

Parental behaviour of blue tits



An IT resource for Primary Schools from ASAB

Worksheets for KS1 and KS2 pupils
(with 'suggested' answers)

2005



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ASAB Education Officer

Key Stage 1

Worksheets

- 1a What happens inside a nestbox?
- 1b What happens inside a nestbox?
- 2 Blue tits and kestrels
- 3a What do blue tit parents feed to their chicks?
- 3b What do blue tit parents feed to their chicks?
- 4 Two foods on the menu!

Key Stage 2

Worksheets

- 1 Food chains
 - 2 From hatching to fledging
 - 3 Blue tits and other garden birds
 - 4 Blue tits – the facts!
 - 5 Adaptations of blue tits
 - 6 Where blue tits find food
 - 7 Survey of blue tit nests
 - 8 Dates when blue tit females laid their first egg
 - 9 Growth rates of blue tit chicks
- 'Suggested' answers to worksheets

Acknowledgements

IT resource

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Worksheets

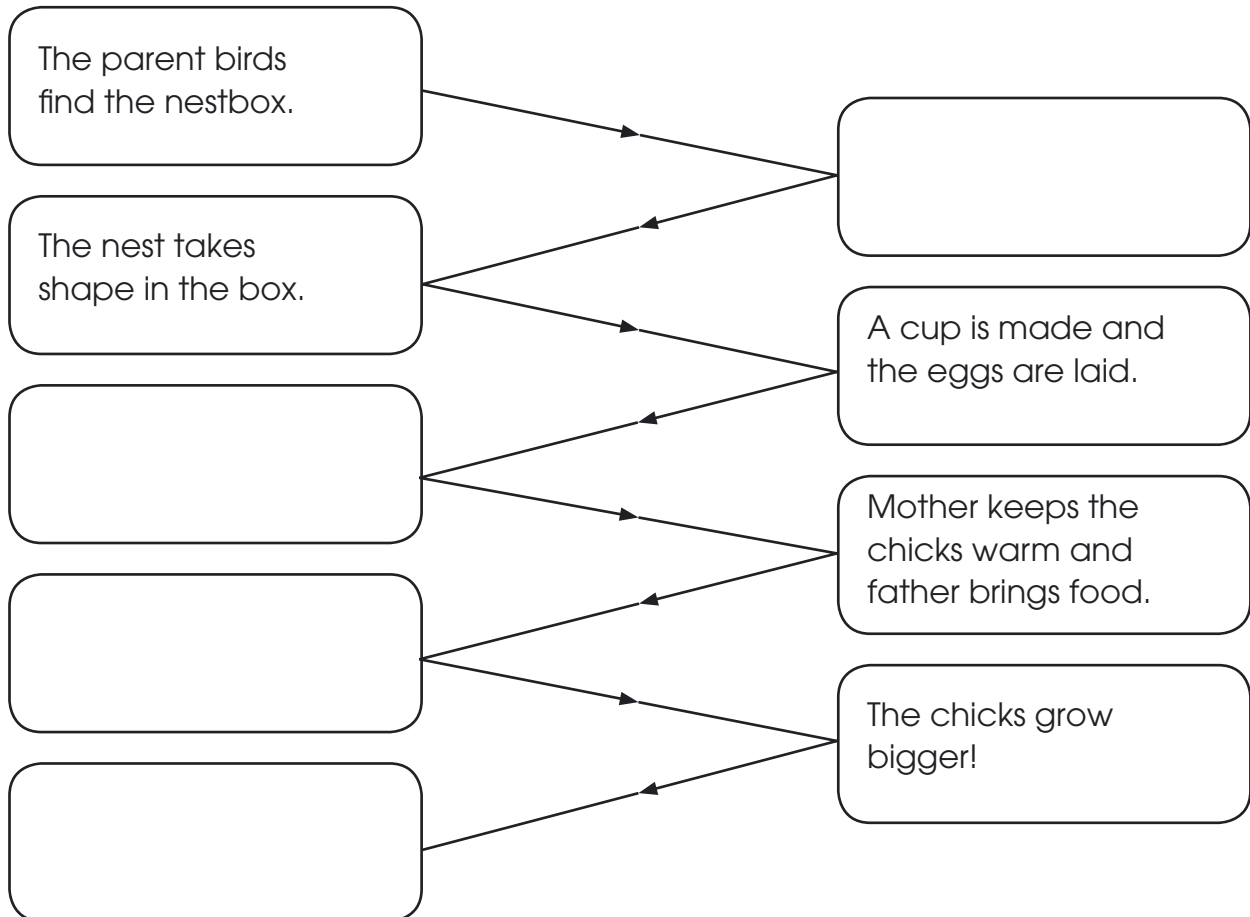
Michael Dockery is very grateful to Dr Nicola Marples, Megan Dickens, Anne Woodfield (Moss Park Infant School, Stretford) and Polly Lee and Joan Boswell (St Monica's R C Primary School, Flixton) for their help in devising the worksheets. ASAB also wish to thank Linda Gray and Judy Evans for their illustrations and Mick Hoult for supplying the photographs.

