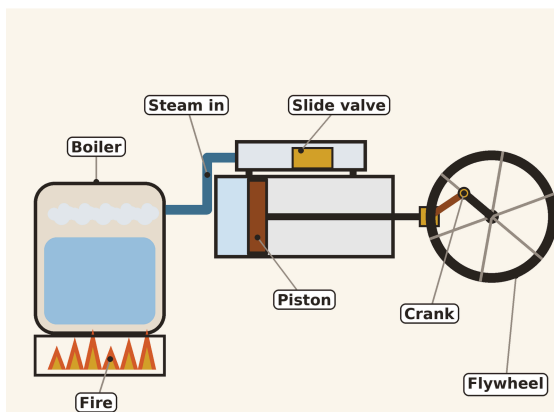
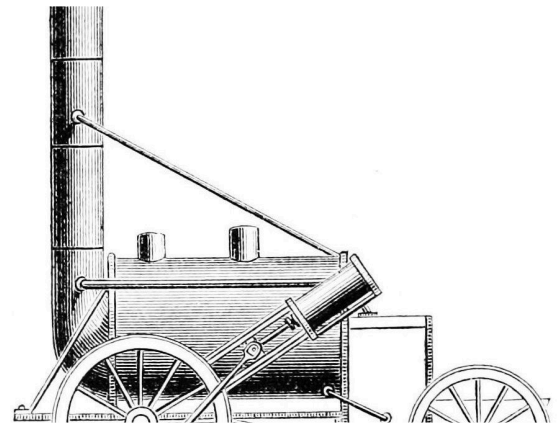


Steam Engines Free Sample

A taste of the printable packs from steam.mechanics.im



FREE

9 PAGES

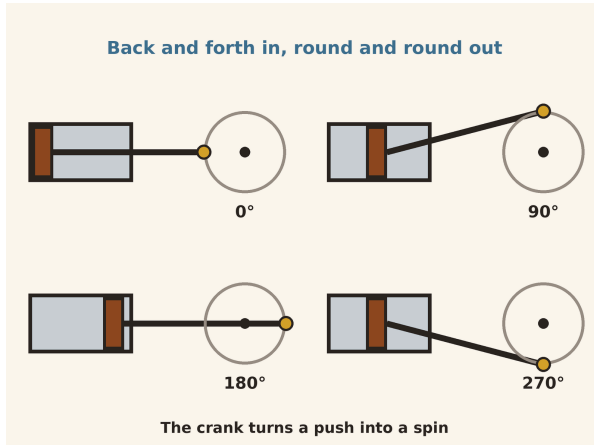
A4 + US LETTER

SHEET 6 OF 10

The crank

How a push becomes a spin

THE FINISHED DIAGRAM



Our own simplified diagram, not to scale.

YOU NEED

A compass, a ruler and a pencil.

STEPS

1. Draw four small cylinders, each with a wheel to its right.
2. In the first, put the piston right in and the crank pin on the left of the wheel.
3. In the second, put the piston halfway and the pin at the top.
4. In the third, put the piston right out and the pin on the right.
5. In the fourth, put the piston halfway and the pin at the bottom.
6. Join each piston to its pin with a straight rod.

YOUR TURN: DRAW IT HERE

HOW IT WORKS

In the classic engine the piston rod drives a crank on a flywheel, which turns the back-and-forth push into round-and-round motion. A flywheel's inertia resists changes in speed, smoothing out the jerky pushes of the piston.

TRUE OR FALSE?

From the puzzle pack

Circle T for true or F for false. Answers at the bottom.

1. Hero of Alexandria used his steam ball to drive mine pumps.

T F

2. In a Newcomen engine, the air pushes the piston down.

T F

3. Watt's engines burned two-thirds less coal than Newcomen's.

T F

4. Rocket was the first steam railway locomotive.

T F

5. Puffing Billy is the oldest surviving steam locomotive in the world.

T F

6. A steam turbine has no piston.

T F

Answers: 1) F 2) T 3) T 4) F 5) T 6) T

EXPERIMENT 1 OF 12

steam.mechanics.im

The syringe squeeze*Squash some air and feel it fight back***YOU NEED**

A plastic syringe with no needle

WHAT TO DO

1. Pull the plunger halfway out.
2. Put a finger firmly over the end.
3. Push the plunger in slowly. How does it feel?
4. Let go of the plunger and watch.

