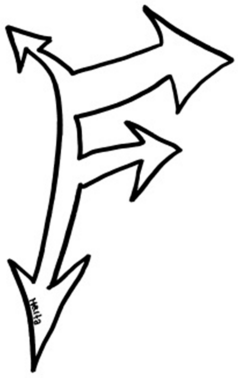
Worksheets unit 2

FORCES IN ACTION



MACHINES MOVE THE WORLD

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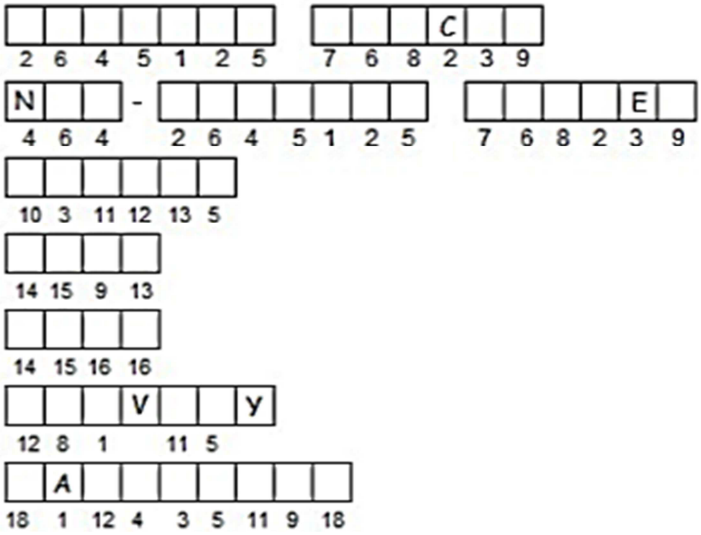
Word search about FORCES

Find these words in the grid on the right.

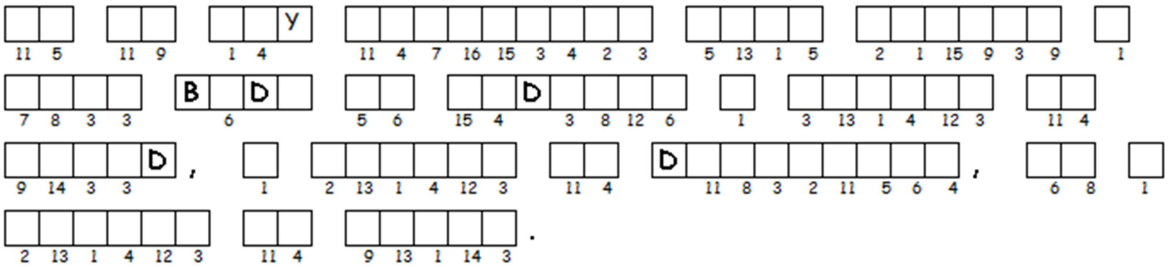
CONTACT FORCES
NON-CONTACT FORCES
PUSH
PULL
MAGNETISM
WEIGHT
FRICTION
GRAVITY

N	A	B	T	I	U	O	W	P	L	C	O	L	E	Q	T	U
O	C	C	G	H	J	E	S	R	P	U	S	H	Q	P	O	U
N	E	X	D	P	N	E	W	D	K	O	L	L	■	F	I	O
-	F	C	■	D	S	C	O	R	M	E	N	K	O	P	R	P
C	O	N	T	A	C	T	■	F	O	R	C	E	J	Y	H	W
O	B	U	F	E	R	O	V	R	E	D	R	A	M	T	O	E
N	F	E	M	E	U	P	O	I	I	E	B	N	V	G	I	I
T	E	R	M	A	G	N	E	T	I	S	M	P	C	I	K	G
A	V	U	N	B	V	C	X	Z	A	U	E	R	X	G	X	H
C	N	O	R	E	S	E	E	R	I	H	F	U	Z	■	R	T
T	O	S	V	S	U	U	■	X	R	V	I	S	A	X	S	X
■	N	V	I	■	R	A	X	X	S	B	X	R	P	L	K	J
F	I	A	A	S	G	R	A	V	I	T	Y	F	U	A	F	H
O	N	I	C	S	P	L	N	I	D	J	U	M	L	R	V	G
R	U	S	F	R	I	C	T	I	O	N	F	■	L	O	S	F
C	G	L	I	X	I	V	W	S	G	P	N	L	S	V	U	D
E	■	X	S	G	U	S	L	P	N	U	J	U	N	A	P	E

Use the name of the forces to complete the words. Copy the letters in the numbered cells to other cells with the same number.



Definition of FORCE



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FORCES IN ACTION

HANDS ON! **Friction**

GROUP:

Student A
Student B
Student C

PROBLEM:

How do **different surfaces** affect the **movement** of the objects?

MATERIALS:

Pencil, toy car, metric tape, 4 clothes pegs, tape, scissors, aluminium foil, wax paper, recycled paper, sand paper, a calculator and plastic cable covers.