The worksheets can be photocopied and used within your school but the copyright remains with ASAB (The Association for the Study of Animal Behaviour).

Blue tits - KS1, Worksheet 1a

What happens inside a nestbox?

The diagram shows what happens in a nestbox. Four stages have been missed out but they are at the bottom of the sheet. Cut out the four stages with a pair of scissors and paste them in the right box.



Chicks leave the box after 17 - 21 days.

The eggs hatch about 2 weeks later.

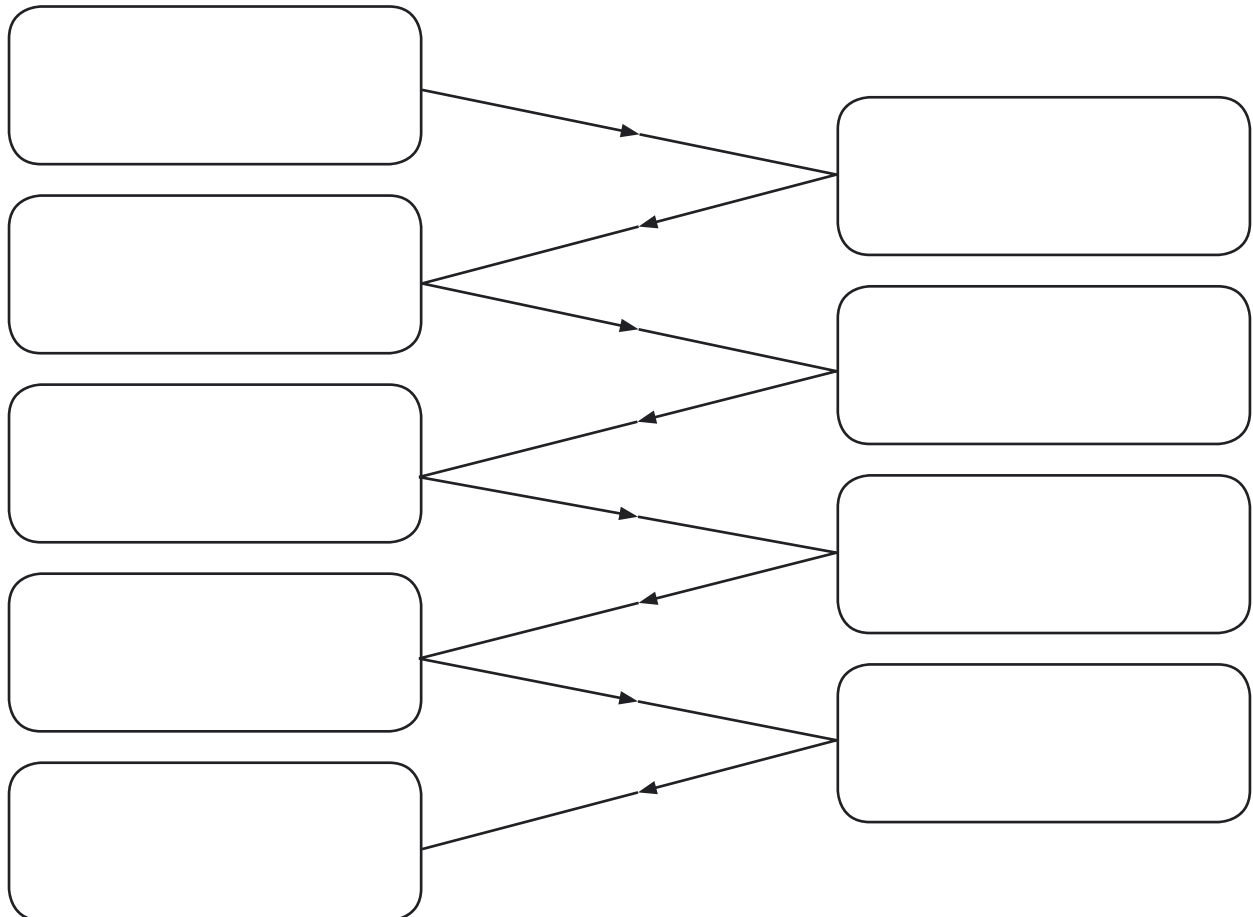
The birds collect materials for the nest.

