Challenge 1 - Air Powered Car

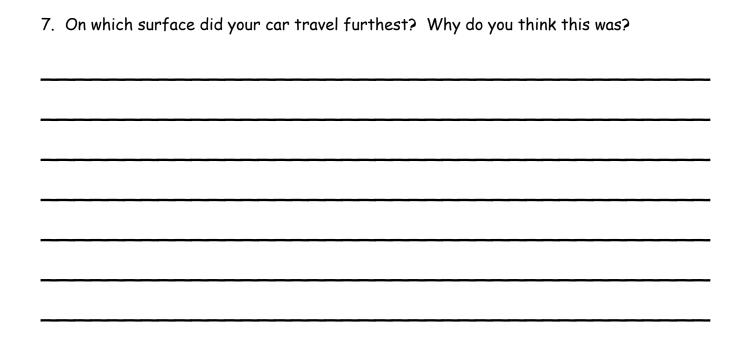
<u>vim:</u>	
1. What I/we had to do:	

2. Any challenges I/we had:
3. How I/we solved the challenges:

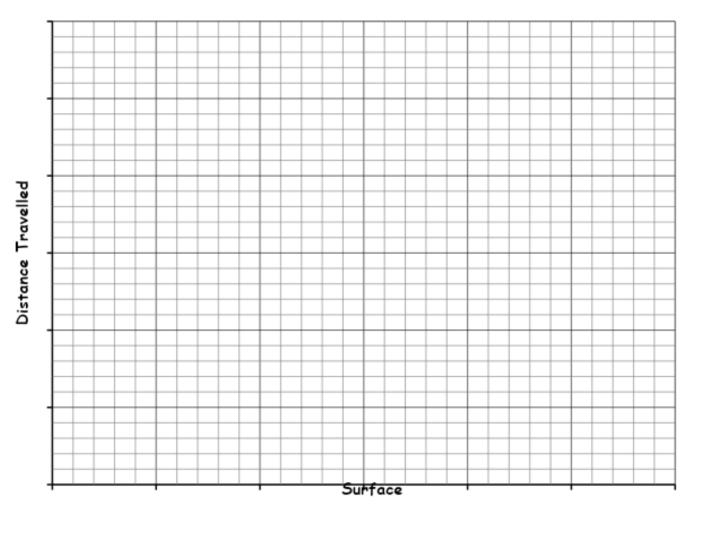
4. Distance the car travelled:	
<u>5. Diagram</u>	

<u>6. </u>	Try	different	surfaces.
---------------	-----	-----------	-----------

6. Try different surfaces.				
<u>Surface</u>	<u>Distance travelled</u>			



8. Record your results as a _____ graph below:



9. What I/we found out or learned:
10. Skills developed

Challenge 2 - Arctic Engineering

<u>Aim:</u>	
1. What I/we had to do:	

2. Any challenges I/we had:
3. How I/we solved the challenges:

1 M/hat T/wa fawad aut an laannad
4. What I/we found out or learned:
Nia anam
<u>Diagram</u>

5. Skills developed

Challenge 3 - Bubble Geometry

<u>Aim:</u>
1 N/hat T/wa had to day
1. What I/we had to do:

2. Any ch	allenges I/we h	<u>ad:</u>			
				 	
					
3. How I/	we solved the c	:hallenges:		 	
			 	 	
				 	
				 	
				 	

4. What I/we found out or learned:
<u>5. Diagram</u>

<u>6. Skills developed</u>	

<u>Challenge 4 - Catapult Challenge</u>

<u>Aim:</u>
1. What I/we had to do:
2. Any challenges I/we had:

				
stance the projec	tile travelled	first time:		
w could you impro	ove your catap	ult to make yo	ur projectile travel	further?
				
