

East Renfrewshire Council: Education Department
Practitioner Moderation Template

School Code	
Practitioner Code	W1
Curriculum Area(s)	Science/Technologies
Level	First
Stage(s)	Focus Pupil Primary 2 (Classes studying topic are p1/2 and p2/3)
Specific subject (if applicable)	Magnetism

Experiences and Outcomes:

By exploring the forces exerted by magnets on other magnets and magnetic materials, I can contribute to the design of a game. SCN 1-08a

I explore materials, tools and software to discover what they can do and how I can use them to help solve problems and construct 3D objects which may have moving parts.

TCH 1-12a

Learning Intentions:

- Explore the push/pull forces of magnets
- Understand that some materials are attracted to magnets
- Contribute to the design a game
- Explore a variety of materials and tools
- Use materials and tools to create 3D objects

Success Criteria:

- I can name at least 2 objects that are magnetic/non magnetic
- I can describe what I found out about the strength and size of magnets
- I can describe what happens when you put like/unlike poles together using words attract/repel
- I can choose and use different materials and tools
- I can make a game that works using magnets

Briefly outline the context and range of quality learning experiences that have been provided making reference to the chosen design principles.

I have attached the topic overview which clearly shows the learning experiences for the 'Magnets' topic in detail. Briefly they are:

- Introductory activity (teacher pretending to be a magician and making things move without touching them). Can class work out how Teacher did it? Completion of first 2 columns of a KWL grid.
- Investigation 1 - Which objects are magnetic? Predict/Investigate. Followed by Tigtag - Odd One Out.
- Investigation 2 - Is the biggest magnet always the strongest? Predict/Investigate.
- Investigation 3 - Like/Unlike Poles. Predict/Investigate. Tigtag - 'What happens next?'
- Design and make a game that works using magnets in a group.
- Explain to each other how to play games and play each other's games. Peer assess.
- Share homework tasks with class - (either design and make a magic trick that works by using magnets or complete a written project exploring the use of magnets in your house). Peer feedback.
- Complete final column of KWL grid to share what we have learned.
- During an open morning, children 'be the teacher' and lead parents through investigation 1

Coherence/Breadth - The Magnets topic brought together an obvious cross curricular opportunity between a range of Es and Os from **Science** and **Technology**. (It also allowed for further development of skills in ICT - exploring activities on Tigtag, HWB - working with others and taking turns and Literacy - Listening and Talking through predicting and discussing findings).

Relevance - During the topic, clear links to the everyday use and importance of magnets were made, (i.e. in electric motors, fridge doors, tablet covers etc). Also the safety aspect of the importance of magnets not being used near devices such as computers, mobile phones etc was explored.

Challenge & enjoyment/Personalisation & Choice - There were lots of opportunities for practical, independent investigations, culminating in making a game that works using magnets. There was an opportunity to share learning at home with parents through choice of 2 homework tasks. Answering 'blooms type questions' from topic overview, about results, allowed pupils to analyse their results. They were able to use own ideas for the design of a game. They had the choice of tools/materials to use. They also had a choice of homework task - magic trick or written project. Different types of learning were used such as whole class/paired/group/individual.

Depth/Application - P2/3 have had the opportunity to develop investigative skills learned in science last year in a different context. They will be able to apply predicting and analysing skills learned in this topic to future science topics.

Record the range of assessment evidence that was gathered to meet the success criteria (Say, Write, Make, and Do) considering breadth, challenge and application.

Make

- A game that works using magnets -made in class in groups and photo enclosed (*This allowed children to bring together both the Science and Tech stands in one task - breadth. They had to be able to apply what they had learned about the push/pull force of magnets to make the game work*)
- A magic trick that works using magnets - focus pupil chose this option for the homework task and photo/peer feedback is enclosed. (*Again applying what they had learned about the push/pull force of magnets to make the magic trick work or using that knowledge to explain how the appliances in their house used magnets*)

Say

- Focus pupil contributions recorded on class flip charts from the start and end of the topic and after individual investigations/activities

Write

- Predict and record which materials are magnetic, (predicting was the challenge and some thought that all metal would be magnetic)
- Predict and record results of pole investigation - describe what happens when you put like/unlike poles together

Do

- Carry out 3 investigations (In pairs 'which materials are magnetic?' and 'pole investigation'. As a whole class 'which magnet is the strongest?')

Self Assessment

- Analyse predictions after carrying out investigations - after all 3 investigations pupil was able to reassess predictions and draw conclusions such as biggest magnet not necessarily the strongest etc. Focus pupil said she was 'surprised' about results of the pole investigation when looking back at predictions. She thought 'the same colour would stick together'.

Peer Assessment

Focus pupil's comments about project of others.

- After listening to another pupil share their homework project, our focus pupil said 'I learned when you close the door of a washing machine it has a magnet'.
- After listening and watching another group explain how to play a game our focus pupil told them they could improve their game if they 'use a 1 minute timer instead of a 2 minute timer so no one finishes too fast

Peer assessment of focus pupil's homework task (see feedback box below)

Briefly outline the oral/written feedback given to the pupil on progress and next steps, referring to the learning intention and success criteria.

Feedback

- As noted on the KWL grid in the 'What I have learned' column, the focus pupil had realised that some metal stuff won't stick to a magnet. Teacher explained not all metals are magnetic. The next time magnets are studied teacher explained that they will learn about the different types of metal and which are magnetic.
- Teacher discussed predictions with child, explaining that predictions may not be right but as long as we carry out the investigation and then compare them with what actually happened that is fine and how we learn.
- Focus child was puzzled that not all coins stuck to the magnet so teacher explained that it depends on when certain coins were made and what kind of metal is in them.

Next Steps

- Focus pupil then had to share what they had learned with parents during a class open morning. Focus pupil had the opportunity to lead parent through one of the investigations we had carried out in class and 'be the teacher'. Opportunity to consolidate learning.
- At Christmas, revise the concept of magnets and poles and use the Christmas context to discuss North and South poles and how they work.

Feedback from peers - Her homework task which was a magic trick - Can you push the train down the track without touching it? (see photo in evidence):

1. I liked it when the pupil got the train to the end of the track
2. I enjoyed seeing her do it
3. Her trick worked using a magnet. She got a train and she got a glove and she put a magnet in it and then she had to get the train to the end without touching it

Pupil Voice:

What have you learned?

Teacher - What have you learned about magnets?

I've learned that some metal does not stick on to magnets but some metal does.

Teacher - Anything else?

Poles are the end of magnets.

Teacher - What happens when you put like poles together?

It doesn't stick. It repels. (said 'reflects' first but could correct herself)

Teacher - What happens when you put unlike poles together?

It sticks.

Teacher - Is the biggest the magnet always the strongest?

No. That the smallest magnet can hold loads and loads of stuff.

How did you learn?

Teacher - How did you learn which materials were magnetic or non-magnetic?

We learned it because we saw what happened to all of the metal stuff.

Teacher - did you just see it happen?

No. We stuck the magnets to metal and 'unmetal' (non metal) stuff. We went to our desks and tried it.

What skills have you developed?

Teacher - What skills have you developed?

We were guessing/ trying to know stuff we didn't know.

Teacher - What special name does that have, when you try to guess what will happen?

Predict!!

Using our partner skills. Doing it together.

Other examples of the pupil voice in the evidence:

Self Assessment

- What I think I already know about magnets at the start of the topic - 'Magnets can pick up anything that is metal'
- After investigation 1 - Tell me 2 objects that will stick to a magnet? Pupil used results sheet to say - 'a spoon and a paper clip'
- After investigation 2 - Did anything surprise you? - Pupil said 'that the big one (magnet) only held 8 (spoons)'. Was the biggest magnet the strongest/ 'No'
- After like/unlike poles experiment, pupil was able to say to explain in her recording that, 'When you put like poles together the repel. when you put like poles together the attract. The 2 ends of the magnets are called poles.'
- What I have learned about magnets at the end of the topic - 'some metal stuff won't go on a magnet'
- Analyse predictions after carrying out investigations - after all 3 investigations pupil was able to reassess predictions and draw conclusions such as biggest magnet not necessarily the strongest etc. Focus pupil said she was 'surprised' about results of the pole investigation when looking back at predictions. She thought 'the same colour would stick together'.