As the chicks get bigger, both parents search for food.

Blue tits – KS1, Worksheet 1b

What happens inside a nestbox?

The diagram shows what happens in a nestbox. Can you put the stages below into the correct boxes? Cut out the stages with a pair of scissors and and paste them into the correct box.



Chicks leave the box after 17 – 21 days.

The eggs hatch about 2 weeks later.

The parent birds find the nestbox.

The birds collect materials for the nest.

As the chicks get bigger, both parents search for food.

A cup is made and the eggs are laid.

The nest takes shape in the box.

Mother keeps the chicks warm and father brings food.

The chicks grow bigger!

Blue tits – KS1, Worksheet 2

Blue tits and kestrels

This is a blue tit.



(Length: 11 - 12 cm)

This is a kestrel.



(Length: 30 - 36 cm)

Write down **two** differences between the two birds.

1

.....

2

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CHALLENGE

3. How can you tell that a kestrel is a bird of prey? Use reference books to help you.

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Blue tits – KS1, Worksheet 3a

What do blue tit parents feed to their chicks?

1. Put a tick beside the foods that blue tits feed to their chicks.

Chips Flies Spiders Sausage Rolls Moths

2. Draw one of the foods they feed to their chicks in this space here.

3. Blue tits also feed their chicks on caterpillars. Here is a caterpillar. Colour it green.



4. Caterpillars have soft bodies. Why does this help the chicks when they eat caterpillars?

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CHALLENGE

5. Blue tits only feed big caterpillars to their chicks when the chicks are more than a week old. Why is this?

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Blue tits – KS1, Worksheet 3b

What do blue tit parents feed to their chicks?

Blue tit parents mostly feed their chicks on insects, like caterpillars, flies and adult moths. But blue tit parents also feed spiders to the chicks.

Here is a caterpillar which could be fed to blue tit chicks.



1. Where do blue tit parents find the caterpillars?

.....
.....

2. What do caterpillars grow into?

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.....

3. Caterpillars have soft bodies. Why does this help the chicks when they eat caterpillars?

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4. Draw a moth or butterfly here



CHALLENGE

5. Blue tit parents can easily find bread in gardens but they do not feed bread to their chicks. Why?

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.....

Blue tits – KS1, Worksheet 4

Two foods on the menu!

Blue tit parents feed flies and spiders to their chicks. Here are drawings of a fly and a spider. Write down **two** differences between the two animals.



