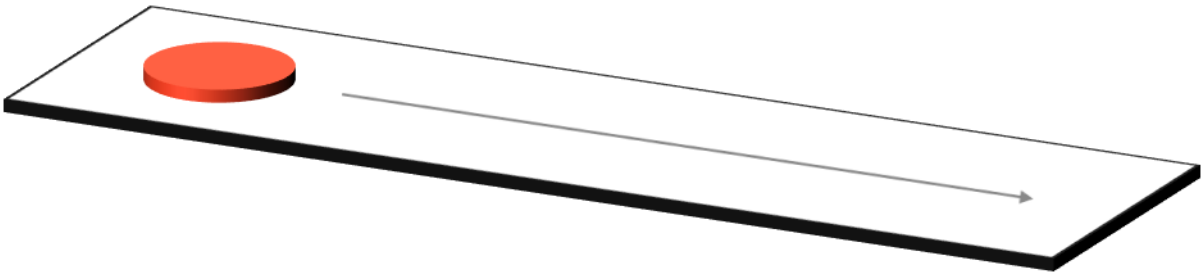


SHUFFLEBOARD

WORKSHEET



GETTING STARTED

Dive into the world of forces with our hands-on shuffleboard activity! Discover how friction affects movement by experimenting with different surfaces and observing how far your puck travels. Perfect for KS3, this engaging challenge reinforces key science concepts, develops your "working scientifically" skills, and provides a fun way to learn about the forces that shape our everyday world. Get ready to slide, measure, and explore the power of friction!

LEARNING OUTCOMES

Following this activity you will be able to:

- Define friction as a force that opposes motion between surfaces in contact.
- Identify that friction can slow down or stop an object's motion.
- Understanding that different surfaces create different amounts of friction.
- Predict how changing the surface or the puck would affect the distance travelled

VOCABULARY

Friction: The force that opposes motion between surfaces in contact.

Force: A push or pull that can change the motion of an object.

Motion: The act of moving.

Surface: The outer layer of an object.

Resistance: The opposition to the flow of energy or movement.

Traction: The grip or adhesion between surfaces.