WHAT I FOUND

THE SCIENCE

Boyle found that pressure times volume stays nearly constant: halve the space and the pressure goes up to match. Gas pressure comes from molecules in constant, random motion, banging into each other and into the walls.

EXPERIMENT 8 OF 12

steam.mechanics.im

How many horsepower are you?*The stair-climb test***YOU NEED**

A flight of stairs, a tape measure, a timer, your weight in pounds

WHAT TO DO

1. Measure the height of the stairs in feet.
2. Walk (don't run) up them while someone times you.
3. Work out: $\text{weight} \times \text{height} \div \text{seconds} \div 550$.
4. That's your horsepower!

WHAT I FOUND

THE SCIENCE

One horsepower is 33,000 foot-pounds of work a minute. Physicists define work as force times the distance something moves.

ENGINE LOG

From the Engine Spotter's Log

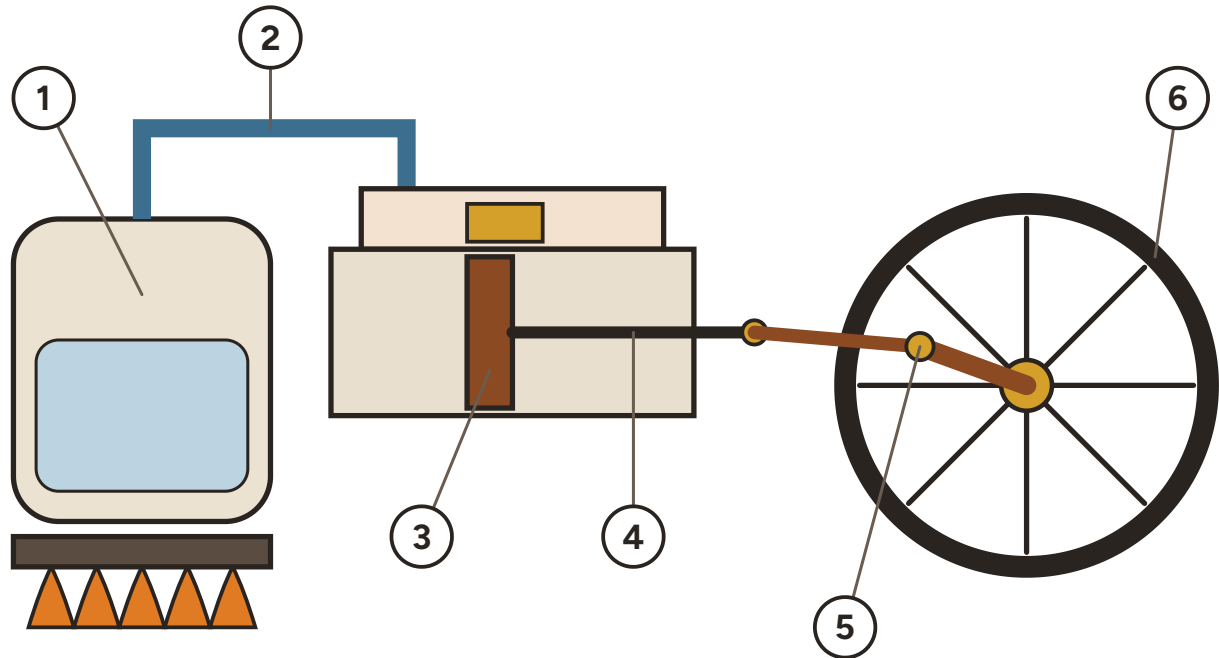
Locomotive, beam engine, traction engine, ship, turbine... they all count

DATE	WHERE	ENGINE NAME OR NUMBER	TYPE	WHAT IT DID / NOTES

LABEL THE ENGINE

From Full Steam Ahead!