1

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2

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CHALLENGE

Write down **two** different ways that spiders can catch flies.

i)

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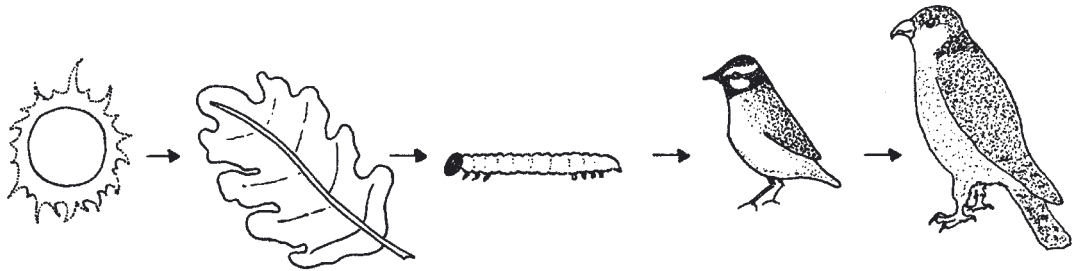
ii)

.....

Blue tits – KS2, Worksheet 1

Food Chains

Here is a food chain which has a blue tit in it.



Sun

Oak leaf

Caterpillar

Blue tit

Sparrowhawk

Complete these sentences:

1. A primary consumer in this food chain is
2. A secondary consumer in this food chain is

Name **two** other predators of caterpillars:

- 3) 4)

Name **two** other wild predators of blue tits:

- 5) 6)

7. Cats sometimes catch blue tits. How can cat owners make it less likely that their cat will catch wild birds?

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8. Suggest **two** foods that we can put out in winter for birds like blue tits.

- i) ii)

Blue tits – KS2, Worksheet 2

From hatching to fledging

Scientists record some observations they make as blue tit chicks grow in a nestbox.* Unfortunately the order of their observations has got mixed up. Put the observations in the correct order, using the line at the bottom of the sheet.



- a) Real feathers then begin to appear and after 10 days the chicks open their eyes.
- b) Blue tit chicks are pink/red in colour when they hatch and have no feathers.
- c) After about three weeks, the chicks are fully grown and ready to leave the box. Usually, the biggest chicks leave the nestbox first.
- d) Eventually, the chicks feed and look after themselves.
- e) Slowly downy feathers appear on a chick's body but pink skin can still be seen.
- f) Once their feathers develop, chicks preen them. They also spend time stretching their legs and flapping their wings.
- g) The chicks often stay fairly close to the nestbox for a few days after they leave since the parents continue to feed them.

