

Sometimes children become very enthusiastic when confronted with well-known things and events. The interesting thing about magnetism is the way it works.

Here again telling a story – of the seafarer or pirate travelling across the seas – of the robber in the forest at night – of little Susan searching her way back home – might help the children to approach the subject.

It may therefore be useful for the following experiments to only show the materials and to tell the story. Afterwards, the children can start to develop their own way of finding solutions to the problems.

## Table of Contents:

Introduction to magnetism	3
Your own compass	5
The dancing sheet of paper	7
A pair of ducks	9
Find the two terrestrial poles with a paper clip	11
The fishing rod game	13

Name:		Category:
Introduction to magnetis	m	recimology – magnetism
For age range: 3 years and older Where: Demonstration room	How long: c. 45 minutes	<ul> <li>For how many?: 6 – 10 children</li> <li>Preparation/materials:</li> <li>Prepare a big table in the demonstration room with various magnetic and non-magnetic materials and cover them with a cloth. The magnets (one magnet for each child) are put at the children's place at the table.</li> <li>Prepare the room (tables, chairs), magnets (one for each child), various magnetic and non-magnetic objects.</li> </ul>
Aims for the children: By making experiments the children find out which objects are attracted by a magnet and which properties they all have in common. Many children have no experience with a magnet yet and can thus gather first hand experience. Scientific explanation: Magnetism is the property of a magnet to attract magnetic substances such as iron, nickel and cobalt. The space around a magnet in which magnetic forces can be found is called magnetic field. Direction and size of magnetic forces are indicated by lines of magnet these go from the north to the south pole and inside from the south to the north pole. Whenever two poles of the same kind get closer they repel each other. Natural magnetism can be eliminated by shock, glowing out (the Curie point is at 721 °C) and by weakening the alternating magnetic field.		<ul> <li>Steps:</li> <li>1. Once the children have decided to take part in the project you show them a magnet in the demonstration room and ask them whether they know what it is and which effect it has.</li> <li>2. Show the children how the magnet attracts a nail.</li> <li>3. Now show the children the materials. Tell them to try out which objects are attracted and which properties these objects have in common.</li> <li>4. After the experimentation phase discuss with the children what they have observed and whether they know which properties all objects attracted by the magnet have in common.</li> <li>5. Finally explain to the children that all objects made of iron are attracted by a magnet.</li> <li>Possible variations:</li> </ul>
Be aware of: It is useful to have the same children participate in the experiments during the entire duration of the project.		





Name:		Category:	
X		Technology – magnetism	
Your own compass			
For age range:		For how many?:	
4 years and older		6 – 10 children	
Where: Demonstration room	How long: c. 45 minutes	Preparation/materials:	
		The globe and the compass are placed onto the table and covered up.	
Aims for the children:		All other materials are supplied. The room is prepared (tables, chairs).	
The children shall see that even with simple materials you		For every child:	
can design your own compass. They will also learn that the		a crown cap, a magnet, a needle, a short pin, a piece of sponge rubber indicating the	
earth has a north and a south pole and that a compass		four points of the compass	
serves to determine the northern of	direction.	In general: adhesive, scissors, a bowl of water, a globe and a compass, a piece of	
• It is the aim for the children to learn that a magnet orientates		paper with an N for north	
itself to a north/south direction.		Steps:	
		1. Take the globe to explain to the children that the earth has got a north and a	
Scientific explanation:		south pole and that by using the compass you can determine the northern	
Magnetism is the property of a magn	net to attract magnetic	direction and therefore also the north pole.	
substances such as iron, nickel and	cobalt.	2. Then ask one child to determine the north by means of the compass. Help the	
The space around a magnet in		child by sticking up the piece of paper indicating the N in northern direction.	
which magnetic		3. Now explain to the children that a magnetised needle would always orientate	
forces can be found is		itself towards the north and that they can therefore make their own compass.	
called magnetic field.		4. Show them a self-made compass and encourage them to build one for	
Direction and size of		themselves (magnetise the needle, stick the needle through the crown cap).	
magnetic forces are		5. In a next step the compass is put into the bowl with water so that it can orientate	
indicated by lines of magnetic flux. Outside		itself towards the north. Please remember which side of the compass shows	
of a magnet these go from the north to the south pole and		towards the north.	
inside from the south to the north pole. Whenever two poles of		6. Afterwards you can attach the disc indicating the four points of the compass.	
the same		7. Finally, check once again whether the disc with the four points of the compass is	
kind get closer they repel each other. Natural magnetism can		firmly attached and discuss with the children what they have observed during the	
be eliminated by shock, glowing out	(Curie point is at 721 °C)	experiment.	
and by weakening the alternating magnetic field.		when the children stick the needle into the crown cap it may happen that the needle	
		becomes bent. I herefore it is advisable to provide several heedles.	
Be aware of:		Possible variations:	
		References:	
		http://www.elektronik-kompendium.de/sites/grd/0302151.htm	
		http://www.physikfuerkids.de/lab1/versuche/korkkom/index.html	

