

Red Squirrels in Northern Ireland

Teacher's resource pack



Preface

This pack has been designed for use by teachers in schools. Northern Ireland Environment Agency (NIEA) is an Executive Agency of the Department of Agriculture, Environment and Rural Affairs. The pack is part of the commitment NIEA has made to biodiversity in general and the conservation of the red squirrel in particular.

There has however been a considerable re-write of the earlier 2006 edition of this booklet.

This version of the Red Squirrels education book was completed in 2017 by the NIEA Wildlife Team and members of Northern Ireland Squirrel Forum (NISF). The exercises are designed to meet the requirements of the Northern Ireland National Curriculum.

Acknowledgements

Richard Hyde & John Griffin
DAERA NI Forest Service

Rose Cremin
Fermanagh Red Squirrel Group

Mr Oliver Townsend & P7 Pupils
Springfarm Primary School, Antrim

Eileen Fleming,
Graphics

Input from the members of Northern Ireland Squirrel Forum

Photo credits

Cover Photograph, Mark Hamblin.

Images reproduced by kind permission of:
Jon Lees, Mark Hamblin, John Doherty, Laurie Campbell & DOE Publishing Unit.

Contents

Introduction

Exercise 1

Red squirrel facts

Teacher's notes	3
Student exercise	3

Exercise 2

The red squirrel: Adaptations, habitat and diet

Teacher's notes	7
Student exercise	7

Exercise 3

The red squirrel - The road to extinction

Teacher's notes	10
Student exercise	11

Exercise 4

How many squirrels?

Teacher's notes	15
Student exercise	18

Exercise 5

Red squirrel scavenger hunt

Teacher's notes	21
Student exercise	22

Exercise 6

A year in the life of a red squirrel

Teacher's notes	23
Student exercise	23

Exercise 7

Red squirrel models

Teacher's notes	26
Student exercise	26

Exercise 8

Red squirrel games

Teacher's notes	30
-----------------	----

Exercise 9

Red squirrel wildlife film - The grey stranger

Teacher's notes	32
Student exercise	32

Exercise 10

Survey of red and grey squirrels

Teacher's notes	33
-----------------	----

Introduction

This text is designed to help teachers bring home the message on nature conservation at a local level. The red squirrel is probably the most high profile under threat mammal species in the UK and ROI. It's story encompasses a number of themes which are common across conservation.

There are populations of red squirrels remaining across Northern Ireland and opportunities for field visits exist including the four 'Red Squirrel Safaris' in the Glens of Antrim. However all wild mammals are shy and are difficult to study, so spotting them in the wild is far from guaranteed. Field signs and local knowledge of their presence will be important. The most obvious of these are nibbled cones, or hazel nuts that have been split in half. Another potential resource is the captive population at Belfast Zoo; this project breeds red squirrels for conservation and education purposes. The small number of animals kept at Belfast Zoo can be spotted by eagle-eyed visitors.

Whether there is direct contact with red squirrels or not, they are an interesting subject for study. Not only are they extremely charismatic creatures, but they also help illustrate the pressure much of our wildlife faces as a result of human activity.

Glens of Antrim red squirrel safaris
www.glensredsquirrelgroup.com/red-squirrels/safaris/

Teachers can use this pack whether they have direct contact with squirrels or not, and can use certain exercises and ignore others, as the subject introduces themes including biodiversity, non-native invasive species, conservation, wildlife management, and disease impacts. It covers and reinforces a number of aspects of the Northern Ireland Curriculum.

Although specifically dealing with red squirrels, the pack is underpinned by a respect for all living things. 'Biodiversity' is the term used to describe all living things.

The need to preserve biodiversity is inherent in the approach used in the pack. This pack has been designed to be used by KS2 children, but many aspects are pitched at a higher level. Many of the exercises will suit KS3 children equally well. With respect to the KS2, a total curriculum approach has been adopted.

Exercises give opportunities to practice various aspects of the curriculum:

The World Around Us, Numeracy, Literacy, and STEM. Some of the exercises are classroom based. Others demand an outdoor setting.

Teachers already familiar with this curriculum will see the links as they move through the exercises. However, some of the connections are outlined in the next section. All relate to KS2.

1 Exercise 1

Red Squirrel Facts

Teacher's notes

This exercise is best used as a group activity and discussion document. Exercises 1, 2 and 3 are designed to furnish pupils with the basic facts to tackle later exercises and should be referred to throughout the project. Exercise 1 assumes knowledge of the difference between coniferous and broadleaf trees. All other new concepts are explained within the text. The cloze procedure is designed to be easy with highlighted clues within the text.

Student exercise

Red squirrels have bodies that are well adapted to living in trees. Their flexible bushy tails help them to balance and keep them warm in winter. They can climb headfirst down tree trunks. Red squirrels live mostly in trees and are very agile climbers, although they will at times run along the ground.

Red squirrels were once common in both broadleaf and coniferous woods. This is their natural habitat. Here they find food depending on the time of year. In the autumn they eat the nuts of trees such as oak, hazel, sweet chestnut and beech. They also eat fungi and berries. In the winter they rely on buried nuts and smaller seeds. In springtime red squirrels eat flowers and birds' eggs. In the summer time they are able to eat cones in coniferous forests.

A squirrel's home is called a drey. This is shaped like a football, which it makes from twigs, lining the inside with hair and moss. It usually builds its drey in the fork of a tree or sometimes in a tree hollow. The drey is used to rest, especially during the cold days of winter. Squirrels do not hibernate, but remain active. In spring a special drey is used to rear the young, which are called kits. The male takes no part in rearing the young.

Red Squirrel



Like all our wild mammals, red squirrels are afraid of people and are difficult to see. We know they are present by looking for signs. Probably the easiest sign to find is nibbled cones under trees.

The history of squirrels in Ireland

At the end of the ice age, roughly 10,000 years ago, trees spread back into Ireland. Red squirrels were able to exploit this new habitat. The forests covered 80% of the landscape. Squirrels were probably very common. Neolithic farmers arrived 6,000 years ago and began to remove the forests to make farms and to use the timber. By 1700 very little woodland was left. All animals need a habitat. The removal of the Irish forests led to the red squirrel becoming extinct or nearly extinct. Red squirrels were re-introduced about two hundred years ago. They did very well and became common again in the available woodland.

The American grey squirrel was introduced to Ireland in 1911. While only 12 animals were ever released they spread very quickly. Where they arrived the red squirrel generally disappeared. It is now known that the grey squirrels can spread disease, outcompete the reds for local food resources and can produce more young than the reds. Red squirrels had lived in both broadleaf and coniferous woods. Since the arrival of the grey squirrel the red squirrel has survived best in coniferous woods. Unfortunately this pressure from the grey squirrel, has put the red squirrel in danger of extinction in Ireland.

Squirrel fact file

Squirrels belong to a large family of small or medium-sized rodents called the Sciuridae. The family includes tree squirrels, ground squirrels, chipmunks, marmots, flying squirrels and prairie dogs.

Fact File

Body length:	20 - 22cm
Weight:	250 - 300g
Colour:	Variable bright red to dark brown, often with 'bleached' tail and ears, with a paler belly
Ears:	Tufted in winter
Habitat:	Predominately restricted to coniferous forest
Diet:	Seeds, nuts, buds, fungi and berries
Breeding:	1 - 2 litters with 3 - 4 kits
Pox Virus:	Very susceptible - Most die within 10 - 14 days of infection
Range:	Across much of Europe and northern Asia, with various subspecies across that range.