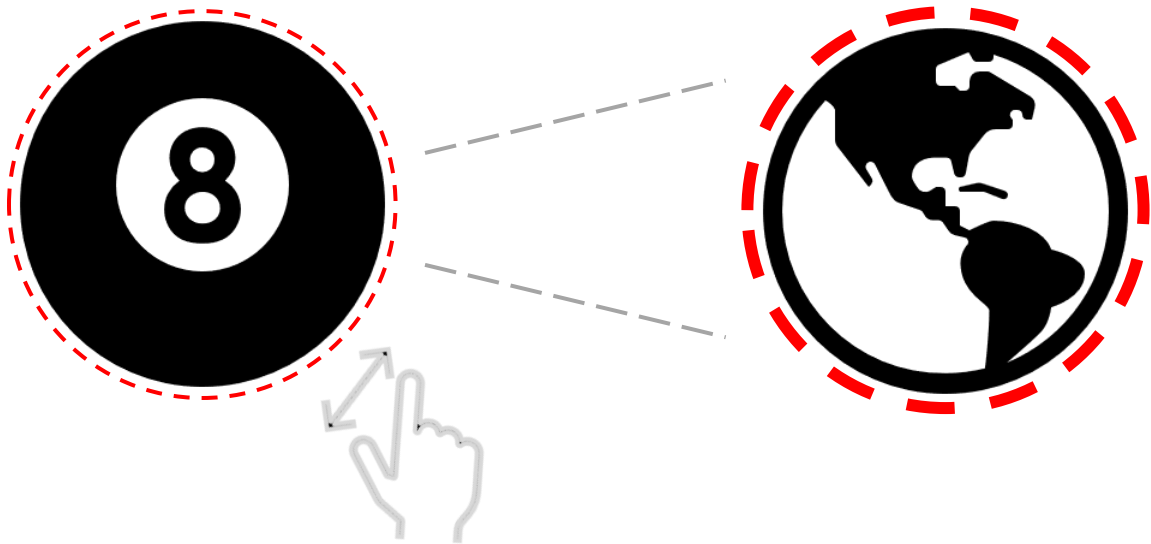
WARM-UP ACTIVITY



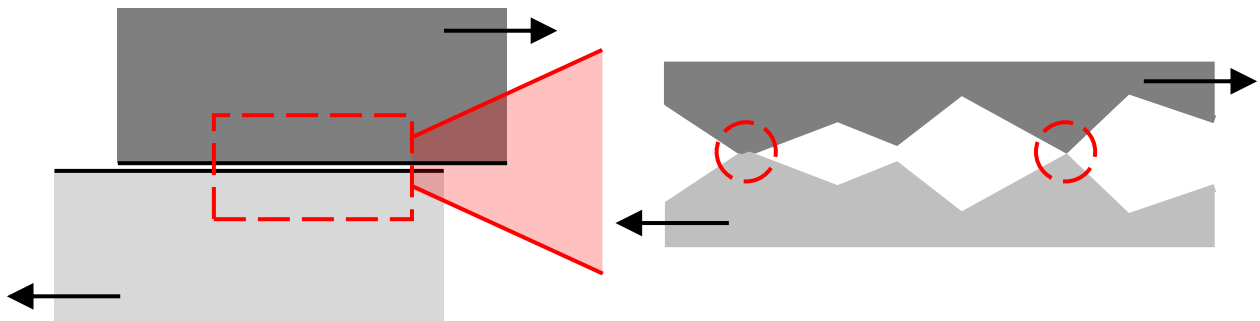
5 mins

How smooth is smooth?

Did you know that if a snooker ball were enlarged to the size of Earth, our planet, despite its mountains, trenches, and canyons, would be smoother in comparison?



In fact, surfaces are never perfectly smooth. They have lots of tiny valleys and peaks, which are what actually touch and separate when surfaces slide against each other.



Apparent contact area

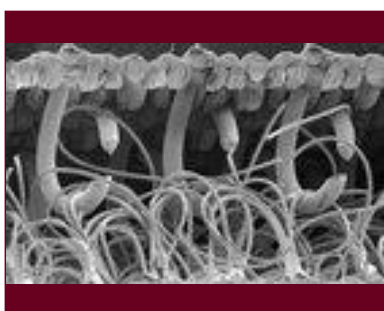
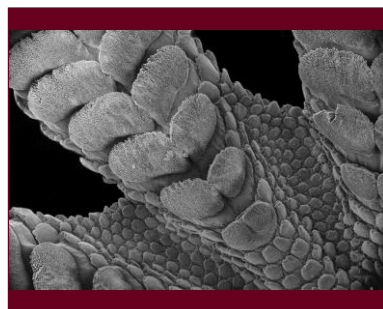
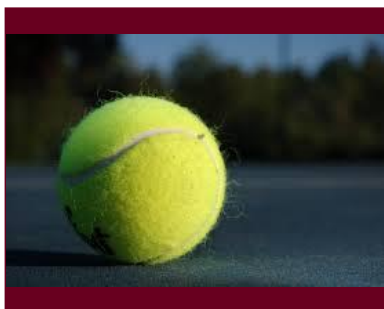
Real contact area

WARM-UP ACTIVITY



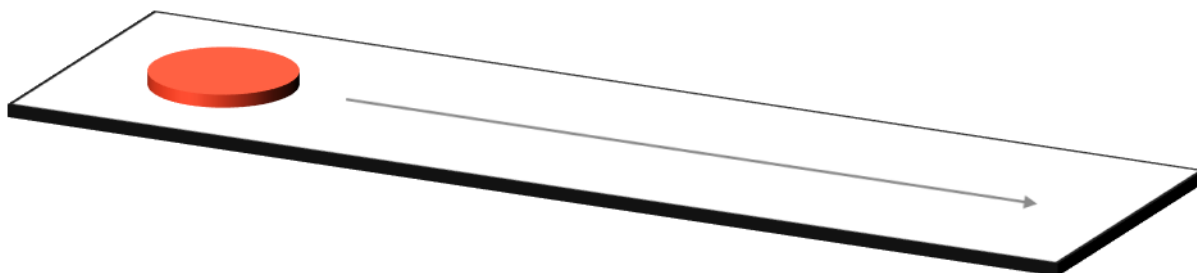
5 mins

Match up the following surfaces:



MAIN ACTIVITY

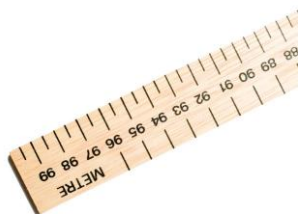
Shuffleboard



MATERIALS



Masses



Tape measure or ruler



Tape



Puck



Velcro



*Adhesive putty
(e.g. Blue Tack)*

METHOD



30 mins

Experimental Procedure

- 1 Slide with one weight, record the distances travelled.
- 2 Slide with three weights, record the distances travelled.
- 3 Slide with three weights + Velcro, record the distances travelled.
- 4 Slide with whichever loading / surface configuration and try to get as close to the marker as possible.