Write the right word next to each number



Boiler · Crank · Flywheel · Piston · Piston rod · Steam pipe

1. _____

2. _____

3. _____

4. _____

5. _____

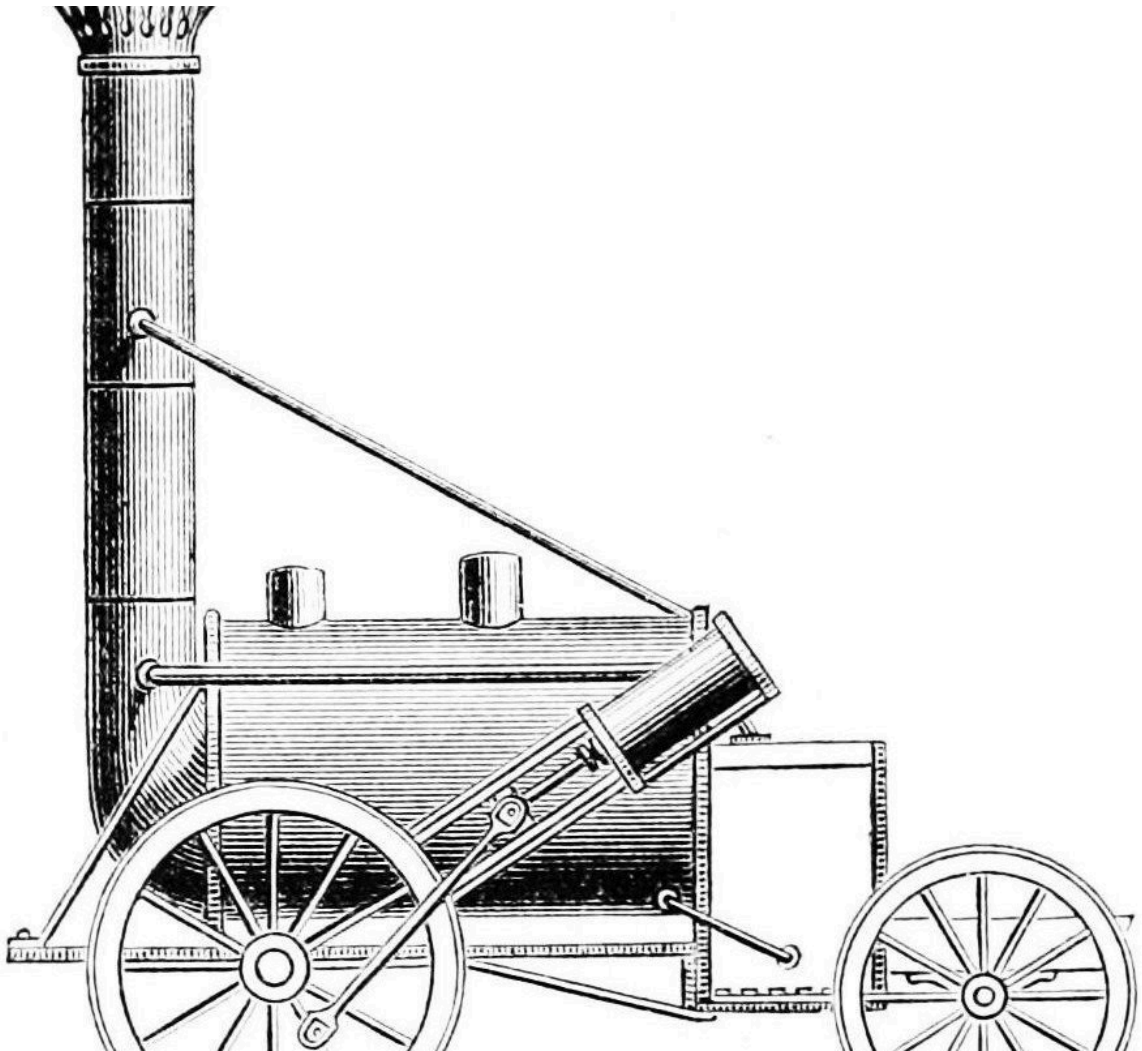
6. _____

Answers: 1) Boiler 2) Steam pipe 3) Piston 4) Piston rod 5) Crank 6) Flywheel

Our own simplified diagram, not to scale.