STEPS:

1. Predict the distance of the toy car will travel on each surface.
2. Create a ramp using clothes pegs and plastic cable covers.
3. Place the toy car on the ramp and measure the distance.
4. Do 3 different trials for each surface and calculate the distance.

CALCULATE

SURFACE	PREDICTION cm	TRIAL 1 cm	TRIAL 2 cm	TRIAL 3 cm	DISTANCE $\frac{T1+T2+T3}{3}$
Aluminium foil					cm
Wax paper					cm
Recycled paper					cm
Sand paper					cm

I/we think that the distance	will be	the same different	on all the surfaces.

CONCLUSIONS

Remember: What kind of motion is it? _____

Why? _____

On which surface is the distance shortest? _____

On which surface is the distance farthest? _____

Why does the same object travel a different distance?_____

_____

Why does the car go down the ramp?_____

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Calculate your WEIGHT in the Solar System

On **Earth** our **mass** is equal to our **weight**.

WEIGHT = MASS x GRAVITY

WEIGHT = 1kg x 1

MASS = 1kg WEIGHT= 1kg

Look at the gravity of the planets, the sun and the moon and **calculate your weight** in respect to those.

Planets, Star and satellite	GRAVITY	MULTIPLIED BY	your MASS	IS EQUAL TO	your WEIGHT
Sun	27,90				
Mercury	0,37				
Venus	0,88				
Earth	1,00				
Mars	0,38				
Jupiter	2,64				
Saturn	1,15				
Uranus	0,16				
Neptune	1,22				
Moon	0,16				

Look at your results and underline the correct part of the sentence.

Is it your weight different or is it equal?

My weight never changes. changes.

Is it your mass different or is it equal?

My mass never changes. changes.

Calculate your weight in newtons

On Earth	On the moon
Weight = mass x gravity in Newtons	
WEIGHT = ……. x 9,8	WEIGHT = ……. x 1,5
WEIGHT = ……..newtons	WEIGHT = ……..newtons

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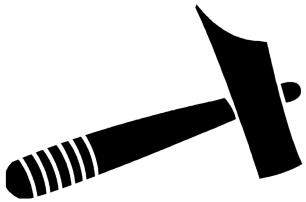
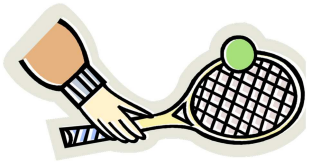
Classify the images below depending on if the force applied is a PUSH or a PULL.

GO BY BICYCLE

KICKING A BALL



USING A HAMMER



PLAYING TENNIS

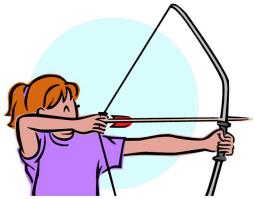
OPEN THE REFRIGERATOR

PLAYING GOLF

RING A BELL

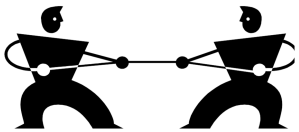
RIDING WITH A TOY HORSE

FISHING



SHOOT AN ARROW

PLAYING WITH A YO-YO



PULLING A ROPE

Why do you think it is a push/pull?

…	is a	push pull	because it is a force that can move something	**away from** **towards from**	somebody/something.

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PUSH

both

PULL

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FORCES IN ACTION

HANDS ON! **Newtons**

Group: Date:
Student A:
Student B:
Student C:

MATERIALS:

- Pencil
- Tape measure
- Weighing scale
- Dynamometer
- 3 objects.

PROBLEM:

How do you use a dynamometer?
What is the relation between mass and force?

$F = m \times a$

STEPS:

1. Predict the power of the force needed to move the objects. Write a number from 1 to 3 (from the bigger force to the smaller force).
2. Measure the objects with a weighing scale and record it in your data table.
3. Put a tape measure on the floor and measure 100 cm in straight line.
4. Attach the object to the dynamometer and pull it along a distance of 100 cm and record the result in your data table.
5. Write your conclusion about the experiment.
6. Share and check the results with all the class.

Objects	PREDICTION	MASS	FORCE NEWTONS	Result
1				
2				
3				

I think that	object 1 object 2 object 3	will need	more less	force than object__to be moved.
The		needs		
I don't think so.				
We/I agree with……				

Write your CONCLUSIONS

If the mass of an object is	bigger smaller	the force needed to move it is	bigger smaller

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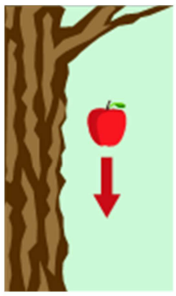
Find the answers to these questions.



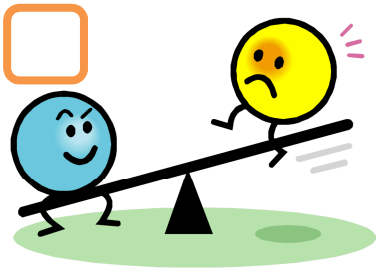
Why is this apple falling?

Why does the scooter stop?

What is happening with this can?

Why is this ball flying?

Why is iron attracted to this material?



Why is the blue ball down on the see saw?

A. It's changing shape.

B. Because of a push.

C. Because of gravity.

D. Because of magnetism.

E. Because of weight.

F. Because of friction.

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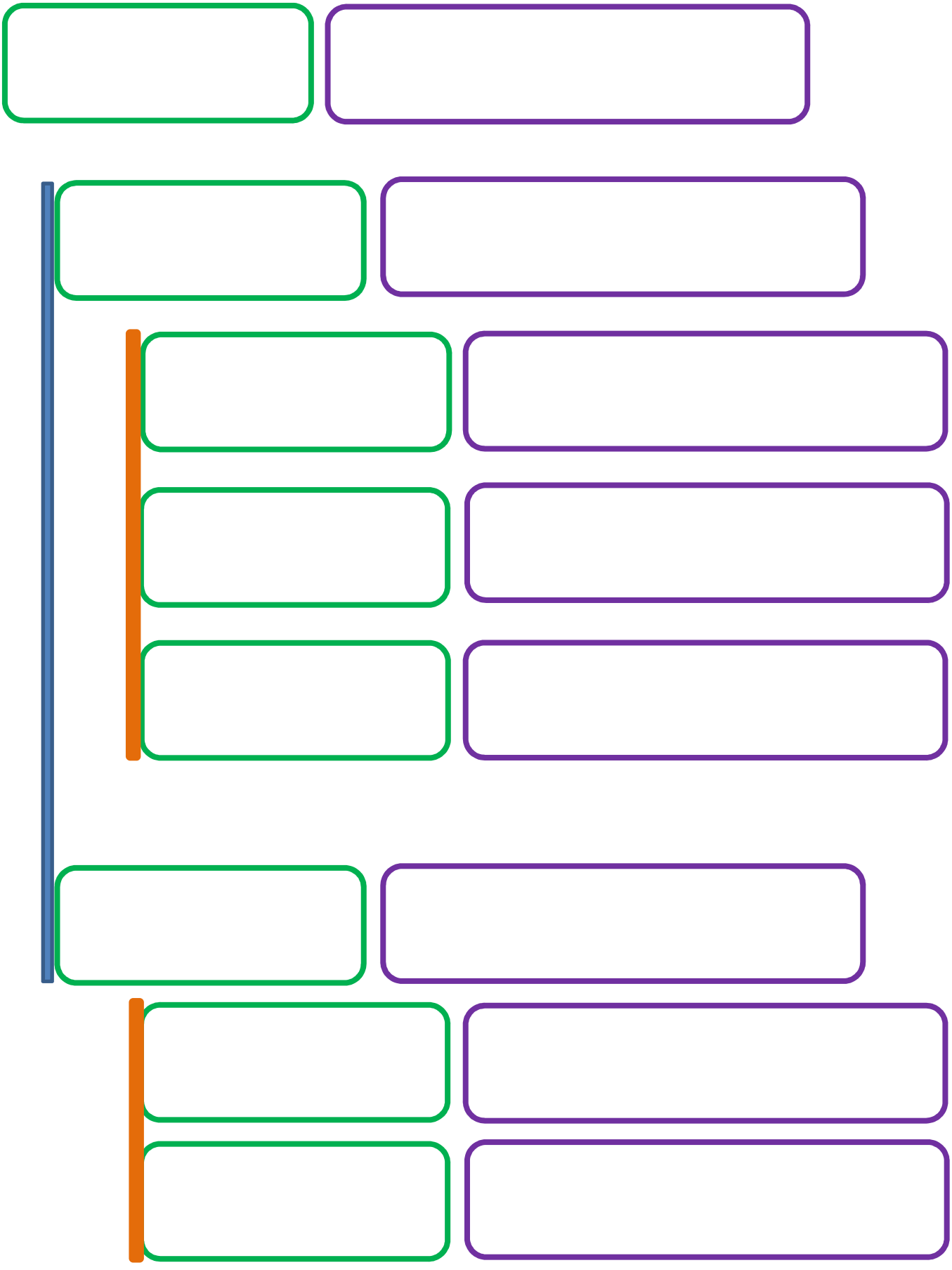
Put the labels in the correct place.



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Running dictation. Find the missing words and match the name with its definition.

GRAVITY	Force of _____ **or** _____ acting between **ferro**magnetic materials like iron.
PUSH	It is a force that pulls all objects towards the center of _____
FRICTION	The _____ of one object against another produces in moving objects go slowly.
FORCE	It is any influence that causes a free body to undergo a change in _____ , a change in _____, or a change in _____
CONTACT FORCES	It is a force that can move something _____ _____somebody/something.
MAGNETISM	It is a force that can move something _____ somebody/something.
NON-CONTACT FORCES	It is a force applied to an object by another body that is _____ with it.
PULL	It is a force that acts at the_____ between two objects.

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