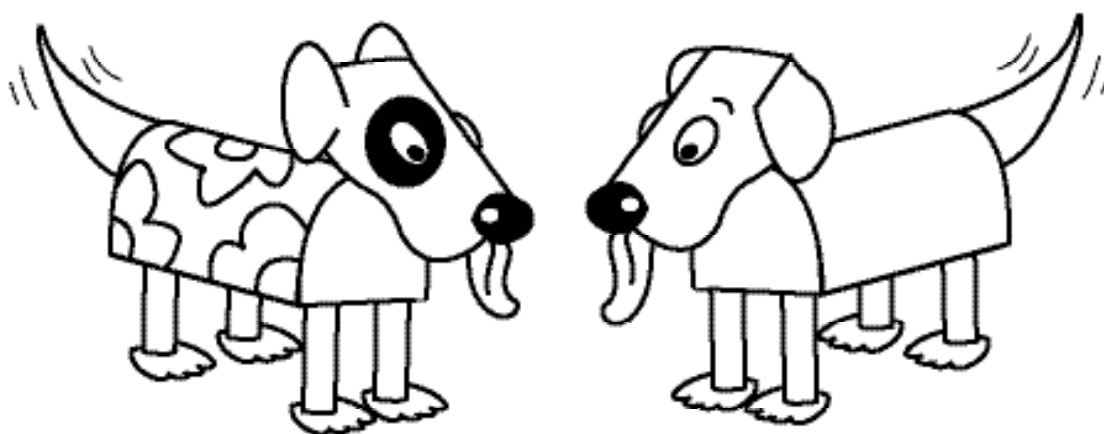


Design a Dog

Design and Technology For 5-11 year olds



**You will just need to print the section
that is relevant to your year group**

	Pages
Year 1 - Making moving dog's tales	12 - 25
Year 2 - Making dog puppets for a purpose	26 - 43
Year 3 - Making toy dogs move with pneumatics	44 - 61
Year 5 - Making toy dogs move with cams	62 - 80
Year 6 - Making toy dogs move with motors	81 - 98

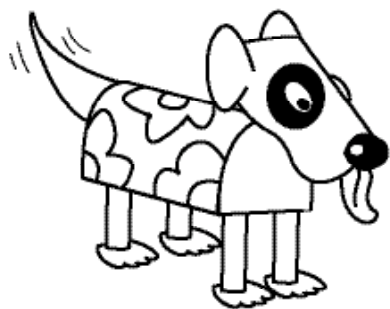
Note

There is not a specific activity for year 4. This is because the curriculum was not suitable for the 'Design a dog' theme. However, the activities can be adapted for use with year 4, if teachers wish to do so.

Contents	Page
Design a dog	3
Cross-curricular links	4
Making Trusty the dog	5
Year 1 activity - Making moving dog's tales (QCA Unit 1a)	12
Year 2 activity - Making dog puppets for a purpose (QCA Unit 2b)	26
Year 3 activity - Making toy dogs move with pneumatics (QCA Unit 3c)	44
Year 5 activity - Making toy dogs move with cams (QCA Unit 5c)	62
Year 6 activity - Making toy dogs move with motors (QCA Unit 6d)	81



Design a dog - Design and Technology resource for Key Stage 1 and 2



Introduction

Welcome to the Design a dog - Design and Technology resource from Dogs Trust. Inside is a range of fun, structured activities for Key Stage 1 and 2 teachers, including detailed support for delivering units 1A, 2B, 3C, 5C & 6D of the QCA Schemes of Work.

Each activity helps pupils to design a moving dog, and provides alternative contexts for learning that will engage and motivate children as they explore technical systems and controls to make moving pictures, puppets and toys. Each unit covers the principle learning objectives and outcomes as stated in the relevant schemes of work and includes an exploration of dog types, responsible dog ownership and safe behaviour around dogs as part of the idea generation process. Links are included to all UK curricula.

The units are divided into a series of short structured sessions consisting of investigations and focused tasks leading to a design and make assignment. Organisation and resource ideas are included along with templates to support practical activities.

Learning through dogs

This resource takes advantage of the fact that dogs fascinate most children and learning through play is a great motivator. Linking these two together, the resource allows teachers to draw on children's interests and desires: to explore, experiment and make things. The finished toys, puppets and pictures provide many opportunities for teaching and learning across the curriculum.

Why we have produced this resource

Dogs Trust is the UK's largest dog welfare charity, with a nationwide network of Rehoming Centres. Education forms a key part of our strategy to encourage responsible dog ownership and reduce the number of dogs that we need to care for and rehome each year.

This resource complements the existing range of Dogs Trust materials for primary schools, including our *Assembly* story resource, *Primary Citizenship* resource and *Literacy* and *Numeracy* resources. It includes detailed ideas for how pupils' creations can be used to help them and other pupils, explore how they can become responsible dog owners and find out more about the work of Dogs Trust.

Using this resource

Because the activities are designed to support work in a range of year groups, this resource is designed in activity sections per year.

Each activity section includes teacher's notes and lesson plans, templates and pupil sheets and extension ideas for using pupils' creations with other Dogs Trust resources. Each activity section follows a common structure combining investigations, focused practical tasks and design and make activities. Each one requires pupils to find out more about dogs and dog ownership, and provides opportunities for finding out about Dogs Trust.

The materials include a support poster (*obtain a copy by calling 0870 333 0432*) that can be used by all year groups, and a main template for 'Dogsbody'.

Dogsbody can be used optionally within the activities for year 2, and is needed for years 3, 5 and 6. In addition, notes are provided for you to turn Dogsbody into a marionette, and how this can be used with the Dogs Trust *Assembly* and *Primary Citizenship* resources. There is also a section with ideas for supporting extension work to explore puppetry in another culture.

Cross-curricular links

The theme of dogs naturally incorporates issues such as responsibility, thinking things through and caring for others. The moving toys, pictures and puppets can be used as props to bring subjects, events and characters to life. Learning about the world and relationships through playing with animated objects allows children to safely explore sensitive issues without personal involvement, 'one step removed' from real life. For **PSHE/Citizenship**, ideas are included for how pupils can use their creations to help tell the stories within the *Assembly* story resource, and to help them explore 'Animals and Us', using the *Primary Citizenship* resource.

The children's creations will naturally lead to storytelling and drama activities. A range of literacy skills will be developed as the children write or act out plays and stories, produce fact sheets on different breeds and write reports on welfare issues. Specific links are made to how pupils can use their creations with the *Literacy* and *Numeracy* resources to support **English** and **Maths**.

Dogs Trust resources can be easily adapted to provide teachers with a further range of prepared activities that make full use of the children's D&T creations. Ideas for each unit have been provided within the teacher's notes for each activity, and in the cross-curricular links section.



Making Trusty the dog

Trusty the dog is a construction kit dog presented as templates to cut out and assemble as described below. Older pupils will use all or parts of Trusty. You can make Trusty yourself, and use him to lead activities both within this resource and with the range of Dogs Trust primary resources available. Before making Trusty, read all of the instructions below and the additional instructions in each activity, as the main template may be modified in each case. Begin by making enough photocopies of Trusty for everybody. You will need to copy onto stiff card, or use as paper templates for cutting out card shapes.

To make the basic Trusty, which can be used as a marionette:

Head

Cut out Trusty's head. Crease along the dotted lines so that his cheeks fold down. With the head right-side up, line up one crease along the edge of a table. Press down with the flat of your hand and roll the head out and over the edge until you reach the crease on the other side – this will add a curl to the top of his head. Fold down his nose. Cut out two ears. Crease along the edge of the tab, and curl the ear over the edge of the table, as above. Do the same for the other ear, but on the opposite side, to make a pair. Put glue on each tab and glue the tab along the lines on the top of his head, so that the tabs point out, the ears fold out and over on top of the tabs. Cut out his tongue, curl it on the edge of a table, and glue inside his head, under his eyes, so it pokes out under his nose.

Body

Cut out the net for Trusty's body. Crease each tab, and curl his top section over the edge of a table. Put glue on each tab and assemble by sticking it to the Trusty base, gluing each tab to the correct point.

Legs and feet – fixed

Cut out four legs, and crease each one to make a box section with three sides. Fold the tabs inwards. Cut out four feet. Put glue on the tabs on one end of each leg, and glue to the marked points on each foot, pressing down firmly. When they are set, put glue on the tabs on the other end of each leg, and glue to each corner of the underside of the body, again pressing or pinching firmly.

Legs and feet – for marionette

To make floppy legs for a marionette, use the side section of one leg (as indicated on the template) as a template to cut out four pieces of flexible material such as fabric, plastic (such as from a thick carrier bag) or bubble wrap. Glue the top tab to the front mark on the body for each leg. Cut out four feet and glue the bottom tab of the leg to the front mark on each foot.

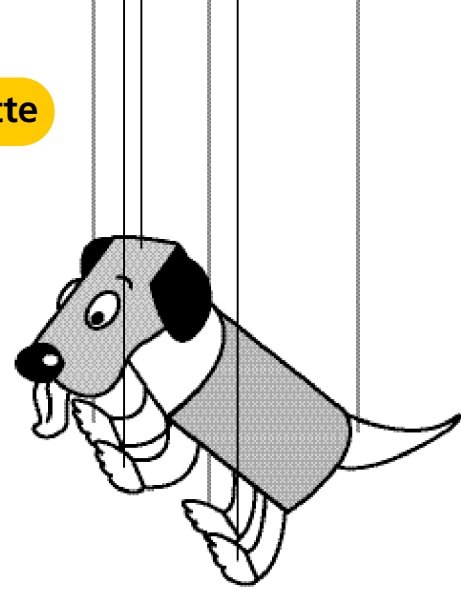
Attaching the head and tail

Cut out the tail. Make a small hole as marked on the tail, and another as marked on the body. Reinforce if required. Tie the tail to the body with a short piece of wool or string. The tail will hang loosely. Make a small hole at the back of the head and front of the body as marked, again reinforce if required. Tie the head to the body with wool or string. Alternatively, attach the head to the body using a small square of card glued to the underside of the head and body, for greater rigidity. The tail can be taped into a slot made at the top of the body to make it rigid.

Making Trusty the dog into a marionette

Construct Trusty the dog, using floppy legs and joining the head and tail using wool or string. Make a stiff 'X' frame using rulers or 30cm wood battens. Make small holes in Trusty the dog's head, tail, body and feet where marked, with an 'X'. Add weight to the feet, head and tail if necessary using modelling clay.

Cut seven 1m lengths of thin string or wool, and tie a large knot in one end of each piece, big enough not to pop through the small holes. Leave a small (1-2cm) tail after each knot. Thread the wool or string up through each hole from underneath the head and feet, one side of the tail and from inside the body. Tape the small tail after each knot to Trusty the Dog for extra strength.



Take the 'body' string, and fix to the centre cross of the 'X' frame, about 60cm above Trusty the dog.

Lightly suspend the body, and affix the 'tail' string to the end of one part of the 'X' frame so that when the frame is level, the tail is level. Now affix the 'head' thread to the opposite end, so that when the frame is level, the head is also at a natural level. Tilt the frame up and down along the length of Trusty the dog to check that his head and tail now rise and dip. Adjust if necessary at the frame end.

Take the rear 'leg' thread from the right side and affix to the right hand of the 'X' frame so that the leg hangs down when the frame is level. Now take the front 'leg' thread from the left hand side and also affix to the right hand side of the 'X' frame, so it hangs down when the frame is level.

Repeat, affixing the left-hand 'rear' leg thread to the left hand of the frame, and the right-hand 'front' leg thread also to the left side, again making sure they hang down when the frame is level.

Tilt the frame to each side to check that when tilted to one side, the rear leg on one side and the front leg on the opposite side rise when the frame is tilted sideways in one direction, and vice versa in the other direction. Adjust at the frame end if necessary, tighten all knots at the frame and trim loose ends of string or wool.

Your Trusty the dog should now 'come alive'!

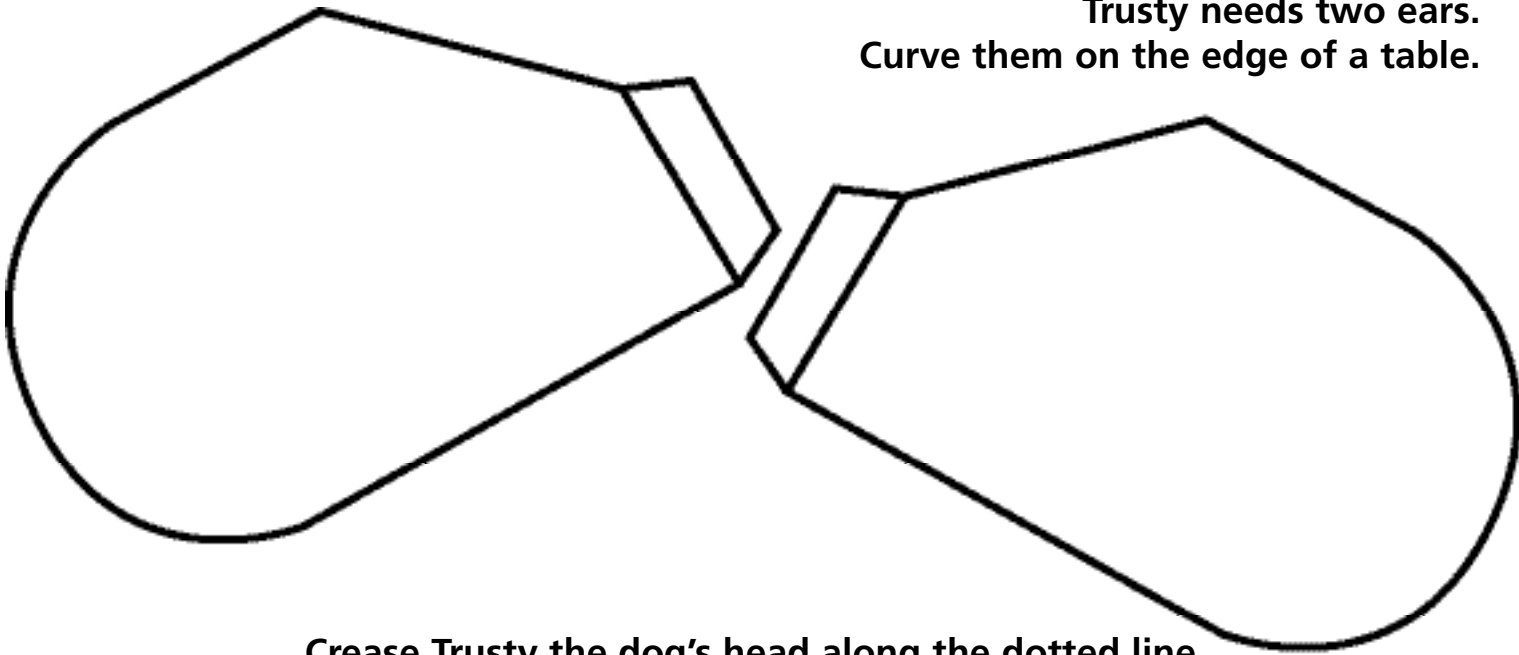
Using Trusty the dog

While many of the units take full advantage of Trusty - it is used for focused practical tasks in units 3C, 5C & 6D - it offers teachers many other opportunities for further activities. Full details are given in the relevant units for adapting it for use with different mechanisms and with other Dogs Trust resources.

Trusty is ideal to use as a marionette with the Dogs Trust *Assembly* and *Primary Citizenship* resources, or as an extension activity for older or more able and dextrous pupils. His basic shape could be modified by changing the proportions of his body, legs and tail, by using different card colours or by colouring in or covering him in different fabrics. Trusty, or several versions of him, can be used to animate the characters in the *Assembly* stories, bringing each story to life, and to help pupils to act out situations in the *Primary Citizenship* pack, bringing dog behaviour, feelings and actions to life. Each character's illustration provides ideas for making his head and proportions match the characters.

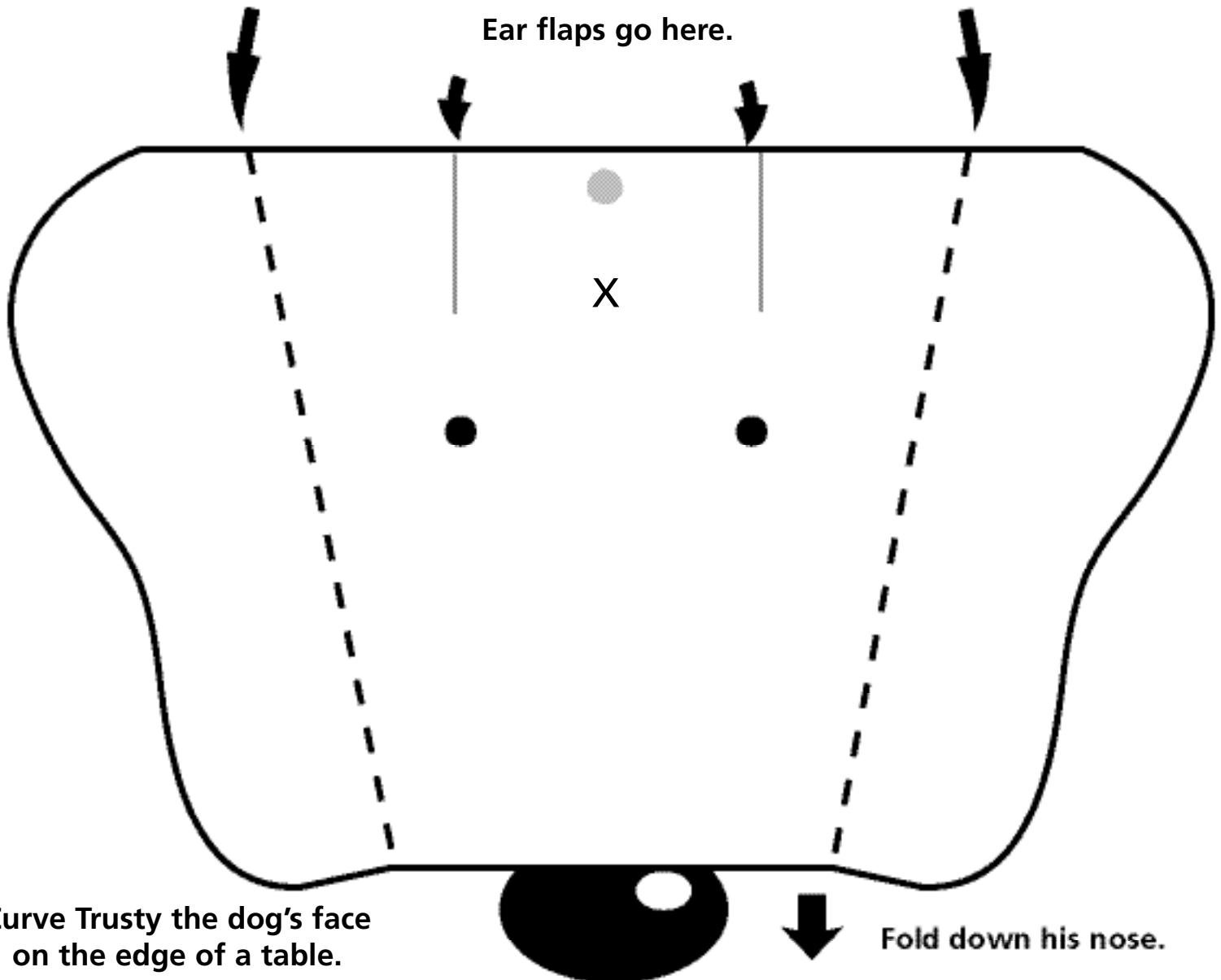
Making Trusty the dog - templates

Trusty needs two ears.
Curve them on the edge of a table.



Crease Trusty the dog's head along the dotted line.

Ear flaps go here.

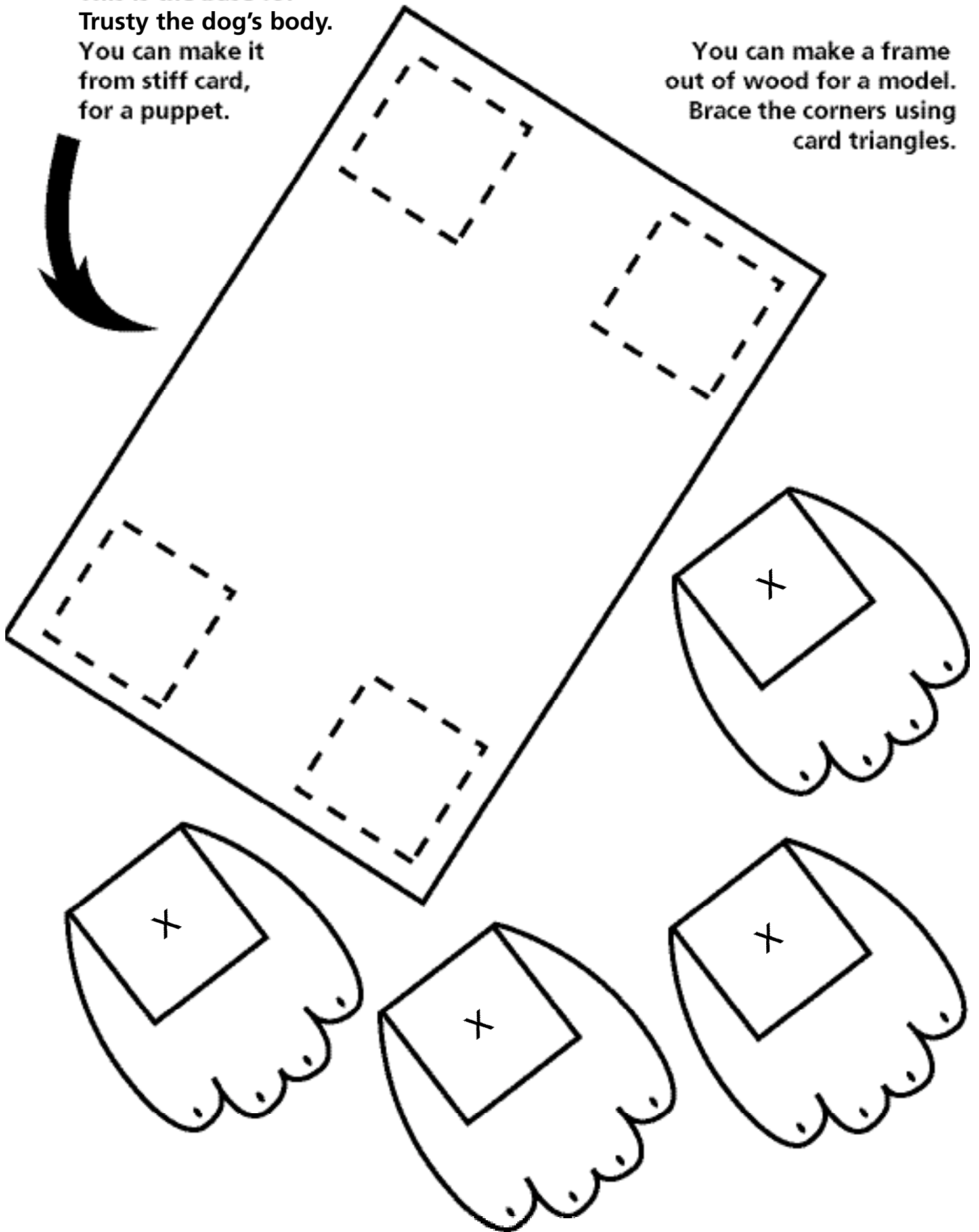


Curve Trusty the dog's face
on the edge of a table.

