Week 1 of Summer 2 (1.6.20 – 5.6.20) overview – FORCES

Something a little gentler compared to some of the packs from Summer 1. This is to help you get back into learning from home as you return from probably less school based learning over Half-Term. We have some investigations for you to try at home – investigating the unseen of forces. We see the effects of forces but we do not see the forces themselves! There is also a Science pack of experiments not prepared by St Mary's that you might enjoy taking a look at as well (SuperStar Home Learning).

We know that we cannot cater for each and every one of your interests with a year 5 pack. Some of you loved the Ancient Greeks and some of you will have not been interested at all. Let us know please what subjects or interests from school you are missing in particular and we might be able to incorporate them in coming weeks. Next week will be forces but we welcome suggestions for your learning diet for the weeks after that. Many thanks and best wishes, The Year 5 team

INTRODUCTION – Forces are just pushes and pulls (or a twist) in a particular direction. Different pushes and pulls have different names depending on where they occur. If two forces are the same then we say that the forces are balanced. This week's work will encourage you to think back to the work you completed in year 3 about forces before moving on.

Day	Subject	Name of Activity	What are we learning? Description of what to do (only if needed – most of this is obvious from the sheet but look here if stuck)
1	Reading	Forces text (in pack)	**Can I understand the meaning of the word forces?** Read the meaning of the word forces and complete the drawing activity after it.
1	Writing	Forces Wordsearch	**Can I find the 'Forces' vocabulary in the wordsearch?** Find the forces vocabulary in the word search to remind you of some of the vocabulary we will be using this week
1	Maths	Ed City On the move	**Can I read and write down the weight of things in Newtons?** Read the weight of the items in Newtons and write the weight in the box provided
1	Science	Introduction to gravity	**Can I think through what I already know about Gravity?** See sheet in pack below
2	Reading	Independent reading	Dig out your individual reading book (and your reading record) and read independently unless you can find someone to read to. Complete your reading record
2	Writing	Design a poster	**Can I design a poster to teach what gravity is?** Think about examples of gravity and how we see it in daily life. Use some of these examples to design a poster to teach other children about the meaning of the word gravity.
2	Science	Weightless water investigation	**Can I investigate what happens to water in cups when it is dropped?** Weightless water investigation – instructions in pack below
2	Maths	Online practise of times tables	**Can I practice my times tables?** Online games – no worksheet in this pack Select the times tables you would like to practice and try not to let the monster fade away. https://www.mathplayground.com/math_monster_multiplication.html
3	Reading	Newton and Gravity fact sheet	**Can I read and understand information about Sir Isaac Newton?** Read the Newton and Gravity fact sheet and answers the questions on the next page (both pages in pack)
3	Writing	Write an acrostic poem to teach about forces	**Can I write an acrostic poem to help teach about forces?** Look at the examples that are completed on the sheet in the pack
3	Maths	Mass appeal Ed City (TF ☺)	**Can I compare the mass of different objects?** Add or subtract the masses to find the answers
3	Science	Ed City (TF ☺) Box Carts	**Can I explain how friction affects how things move?** Think back to the year 3 work on friction (it might have involved balloons and your hair) See what you can remember about how friction has an effect on objects in slowing them down.

4	Reading	Talk about Forces (sheet in pack)	**Can I identify the forces acting on objects?** Read the story about forces and see if you can identify the forces acting on the objects.
4	Writing	Spellings (sheet in pack)	**Can I spell scientific vocabulary related to forces?** Use the words on the word mat found within the pack. Pick up to 10 of these words to practise using your preferred method of learning spellings (rainbow writing, pyramid writing, look cover write check). Ask someone at home to give you a quiz on the words **Extension task:** Write some of these words in a sentence to show your understanding of the meaning.
4	Maths	Multiplication Skills catch up	The Master and Master Master question sheets have been included in this pack – can you do them each correctly? Can you still do them in less than 5 minutes? Then use Mathletics or Education city (see below) **Can I practice and area of learning I am finding hard?** **USE MATHLETICS FOR THIS – NOTHING IN THE PACK TO GO WITH THIS** Use Mathletics to work on an area of learning you find challenging – fractions perhaps or converting measures – two areas that many of you find a challenge.
4	Science	Air resistance investigation	**Can I investigate the effects of air resistance and gravity?** Helicopter investigation – instructions in the pack below
5	Reading	Friday Fun reading	Take some time to read your reading book or whatever you are reading at present to anyone or anything you like: your teddy bear, your pet, your brother or sister. Could you call someone online and read to them over a video call? Remember to write in your reading record what you manage to do.
5	Writing	The Magician – (sheet in pack)	**Can I write sentences using relative clauses?** Using the picture called 'The Magician', practice writing your own relative clauses to add meaning to simple sentences.
5	Maths	Kitchen Maths (sheet in pack)	**Can I order different weights?** With an adult's permission, find **five** packets or items from the kitchen which have a weight recorded on the packet. These are likely to be packets with dried ingredients in, such as pasta, cereal. Can you find the measurements and then order the packets from lightest to heaviest? Some of the measurements may need to be converted from grams to kilograms. *Remember – 1000g = 1 kilogram.*
5	Science	Air resistance investigation	Carrying on from the helicopter investigation from yesterday, ask your own 'what if..?' question to explore. Change the investigation in your own way to explore what might happen. You could ask, what if we changed the paper or material I use?, what if I change the number of paper clips on the bottom?, what if I throw the helicopter up before letting go?

