

Y3 Moving On Surfaces

KS2 Science · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Why does a toy car roll further on smooth tiles than on carpet?

Step 1 · What force acts when two surfaces rub together?

Friction

Step 2 · Which surface is rougher?

Carpet

Step 3 · Which has more friction?

Carpet — rough surfaces grip more

Step 4 · What does more friction do?

Slows the car down more quickly

Answer: Carpet is rougher, so there is more friction. It slows the car down sooner, so it travels a shorter distance.

Check: Smooth → less friction → further. Rough → more friction → shorter.

2. Now try one with the steps

Plan a fair ramp test to compare surfaces.

Step 1 · What will you change?

Step 2 · What will you keep the same?

Step 3 · What will you measure?

Step 4 · How can you make the results more trustworthy?

Answer:

3. Practice

Have a go at each one. There is space underneath to work it out.

1. What is a force?

2. What is the force that slows things down when two surfaces rub together?

3. Which surface has more friction: ice or carpet?

4. On which surface would a toy car roll furthest: sandpaper, carpet or smooth tiles?

5. Is kicking a ball a contact or a non-contact force?

6. Name a force that can act without touching.

7. Why do football boots have studs?

8. What equipment would you use to measure how far a car rolls?

9. Results: tiles 180 cm, wood 140 cm, carpet 60 cm, sandpaper 30 cm. Which surface had the most friction?

10. Using those results, how much further did the car roll on tiles than on sandpaper?

11. Ayo pushes the car down the ramp for some surfaces and just lets go for others. Why is this not a fair test?

12. Why do councils spread grit on icy roads in winter?

13. Why is a playground slide made of smooth, shiny material?

14. Write a conclusion for the ramp test.

4. Before you hand it in

Friction only happens on rough surfaces.

Smooth surfaces have less friction, but never none.

Friction is always a nuisance.

Friction can be helpful (grip) or unhelpful (slowing things we want to move).

Pushing the car down the ramp so it goes further.

Always let the car go from the same line without pushing.

All forces need to touch.

Most everyday forces need contact, but magnetic forces can act at a distance.