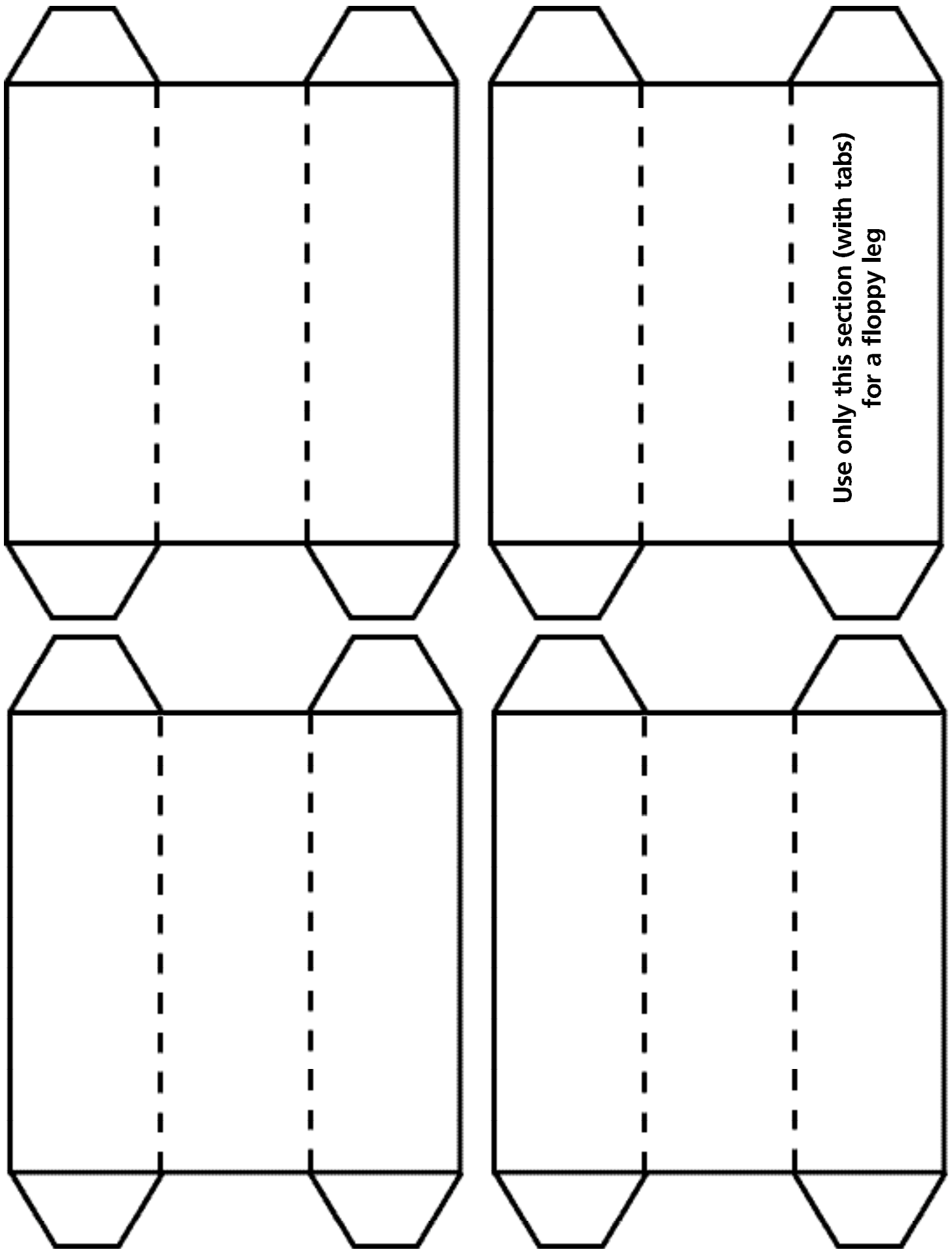
Fold down his nose.

This is the base for
Trusty the dog's body.
You can make it
from stiff card,
for a puppet.

You can make a frame
out of wood for a model.
Brace the corners using
card triangles.

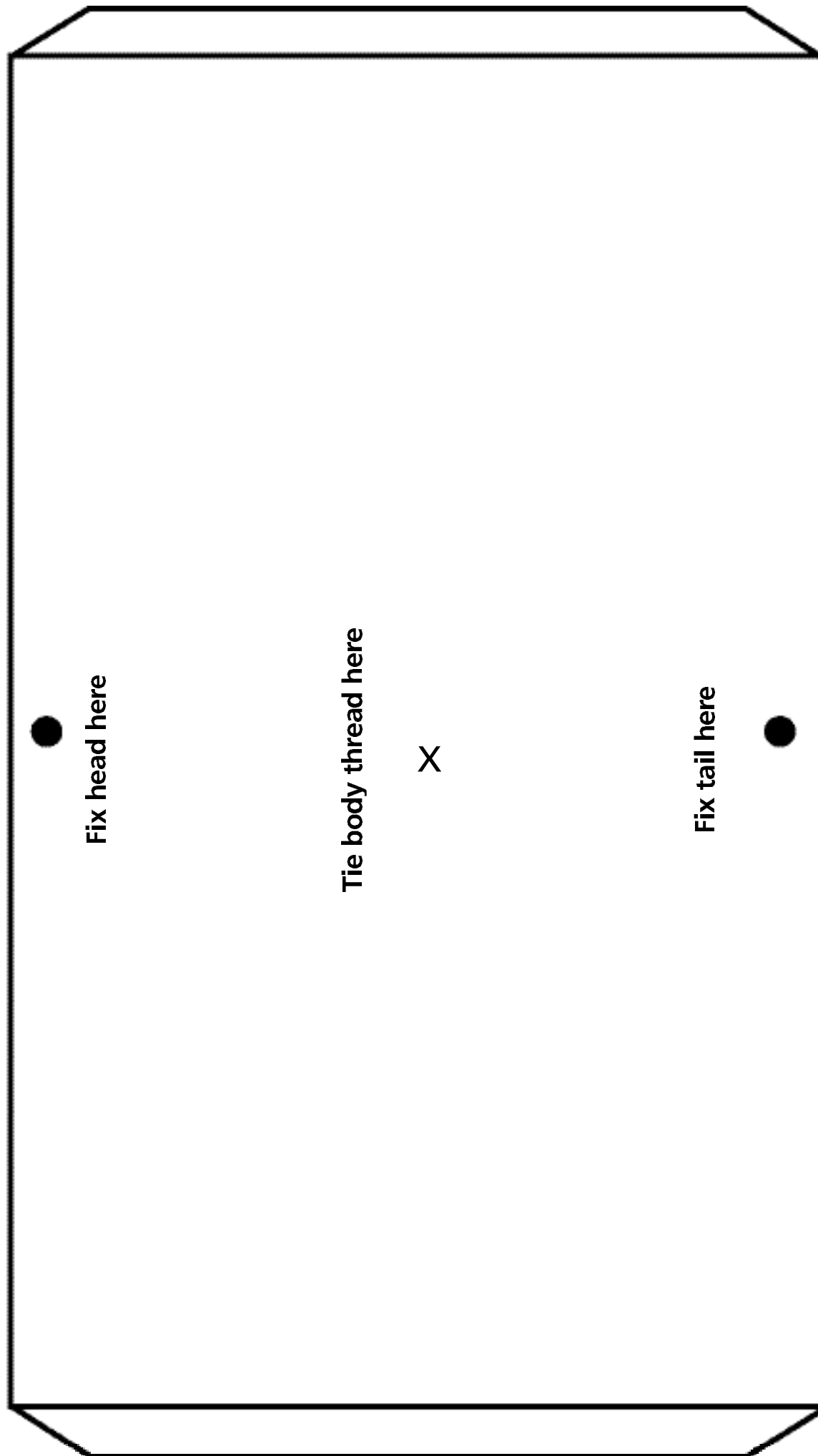


Trusty the dog needs four feet, as well.

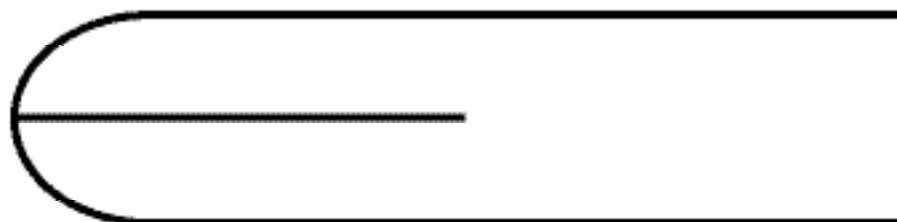


You need four legs for Trusty. They can be rigid, like these, for a model.
Curve them on the edge of a table. You can use fabric for a puppet.

This is Trusty the dog's body. You can make it from stiff card. You could cover it in fabric if you want!



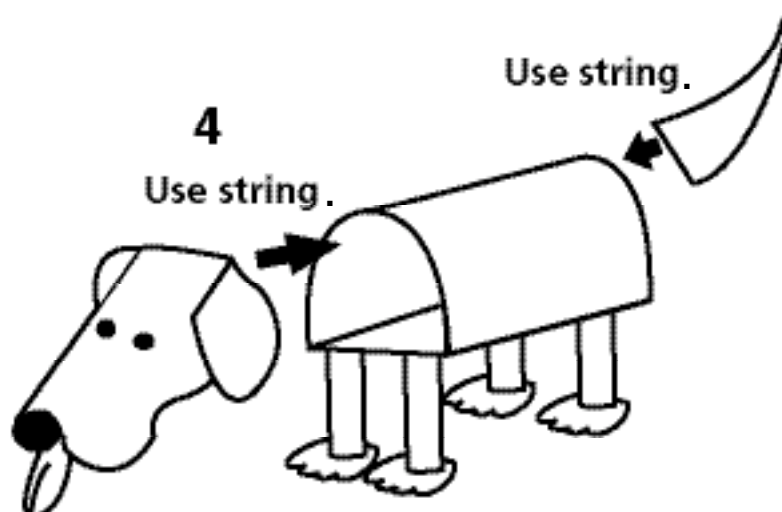
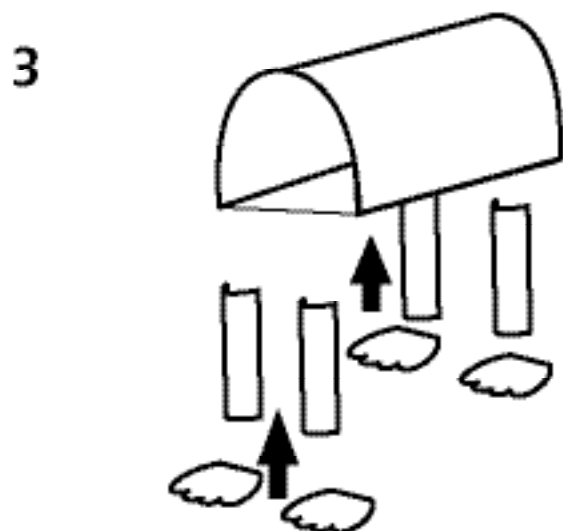
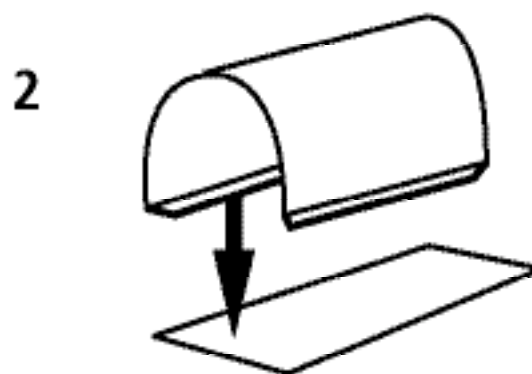
Trusty has a long tongue.



Stick this end inside his head under his eyes.



This is how Trusty fits together.



Design a Dog

Year 1 activity

(pupils aged 5-6)

Making moving dog's tales
(QCA Unit 1a)



www.learnwithdogs.co.uk

Contents	Page
Introduction	14
Helping pupils learn about dogs	15
Session 1 - Generating IDEAs and research	16
Session 2 - Investigating pictures (IDEAs)	17
Session 3 - Investigating how pictures tell us things (IDEAs) & making a picture (FPT)	18
Sheet A - Image ideas	19
Sheet B - Design Decisions	20
Session 4 - Investigating simple levers and sliding mechanisms (IDEAs) & making cardboard products (FPT)	21
Sessions 5 - 6 Design Decisions (DMA) & making moving pictures (DMA)	22
Session 7 - Evaluation (DMA)	22
Sheet C - Design evaluation	23
Session 8 - Create a display	24
Development and extension ideas	25

Introduction

This 'Design a Dog' Year 1 activity supports work for pupils aged 5-6. Pupils will investigate moving picture mechanisms to design and make a simple moving picture that helps other children to learn about safe and responsible behaviour towards dogs. This resource supports the QCA Scheme of Work Unit 1a - Moving Pictures. The focus is on investigating levers and sliding mechanisms to design and make a moving picture about dogs. The moving picture can be a scene from one of the five Assembly stories, one inspired by using the Primary Citizenship resource, or one of their own devising.

Pupils will use their moving picture as a platform for exploring how dogs can react in positive or negative ways to our behaviour, and express their feelings through body language. The picture can show someone doing something positive or negative towards a dog, and in turn, the dog's reaction. Making and showing the moving picture will help show other pupils how they can become safer around dogs and more considerate and responsible dog owners of the future. Pupils could use their moving pictures to illustrate the important dog feelings and behaviours on the poster. How can they use a simple moving picture mechanism to show happiness, fear or aggression, for example?

By completing these activities, which should take around 8 sessions, pupils will:

- Learn about simple lever and slider mechanisms for use with paper or in books
- Create a display of their work, helping other pupils to become safer around dogs and more responsible dog owners

Additional curriculum links

- Sc4 - Physical processes 2b
- En2 - Reading literature 3a, b & c
- PSHE - 2d different kinds of responsibilities, 5a taking responsibility

• Wales

Activities support the following elements of the Design and Technology National Curriculum at KS1: 1.1; 2.1, 2.2, 2.3, 2.4; 3.1, 3.2, 3.3, 3.4, 3.5

• Scotland

Activities support the programmes of study for Art and Design in the 5-14 Curriculum Guidelines, including opportunities for pupils to investigate visually and record, create and design work of their own, reflect upon and describe their work, and respond to it, including suggestions for improvement.

• Northern Ireland

Activities support the following elements of the Art and Design National Curriculum at KS1:

Investigating and realising: a, b, c, d, f, g
Materials, tools and processes: a, g, h

What you will need

- The support poster (available to order from www.learnwithdogs.co.uk or by calling 0870 333 0432)
- The resources needed for each session, as listed for each session
- Stay Safe with Dogs and Owning a Dog leaflets – downloadable from www.learnwithdogs.co.uk

Useful websites

- www.the-kennel-club.org.uk
- www.petplanet.co.uk
- www.allaboutpets.org.uk
- www.takingthelead.co.uk

Helping pupils learn about dogs

Helping pupils learn about dogs is the common theme throughout this resource. Dogs make great companions, and can be your best friend. Like humans, dogs have emotions and needs, and can become hungry, bored, happy or annoyed, for example. They communicate this by using their body language. Making moving dogs helps pupils to explore how dogs communicate with their owners, and your pupils' display will help their peers to learn to be safer and more responsible when with dogs.

The poster shows pupils how to interpret dogs' body language so they can tell what a dog is feeling, and how to be safe with dogs. This can be used alongside the activities to help pupils to create models that express a dog's body language, and from this learn about responsible and safe behaviour towards dogs.

Sessions 1 - 2

When pupils start to think about what they will do with their moving picture, they can compare a dog's needs with their own. They should think about how dogs can be happy, sad, scared or angry, and how they express this. Pupils can look at the pictures on the poster and choose a feeling for their moving dog picture to express, to help them teach another person about how dogs express their feelings or about being safe with dogs.

- What features of the dog need to move (for example ears or tail)?
- What feeling does this express?
- Is this a good or bad feeling?
- When might a dog have this feeling?
- How could they show this using a slider or lever mechanism?

Sessions 3 - 6

Pupils should use their ideas and discoveries about how dogs react to humans, and express their feelings, when they begin to make their special moving picture.

Pupils can use the poster or other materials to help them think about how they could change the attributes or dimensions of their dog, to represent their favourite breed, or their own pet. Pupils should stay focused on the feeling or emotion they want their model dog to convey. How can their model's design and moving features do this?

Session 7 – evaluation

Using their moving dog picture to communicate an important message about dogs' feelings, or responsible dog ownership, helps young pupils to remember that design is always for a purpose. As well as its aesthetic and mechanical qualities, how well does their model help them to explain to someone else about the importance of being sensitive to a dog's feelings, and how they are expressed?

Session 8 – display

This is where the pupils' efforts all come together to create an educational display for their peers. Pupils should stay focused on the reason for their display – how can they use their creations, along with some simple words and pictures, to get their messages across about how dogs have feelings, or about safe and responsible behaviour towards dogs?

Session 1 - Generating IDEAs & research

Resources

- Pop-up books
- Dogs Trust information poster (If you do not already have this, you can order your free copy from www.learnwithdogs.co.uk)
- Internet access to www.dogstrust.org.uk, if available
- Selection of materials about dogs (you can download information from our website, just go to the information section).

Starter

Tell the children that the big final task is to design and make a moving picture that tells a story or gives a message about being good to dogs. Explain that they are not going to make the picture straight away as there are some things they need to find out beforehand.

Show them a pop-up book to stimulate ideas. Ask them what they think the person who made the book had to find out before they started. Differentiate between 'things to find out' and 'things to decide'. For example, 'what dogs are like' is not the same as 'what the dog in my picture will be like'.

List their ideas on a large piece of paper for future reference and point out the three main things to investigate.

We need to find out:

1. About dogs
2. How to make things move
3. How pictures tell us things

Main activity

Divide the class into small groups and provide each with a selection of books, magazines, leaflets and pictures about dogs. Pupils can also investigate using the poster in this resource, the ideas in the Dogs Trust Primary Citizenship and Assembly resources, or by visiting www.dogstrust.org.uk. Write some questions on the board about dogs:

- How do you look after dogs?
- What games do dogs like to play?
- What happens if dogs are not looked after properly?

Explain to pupils that they have to try to find some answers.

Plenary

Ask each group to share two things they've found out. Write some notes under each of the questions for future reference.

Session 2 - Investigating pictures (IDEAs)

Resources

- Selection of information about dogs from Dogs Trust
- Large picture showing something to do with dogs, or poster from this resource
- Photocopies of the picture or part of the poster, for each group.

Starter

Refer back to the 'Things we need to investigate list' and explain that the children will be looking at how pictures can use images (the small parts of a picture) arranged on the page, to tell a story. Explain that this will help them decide what images to put in theirs and where to put each image. Show the class the large picture and ask them to explain what the picture tells us. Prompt with questions: What can we see? What is happening? What do you think happens next? Ask the children to suggest how the story would change if one image was moved or taken out.

Activity

Working in groups as per the last session, ask the children to think about a moving picture to do with dogs. What can it show about how to behave towards dogs, or how to be a good dog owner? Talk about what part of the picture should move and why. Suggest they take it in turns to give an idea about the parts of the picture that they think should move. Tell them they have 10 minutes to choose the best idea. If they can't agree they can vote.

Plenary

Ask each group to share their idea and give a reason for their choice. Discuss the merits of each in relation to what the picture is about.

Session 3 – Investigating how pictures tell us things (IDEAs) & making a picture (FPT)

Resources

- Sheet A - Image ideas photocopied onto card (separate the levers and sliders to be used in session 4)
- Sheet B - Design Decisions (for your reference). NB. This sheet includes a choice of three subject ideas and three background ideas for the pictures. Add one of the children's ideas before photocopying for use in session 5
- Old magazines and papers for cutting out additional images as needed.

Starter

Explain that the children will make their own special picture about dogs by drawing the background (the place where the story takes place) and then adding parts of pictures already made by someone else. Show them a picture you made using images from Sheet A put onto a drawn background (add others from old magazines as necessary). Ask the children what they think the picture is about and how it was made. Explain the steps and write them down for future reference.

To make this type of picture you need to...

- Decide what happens in your picture story (to do with good behaviour or dog ownership)
- Decide where the story takes place (the background, such as at home or in the street)
- Use Sheet A (or old magazines) to choose the images you need
- Draw the background
- Choose the images from Sheet A and cut them out
- Place the images on the background and stick them down.

Activity

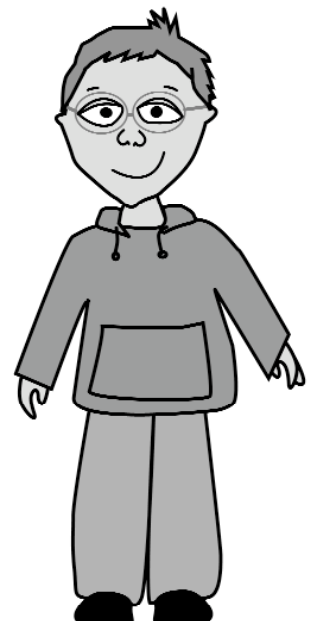
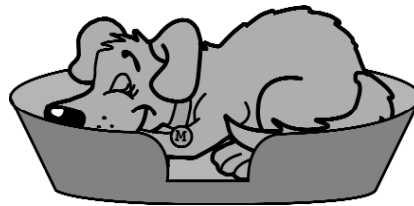
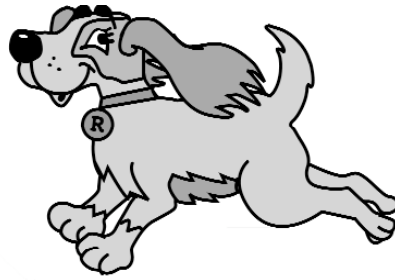
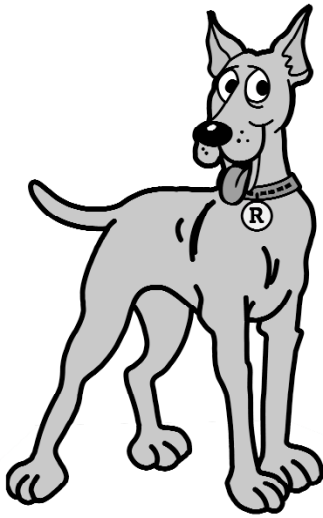
Write the subjects and background choices from Sheet B on the board. Tell the children that they have to decide what their picture is about and where the story takes place from these choices. Refer to the information they found about dogs in session 1 to show how they link to their ideas.

The children can work in pairs. Support younger or less able children pre-selecting and cutting out images for each subject. Store in labelled envelopes.

Plenary

Select a few pictures. Ask the children to say what they are about and what they like about it. Why did they choose their message about good behaviour towards dogs, or good dog ownership? Ask them how each could be improved. Demonstrate adding details such as cartoon movement marks and ask for other ideas.

Sheet A - Image ideas



Cut this out to make a lever.

Try putting paper fasteners in different places.

Cut this out to make a slide.
Draw around it to make another slide.

Sheet B - Design Decisions

Name: _____

My moving picture

Answer these questions before you make your picture

1. What will your picture be about?
- Looking after dogs
 - Dogs playing
 - Dogs not being looked after properly

☐
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2. Where does the story take place?
- In a house
 - In a park
 - At the vets

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3. What images will you need?