Useful Websites to accompany the Science learning

Description	**Link –** easy to click on an onscreen copy, but if working from a paper copy the TinyURL will take you to the same place and is less complicated to type in	**Tiny URL** – shorter link, easier to type in if working from a paper copy
Introduction to Gravity, links to other vocabulary	https://www.bbc.co.uk/bitesize/topics/zf66fg8	https://tinyurl.com/ydxdy88l
Explanations of different forces	https://www.dkfindout.com/uk/science/forces-and-motion/what-is-force/	https://tinyurl.com/y83xduqg

Forces

Forces are just pushes and pulls in a particular direction (or a twist).

Forces are shown by arrows in diagrams. The direction of the arrow shows the direction in which the force is acting. The bigger the arrow, the bigger the force.

Balanced forces

If two forces are balanced, it means the forces are the same size but are acting in opposite directions.

If two balanced forces are acting on an object, that object will not change its motion. If it is still, the object will stay still or if it is moving, it will continue moving in the same direction and at the same speed.

Unbalanced forces

When two forces acting on an object are not equal in size, we say that they are unbalanced forces. Unbalanced forces do change the way something is moving.

They can make objects start to move, speed up, slow down or change direction.

In the boxes below, draw a child moving a toy car. Draw an arrow to show the push or pull on the car.

Push
Pull

Forces

E C R O F Y P S E P

L D A H P C U U C M

I E D N R N L L N A

Y C V N E A L U A T

T A P E E Y E M T E

I F E D R O E G S R

V R S N H U Z T I I

A U R S D B A E S A

R S P U L L E Y E L

G O N O I T C I R F

GRAVITY
FORCE
PULLEY
RESISTANCE
GEAR

BUOYANCY
FRICTION
LEVER
SURFACE
MATERIAL

On the Move

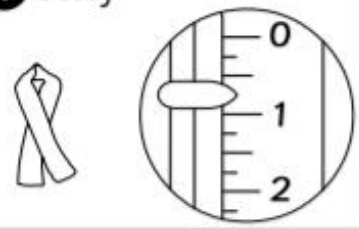
Activity Sheet

EducationCity

Name: _____ Class: _____

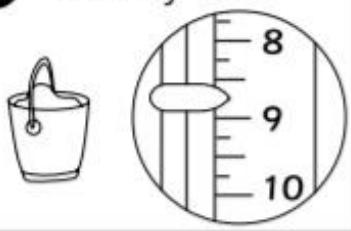
Write the weight of the items in the boxes. Do not forget to write the N for Newtons.
One has been done for you.

1 scarf



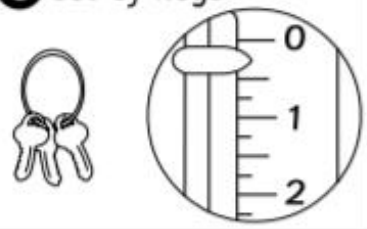
weight = **0.75 N**

2 bucket of sand



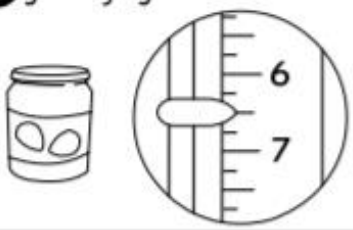
weight =

3 set of keys



weight =

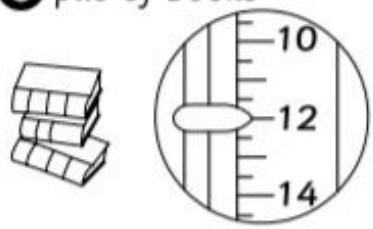
4 jar of jam



weight =

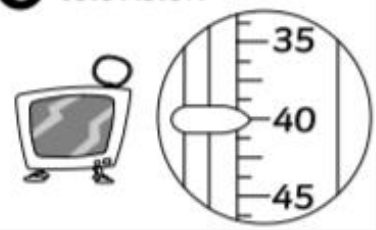
Do the same for these items but be careful, the scales on these forcemeters are different.

