ST. MARY'S *Catholic High School*

Balanced and unbalanced Forces Worksheet

Name: _____ Year 6___ Date:_____

1. **Name the following:**

i) A force that tries to slow things down when two things rub together . ……..

ii) A force from water that pushes things up……..

iii) A force that tries to slow things that are moving through air……

iv) Not moving……

v) When two forces working in opposite directions are not the same strength……..

vi) The amount of force on something from gravity .It is measured in Newtons…….

vii) The unit of force(N)……..

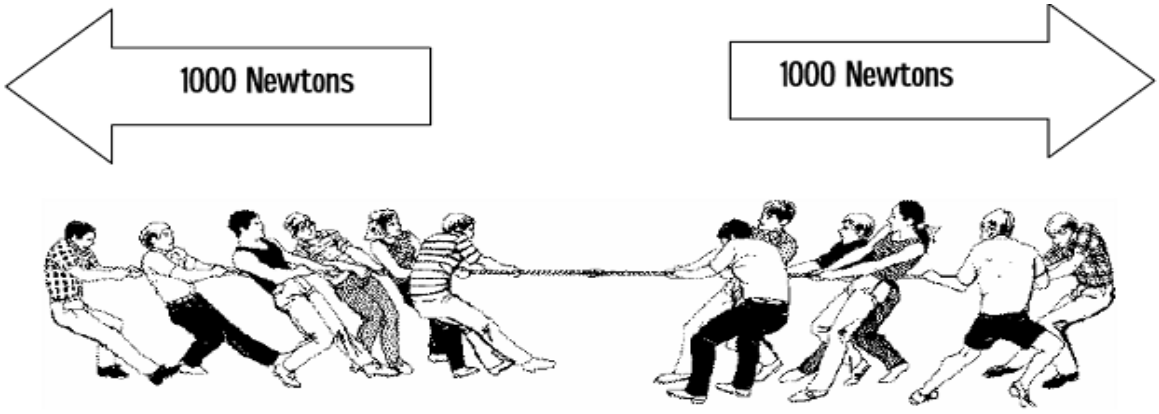
viii) The force of attraction between two objects. The Earth has a large force of gravity which pulls things towards it……

ix) A push or a pull……

x) A piece of equipment containing a spring that is used to measure forces……..

xi) They can attract and repel each other. They also attract things made of iron……..

2. Circle the best answer:



A. The forces shown above are **PUSHING / PULLING** forces.

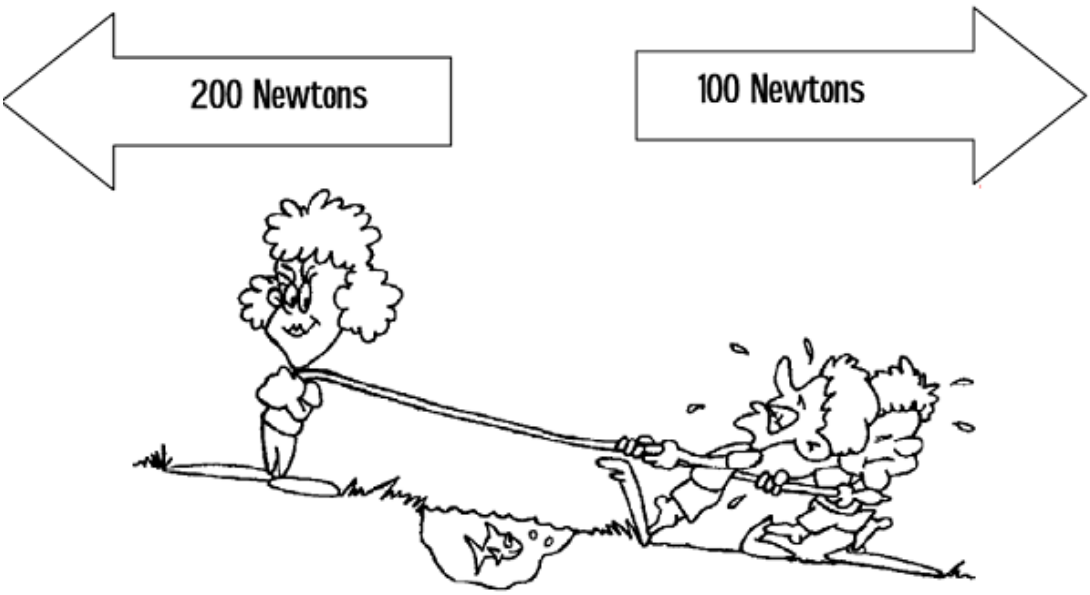
B. The forces shown above are **WORKING TOGETHER / OPPOSITE FORCES.**

