

The Primary Stage of Grades (4-5)
School Year 2022- 2023

Name: Key

Subject: Science

Unit 7: Effects of Forces

Worksheet 4: Friction

Class: Grade 5 CP (All sections)

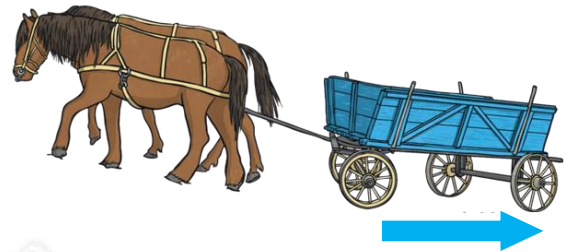
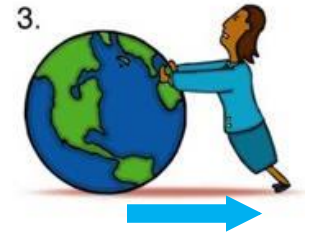
Date: / /

Objective/s:

- Know that friction is a force that acts in the opposite direction of movement.
- Identify situations and decide whether friction is useful or a problem.
- Relate the amount of the force of friction to the roughness of surfaces.
- Represent results in a bar chart.

Question 1:

Draw an arrow to show the direction of the force of friction on each of the following pictures:



Question 2:

Determine whether friction is useful or a problem in each of the following situation:

Situation	Friction is useful	Friction is a problem
Stopping the tires of a car	✓	
Sliding on a playground slide		✓
Goalkeeper's gloves	✓	
Tying your shoe lace	✓	
When you open a drawer		✓
You are Ice skating		✓
You are Climbing rope	✓	

Question 3:



(a) Use the words below to complete the sentence.

colour direction speed weight

When the footballer kicks a football, the force of the kick can change the speed and the direction of the ball. [2]

(b) The footballer must make sure his feet do not slip when he kicks the ball.

Name the force that gives him a good grip so he does not slip.

Friction [1]

Investigating friction in different surfaces:

Question 4:

Pedro and Arturo measured how far their toy car moved on different surfaces. These are their results.

Surface	Distance car moved in cm			
	Test 1	Test 2	Test 3	Average
grass	11	10	9	$(11+10+9)/3=10$
wet tar	19	21	20	$(19+21+20)/3=20$
sand	12	14	13	$(12+14+13)/3=13$
cement	15	18	18	$(15+18+18)/3=17$

1 Why did Pedro and Arturo repeat their measurements?

To have reliable (accurate) results.

2 Calculate the average distance the car moved on each surface and write it in the table.

Average= the sum of all the readings on one surface ÷ the number of tests

3- Name the **independent variable** in this investigation?

.....The surface

4- Name the **dependent variable** in this investigation?

.....The distance the car moved.....

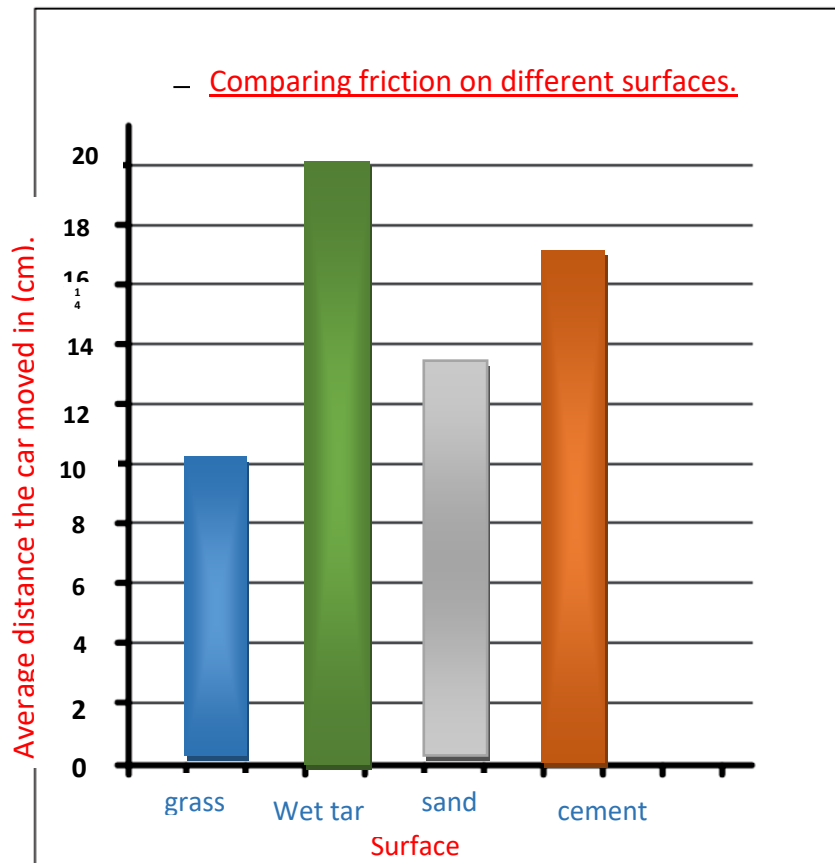
5- Name two **controlled variables** in this investigation (must stay the same)?

- Use the same toy car. - Push the car with the same force.
- Use the same ruler. - The same person to measure.

.....

6-

a Draw a bar chart of the results.



b On which surface did the car move furthest? Suggest a reason for this.

On wet tar. Water on wet tar made the surface slippery and smooth, this produced less friction.

c Suggest a reason why the car did not move far on the grass.

Grass is a very rough surface. There was a lot of friction between the car's wheels and the grass.

7 Predict how the results would be affected if the tar surface was dry. Explain why.

The car will move a shorter distance on dry tar. Dry tar will have a rougher surface without water, so the force of friction will be more.