

Vei, fart, tid- på engelsk

Distance, velocity, time and acceleration

Velocity and acceleration

Velocity or speed is a measurement of how fast something moves within a certain amount of time. We can use two racing cars as an example. The cars drive the same distance.

To discover which of the two cars drives the fastest and wins the race, we can calculate their velocity. The car with the highest velocity moves the fastest. To calculate the cars' velocities, we need to know how far they have gone, and how long they took. For the calculation, we use a formula called the velocity formula. The velocity formula says:

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$$\text{fart} = \frac{\text{vei}}{\text{tid}} \quad \text{eller} \quad v = \frac{s}{t}$$

v = velocity (or speed)

s = distance

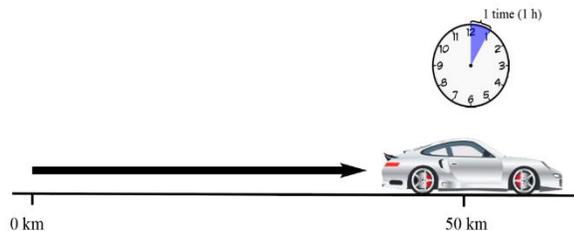
t = time

Common metric units for velocity are km/h and m/s.

- The unit km/h (kilometres per hour) tells us how many kilometres something has travelled in one hour.
- The unit m/s (metres per second) tells us how many metres something has moved in one second.

If a car travels 50 km in one hour, the velocity of the car is 50 km/h:

$$\text{fart} = \frac{50 \text{ km}}{1 \text{ h}} = 50 \text{ km/h}$$



When we divide the distance with the time as in the equation above, we calculate the car's average velocity or speed.

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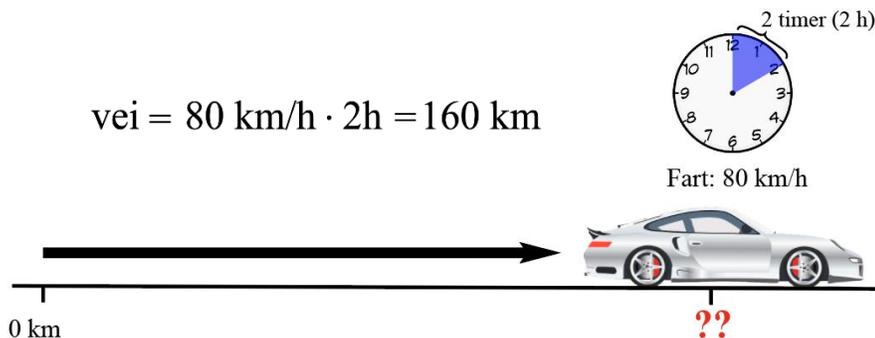
Acceleration is a measurement of how quickly something changes its velocity, e.g. how quickly a car can go from 0 to 100 km/h. When the velocity changes, that means the car is accelerating, whether the car is going faster or slower. If the velocity increases, the acceleration is positive. If the car goes slower, the acceleration is negative. Acceleration is measured in metres per second per second, or m/s^2 .

Calculate distance, velocity and time:

We have already seen how we can use the velocity formula to calculate velocity. But we can also use the velocity formula to calculate how far something moves, if we know the velocity and time. We can also use the formula to calculate the time, if we know the velocity and distance.

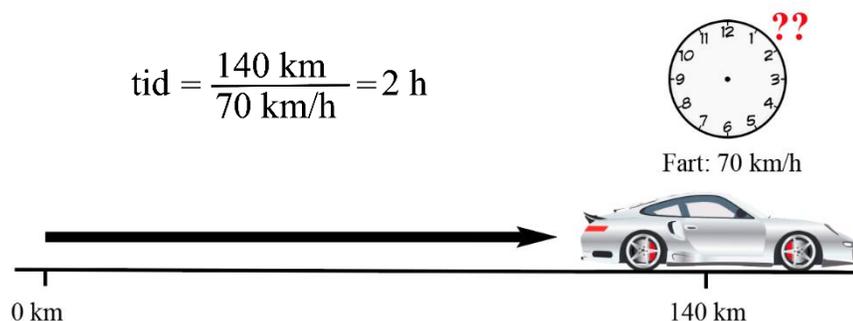
Distance:

To calculate how far something has moved, we can multiply the velocity by the time. If we know that a car has gone 80 km/h for two hours, we can calculate that the distance travelled was 160 km:



Time:

To calculate the time it takes for something to move a certain distance, we can divide the distance by the velocity. If we know that a car has gone 140 km at 70 km/h, we find that the trip took two hours:



Questions for the text on velocity and acceleration:

- What do we need to know to calculate a car's velocity? Choose at least one answer.
 - How far the car has travelled
 - How long the trip took
 - How big the car is
- What is a common unit for velocity? Choose at least one answer.
 - Km/h
 - m/s
 - m/s^2
- What is acceleration? Choose one answer.
 - The highest possible velocity
 - How fast something changes its velocity
 - How far something travels
- What is a common unit for acceleration? Choose one answer.
 - m
 - km/h
 - m/s^2
- What can we calculate using the velocity formula? Choose at least one answer.
 - How fast something moves (velocity/speed)
 - How far something moves (distance)
 - How long it takes for something to travel a certain distance (time)