5 pile of books



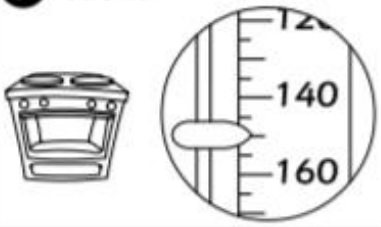
weight =

6 television



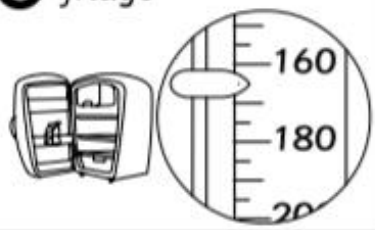
weight =

7 cooker



weight =

8 fridge



weight =

Can I think through what I already know about Gravity?

Find two object of about the same size, e.g. a tennis ball and a hairbrush. Hold them at arm's length away from you and let go of them at the same time. What happens to them? Try this with 5 pairs of different things. Record your answers in the chart below.

The two objects I let go of	**What I saw happen**	**Any scientific language I already know to describe what is happening**
e.g. tennis ball and a hairbrush	I let them go at the same time and they both dropped to the floor. The hairbrush hit the floor just before the ball did	

Are any of these scientific words useful to describe what is happening?

Resistance	weight	mass	gravity	air resistance

Using some of the vocabulary from the box above, can you describe what happened to one of the pairs of objects using scientific vocabulary?

_____

_____

_____

Can I investigate what happens to water in cups when it is dropped?

Equipment

2 plastic or foam cups

Water

Children scissors

Instructions

Take the cups and a jug of water **outside** to complete this investigation.

Half fill one cup with water and drop it to the floor from chest height. Watch what happens.

Make holes in the bottom of the other cup and half fill it with water – watch what happens to the water.

Then half fill the cup with holes in again and drop the cup from chest height and watch what happens.

What happened when you dropped a complete cup of water?

_____

_____

What happened when you put holes in the cup and filled it with water?

_____

_____

What happened when you dropped the cup full of water with holes in?

_____

_____

Why do you think the water did not come out of the holes when you dropped the cup?

_____

_____

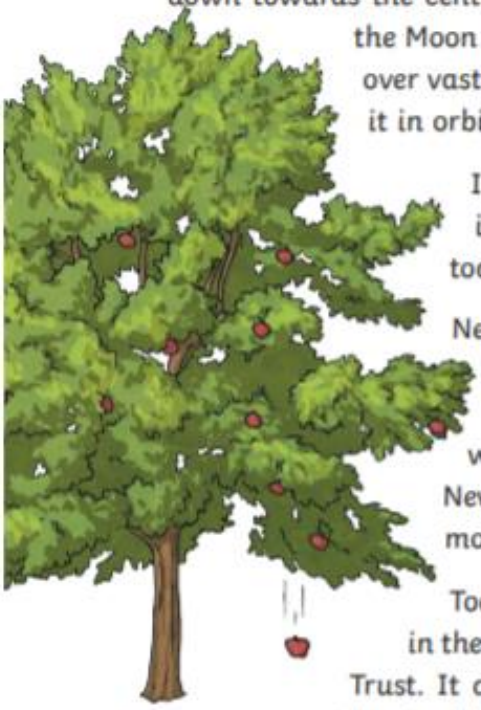
Newton and Gravity Fact Sheet

Isaac Newton was an English scientist and mathematician. He made many discoveries in his lifetime. One of the most important and influential discoveries that he made was the law of gravity.

Newton was born in 1643 at Woolsthorpe Manor in Lincolnshire. He worked hard at school, and was accepted to study at Cambridge University. He worked there for many years, but in 1665, the plague broke out and he was forced to move back to Woolsthorpe Manor.