Native European Red Squirrel
(*Sciurus vulgaris*)

Squirrels are indigenous to the Americas, Eurasia and Africa and have been introduced to Australia. Unlike rabbits or deer, squirrels cannot feed upon cellulose and must rely on foods rich in protein, carbohydrates, and fat.

In temperate regions, early spring is the hardest time of year for squirrels, because buried nuts begin to sprout and are no longer available for the squirrel to eat, and fresh food sources have not become available yet. During these times squirrels rely heavily on the buds of trees. Squirrel diets consist primarily of a wide variety of plant food, including nuts, seeds, conifer cones, fruits, fungi and green vegetation. However, some squirrels also consume meat, especially when faced with hunger. Squirrels have been known to eat insects, eggs, and young birds.



Fact File

Body length:	25 - 27cm
Weight:	400 - 600g
Colour:	Variable: normally grey, often with hints of reds, browns and in some places black. All generally with a paler belly
Ears:	Never tufted
Habitat:	Largely broad-leafed forest or parkland, can use mature hedgerows and gardens
Diet:	Wide ranging, similar to red, plus large seeds, acorns, blubs, flowers, human food, contents of bird feeders
Breeding:	2 - 4 litters with 4 - 6 kittens
Pox Virus:	Carrier, but largely unaffected
Native Range:	Eastern United States of America and Southern Canada. Introduced to UK, Ireland, Italy and South Africa (was eradicated from Australia in 1973).

Non-native American Grey Squirrel
(*Sciurus carolinensis*)

Student worksheet

Fill in the missing words for these sentences.
Use the best word from the passage you have read previously.

1. Rats, mice and squirrels are _____
2. Squirrels are _____ to living in the trees.
3. The red squirrel's _____ is coniferous and broadleaf forests.
4. The home of a squirrel is called a _____
5. Nibbled cones are the best _____ that squirrels are present.
6. Red squirrels first came to Ireland after the _____ age.
7. Squirrels were very common as forest covered _____ of the country.
8. The _____ farmers began to cut down the forest 6,000 years ago.
9. The red squirrels now live mostly in _____ forests.
10. Grey squirrels in our forests lead to the red squirrels becoming _____

2 Exercise 2

The Red Squirrel - Adaptations, Habitat and Diet

Teacher's notes

This exercise is designed to form a basis of discussion about the red squirrel and its lifestyle. The habitat section allows the children to think about the different types of life forms present within the woodland, which the squirrel exploits for food. The pupils can either draw or cut out the illustrations. A visit to a woodland or park would obviously be of benefit, even if squirrels are not present (see exercise 5).

Student exercise

To understand the red squirrel or any creature, we need to use a number of special words.



Draw a picture of the squirrel. Label it with its special adaptations.

Student exercise



Red squirrels are able to build their dreys in the forks of tall trees or in tree hollows.

Adaptations

- Senses:** Sight, hearing and smell are very good. They help it find food and avoid danger.
- Teeth:** Rodents' teeth grow throughout their lives, to allow them to eat hard nuts and seeds.
- Fur:** Keeps it warm and camouflaged.
- Paws:** Allows squirrel to grip food.
- Tail:** Helps squirrel to balance and keeps it warm.
- Back legs:** Have special joints which twist and allow the squirrel to climb down trees.

Habitat Diet

Red squirrels are adapted for life in the trees. They need quite large forests to live in as they need a lot of food. This forest is their habitat. Here they can find enough food all year round to survive. What they eat is called their diet. They are also able to build their dreys in the forks of tall trees or in tree hollows. Here they can be safe at night and raise their young. Red squirrels are very good climbers. Life in the trees keeps them safe from most predators. Red squirrels can live in either broadleaf or coniferous forests, but are better adapted than grey squirrels for life in coniferous forests.

Squirrel food

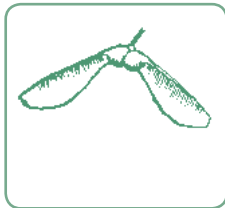
Here are some pictures of what a squirrel might eat. Use the list below to label them correctly: Discuss when they would be available.

Label these foods to show what is available at different times of the year: spring, summer, autumn and winter. Note that cones have seeds in them during the summer.





















Word List

Acorns, hazel nuts, cones, birds' eggs, fungi, seeds, berries, flowers, apples, buds.

3 Exercise 3

The Red Squirrel - The Road to Extinction

Teacher's notes

The decline of the red squirrel is discussed from the point of view of habitat destruction and introduced species. Discussion could be expanded to examine the idea of species loss in other contexts, e.g. tropical rainforests. This involves the concept of 'biodiversity'; which the red squirrel illustrates very well. The map requires the children to apply knowledge already gained in the previous exercises. The map is a constructed landscape and refers to no actual place, but tries to illustrate the way the landscape in general affects squirrels.

The first six questions require basic map reading skills. **Question 6** assumes that in most cases red squirrels now occupy coniferous woods and are now absent from broadleaf woods. **Question 7** refers to the grey squirrel's capacity to live in hedges. They would have used these hedges to invade Killnua Wood (see Exercise 3). **Question 8** refers to the affect of rivers on squirrel dispersion. No clues have been given, but pupils may work out that squirrels find rivers a barrier, although they can swim. **Question 9** is basic map reading. Knock Wood has no hedges around it indicating that it is on high ground. **Question 10** can be answered by saying that Knock Wood is coniferous and isolated by rivers and a lack of hedges making it difficult for grey squirrels to invade.

Further clues exist in the place names derived from the Irish used for this constructed landscape.

Clues

Knock = Cnoc = Hill
Killnua = Coill Nua = New Wood
Dacrann = Dhá Chrann = Two Trees
Shankill = Seancoill = Old Wood
Glendara = Gleann Darach = Oak Glen

Student exercise



An endangered species

Red squirrels have lived in Ireland since the last ice age 10,000 years ago. The forests were so extensive that they covered 80% of the country. It is said that they could travel from Malin Head in the north of Ireland to Mizen Head in the south and never have to touch the ground. They could not do this today as so little forest is left. In NI, there is 8% tree cover, with 6% coniferous forest and 2% broadleaf forest. Most of the forest had been harvested for timber by 1700. It is believed that around this time there were very few squirrels left in Ireland. Whether they were totally extinct is unclear. They were re-introduced to Ireland about 200 years ago. Where the woodland cover remained they did very well.

Clues

Depending on the types of trees growing in the forest the reds and greys can live together for as long as twenty years, but usually the reds disappear much more quickly. There is little evidence to say that the greys attack the reds directly, but greys will chase the smaller reds away from a food resource where both are present. Greys are capable of eating certain seeds, fruits and nuts before they would be ripe enough for a red to eat them. Therefore, grey squirrels can strip a food resource from a woodland. Once established, grey squirrels breed more quickly than red squirrels and the greys spread easily across the countryside using hedges as corridors. Grey squirrels are known to carry disease that appears to do them no harm but it is fatal to reds. Known as Squirrel Pox, it spreads quickly amongst a group of reds in the forest and most will quickly die.

Non-native invasive species

With pressure from the grey squirrels, the red squirrels now do best in coniferous woods where trees such as Scots pine, Norway spruce and larch grow. These trees have large cones, which the red squirrels like to eat. Such woods are generally on higher ground.

What can be done to prevent the red squirrel becoming extinct?

