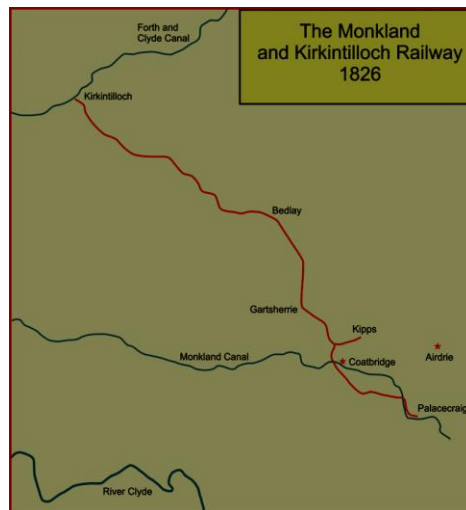


Friction on the Rails

Sometimes friction can be a good thing, for example the breaks on your bike slowing you down so you don't crash, or a good grip on your shoes to stop you slipping. But for the engineers pioneering the railway routes in Lanarkshire 200 years ago, friction was not good. It was slowing down the wagons and making journey times longer.

In 1826 Thomas Grainger and John Miller engineered The Monkland and Kirkintilloch Railway; the first public railway opened in Scotland. The railway connected with the Monkland Canal at Airdrie with the Forth and Clyde Canal at Kirkintilloch and carried minerals as well as being a popular passenger route for canal workers getting to and from work. At the outset wagons were pulled by horses, but later by steam train.



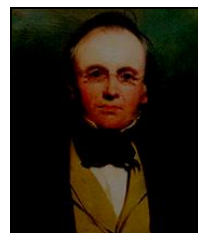
Grainger & Millar made the decision to use rails made from malleable iron instead of wood. This made the railway more expensive to build but also more reliable as iron is more durable than wood. Iron is also smoother than wood so there was less friction- in practical terms the horses pulling the carriages could go faster and use less energy. In subsequent times of steam it meant less coal was needed.

You can find out more about Lanarkshire's canals and railways by visiting our collections website:

<https://www.culturenlmuseums.co.uk/theme/transport/>



Thomas Grainger
Born: 1794 near Edinburgh
Died: 1852



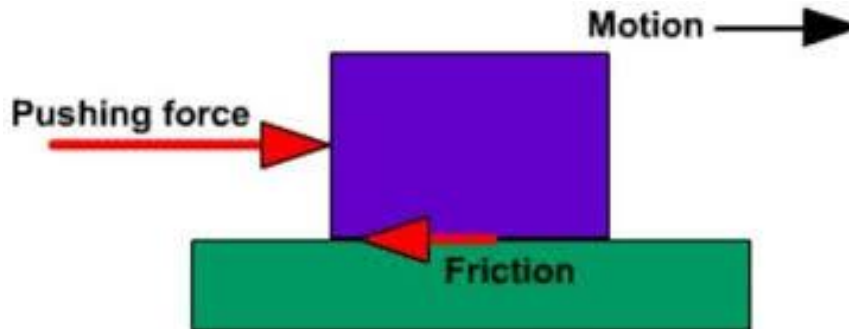
John Miller
Born: 1805 in Ayr
Died: 1883

supported by



Friction Experiments

Friction is a force which reduces motion (i.e. slows an object down) or can make it stop.



Try some practical experiments at home to learn more about friction:

Gather some buttons or coins and various types of paper/ surfaces e.g. sandpaper, cardboard, wrapping paper, metallic paper, and wallpaper. Try gently sliding the bottom or coin across each to see which goes the furthest. In general terms, the rougher the surface, the slower the coin will move as there is more friction present.

Friction Ramp

What you need- think cardboard or wood to make a ramp

Toy car

Timer or stop watch

Different surfaces e.g. card, sand paper, metallic paper, carpet (improvise with what you have available) alternatively toy can stick different surfaces on to the cardboard to give it a texture; such as tin foil, Elastoplast, netting.

Set up an angled ramp.

Maintaining the same angle each time let the car go at the top of the ramp and use timer to see how long it takes to ravel from stat to finish.

Now change the surface of the ramp and time the car again (making sure it travels the same distance)

Which journey is the fastest? Which surface creates the most friction- usually the smoother the surface the less friction it creates and should therefore be the fastest?

supported by