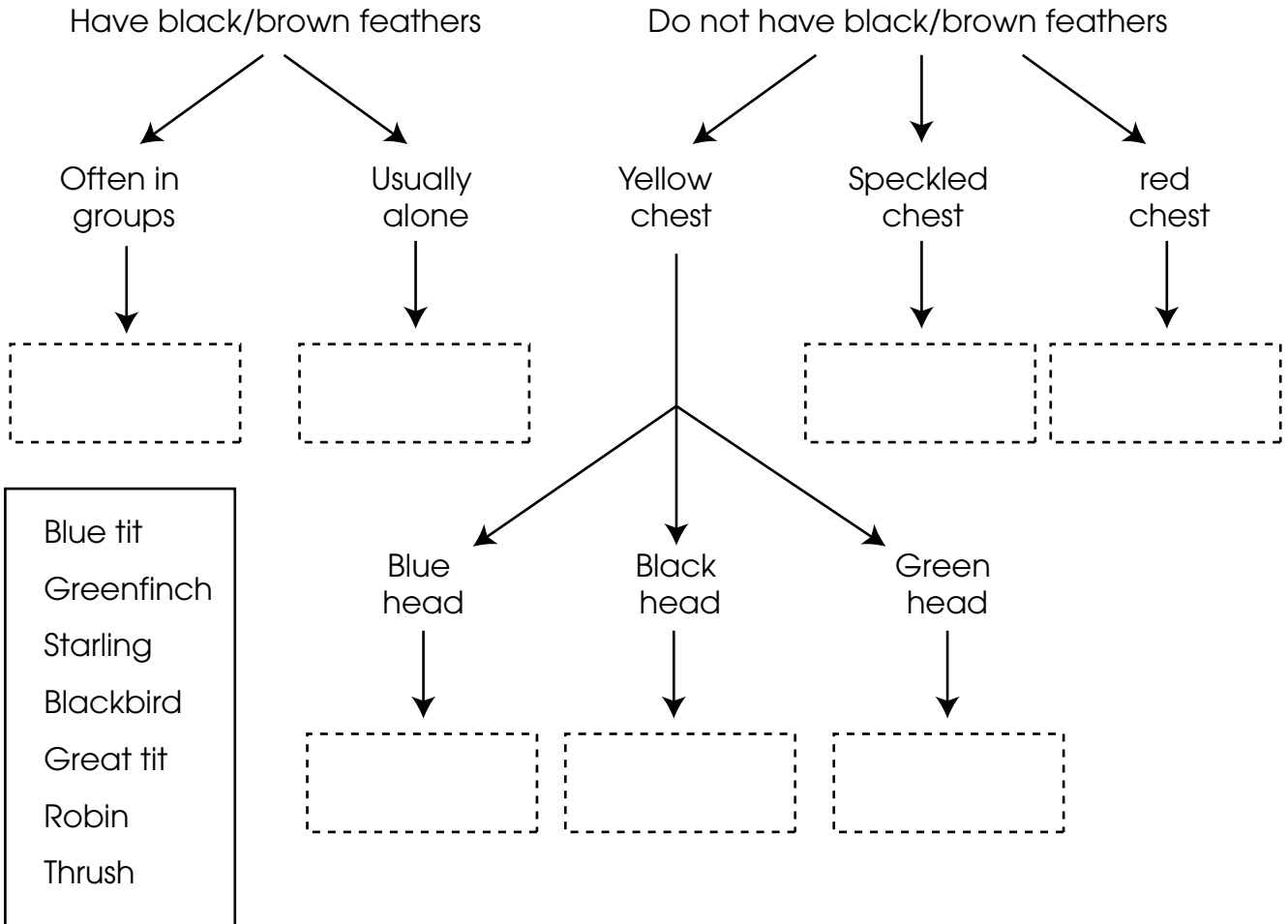
The correct order should be: _ , _ , _ , _ , _ , _ , _

*The nestbox and camera system was supplied by BoxWatch Ltd., Bracken House, Bank Farm, Cowden, Kent, TN8 7EG

Blue tits – KS2, Worksheet 3

Blue tits and other garden birds

Use the key to identify the garden birds listed below. Use a reference book, CD-Rom or website to help you.



Name **one** other garden bird and write **two** facts about it.

Bird

Fact 1

.....

Fact 2

.....

Suggest **two** ways in which we can help attract birds to a garden.

1.

.....

.....

2.

.....

.....

Blue tits - KS2, Worksheet 4

Blue tits - the facts!

Using books, CD-Roms or the Internet, complete these sentences to provide some of the basic facts about blue tits.

1. Blue tits are around 11 - 12 cm in length, so they are smaller than a but larger than a

2. They are colourful birds, with a crown, cheeks and breast. Male and female blue tits have very similar coloured feathers: a bird's feathers are called its pl

3. In winter, they regularly come to bird tables and f e e _ _ _ _ to take peanuts, and

6. The eggs are incubated for around ... days by the female blue tit.

5. The female blue tit may lay between and eggs, though usually they lay 8 - 10 eggs.

4. Blue tits mostly build their nest of, hair and feathers in April and the eggs hatch in

7. After they have hatched, the young are fed on insects, spiders, etc. but the food they eat most of is c _ t e r _ i _ _ _ _ .