C. The forces are **EQUAL / NOT EQUAL.**

D. The forces **DO / DO NOT** balance each other.

E. The resultant force is **1000 N TO THE RIGHT / 1000 N TO THE LEFT /ZERO.**

F. There **IS / IS NO motion**.



A. The forces shown above are **PUSHING / PULLING** forces.

B. The forces shown above are **WORKING TOGETHER / OPPOSITE FORCES**.

C. The forces are **EQUAL / NOT EQUAL**.

D. The forces **DO / DO NOT** balance each other.

E. The stronger force is pulling to the **RIGHT / LEFT**.

F. The weaker force is pulling to the **RIGHT / LEFT**.

G. Motion is to the **RIGHT / LEFT**.

Circle the best answer on the line provided.

i. If an object starts to accelerate, _____.

a. a balanced force is acting on it **c. velocity is acting on it**
b. gravity is acting on it **d. an unbalanced force is acting on it**

ii. When forces are balanced, the total force ____.

a. is greater than the sum of the forces **c. is negative**
b. is zero **d. is equal to the largest force**

iii. A force is which one of these?

a. a push **b. a push or pull** **c. a pull** **d. none of these**

iv. Force is measured in which units?

a. kilograms **b. newtons** **c. degrees** **d. m/s2**

3.Give **two** examples of a **pushing** force **AND two** examples of a **pulling** force:

Pushing Force Pulling Force

1-_____ 1-_____

2-_____ 2-_____

4. Jack is going skiing. Does he need **high or low** friction between his skis the snow? Explain your answer. ……

……

……

5. Jill is climbing. Where does she need **high** friction?
Explain your answer……

……

……

6. The drawing shows Samir riding his mountain bike.

i) Draw a circle around the places on the drawing where there should be a lot of friction.

ii) Explain why there should be **a lot of** friction in these places.

……

……

……

iii) Draw a square around a place where friction should be **low.**

iv) Explain why there should be **low friction** in these places.

……

……

……

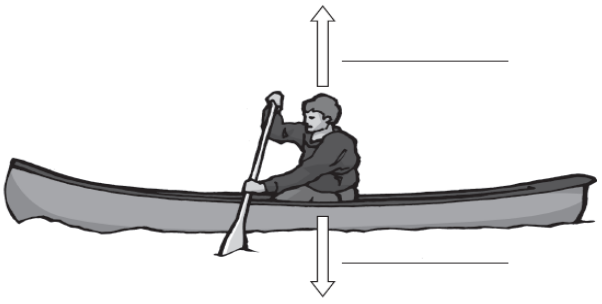
v) How can Samir make sure the friction is **as low as possible** in these places.

……

……

7.i) Label the forces .

Select the correct answer.



ii) What **two** forces affect you when you float?
(**Weight and upthrust** OR **Mass and push**)

iii) When an object floats, the two forces are

(**the same size** OR **different sizes**)

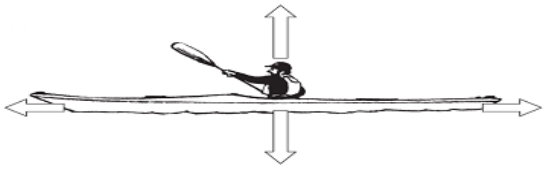
8.The force that stops the cyclist from skidding is called……

Two forces are trying to make the cyclist slow down. They are

…… , …… , ……

9. Label the forces on this Kayak.
Use the letters next to each phrase.

A	Forward force from the paddle
B	Water resistance
C	gravity
D	Up thrust



10. a. What **SD** can friction do to moving objects?..... .....

b. What **WA** can friction do to things like brake pads?.....