In areas which contain only red squirrels, volunteers can help look after them by providing extra food during lean times, watching out for invading grey squirrels and planting more trees that support red squirrels. There is no future for the red squirrel where the grey persists. The only way to safeguard the native species is to humanely remove the non-native invader.

Scientists have identified forests with the right mix of trees to support red squirrels. These areas are chosen as they are unattractive to greys but they require frequent monitoring to ensure they are kept free of greys. Where necessary greys are humanely removed. Where the two kinds of squirrel live together the red squirrels can be fed from feeders that restrict grey squirrel usage, but removal of the grey squirrels is a priority.

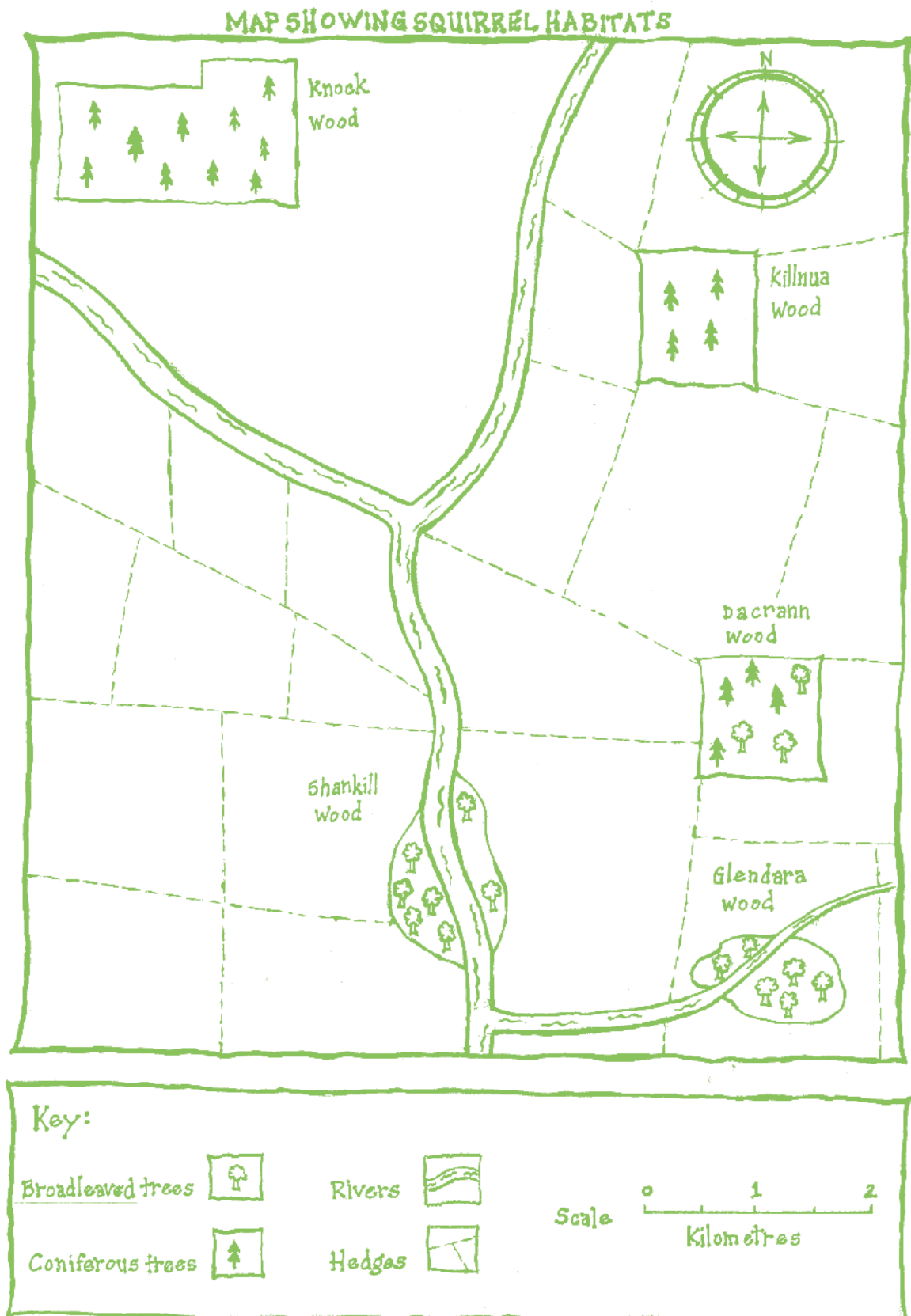
Vaccines that protect the reds from the Squirrel Pox

Scientists are working on vaccines (medicines) that protect the reds from the Squirrel Pox and they are also investigating drugs that stop the greys breeding. Neither of these methods are ready to be used in the field yet, but they may prove useful in the future.

Ultimately the only way to secure the future of the red squirrel in Northern Ireland is the complete removal of the grey squirrel from the island of Ireland.

Map showing squirrel habitats

Examine the map below. Then use the information from the passage on page 10 to answer the questions on the following page, page 14.



Student worksheet

1. Which wood is the furthest north? _____

2. Which is the largest wood? _____

3. Name the two broadleaf woods? _____

4. Name the two coniferous woods? _____

5. Which is the only mixed wood? _____

6. Which wood is most isolated, the furthest from the other woods?

7. Killnua Wood has the right kind of trees, but is not likely to contain red squirrels. Why is this the case?

8. How might the rivers affect the spread of grey squirrels?

9. Knock Wood is on high ground. Is there anything on the map to suggest this?

10. Which wood is most suitable for red squirrels?
Give reasons for your answer.

11. Grey squirrels in our forests lead to the red squirrels becoming

4 Exercise 4 How Many Squirrels?

Teacher's notes

Pupils will also need to use what they have learnt from previous chapters to answer the questions. The series of graphs show the gradual invasion of grey squirrels from 1988 to 2013. By 2008 the red squirrels are confined to just one wood, Knock Wood. It is better to thoroughly discuss the meaning of the graphs as a group activity before attempting the questions.

Questions 1 - 6 are fairly straightforward in that they require only that the graphs be interpreted. **Question 7** relates to the type of trees in Knock Wood.

We can presume these are mostly Sitka spruce as so few squirrels live there. The general direction of movement asked for in **Question 8** is north. This relates to the gradual spread of grey squirrels in Ireland. **Question 9** is in essence a repeat of **Question 10** from the previous chapter. Knock Wood is isolated. It is a coniferous forest more suited to red squirrels and it has no hedges around it which would facilitate a grey squirrel invasion.

Discussion Questions

The discussion questions can be tackled on a group basis. The first question will allow the children to interpret the trend the graphs indicate, i.e. the gradual occupation of woods by grey squirrels and the extinction of red squirrels. The second discussion allows the children to review a number of options which have been tried to help the red squirrel.

The graphs can be used to tell the story of what happened to red and grey squirrels from 1988 - 2013. What is this story?

The following methods have been considered or tried to help conserve red squirrels. Discuss the strengths and weaknesses of the methods listed below. Remember no singular action is likely to conserve the red squirrel on its own.

- (a) Humane killings of the grey squirrels by traps, and or shooting.
- (b) The widespread use of rodenticide (Rodent killing) poisons.
- (c) Use special feeders to feed the red squirrels but not the greys.
- (d) Make sure that woods chosen to preserve the red squirrels have no hedges near them.
- (e) Plant new woods made up of coniferous trees but not Sitka spruce.
- (f) Replant old Sitka spruce woods with other types of coniferous trees.
- (g) The vaccination of red squirrels against squirrel pox disease.
- (h) The use of drugs that stop the grey squirrels breeding.
- (i) Why do you think it is important to preserve the red squirrel in Northern Ireland?

