

Friction: friend and enemy

One force. Different jobs.

Explain what friction does, and when it helps or hinders.

FORCES / CONTACT / EVIDENCE



What do you notice?

01

Supported: gently rub your hands for five seconds.

02

Standard: describe what you feel and name the force.

03

Stretch: explain where the warmth came from.

You can watch, point, speak, draw or write.

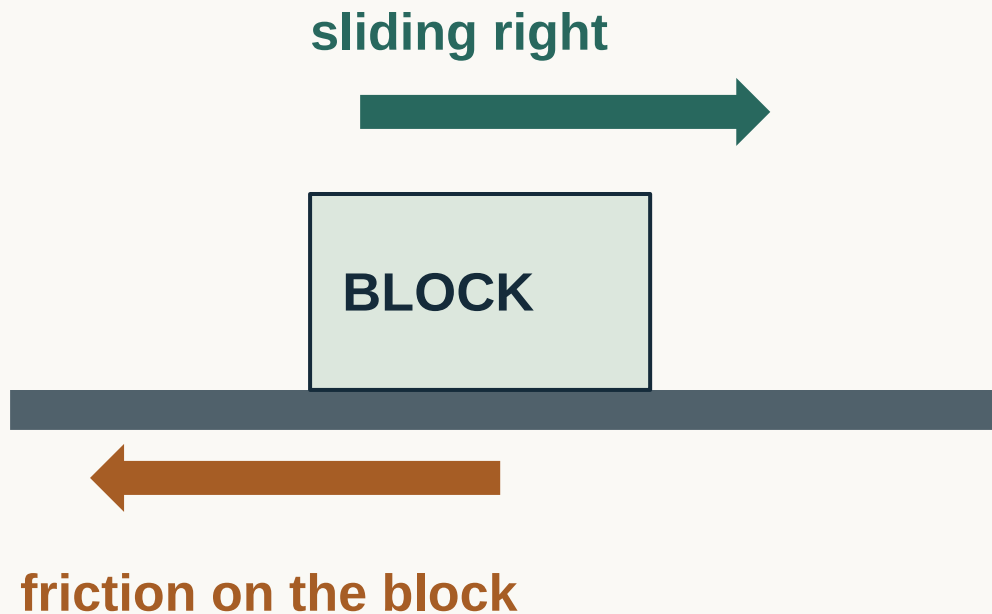
Three things to work out

1 What is friction?

2 When does friction help or hinder?

3 What will happen on two different surfaces?

Friction acts at a contact



A force between surfaces that slide, or try to slide, past each other.

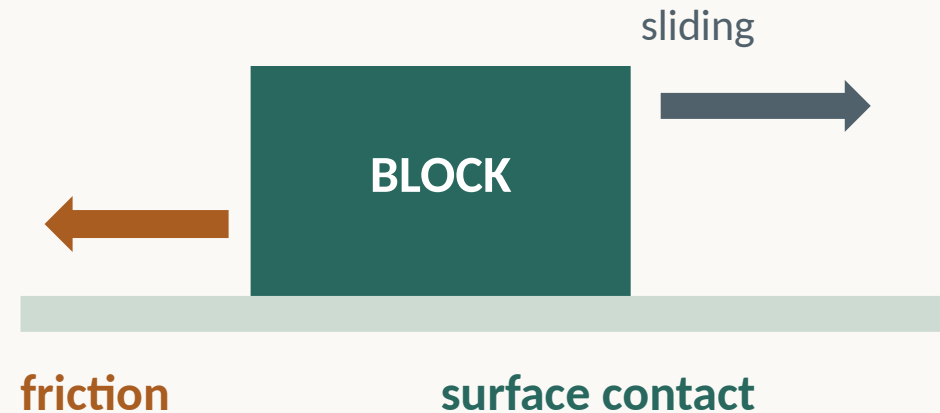
Name the two touching surfaces.

Change one thing: the surface

Keep the block, ramp and release the same.

Change only the run-out surface.

Predict where the block will stop. Then observe.



What stayed the same? What changed?

Helpful or unhelpful?

- 01 Bike brakes

- 02 Trainers on a wet floor

- 03 Moving engine parts rubbing

- 04 Pushing a heavy box across carpet

- 05 A door handle

Name the surfaces. Explain the job.

The job changes the answer

HELPS THE JOB

Braking a wheel
Gripping the floor
Holding a handle

HINDERS THE JOB

Moving parts heating and wearing
Sliding a box across carpet

Explain both sides

Friction is helpful here because...

...but it is unhelpful here because...

Use the touching surfaces and the job in your explanation.

Sort the claims

TRUE / FALSE / NOT A SCIENTIFIC CLAIM

- 01 Sliding friction opposes sliding at the contact.

- 02 Friction only happens with rough surfaces.

- 03 Oil can reduce friction in suitable lubricated contacts.

- 04 Without friction we could not walk normally.

- 05 Friction is a bad force.

Check the science

- 01 TRUE Sliding friction opposes sliding at the contact.

- 02 FALSE Smooth surfaces can have friction too.

- 03 TRUE Suitable lubrication can reduce friction.

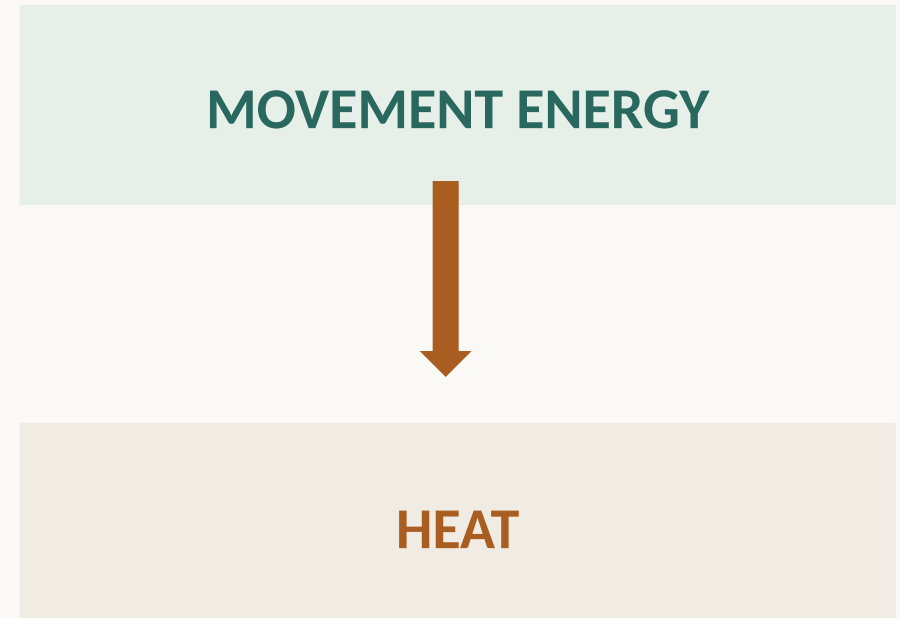
- 04 TRUE Walking normally needs grip at the ground.

- 05 JUDGEMENT “Bad” depends on the job.

Build a complete explanation

Friction is helpful at a bike brake: it transfers movement energy to heat and slows the wheel.

It can be unhelpful between moving engine parts because rubbing heats and wears them.



Keep your prediction for next time

01

Keep your named worksheet and first prediction.

02

Next lesson: compare three surfaces and repeated results.

03

Point to one idea you want to check again.