8. The chicks leave the nest after 17 - .. days but are fed by their for a few more days.

9. When the blue tit chicks leave the nest, many are taken by predators such as and

10. Sometimes, blue tit parents will raise a second of chicks in June or July!

Blue tits – KS2, Worksheet 5

Adaptations of blue tits

Here is a drawing of a blue tit.



1. Blue tits often peel back the bark on trees to search for insects. How does its bill (beak) help it to do this?

.....

2. How do the feet of a blue tit suit it to nimbly moving around the twigs and branches of trees searching for food?

.....

3. The second drawing shows a blue tit getting a peanut by hauling up some of the string with its beak. It then uses one of its feet to hold the string before repeating the action. Eventually the bird gets the nut onto the branch and eats it.



i) How could scientists investigate this behaviour to find out if blue tits use their right foot or their left foot when hauling up nuts?

.....

.....

ii) How many blue tits do you think they should study?

iii) Why might they need to watch each individual blue tit pull up a peanut on a string several times?

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Blue tits – KS2, Worksheet 6

Where blue tits find food

The table below shows where adult blue tits find food from November – April and from June – August during a one year study in an Oxford wood.

Where they look for food	Nov-Apr (%)	Jun-Aug (%)
Ground	7	0
Branches of trees	8	2
Dead parts of trees	16	5
Twigs & buds	34	2
Leaves	3	90
Elsewhere (i.e. not on trees)	32	1

Using the numbers in the table, a graph has been drawn to show where the blue tits found food, see Figure 1.

Feeding areas of blue tits (%)
in Marley Wood, Oxford

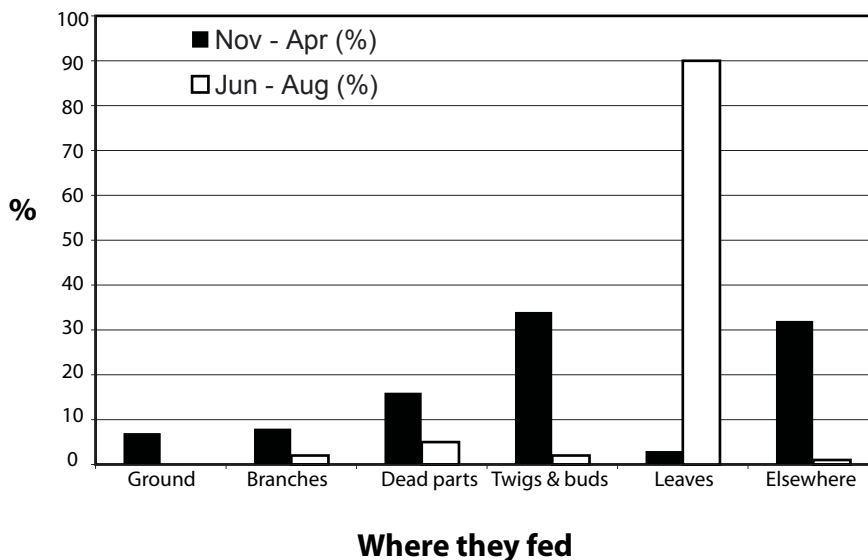


Figure 1 Where blue tits find food in some months of the year.

1. Where do blue tits spend most of their time looking for food in November – April?
About what fraction of their time is spent there?

..... The fraction is

2. Why do blue tits spend very little time looking for food on the ground between November and April?

.....

.....

3. Where do blue tits spend most of their time looking for food between June and August and suggest **one** type of food they are most likely to find there at this time?

.....

.....

4. Blue tits spend a lot of time in winter searching in areas called `elsewhere`. Suggest **one** place that `elsewhere` might be and suggest **two** foods that blue tits might find there.

.....

i) ii)

5. Why do blue tits spend so long looking in `dead parts` of trees in November – April and what food might they find there?

.....

.....

