

## Distance vs displacement simulation

### Challenge 1:

Set up the following scenario:

- Start flag position: 5 meters
- Destination flag position: 55 meters
- The car should face towards the **right**.

Start the simulation and fill the following data:

- Distance: \_\_\_\_\_
- Displacement: \_\_\_\_\_

As you noticed, the car travelled **49km (displacement)** towards the east. The distance between the starting point and the goal is also **49 km**.

### Challenge 2:

Set up the following scenario:

- Start flag position: 30 meters
- Destination flag position: 55 meters
- The car should face towards the **right**.

Start the simulation and fill the following data:

- Distance: \_\_\_\_\_
- Displacement: \_\_\_\_\_

As you noticed, the car travelled **24km (displacement)** towards the east. The distance between the starting point and the goal is also **24 km**.

**Challenge 3:**

Set up the following scenario:

- Start flag position: 30 meters
- Destination flag position: 6 meters
- The car should face towards the **left**.

Start the simulation and fill the following data:

- Distance: \_\_\_\_\_
- Displacement: \_\_\_\_\_

As you noticed, the car travelled **-24km (displacement)** towards the west. Notice the negative number; that means that the car travelled towards the west. The distance between the starting point and the goal is **24 km**.

**Challenge 4:**

Set up the following scenario:

- Start flag position: 30 meters
- Destination flag position: 55 meters
- The car should face towards the **right**.

Start the simulation; once your car is in the middle point between both flags stop the simulation. Then, change the direction of the car (**left**). Stop the car once you reach the starting point. Take note of the following data.

- Distance: \_\_\_\_\_
- Displacement: \_\_\_\_\_

Did you notice that the distance is increasing all the time and that displacement increases and decreases according to the position of the car?

Now, move your car 5 more km; after, change directions and reach the goal.