TIPS / HINTS

- Remember, to make it a fair test, change only one thing at a time. Keep everything else the same
- Measure multiple times and calculate an average to reduce errors.
- Be mindful of your surroundings and avoid launching the puck with too much force.

RESULTS



7.5 mins

Activity One

Slide with one weight, record the distances travelled.

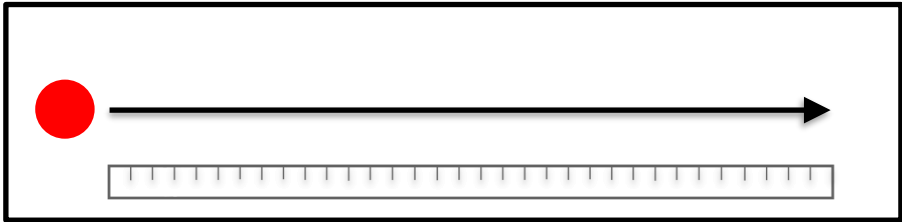
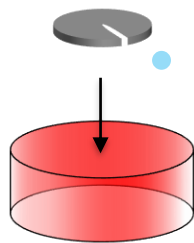


Table 1
Results from activity one.

Sliding distance (cm)	
Attempt	1
	2
	3

Average value =

RESULTS



7.5 mins

Activity Two

Slide with three weights, record the distances travelled.

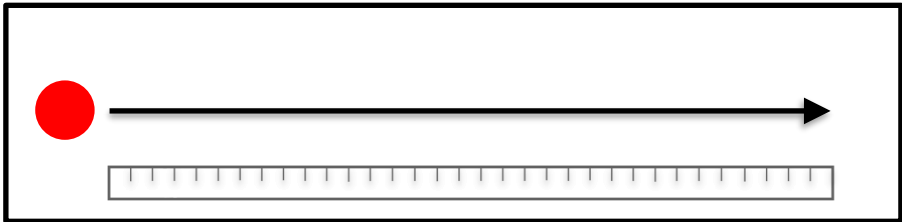
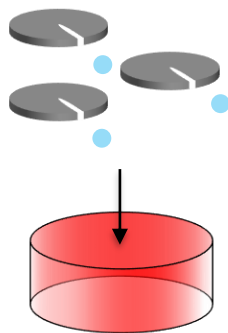


Table 2
Results from activity two.

Sliding distance (cm)	
Attempt	1
	2
	3

Average value =

RESULTS



7.5 mins

Activity Three

Slide with three weights + Velcro, record the distances travelled.

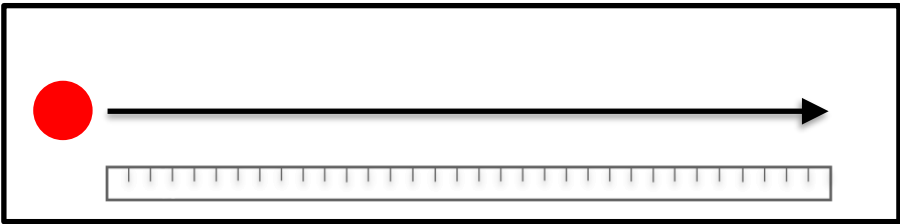
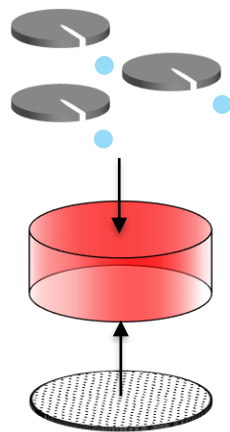


Table 3
Results from activity three.

