

No.

Science Autumn 1 Year 5 Physics -Forces

TAPS Assessment: Spinners

Key vocabulary: Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears						
National Curriculum	Week	NC - Coverage	Disciplinary	Substantive	Activity Outline	
			Knowledge	Knowledge		
The national curriculum for		Explain that	To identify	To know that	Show children a video clip with a range of forces in	
Science aims to ensure that all		unsupported	scientific evidence	unsupported	action including a spacecraft being launched,	
pupils:		objects fall	that has been	objects fall to	astronauts moving in space, sprinters on an	
		towards the Earth	used to support or	Earth because of	athletics track, an elephant pulling a log, a bird	
Working Scientifically Upper		because of the	refute ideas or	the force of	landing, a car travelling over a rough surface, a	
<u>KS2</u>		force of gravity	arguments.	gravity acting	stunt car and a boat being launched	
Pupils should be taught to use		acting between	Research how the	between the	http://www.bbc.co.uk/learningzone/clips/forces-	
the following practical scientific	1	the Earth and the	work of scientists	earth and the	in-action-no-narration/1601.html.	
methods, processes and skills		falling object	such as Galileo	falling object	Use still images from the video and ask children to	
through the teaching of the			Galilei to help		discuss how they were linked. Teacher to drop a	
programme of study content:			develop the		ball and ask children to explain how the images are	
planning different			theory of		linked to this.	
types of scientific			gravitation.			
enquiries to answer			8			
questions, including		Explain that	Identify	To know that	Introduce gravity as a force acting between the	
recognising and		unsupported	scientific	gravity on Earth	Earth and an object pulling it down. Children to be	
controlling variables		objects fall	evidence that	pulls objects	shown a moonwalking clip to show the impact of	
where necessary		towards the Earth	has been used	down to the	reduced gravity and then asked to consider the	
taking measurements,	2	because of the	to support or	ground	idea of (A world without gravity' Children to	
using a range of		torce of gravity	refute ideas or	grouna.	idea of A world without gravity . Children to	
scientific equipment,		acting between	arguments.		identify positives and negative consequences.	
with increasing accuracy		the Earth and the			Show children a globe with some LEGO people	
and precision, taking		falling object.			stuck on and ask them to think about what would	



repeat readings when					happen to a ball that each person threw. After
appropriate					discussion, children to drow and evaluate their ideas
appropriate * recording data and					discussion, children to draw and explain their ideas
rosults of incrossing					about this.
comployity using					
complexity using					
keys, tables, scatter					
graphs, bar and line		Explain that	To <mark>take precise</mark>	To recognise that	To give children a set of forcemeters to look at and
graphs		unsupported	readings, choosing	gravity acts as a	consider how they were the same and different.
using test results to		objects fall	the most	pulling force	The teacher to demonstrate how to take a
make predictions to set		towards the Earth	appropriate forcemeter depending on the size of the force.		
up further comparative	-	because of the		between the	measurement by putting an object in a hole
and fair tests	3	force of gravity		Earth and the	punched plastic wallet and hanging it on the hook.
reporting and		acting between		falling object.	Highlight it needs to be kept steady and for it to be
presenting findings from		the Earth and the		0,	held at eve-level. The children to take
enquiries, including		falling object.			
conclusions, causal					measurements with a partner.
relationships and		Compare how	Το μερ	To know and can	To show children the image and ask them to think
explanations of and		things move on		identify the	about why the boy was finding it hard to pull the
degree of trust in results,		different surfaces	appropriate	offocts of air	girl and the deg. The teacher to then introduce
in oral and written forms	4	 4 (Y3) • Identify the effects of air resistance, water resistance and friction, that act 	subject knowledge	rosistanco wator	friction as a force acting when one solid moves over another solid. Children to make predictions testing the movement of a shoe/trainer on
such as displays and	4		to <mark>make a</mark>	resistance, water	
other presentations			prediction	friction that act	
identifying scientific			prediction.	hotwoon moving	
evidence that has been			To <mark>identify a</mark> variable that	between moving surfaces.	different suffaces.
used to support or					
		between moving			
		surfaces.			