- 5 -



Name:		Category:	
		Physics	
The dancing sheet of paper		- Magnetism	
For age range:		For how many?:	
4 years and older		6 – 10 children	
Where: Demonstration	How long:	Preparation/materials: All materials are placed onto the table in the	
room	ca. 30 minutes	demonstration room and covered.	
		The room is prepared (table, chairs,) – for every child:	
		a shoebox, a magnet, a paper clip	
		For all: cardboard, crêpe paper, scotch tape, scissors, adhesive, coloured	
		pencil	
Aims for the children:		Steps:	
The children should find	but that a magnetic object can be moved	1. First, motivate the children by showing them a finished "stage" (shoebox)	
even through, for example	e, cardboard.	with a dancing sheet of paper.	
		2. Now encourage the children to use their creativity in making the stage	
		and the dancing object.	
		5. Then ask them to find out ways of making the object dance (slick a paper clip to an object and move it from behind with the magnet)	
Scientific explanation:		A Afterwards the children can test their "stage" with the dancing object	
Magnetism is the propert	y of a magnet to attract magnetic	5 Finish the project by discussing again the reasons why the object	
substances such as iron, nickel and cobalt.		dances	
The space around a magnet in which			
magnetic			
forces can be found is called			
magnetic field. Direction and size			
indicated by lines of mag			
flux. Outside of a magnet	these to from the north to		
the south pole and inside	from the south to the north pole. Whenever		
two poles of the same			
kind get closer they repel	each other. Natural magnetism can be		
eliminated by shock, glowing out (Curie point is at 721 °C) and by			
weakening the alternating magnetic field.			
Be aware of:		Possible variations:	
The dancing object should not be too big since otherwise the magnet		You can bring in variations by changing the stage and/or the dancing object.	
may no longer attract the dancing object since it is too heavy.			
		References:	
		http://www.physikfuerkids.de/lab1/versuche/erbbuero/erdbuerowfd.html	

n detail:	

Name: The pair of ducks For age range: 4 years and older Where: Demonstration room	<b>How long:</b> Ca. 45 minutes	Category:         Physics         - Magnetism         For how many?:         6 - 10 children         Preparation/materials: for every child:         All materials are prepared on the table and covered.         The room is prepared (table, chairs,). One magnet, two cork discs, two needles, two duck templates made of sponge rubber, a small bowl with
Aims for the children: The aim is for the children attract or repel each othe Scientific explanation: Magnetism is the property substances such as iron, The space around a mag magnetic forces can be found is ca magnetic field. Direction a of magnetic forces are indicated by lines of magnetic flux. Outside of a magnetic the south pole and inside two poles of the same kind get closer they repel eliminated by shock, glow weakening the alternating <b>Be aware of:</b> For this project it is best to cork pieces made of crow	n to see that two magnetised needles r just like two magnets.	<ol> <li>Steps:         <ol> <li>Motivate the children by asking them whether they know that it is possible to find out whether ducks like each other or not.</li> <li>Now explain to them that two magnetised needles attract or repel each other. Show the effect by using two magnets because magnetised needles react just like magnets.</li> <li>Then show the children the finished ducks (stick the magnetised needles into the duck templates and then put the ducks into the cork discs). The children make their own ducks.</li> <li>Afterwards, the ducks are launched into the water. Watch their behaviour.</li> <li>Finish the project by discussing the various observations.</li> </ol> </li> <li>Possible variations:         <ul> <li>You can also use different animals or objects.</li> </ul> </li> </ol>
		References: http://home.t-online.de/home/hanuta.schoon/Hendrik%20experimente.html