Sliding distance (cm)	
Attempt	1
	2
	3

Average value =

RESULTS



7.5 mins

Activity Four

Slide with whichever loading / surface configuration and try to get as close to the marker as possible.

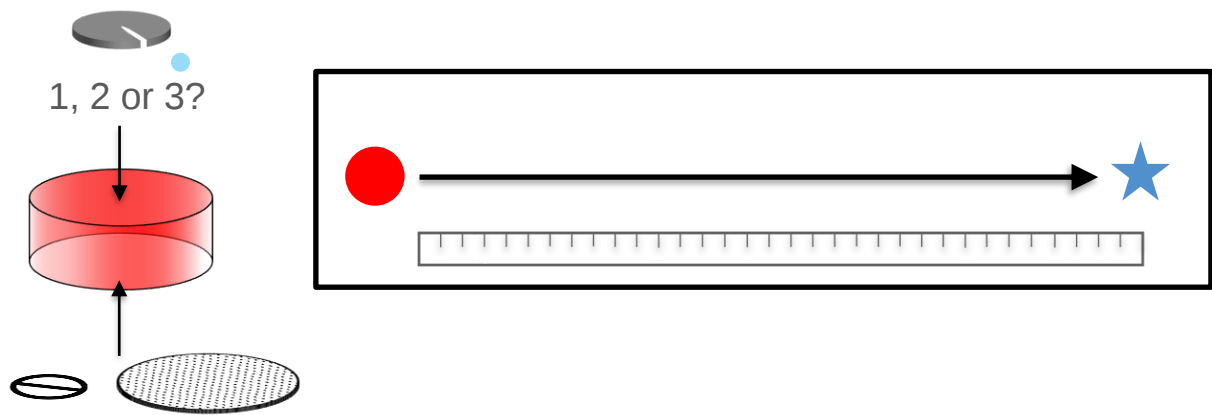


Table 4
Results from activity four.

Distance from marker (cm)	
Attempt	1
	2
	3

Smallest value =

Discussion



10-20 mins

Stretch Activity

Reducing resistance: Lubricants!

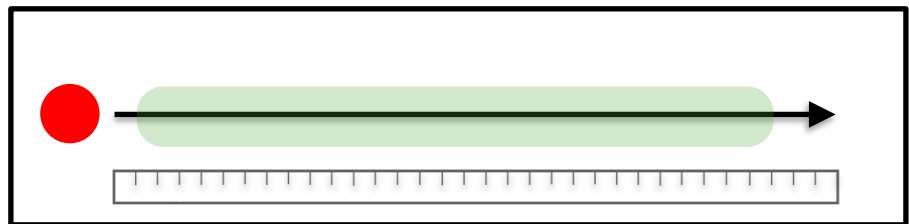
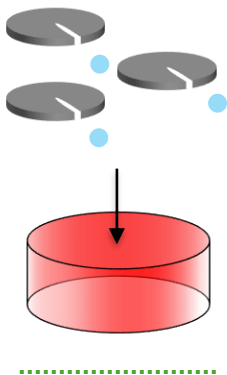
A lubricant is a substance that helps to reduce friction between surfaces in contact.

Which of the following is a lubricant (✓ / ✗):



Activity Five

Slide with three weights + washing up liquid.



What effect did a lubricant have?

QUIZ



5-10 mins

Did the pucks slide further with more or less mass / load?

What was the difference in average sliding distance between a puck loaded with one and three masses?

Based on the above, do you think there is a link between friction and applied mass / load? (yes / no)

Which surface has more contact with the desk – The plain puck surface or Velcro surface?

Which surface has the bigger real contact area with the desk – The plain puck surface or Velcro surface?

QUIZ



5-10 mins

What was the difference in average sliding distance between a plain puck surface (activity two) and Velcro surface (activity 3)?

Based on the above, do you think there is a link between friction and real contact area? (yes / no)

Which of the following effect friction?

- | | |
|--|---|
| ☐ Mass / load | ☐ Surface material |
| ☐ Type of launch mechanism | ☐ Size of desk |
| ☐ Sliding speed | ☐ Number of contacting points |
| ☐ Time of day | ☐ Colour of puck |
| ☐ Surface roughness | ☐ Prescence of a liquid |

Name a scenario in which friction is desirable and undesirable?

Desirable:

Undesirable:
