

# 1. Ten basic `while` loop exercises

## 1.1 – Count 1 to 5

Write a program that:

- Creates a variable `num` with the value `1`.
  - Uses a `while` loop to print the numbers `1, 2, 3, 4, 5` each on its own line.
  - Inside the loop:
    - Print `num`.
    - Increase `num` by `1`.
  - The loop must stop when `num` becomes `6`.
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## 1.2 – Count down from 5 to 1

Write a program that:

- Creates a variable `num` with the value `5`.
  - Uses a `while` loop to print `5, 4, 3, 2, 1` each on its own line.
  - Inside the loop:
    - Print `num`.
    - Decrease `num` by `1`.
  - The loop must stop when `num` is `0`.
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## 1.3 – Sum of numbers 1–10

Write a program that:

- Creates `num = 1` and `sum = 0`.
  - Uses a `while` loop that runs as long as `num` is less than or equal to `10`.
  - In each iteration:
    - Add `num` to `sum`.
    - Increase `num` by `1`.
  - After the loop, print the final value of `sum` (should be the sum of 1–10).
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## 1.4 – Print even numbers from 2 to 10

Write a program that:

- Creates `num = 2`.
  - Uses a `while` loop to print the even numbers: **2, 4, 6, 8, 10**.
  - In each iteration:
    - Print `num`.
    - Increase `num` by `2`.
  - The loop stops when `num` becomes `12`.
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## 1.5 – Ask until number $\geq 10$ (no actual input, just simulate)

Write a program that:

- Creates `num = 3`.
- Uses a `while` loop that runs as long as `num` is **less than 10**.

- In each iteration:
    - Print "num is X" where X is the current value.
    - Increase num by 2.
  - Stop when num reaches or passes 10.
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### 1.6 – Print 1 to 3

Write a program that uses a `while` loop and a counter to print the numbers **1, 2, 3**.

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### 1.7 – Print multiples of 5 up to 25

Write a program that uses a `while` loop to print **5, 10, 15, 20, 25**.

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### 1.8 – Countdown by 2

Write a program that starts with `num = 10` and uses a `while` loop to print **10, 8, 6, 4, 2**.

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### 1.9 – Print “hello” 4 times

Write a program that uses a `while` loop and a counter to print "hello" exactly 4 times.

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### 1.10 – Sum of even numbers 2–10

Write a program that uses a `while` loop to calculate and print the sum of the even numbers **2, 4, 6, 8, 10**.

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## 2. Ten basic `for` loop exercises

(First 5 detailed, next 5 shorter.)

### 2.1 – Count 1 to 5

Write a `for` loop that:

- Starts a counter at 1.
  - Runs while the counter is less than or equal to 5.
  - Increases the counter by 1 each time.
  - Prints the counter in each iteration (1, 2, 3, 4, 5).
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### 2.2 – Count down from 5 to 1

Write a `for` loop that:

- Starts a counter at 5.
  - Runs while the counter is greater than or equal to 1.
  - Decreases the counter by 1 each time.
  - Prints the counter (5, 4, 3, 2, 1).
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### 2.3 – Sum 1–10 with `for`

Write a program that:

- Has a variable `sum` starting at 0.
- Uses a `for` loop from 1 to 10 (inclusive).
- In each iteration adds the loop variable to `sum`.
- After the loop, prints the final `sum`.

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## 2.4 – Print even numbers 2–10

Write a `for` loop that:

- Starts at `2`.
  - Ends at `10` (inclusive).
  - Increases by `2` each time.
  - Prints the loop variable (`2, 4, 6, 8, 10`).
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## 2.5 – Print “JS” 3 times

Write a `for` loop that:

- Runs exactly 3 times.
  - In each iteration prints `"JS"`.
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## 2.6 – Print 1–4

Write a `for` loop that prints the numbers `1, 2, 3, 4`.

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## 2.7 – Print multiples of 3 up to 15

Write a `for` loop that prints `3, 6, 9, 12, 15`.

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## 2.8 – Print numbers from 10 down to 0 (step -2)

Write a `for` loop that prints `10, 8, 6, 4, 2, 0`.

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## 2.9 – Sum 5–15

Write a program that uses a **for** loop to calculate and print the sum of the numbers from **5** to **15** (inclusive).

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## 2.10 – Print index and square

Write a **for** loop that runs from 1 to 4, and in each iteration prints the loop index and its square (for example: **1 1**, **2 4**, etc.).

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# 3. Ten exercises: turn **while** into **for**

## 3.1

```
let i = 1;
while (i <= 5) {
    console.log(i);
    i++;
}
```

## 3.2

```
let i = 10;
while (i >= 1) {
    console.log(i);
    i--;
}
```

## 3.3

```
let i = 2;
while (i <= 10) {
    console.log(i);
    i += 2;
}
```

## 3.4

```
let i = 5;
while (i <= 15) {
    console.log("Number:", i);
    i++;
}
```

### **3.5**

```
let i = 3;
while (i < 12) {
    console.log(i * 2);
    i += 3;
}
```

### **3.6**

```
let i = 0;
while (i < 4) {
    console.log("hello");
    i++;
}
```

### **3.7**

```
let i = 1;
while (i <= 3) {
    console.log("i is", i);
    i++;
}
```

### **3.8**

```
let i = 10;
while (i >= 0) {
    console.log(i);
    i -= 2;
}
```

### **3.9**

```
let i = 1;
let sum = 0;
while (i <= 5) {
    sum = sum + i;
    i++;
}
console.log(sum);
```

### 3.10

```
let i = 5;
while (i < 10) {
  console.log(i + 1);
  i++;
}
```

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## 4. Ten exercises: turn `for` into `while`

### 4.1

```
for (let i = 1; i <= 5; i++) {
  console.log(i);
}
```

### 4.2

```
for (let i = 10; i >= 1; i--) {
  console.log(i);
}
```

### 4.3

```
for (let i = 2; i <= 10; i += 2) {
  console.log(i);
}
```

### 4.4

```
let sum = 0;
for (let i = 1; i <= 10; i++) {
  sum += i;
}
console.log(sum);
```

### 4.5

```
for (let i = 0; i < 3; i++) {
  console.log("Hi");
}
```

## 4.6

```
for (let i = 5; i <= 15; i++) {  
  console.log("i is", i);  
}
```

## 4.7

```
for (let i = 10; i >= 0; i -= 2) {  
  console.log(i);  
}
```

## 4.8

```
for (let i = 1; i <= 4; i++) {  
  console.log(i * i);  
}
```

## 4.9

```
for (let i = 3; i < 12; i += 3) {  
  console.log(i);  
}
```

## 4.10

```
for (let i = 1; i <= 3; i++) {  
  console.log("Loop:", i);  
}
```

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## 5. Ten exercises: fix infinite **while** loops

Each of these **never ends** as written.

*What is wrong? How do you change it so it stops correctly?* (Don't change the goal of the loop.)

### 5.1

```
let i = 1;  
while (i <= 5) {  
  console.log(i);  
}
```

## 5.2

```
let i = 10;
while (i >= 0) {
    console.log(i);
    i++; // wrong direction
}
```

## 5.3

```
let i = 0;
while (i < 3) {
    console.log("hello");
    // missing change to i
}
```

## 5.4

```
let i = 5;
while (i > 0) {
    console.log(i);
    i = i + 1;
}
```

## 5.5

```
let i = 1;
while (i !== 10) {
    console.log(i);
    i -= 1;
}
```

## 5.6

```
let i = 2;
while (i < 20) {
    console.log(i);
    i = i - 2;
}
```

## 5.7

```
let i = 0;
while (i <= 4) {
    console.log(i);
    // no change to i
}
```

## 5.8

```
let i = 10;  
while (i >= 0) {  
    console.log(i);  
    // no change to i  
}
```

## 5.9

```
let i = 1;  
while (i < 5) {  
    console.log(i);  
    i = i + 0; // useless change  
}
```

## 5.10

```
let i = 3;  
while (i > 0) {  
    console.log(i);  
    i = i + 2;  
}
```

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# 6. Ten exercises: fix infinite **for** loops

Same idea: these loops never end (or are logically wrong). Students need to fix them.

## 6.1

```
for (let i = 1; i <= 5; ) {  
    console.log(i);  
}
```

## 6.2

```
for (let i = 10; i >= 0; i++) {  
    console.log(i);  
}
```

## 6.3

```
for (let i = 0; i < 3; ) {  
    console.log("hi");  
    // missing i++  
}
```

## 6.4

```
for (let i = 5; i > 0; i++) {  
    console.log(i);  
}
```

## 6.5

```
for (let i = 1; i !== 10; i--) {  
    console.log(i);  
}
```

## 6.6

```
for (let i = 2; i < 20; i -= 2) {  
    console.log(i);  
}
```

## 6.7

```
for (let i = 0; i <= 4; ) {  
    console.log(i);  
    i = i; // no real change  
}
```

## 6.8

```
for (let i = 10; i >= 0; ) {  
    console.log(i);  
    // i not changed  
}
```

## 6.9

```
for (let i = 3; i > 0; ) {  
    console.log(i);  
    i = i + 2;  
}
```

## 6.10

```
for (let i = 1; i < 5; i = i + 0) {  
    console.log(i);  
}
```

---

## 7. Ten exercises: while / for – what will be printed?

### 7.1

```
let i = 1;  
while (i <= 3) {  
    console.log(i);  
    i++;  
}
```

**What will be printed?**

---

### 7.2

```
let i = 5;  
while (i > 0) {  
    console.log(i);  
    i--;  
}
```

**What will be printed?**

---

### 7.3

```
let sum = 0;  
for (let i = 1; i <= 4; i++) {  
    sum = sum + i;  
}  
console.log(sum);
```

**What will be printed?**

---

## 7.4

```
for (let i = 2; i <= 10; i += 2) {  
    console.log(i);  
}
```

**What will be printed?**

---

## 7.5

```
let i = 0;  
while (i < 3) {  
    console.log("loop");  
    i++;  
}  
console.log("end");
```

**What will be printed?**

---

## 7.6

```
for (let i = 3; i > 0; i--) {  
    console.log("i is", i);  
}
```

**What will be printed?**

---

## 7.7

```
let i = 1;  
while (i <= 5) {  
    if (i % 2 === 0) {  
        console.log("even", i);  
    }  
    i++;  
}
```

**What will be printed?**

---

## 7.8

```
let product = 1;
for (let i = 1; i <= 3; i++) {
  product = product * i;
}
console.log(product);
```

**What will be printed?**

---

## 7.9

```
let i = 10;
while (i >= 6) {
  console.log(i);
  i -= 2;
}
```

**What will be printed?**

---

## 7.10

```
for (let i = 1; i <= 5; i++) {
  if (i === 3) {
    console.log("middle");
  } else {
    console.log(i);
  }
}
```

**What will be printed?**

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If you want a follow-up, I can:

- Add a “**loops + if + operators**” summary pack,
- Or turn some of these into a printable worksheet / Google Sheets table.