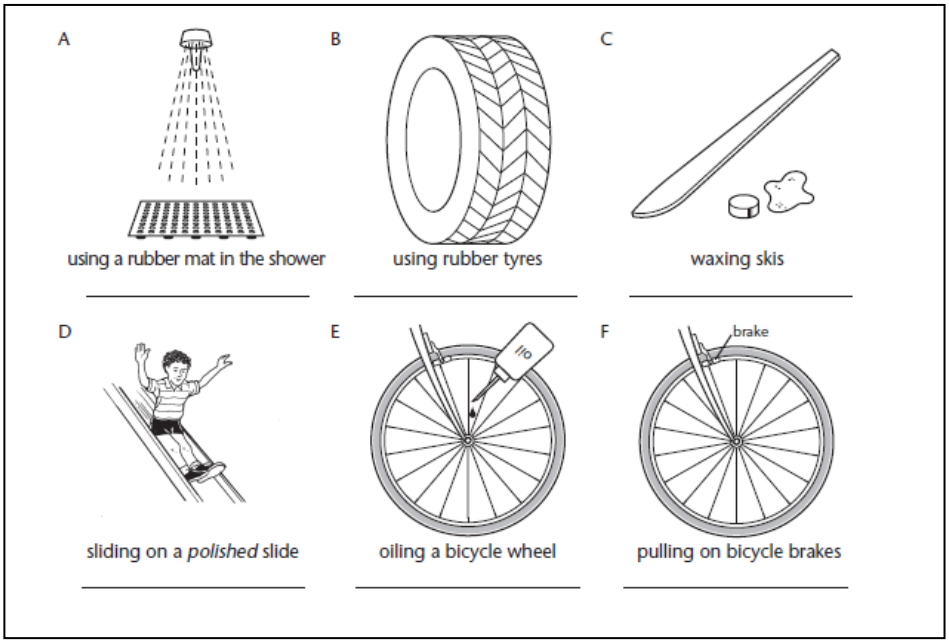
c. What **H** and **N** can friction produce?..... .....

d. What **E** is something that can be stretched but goes back to its original shape.....

e. What **G** is a force that pulls things down to Earth?.....

f. What **W** is the amount of force with which gravity is pulling down on something?

11. Decide whether each picture/statement below indicates **more friction** or **less friction**.



12. Name the forces:

i) A force which pulls you down.....

ii) This force helps to hold things on fridge doors.....

iii) This force rubs things away.....

iv) This force helps a ship float.....

v) This type of force needs to touch something to affect it.....

vi) A force that slows down things moving through air.....

13. Write the forces below to show whether they are **Contact** or **Non-Contact** forces:

air resistance friction gravity magnetic force static electricity water resistance

Contact	Non-contact

14.

Josh is learning to dive.

He is seen floating in the water. Label the two forces.

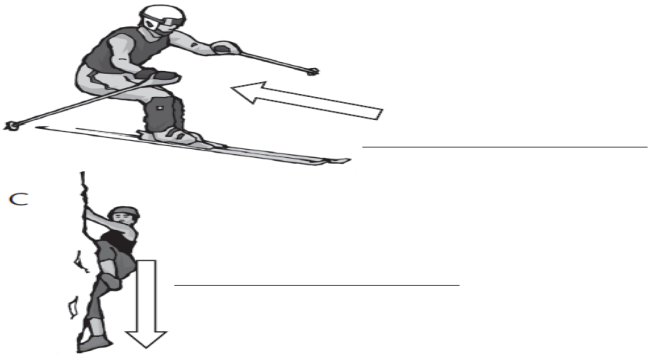
Josh picked up a rock from the sea bed.

