

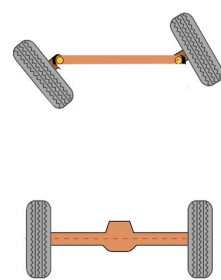
Lesson 3.5 - Mars Rover

Student Workbook Component

Warm Up

How do vehicles turn?

It seems that all vehicles use the same system to steer - turning the front wheel: But is this really the only or the best way?

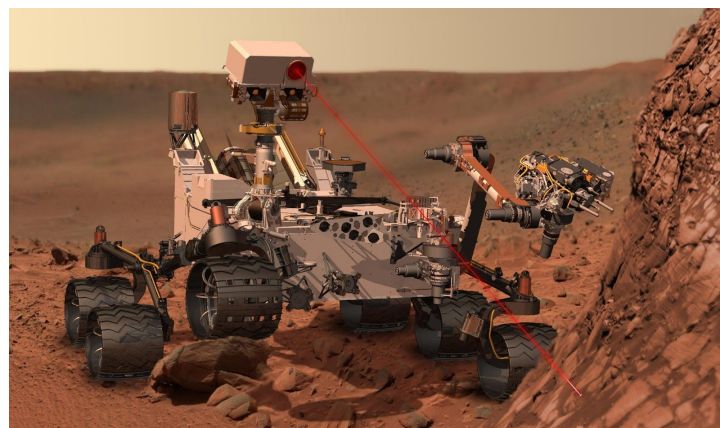


Can you think of any reasons why we might need a different system? Think about what happens if you try to steer a bike or a car very abruptly. What happens?

What about hoverboards and skates?



What about the Mars Rovers?



Mini-lesson

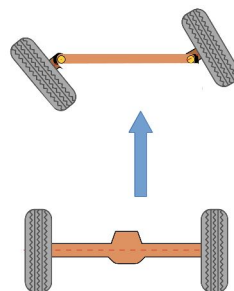
How do other vehicles turn?

Many specialized vehicles, especially those that use tracks, cannot turn like a bike a scooter or car, since the have no wheels. These vehicles cannot use normal wheels as they have to travel over snow or very uneven ground. And they have to get there! Often these vehicle are used in extreme conditions where people's' lives or survival depend on them, so their steering mechanism must also be robust.



So how do they turn? These vehicles have two tracks, one on each side. There are motors attached to each track. If we make one track go faster than the other, then the vehicle will turn.

If you think about it, this makes a lot of sense. When we turn the wheels on a car or a bike, the motion of the vehicle is pushing the wheels **forward**... but the wheels are facing **sideways**.



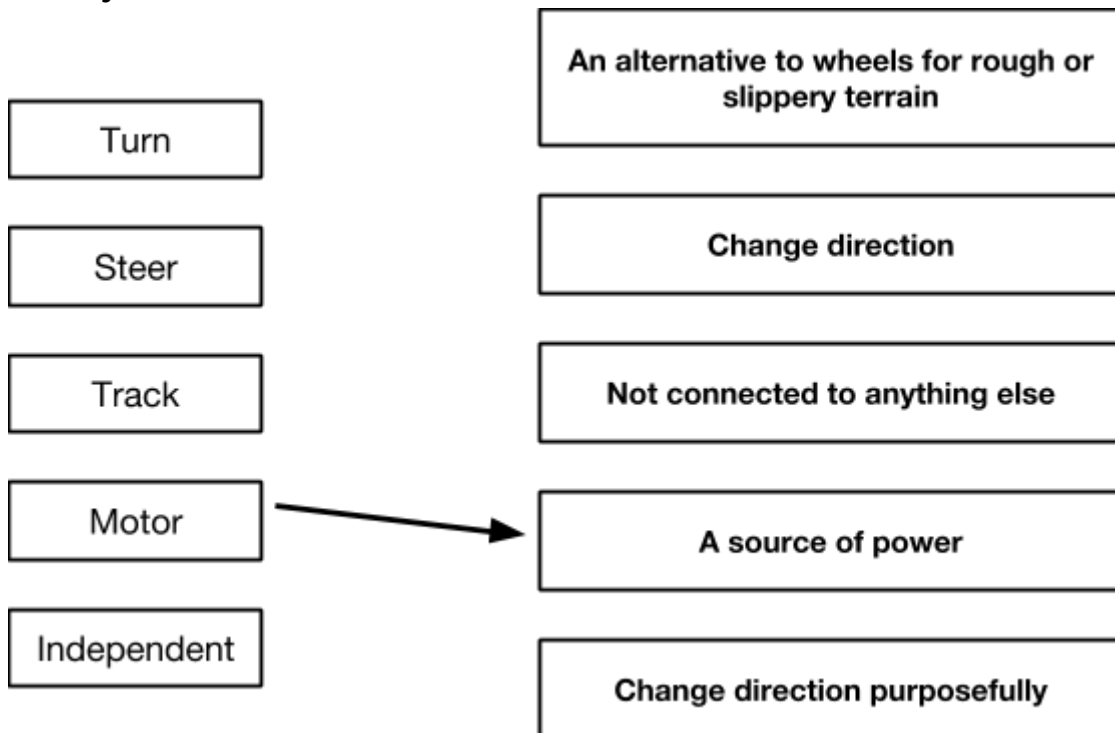
This makes it relatively easy for the vehicle to skids or to lose grip. So it makes a lot of sense to have independent steering for each wheel, or at least for the wheels at the front and the beck.

Mini-lesson

Learning Check

Let's Discuss: Why is moving only the front wheel not always the best way for a vehicle to steer? In your workbook or with a partner, record, discuss, or share ideas for alternative methods of controlling steering

Fill in the definitions with the appropriate keyword. The first one has been done for you

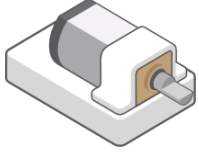






Challenge 1

Planning Your System

Learning Objective: Make a SAM Car which steers using two options.

1. Which blocks do you need?

	<p>The Motors drive the wheels</p>
 KEY PRESS	<p>The various Key Press blocks control the different functions in the Switch system</p>
 SWITCH DIRECTION	<p>The Switch Direction blocks reverse the direction of rotation of the Motors</p>
 CAR CONTROLLER	<p>The Car Controller is a dedicated block, just for the combination of blocks that make up a car</p>
 SWITCH	<p>The Switch block allows a signal to only be sent when it is activated by one or more inputs</p>

Lesson 3.5 - Mars Rover

Student Workbook Component

2. Sketch your plan: Think about the SAM system you want to create and use the space below to draw it out.

- Which are your inputs and outputs? (*Remember inputs on the left connected to your output on the right*)
- How will they be connected together?
- What settings do you need to edit?