arguments.be controlled.Subject Contentbe controlled.upplis should be taught fo: 	refute ideas or			should and could		
Subject Content Implies should be taught to: • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to baye a greater effect Identify the effects effects fair effects fair resistance effects fair resistance identify the effects oil arresistance, water resistance as affection, that act between moving surfaces. fair eresistance if any effects fair fair effects fair fair eresistance fair eresistance	arguments.			be controlled.		R:
Hupits should be taught to: A explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object A identify the effects of air resistance, water resistance, water resistance, water resistance and friction, that act between moving surfaces. To make To know and can Teacher to hold up a parachute in the air and ask * identify the effects of air resistance, water To make To make predictions about the effects of air resistance, water resistance and friction, that * recognise that some mechanisms, including e.g. parachutes. e.g. parachutes. surfaces. and fiction, if possible, the words 'gravity' and 'air resistance'. 6 Identify the effects of air resistance in a parachutes. gravitable object. air copy two parachutes at the same time, one surfaces arge of contexts e.g. parachutes. arge of contexts e.g. parachutes. arge of context	Subject Content					A Phillippe and
Pupils should be laught te: 						es in the second and a second and a second a sec
 explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces f identify the effects of air resistance, water resistance and friction, that act between mechanisms, including levers, pulleys and gears, allow a smaller force to bave a greater effect. 	Pupils should be taught to:					- Part -
 Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. act between moving surfaces. act between moving surfaces. act between moving surfaces. act between moving surfaces. act between moving surfaces. 	explain that					and the second s
towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	unsupported objects fall					
because of the force of gravity acting between the Earth and the falling object	towards the Earth					Teacher to hold up a parachute in the air and ask
 gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	because of the force of				To know and can	what would happen if it they let go. Drop two
 the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to bave a greater effect. a far resistance, water resistance and friction air resistance and friction. a far resistance, water resistance and friction. b far resistance, water resistance and friction. b far resistance and friction. b far resistance and friction. b far resistance and friction. c far resistance and friction. b far resistance and friction. c far resistance and friction. d far resistance and friction. d far resistance and friction. f far resistance and friction.	gravity acting between		Identify the effects		identify the	identical parachutes at the same time, one
objectwater resistance and friction, that act between moving surfaces.To make predictions about the effects of air resistance in a range of contexts e.g. parachutes.resistance, water resistance and friction, that act between moving surfaces.children to make observations. Teacher to introduce air resistance and object down as it moves through air as air particles block the path of the object. Drop two parachutes with different sized canopies and ask the children to make observations. Ask children to describe a parachute jump including, if possible, the words 'gravity' and 'air resistance'.6	the Earth and the falling		of air resistance,	_	effects of air	scrunched up and the other held open. Ask the
 identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. and friction, that act between moving surfaces. bredictions about the effects of air resistance in a range of contexts e.g. parachutes. and friction, that act between moving surfaces. and friction, that act between moving surfaces. bredictions about the effects of air resistance and friction, that act between moving surfaces. bredictions about the effects of air resistance in a range of contexts e.g. parachutes. and gravity and the object. Drop two parachutes with different sized canopies and ask the children to describe a parachute jump including, if possible, the words 'gravity' and 'air resistance'. 	object		water resistance	To <mark>make</mark>	resistance, water	children to make observations. Teacher to
air resistance, water resistance and friction, that act between moving surfaces	 identify the effects of 		and friction, that	predictions about	resistance and	introduce air resistance as a force that slows an
 moving surfaces. resistance in a range of contexts e.g. parachutes. recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to bave a greater effect. 	air resistance, water	5	act between	the effects of air	friction, that act	object down as it moves through air as air particles
 that act between moving surfaces range of contexts e.g. parachutes. recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	resistance and friction,	•	moving surfaces.	resistance in a	between moving	block the path of the object. Drop two parachutes
 surfaces e.g. parachutes. to make observations. Ask children to describe a parachute jump including, if possible, the words 'gravity' and 'air resistance'. allow a smaller force to have a greater effect. 	that act between moving			range of contexts	surfaces.	with different sized canopies and ask the children
 recognise that some parachute jump including, if possible, the words 'gravity' and 'air resistance'. allow a smaller force to have a greater effect. 	surfaces			e.g. parachutes.		to make observations. Ask children to describe a
allow a smaller force to have a greater effect.	recognise that some					parachute jump including, if possible, the words
allow a smaller force to	mechanisms, including					'gravity' and 'air resistance'.
allow a smaller force to have a greater effect.	levers, pulleys and gears,	6				
	allow a smaller force to					
	nave a greater enect.					
School Context	School Contoxt					
Children to discuss the concent cartoon:	School Context					Children to discuss the concent cartoon:
Levers in D&T in Year 4 and	Lovers in D&T in Year 4 and					
Pulleys in Vear 6	Pulleys in Year 6			To report and		
present findings				present findings		



Common Misconceptions	Identify the effects	from enquiries,	To associate the	Paper Helicopter
Some children may think:	of air resistance,	including	shape of the	If you node the spinner It is using replaced paper This longer to full to the
 the heavier the object the 	water resistance	conclusions.	object with the	it would fail much faster! I that dynamic appropriate I
faster it falls, because it has	and friction, that		amount of air	in a state of the
more gravity acting on it •	act between		resistance and	
forces always act in pairs which	moving surfaces.		recognises that	
are equal and opposite •			this can have an	
smooth surfaces have no friction			impact on how it	VS Sc Forces - Session D () Insuedious Tune 2011
 objects always travel better 			falls.	
on smooth surfaces • a moving				
object has a force which is				Based on the spinner, ask the children to plan an
pushing it forwards and it stops				investigation to answer their own question.
when the pushing force wears				Children to record the results, calculate an average
out • a non-moving object has				and comment on patterns in data (use two lessons
no forces acting				for this investigation).