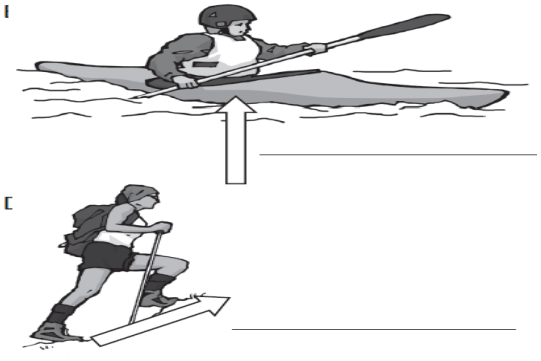
It was easy to lift.

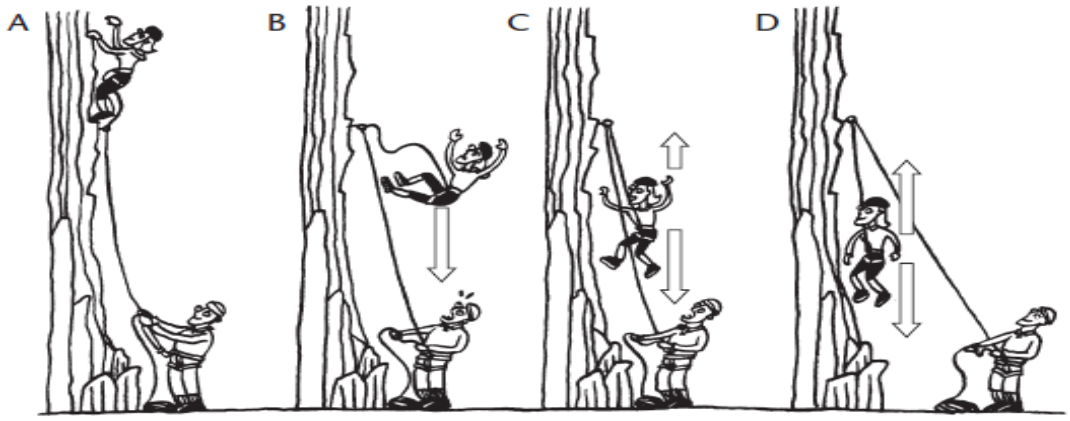
It felt much heavier when he carried it up the beach.

Why did the stone feel lighter when it was under the water ?

15. Look at the pictures. Write the names of the forces next to the arrows.







16. i) What force or forces are acting on the falling climber in picture **B**? ……

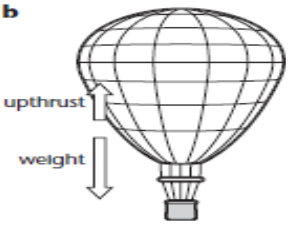
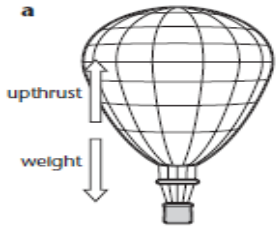
ii) What forces are acting on the climber in **C**?……

ii) Are the forces **balanced** or **unbalanced** ? ……..

iii) What will happen to the **falling speed** of the climber? ……

iv) Are the forces **balanced or unbalanced in D**? ……

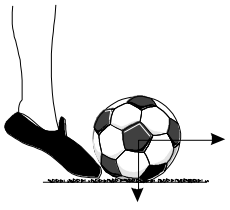
17. If two forces are the **same size** and are in the **opposite directions**, they are **……**

Cross out the words that are wrong.	Cross out the words that are wrong.
b  The forces on the balloon are **balanced/ unbalanced** The balloon will start to **move up / stay where it is / start to move down.**	a  The forces on the balloon are **balanced/ unbalanced** The balloon will start to **move up / stay where it is / start to move down**.

18. The girl is kicking the football.

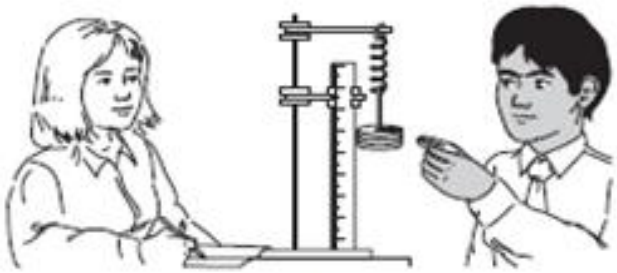
The arrows show the direction of two forces on the ball. Draw **TWO** arrows on each of these pictures to show two forces on each football.