While Newton was in the garden at Woolsthorpe Manor one day, he saw an apple fall from a tree. Some say it fell on his head but there is no evidence that this definitely happened. The sight of the apple falling down from the branch to the ground inspired Newton to think about the way it fell. Years later, he told his friend William Stukeley that he wondered why the apple fell down rather than sideways or upwards. He concluded there must be a 'drawing power' in the Earth and that 'the sum of the drawing power must be in the Earth's centre, not in any side of the Earth.'

Newton spent a lot of time thinking hard about the force of gravity, and how it pulls objects down towards the centre of the Earth. He was particularly interested in the way the Moon orbits the Earth, and he reasoned that gravity must extend over vast distances, pulling the Moon towards the Earth and keeping it in orbit.



In 1687, Newton published his discoveries about gravity in his famous book, The Principia. His findings are known today as Newton's Law of Universal Attraction.

Newton died in 1727, but his legacy lives on. All forces are measured in newtons (N), using a newton meter – both of which are named after Isaac Newton. Even Albert Einstein, writing in 1927, 200 years after Newton's death, described Newton as a 'shining spirit', and claimed he had one of the most brilliant minds of anybody who had ever lived.

Today, the apple tree that inspired Newton's ideas still grows in the gardens at Woolsthorpe Manor, now owned by the National Trust. It can be seen from the window of the room that was Isaac Newton's bedroom.

Newton and Gravity

1. When was Isaac Newton born?

2. Why did Newton move from Cambridge to Woolsthorpe Manor?

3. What fruit did Newton see falling from a tree?

4. In which direction does gravity pull objects?

5. Why does the Moon stay in orbit around the Earth?

6. What are forces measured in?

7. What did Albert Einstein think of Isaac Newton?

8. What can still be seen from Isaac Newton's old bedroom window?

Can I write an acrostic poem to help teach about forces?

An acrostic poem is where you take the first letter of your word and use it to begin each line of your poem

e.g

Full of energy

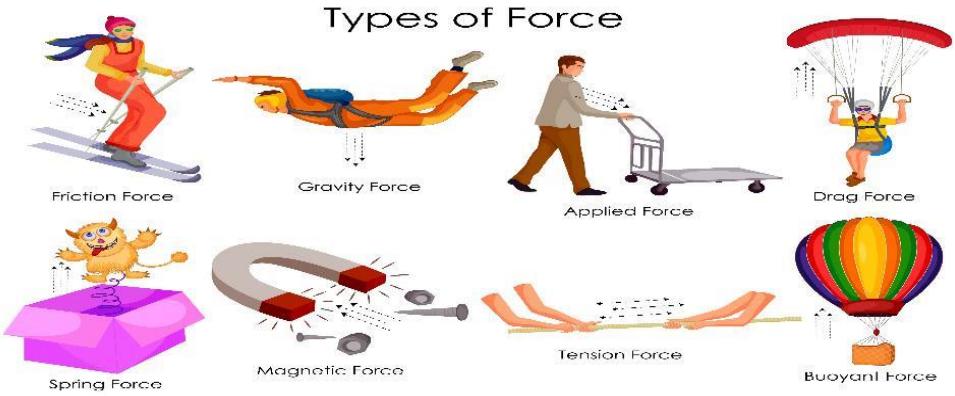
Other things might move

Resistance is a force

Catch the apple falling from the tree

Energy causes movement

Now you have a go, choose any of the forces vocabulary we have looked at so far this week to write yours.



_____

_____

_____

_____

_____

_____

_____

_____

Mass Appeal
Activity Sheet

EducationCity

Name: _____ Class: _____

Compare the mass of the objects.