	 	 	 	
				
	stance the projec	stance the projectile travelled	stance the projectile travelled first time:	istance the projectile travelled first time:ow could you improve your catapult to make your projectile travel

6. What's the best launch angle?	
	
	
7. Diagram	
<u>First Catapult</u>	Improved Catapult
8. Try again	
<u>Attempt</u>	<u>Distance travelled</u>

	a your	resul	ts as	α	 	gr	aph	:						_		_
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11. Skills developed	 	 	

<u>Challenge 5 - Chasing Shadows</u>

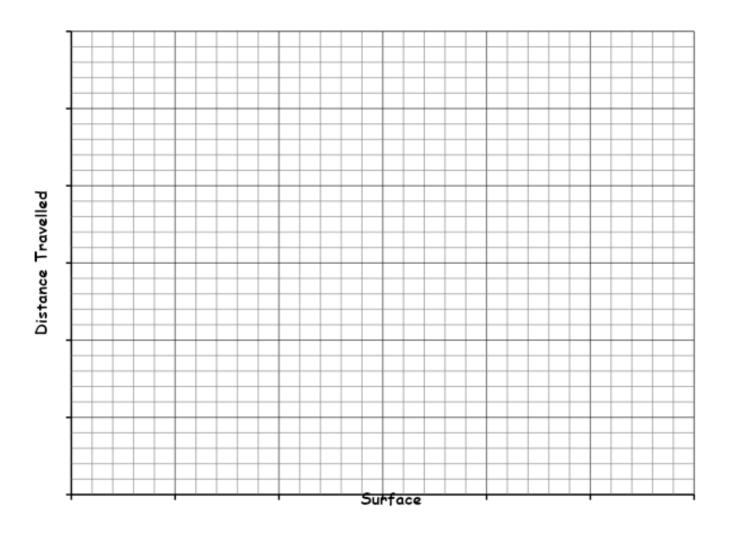
<u>lim:</u>	
1. What I/we had to do:	

2. Any challenges I/we had:

	 			 	
3. How 1	[/we solved t	he challenges	<u>:</u>		
				 	
				 	-

<u>Time</u>	Shadow Measurement	Shadow Position

<u>5.</u>	Diagram		
6.	Record your results as a	graph below:	



7. What I/we found out:			
			
			
			

8. Skills developed		
9. Key vocabulary		
	Challenge 6 - Dancing Salt	
<u>im:</u>		
		
 	 	
1. What I/we had to do:		

2. Any challenges I/we had:

3. How I/we solved the challenges:

4. Diagram 5. What happens to the salt as you change the volume of the music? 6. What kind of music makes the salt dance best?	
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5. What happens to the salt as you change the volume of the music? 6. What kind of music makes the salt dance best?	
6. What kind of music makes the salt dance best?	4. Diagram
6. What kind of music makes the salt dance best?	
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6. What kind of music makes the salt dance best?	5. What happens to the salt as you change the volume of the music?
6. What kind of music makes the salt dance best?	<u></u>
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6. What kind of music makes the salt dance best?	
	b. What kind of music makes the salt dance best?

7 W	Vhat patterns does the salt make?	
<u>, </u> ₹\	That particinis does the suit maker	

<u>Ingredients</u>	<u>Differences</u>

9.	What I/we found out or learned:	

10. Skills developed

11. Key vocabulary		
	<u>Challenge 7 - Decoding Nature's Patterns</u>	
<u>Aim:</u>		
1. What I/we had t	o do:	

— — — — — — — — — — — — — — — — — — —
2. Any challenges I/we had:

2 7/	
3. How I/we so	lved the challenges:
	
	
	
	
4 Write down o	any examples that you find.
Symmetry	
<u> </u>	
<u>Spirals</u>	
1	

	<u>Tessellation</u>				
<u>5.</u>	<u>Diagram</u>				
<u>6.</u>	What I/we foun	d out or learned:			
				 	
				 	

7. Skills developed	
8. Key vocabulary	
·	
	<u>Challenge 8 - Desert Island Rafts</u>
<u>Aim:</u>	

	_Imagine you were stuck on a desert island. What natural resources could you use to l you escape?
2.	What I/we had to do:

3. Any challenges I/we had:
, <u> </u>
4. How I/we solved the challenges:
T. Flow 17 we solved the chanenges.

5. How does adding a decorative mast using a stick and a leaf affect the balance of your raft?

6. Diagram
7. What I/we found out or learned:

	
8. Skills developed	
0.11	
9. Key vocabulary	
	Challenge 9 - Drops on a Penny
Aim:	- ,

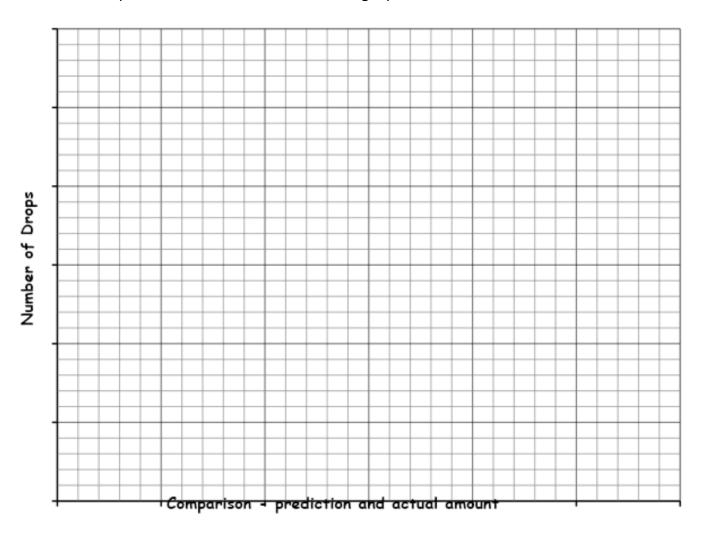
1. Predict how many drops of water you think you will be able to fit on a penny.
2. How many drops of water did your penny hold?
3. What I/we had to do:

4. Any challenges I/we had:

5. How I/we solved the challenges:

6. Diagram

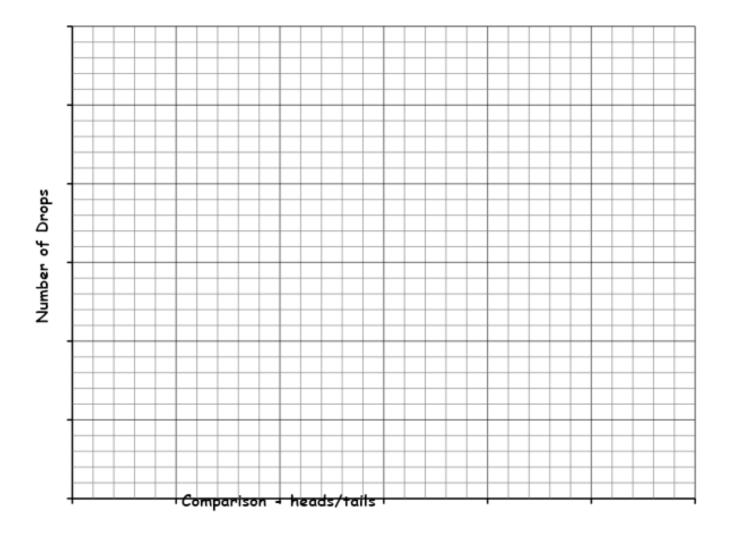
7. Record your results as a _____ graph below:



8. Which side of the penny holds water best? Heads or tails

<u>Coin</u>	Number of Drops
Heads	
Tails	

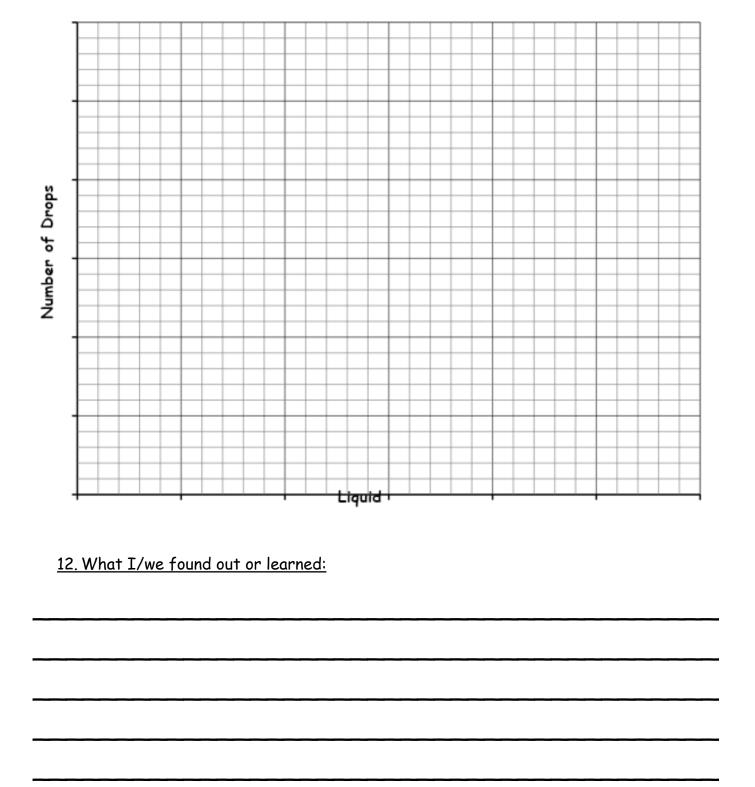
9. Record your results as a _____ graph below:



10. Do we get the same result (number of drops) if we use a different liquid such as cooking oil?

<u>Coin</u>	Number of cooking oil drops
Heads	
Tails	

11. Record your results as a _____ graph below:



14. Key vocabulary		
·		
	<u> Challenge 10 - Egg Parachutes</u>	
<u>Aim:</u>	Stationy 10 Lyg I al activities	

1. What I/we had to do:
2. Any challenges I/we had:

3. How I/we solved the challenges:

4.

<u>Design</u>	<u>Success Rate</u>

<u>5.</u>	Which was the most successful design? Which was the most successful design?	hy do you think this was?
		-
	 	
		
<u>6.</u>	Diagram	

7. What I/we found out or learned:	
	_

9. Key vocabulary
Challenge 11 - Fireworks in a Jar
<u>Aim:</u>
1. What I/we had to do:

2. Any challenges I/we had:

3. How I/we solved the challenges:
4. Diagram

5. Try adding other fluids to your jar such as honey or milk. How do their densities compare to the water and vegetable oil?
6. Diagram

7. What I/we found out or learned:	
	

<u>9.</u>	Key vocabulary		
		Challenge 12 - Green Coins	
<u>Aim:</u>			
<u>1.</u>	What I/we had to do:		

2. Any challenges I/we had:

4. After 10 minutes

<u>Liquid</u>	What do you notice?
Lemon Juice	
Vinegar	
Cola	

5	After	
	ich liquid was most effective at making coi	ns shiny?
	<u>Liquid</u>	Effectiveness ranking (1st, 2nd, 3rd)
	Lemon Juice	
	Vinegar	
	Cola	
	Try the experiment using vinegar again, but What happens to the speed of the reaction	
		

ı

7. Diagram
8. What I/we found out or learned:

9. Skills developed		
10. Key vocabulary		
	Challenge 13 - Leaf Shape S	Sorting
<u>.im:</u>		

3. Key vocabulary		
	Challenge 14 - Lolly Stick Bridges	
<u>lim:</u>		

2. Any challenges I/we had:

4. Think of any bridges you have seen. What do they look like? What are they made of? How are they designed?
5. Diagram - Bridge Design

	_Test the bridge using toy cars to see how much weight it can hold. Number of cars the bridge can hold:
<u>7.</u>	_Was your bridge successful? If not, how could you improve it? Could a different design hold more toy cars?
•	
<u>8.</u>	What I/we found out or learned:

9. Skills developed	
10. Key vocabulary	
·	
	<u>Challenge 15 - Magic Milk</u>
<u>Aim:</u>	
1. What I/we had to do:	
1. What I/we had to do:	

2 Any chal	lenges I/we had:			
Z. Any chai	renges 17 we nau.			
				
- 				
				
	 			
3. How I/w	e solved the challenges:			
	, , , , , , , , , , , , , , , , , , , 			
				
				

4. Try the experiment again, but this time using semi-skimmed milk. Does the reaction change? Why might this be?

-

<u>5. Diagram</u>

6. What I/we found out or learned:	

8. Key vocabı	<u>aiui y</u>			
	Challe	enge 16 – Marble	Run Mavhem	
<u>Aim:</u>				
<u>-11111)-</u>				
			 	
				
1. What I/we	z had to do:			
1. What I/we	≥ had to do:			
1. What I/we	z had to do:			

2 /	Amy challenges T/we had:
<u> 2. P</u>	Any challenges I/we had:
	
<u>3. F</u>	low I/we solved the challenges:
 -	

4. Diagram
<u>1. Diagram</u>
5. What I/we found out or learned:

6. Skills developed	
7. Key vocabulary	
A i.m.	Challenge 17 - Marshmallow Challenge
Aim:	
4 14/1 17/ 1 11	
1. What I/we had to	<u>_do:</u>

	
2	. Any challenges I/we had:
	, snansiges 2,s nas
<u>3</u>	. How I/we solved the challenges:

4. How tall is your tower?
5. Diagram
<u>o. Diagi am</u>
6. What I/we found out or learned:

7. Skills developed	
8. Key vocabulary	
A im:	<u>Challenge 18 - Minibeast Mapping</u>
<u>Aim:</u>	

1. What I/we had to do:
2. Any challenges I/we had:
3. How I/we solved the challenges:

		ts you will be e	
abitat: ow many minibeas	 		

ا خ	Habitat:	
	How many minibeasts are here?	
	Minibeast	Number
ļ		
7 <u>.</u> _	Habitat:	
	How many minibeasts are here?	
	<u>Minibeast</u>	Number

<u>Minibeast</u>	here? <u>Number</u>
	popular with each type of minibeast? Why do you th
/hich habitats are most p	popular with each type of minibeast? Why do you th
	popular with each type of minibeast? Why do you th
	popular with each type of minibeast? Why do you th

11. What I/we found out or learned:

13. Key vocabulary
<u>Challenge 19 - Musical Milk Bottles</u> im:
1. What I/we had to do:

2	. Any challenges I/we had:
<u>3</u>	. How I/we solved the challenges:

4. What do you notice about the pitch of the sound and the volume of water in each bottle?	
5. Order the bottles from lowest to highest pitched. What do you notice?	
6. Diagram	

7. What I/we found out or learned:

9. Key vocabulary
<u> Challenge 20 - Newspaper Towers</u>
<u>Aim:</u>
1. What I/we had to do:

2. Any challenges I/we had:	
	
3. How I/we solved the challenges:	

4. How tall is your tower?	
•	
5. Diagram	
6. What I/we found out or learned:	
	

7. Skills developed	
8. Key vocabulary	
	Challenge 21 - Oil Spill Clean-Up
Aim:	
1. What I/we had to do:	

2	. Any challenges I/we had:
	. ruly onahonges 27 wo had-
3	. How I/we solved the challenges:
_	. The street me shanenges
	

4. Measure how much oil is in the plastic cup.
5. How many feathers have been cleaned?
6. How successful was the clean-up challenge? Why?
7. Diagram

8. What I/we found out or learned:

10. Key vocabulary		
	<u> Challenge 22 – Paper Plane Bu</u>	<u>Illseye</u>
<u>Aim:</u>	Challenge 22 - Paper Plane Bu	<u>lllseye</u>
<u>Aim:</u>	Challenge 22 - Paper Plane Bu	<u>Illseye</u>
<u>Aim:</u>	Challenge 22 - Paper Plane Bu	illseye
<u>Aim:</u>	Challenge 22 - Paper Plane Bu	illseye
		illseye
Aim: 1. What I/we had to		illseye
		illseye
		illseye

2. Any challenges I/we had:
3. How I/we solved the challenges:
4. Diagram - Plane 1 - Labelled drawing
4. Diagram - Plane 1 - Labelled drawing
4. Diagram - Plane 1 - Labelled drawing
4. Diagram - Plane 1 - Labelled drawing

<u>5.</u> Short-range (5 metres)

<u>Attempt</u>	<u>Measurement</u>	Changes Made to Plane
<u>1</u>		
<u>2</u>		
<u>3</u>		
4		
<u>5</u>		
<u>6</u>		

6. Long-range (10 metres)

<u>Attempt</u>	<u>Measurement</u>	Changes Made to Plane
<u>1</u>		

<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
	uccessful designs for each	ch target. Why did they work best? How
 		

8. What I/we found out:				
	 	 	 	
9. Skills developed				

<u>10. Key vocabulary</u>	
	Challenge 23 - Paper Cup Phones
Aim:	
7.111 <u>1</u>	
	
1. What I/we had to do:	
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1. What I/we had to do:	
1. What I/we had to do:	
1. What I/we had to do:	

2. Any challenges I/we had: 3. How I/we solved the challenges:	
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3. How I/we solved the challenges:	
	

1. How does changing	,		тио образат, об	
				
5. Diagram				
5. What I/we found	<u>out or learned:</u>			
		 		
				

Challenge 24 - Photo Scavenger Hunt Aim: 1. What I/we had to do:

2. Any challenges I/we had:

3. How I/we solved the challenges:

4. Diagram

5. What I/we found out or learned:
6 Skilla dovologod

7. Key vocabulary

Challenge 25 - Playing with Puddles

<u>Aim:</u>	
1. What I/we had to do:	
	
	
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<del></del>	
<del></del>	
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
~	
2. Any challenges I/we had:	

3. How I/we solved the challenges:
 Two experiments - 1. Pour water in one place Spread water more thinly over a larger area
Measure the perimeter (distance around the outside) of your puddles by placina string

Measure the perimeter (distance around the outside) of your puddles by placing string around the chalk outline. Then measure the string against the measuring tape.