- (a) Depending on the students in your class, the idea of killing grey squirrels to protect reds may receive a mixed response. However, the reality exists that some sort of grey squirrel control will be necessary as part of an integrated approach to conserve Ireland's red squirrels and protect its young forests from damage. Trapping or shooting of grey squirrels to stop them spreading into red-only woodlands is likely to be required as a key conservation measure.
- (b) Poisoning, was used in grey-only areas of England, is not generally suitable for use in Ireland, owing to the widespread nature of the red squirrel in this country. The portrayal of the grey squirrel as a pest species (the 'tree rat') may make the concept of control more palatable; students from more rural backgrounds may be generally more receptive to vermin control. There are no legally permitted pesticides currently available.
- (c) Special feeders have been trialled which exclude the grey squirrels. However, it has not been properly successful as it proved difficult to select a diet which would support red squirrels. This may best be applied as a means of supplementing the diet of red squirrels in areas where food supply is poor, or in forests where red squirrels have been deliberately introduced; this has recently taken place in Belleek Wood in Co. Mayo and Derryclare in Co. Galway. Supplementary feeding works well in association with grey surveillance and local control.
- (d) Isolating Safe Zones is necessary to prevent grey squirrels invading. However, grey squirrels will disperse rapidly along treelines beside rivers and through gardens of inhabited areas.
- (e) Planting Schemes are a possibility, but would take a long time to work as the trees need to be mature before they produce suitable cones. It would also be very expensive. However, it may be feasible in some areas of the country that still have red squirrels and where the planting of new forests is planned; the west of Ireland may be particularly suitable in this regard.
- (f) Diverse Planting Scheme is probably the best long-term solution for conserving red squirrels, though it does little to reduce the spread of grey squirrels. Where red squirrels still flourish in coniferous woods extra help can be given by replacing the dominant Sitka spruce with more suitable coniferous trees which produce a larger cone. It is not a quick fix as the trees would take a long time to produce suitable cones. Red squirrels could survive in small numbers in the Sitka forest, which do not suit grey squirrels. They could then take advantage of the larger cone bearing species. Suitable tree species for such replacement include European larch, Lodgepole pine, Norway spruce and Scots pine, the latter actually being a native Irish tree species.

- (g) Several scientific solutions are being explored but are not ready for field trials at this stage; the use of immuno-contraceptives - using chemicals to prevent pregnancy - thereby reducing the number of grey squirrels
- (h) Secondly the possibility of using vaccines to prevent the spread of Squirrel Pox is being investigated - this could prevent local red squirrel extinctions. Both these methods are extremely labour intensive and non-target specific, therefore the mechanism for chemical delivery must be robust to prevent non-target contamination.

This question is an open ended one. It might lead to a number of important related topics: conservation, biodiversity, sustainability and endangered species in other parts of the world.

Student exercise

When an animal is in danger of extinction it is very important to keep a check on its numbers. Scientists have surveyed the five woods on the map in the previous exercise counting the number of red and grey squirrels.

This check was made every ten years in 1988, 1998, 2008 and a midterm survey in 2013. The number of squirrels depends on a number of factors: the size of the wood, the type of trees in the wood, the capacity of the types of trees to support the different types of squirrel, and the presence of predators or hunters.

Generally, the bigger the wood the more squirrels it will support. However greys live at higher densities than reds (that is you would expect to see more greys in a given area than reds in a similar sized area). Both types of squirrel can live in broadleaf and coniferous woods. In Ireland, coniferous woods have been planted by people. They cover around 5% of the island of Ireland. Approximately 60% of these woods are Sitka spruce, a non-native tree favoured for timber production. These grow quickly and thrive on poor soil so they are good trees to plant in upland areas. Its cones are small and they produce a small seed which does not provide the squirrel with very much energy. The reds will eat them where there is no other food available and the greys avoid them. This means that a broad band of Sitka spruce planted around the perimeter of the forest can act as a barrier to invading greys. The best species of coniferous trees for red squirrels are: Scots pine, Norway spruce, and the larch species, as these supply the most energy to the squirrels. The best woodlands contain a mix of tree species with a good age range of trees, so that there is a more continuous supply of food for the squirrels.

On the next page, are the results of the scientists' survey shown in graph form. Examine the graph carefully and then answer the questions on the following page.

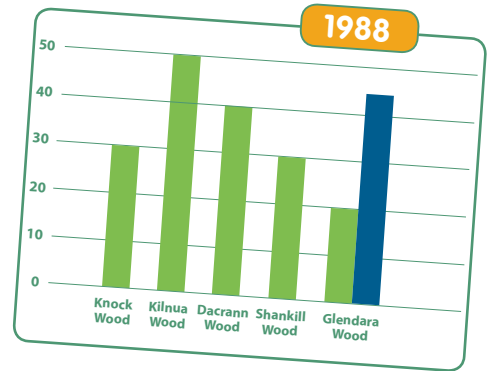


The best species of coniferous trees are Scots Pine

Squirrel survey

- How many red squirrels were there in Killnua Wood in 1988?

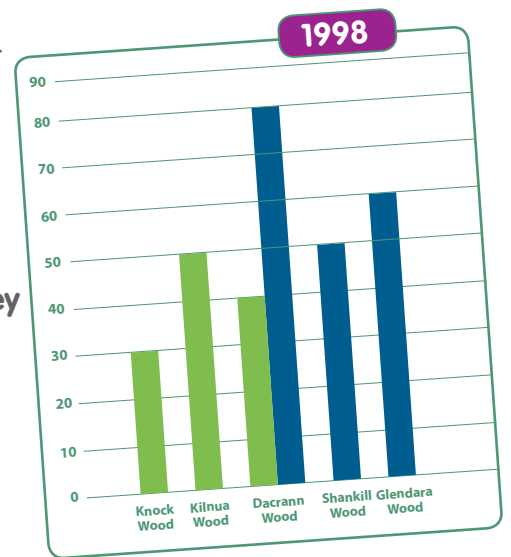
- How many grey squirrels were there in Killnua Wood in 1988?



- Which was the only wood with grey squirrels in 1988?



- How many woods had grey squirrels in 1998?



- Which was the only wood that had both red and grey squirrels in 1998?

- Which was the only wood free of grey squirrels in 2008?

- Knock Wood is the largest wood. Is there any reason why it supports so few squirrels?

- By using the graph and the map from the previous exercise, you can work out which direction the grey squirrels moved. What direction was it?

