intro.php?type=stage&id=2101> (Accessed: March 13, 2023).