<u>Time</u>	<u>Water in one place</u>	Water spread more thinly	<u>Perimeter (in cm)</u>

5. Which puddle evaporated quickest, the one with the largest or smallest perimeter? Why do you think this was?
6. Diagram

(Put a tick (\checkmark) for evaporated or a cross (x) for not evaporated)

7. What I/we found out or learned:

9. Key vocabulary

Challenge 26 - Plugging Pipelines

<u>Aim:</u>		
1. What I/we had to do:		
		 · · · · · · · · · · · · · · · · · · ·
	····	
	 	
	·	
		 ,

2. Any challenges I/we had:

3. How I/we solved the challenges:
4. Diagram

5. What I/we found out or learned:
6 Skills developed

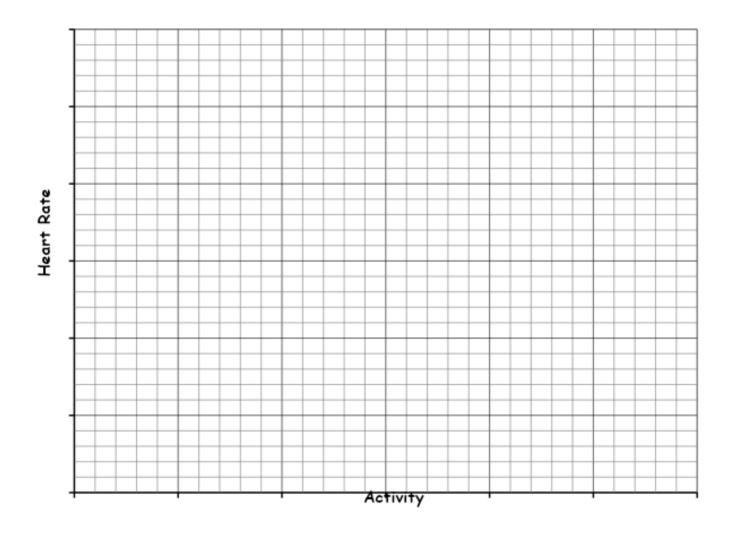
Challenge 27 - Racing Hearts

<u>Aim:</u>				
1. What I/we had to do:				
	 		 	
	 		 	
	 	 	 	

2. Any challenges I/we had:
2 How T/wa salvad the challenges:
3. How I/we solved the challenges:
4. Resting heart rate (after 1 minute)
5. Heart rate after jogging for 30 seconds
6. Heart rate after sprinting
7. What happened to your heart rate when your level of exercise increased?

	 	 	
8. Diagram		 	
<u> </u>			

9. Record your results as a _____ graph below:



10. What I/we found out or lear	<u>rned:</u>	

11. Skills developed			
12. Key vocabulary			
<u>Chal</u>	lenge 28 – Rainbow Wa	ılking Water	
<u>Aim:</u>			
1. What I/we had to do:			

				
				
				
<u>2. An</u>	y challenges I/we had:			
				
3. Ho	w I/we solved the challenges:			
	5			
				
				

	<u>Time</u>	<u>Observations</u>
	I	
. Diagram		

6. What I/we found out:

8. Key vocabulary
<u>Challenge 29 - Robot Obstacle Course</u>
<u>Aim:</u>
1. What I/we had to do:

	
	