Science Autumn 2 Year 5 Physics - Light

TAPS Assessment: Plan Solar System

Key vocabulary: Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planet					
National Curriculum	Week	NC - Coverage	Disciplinary	Substantive	Activity Outline
			Knowledge	Knowledge	



The national curriculum for Science nims to ensure that all pupils: <u>Morking Scientifically Upper KS2</u> pupils should be taught to use the following practical scientific methods, processes and skills	1	Describe the movement of the Earth, and other planets, relative to the Sun	To identify scientific evidence that has been used to support or refute ideas or arguments.	Knows some ideas about the movement of the Earth, and other planets, relative to the Sun.	KWL grid: Use following as an introduction to the topic and for AfL. Ask children to sort a series of statements about the solar system into 'true', 'false' or 'not sure'. Provides the teacher with information about the children's starting points and misconceptions.
hrough the teaching of the programme of study content: § planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary § taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when	2	Describe the movement of the Earth, and other planets, relative to the Sun	Use secondary sources to help create a model e.g. role play to show the movement of the Earth around the Sun.	The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits.	Through role play, show children the movement of the planets around the Sun using the key vocabulary orbit to describe the movement. Following the role play, ask children to explain/write what they have learnt.
appropriate § recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	3	Describe the movement of the Earth, and other planets, relative to the Sun	Use secondary sources to create a model to understand the movement of the Earth.	Earth takes 365¼ days to complete its orbit around the Sun.	During this lesson, children to return to their role play model and use their understanding of the movement of the Earth to explain how many days there are in a year and how leap years occur. Children to then draw a model to describe the movement of planets using arrows.



§ using test results to make		Use the idea of the	Make <mark>first-hand</mark>	As Earth rotates half	Children to make observations of shadows outside
predictions to set up further		Earth's rotation to	observations of how	faces the Sun (here	at different times of day. Children to then
comparative and fair tests		explain day and night	shadows caused by	it is day) and half is	demonstrate their understanding using diagrams.
§ reporting and presenting		and the apparent	the Curreleance	facing away from	Provide children with a series of questions about
findings from enquiries,		movement of the sun	the Sun change	the Sun (night).	I At what time of the day are shadows at their shadows
including conclusions,		across the sky	through the day.		shortest? 2. In what ways do shadows change throughout the Caused by
causal relationships and					day? 3. Why do shadows change their length? the Sun and
explanations of and degree	Λ				the day what would eventually happen to the how these
of trust in results, in oral	-				5. Why? can be used
and written forms such as					6. Where in the playground can you use a shadow to tell the
displays and other					7. Would it work in a shady place? time.
presentations					9. Does it matter which way around you place it? 10. How can you check that your clock faces the
§ identifying scientific					correct direction? II. How accurately can you tell the time with the
evidence that has been used					shadow clock? 12. Is it accurate to the hour half hour quarter hour
to support or refute ideas or					for example?
arguments.		Use the idea of the	Use <mark>secondary</mark>	The Earth rotates	Ask children to use a globe, a LEGO person and a
		Earth's rotation to	sources to create a	(spins) on its axis	torch to demonstrate how the rotation of the Earth
Subject Content		explain day and night	model to show why	every 24 hours.	causes day and night, the apparent movement of
		and the apparent	day and night occur.	As Earth rotates	the Sun across the sky, and changes in shadows.
Describe the movement of the	_	movement of the sun		half faces the Sun	Capture evidence verbally.
Earth, and other planets, relative to	5	across the sky		(here it is day) and	
the Sun				half is facing away	
Describe the movement of the				from the Sun (night).	
Moon relative to the Earth				As the Earth rotates	
Describe the Sun, Earth and Moon				the Sun appears to	
as approximately spherical bodies				move across the sky	
Use the idea of the Earth's rotation		Describe the	Use secondary	The Moon orbits the	Use role play to demonstrate the movement of the
to explain day and night and the		movement of the	sources to create a	Earth.	Nioon around the Earth. Capture understanding
apparent movement of the sun	6	Nicon relative to the	model to show why	It takes about 28	verbally.
across the sky	2	Edf([] Describe the	uay and hight occur.	uays to complete its	
		movement of the		UIDIL.	
		movement of the			

School Context	Earth, and other	Consider the views	The Sun, Earth and	Extension: Children to plan and research their own
	planets, relative to	of scientists in the	Moon are	information texts with the title 'Earth, Space and
Use playground to create role play of the solar system <u>Common Misconceptions</u> Some children may think: • the Earth is flat • the Sun is a planet • the Sun rotates around the Earth • the Sun moves across the sky during the day • the Sun rises in the morning and sets in the evening • the Moon appears only at night • night is caused by the Moon getting in the way of the Sun or the Sun	planets, relative to the Sun	of scientists in the past and how evidence was used to deduce the shapes and movements of the Earth, Moon and planets before space travel.	Moon are approximately spherical.	Information texts with the title 'Earth, Space and Beyond' by drawing on what they have learnt in the sequence of lessons. Children to conduct additional research into areas of interest to themselves. Children to create an information booklet for children of a similar age.
in the way of the Sun or the Sun moving further away from the Earth				

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