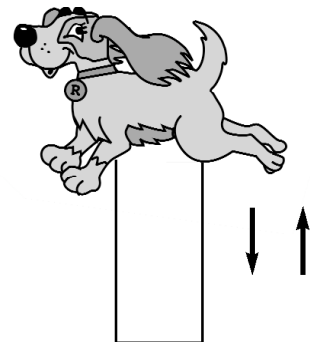


4. Which image will move? (Choose one)

5. How will the image move?
- In a curve
 - In a straight line from side to side
 - In a straight line up and down

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6. What mechanism will you use?
- A lever
 - A slider

☐
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Session 4 - Investigating simple levers and sliding mechanisms (IDEAs) & making cardboard products (FPT)

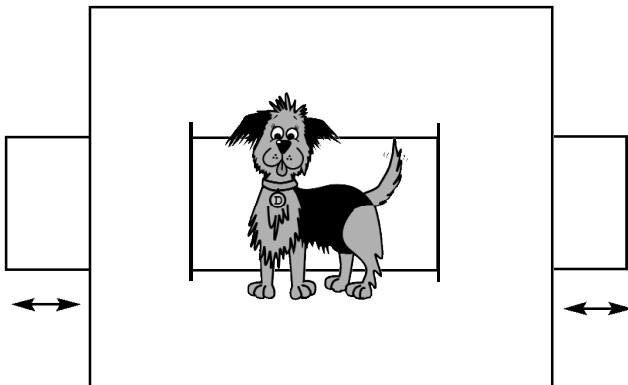
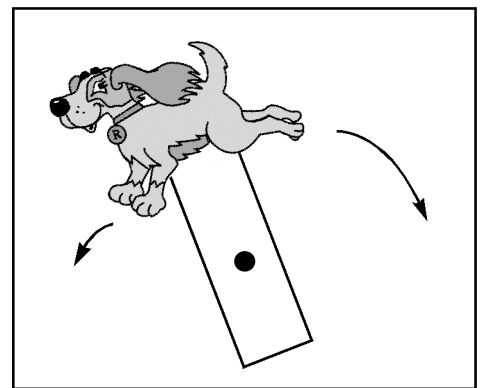
Resources

- Products that work by a lever mechanism: scissors, balance, garlic press, folding chair, bottle opener, lever type corkscrew, and stapler
- Products (or pictures) that use a sliding mechanism – food chopper, blinds, windows, doors, serving hatch, sun-roofs
- Examples of levers and slides made from paper and card
- Levers and sliders from Sheet A - Image ideas
- Hole punch.

Starter

Explain that pupils are going to work out how things move and then make some moving things of their own. Demonstrate each product and refer to the pictures. Ask the children to explain what it does and how they think it works. Prompt them to identify which part moves and how this movement has been made. Introduce and point out the levers, pivots and sliders. Safety: warn pupils to avoid trapped fingers!

Show them a cardboard lever attached to A4 card. Explain that the lever moves around a fixed point called the pivot and that the lever follows a path.



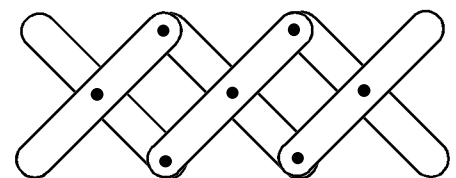
Show them a slider moving between two slots and ask the children to say when the end appears and disappears. Refer back to the products to reinforce these points.

Tell the children they are going to make cardboard versions of the products. Demonstrate making a pair of cardboard scissors. Make two holes using a hole-punch a third of the way into two pre-cut strips of card and fasten with a paper fastener. Show what happens when you change the position of the pivot. Does it still look and move like a pair of scissors? Demonstrate making a single slider and show what happens when the distance between the slots is made bigger and smaller.

Activity

Ask the children to make different 'products'. Remind them to experiment by changing the position of the hole and paper fastener (the pivot) or the slots (for the slider). What happens if the pivot is at the end of the lever?

Children can work in pairs or individually. Support younger or less able children by limiting the resources and giving a specific task such as making a pair of scissors. Remind children how to use tools correctly. Older or more able children can be asked to investigate what happens when they join 3 levers together.



Plenary

Talk about what the children have found out. What happened when they changed the positions of the pivots and slots? How could they use each mechanism to make a picture move? Use a pop-up book to stimulate ideas. Use your picture to demonstrate what happens when you place one of the images on a lever and attach it by a pivot point. Demonstrate using a slider. Encourage the children to see that this makes the image appear, move up and down or side to side and then disappear. Ask the children which movement is best for this image. Put the products and your moving picture on display.

Sessions 5 – 6 Design Decisions (DMA) & making moving pictures (DMA)

Resources

- Copies of Sheet B - Design Decisions

Starter

Ask the children what they have learnt so far. Refer to the 'things to investigate list'. Encourage the children to recognise that they're now ready to design and make their own moving picture. Ask the children to go through what they need to do and help them to order the tasks.

Activity

Tell the children they can work in pairs to help each other, but must make their own picture. Go through sheet B as a class, before asking the children to complete. Explain that once they've made their decisions, they can start. The pupils may need several sessions to complete their picture. At the start of each session ask the children to talk about problems, solutions and ideas for improvements.

Session 7 - Evaluation (DMA)

Use Sheet C - Design evaluation for pupils to evaluate their designs. As a plenary, discuss with pupils how problems were solved and how the final version differed from the design criteria.

Sheet C - Design evaluation

Did you keep to your decisions?

1. What was your picture about?

- Looking after dogs
- Dogs playing
- Dogs not being looked after properly

☐
☐
☐

2. Where did the story take place?

- In a house
- In a park
- At the vets

☐
☐
☐

3. What images did you use? _____

4. Which image moved? _____

5. How did the image move?

- In a curve
- In a straight line from side to side
- In a straight line up and down

☐
☐
☐

6. What mechanism did you use?

- A lever
- A slide

☐
☐

7. How well did your moving picture explain your message?

- Very well
- Okay
- Not very well

☐
☐
☐

Explain why: _____

Session 8 - Create a display

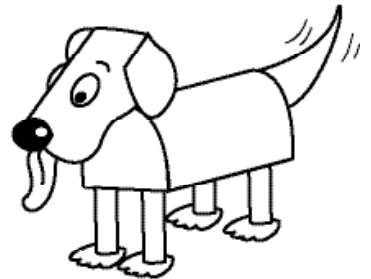
Resources:

- Pupils' moving dog pictures
- Display materials, such as coloured sugar paper, plain paper, marker pens and paint.

Pupils should follow up their moving picture making by creating a display of their work, to communicate their chosen key messages. This can show each moving picture along with a description of the emotion it is designed to convey, and the importance of this for a responsible dog owner. Individual models can be brought together using a central theme, for example, 'what your dog is telling you'. Pupils can provide responses to these emotions by explaining how responsible dog owners can prevent their dog being lonely or afraid, and how to nurture a happy, playful companion, in their own words.

Their display could include:

- A bold title
- An eye-catching layout
- A main panel highlighting the key safety messages
- A small panel by each dog model, explaining how it can be used to learn more about being safe and responsible when with dogs
- Information about Dogs Trust



Development and extension ideas

Dog stories

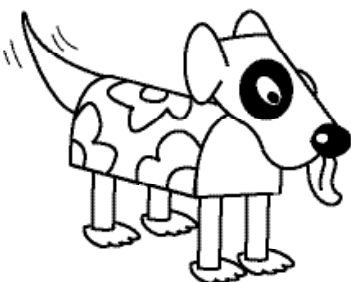
Pupils can tell their story using their picture as a prop. The stories can be written up and attached to each picture for use during shared reading. These can be used to complement circle-time work with either the Assembly or Primary Citizenship resources, for example.

Using Dogsbody with sliders and levers (unit 1a)

Working in adult led groups for support, children can make and adapt Dogsbody with a part that moves using a slider. Make Dogsbody using rigid legs. Show the children how to put the model together and attach the head using a paper fastener. Prompt children to suggest where and how they could attach a slider to make his head move. You will need to attach the slider to the underside of the head using tape and make a slot in the body trunk so it can be operated under the body. Point out that the head acts like a lever. Ask the children to suggest how they could make the tail move in a similar way.

Ideas for using other Dogs Trust resources – Assembly (KS1&2) and Literacy (KS1&2)

As mentioned, the moving pictures can be developed from the stories provided in the Assembly or Literacy resources. The chosen story can be introduced in session 3 as an alternative to the children making up their own. Read the story and talk about what happens. Ask the children to take turns in re-telling each part of the story. Support them to identify the characters and sequence the events by asking a group to act out the story to the rest of the class. Use a freeze frame technique for the children to see how a picture can tell all or part of a story: i.e. as the children are acting out the story, clap your hands or use an instrument to indicate that the children should 'freeze' and maintain their pose. Ask the children to describe what is happening and what will happen next. Use their suggestions to help them identify the characters and background for their picture and which part should move.



Design a Dog

Year 2 activity

(pupils aged 6-7)

Making dog puppets for a purpose
(QCA Unit 2b)



www.learnwithdogs.co.uk

Contents	Page
Introduction	28
Helping pupils learn about dogs	29
Session 1 - Generating IDEAs & making labelled drawings	30
Session 2 - Teacher input: basic sewing - starting, ending and running stitch; practising sewing (FPT)	31
Session 3 - Investigating textiles (IDEAs) & joining techniques (FPT)	32
Session 4 - Investigating features and dogs (IDEAs) & making paper mock-ups (FPT)	33
Sessions 5 and 6 - Making Design Decisions (DMA) & designing and making dog puppets (DMA)	34
Session 7 - Evaluation (DMA)	35
Session 8 - Create a display	35
Development and extension ideas	36
Sheet A - Textile Table	37
Sheet B - Textile Template	38
Sheet C - Design Decisions	39
Sheet D - Design Evaluation	41
Sheet E - Image Ideas	43

Introduction

This 'Design a Dog' Year 2 activity supports work for pupils aged 6-7 and supports the QCA Scheme of Work Unit 2b. Pupils will investigate textiles and joining techniques to design a hand puppet to use in a class display and/or a variety of further teaching and learning activities. The hand puppets can be used by pupils to explore good behaviour towards dogs, within circle time or PSHE/Citizenship, or using Dogs Trust primary resources *Assembly* or *Primary Citizenship*.

Pupils can use their hand puppet as a platform for storytelling that explores how dogs can react in positive or negative ways to our behaviour, and express their feelings through body language. The puppets can be used to demonstrate, in a story or discussion, someone doing something positive or negative towards a dog, and in turn, the dog's reaction. Making and using the puppets will help show other pupils how they can become safer and more considerate around dogs and be responsible dog owners of the future. Pupils could use their hand puppets to illustrate the important dog feelings and behaviours on the poster.

By completing these activities, which should take around 8 sessions, pupils will:

- Learn about simple techniques for shaping and joining fabric into a puppet
- Create a display of their work, helping other pupils to become safer around dogs and more responsible dog owners

Additional curriculum links

- Sc3 - Materials and their properties 1a,b,c & d
- En2 - Reading for Information 2a
- PSHE - 2d different kinds of responsibilities, 5a taking responsibility

• Wales

Activities support the following elements of the Design and Technology National Curriculum at KS1: 1.1, 1.2; 2.1, 2.2, 2.3, 2.4; 3.1, 3.2, 3.3, 3.4, 3.5

• Scotland

Activities support the programmes of study for Art and Design in the 5-14 Curriculum Guidelines, including opportunities for pupils to investigate visually and record, create and design work of their own, reflect upon and describe their work, and respond to it, including suggestions for improvement.

• Northern Ireland

Activities support the following elements of the Art and Design National Curriculum at KS1:

Investigating and realising:	a, b, c, d, f, g
Materials, tools and processes:	a, f, g, h

What you will need

- The support poster (available to order from www.learnwithdogs.co.uk or by calling 0870 333 0432)
- The resources needed for each session, as listed for each session
- Stay Safe with Dogs and Owning a Dog leaflets – downloadable from www.learnwithdogs.co.uk

Useful websites

- | | |
|--|--|
| • www.the-kennel-club.org.uk | • www.allaboutpets.org.uk |
| • www.petplanet.co.uk | • www.takingthelead.co.uk |

Helping pupils learn about dogs

Helping pupils learn about dogs is the common theme throughout this resource. Dogs make great companions, and can be your best friend. Like humans, dogs have emotions and needs, and can become hungry, bored, happy or annoyed, for example. They communicate this by using their body language. Making dog puppets helps pupils to explore how dogs communicate with their owners, and your pupils' display will help their peers to learn to be safer and more responsible when with dogs.

The poster shows pupils how to interpret dogs' body language so they can tell what a dog is feeling, and how to be safe with dogs. This can be used alongside the activities to help pupils to create puppets that express a dog's body language, and from this learn about responsible and safe behaviour towards dogs.

Sessions 1 and 4

When pupils start to think about how they could make their puppet, they can think about how they will use it to tell others about dogs. How can dogs show that they are happy, sad, scared or angry, and how can pupils express this using their puppet? Pupils can look at the pictures on the poster and choose a feeling for their puppet to express, to help them teach another person about how dogs express their feelings or about being safe with dogs.

- What features of the dog need to move (for example ears or tail)?
- What feeling does this express?
- Is this a good or bad feeling?
- When might a dog have this feeling?
- How could they use fabric and other materials in their puppet to help show this?

Session 3

Pupils should use their ideas and discoveries about how dogs react to humans, and express their feelings, when they begin to investigate textiles to use.

Pupils can use the poster or other materials to help them think about how they could change the attributes or dimensions of their dog, to represent their favourite breed, or their own pet. How can their puppet's design and moving features do this?

Sessions 5 and 6

As they create their puppets, pupils can discuss how they could use it to tell a story about a dog's feelings, or how best to behave towards dogs. They can practice using their partially completed puppet to make sure that its design and features allow them to show how the dog feels.

Session 7 – evaluation

Using their puppets to tell a story about dogs' feelings, or responsible dog ownership, helps young pupils to remember that design is always for a purpose. As well as its aesthetic and mechanical qualities, how well does their puppet help them to explain to someone else about the importance of being sensitive to a dog's feelings, and how they are expressed?

Session 8 – display

This is where the pupils' efforts all come together to create an educational display for their peers. Pupils should stay focused on the reason for their display – how can they use their creations, along with some simple words and pictures, to get their messages across about how dogs have feelings, or about safe and responsible behaviour towards dogs?

Session 1 - Generating IDEAs & making labelled drawings

Resources

- Selection of puppets, or images of puppets.

Starter

Tell the children that the big task is to design and make a dog hand puppet that can be used as a prop for storytelling. Their story will be one about how to behave towards dogs, or how to be a good dog owner.

Explain that the first task is to make a list of what they need to find out before they can make their dog puppets. Stimulate ideas by showing the children a selection of hand puppets or videos of puppet shows. What did the puppet maker have to do to put the puppet together? What has been added to make it come alive? What are the differences between people and animal puppets?

List their ideas on a large piece of paper for future reference. If necessary, point out the three main things to investigate.

We need to find out:

- how hand puppets are made
- how features can bring characters to life
- how dogs move and what different movements mean (body language)

Ask the children to look more closely at each puppet to identify how it was made. What materials have been used and how are the materials joined together? Encourage them to describe the properties of each material and suggest why they were chosen e.g. the material is soft and bends to the shape of the hand, cardboard is stiff so the ears stick up, the wool looks like real hair, etc.

Activity

Ask the children to draw one of the puppets and add some labels to explain what each part of the puppet is made from and how the materials were joined. They can also add a sentence about what they like and dislike. Provide support for younger or less able pupils by writing some vocabulary on the board along with the beginning sentences of two labels.

Plenary

Talk about their likes and dislikes. Ask the children to suggest how they could use what they found out to make their own puppets.

Session 2 - Teacher input: basic sewing - starting, ending and running stitch; practising sewing (FPT)

Resources

- Two pre-cut small squares of hessian or binca, a needle and a thread for each child, and tailor's chalk to share in small groups.

Starter

Explain that the children will investigate different ways of joining different materials in the next session, but first they need to practise sewing. Demonstrate threading a needle, making a knot, running stitch and finishing (either by repeat sewing in the same place or tying off).

Activity

Provide the children with the resources. Support younger or less able children by giving them pre-threaded needles and marking a sewing line using tailor's chalk. Explain how to handle and store needles safely and how to avoid pricking their fingers (turning the material over before pushing the needle through). Older or more able pupils can be challenged to sew circles of fabric together by drawing around two different containers to mark the cutting line and then inside this, the sewing line.

Plenary

Share ideas on how to keep the sewing neat and in line.

Session 3 – Investigating textiles (IDEAs) & joining techniques (FPT)

Resources

- Large selection of textiles inc. cardboard, pipe cleaners, wool, buttons and fabrics pre-cut into small squares or lengths and sorted into labelled boxes (categorised by common properties – e.g. shiny, rough, soft, stretchy, paper, plastic, wool)
- Scissors, PVC glue, needles, thread, tailor's chalk, stapler and staples
- Sheet A - Textile Table.

Starter

Select some textiles for the children to talk about. Ask them to suggest other ways of grouping them and identify some common names or descriptions e.g. cotton, wool, nylon, open weave.

Activity

Explain that the children are going to choose one textile at a time from each group and investigate three different ways of joining them (gluing, stapling and sewing) to find out the best method for that material. Remind them they'll need a total of 6 pieces of each material to test the 3 methods. Demonstrate the activity and show how to record their work in the table (sheet A): a sample of each textile can be attached. Older or more able pupils can write a comment under their tick or cross e.g. [cross] thin plastic tears (sewn), [cross] there are gaps (stapled).

Plenary

Share and compare results. Ask the children to identify which materials could be used for different parts or types of puppets. What sort of materials could best be used to represent different types of dog?

Display the tables.

Session 4 - Investigating features and dogs (IDEAs) & making paper mock-ups (FPT)

Resources

- Puppets, puppet images or videos (if available)
- Support poster.

Per pair

- Sheet E - Image Ideas
- Sheet B - Textile Template
- Sheet A - Textile Table
- Scissors, glue

Starter

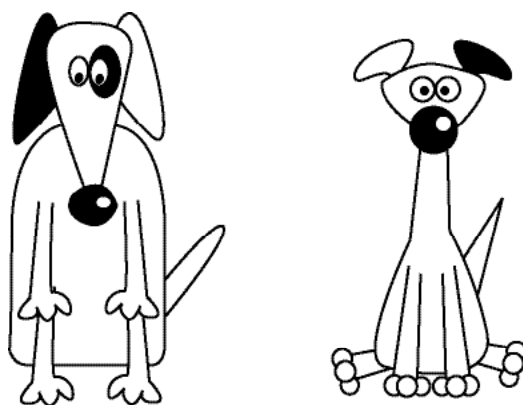
Use the puppets, images or videos if available to discuss how the puppets have been made to come alive; draw attention to the features. Ask the children to describe the different shapes, sizes and positions and to suggest how each gives clues about the puppet's character e.g. large round eyes to show surprise, a downward mouth to show sadness, small eyes to look mean.

Refer to the list from session 1 to point out that they need to find out how dogs use their bodies to show how they're feeling, to help pupils make their dog puppets look real and come alive. Show them Sheet E - Image Ideas and ask them to describe what they see. Prompt them to recognise that dogs use the position and movement of their head, eyes, ears, tail, mouth (and teeth) and trunk to 'talk'. Use the poster to explore how dogs show their feelings and how this might help them to behave when with dogs. Encourage pupils to recognise high alert ears, friendly fast wagging tail, low head and ears showing fear, etc.

Activity

Pupils can work in pairs using Textile Templates (sheet B) to make paper versions of different dog puppets. Point out that this is the time to experiment with different looks by choosing different shapes, sizes and positions of features.

Demonstrate the activity; select and cut out the templates and stick them in position



Ask the children to suggest alternative positions and templates. Remind them to draw around templates to make matching pairs (for the eyes and ears). Older or more able pupils can make additional templates.

Plenary

Share and display the children's work. What expression or feeling does their dog puppet show? Why did they choose this? What message can their puppet help them to tell others about behaviour when with dogs? Discuss problems and solutions (e.g. you had to find the right position before sticking bits down, use less glue, use tweezers to stop small pieces sticking to fingers, etc)]. Go through the images on sheet A in more detail and make links with the children's paper versions. The pictures show: alert, playful, tired, submissive, defensive (angry). Use other pictures of dogs from magazines, the poster or at www.dogstrust.org.uk to compare different breeds to stimulate ideas for different sizes, shapes and coat colours. Use the poster to remind pupils of dogs' expressions of feelings.

Sessions 5 and 6 – Making Design Decisions (DMA) & designing and making dog puppets (DMA)

Resources

- 1 enlarged Sheet C - Design Decisions and a copy for each child
- Materials as per session 3
- Sheet B - Textile Template.

Starter

Ask the children if they think they are ready for the big task. Recap on what they have learned in previous sessions and refer to the list from session 1.

Explain that they need to make some design decisions before they start. Go through sheet B together. Ask the children to suggest whom the dog puppets will be for and how they want to use them. Give them the choices and explain there is a space for them to add one more that they all agree on. List their ideas and take a vote.

Use their paper mock ups to talk about what material would be most suitable for different features and how they can be joined e.g. glued cardboard for sticking up ears; stapled or sewn on thin material for long drooping ears, etc.

Demonstrate pinning large templates onto materials (safety pins can be used) and marking out (with tailor's chalk) before cutting. Draw their attention to right side and wrong side of materials. Show a pre-sewn main body part and point out that it's sewn right sides together and only up three sides. Turn it right side out. Older or more able pupils can be directed to consider the 'fit' of the puppet for the user by discussing how the templates can be made larger or smaller and how this size can be retained once sewn by including a seam allowance.

Activity

Children can work in pairs for support, but need to complete the Design Decisions sheet individually before they begin making. Additional sessions will be needed for children to complete their designs.

Plenary

Provide regular feedback sessions during the making stage to discuss problems, share solutions and encourage evaluation. Use the second half of the design decisions sheet once the puppets are completed.

Session 7 - Evaluation (DMA)

Use Sheet D for pupils to evaluate their designs. As a plenary, discuss with pupils how problems were solved and how the final version differed from the design criteria.

Session 8 - Create a display

Resources:

- Pupils' dog hand puppets.
- Display materials, such as coloured sugar paper, plain paper, marker pens and paint

Pupils should follow up their puppet making by creating a display of their work, to communicate their chosen key messages. This can show each puppet along with a description of the emotion it is designed to convey, and the importance of this for a responsible dog owner. Individual models can be brought together using a central theme, for example, 'what your dog is telling you'. Pupils can provide responses to these emotions by explaining how responsible dog owners can prevent their dog being lonely or afraid, and how to nurture a happy, playful companion, in their own words.

Their display could include:

- A bold title
- An eye-catching layout
- A main panel highlighting the key safety messages
- A small panel by each dog model, explaining how it can be used to learn more about being safe and responsible when with dogs
- Information about Dogs Trust

Development and extension ideas

Using Trusty the dog with textiles (Unit 2b)

Although this unit does not include use of the main Trusty template, it's ideal for use as an extension activity. Demonstrate how to cut out and assemble the templates and ask children to suggest what textiles would be suitable for different body parts and features.

- How could Trusty be made to come to life?
- What sort of character will they give him?

The children can work in teams to make different versions. They will need to agree on Trusty the dog's character; decide what textiles will be used for his features and each body part and allocate tasks between them.

Younger or less able children can be supported in an adult led group.

Again, how can Trusty the dog's proportions and face be modified so that he looks like different breeds or types of dog. Can pupils with pet dogs make one to represent their own dog, and describe its character?

Ideas for using other Dogs Trust resources

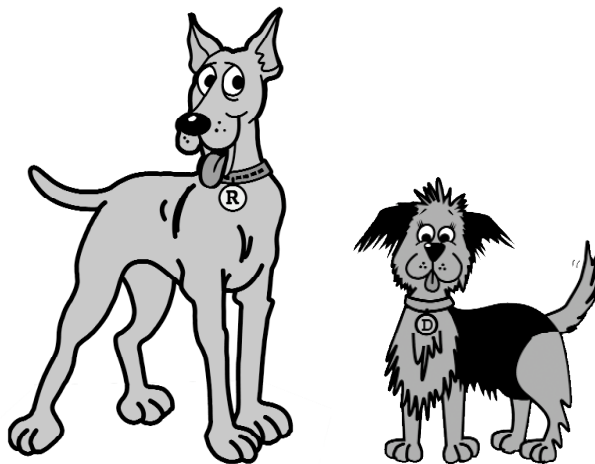
The puppets are an ideal medium for teaching children how to be safe around dogs and for exploring PSHE issues. You can download a 'Stay Safe around Dogs' leaflet from www.learnwithdogs.co.uk, or you can use the safe section from the poster.

Download the guide and discuss it with the class. Ask the children to suggest ways of presenting the information using their puppets.

The *Assembly* resource stories can be brought to life using the puppets as props. Introduce the idea during the starter discussion of session 5. An additional session will be needed to familiarise the children to the stories and the five characters; Rex, Rosie, Flick, Muffin and Zippy. Pictures of each character can be found on www.learnwithdogs.co.uk as well as in the resource. Download and enlarge for the children to talk about the character's appearance. Summarise the stories and talk about each character. Ask the children to suggest how they could design the features of the puppets to represent each one.

The puppets, perhaps in combination with other human puppets you may have, can be used to illustrate some of the content of the *Primary Citizenship* resource. For example acting out the photo story, or aiding pupils as they take on the character of a dog and explain their needs, such as food and water, love and attention, warmth and good health.

Name _____



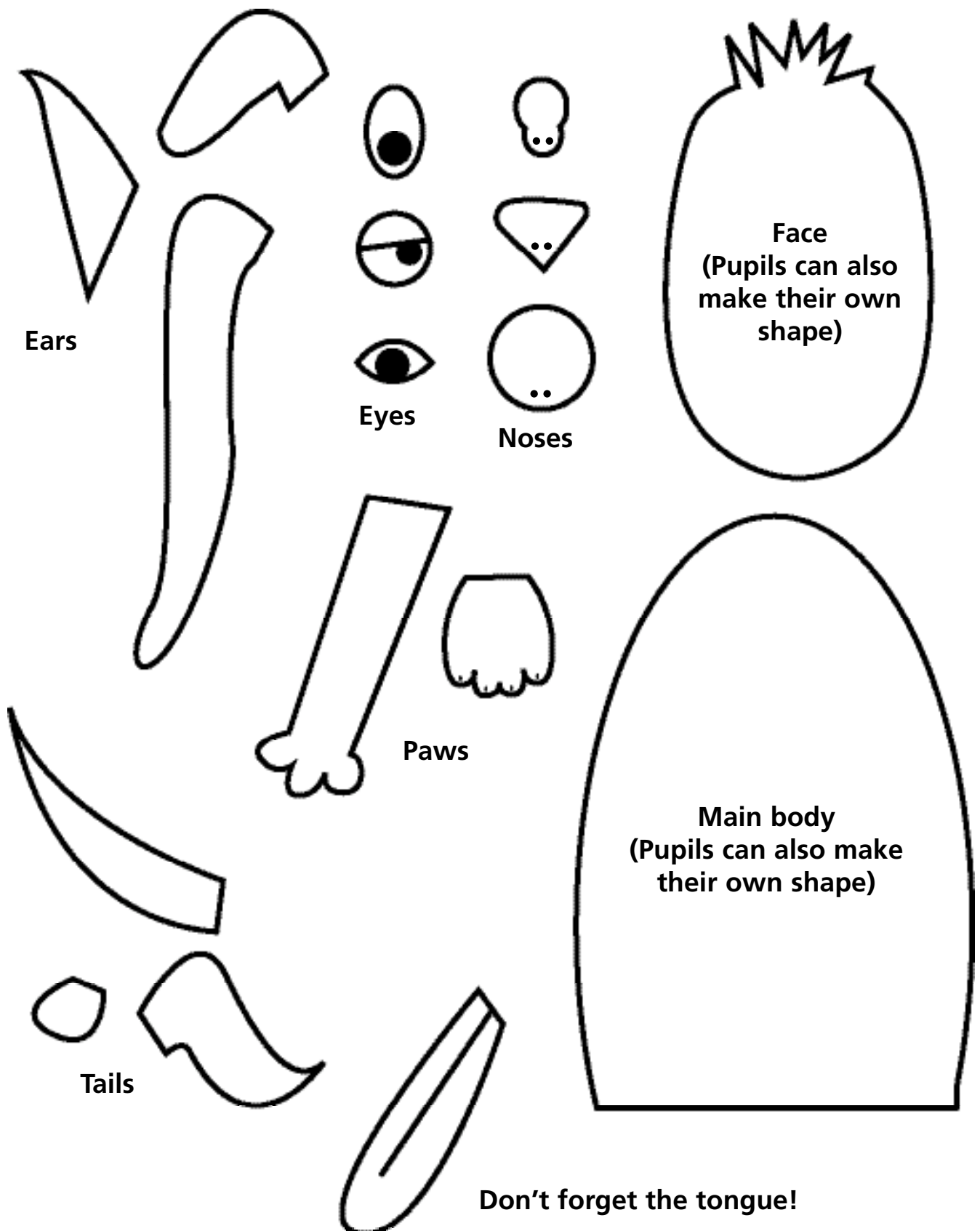
Investigate the best way of joining different textiles to help you make your dog puppet. Put a **P** if it works, a **X** if it doesn't.

Textile group (and sample)	Name of textile or description Appearance – what it looks like or Texture – what it feels like	Joining with glue	Joining with staples	Joining by sewing	Comments

Sheet B - Textile Template

Making dog hand puppets

Make your dog puppet come alive!
Choose and cut out different body parts to show your dog's character.



Design Decisions

Name _____

Make some Design Decisions about your dog puppet.

1. Who will the dog puppet be for?

- Me
- A younger child

☐
☐

2. What will it be used for?

- As a prop to teach children how to be safe around dogs
- As a prop for storytelling about dogs and people

☐
☐

3. What type of character will it be?

- Friendly
- Angry
- Frightened

☐
☐
☐

4. How will you design each body part to show its' character?

The eyes will be _____

The nose will be _____

The ears will be _____

The tail will be _____

5. What textile will you use for the...

main body _____

nose and face _____

ears _____

eyes _____

paws _____

6. How will you join each body part?

main body: glue ☐

staple ☐

sew ☐

ears: glue ☐

staple ☐

sew ☐

eyes: glue ☐

staple ☐

sew ☐

nose: glue ☐

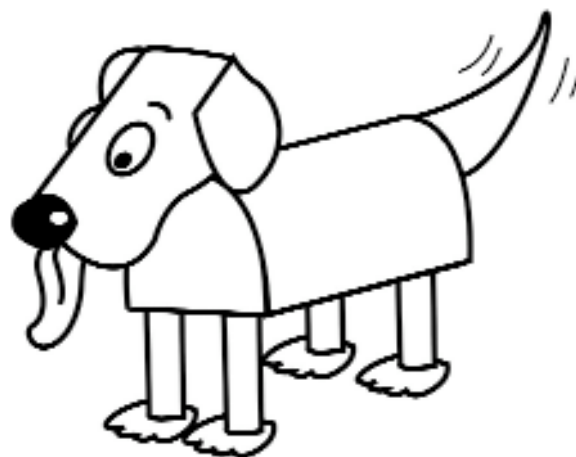
staple ☐

sew ☐

paws: glue ☐

staple ☐

sew ☐



Design Evaluation

Name _____

Look back at your design decisions to compare what you planned to do, with what you did.

1. Who is the dog puppet for?

- Me
- A younger child

☐
☐

2. What is it used for?

- As a prop to teach children how to be safe around dogs
- As a prop for storytelling about dogs and people

☐
☐

3. What type of character is it?

- Friendly
- Angry
- Frightened

☐
☐
☐

4. How does each body part show its character?

The eyes are _____

The nose is _____

The ears are _____

The tail is _____

5. What textile is used for the:

main body _____

nose and face _____

ears _____

eyes _____

paws _____

6. How have you joined each body part?

main body: glue ☐

staple ☐

sew ☐

ears: glue ☐

staple ☐

sew ☐

eyes: glue ☐

staple ☐

sew ☐

nose: glue ☐

staple ☐

sew ☐

paws: glue ☐

staple ☐

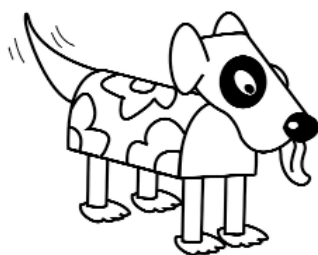
sew ☐

7. How well did your puppet explain your message?

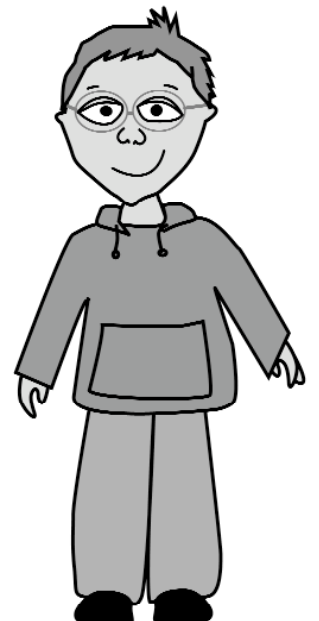
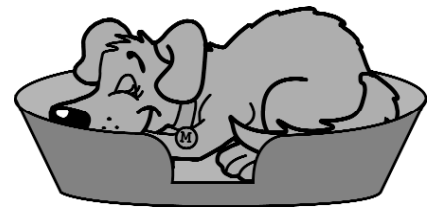
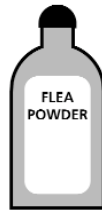
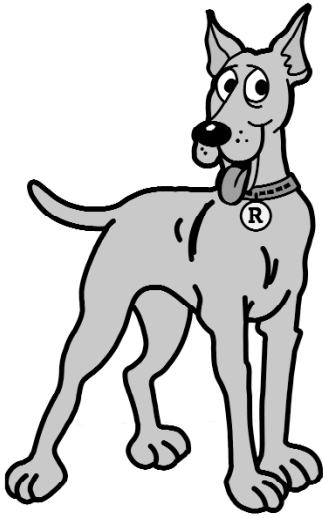
- Very well
- Okay
- Not very well

☐
☐
☐

Explain why: _____



Sheet E - Image Ideas



Design a Dog

Year 3 activity

(pupils aged 7-8)

**Making toy dogs move with pneumatics
(QCA Unit 3c)**



www.learnwithdogs.co.uk

Contents	Page
Introduction	46
Helping pupils learn about dogs	47
Session 1 - Investigating dogs (IDEAs)	48
Sheet A - Dogs have feelings too!	49
Session 2 - Generating IDEAs & investigating objects that work using air	51
Session 3 - Investigating & making pneumatic systems (FPT)	52
Session 4 - Making moving toys using kits (FPT)	52
Sheet B - Make Trusty the dog move	53
Sheet C - Design Decisions	55
Session 5 - Investigating, drawing & modelling dog shapes (IDEAs & FPT)	56
Session 6 - Making design decisions and designing and making dog toys (DMA)	58
Session 7 - Evaluation (DMA)	58
Sheet D - Evaluation	59
Session 8 - Create a display	60
Development and extension ideas	61

Introduction

This 'Design a Dog' Year 3 activity supports work for pupils aged 7-8. Pupils investigate pneumatic systems to design and make a toy dog that has a moving part controlled by pneumatics.

Pupils use this as a platform for exploring how dogs express their feelings through body language, and from this, how they can become safer around dogs and more considerate and responsible dog owners of the future. Pupils could also use their dogs to illustrate the important dog feelings and behaviours on the poster. How can they use a simple pneumatic mechanism to show happiness, fear or aggression for example?

By completing these activities, which should take around 8 sessions, pupils will:

- Learn about simple pneumatic control
- Create a display of their work, helping other pupils to become safer around dogs and more responsible dog owners

Additional curriculum links

The activities also support:

- Sc4 Forces & motion 2c
- En2 Reading for information 3c,d & e
- PSHE - 2d different kinds of responsibilities, 5a taking responsibility

• Wales

Activities support the following elements of the Design and Technology National Curriculum at KS2: 1.1, 1.2; 2.1, 2.2, 2.3, 2.4, 2.5; 3.1, 3.2, 3.3, 3.4, 3.5

• Scotland

Activities support the programmes of study for Art and Design in the 5-14 Curriculum Guidelines, including opportunities for pupils to investigate visually and record, create and design work of their own, reflect upon and describe their work, and respond to it, including suggestions for improvement.

• Northern Ireland

Activities support the following elements of the Art and Design National Curriculum at KS2:

Investigating and realising: a, b, c, d, f, g
Materials, tools and processes: a, c, g, j

What you will need

- The support poster (available to order from www.learnwithdogs.co.uk or by calling 0870 333 0432)
- The resources needed for each session, as listed for each session
- Stay Safe with Dogs and Owning a Dog leaflets – downloadable from www.learnwithdogs.co.uk

Useful websites

- www.the-kennel-club.org.uk
- www.petplanet.co.uk
- www.allaboutpets.org.uk
- www.takingthelead.co.uk

Helping pupils learn about dogs

Helping pupils learn about dogs is the common theme throughout this resource. Dogs make great companions, and can be your best friend. Like humans, dogs have emotions and needs, and can become hungry, bored, happy or annoyed, for example. They communicate this by using their body language. Making moving dogs helps pupils to explore how dogs communicate with their owners, and your pupils' display will help their peers to learn to be safer and more responsible when with dogs.

The poster shows pupils how to interpret dogs' body language so they can better tell what a dog is feeling, and how to be safe with dogs. This can be used alongside the activities to help pupils to create models that express a dog's body language, and from this learn more about responsible and safe behaviour towards dogs.

Session 1

Pupils can compare a dog's needs with their own, and think about what being a responsible dog owner involves. Pupils can look at the pictures on the competition poster and choose a feeling for their moving dog to express, to help them teach a younger person about being safe with dogs. The activity sheet will help them to consider:

- What features of the dog need to move (for example ears or tail)?
- What feeling does this express?
- Is this a good or bad feeling?
- When might a dog have this feeling?
- How should an owner make sure their dog's feelings are considered?

Session 4

It is important that pupils understand that owning a dog is an important decision, and choosing the right sort of dog is central to this.

- What sort of dog would be best suited to their circumstances?
- Would it need lots of attention?
- Would it need lots of exercise?
- Would it need lots of space?
- Could you leave it alone, or with children?

Optionally, 'Choose your perfect dog' in the Primary Citizenship resource can support this activity, or you can use information of your own and the experiences of pupils. Pupils can use the competition poster or other materials to help them think about how they could change the attributes or dimensions of their dog, to represent their favourite breed, one suitable for their circumstances, or their own pet.

Session 5

As pupils draw their own design for a dog's body they can use their findings from the above activities to guide them. Pupils should stay focused on the feeling or emotion they want their model dog to convey. How can their model's design and moving features do this? Pupils can begin to think ahead – how can they use their model to help teach, for example, a younger person what this emotion means to a dog, and what it means for an owner?

Session 6

Again, pupils should use their findings from sessions 1 and 4 to guide them as they make their final model.

Session 7 – evaluation

Using their toy to communicate an important message about responsible dog ownership helps pupils to remember that design is always for a purpose. As well as its aesthetic and mechanical qualities, how well does their model help them to explain to someone else about the importance of being sensitive to a dog's feelings, and how they are expressed?

Session 8 – display

This is where pupils' efforts all come together, both to create an educational display for their peers. Pupils should stay focused on the reason for their display – how can they use their creations, along with words and pictures, to get their messages across about safe and responsible behaviour towards dogs?

Session 1 – investigating dogs (IDEAs)

Resources

- Selection of books about dogs
- Support poster
- Sheet A - Dogs have feelings too!
- Internet access to www.dogstrust.org.uk if available.

Starter

Explain that the children will be using books and the Internet to find out about dogs and dog behaviour. Ask them to suggest what information they will need to design their models. Prompt them by asking for some key search words or subject words they might find in an index. Direct them to relevant websites.

Ask the children to start thinking about a theme for using their toys to teach younger children something about dogs, using the poster and Sheet A to guide their thinking. What can their pneumatic dog be used to help teach? Why is teaching this to a younger person important? What movement in their dog would be required in order to help do this?

Activity

The children can explore the information about dogs and make notes to record the information. Children complete the Sheet A - Dogs have feelings too! to compare their own needs with those of a dog.

Plenary

Share the information and encourage pupils to link it to ideas for their designs. What colours could be used? How do dogs vary in shape and size, for example?

Pupils should also consider how they will use their moving dog in their competition entry class display:

- What are the important safety messages when with dogs?
- What are the important messages about being a good dog owner?

Sheet A - Dogs have feelings too!

What feelings do you have?

Think about the feelings you have during the day.

Write some down, and say what might give you that feeling. Include both good and bad feelings. How do you show your feelings? Explain how you show each one.

e.g. Bored

When there's no one to play with

I pace around and can be rude

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Expressing a feeling

Choose one of the things a dog needs to be healthy or happy.

- What feelings might the dog have if that need is met, or if it is not met?
- How could the dog express its feelings?

What should a good dog owner do to make sure they look after this need?

Feelings and needs

We all have feelings. Our happy feelings arise when our basic needs to be healthy and happy are met. Our sad feelings arise when our basic needs are not met.

- **What things do you need to be healthy and happy? Write your ideas around your name:**



- **What does a dog need to be healthy and happy? Write your ideas around the name you will give your toy dog:**



Session 2 – Generating IDEAs & investigating objects that work using air

Resources

- A selection of objects that work using air: bicycle pump, airbed/beach inflatable foot pump, whistle, toys (e.g. jumping frog)
- A feather, pencil, paper, balloon and swimmer's arm-band.

Starter

Tell the children that the big task is to design and make a toy dog with a part that moves using air. Explain that the toy will be used to teach something to younger children about being safe when with dogs, or how to be a good dog owner; they will need to decide what and how.

The first task is to make a list of things they need to find out before they can make their moving dog. Stimulate ideas by posing some questions. What objects work using air? Do they know how they work? How will they make it look like a dog? List their ideas on a large piece of paper for future reference. If necessary, point out the three main things to investigate.

Pupils need to find out:

1. How air can be used to make things work or move
2. How to make a system that uses air to make things move on a model
3. About dogs - what they look like, how they move and what different movements mean

Explain that this first session is for the children to investigate how air can be used to make things move. Present them with a feather, a pencil, a piece of paper (folded with one fold sticking up), a balloon and an inflatable swimming aid. Ask them to predict how far each object will move (or how much it will increase in size) with one press of a foot pump with the tube removed compared to one push on the foot pump when used with the tube.

Test their predictions by demonstrating what happens and discuss the outcomes. Prompt them to explain why the things went further or increased in size when the foot pump was attached to the tube. Draw attention to the size of the chamber where the air is stored compared to the size of the tube where the air has to pass. Encourage them to recognise that as the air in the chamber is pumped into the tube, it goes into a smaller space and so becomes squashed (compressed). As this compressed air is released its force is greater.

Show the children other objects that use air to work. Ask them to describe each by explaining what it's used for and how the air is used (and controlled) to make it work. Draw attention to the potential dangers of using air under pressure.

Activity

The children can make a diagram of one of the objects, label each part and explain how it works using appropriate vocabulary.

Plenary

Use their explanations to introduce or revise appropriate vocabulary (compressed, stored, force, inflate, control). Explain that the word pneumatics describes mechanisms that work using compressed air. Display their work for future reference.

Session 3 - Investigating & making pneumatic systems (FPT)

Resources

- A selection of materials inc. plastic bottles, different sized tubes and syringes, balloons, masking tape, plasticine and elastic bands, different sized cardboard boxes, tubes, paper fasteners, etc.

Starter

Ask the children to suggest how they could construct a simple pneumatic system using found objects. How could they make their own pump? What could be used to store the air and for compressing it? Demonstrate how you can construct a simple system by joining a balloon to some 5mm tubing and then attach this to a washing-up liquid bottle, or by joining two syringes using a tube. Ask the children for ideas on fixing the parts together and on ways of improving the joints to make them airtight.

Activity

Explain that the children are to make a simple pneumatic system and investigate it. What happens to the air when you squeeze the bottle or press the plunger in? What happens when you let go? Ask them to use it to make something move. Suggest some ideas to try out, e.g. put the balloon in different sized boxes with lids to see if it can lift the lid; put it in a box & stick a ruler through a slot on the side or top and see if they can move it, use a construction set to build a swing and attach the syringe plunger, etc.

Plenary

Ask the children to share the results of their investigations and draw some conclusions, e.g. when you let go of the bottle the air comes back and the balloon goes smaller, you can change the direction of the movement using hinged levers, etc. Encourage appropriate use of vocabulary e.g. inflate, deflate, hinge, lever, pivot.

Session 4 – Making moving toys using kits (FPT)

Resources

- 2 x A3 Trusty the dog templates (one of each) copied onto card – download 'Making Trusty the dog and cross-curricular links
- Trusty the dog instructions (for self, as reminder)
- Sheet B - Make Trusty the dog move instructions
- Sheet C - Design Decisions
- Completed Trusty the dog

Starter

Explain that the children are going to each make a toy dog from an existing kit to give them ideas for making their own ones. Show them a completed version of Trusty the dog without moving parts. Ask the children to suggest which parts could move and how it could be done using pneumatics. Go through the template and instruction sheet A; demonstrate how the adaptations for the moving head and ears fit together. Discuss ideas for making the tail move.

Activity

Children can work in pairs to make Trusty the dog. Remind them to find the right position before sticking or fixing the parts in place. If making the head move, remind children to test different ways of attaching the head to the top of Trusty the dog's body (e.g. paper fastener or string, etc.) so that it can pivot. They will need to find the best position for the pneumatic mechanism and find a way of fixing it to the base whilst still allowing air to flow into and out of the balloon.

Plenary

Discuss problems and solutions.

Sheet B - Make Trusty the dog move

You can tell a lot about dogs from the way they move. Here's how to get Trusty the dog's body moving...

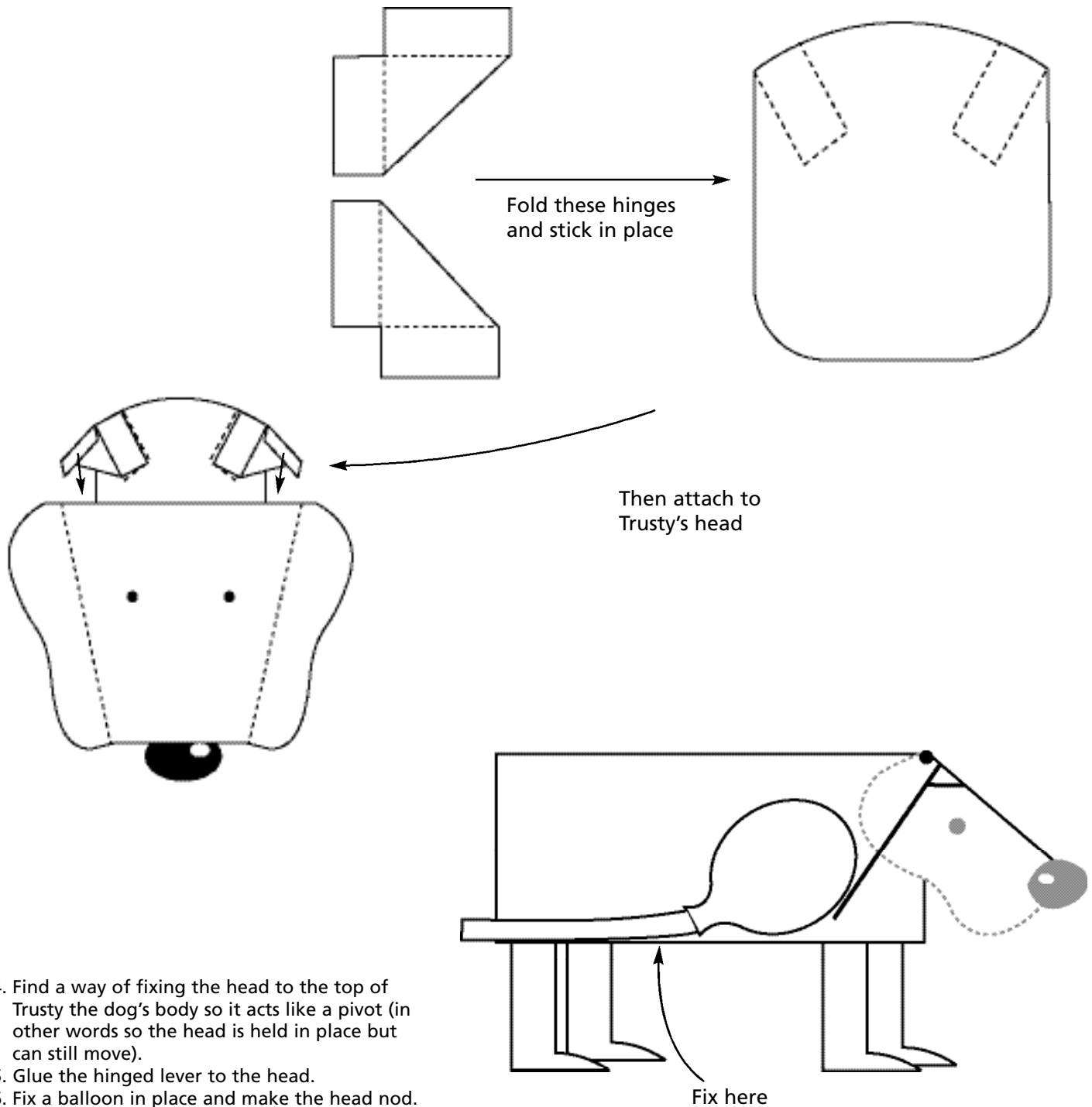
Key:

----- Folding line

————— Cutting line

Try this for a nodding head

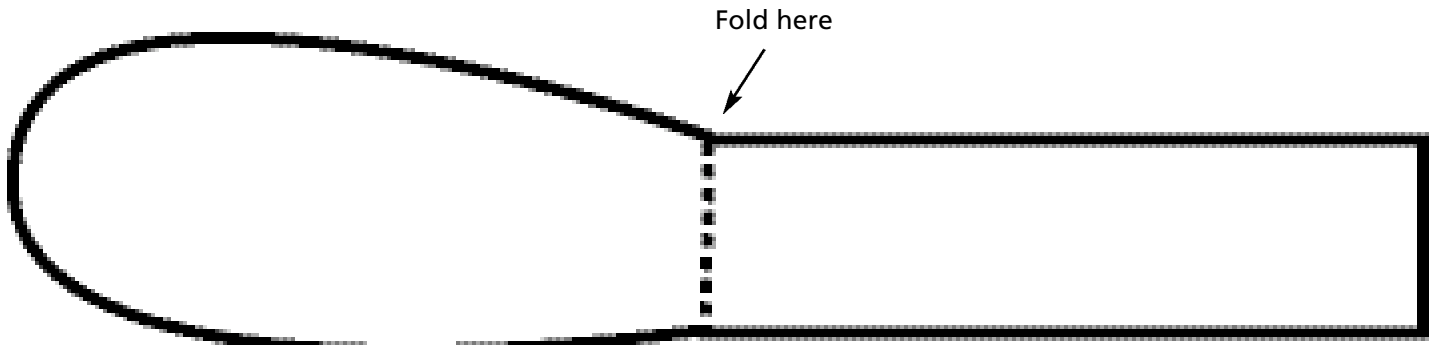
1. Cut out all the templates from the Make your own Trusty the dog!
2. Put Trusty the dog together, but don't attach the head.
3. Cut out and assemble these templates to make a hinged lever.



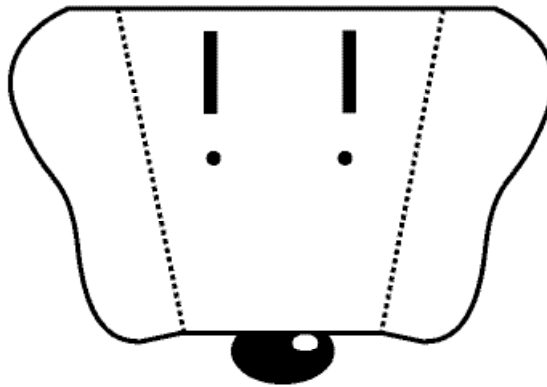
4. Find a way of fixing the head to the top of Trusty the dog's body so it acts like a pivot (in other words so the head is held in place but can still move).
5. Glue the hinged lever to the head.
6. Fix a balloon in place and make the head nod.

Or...try this for ears that can go on high alert.

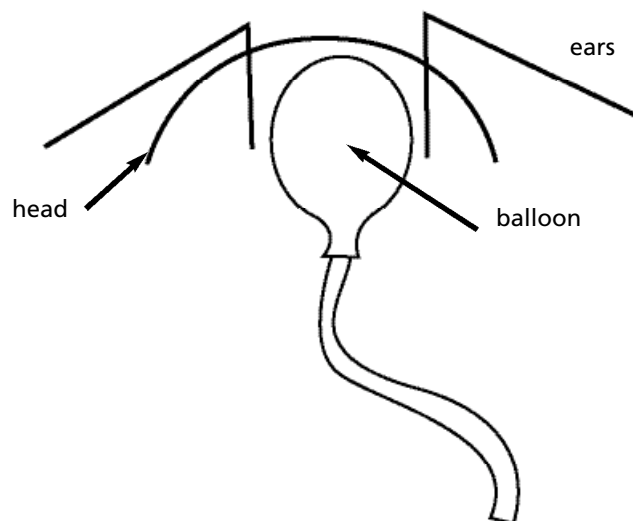
1. Cut out all the templates from the Make your own Trusty the dog! sheet except the ears.
2. Put Trusty the dog together, but don't stick the head on yet.
3. Cut out this template and use it to make a copy (he'll need two ears!).



4. Cut two holes in Trusty's head; one for each tab.



5. Work out the best position to attach the head and pneumatic system, so that when the balloon is inflated, the ears flap!



Can you find a way to make a wagging tail? Try using the hinged lever and make a new template for the tail so you can attach it to the hinged lever.

Sheet C - Design Decisions

Make some design decisions about your dog toy.

1. What will your toy be used for? What important message about looking after a dog, or how to behave with a dog, do you want to explain?

2. What will you use to make each body part?

The main body will be made _____

The ears will be made _____

The eyes will be made _____

The tail will be made _____

The nose will be made _____

3. How will you make sure it looks like a dog?

4. Which part will move?

5. How will it move? (Explain how you will make a pneumatic system and how you will attach it)

6. What materials will you need? (Make a list)

7. What jobs will you need to do? (Make a list, starting with the first job)

8. Who will do each job? (Write their names)

9. Who did each job? (Fill this in when you have finished)

Session 5 – Investigating, drawing & modelling dog shapes (IDEAs & FPT)

Resources

- The body net (following) copied onto card for each pupil.

Starter

Build on what the children found out in earlier sessions. Ask them to describe differences in position and movements of features e.g. dogs have a sticking out nose, the eyes face the front, etc. Explain that the children will be drawing outlines of dogs to practise making the body shape and position of features before they have a go at making the main body part out of cardboard or found material in 3D. Show them how to assemble the net and explain that they can use this or found materials such as plastic bottles, toilet rolls, cardboard boxes to make their dog's body.

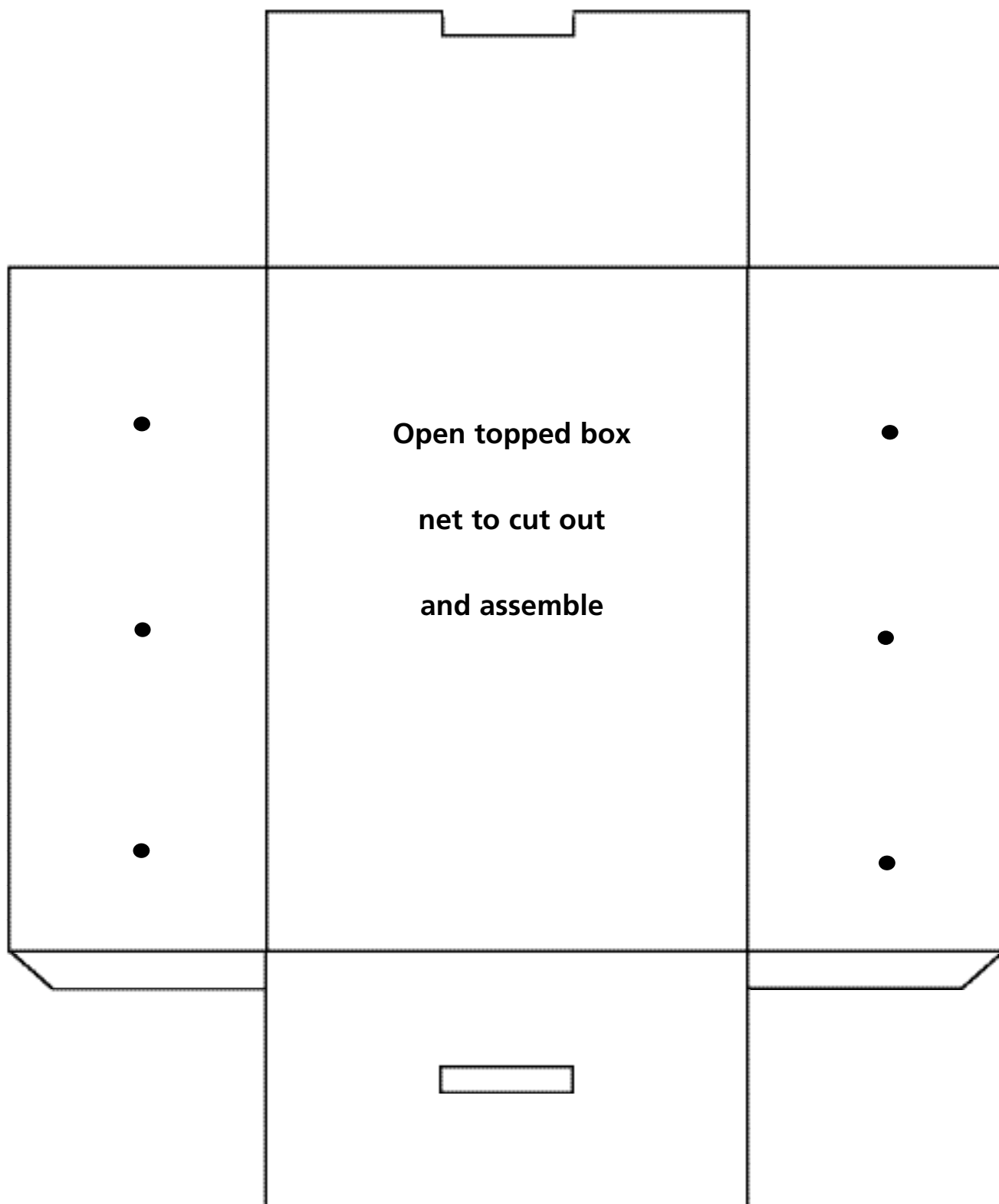
Activity

Children draw their dog's body. If children have difficulty drawing 2D pictures of dogs from different angles, they can use tracing paper. Once children have made the main body part, ask them to start investigating ways of adding other body parts and consider how these could be made to move.

Plenary

Share ideas and ways of solving problems e.g. giving stability to the toy and making sure the legs are level.

Body Net for Trusty



Session 6 – Making Design Decisions and designing and making dog toys (DMA)

Resources

- Large selection of found materials, cardboard boxes, card, scissors, glue, paper fasteners
- Resources as session 2
- Completed design decision sheets.

Starter

Ask the children if they think they are ready to start making their toys. Refer to the list from session 1. Explain that they will be working in small groups to design and make a toy. Prompt them to identify the type of decisions they will need to make before they start. Go through the Design Decision sheet and discuss each question. To decide on the user and purpose, the children should refer to the information noted down in session 4.

Session 7: Evaluation (DMA)

Resources

- Sheet D - Evaluation

Use the evaluation sheet provided below for pupils to evaluate their designs. Discuss how problems were solved and how the final version differed from the design criteria. How did they use their design to help communicate an important message about behaving when with a dog? How could they use their design in the future? What other designs could they make and use?

Sheet D - Evaluation Sheet

1 What was your toy used for?_____

2 What emotion does your toy show?_____

3 What did you use to make each body part?

The main body was made _____

The ears were made _____

The eyes were made _____

The tail was made _____

The nose was made _____

4 How much does it look like a dog?_____

5 Which part moves?_____

6 How does it move? (explain how you made the pneumatic system and how you attached it)

7 What other materials did you need?

Session 8: Create a display

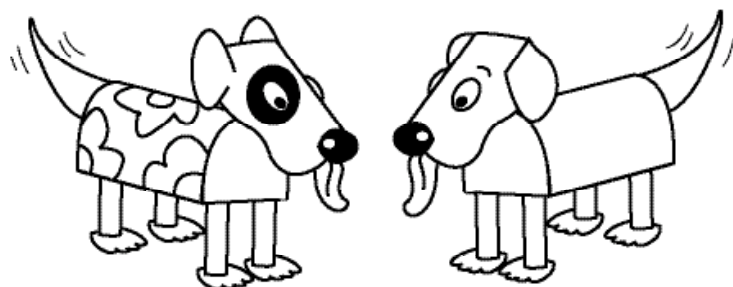
Resources:

- Pupils' moving dog models
- Display materials, such as coloured sugar paper, plain paper, marker pens and paint

Pupils should follow up their model making by creating a display of their work, to communicate their chosen key messages. This can show each model along with a description of the emotion it is designed to convey, and the importance of this for a responsible dog owner. Individual models can be brought together using a central theme, for example, 'what your dog is telling you'. Pupils can provide responses to these emotions by explaining how responsible dog owners can prevent their dog being lonely or afraid, and how to nurture a happy, playful companion.

Their display could include:

- A bold title
- An eye-catching layout
- A main panel highlighting the key safety messages
- A small panel by each dog model, explaining how it can be used to learn more about being safe and responsible when with dogs
- Information about Dogs Trust



Development and extension ideas

If you like, you can also use the following optional activity to explore other D&T concepts using pupils' work and ideas:

Session 3

Magnet revision – make each Trust the dog's head move by magnet attached to a cardboard dog toy model and to dog's head. Dog can refuse (turn head away) or accept (turn head towards) depending on where poles of magnets are placed (link to Science: simple magnetism; opposites attract).

Ideas for using other Dogs Trust resources

Pupils can use their work to support activities from the Literacy and Numeracy resource, using their dogs to help teach younger pupils something about numbers, such as composing counting rhymes on the theme of dogs. They can also use them to teach younger pupils about being safe when with dogs, or about responsible dog ownership.

As part of the decision making process in session 6, children will decide how their toys can be used to teach younger children. The *Literacy* and *Numeracy* resource can be used to stimulate ideas and encourage the children to consider how their toys can be used to teach other subjects.

Remind the children to keep their ideas simple. Show them one of the Key Stage 1 *Numeracy* activity sheets and ask them to explain what the sheet is about. Can they think of other ways of using the toys to teach something about numbers to younger children? Prompt them to identify what they learnt about numbers when they were little; counting on, matching and grouping things, simple sums, etc. How could they put together a short presentation using their toys to help young children practise these skills? Prompt them to think of simple counting rhymes that could be adapted e.g. 'ten green bottles hanging on a wall' could be '10 nodding dogs nodding off to sleep... and if one nodding dog fell fast asleep...'

Pupils can also use their dogs in any work carried out using the *Primary Citizenship* resource, for example using their pneumatic dog's ability show feelings to help illustrate a dog's needs, and positive /negative dog responses to good or bad behaviour towards a dog. Pupils could create models of the important items needed by a dog owner to create a display, and combine their designs with written and drawn work created within PSHE/Citizenship.

Design a Dog

Year 5 activity

(pupils aged 9-10)

**Making toy dogs move with cams
(QCA Unit 5c)**



www.learnwithdogs.co.uk

Contents	Page
Introduction	64
Helping pupils learn about dogs	65
Session 1 - Generating ideas & investigating mechanisms (IDEAs) to make a labelled drawing (FPT)	66
Session 2 - Investigating dogs (IDEAs)	67
Session 3 - Investigating design aspects (IDEAs)	68
Session 4 - Investigating and making cams (FPT)	69
Session 5 - Making a moving toy from a construction kit	70
Session 6 - Making design decisions and designing and making a moving toy dog (DMA)	70
Session 7 - Evaluation (DMA)	71
Session 8 - Create a display	71
Development and extension ideas	72
Sheet A - Cams: Net, Templates and assembly	73
Sheet B - Make Trusty the dog a nodding dog	75
Sheet C - Design Decisions	76
Sheet D - Design evaluation	77
Sheet E - Shape Sketches	78
Sheet F - Nodding dog box	79
Sheet G - Image Ideas	80

Introduction

This 'Design a Dog' Year 5 activity supports the QCA Scheme of Work Unit 5c. Pupils investigate cam mechanisms to design and make a toy dog that moves using a cam. It will draw on and extend earlier work on levers and sliders. The design brief is to design a toy that is both fun and educational. This creates a platform for pupils to use their designs to communicate important messages about responsible dog ownership and safe behaviour towards dogs, to their peers and to younger pupils in their school.

Pupils will use their toy dog as a platform for exploring how dogs can react in positive or negative ways to our behaviour, or how they express their feelings through body language. Making and showing the toy dog will help show other pupils how they can become safer around dogs and more considerate and responsible dog owners of the future. Pupils could use their toy dogs to illustrate the important dog feelings and behaviours on the poster provided. How can they use a simple cam mechanism to show happiness, fear or aggression, for example?

By completing these activities, which should take around 8 sessions, pupils will:

- Learn about simple cam mechanisms for use with a moving toy
- Create a display of their work, helping other pupils to become safer around dogs and more responsible dog owners

Additional curriculum links

- Sc4 - Forces & motion 2a,b & c
- English - Reading for information 3c,d & e
- PSHE - 2d different kinds of responsibilities, 5a taking responsibility

• Wales

Activities support the following elements of the Design and Technology National Curriculum at KS2: 1.1, 1.2; 2.1, 2.2, 2.3, 2.4, 2.5; 3.1, 3.2, 3.3, 3.4, 3.5

• Scotland

Activities support the programmes of study for Art and Design in the 5-14 Curriculum Guidelines, including opportunities for pupils to investigate visually and record, create and design work of their own, reflect upon and describe their work, and respond to it, including suggestions for improvement.

• Northern Ireland

Activities support the following elements of the Art and Design National Curriculum at KS2:

Investigating and realising:	a, b, c, d, f, g
Materials, tools and processes:	a, c, g, j

What you will need

- The support poster (available to order from www.learnwithdogs.co.uk or by calling 0870 333 0432)
- The resources needed for each session, as listed for each session
- Stay Safe with Dogs and Owning a Dog leaflets – downloadable from www.learnwithdogs.co.uk

Useful websites

- | | |
|--|--|
| • www.the-kennel-club.org.uk | • www.allaboutpets.org.uk |
| • www.petplanet.co.uk | • www.takingthelead.co.uk |

Helping pupils learn about dogs

Helping pupils learn about dogs is the common theme throughout this resource. Dogs make great companions, and can be your best friend. Like humans, dogs have emotions and needs, and can become hungry, bored, happy or annoyed, for example. They communicate this by using their body language. Making toy dogs helps pupils to explore how dogs communicate with their owners, and your pupils' display will help their peers to learn to be safer and more responsible when with dogs.

The poster shows pupils how to interpret dogs' body language so they can tell what a dog is feeling, and how to be safe with dogs. This can be used alongside the activities to help pupils to create models that express a dog's body language, and from this learn about responsible and safe behaviour towards dogs.

Sessions 1 - 3

When pupils start to think about how they will make and demonstrate their toy dog, they can compare a dog's needs with their own. They should think about how dogs can be happy, sad, scared or angry, and how they express this. Pupils can look at the pictures on the poster and choose a feeling for their toy dog to express, to help them teach another person about how dogs express their feelings or about being safe with dogs.

- What features of the dog need to move (for example ears or tail)?
- What feeling does this express?
- Is this a good or bad feeling?
- When might a dog have this feeling?
- How could they show this using a cam mechanism?

Pupils can use the poster or other materials to help them think about how they could change the attributes or dimensions of their dog, to represent their favourite breed, or their own pet. Pupils should stay focused on the feeling or emotion they want their toy dog to convey. How can their toy's design and moving features do this?

Session 4

As pupils explore the mechanics of cams, they should remind themselves of how the cam can help their toy dog communicate a message about how dogs show their feelings. For example, how could a cam move the dog's ears, mouth, head or tail?

Sessions 5 and 6

As pupils construct Trusty the dog and then their own cam toy, they can use their partially completed models to discuss how well their cam idea is helping them to convey a dog's feelings, as a way to tell other people how to behave safely and responsibly towards dogs.

Session 7 – evaluation

Using their dog toy to communicate an important message about dogs' feelings, or responsible dog ownership, helps young pupils to remember that design is always for a purpose. As well as its aesthetic and mechanical qualities, how well does their toy dog help them to explain to someone else about the importance of being sensitive to a dog's feelings, and how they are expressed?

Session 8 – display

This is where the pupils' efforts all come together to create an educational display for their peers. Pupils should stay focused on the reason for their display – how can they use their creations, along with some simple words and pictures, to get their messages across about how dogs have feelings, or about safe and responsible behaviour towards dogs?

Session 1 – Generating ideas & investigating mechanisms (IDEAs) to make a labelled drawing (FPT)

Resources

- A selection of moving toys that work using a cam mechanism: e.g. pull-alongs and push type objects that have 'pop-up' moving parts (forwards and backwards or up and down movements), automata.

Starter

Tell the children that the big task is to design and make a toy dog with a part that moves using cams. The aim is to make something that is fun and educational i.e. the user has to learn something about how to behave well towards, or when with dogs.

Explain that the first task is to make a list of things they need to find out before they can make their moving dog. Stimulate ideas by posing some questions. Do they know what a cam is and how it works? What do they know already about other mechanisms? What will they need to know about dogs? What is the difference between a toy and a model? List their ideas on a large piece of paper for future reference. If necessary, point out the five main things to investigate.

We need to find out:

1. What a cam is
2. How cams can be used to make things move
3. How other mechanisms can be used with a cam to make things move
4. About dogs: their shape, their movements, how to look after them
5. About toys: who they are suitable for, what you can do with them, how to make them safe and last

Explain that this first session is for the children to investigate moving toys to find out about cams and see how they can be used with other mechanisms. Operate the toys and ask them to point out the different parts and mechanisms. Can they explain how the mechanisms work together to make the movement? Introduce or clarify the following as necessary:

- The *crank handle* is turned to operate the mechanism (in some cases the toy may be pulled along by string which is attached to cams and sliders).
- A straight *shaft* extends movement. A shaped shaft alters the direction of movement. A shaft can be used to drive other parts by linking it to a cam, lever or slider [*illustration of shaped shaft and slider – can take from template*]
- A *cam* can be a regular or irregular shaped 'wheel' used to change circular (round and round) movement to reciprocal (up and down or backwards and forwards). It can be linked to a *lever* or *follower* to drive other parts. If regular, the crank or shaft must be placed *off-centre* for it to produce movement.

Activity

Explain that the task is to find out more about mechanisms (particularly cams) and then use that information to help them draw a labelled diagram of one of the toys showing how it works. Remind them to explain the direction of movement made by each part and how movement is changed when the mechanisms are linked together e.g. you turn the crank which turns the cam; the round and round movement is irregular so the lever on top of the cam and moves up and down.

Plenary

Pupils can compare their labelled drawings. Use their investigations to discuss how they could reproduce the mechanisms. What materials would they need? What parts would need to be fixed? Which parts move freely but need to be kept in place?

What parts of a model or toy dog could they make move using a cam mechanism?

Session 2 - Investigating dogs (IDEAs)

Resources

- Pictures of dogs and other sources of information such as books
- The support poster
- Internet access to www.dogstrust.org.uk if available
- Sheet G - Image Ideas
- Sheet E - Shape sketches.

Starter

Ask the children to share what they know about dogs. Show Sheet G and ask them to describe what each dog looks like. What shapes are their bodies made up of? How do these shapes change when they are in different positions (e.g. lying, sitting, standing, etc.)? Ask them to describe how different body parts move; opening and closing the mouth, wagging tail from side to side, ears and head up and down. Add their suggestions as answers to the 'what we need to find out' list.

Activity

Children can work in small groups. Give them Sheet G and direct them to use the Internet, poster and other resources. Give them Dogs Trust and other relevant website addresses. Discuss some suitable key words to use in searches. Tell them they have two tasks:

- To observe dog shapes and sketch (or trace) outlines of dogs in different positions to get ideas for their toy: it's shape, which part will move and the direction of movement.
- To find out about responsible dog ownership and/or safe behaviour when with dogs, and make some notes which will help them to design an educational aspect to their toy.

Plenary

Compare the sketches pupils have made and ask them which parts could move. Point out that a dog's body is made up of different shapes. Copy and enlarge the shape sketches sheet to show the children. Ask them to suggest what materials they could use for their toy. How could they be joined together?

Share and discuss what they have found out about good behaviour towards dogs, and how to be safe when with them. Why does Dogs Trust say that a 'A Dog is for Life'? What does 'responsible ownership' mean? How could the toy dog be used to get across some of this important information?

Session 3 – Investigating design aspects (IDEAs)

Resources

- Selection of toys from session 1, plus other examples found in school.

Starter

Use the selection of toys to discuss aspects of design (i.e. intended user and purpose, materials, construction and safety). Ask the children to consider whom each toy is for and what makes it suitable for them. What might they learn from playing with it?

Point out some educational aspects of using toys, as necessary e.g. board games – counting, taking it in turns; dolls and teddy bears, using the imagination, looking after things. Draw pupils' attention to safety and durability. Are there any sharp bits sticking out? What is it made of? Build on their ideas and suggestions from the last session.

Activity

The children can start planning their ideas for the educational aspect of their toy. They must create another way to communicate some of the key messages about safety with dogs and responsible dog ownership. This would accompany their design to help them, or another user, make the most of its educational potential. This can be a simple leaflet explaining how to look after their dog, a set of illustrated fact cards (e.g. things dogs like or how to be safe around dogs) or a play script for the user to act out with their toy. Pupils can concentrate on one simple message; more able or fast working pupils can include a range of the key messages and consider how their design could support more than one important message about being safe with dogs or a good dog owner.

Plenary

Share the children's work and discuss how suitable it is for the intended user. Ask the pupils to think of ways of making sure the educational aspect is fun e.g. using simple, but fun language.

Session 4 – Investigating and making cams (FPT)

Resources

- Cams: net, template and assembly Sheet A copied onto thin card
- Various thickness of card
- 30 amp fuse wire (20cm lengths)
- Scissors, blue tack or modelling clay
- Assembled sample mechanisms from Sheet A.

Starter

Make up the 3 examples of mechanisms (2 cams and 1 shaft) from Sheet A to present to the class. Thick fuse wire and cardboard can be used for the initial investigations as it is easy to manipulate. Demonstrate some of the modifications you made and ask the children to explain how each one works. Talk them through each stage of the making e.g. 1. cut out the template 2. decide which diagram to copy 3. look closely at the diagram 4. shape the wire and cut out cam template, etc. Remind children how to use tools safely.

Activity

Explain that the children should make one of the mechanisms you've made (using Sheet A) and investigate the following points.

- Putting the shaft at different heights or positions
- Placing sliders and levers in different positions
- Ways of fixing the cam to the shaft
- Ways of reinforcing the entry and exit points

Once the above is completed, they can experiment with the irregular cam shape (Sheet A) and try other shapes. Older or more able children can find other ways of attaching levers.

Plenary

Discuss the outcomes of their investigations and find solutions to problems. Ask the children what other materials could be used to make the mechanisms work better and last longer. Should the wire or cardboard be thicker? Is the box too small? How did they manage to get the shaft inside the box? What parts must be reinforced? How can the levers or sliders be kept in place?

Use the children's examples to discuss which types of mechanisms would be most suited to different dog movements. Which are most suitable to helping them get their important message across to users of their design?

Session 5 – Making a moving toy from a construction kit

Resources

- Per pair: A Trusty the dog template copied onto thick card
- Instruction Sheet B - Making Trusty a nodding dog
- Thin stiff wire, masking tape, blue tack or modelling clay, glue pliers, strips of wood (1cm x 1cm), dowelling rod, thick card.

Starter

Show the children the Trusty the dog template and explain that the children will be following basic instructions to make and assemble a Trusty the dog that will be modified to move using a cam mechanism. Go through Instruction Sheet B and point out that there are two choices of mechanisms. Prompt the children to recognise that they will need to work out the correct lengths needed for the shaft wire and looped wire or for the axle, follower and handle rod.

Activity

Pupils can work in pairs for support as they complete the construction task. They need to think about how they can combine the information in the template with that on the Trusty the dog template, to build their mechanism into Trusty the dog.

Plenary

Ask the children to talk about how they found the correct lengths for each of the parts and what modifications that had to make for the mechanism to work well.

Session 6 – Making design decisions and designing and making a moving toy dog (DMA)

Resources

- As per session 5
- Sheet C - Design Decisions

Starter

Refer back to the 'what we need to find out' list and ask the children if they think they are ready to design and make their own toy from scratch. Ask them to brainstorm the decisions they should make before the start. Go through Sheet C and recap on work carried out in previous sessions.

Activity

Children can work independently or in pairs. Several sessions may be needed to complete the toys, and pupils should remain focused on the use of their design to help other children learn about dogs.

Plenary

Encourage children to discuss progress and share ideas for developing or improving their designs. Groups of children from other classes can be asked to evaluate the finished products against the design criteria. The class can prepare a simple questionnaire for the children to complete e.g. who do you think would like to play with this toy? Does the way it looks make you want to play with it? Arrange for the children to present their toys to a small group of younger children to aid evaluation.

Session 7 - Evaluation (DMA)

Use the design evaluation Sheet D, for pupils to evaluate their designs. As a plenary, discuss with pupils how problems were solved and how the final version differed from the design criteria.

Session 8 - Create a display

Resources:

- Pupils' moving dog models
- Display materials, such as coloured sugar paper, plain paper, marker pens and paint.

Pupils should follow up their moving picture making by creating a display of their work, to communicate their chosen key messages. This can show each moving picture along with a description of the emotion it is designed to convey, and the importance of this for a responsible dog owner. Individual models can be brought together using a central theme, for example, 'what your dog is telling you'. Pupils can provide responses to these emotions by explaining how responsible dog owners can prevent their dog being lonely or afraid, and how to nurture a happy, playful companion, in their own words.

Their display could include:

- A bold title
- An eye-catching layout
- A main panel highlighting the key safety messages
- A small panel by each dog model, explaining how it can be used to learn more about being safe and responsible when with dogs
- Information about Dogs Trust

Development and extension ideas

The children are asked to make a toy dog that is fun *and* educational. Introduce Dogs Trust resources during session 3 to stimulate ideas and to act as a resource for the children to find out about dogs and being a responsible owner. The statements at the bottom of each will give the children a useful starting point.

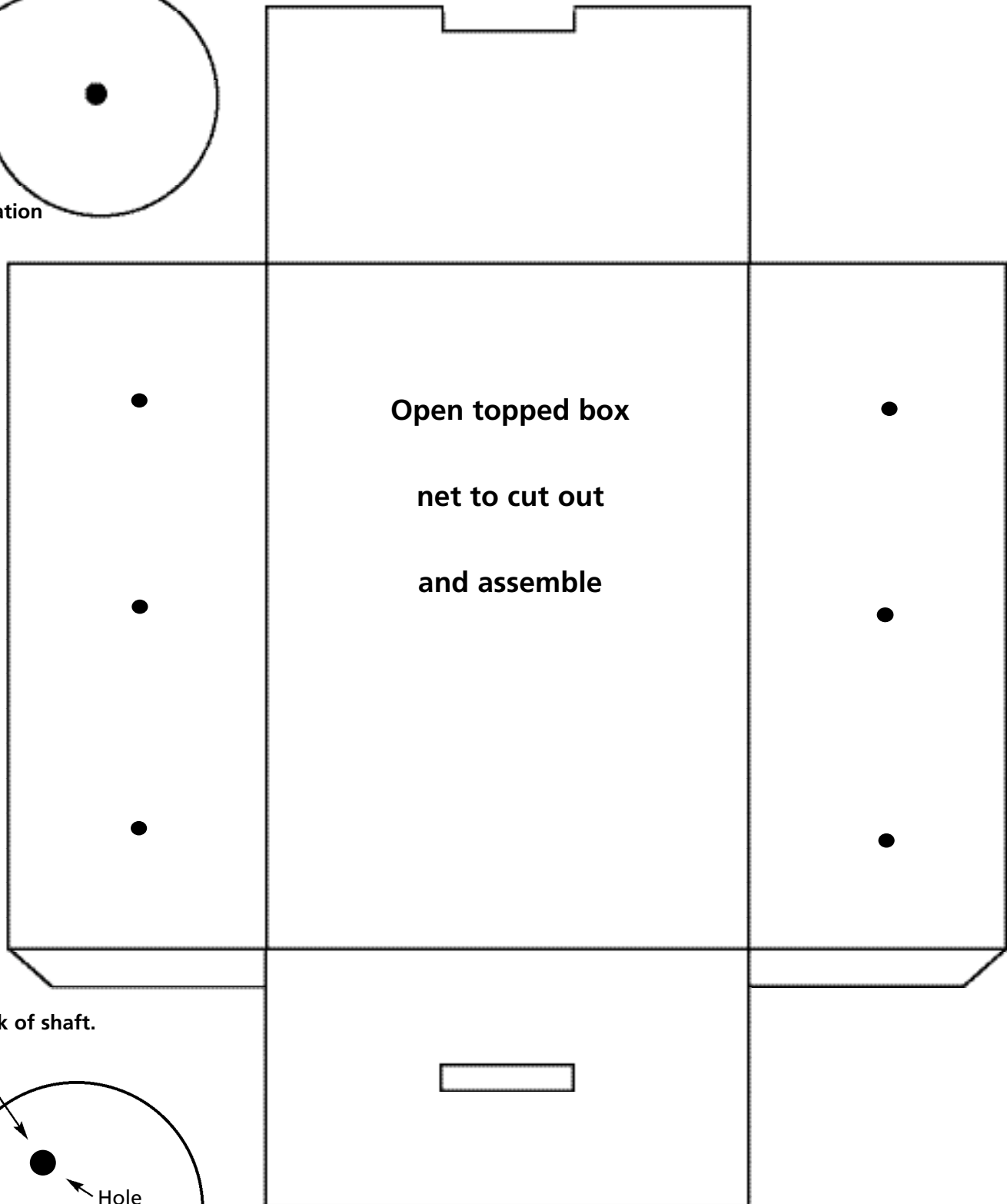
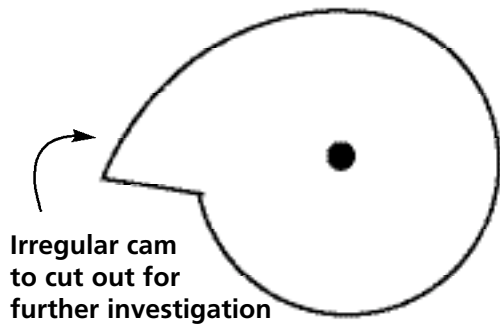
Pupils can use the information and activities for younger pupils in the *Primary Citizenship* resource to help focus their thinking on how they can use their design to communicate important messages about dogs.

All the packs, including *Literacy* and *Numeracy*, include statements at the bottom of each page. Pupils can use these, or modifications of them, as titles for their design, which can bring the statement to life, e.g. page 4 *Numeracy* pack 'dogs make great companions and can be your best friend' could be made into a label attached to the toy e.g. 'Look after me and I'll be your best friend'.

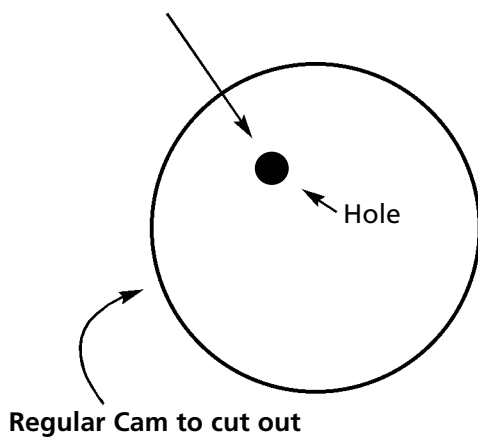
Groups of pupils can create displays of designs that complement each other to create a set of messages for younger pupils to learn as they play with the designs. They can use their leaflet of fact card designs to support their display and to provide something for visitors to take away, for example at a parent's evening or from a foyer display.

Sheet F shows how you can make a nodding dog box, as an alternative or extension activity for your pupils.

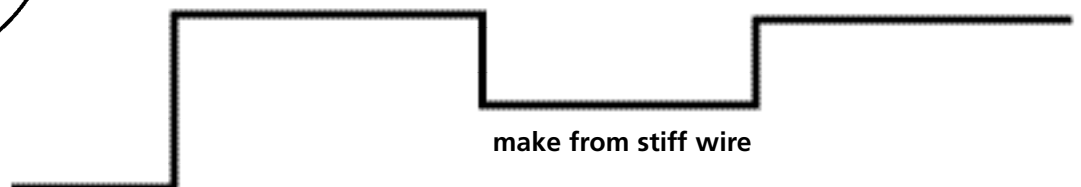
Sheet A - Cams: Net, templates and assembly



Position of crank of shaft.

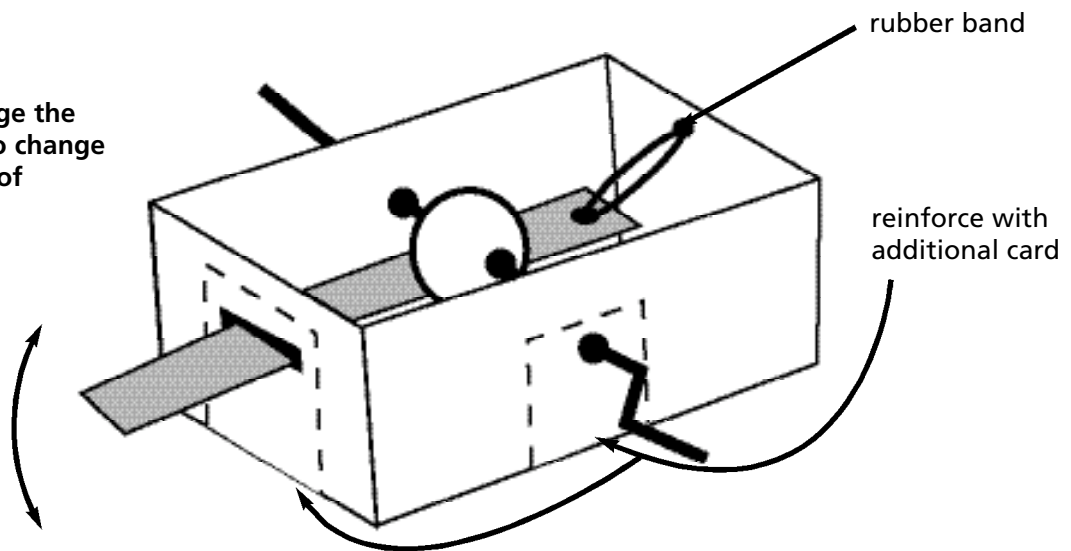


Guidance for crank and shaft shape

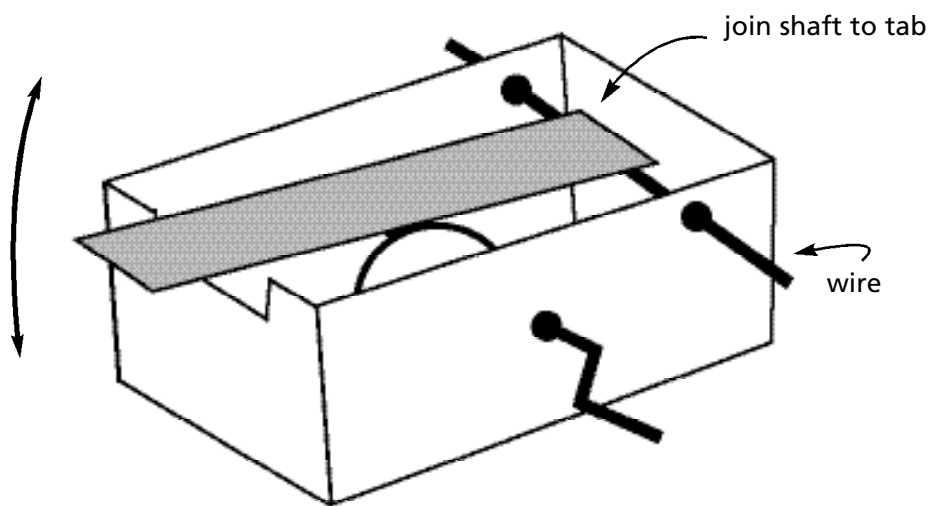


Sheet A - cont. - Straight shaft with regular cam and lever

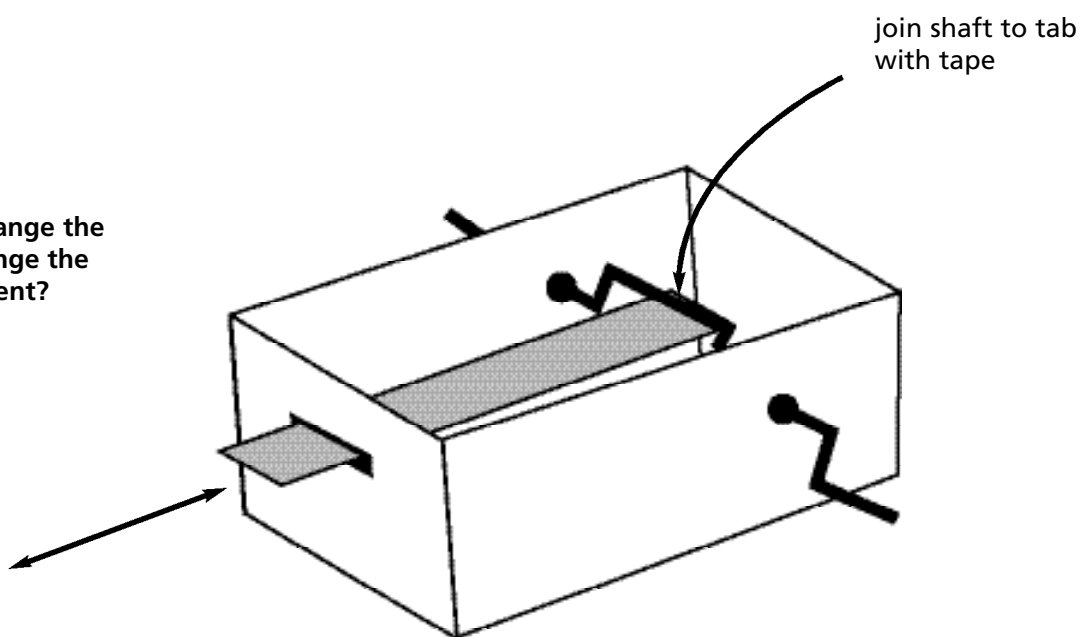
1. How can you change the cam shape (or size) to change the sort (or amount) of movement?



2. How can you change the cam shape (or size) to change the sort (or amount) of movement?



3. How can you change the shaft shape to change the amount of movement?

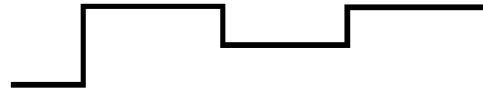


Make Trusty the dog a nodding dog

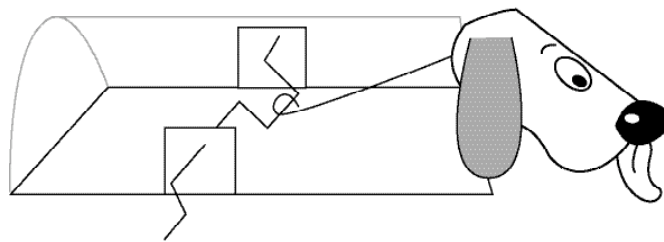
1. Make a wooden frame for the base of Trusty. Make it stronger by bracing the corners using card triangles.
2. Cut out all the other templates for Trusty.
3. Stick the base to the top part of his body with masking tape (so you can take it apart to fix the cam or shaft in place if you need to).

If you want to make a cam shaft.....

4. Use pliers to make this shape out of wire.



5. Use the templates from the other sheet to make the hinged lever out of stiff card.
6. Glue the hinged lever to the inside of the head. Use extra card to reinforce the sides of his body.
7. Make a loop in one end of another piece of wire.
8. Put one end of the shaft in the side of Trusty the dog's body and then thread the looped wire through it before bringing it out the other side.
9. Attach the end of the looped wire to the hinge.

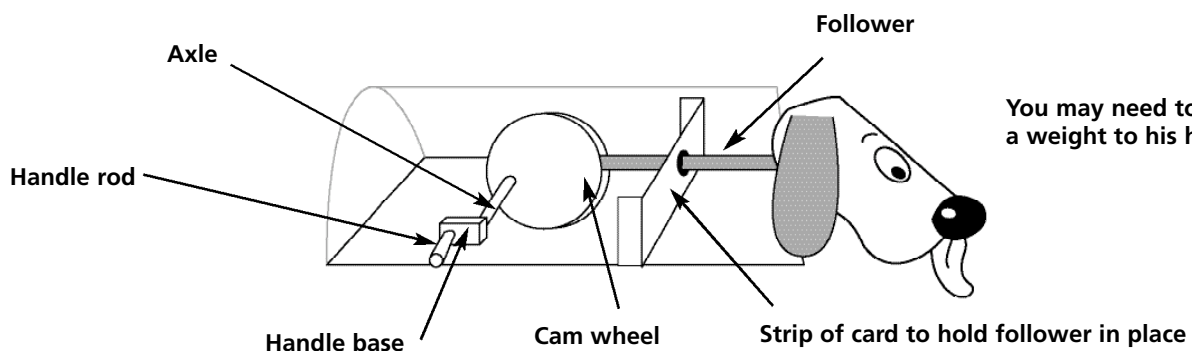


You may need to add a weight to his head.

10. Check it works and then stick the rest of Trusty the dog together.

If you want to make a cam wheel and follower....

1. Put a wooden cam wheel in a G-clamp and make a hole off-centre using a drill
2. Place some wood in a g-clamp and saw it to make the base for the handle. Drill a hole in each end (not on the same side) – one for the handle and one for the axle.
3. Saw three dowelling rods to make the axle, the handle rod and the follower.
4. Use the templates from the other sheet to make the hinged lever out of stiff card.
5. Glue the hinged lever to the inside of the head. Use extra card to reinforce the sides of his body.
6. Use masking tape to attach the follower to the hinge
7. Put one end of the axle in the side of Trusty the dog's body and pass it through the cam before bringing it out the other side.
8. Add a strip of thick card to support and guide the follower (you will need to take one side of the base off to do this).



You may need to add a weight to his head.

Design Decisions

Answer these questions to make some design decisions about your toy dog before you start

1. Who is the toy for? _____
2. What is the purpose of the toy (besides having fun playing with it)? _____

3. How will the toy teach the user something about dogs?
 - make a lead, collar, brush, etc to go with it
 - write a leaflet explaining how to look after it
 - other:
4. What part of the toy will move? _____

5. Make a sketch of your toy showing the cam mechanism
6. What materials will you need? (make a list) _____

7. What tools will you need? (make a list) _____

8. How will you make your toy strong, so it lasts longer? _____

9. How you will make the finished toy safe for the user? _____

10. How will you make the toy dog look appealing to the user? _____

11. Check it works and then stick the rest of Trusty the dog together.

Sheet D - Design evaluation

Look back at your design decisions to compare what you planned to do with what you did.

1. Who will the dog puppet be for?

- Me
- A younger child

☐
☐

2. What will it be used for?

- As a prop to teach children how to be safe around dogs
- As a prop for storytelling about dogs and people
- Blank

☐
☐
☐

3. What type of character will it be?

- Friendly
- Angry
- Frightened

☐
☐
☐

4. How will you design each body part to show its' character?

The eyes will be _____

The nose will be _____

The ears will be _____

The tail will be _____

5. What was the cam used to move?

Main body _____

Nose and face _____

Ears _____

Eyes _____

Paws _____

6. How have you joined the cam to the moving parts?

Glue ☐

Staple ☐

Sew ☐

Blank ☐

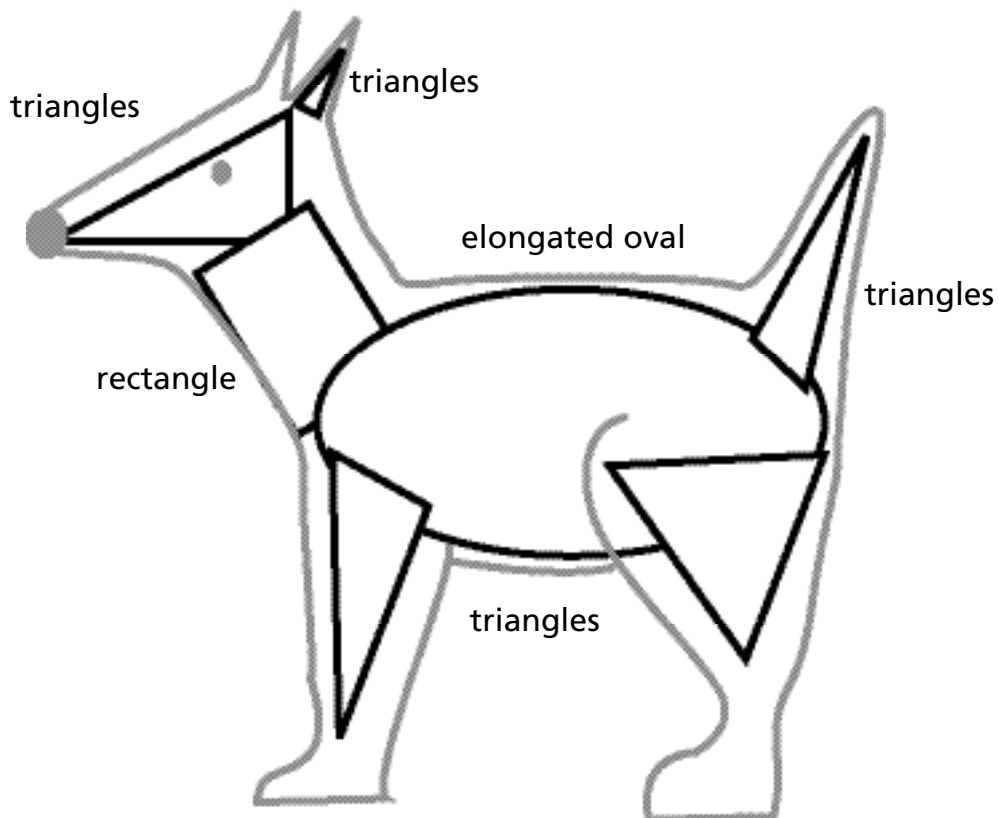
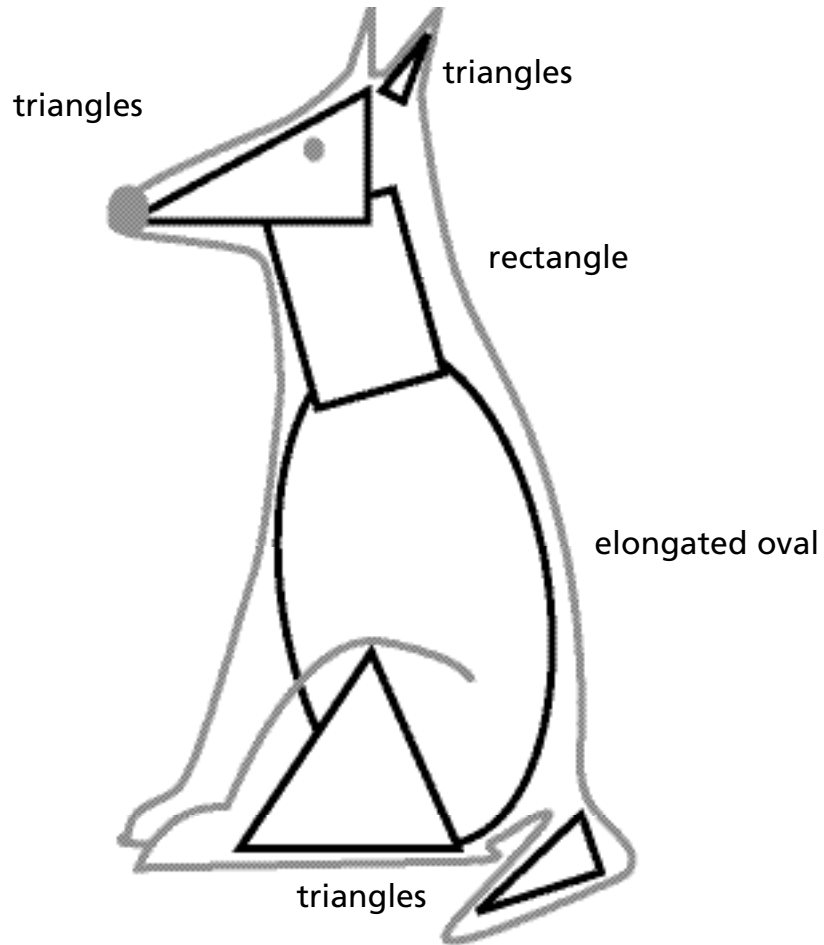
7. How well does your cam convey the dog's feelings?

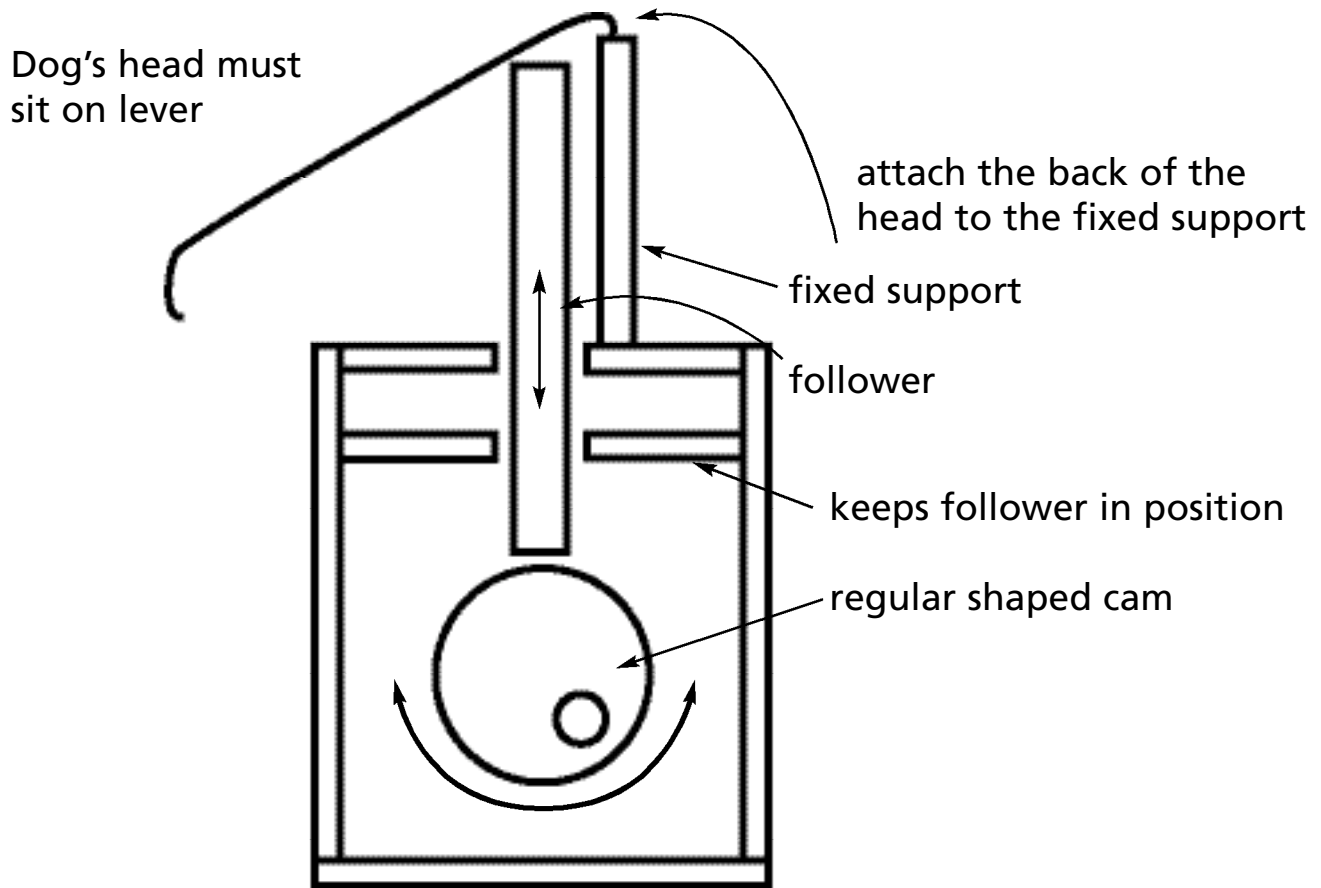
Not well ☐

Quite well ☐

Very well ☐

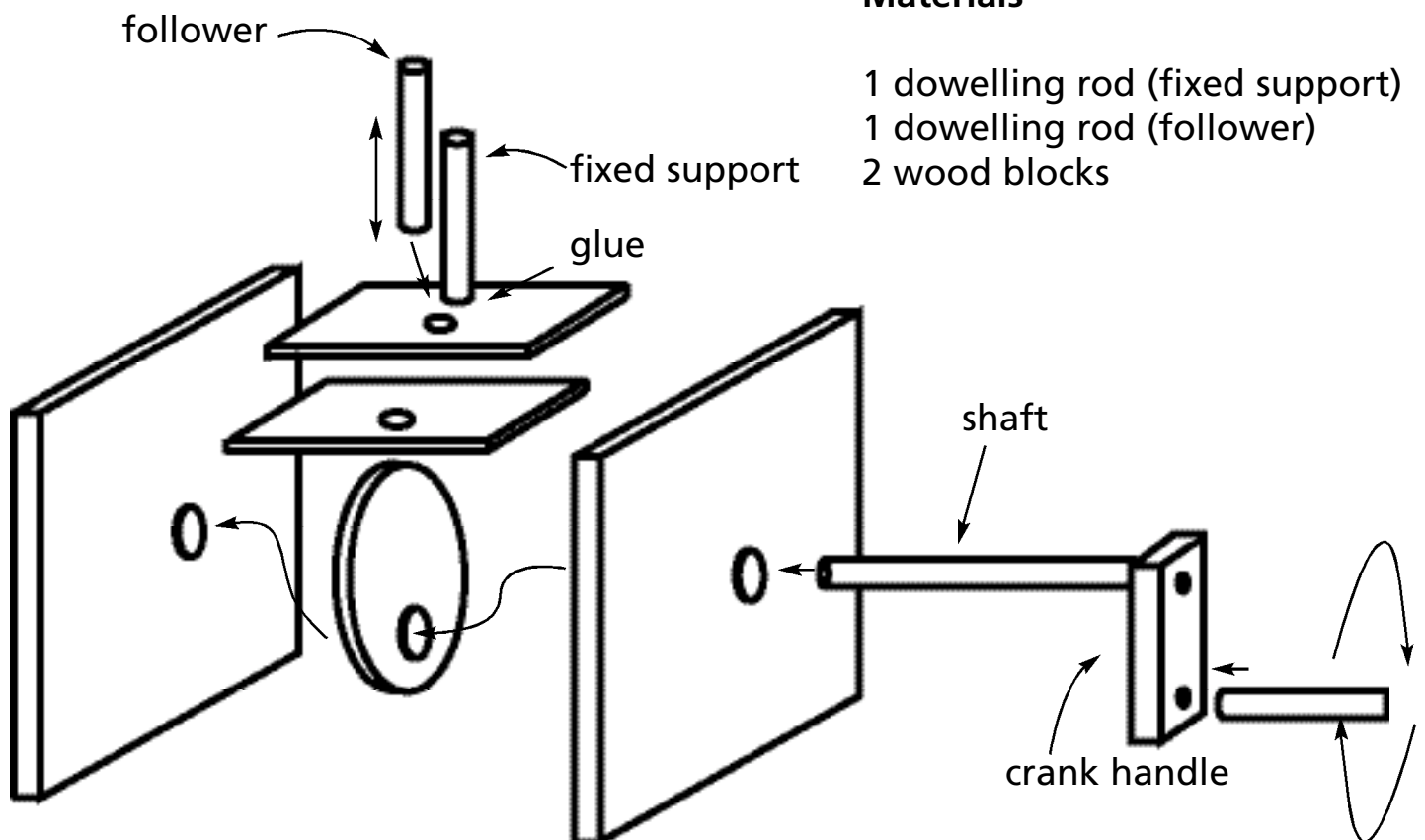
Sheet E - Shape Sketches



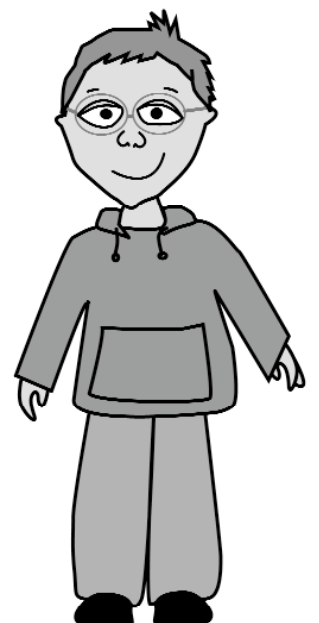
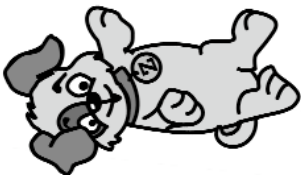
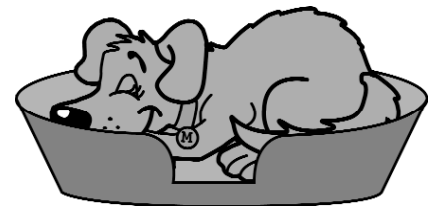
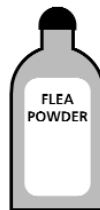
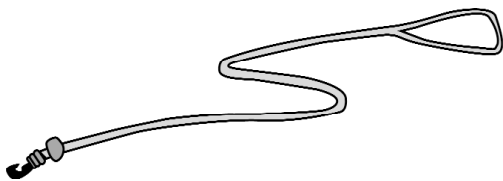
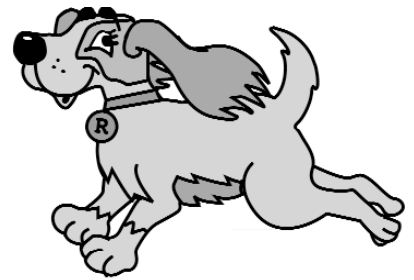
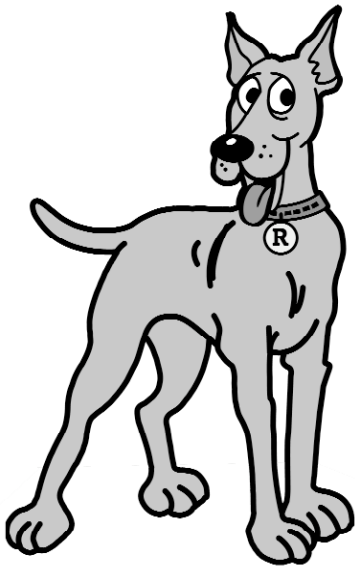


Materials

- 1 dowelling rod (fixed support)
- 1 dowelling rod (follower)
- 2 wood blocks



Sheet G - Image Ideas



Design a Dog

Year 6 activity

(pupils aged 10-11)

**Making toy dogs move with motors
(QCA Unit 6d)**



www.learnwithdogs.co.uk

Contents	Page
Introduction	83
Helping pupils learn about dogs	84
Session 1 - Investigating controllable toys (IDEAs)	85
Session 2 - Drawing labelled diagrams (FPT)	86
Session 3 - Investigating electrical control (FPT)	86
Session 4 - Investigating dogs (IDEAs)	88
Session 5 - Investigating textiles (IDEAs) & making sample squares (FPT)	89
Session 6 - Making a simple chassis and pulley mechanism (FPT)	89
Session 7 - Design Decisions (DMA) and designing & making a motorised dog toy (DMA)	90
Session 8 - Evaluation (DMA)	90
Session 9 - Create a display	91
Development and extension ideas	92
Sheet A - Design Decisions	93
Sheet B - Evaluation	94
Sheet C - Making a wooden frame chassis with motorised wheels - paw by paw instructions	95
Sheet D - Symbols	98

Introduction

This 'Design a Dog' Year 6 activity supports the QCA Scheme of Work Unit 6d. Pupils investigate electrical control to design and make a battery-powered toy dog. It will draw on and extend work on energy, electrical circuits and mechanisms. Pupils focus on making their toy represent different types or breeds of dog and used with the *Primary Citizenship* resource poster, *Literacy* resource or *Assembly* stories, can help pupils to better understand responsible dog ownership and the importance of choosing the right dog for their circumstances.

By completing these activities, which should take around 9 sessions, pupils will:

Learn about simple techniques for using electric motors and switches to control a toy dog

Create a display of their work, helping other pupils to become safer around dogs and more responsible dog owners.

Additional curriculum links

- Sc4 - Forces & motion 2c
- En2 - Reading for information 3c,d & e
- PSHE - 2d different kinds of responsibilities, 5a taking responsibility

• Wales

Activities support the following elements of the Design and Technology National Curriculum at KS2:

1.1, 1.2, 1.3; 2.1, 2.2, 2.3, 2.4, 2.5; 3.1, 3.2, 3.3, 3.4, 3.5

• Scotland

Activities support the programmes of study for Art and Design in the 5-14 Curriculum Guidelines, including opportunities for pupils to investigate visually and record, create and design work of their own, reflect upon and describe their work, and respond to it, including suggestions for improvement.

• Northern Ireland

Activities support the following elements of the Art and Design National Curriculum at KS2:

Investigating and realising: a, b, c, d, f, g

Materials, tools and processes: a, c, g, j

What you will need

- The support poster (available to order from www.learnwithdogs.co.uk or by calling 0870 333 0432)
- The resources needed for each session, as listed for each session
- Stay Safe with Dogs and Owning a Dog leaflets – downloadable from www.learnwithdogs.co.uk

Useful websites

- www.the-kennel-club.org.uk
- www.allaboutpets.org.uk
- www.petplanet.co.uk
- www.takingthelead.co.uk

Helping pupils learn about dogs

Helping pupils learn about dogs is the common theme throughout this resource. Dogs make great companions, and can be your best friend. Like humans, dogs have emotions and needs, and can become hungry, bored, happy or annoyed for example. They communicate this by using their body language. Making moving dogs helps pupils to explore how dogs communicate with their owners, and your pupils' display will help their peers to learn to be safer and more responsible when with dogs.

The poster shows pupils how to interpret dogs' body language so they can tell what a dog is feeling, and how to be safe with dogs. This can be used alongside the activities to help pupils to create models that express a dog's body language, and from this learn about responsible and safe behaviour towards dogs.

Sessions 1 and 4

When pupils start to think about how they could make their electric toy dog, they can think about how they will use it to tell others about dogs. How can dogs show that they are happy, sad, scared or angry, and how they express this using their puppet? Pupils can look at the pictures on the poster and choose a feeling for their puppet to express, to help them teach another person about how dogs express their feelings or about being safe with dogs.

- What features of the dog need to move (for example ears or tail)?
- What feeling does this express?
- Is this a good or bad feeling?
- When might a dog have this feeling?
- How could they use fabric and other materials in their puppet to help show this?

It is important that pupils understand that owning a dog is an important decision, and choosing the right sort of dog is central to this. When choosing a breed for their dog to represent, pupils can consider:

- What sort of dog would be best suited to their circumstances?
- Would it need lots of attention?
- Would it need lots of exercise?
- Would it need lots of space?
- Could you leave it alone, or with children?

Optionally, 'Choose your perfect dog' in the Primary Citizenship resource can support this activity, or you can use information of your own and the experiences of pupils. Pupils can use the support poster or other materials to help them think about how they could change the attributes or dimensions of their dog, to represent their favourite breed, one suitable for their circumstances, or their own pet.

Sessions 5 -7

As they create their electric moving dogs, pupils can discuss how they are modifying a basic dog shape to represent a specific breed, and how different breeds are suited to different owners and circumstances.

Session 8 – evaluation

Using their electric dogs to tell others about the importance of choosing the right breed of dog for your circumstances helps young pupils to remember that design is always for a purpose. As well as its aesthetic and mechanical qualities, how well does their electric dog help them to explain to someone else about the importance of being sensitive to a dog's feelings, and how these are expressed?

Session 9 – display

This is where the pupils' efforts all come together to create an educational display for their peers. Pupils should stay focused on the reason for their display – how can they use their creations, along with some simple words and pictures, to get their messages across about how dogs have feelings, or about safe and responsible behaviour towards dogs?

Session 1: Investigating controllable toys (IDEAs)

Resources

- A selection of controllable toys.

Starter

Tell the children that the big task is to design and make an electrically controlled toy dog that looks like a particular type of dog. It will be up to the children to find ways of using the toys to give people information and to teach them why it's so important to choose the right dog for their circumstances.

Explain that the first task is to make a list of things they need to find out before they can make their toy dog. Stimulate ideas by posing questions. What do they already know about electricity and circuits? How can things move using electricity? What do they know about dogs and different breeds? List their ideas on a large piece of paper for future reference. If necessary, point out the four main things to investigate.

We need to find out...

1. How electricity can be used to make things work
2. How electricity can be controlled
3. About different breeds
4. How to make the toys look like different breeds

Ask the children to brainstorm things that use electricity. Prompt them to think of machines, tools and appliances. How do they work? What parts move? What does the electrical energy change to? Point out that some change electricity into more than one form of energy e.g. hairdryer - heat and movement; TV – light and sound. Remind them of the dangers of mains electricity.

Activity

The children work in groups to investigate controllable toys. Rotate each toy around the groups, or set up the classroom as a 'circus' around which pupils can circulate. The task is to find out how each model works and how it has been made. Remind pupils to look closely at the mechanisms, parts and movement to identify:

- Where the power comes from
- How it's controlled
- How the wheels are driven
- How other mechanisms and parts are linked
- Remind them to keep fingers and objects away from moving parts.

Plenary

One child from each group presents the results to the rest of the class. Introduce and clarify the following vocabulary: axle, wheel, chassis, control, speed, motor, pulley.

Session 2: Drawing labelled diagrams (FPT)

Resources

- Sheet C - Diagram views
- Sheet D - Symbols

Starter

Show the children the diagrams and discuss how they differ. What are the advantages and disadvantages of each view? Which are clearer?

Activity

The task is to draw a labelled diagram of one of the toys from two different views and write a short report explaining how it works, what it's made of and what it does. Remind children of the structure and language features of report texts i.e. non-chronological, present tense, etc. Older or more able pupils can draw the diagram using a CAD programme.

Plenary

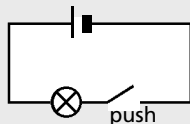
Put the diagrams on display and talk about where improvements could be made.

Session 3 - Investigating electrical control (FPT)

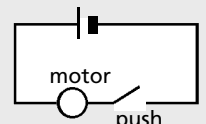
Resources

Four activity stations with an example of each of the following circuits:

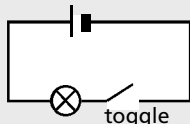
a push-to-make switch with a lamp



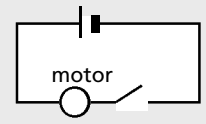
a push-to-make switch with a motor



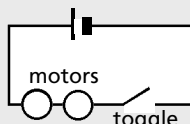
a toggle switch (on/off) with a lamp



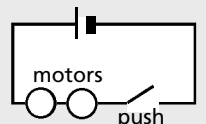
a toggle switch (on/off) with a motor



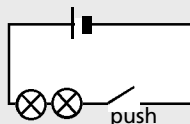
a toggle switch (on/off) with a motor (leads reversed)



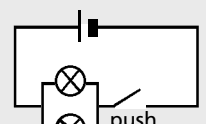
a push-to-make switch with a motor (leads reversed)



two lamps in series



two lamps in parallel



You will need:

- | | | |
|-------------------------------------|--|--------------------------------|
| • wires | • wire strippers | • batteries (not rechargeable) |
| • switches (push and toggle on/off) | • motors (including reversible switches) | • bulb and holder |
| • paper clips | • aluminium foil | • symbols Sheet D |

Session 3 - Investigating electrical control (FPT) cont...

Starter

Recap on previous work on electric circuits. Ask the children to share what they already know and ensure they understand the need for a complete circuit. Show them the resources and ask them to point out the differences in the switches and motors. Demonstrate how to make a circuit; use the wire strippers and connect a switch and lamp or motor to a battery. Remind children how to use tools safely.

Activity

The children can work in groups to begin with. Explain that there are different types of circuits at each station. The children's task is to explore each circuit and then make their own. Remind them to look closely at how each is connected, note what happens when each switch is operated and pay special attention to the direction of the motor spindle. Direct older or more able children to make their own switches using aluminium foil.

Plenary

Discuss each circuit and identify differences. What happens when you stop pressing the push-to-make switch? How did you stop the motor with the on/off switch? Why were the motors turning in different directions? Can they explain the difference between a series and parallel circuit?

Ask the children to suggest how each one could be used to control a toy and what they could add to a motor so it drives something.

Extension

The children can draw circuit diagrams. Give them the symbols sheet and demonstrate how they are used.

Session 4 – Investigating dogs (IDEAs)

Resources

- Books and other resources about dogs
- The support poster
- Internet access to www.dogstrust.org.uk if available.

Starter

Refer to the 'what to find out' list and ask the children to suggest how they can find out about different types of dogs. Remind them that the purpose of their toy is to get across the important welfare message of choosing the right dog to suit your lifestyle and circumstances.

Give the children some background information about the work of Dogs Trust and let them explore the poster. Explain that many dogs are abandoned or unwanted because people choose the wrong dog for their situation. Prompt the children to recognise that dogs not only come in all shapes and sizes, but also have different temperaments and needs. If these needs are not met, some dogs can become difficult to handle. For example, energetic dogs need long walks everyday. Left alone for long periods and they can get bored or frustrated; perhaps ripping things up or becoming snappy. Others are happy to laze around and don't mind being left alone sometimes. Some dogs are very sensitive and don't like being around young children or toddlers (like many teachers they don't like a lot of noise!), others can be dominant and not accept other dogs onto their territory.

Ask them to describe a dog they know or have met. What things did the dog like doing? Did the dog have an excitable or calm temperament?

Activity

Explain that the children will be using the Internet and books to get some information on different types or breeds of dogs. They will need to choose one type, sketch the body and head shape and make notes about their characteristics. Write the following on the board for guidance:

- type of dog
- body shape (sketch)
- size
- coat colour
- coat texture
- temperament
- exercise needs

Direct the children to www.dogstrust.org.uk and relevant sites about dogs. Ask them to suggest key search words. If children have trouble sketching dogs, they can download pictures and trace the outline.

Plenary

Ask the children to share a key fact about their chosen dog and try to make a link with the welfare message e.g. border collies are used for rounding up sheep so they are intelligent and energetic - they will need an active owner who likes walking everyday.

Discuss how the information could be presented; prompt the children to think about making leaflets, posters or fact cards to display alongside their toys. Ask them to think about making catchy slogans to get the message across e.g. If you want a Springer (spaniel), you'll need a spring in your step to keep up!

Session 5 - Investigating textiles (IDEAs) & making sample squares (FPT)

Resources

- Range of textiles and materials including; wools and threads, sand, wood chips, straw, cotton wool, spaghetti, tagliatelle
- Cladding materials: bubble wrap, sponge
- Small squares of card, card, scissors, glue
- Paint (can mix with PVC glue to adhere better)
- Trusty the dog templates photocopied onto card, and finished dog ('Trusty the dog')

Starter

Show the children the template sheet of Trusty the dog as well as a finished cardboard version. Refer to the information found in the last session and ask the children to think about how they can make Trusty the dog look like their chosen breed. Which textiles could be used for the coat or tail? How could the body, head, ear or tail template be changed or improved? How could they use cladding to give shape and form to the main body?

Activity

Explain that there are two tasks. The first is to experiment with a range of textiles to represent different types of coat and tails. The second is to make up Trusty the dog and find ways of cladding it.

Plenary

Share, compare and discuss the results of their investigations. Identify problems and find solutions. Prompt the children to think of how the textiles for the coat can be joined to the cladding.

Session 6 - Making a simple chassis and pulley mechanism (FPT)

Resources

- As per session 3
- Wooden strips, dowelling, card, wheels, elastic bands,
- Drill, saw, G-clamp

Starter

Make a completed version of the wooden frame chassis. Show it to the children and ask them to identify the stages you went through to make it. Discuss and ask the children to find solutions to the following:

- How can you find the mid point of the wheel?
- How can you find the right position for the axle holes on the chassis?
- How can you join the axle to the chassis?
- How can you stop the belt slipping off the pulley?

Demonstrate the following as necessary

- Marking out the centre point of the wheels using crossing diagonals
- Correctly marking and drilling 4 holes in the chassis frame for the axle to pass, OR punching holes in card triangles and attaching to chassis to make axle bearings

Activity

Give the children instruction sheet B and read through as a class before they start.

Plenary

Discuss problems and solutions. Use their examples to develop a check list:

- Is there a complete circuit?
- Are the connections good?
- Is their power in the battery?
- Do the axles rotate freely?
- Is the pulley belt too tight or too loose?
- Is the load (battery & motor) too heavy for the vehicle or in the wrong place?

Session 7 – Design Decisions (DMA) and designing & making a motorised dog toy (DMA)

Resources

- As per session 3 & 6
- Sheet A - Design Decisions

Starter

Refer to the 'we need to find out' list and ask the children if they think they are ready to design and make their own toy. Ask them what decisions they need to make before they start and go through the Design Decisions sheet. The children can work in pairs adapting the Trusty the dog template or work from scratch. Remind the children to consider how the wooden chassis will be attached to the main body.

Activity

Several sessions will be needed for children to complete their DMA and to produce their leaflet, poster or fact card.

Plenary

Encourage children to discuss progress and share ideas for developing or improving their designs. The children can identify ways of evaluating the finished products against the design criteria. The toys could be presented to the parents, teachers or governors. Contact could be made with the nearest Dogs Trust Rehoming Centre for the toys to be used as an educational display.

Session 8: Evaluation (DMA)

Resources:

- Sheet B - Evaluation

Use the evaluation sheet provided for pupils to evaluate their designs. Discuss how problems were solved and how the final version differed from the design criteria. How did they use their design to help communicate an important message about the importance of choosing the right breed of dog? How could they use their design in the future? What other designs could they make and use?

Session 9: Create a display

Resources:

- Pupils' dog models
- Display materials, such as coloured sugar paper, plain paper, marker pens and paint.

Pupils should follow up their moving picture making by creating a display of their work, to communicate their chosen key messages. This can show each moving picture along with a description of the emotion it is designed to convey, and the importance of this for a responsible dog owner. Individual models can be brought together using a central theme, for example, 'what your dog is telling you'. Pupils can provide responses to these emotions by explaining how responsible dog owners can prevent their dog being lonely or afraid, and how to nurture a happy, playful companion, in their own words.

Their display could include:

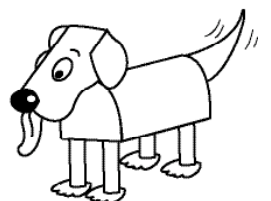
- A bold title
- An eye-catching layout
- A main panel highlighting the key safety messages
- A small panel by each dog model, explaining how it can be used to learn more about being safe and responsible when with dogs
- Information about Dogs Trust

Development and extension ideas

The children will make toys that represent different types of dogs. They will need to decide how their toys can be used to give people information about particular dogs *and* teach them why it's so important to choose the right dog for their circumstances.

The tales of Muffin and Biff (*Literacy* resource pages 5 & 8) can be used to discuss the consequences of irresponsible ownership. Caring for Flick (page 7) will provide a good starting point for discussion. Prompt the children to identify the different needs of Zippy (an energetic puppy) and Flick (an older dog). The children can describe the type of owners that would be able to take proper care of Zippy and Flick.

The ideas for using other Dogs Trust resources with Unit 5c can also be used here.



Design Decisions – motorised toy dog

Name _____

1. What will your toy dog look like? (draw a diagram showing the outside)

2. How will your toy be controlled? (draw a diagram showing the inside)

3. What breed of dog will your toy represent? _____

4. What are the characteristics of this breed?

- size _____
- coat colour _____
- coat texture _____
- temperament _____
- exercise needs _____

5. What sort of person or family would this breed be suitable for?

- A family with young children ☐
- A family with older children ☐
- A couple or single person without children who like walking ☐
- An older couple or older person who are not very active ☐

6. How will you make your toy look like this breed? (explain what textiles you will use and how will you give it shape?)

7. What material, tools and equipment will you need? (List everything you need to make your toy)

Sheet B - Evaluation Sheet

- 1 What was your toy used for? _____

- 2 What emotion does your toy show? _____

- 3 What did you use to make each body part?
 - The main body was made _____
 - The ears were made _____
 - The eyes were made _____
 - The tail was made _____
 - The nose was made _____
- 4 How much does it look like a dog?

- 5 Which part moves?

- 6 How does it move? (explain how you made the electric system and how you attached it)

- 7 What other materials did you need?

Sheet C - Wooden frame chassis with motor

Making a wooden frame chassis with motorised wheels - paw by paw instructions

1. To make the frame chassis:

- Cut two 13cm lengths and two 10cm lengths of wood
- Join and strengthen it with card triangles to make the frame
- When dry, mark and make holes for the axle

2. Make four wheels

- Mark out the centre points on each wheel
- Use g-clamp to hold wheel and drill hole

3. Make the pulley

- Use a small wheel; sandwich and glue it between two larger wheels (made from cardboard). Leave to dry

4. Make the axles

- Cut two pieces of dowelling rod of the right length. Put one axle on. Add the washers and fix the wheels

5. Attach the pulley

- Mark the centre point on the pulley, clamp and drill a hole. Put the axle through one side of the chassis and then the pulley. Add the washers and fix the wheels

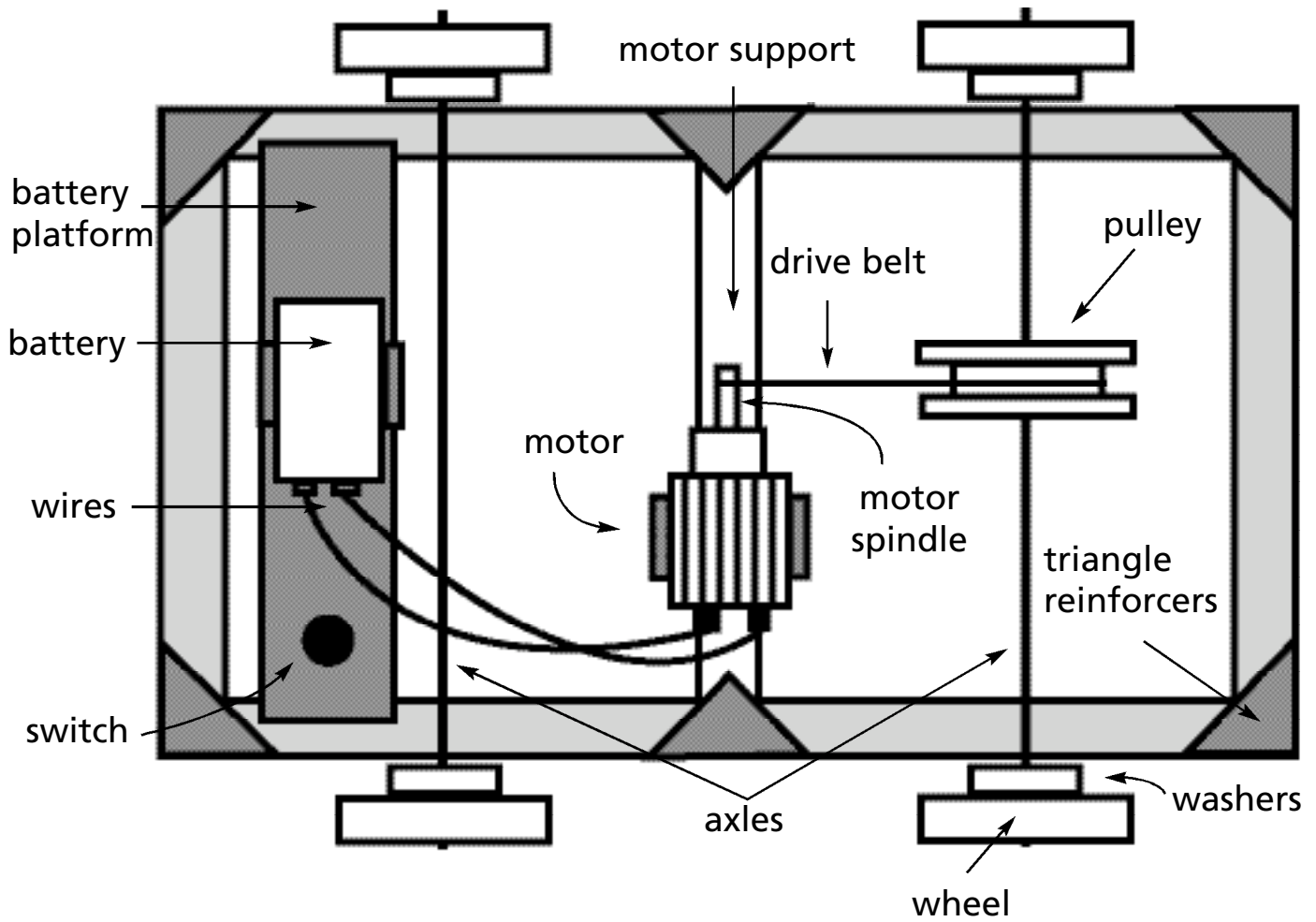
6. Work out the correct size for the motor and battery supports, cut the cardboard, glue in position and leave to dry

7. Position the motor and battery, complete the circuit with wires and a switch

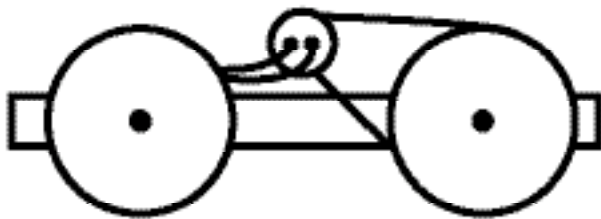
8. Mount the drive belt and...make adjustments... you're off

Sheet C - Wooden frame chassis with motor

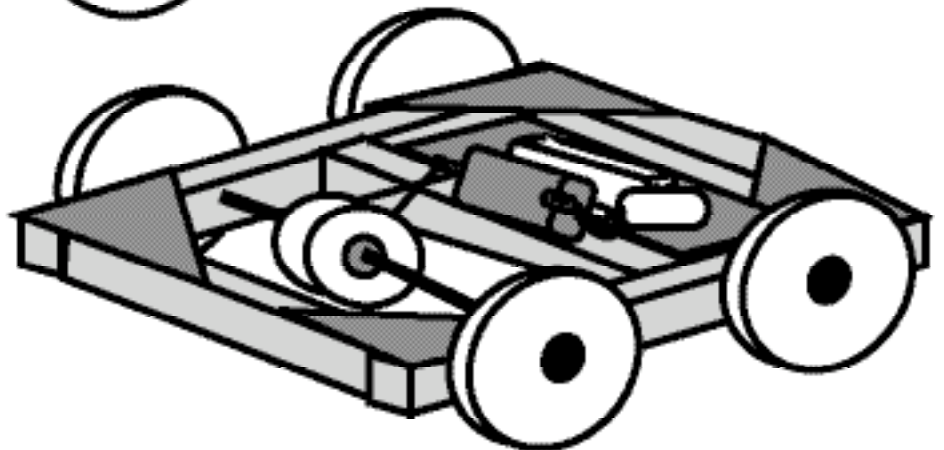
Plan view



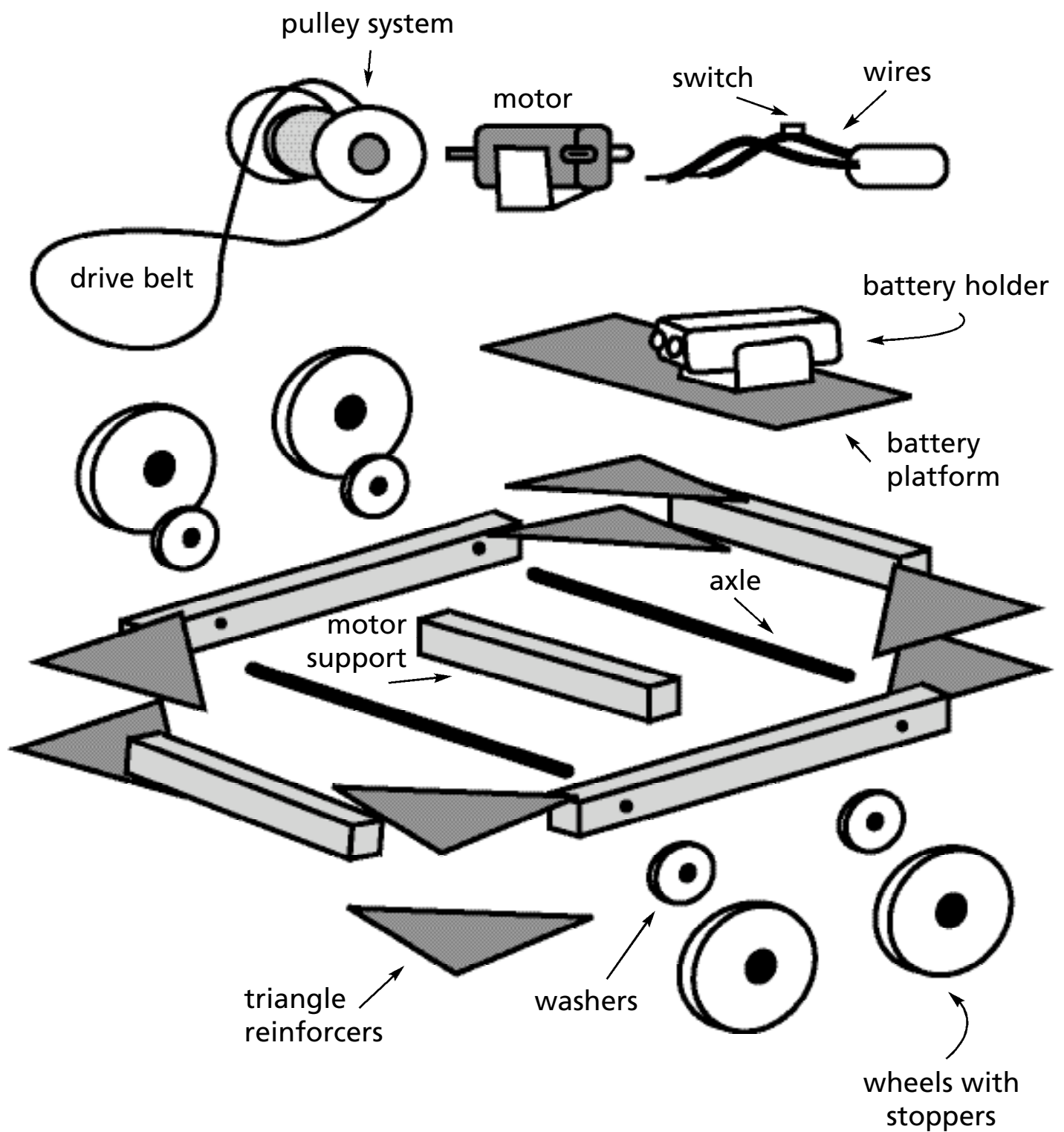
Side view



3-D view



Exploded view of a simple chassis



Sheet D - Symbols



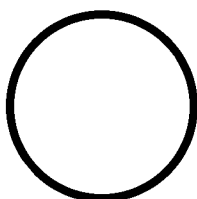
battery



switch



lamp



motor