	
2. Any	<u>y challenges I/we had:</u>
<u>3. Hoi</u>	w I/we solved the challenges:
	
	
	~

				 	 _
<u>4. C</u>	Diagram of obs	tacle course (<u>(labelled)</u>		
5. V	What I/we fou	nd out:			
	•	· · · · · · · · · · · · · · · · · · ·			
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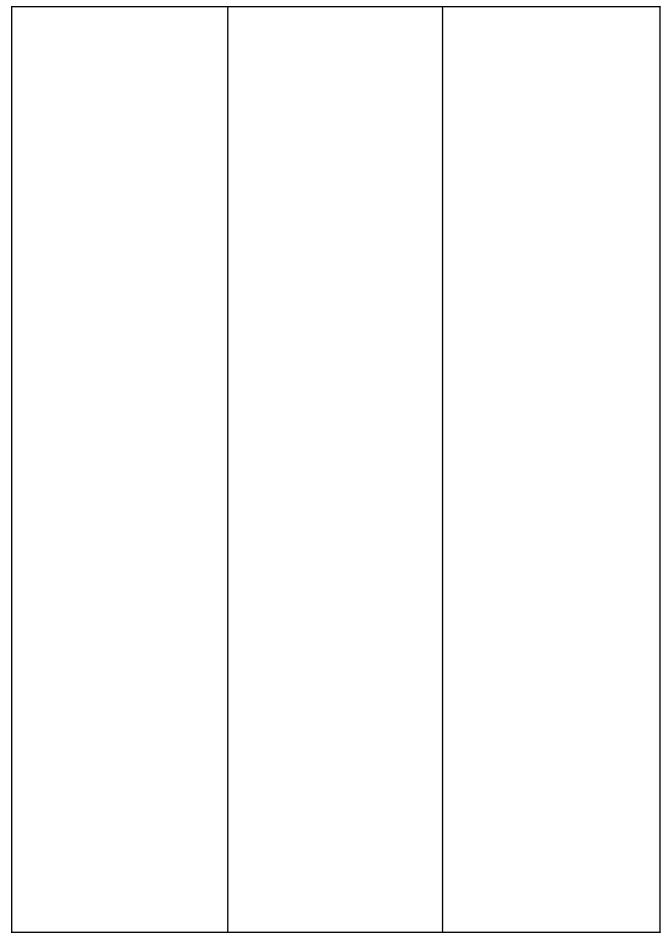
6. Skills developed	
7. Key vocabulary	
····	
	Challenge 30 - Rock Rummage
<u>Aim:</u>	
4 240 - 74 1 1 1 1	
 What I/we had to do: 	

	
	
	
2. Any	<u>y challenges I/we had:</u>
<u>3. Hoi</u>	w I/we solved the challenges:
	
	
	~

4.	List the ways you could sort your rocks. Fo	or example, smallest to largest.	
			
			
5.	5. Now sort your rocks in the ways you listed and take a photo of them.		
	Print the photos or draw a picture of your r the tables.	rocks and place them in the correct place on	
	<u>Igneous</u>	<u>Sedimentary</u>	

Metamorphic	Permeable	Tmnermeable

<u>Metamorphic</u>	<u>Permeable</u>	<u>Impermeable</u>



7. What I/we found out or learned:

<u>Challenge 31 - Rocket Racers</u>

<u>Aim:</u>				
1. What I/we had to do:				
				
2. Any challenges I/we had:				

3. How I/we solved the challenges:

4. Complete the table		
<u>Racer</u>	Time	
5. Who had the rocket that got to the other end quickest? Why do you think this was?		
o. Who had the focker that got to the other end quickests why do you think this wass		
	 	

6. Diagram
7. Now try experimenting with different sized balloons or by adding more or less air. You could also angle the string upwards or downwards slightly. What do you notice?

8. What I/we found out or learned:

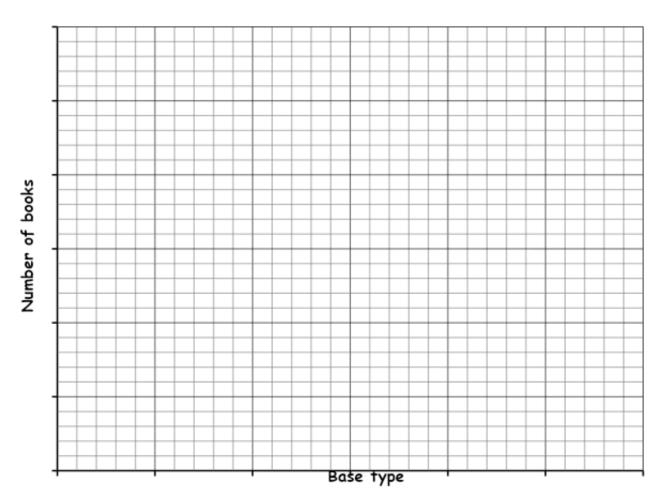
Challenge 32 - Shape Strength

<u>Aim:</u>
1. What I/we had to do:
2. Any challenges I/we had:

	 			
2				
<u>3. </u>	How I/we solved the challenges:			
				
				
				
4. Before you test your columns, predict which one you think will hold the greatest				
weight. Why do you think this?				
				
	 			
	 			
				
5. Test one column at a time by slowly stacking books on top of it. Record how many				
books it holds before collapsing.				
ı				
	<u>Base</u>	Number of Books		
	Caucana			
	Square			

	Circular				
	Triangular				
6.	6. Which shape base held the most books? Why do you think this was?				
	<u> </u>	, ,			
<u>7. </u>	Diagram				

8. Record your results as a _____ graph below:



9. What I/we found out or learned:

Challenge 33 - Sweetie Symmetry

<u>im:</u>
1. What I/we had to do:

3. How I/we solved the challenges: 4. Diagram	2. Any challenges I/we had:
	
	
4. Diagram	3. How 1/we solved the challenges:
4. Diagram	
4. Diagram	
4. Diagram	
4. Diagram	
4. Diagram	
4. Diagram	
	4. Diagram

5. What I/we found out or learned:

Challenge 34 - Special Snowflakes

<u>Aim:</u>
1. What I/we had to do:
2. Any challenges I/we had:

					
		 			
3.	How I/wes	solved the challenges:			
		5			
					
		 			
					
4	M/l a a sa a sa a sa a				
4.	wnere are	you dropping your snow	wtiake from?		
5.	Complete t	he table			
	<u>Attempt</u>	Time to reach	Adaptation made		
		ground			
	1				

	3		
	4		
	5		
<u>6.</u>	Diagram		
<u>7. </u>	What I/we	found out or learned:	
			
			

<u>Challenge 35 - Spinning Helicopters</u>

<u>Aim:</u>		
1. What I/we had to do:		

2. Any challenges I/we had:	
3. How I/we solved the challenges:	

4. Complete the table

<u>Attempt</u>	Number of paperclips	<u>Number of spins</u>
1		
2		
3		
4		

	5		
<u>5. Diagram</u>			
6. What I/we found out or learned:			
	 		
			
			

7. Skills developed		

Challenge 36 - Spoon Sound Waves

<u> </u>
1. What I/we had to do:

2. Any challenges I/we had:

<u>3.</u>	How I/we solved the challenges:
4.	Is it true that the harder you hit the spoon, the louder the sound?
5.	Experiment with adjusting the string to different lengths. Does this change the sound? How?

6. Diagram
<u>5. 5.ag. am</u>
7. Try using different sized spoons. Does this affect the sound? If so, why might this
be?

8. What I/we found out or learned:

9 Skills developed

9. Skills developed

Challenge 37 - Static Salt 'n' Pepper

<u>3.</u>	How I/we solved the challenges:
4.	Hold the spoon above the salt and pepper to watch them separate. What do yo notice?
5.	What happens when you move the spoon further away from the plate?

6. Diagram	
7. What I/we found out or learned:	

8. Skills developed

<u>Challenge 38 - Tinfoil Cargo Boats</u>

Aim:	
1. What I/we had to do:	
	
2. Any challenges I/we had:	

3. How I/we solved the challenges:

4. Number of coins: Weight of coins:
5. How could you improve your design to make it hold more?

6. Diagram

7. Now create smaller and larger tinfoil boats shaped like canoes, squares and rectangles. Explore how the different shapes and sizes affect the weight they can hold.
8. What I/we found out or learned:
9. Skills developed

<u>Challenge 39 - Water Colour Carnival</u>

<u>Aim:</u>
1. What I/we had to do:
2. Any challenges I/we had:

		
Complete the table (Colour 1	+ Colour 2 = Colour 3)	
<u>Colour 1</u>	<u>Colour 2</u>	<u>Colour 3</u>
<u>Diagram</u>		
<u> </u>		

6. What I/we found out or learned:	
7. Skills developed	

8. Key vocabulary
Challenge 40 - Water Filter Challenge
Aim:
1. What I/we had to do:

		4	
			
<u>2.</u>	Any challenges I/we had:		
			
			
<u>3.</u>	How I/we solved the challeng	<u>jes:</u>	
			
<u>4.</u>	Complete the table		
	Natural material used and	Volume of muddy water	Time taken for muddy
	amount (in grams)	used	water to filter through
			into the plastic cup

<u>5.</u>	<u>Diagram</u>		

7. Skills developed