1. How much heavier is the ruler than the pencil?

_____ g

2. How much heavier is the rubber than the scissors?

_____ g

3. How much heavier is the stapler than the glue stick?

_____ g

4. How much heavier is the glue stick than the ruler?

_____ g

5. How much heavier is the pencil than the rubber?

_____ g

6. How much heavier is Sten's pile of books than Klara's pile?

_____ kg

7. How much heavier is Rosa's pile of books than Sten's?

_____ kg

8. How much heavier is Sten's pile of books than Manu's?

_____ kg

9. How much heavier is Rosa's pile of books than Klara's?

_____ kg

10. How much heavier is Klara's pile of books than Sten's?

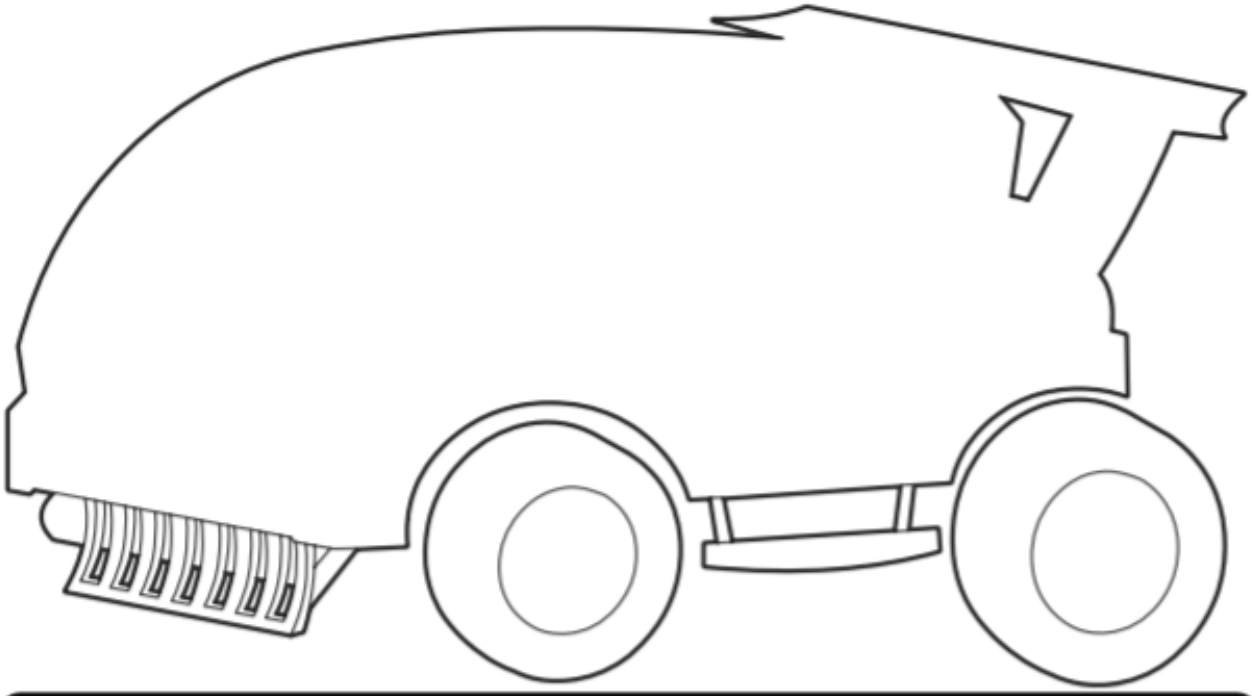
_____ kg

Box Carts

Activity Sheet

Name: _____ Class: _____

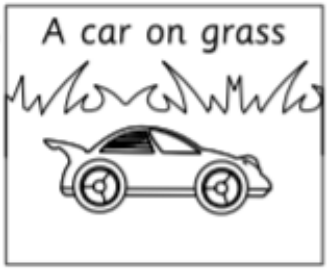
What do you know about friction?
Write a list of facts in the box cart below.



Can you make some predictions?
What do you think will happen when the following surfaces meet?

1. A car on ice

2. A car on grass



3. Two hands being rubbed together

Talk about Forces

To identify forces acting on objects.

Read the story together. Highlight or underline examples of forces in the story. Then, in the second column, briefly explain the forces that are being applied in each example. The first one has been done for you.

The magician reached inside her magic box and lifted up a gigantic magic wand high into the air. She pushed her very heavy magic box along the wooden floor so that it was by the side of the stage. Next, she juggled with silk handkerchiefs. After she threw them into the air, they fell gently downwards for her to catch. After, she lifted a robot penguin out of the box. She held it high in the air. There was a screen behind the magician and she pushed the screen to one side. Behind the screen was a paddling pool. The magician placed the penguin into the water and it started to swim a length of the pool. The children laughed and cheered, although they weren't sure what was magical about the robot swimming in the pool! The magician ended her show by popping a big party popper. The popper shot long strips of colourful paper into the air, which then fell softly to the ground.	**The magician's force is lifting it up and gravity is pulling it down to Earth.**