(a) Moving to the right through the air.



(b) Not moving, on the ground.

19. Matilda and Ravi carried out an experiment with springs. They put different masses on the spring and measured the length of the spring each time. The table shows some of their results.



Mass (____)	Weight (force) (____)	Length (cm)
0	0	10
200	2	14
400	4	18
600		22
800		26
1000		30

i) Fill in the missing **units** in the table.

ii) Fill in the missing **weights** in the table.
(Remember that a mass of 100g has a weight of **1 N**

iii) Draw a **graph** to show the results.

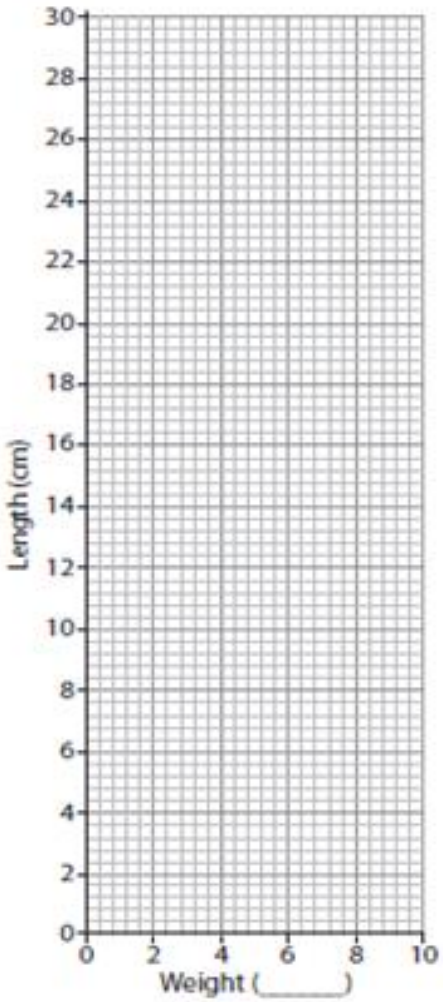
iv) Which is the **best conclusion** for this experiment

A ☐ The bigger the mass, the larger the weight.

B ☐ The larger the weight, the longer the spring.

C ☐ The longer the spring, the bigger the weight.

D ☐ The shorter the spring, the bigger the weight.

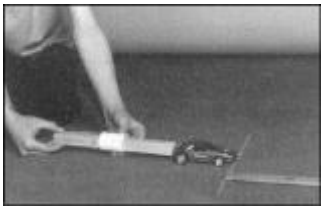


v) Ravi uses the same spring and hangs different objects from it. He uses his graph to work out the weight of each object. The table shows his results.
Fill in the missing weights.

Object	Length of spring (cm)	Weight of object (N)
A	26	8
B	14	
C	22	
D	16	
E	28	

20. Write whether each statement is **'True' ,'False' or 'Partly true'.**	**True**	**False**	**Partly True**
a) Friction always slows things down.			
b) Cars need friction to keep moving.			
c) Cars need friction to stop.			
d) You could not walk without friction.			
e) Friction is useful to gymnasts.			
f) Matches light because of friction.			
g) Friction is useful to ships.			
h) Shoe laces stay tied up because of friction.			
i) You could not pick up a a cup of tea without friction.			
j) You could drink from a glass without friction.			
k) Snow increases the friction between your shoes and the ground.			
l) Friction is useful in playgrounds.			
m) Pencils do not need friction to write.			
n) There is no friction when you are roller skating.			

21. The **force meter** measures the size of pushes and pulls.



Saida used her forcemeter to start a car moving.
Here is her table of results.

Distance moved by the car using different sized starting forces

Starting force in N	1	2	3	4	5
Distance moved in cm	18	52	140	235	316

Describe how the size of the starting force affects the distance moved by the car.

.....

.....