STEAM PIONEERS POSTER

Rocket



Rocket, in an engraving from the 1870s (public domain).

The Rainhill winner

Rocket won the Rainhill Trials in October 1829, a public contest run by the Liverpool and Manchester Railway with £500 on offer.

Rocket's big ideas were its multi-tube boiler and using exhaust steam to draw air through the firebox.

Britannica says Rocket reached 36 mph (58 km/h) for a short stretch.

The Science Museum puts Rocket's record at 35 mph, three times its design speed, with an average of 15 mph in the trials.

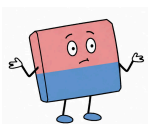
WANT MORE?

Six full steam engine packs

All checked against Britannica, NASA Glenn Research Center and the Science Museum Group

PACK	WHAT'S INSIDE
Draw Your Own Steam Engines: Step-by-Step Diagram Sheets	Ten steam engine diagrams to draw with a ruler and compass, from Hero's spinning ball to Watt's governor, each with simple steps, a practice grid and how the part works
Steam Engine Puzzle Pack: Cranks, Codes & Crosswords	A crossword, a word search, a maze through the boiler, a timeline puzzle, a code-breaker and engine-part matching, all with answer keys
No-Heat Steam Science Experiment Cards	Twelve cards of steam science with no kettles or flames: the syringe squeeze, a card crank, a balloon spinner, the stair-climb horsepower test and more
Engine Spotter's Log: Steam Visit & Record Book	Log the engines you see at museums and heritage railways, sketch the moving parts, time a flywheel and work out your own horsepower
Full Steam Ahead! Kids' Steam Engine Worksheets	For ages 6 to 11: label the engine, put the inventors in order, steam maths, true or false, a maze and colouring, with answer keys
Steam Pioneers Poster Set	Six fact-checked posters: how a steam engine works, Newcomen, Watt, Trevithick, Rocket and the steam turbine

Each pack comes in A4 and US Letter, and all six come together in The Complete Steam Engines Printables Bundle. See steam.mechanics.im/shop/ for links. Free steam engine games: steam.mechanics.im



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The small print, kept short

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PICTURES

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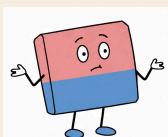
Pictures are public domain images (credits above), from Wikimedia Commons, cropped. Names of historic engines are used only to describe history; no museum, railway or other organisation endorses this pack. All diagrams, puzzles and layouts are REALLYBYTE's own work.

WHERE THE FACTS COME FROM

Every fact in this pack was checked against the pages below (Encyclopaedia Britannica, NASA Glenn Research Center's Beginner's Guide to Aeronautics and the Science Museum Group blog) on 31 Oct 2026. The diagrams are our own, simplified and not to scale. Not endorsed by Britannica, NASA or the Science Museum Group.

Encyclopaedia Britannica: steam engine: www.britannica.com/technology/steam-engine
 Encyclopaedia Britannica: flywheel: www.britannica.com/technology/flywheel
 Encyclopaedia Britannica: Heron of Alexandria: www.britannica.com/biography/Heron-of-Alexandria
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 Science Museum blog: Steam train in Kensington Gardens: blog.sciencemuseum.org.uk/steam-train-in-kensington-gardens/
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 Encyclopaedia Britannica: locomotive: www.britannica.com/technology/locomotive-vehicle
 Encyclopaedia Britannica: Rocket: www.britannica.com/technology/Rocket-locomotive



NEED HELP?

Useless can't help (he's an eraser, and he's busy polishing a flywheel), but we can. Problems with your file, or spotted something we should fix? Email info@reallybyte.com.

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