	Category.	
	Physics	
es with a paper clip	Magnetism	
	For how many?:	
	C. three children or more	
low long:	Preparation/materials:	
20 minutes	Paper clip (not made of synthetic material), a thin, long string, a strong magnet	
	Steps:	
efine north and south pole	If you want to find the northern and southern magnetic pole here we tell you what to do:	
the metal the paper clip itself has turned into a small huge magnet and magnets influence each other the the direction of the poles. an effect into the room – even if there is a vacuum. het is called magnetic field. magnetic field. It is caused by electric currents in the e earth. It is great that our planet is surrounded by a elds off the earth against dangerous radiation ticles of the sun. This ensures our survival. It is a ry birds have a sense of orientation based on the by using a trick we can do alike four magnetised freely rotating paper clip (or the cork compass) will always align itself towards the of the earth just as if they were attracted by them. at the magnetic poles of the earth are not exactly forth and south pole and furthermore have a tendency ficult to navigate (to determine one's position) with a choice for navigation purposes is a gyrocompass.	You need a paper clip made of metal (important: not made of synthetic material), a thin and long string as well as a strong magnet. Attach the string to the metal paper clip (in the middle) and hang it freely suspended to a table or cupboard edge. Now rub the magnet several times in the same direction over the paper clip and then let the clip hang freely suspended. Now the paper clip aligns itself and shows you the direction of the north and the south pole. Possible variations: References: http://www.physikfuerkids.de/lab1/versuche/erbbuero/erdbuerowfd.html	
e three trys containing	s with a paper clip  with a paper clip  with a paper clip  with a paper clip itself has turned into a small  muge magnet and magnets influence each other the muse a selled magnetic field. muge muge that our planet is surrounded by a muge a lds off the earth against dangerous radiation muse of the sun. This ensures our survival. It is a muse a sense of orientation based on the musing a trick we can do alike mur magnetised freely rotating paper clip (or the muse compass) will always align itself towards the muse attracted by them. t the magnetic poles of the earth are not exactly outh and south pole and furthermore have a tendency cult to navigate (to determine one's position) with a choice for navigation purposes is a gyrocompass.	



Name:		Category:
		Physics
The fishing rod game		Magnetism
For age range:		For how many?:
For years and older		6-8 participants
Where:	How long: c	Preparation/materials:
Demonstration room	2 times 45 minutes	All materials are prepared in the demonstration room. Sponge rubber (white),
		coloured pencils, sticks, scissors, DIN A 4 sheets, laminating machine and foil,
		magnets, wool
Aims for the children:		Steps:
The children shall create	their own game and implement their first-	1. The children start by making fishing rods from wool, sticks and magnets:
hand experience with ma	gnetism in a final product.	Then they use white sponge rubber and coloured pencils to make fish and
		other objects. Ask them to think how it could be possible to catch these fish
		(paper clips) and why. The pieces of fish can be equipped with dots.
		2. During the second nour of the experiment the children take white sheets of
		paper for the sides of the aquarium and paint them. Then the sheets are
		laminated. After cooling-down the sheets are punched and the together. In a
Scientific explanation:		Possible variations:
Magnetism is the propert	v of a magnet to attract magnetic	
substances such as iron, nickel and cobalt		
The space around a magnet in which		
magnetic		
forces can be found is called		
magnetic field. Direction and size		
of magnetic forces are		
indicated by lines of mag	netic	
flux. Outside of a magnet	these go from the north to	
the south pole and inside	from the south to the north pole.	
Whenever two poles of the	ne same	
kind get closer they repe	each other. Natural magnetism can be	
eliminated by shock, glow	n magnetic field	
Be aware of:		References:
Laminated sheets are more resistant in daily use by children than		Self-invented
cardboard or similar materials.		

In detail:

