Nuffield Design & Technology working in the curriculum

What should be stuck to your fridge?
four hours work

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Young children like fridge magnets. The small size, an apparent defying of gravity, the sharp click when the magnetic field grasps onto the fridge and the low price all contribute to the appeal. And of course the subject matter can be anything from the latest craze to worthy dietary exhortation. The shapes vary considerably but usually they are quite flat and it is here that you can encourage your children to make fridge magnets with a difference – fridge magnets that are a little bit 3D because they are made from layers. In this activity the children will be working as part of a group in deciding the overall theme of a fridge magnet set and as individuals in making one of the fridge magnets in the set. And there is the added bonus that the fridge magnet can be used to hold a spelling list and so help them get better at spelling.

In this unit children will learn:

- to develop a product from the stimulus of a commercial idea; (Session 1)
- to conduct a simple survey of their class related to fridge magnets; (Session 1)
- to explore a personal need in some detail (consider what they can’t spell); (Session 2)
- to work as a group; (Session 3)
- to think of an image in layers; (Session 4)
- techniques of cutting, joining and layering paper; (Session 4)
- to use a template; (Session 5)
- to develop simple line images; (Session 5)
- to consider why an image might be popular. (Session 6)
The small tasks
the focused practical tasks

1. Thinking about fridge magnets
   40 minutes

2. Identifying common spelling mistakes
   20 minutes

3. Developing ideas for fridge magnets
   30 minutes

4. Creating images in layers
   30 minutes

The big task
the design and make task

The big task is to design a fridge magnet set that will appeal to young children. What’s different about these fridge magnets is that each one is made from layers, which will add considerably to their attractiveness. The fridge magnet will be used to hold up a list of commonly mis-spelt words. Each table or group of children will produce one set of fridge magnets and within a group each child will make just one.

60 minutes

The evaluation
30 minutes

Unit review
30 minutes

The key is simplicity – most of the shapes are easy to cut out. Careful cutting so that the shapes fit together well gives a professional finish
The children can decide the following:

as a group –
- the theme of their fridge magnet set
  required learning in Sessions 1 and 3,
  design decision made in Session 5;
- an image for the theme
  required learning in Sessions 1 and 3,
  design decision made in Session 5;

as individuals –
- the size and proportions of the image
  required learning in Session 4,
  design decision made in Session 5;
- the parts of the image to form the different layers
  required learning in Session 4,
  design decision made in Session 5.
thinking about fridge magnets

Teacher input

It would be a good idea to start this activity on a Friday afternoon. Show the class a fridge magnet and ask them what it is. If possible, have a large image of a “fridge” on the wall, made of paper.

Set the class the task of thinking why we have fridge magnets at all. Tell them that they will be designing one for their own fridges (or other metal objects) that will be a spelling helper. Divide the class into groups. Give each group a copy of ‘Fridge magnet brainstorming’ sheet, available as a ready-to-copy master, enlarged onto A3 paper. The brainstorming activity should take 10–15 minutes.

Pupil activity

Groups can fill in the ‘Fridge magnet brainstorming’ sheet and pair up to share ideas and jot down any new ideas. Then each child should answer the following questions in his/her book.

- Who uses them?
- Where do you get them?
- What are they for?
- What are they made from?
- How big are they?

There is a ready-to-copy sheet ‘Fridge magnet check list’ available that you may wish to use with some children.

As homework for the weekend, ask the class to list any fridge magnets they have at home and make a drawing of one to put on the class fridge. Emphasise the importance of getting the scale right – huge ones won’t fit.

Resources

Stimulus: an example of a fridge magnet; large image of a fridge on the wall, made of paper;

Consumables: paper or ‘Fridge magnet brainstorming’ sheets and ‘Fridge magnet check list’;

Tools: pencils.

Health and safety check

Discuss the hazards and risks involved in moving between tables into groups and how these risks can be controlled by the way the children behave.
identifying common spelling mistakes

Teacher input
Remind the class that they are going to design a fridge magnet with a purpose – it will help them with their spelling.

Pupil activity
Give the class about 20 minutes to research in their groups/tables common spelling mistakes that they make.

Each child should produce a list of between 5 and 20 words that they need to learn. If a computer is available it would be a good idea for the children to use the spell checker.

While this is going on you can collect the homework and pin it to the class fridge.

At the end of the session collect in the lists so that they can be checked for accuracy.

A follow-up activity is for each child to produce a neat, correct version using the class computer and printer. They can decide on the font and layout of their lists. They could make the tricky part of each word a different colour, or in italics.

Resources
Consumables: writing paper;
Tools: computer with simple word processing software and printer (optional), pencils.

Health and safety check
Discuss the hazards and risks involved in using computers and how the risks can be controlled by sitting properly at the correct height and not straining to see the screen.
Teacher input
Tell the class that they must now think about the appearance of their fridge magnets. Explain that each group can begin by trying to identify a theme from this list, for example:

- animal shapes;
- plant shapes;
- monster shapes.

You can make suggestions to groups that are stuck.

“What about bird shapes, or insects, or reptiles? What about your pets at home? There are lots of different shapes of flowers. You could make up a monster shape. Remember – keep it simple because you will have to cut it out.”

Pupil activity
To help the group make its decision each child should then produce an A4 image of a fridge magnet idea using poster paints or other media to apply blocks of solid colour. Note that applying blocks of colour is best done with a thick or dense medium. Avoid watery paints as these will take a long time to dry and be difficult to control.

Put each group’s fridge magnet ideas on display. This wall of images can be used by each of the groups in deciding their theme and individual children’s designs.

Resources
Consumables: drawing/painting paper, poster paints or equivalent;
Tools: paint brushes, pencils, felt tip pens or equivalent.

Health and safety check
Discuss the hazards and risks involved in using paint, paint brushes and felt tip pens and how these risks can be controlled by careful use and using the correct procedures.
Teacher input

Show the class a ready assembled ‘Fridge magnet giant layer model’ of a pig. (There is a ready-to-copy example at the end of this unit.)

Have another one in pieces and show how you can build up the image by putting one layer on top of another.

Explain that this is how they are going to make their fridge magnets only much smaller.

Explain that they will need to practise the cutting out so they will each need to do three drawings of their ideas. The first drawing will be the bottom layer and the biggest drawing. The second drawing will be the next layer and the third drawing the final layer. They will need to cut out each drawing and stick the second layer onto the first layer and then the third layer onto the second layer, just as you did with the giant pig, only smaller. Tell the class that they can turn their results into badges.

Pupil activity

Each child then draws the layers, adds colour, cuts out and assembles.

To finish off, each child can stick the image onto thin card, carefully cut out and use as a badge. Note that it is important to avoid using too much PVA glue as it makes paper go soggy. Use cocktail sticks or wooden spills as spreaders to apply small dots of glue that can be spread into a very thin film.

Use a treasury tag to attach to a button hole rather than a safety pin. Attach the treasury tag to the back of the badge with adhesive tape.

Resources

Stimulus: display of ideas from previous session;
Consumables: thin white card, treasury tags, PVA glue, adhesive tape, cocktail sticks or wooden spills, ‘Fridge magnet giant layer model’;
Tools: sharp scissors, felt tip pens or equivalent.

Health and safety check

Discuss the hazards and risks involved in using scissors, adhesive tape, glue and small glue spreaders how these risks can be controlled by careful use and using the correct procedures.
the big task: designing and making fridge magnets

Teacher input
Tell the class that now each group has to decide on its theme. Explain that each child within the group has to decide on the fridge magnet that they will make for that theme. Tell the class that each child has to make a suggestion that is agreed by the rest of the group as being part of the theme. There is a ready-to-copy ‘Fridge magnet specification’ sheet that the children can use to record their decisions and then to evaluate their finished products at the end of this unit.

Pupil activity
Each child then draws the layers that will make up his/her design onto corrugated card, adds the colour and cuts them out ready to assemble. Some children will find cutting the corrugated card difficult, so it is important to keep the shapes required simple. The colouring should be done with thick marker pens or nearly dry paint to prevent the card from going soggy. Detail can be added using fine line markers. Once the pieces are ready, they can be checked for size and shape and any small adjustments made before sticking together with PVA glue. When the glue has dried the child can give the whole image a finish with a coat of PVA glue to act as a protective shiny seal. Now each child can glue a small button magnet onto the back when dry, using PVA glue.

Resources
Consumables: ‘Fridge magnet specification’ sheet, PVA glue, corrugated card, poster paints;
Tools: scissors, thick markers, fine markers, paint brushes, button magnets, fridge magnets.

Health and safety check
Revisit the discussion about controlling risks when using scissors, adhesive tape, glue, small glue spreaders, paint, paint brushes and felt tip pens. Discuss the hazards and risks involved in using small magnets and how these risks can be controlled by careful use.
session five
extension work

Children who finish early or who need an extra challenge might be asked to do the following.

◊ Produce another fridge magnet using corrugated card that has only one side covered in plain card. This allows the texture of the corrugations to be used to enhance the appearance of the fridge magnet.

◊ Produce another fridge magnet using plastic corrugated sheet. This comes in bold colours and is stiff.

◊ Produce another fridge magnet using felt or Plastizote*. These come in bold colours but are floppy so the child will need to produce a card backing plate.

* You can obtain Plastizote from TEP and Hobbycraft.

Resources

Consumables: card, corrugated plastic, single-sided corrugated card, felt, Plastizote;
Tools: scissors, PVA glue, pencils, button magnets, fridge magnets.

Health and safety check

Revisit the discussion about controlling risks when using scissors and glue.
Teacher input

Ask all the class to try their fridge magnets on a metal sheet to see if it works.

When all the fridge magnets are on display tell the class to look at them to see how they look, whether any are particularly popular and to explain why.

Ask the children the following questions.

♦ Is it the choice of theme that makes it popular?
♦ Is it the treatment of the image – serious, funny, ugly, pretty?
♦ Is it the colours?
♦ Is it to do with how well it is made?

Pupil activity

There is a ready-to-copy ‘Evaluating my fridge magnet’ sheet that the children can use to record their evaluations.

In addition each child should try to write a sentence explaining why a particular fridge magnet is popular.

It will be useful for each group to talk about how they researched their decisions.

All the children can then take home their fridge magnets and use them with the spelling lists written out in Session 2 and you can organise a spelling test in the future to check on the effectiveness of their products!

Resources

Stimulus: fridge panel or similar to act as metal sheet to display finished work e.g. radiator;
Consumables: writing paper, ‘Evaluating my fridge magnet’ sheet;
Tools: pencils.

Health and safety check

Discuss the hazards and risks involved in using a fridge magnet and how the risks can be controlled.
Teacher input
Explain to the class that it is important to think about how to get better at design & technology and that they can do this by discussing the following questions.

- What did you enjoy most?
- What did you find easy?
- What did you find difficult?
- What did you get better at?
- Did you help each other?
- What could have been done better?
- How could these be done better?

Pupil activity
The children should discuss the questions in groups and when they have finished you should ask each group to make a short report to the class. The class should agree a statement of improvement based on these reports for their next design & technology unit.

Resources
None required.

Health and safety check
Discuss whether the class used hazard recognition, risk identification and risk control to design and make safely.
### Vocabulary

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Session 3</th>
<th>Session 4</th>
<th>Session 5</th>
<th>Session 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>magnet, magnetic</td>
<td>shape</td>
<td>layer</td>
<td>template, finish</td>
<td>popular</td>
</tr>
</tbody>
</table>

### Resources Summary

<table>
<thead>
<tr>
<th>Stimulus materials</th>
<th>Consumable materials</th>
<th>Tools</th>
</tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>Session 6</td>
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<td>pencils</td>
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* You can obtain Plastizote from Hobbycraft, at www.hobbycraft.co.uk (7 Enterprise Way, Bournemouth International Airport, Christchurch, Dorset, BH23 6HG) and TEP (Technology Enhancement Programme) at International Manufacturing Centre, University of Warwick, Coventry, CV4 7AL
links to other subjects

Science
The children will enjoy investigating at home and school things that the fridge magnet will stick to and making lists of things they do stick to and things they don’t. The children could then have a range of materials and sort them into two groups, those that their fridge magnets will stick to and those that they won’t.

Literacy
There are plenty of opportunities for writing in this module – turning notes into a report, writing specifications and drawing up lists. The making of the fridge magnets could be linked to writing instructions in term 1, or producing simple flow charts and diagrams in term 2 of the National Literacy Strategy.

Art
The mixing and choice of colour for a theme or group will be important in order to produce colours that are bright and attractive.

Mathematics
In reducing natural form to the simplest shapes children will begin to learn about geometric shapes.
Fridge magnet brainstorming

The purpose of fridge magnets is ____________________________

______________________________________________________

They can be bought from ________________________________

______________________________________________________

and they are bought by _________________________________

______________________________________________________

Fridge magnets are made out of __________________________

______________________________________________________

They work by _________________________________________

______________________________________________________
# Fridge magnet check list

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
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<tbody>
<tr>
<td>Who uses them?</td>
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<tr>
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<td>How big are they?</td>
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</table>
Fridge magnet giant layer model
**Fridge magnet specification**

My group is ________________________________

The theme for our fridge magnets is ________________________________

My fridge magnet will be a ________________________________

The layers will be

1. ________________________________

2. ________________________________

3. ________________________________

My fridge magnet should stick to the fridge and hold my spelling list.
## Evaluating my fridge magnet

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>☺</th>
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<tbody>
<tr>
<td>Does the fridge magnet stick to the fridge?</td>
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<tr>
<td>Can the fridge magnet hold a spelling list?</td>
<td></td>
<td></td>
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<tr>
<td>Is the theme clear?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does each fridge magnet fit in with the theme?</td>
<td></td>
<td></td>
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<tr>
<td>Is the fridge magnet well drawn?</td>
<td></td>
<td></td>
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<tr>
<td>Is the fridge magnet well cut out?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the fridge magnet well made?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the fridge magnet well finished?</td>
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Acknowledgements

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