Peer Assessment

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- After listening to another pupil share their homework project, our focus pupil said 'I learned when you close the door of a washing machine it has a magnet'.
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Did the learner successfully attain the outcomes? **YES/No**

Primary 2/3 Magnets Investigation 1


Which objects are magnetic and will stick to your magnet?

1. Look at each object in the table and predict if you think it will stick to your magnet
2. Test each object to see if it does stick to the magnet.

Object	Prediction ✓ or x	Is it magnetic? ✓ or x
paper clip	✓	✓
rubber	x	x
10p coin	✓	✓
spoon	✓	✓
ruler	x	x
string	x	x
cloth	x	x
staple	✓	✓
post it note	x	x
pencil	x	x
2p coin	✓	x
pin	✓	✓

3. Be ready to tell your teacher what is the same about all the objects that stuck to the magnet.

You managed to make very sensible predictions, well done!



E (Focus Pupil) has managed to make sensible predictions and has correctly tested all of the objects with her partner.

Focus Pupil highlighted in yellow and referred to as 'E'.

Can you predict which objects will be attracted to the magnet?

Z - The paperclip

M - The ones which are made of metal.

E - Things like paper and a ruler would not be magnetic because they are not made of metal.

E has been able to name 2 things which are non-magnetic.

She has also named objects which are magnetic following the investigation .

Tell me 2 objects that did stick to the magnet.

E - a spoon and a staple (Emily used her list to help her)

A - a paperclip and a 10p coin.

O - 10p coin and a pin.

M - pins and a paper clip.

What did you learn about magnets after testing them? Did anything surprise you?

L - The paperclip we tested did not stick to the magnet but Daniel and Eva's did, but our paper clip feels different to theirs it might be plastic.

L - No I got all of them correct.

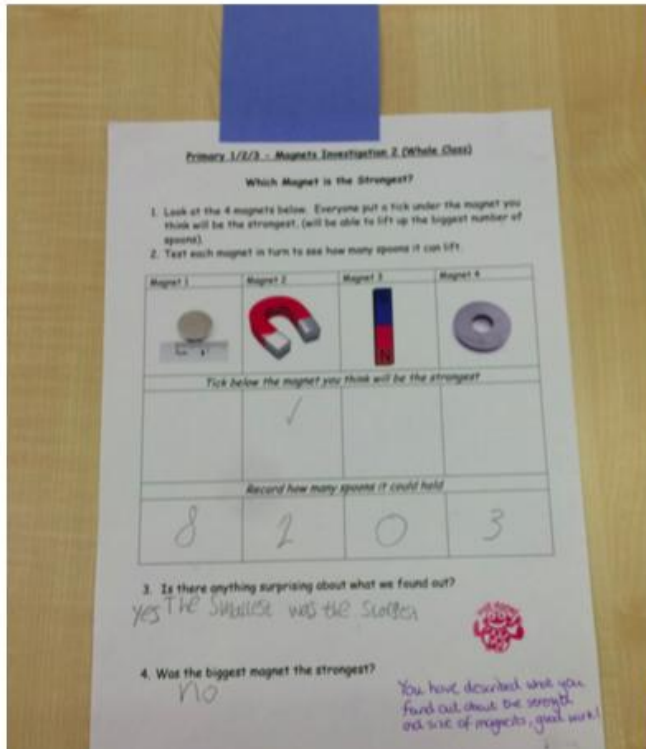
Z - I knew all of the objects that would be magnetic.

E - All of the objects which were not made of metal were not magnetic, like the pencil and the rubber.

E – The 10p stuck, but the 2p didn't. I thought the 2p was made of metal.

E has responded well to the question and has noticed that the common theme of most metals being magnetic does not apply to the 2p coin.

LESSON 2 EVIDENCE



After having a chance to see and hold each magnet which is on the sheet, E along with the rest of the class predicted that the red magnet would be the strongest as it was the biggest and the heaviest. E successfully managed to describe what she found surprising about the strength and size of magnets following her investigation (in written form). She knew that

Z and R testing out the strength of the smallest magnet and discovering that it could hold 8 spoons.

'How can it hold so many! It's tiny!'

Out of these four magnets, which one would you think would be the strongest?

R – The big red one.

L – The biggest one because the others are too small.

L – The red one because it is the heaviest.

What was surprising about what you have learned after doing the investigation?

D – The biggest one only held 2 spoons.

R – I was surprised the smallest could hold so many!

So what do we now know about the strength and size of magnets?

So what do we now know about the strength and size of magnets?

Z – Don't always think the biggest is the strongest, try them all.

E has orally been able to explain what she found out about the strength of the small magnet during a class discussion after completing their investigation. She clearly knows this is surprising

E – The smallest magnet can sometimes be the strongest which is weird.

M – The smallest magnet could hold 8 spoons.

LESSON 3 EVIDENCE

What happens when you put like/unlike poles together?

Magnets have ends called 'poles'. On these magnets they are coloured red and blue. We are going to investigate what happens when you touch the poles together.

		Prediction		What actually happens	
		Attract or Repel		Attract or Repel	
Red	*	Red	*	Attract ✓	Attract ✓
Red	*	Blue	*	Repel ✓	Repel ✓
Blue	*	Red	*	Repel ✓	Repel ✓
Blue	*	Blue	*	Attract ✓	Attract ✓

Use the words below to complete the sentences:

attract	poles	repel
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- When you put like poles together they repel ✓
- When you put unlike poles together they attract ✓
- The 2 ends of the magnet are called poles ✓

It is clear you have understood what happens when you put like and unlike poles together and you have been able to use the correct scientific vocabulary, excellent!



E and E testing what happens when like/unlike poles are put together.

'We were right! Two of the same colour push each other away but a red and a blue stick together.'

E worked with a partner and made sensible predictions after using her knowledge she gained from watching a video and information from TigTag resources. It is clear she knows what attract/repel mean as she has investigated and used the correct language to describe her findings.

Who can tell me what the words repel and attract mean?

L - Repel means when the magnets push away from each other and attract means when they stick together.

What do you think will happen when we put 2 like poles together and 2 unlike poles?

L - The like poles will attract and unlike poles will repel.

K - The like poles will push away from each other and the unlike poles will attract, they will stick together

R - I think if 2 red parts and 2 blue parts are put together they will stick together

Noted a mistake in someone else's answer. She was able to use the correct scientific vocabulary to orally predict what she thought would happen when like/unlike poles were put together.

E - I don't think that, I think if 2 red parts are put together they will repel but if we put a blue and red part together they will attract.

What actually happened when we tried out our investigation?

M - The like poles repelled and the unlike poles attracted.

LESSON 4 EVIDENCE



E has been able to design a game with her group that uses magnets to pick up fish. She has named all of the different materials and tools she needs, how it should be played and what the aim is. She has also drawn a diagram which shows the range of materials needed.



The groups decided who would have specific roles, for example drawing and cutting the fish, making the rod, attaching the paper clips to the fish etc.



This group (including focus pupil) are explaining how to play their game to others.

'The magnet on the end of the rod picks up the fish but you are only allowed to pick up one at a time. You have to see how many you can pick up before the time runs out.'



The groups tested each other's out under timed conditions to see which game they thought worked best and what could be improved upon. This was just before they self and peer assessed their games.

Would anyone like to peer assess and give stars or wishes to the other groups on how well their games worked?

E has given another group a star and a wish.

E- I liked the way they made their fish really small so it was harder to pick them up. The bigger fish were too easy. They could have made sure their string was properly stuck to the rod because it kept falling off.

D - The paperclips kept falling off but I liked the design of their fish.

Z - They worked well as a team to get it finished quickly but they could have taken more time putting the paperclips on because they kept falling off.

Now let's self- assess. How well do you think your own game worked?

D - We kept picking up more than one fish at a time because we were rushing to win.

A - The rod could have been better, we could have used card for the fish as well.

E has self-assessed her team's game. She was able to explain what she thought they did well as a group and what they could improve upon if they were to make it again.

E - We worked well as a team because I cut the fish, Orla put the paperclips on the fish and drew them and Lewis made the rod with string. Our fish could have maybe been bigger.

L - I think our fish could have also been better but we tried our best.

M - I think our game worked the best.



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