Words for spellings

Forces

gravity

friction

air resistance

buoyancy

compress

extend

exert/apply

repel/attract

resist/resistance

unit

weight

mass

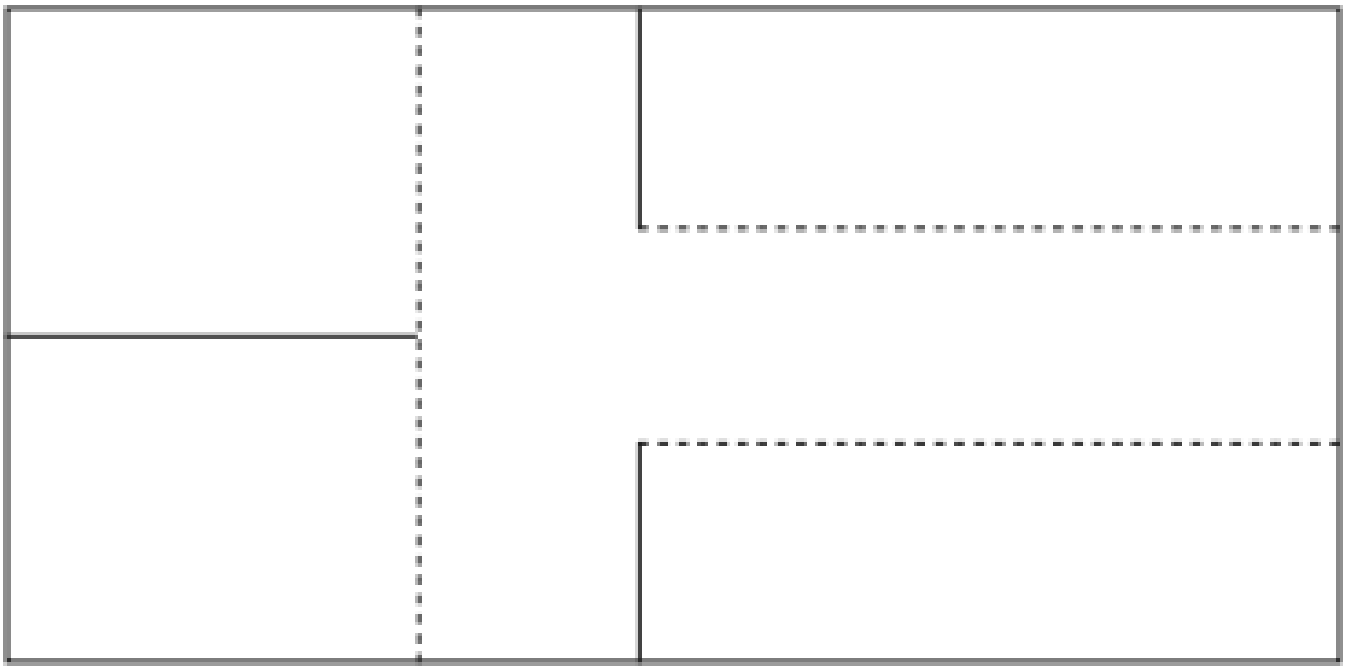
Paper Helicopter Investigation

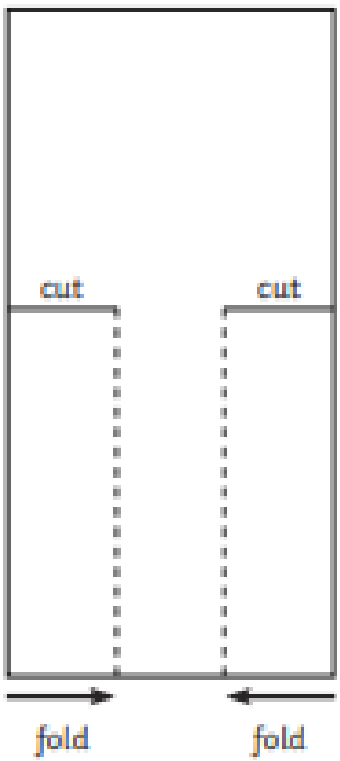
Make a paper helicopter and investigate the effects of air resistance and gravity.

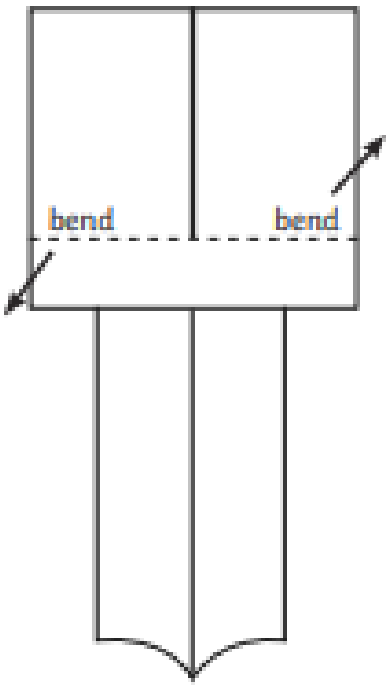
A helicopter hovers in the air as its propellers rotate. Use the template and follow the instructions to create a paper helicopter that spins as it slowly falls to the ground.

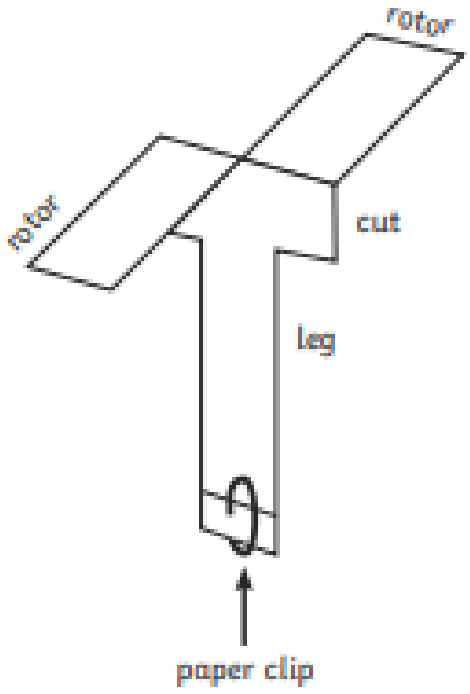
Time how long your paper helicopter takes to fall to the ground. Can you make a new paper helicopter that falls more slowly? Think about the forces of gravity and air resistance, and how you can use them to make the helicopter fall slower.

Draw a picture of your new helicopter below and explain how you made it fall slower.




cut
cut
fold
fold


bend
bend


rotor
rotor
cut
leg
paper clip

MASTERS CHALLENGE 2 x 2 =	**24 ÷ 6=**	**10 x 9 =**
8 x 7 =	**44 ÷ 4 =**	**8 x 12 =**
3 x 3 =	**3 x 4 =**	**8 x 8 =**
5 x 4 =	**4 x 4 =**	**54 ÷ 9 =**
1 x 1 =	**5 x 3 =**	**40 ÷ 8 =**
48 ÷ 6 =	**3 x 8 =**	**6 x 3 =**
28 ÷ 4 =	**60 ÷ 12 =**	**6 x 12 =**
3 x 6 =	**36 ÷ 3 =**	**3 x 6 =**
4 x 7 =	**4 x 11 =**	**4 x 12 =**
4 x 5 =	**3 x 5 =**	**9 x 5 =**
9 x 7 =	**9 x 11 =**	**9 x 12 =**
42 ÷ 7 =	**4 x 8 =**	**8 x 9 =**
45 ÷ 5 =	**12 x 11 =**	**12 x 12 =**
5 x 6 =	**9 ÷ 1 =**	**10 ÷ 5 =**
3 x 7 =	**10 x 3 =**	**6 x 6 =**
2 x 9 =	**9 x 9 =**	**90 ÷ 10 =**
36 ÷ 9 =	**8 x 3 =**	**10 x 10 =**
121 ÷ 11	**72 ÷ 9 =**	**10 x 3 =**
1 x 7 =	**66 ÷ 6 =**	**48 ÷ 4 =**
8 x 4 =	**1 x 10 =**	**54 ÷ 6 =**
99 ÷ 9=	**6 x 5 =**	**108 ÷ 9 =**
5 x 7 =	**5 x 11 =**	**5 x 12 =**
9 x 2 =	**2 x 8 =**	**8 x 10 =**
7 x 7 =	**7 x 11 =**	**7 x 12 =**
11 x 7 =	**11 x 11 =**	**11 x 12 =**
6 x 10 =	**63 ÷ 7 =**	**3 x 9 =**
3 x 7 =	**3 x 11 =**	**3 x 12 =**
8 x 5 =	**4 x 10 =**	**18 ÷ 2 =**
2 x 11 =	**6 x 9 =**	**10 x 10 =**
8 x 7 =	**60 ÷ 5 =**	**12 ÷ 1 =**
4 x 7 =	**84 ÷ 7 =**	**9 x 7 =**
88 ÷ 8=	**10 x 11 =**	**72 ÷ 6 =**
10 x 7 =	**10 x 11 =**	**10 x 12 =**
3 x 12 =	**120 ÷ 12 =**	**36 ÷ 3 =**

Master Master Challenge

72 ÷ 8 =	6 ÷ 1 =	56 ÷ 7 =	18 ÷ 2 =
64 ÷ 8 =	18 ÷ 3 =	24 ÷ 3 =	40 ÷ 8 =
28 ÷ 7 =	30 ÷ 6 =	8 ÷ 8 =	56 ÷ 7 =
9 ÷ 9 =	32 ÷ 8 =	12 ÷ 4 =	24 ÷ 6 =
54 ÷ 9 =	12 ÷ 4 =	35 ÷ 7 =	12 ÷ 2 =
40 ÷ 8 =	18 ÷ 6 =	15 ÷ 3 =	9 ÷ 1 =
1 ÷ 1 =	16 ÷ 8 =	56 ÷ 8 =	35 ÷ 7 =
63 ÷ 9 =	2 ÷ 2 =	36 ÷ 4 =	42 ÷ 6 =
27 ÷ 9 =	36 ÷ 4 =	9 ÷ 1 =	15 ÷ 5 =
16 ÷ 2 =	54 ÷ 6 =	12 ÷ 6 =	6 ÷ 1 =
7 ÷ 1 =	72 ÷ 9 =	36 ÷ 9 =	9 ÷ 9 =
12 ÷ 3 =	14 ÷ 2 =	30 ÷ 5 =	24 ÷ 6 =
27 ÷ 3 =	24 ÷ 4 =	6 ÷ 1 =	45 ÷ 5 =
10 ÷ 2 =	30 ÷ 6 =	48 ÷ 6 =	8 ÷ 4 =
16 ÷ 4 =	45 ÷ 9 =	2 ÷ 2 =	7 ÷ 1 =
3 ÷ 3 =	16 ÷ 4 =	21 ÷ 7 =	9 ÷ 9 =
18 ÷ 3 =	21 ÷ 7 =	9 ÷ 3 =	30 ÷ 5 =
40 ÷ 5 =	81 ÷ 9 =	30 ÷ 6 =	32 ÷ 4 =
32 ÷ 4 =	16 ÷ 2 =	14 ÷ 2 =	12 ÷ 3 =
24 ÷ 4 =	35 ÷ 5 =	56 ÷ 8 =	63 ÷ 9 =
45 ÷ 5 =	49 ÷ 7 =	36 ÷ 4 =	24 ÷ 8 =
40 ÷ 5 =	54 ÷ 9 =	18 ÷ 9 =	25 ÷ 5 =
20 ÷ 4 =	15 ÷ 3 =	20 ÷ 5 =	32 ÷ 4 =
48 ÷ 6 =	20 ÷ 5 =	24 ÷ 8 =	36 ÷ 9 =
54 ÷ 6 =	28 ÷ 7 =	24 ÷ 4 =	48 ÷ 8 =

Can I write sentences using relative clauses?

The Magician

Take some time to explore this picture. You could talk about your answer with someone or jot down your ideas on the next page.

- What do you see and how might these things be important?
- What do you think has happened?
- What do you think has caused these events?
- How is the magician responsible for what is happening? Is he good or evil?
- What is the building in the background and why is the magician approaching it?

See the next page for a writing task linked to this picture

Using the Magician picture

The key grammar skill we would like you to focus on is using relative clauses, something we have already worked on in Year 5. It is a way to add more information to a sentence.

A relative clause begins with a variety of relative pronouns, but the main ones are 'who', 'which', 'with' or 'that'. Commas should surround the main clause. For example:

The magician, who had incredible powers, strode confidently across the marble floor.

Now try your own sentences below, using as many details from the picture as you can. Challenge yourself with the words at the bottom of this page to extend your vocabulary.

The magician, _____, stood before the imposing building.

The sky, _____, reminded him that dark forces were at work.

The magic dust, _____, swirled all around him.

Everyday objects, _____, appeared to have a life of their own.

The windows, _____, shook with the swirling wind outside.

Now choose your own main clause to add a relative clause to.
Some of the words at the bottom of the page might help you to create your relative clauses.

_____

_____

_____

_____

_____

_____

_____

_____

determined steadfast calm unwavering burnt orange
devilishly dark dark as night fearsome sparkled glistened
gleamed shimmered crashed violently mysteriously
dangerously foreboding sanctuary

Maths – Can I order different weights?

With an adults permission, find **five** packets or items from the kitchen which have a weight recorded on the packet. These are likely to be packets with dried ingredients in. Can you find the measurements and then order the packets from lightest to heaviest? Some of the measurements may need to be converted from grams to kilograms.

Remember – 1000g = 1 kilogram.