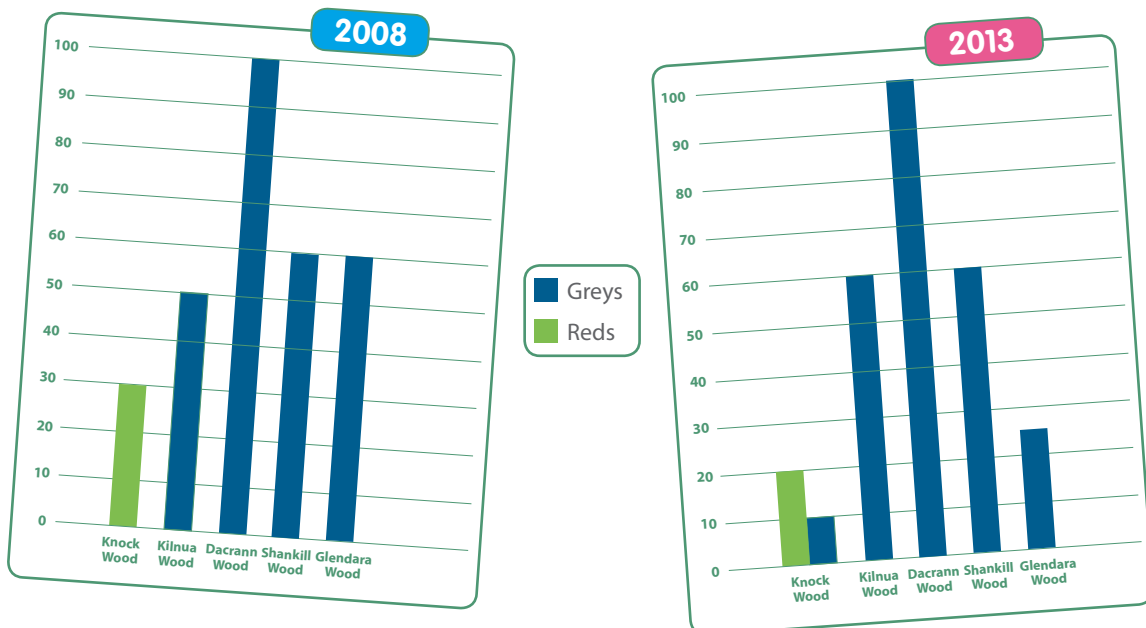
- Knock Wood was the only wood to keep red squirrels by 2008. Why has this happened?

- Grey squirrels in our forests lead to the red squirrels becoming?

Discussion

The graphs can be used to tell the story of what happened to red and grey squirrels from 1988 - 2013. What is the story? The following methods have been considered or been tried to help conserve red squirrels. Discuss the strengths and weaknesses of the methods listed below. Remember no singular action is likely to conserve the red squirrel on its own.

- Humane killing of the grey squirrels by traps, and/or shooting.
- The widespread use of rodenticide (rodent killing) poisons.
- Use special feeders to feed the red squirrels, but not the greys.
- Make sure that woods chosen to preserve the red squirrels have no hedges near them.
- Plant new woods made up of coniferous trees but not Sitka spruce.
- Replant old Sitka spruce woods with other types of coniferous trees.
- The vaccination of red squirrels against Squirrel Pox disease.
- The use of drugs that stop the grey squirrels breeding.
- Why do you think it is important to preserve the red squirrel in Northern Ireland?



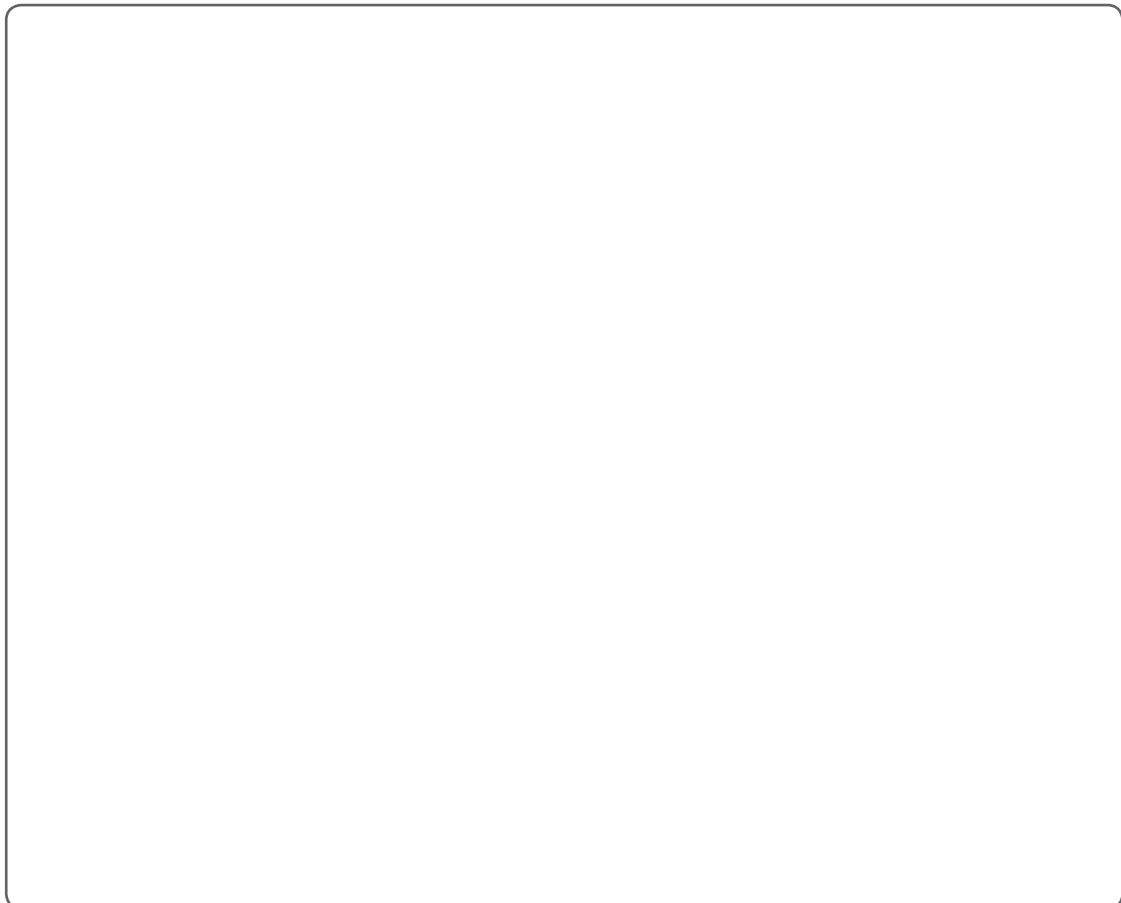
5 Exercise 5 Scavenger Hunt

Teacher's notes

The scavenger hunt aims to collect or draw 5 items used by squirrels in the natural environment as listed on the pupil's sheet. This is an outdoor activity best conducted on a visit to a wood or park, or alternatively around the school grounds where available. The game should be tailored to meet the habitat being used. Items don't have to be physically collected to avoid habitat destruction; the students can find an item and draw it in situ. An element of competition often helps with the enthusiasm for gathering samples. Not all the items will always be available throughout the year, which is also true for the squirrel. A poor harvest can be used to illustrate the squirrel's difficulties in finding food at different times of the year. Obviously, autumn will produce the best results. The list could be supplemented for other times of year by replacing the items on the list.

Students should wash their hands after the exercise.

The collage should be easy to make, but fungi should be avoided as they rot too easily. The group could help construct one drey, which can be made from flexible twigs. The shape should be roughly football shaped with an entrance at the top. The inside can be lined with dry grasses, discarded feathers and hair. Leaves can be added to the outside of the twigs.



Student exercise



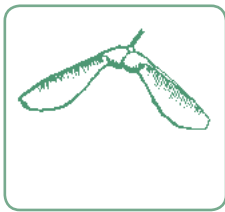
Twigs



Hazel Nuts



Berries



Seeds



Fungi



Hair/feather



Eggs



Fruit



Cones



Acorns



Squirrels



Trees

Art Work

Make a collage of what you have found. Using a big picture of a squirrel in its habitat as a background make a model of a squirrel's drey. Use the twigs, leaves, hair and feathers.

Note: Safety first - wash your hands after the scavenger hunt.

6 Exercise 6

A Year in the Life of a Red Squirrel

Teacher's notes

This exercise allows the children to examine the seasonal changes in the life of a squirrel especially feeding and breeding. Making a second calendar of the pupil's life would allow the contrasts between a squirrel and a human to be made.

Student exercise

Below is a description of what red squirrels do during different months.

January	Cold, dark and little food available. Squirrels mate.
February	Drey building.
March	First litters are born. Males take no part in rearing the young.
April	Adults moult. Young come out for first time.
May	First young leave home. Squirrels eat flowers and buds.
June	Cones available.
July	Summer litters born, if enough food available.
August	Most food available: berries, cones and nuts. Second moult.
September	Summer litters leave home.
October	Squirrels heaviest. Ready for winter.
November	Squirrels eat fungi. Activity falls because it's colder.
December	Cold and dark, little food available. squirrels rely on their food caches.

Squirrel activity calendar

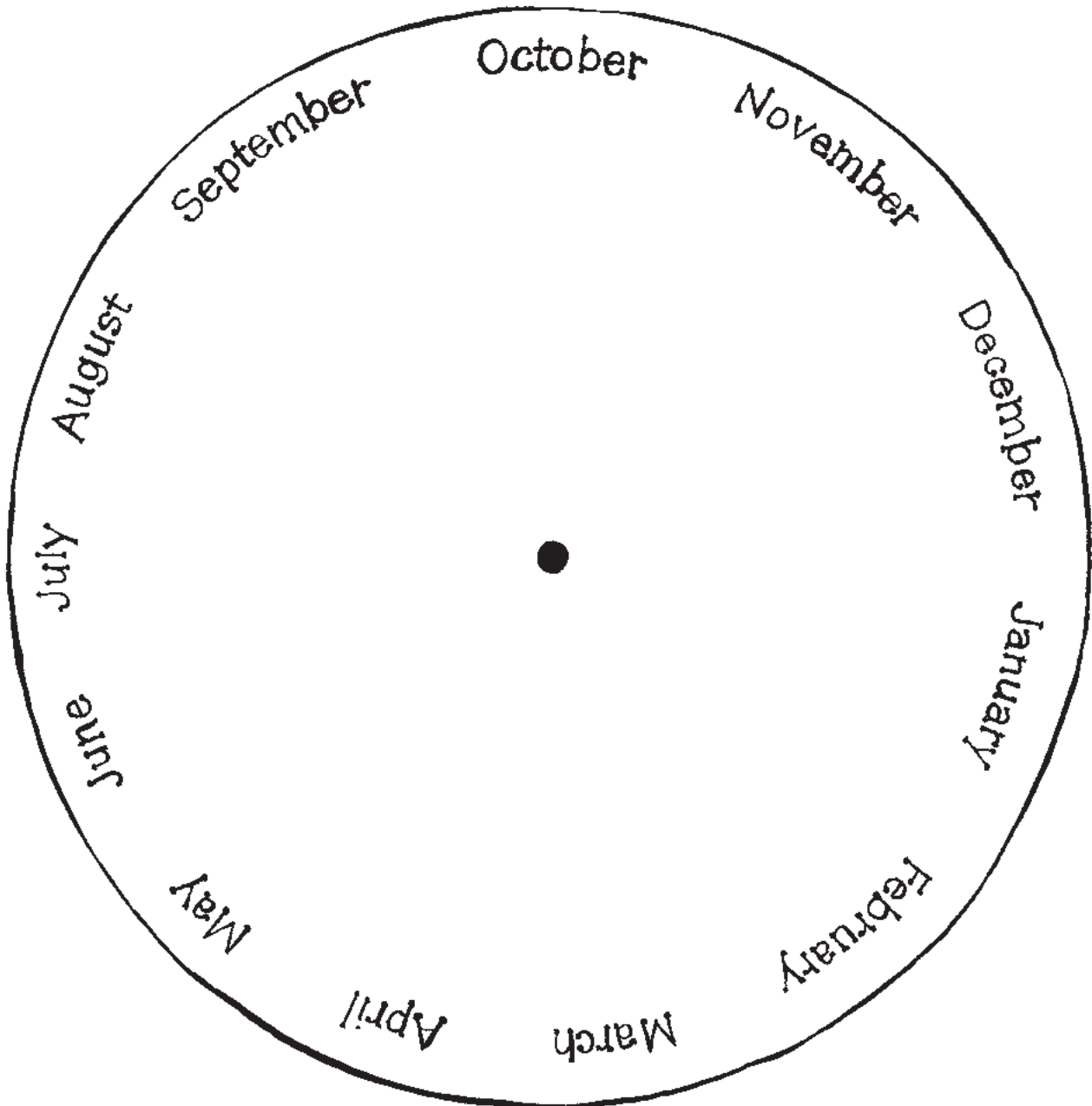
Cut out the two shapes on this page and the next. Write the squirrel's activity for each month in the correct space on the shape on the next page. Use a clip to make it turn. You now have a squirrel calendar.

Top shape



A year in the life of a red squirrel

Bottom shape



You could make a second calendar. This time fill in your activities for each month.

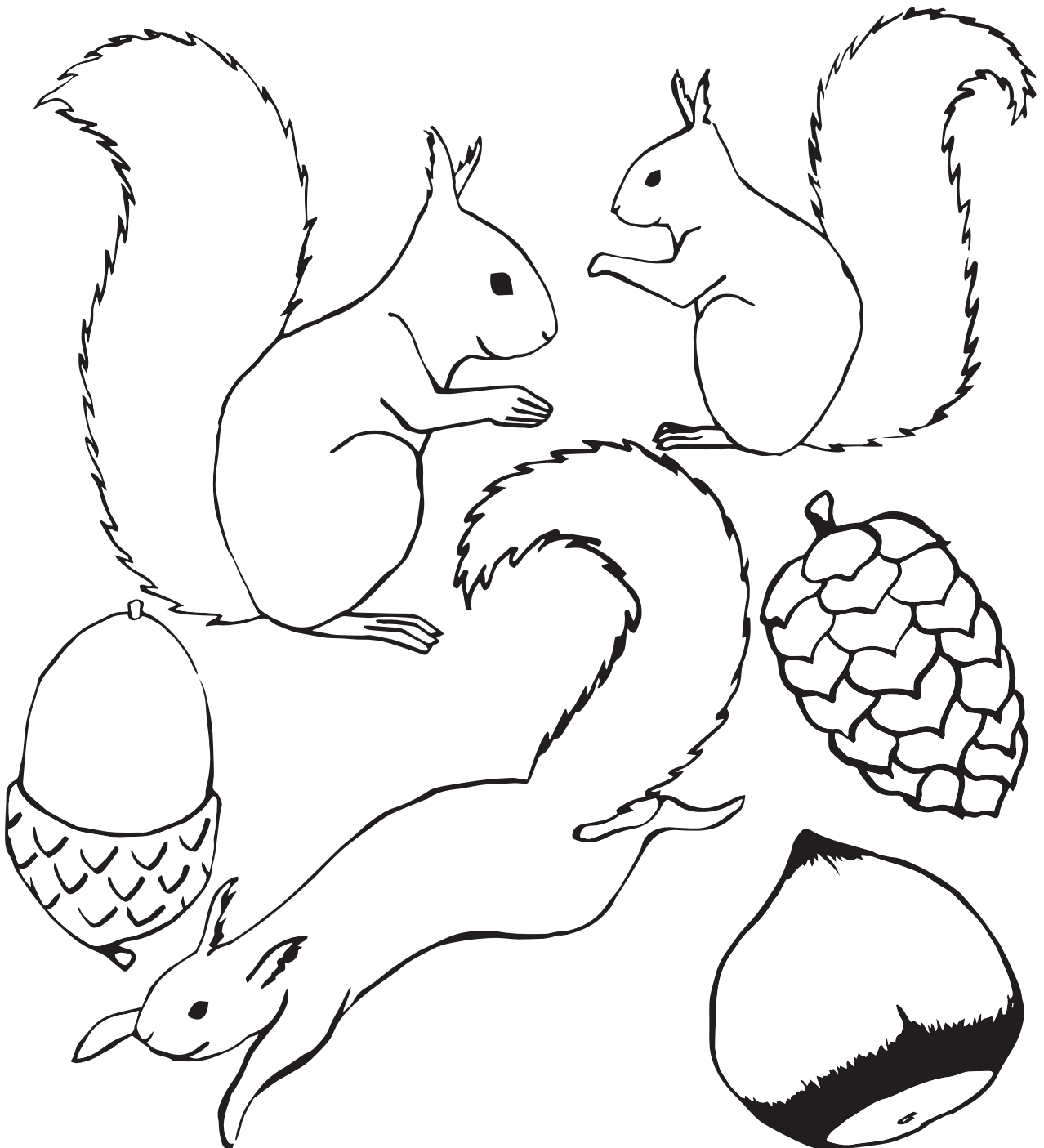
7 Exercise 7 Red Squirrel Models

Teacher's notes

Children will enjoy making the models. Extension of the work could be done by using them in a drama. The storyboard exercise (see exercise 9) could be used as a basis for this drama.

Student exercise

Cut out these models using white card. Colour them in with the correct colours.

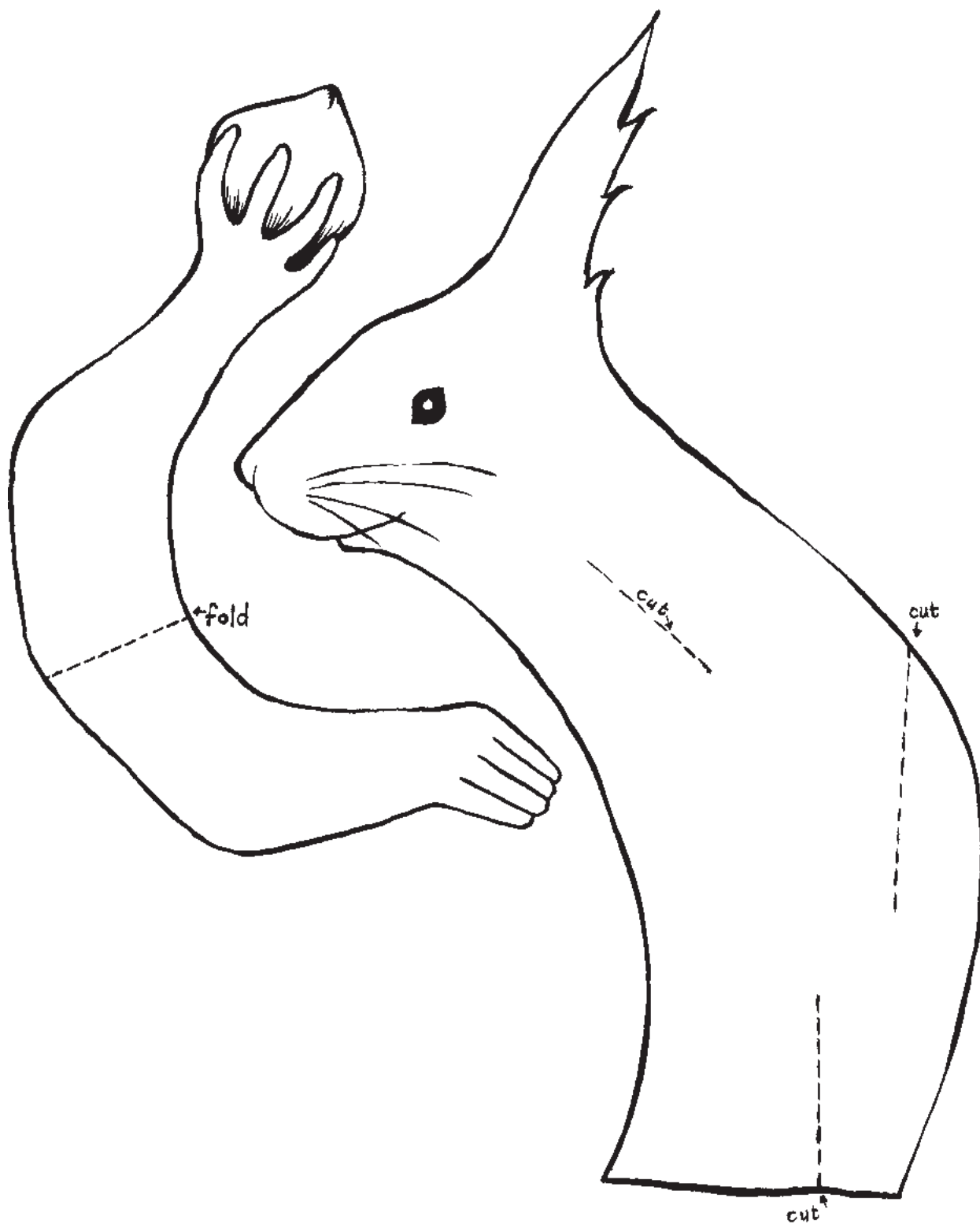


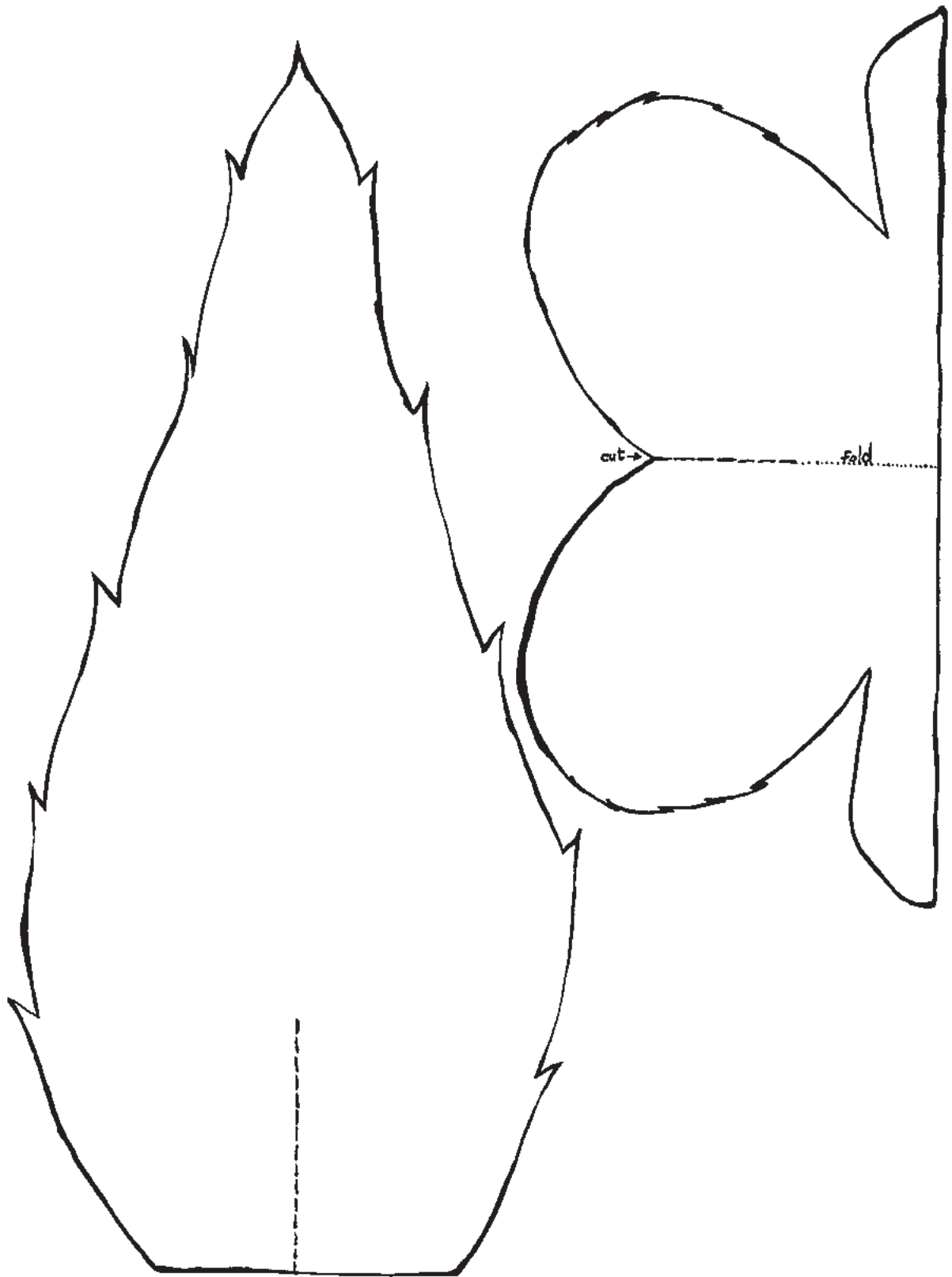


Cut out the mask and colour

Red squirrel model.

Children will enjoy making the models. Cut and fold on the dotted lines.





8 Exercise 8 Red Squirrel Games

Teacher's notes

A. The nut burying game

This is a game to illustrate the difficulty associated with finding buried food. Squirrels have a powerful sense of smell to help them, which we humans do not have. Take a bag of marbles (to represent nuts) outside with the class and get each child ("squirrel") to take three nuts. These each represent 100 nuts (300 in total). They have 20 seconds to find somewhere to bury them, where other "squirrels" will not find them. Much later on in the day, give the children another 20 seconds to find their nuts again. The difficulty in finding them can be discussed and the effect on "squirrels" if nuts were lost; whether anyone pinched other "squirrels" nuts, and the potential problems of hiding them all in the same place. Remember to wash hands after sessions outdoors.



B. Tree felling game

This is a fun game to illustrate the problems encountered if woods, i.e. red squirrel habitat, is lost. Some of the class (eg 4 pupils) are trees. They are made to stand still with their arms out. All the other pupils are squirrels. The squirrels run around the trees until you tell them it is time to build a drey (a squirrel's nest). They then have to hold onto the branch of one of the trees, to represent this. However, only 4 squirrels are allowed to nest in any one tree.

The game begins again, with a new year, and the squirrels run around, but when nesting time begins they must nest in a different tree. This continues for a number of years, until you introduce either yourself or another pupil as a businessman interested in building a car park, or office block in the wood. This means some of the trees need to be felled. The trees should be felled one at a time whilst the squirrels are running round, so that each time they try to find a tree to nest in, there are fewer.

They will reach the point where squirrels have to disappear because there are not enough trees to accommodate all the squirrels.

A discussion on the point of the game can take place, generating an understanding of why woodlands should not be allowed to be felled for development, not just for squirrels, but for all other woodland wildlife too.

C. My friend's a tree

An exciting game to introduce pupils to the uniqueness and complexity of trees. The pupils are split into pairs and one of each pair is blindfolded. The other then leads the blindfolded pupil and puts them next to a tree. The blindfolded pupil has to feel the tree and get to know it (size, shape, texture, bumps, smell, sounds). The blindfold is then removed and the pupil has to identify the tree with which he made friends. Not as easy as it sounds!

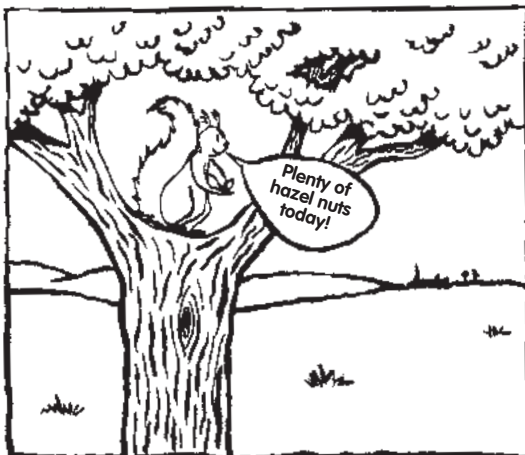
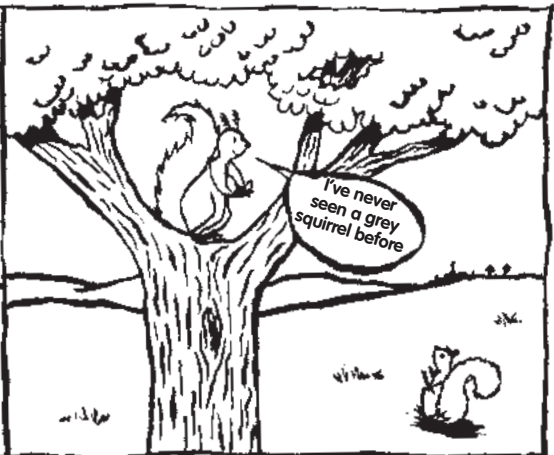


9

Exercise 9 Red Squirrel Film - The Grey Stranger

Teacher's notes and Student exercise

This is a creative writing exercise. The children will be expected to utilise the information they have learnt about the red squirrel to link the story to reality. The storyboard could be used initially and then a continuous narrative could be tried.

	
<p>Rua the red squirrel lives happily in the broadleaf wood.</p>	<p>One day he sees a strange grey squirrel for the first time.</p>

10 Exercise 10

Survey of Red and Grey Squirrels

Teacher's notes

The collection of records of animal sightings is an important tool in protecting wild animal populations. This is an area where you can help conserve wildlife by reporting any time you see a grey or red squirrel.

The internet makes wildlife recording easier. When you tell us about an animal or bird you see we call these 'biological records'. We make good use of your records of red and grey squirrels, as well as many other species. There are two links below to websites that specialize in collecting your wildlife sightings.

www.nmni.com/cedar

Squirrel and pine marten sightings can be uploaded to the CEDaR website via this portal: www2.habitas.org.uk/records/squirrels

www2.habitas.org.uk/records/pine-marten

To create prosperity and well-being through
environment and heritage excellence

Northern Ireland Environment Agency
Klondyke Building
Cromac Avenue
Gasworks Business Park
Lower Ormeau Road
Belfast BT7 2JA

Tel: 0845 302 0008
www.daera-ni.gov.uk/niea

ISBN: 978-1-84807-768-3



An Agency within the Department of
**Agriculture, Environment
and Rural Affairs**
www.daera-ni.gov.uk



**INVESTORS
IN PEOPLE**