6. Sometimes other animals catch and eat blue tits. Suggest **two** other British animals that might eat blue tits and draw **one** of these animals in the space here.

i)

ii)



Blue tits – KS2, Worksheet 7

Survey of blue tit nests

The table below has the results of a survey of blue tit nests from a wood near Oxford. It shows how many nests had clutches with between 4 and 17 eggs in them.

No. of eggs	4	5	6	7	8	9	10	11	12	13	14	15	16	17
No. of nests	3	1	5	10	26	40	86	73	57	40	10	3	0	1

Using these numbers in the table, a graph has been drawn to show the number of eggs in the nests.

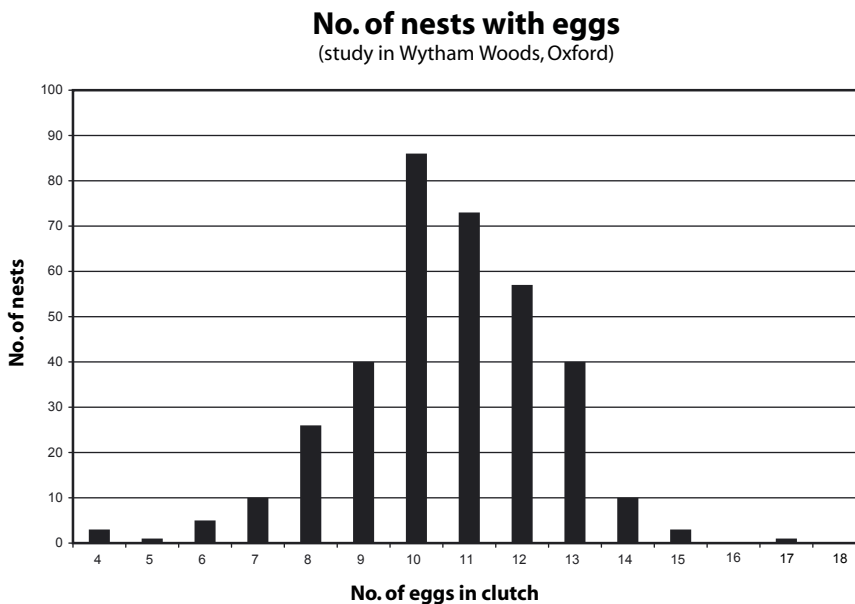


Figure 1 Number of nests with certain clutch sizes.

- Which clutch size occurred most frequently (mode)?
- How many more nests had 13 eggs than 7 eggs?
- How many nests had fewer than 8 eggs in them?
- How many nests were counted in this study?

5. It is very unlikely that any blue tit female could lay 17 eggs in one clutch. Try to suggest **one** reason why the scientists found 17 eggs in one nest.

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.....

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6. The average mass of a blue tit chick is less in a big clutch than it is in a small clutch. Suggest **one** reason why this is the case.

.....

.....

7. When blue tit chicks beg for food, it is often the chick with its head highest that gets the food. Scientists have found that the legs of blue tit chicks grow faster than their wings: for example, the legs of a chick reach their maximum length 13 days after they hatch but their wings take 18 days. Suggest **one** reason why a chick might find it an advantage to have its legs growing faster than its wings when it is in the nest.

.....

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8. As you may know, blue tits usually make their nests in holes in trees or in nestboxes. The photograph you can see here shows the nest of a reed warbler. Reed warblers are about the same size as blue tits but are not so colourful.

Sometimes cuckoos leave an egg in the nest of a reed warbler but cuckoos never leave eggs in the nests of blue tits. Suggest **one** reason why cuckoos do not leave their eggs in blue tit nests.

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Blue tits – KS2, Worksheet 8

Dates when blue tit females laid their first egg

A scientist records the date in April that 11 blue tit females began to lay their clutch of eggs and how many each female laid. The data are below.

Nest	Date in April when first egg was laid	Number of eggs in the clutch
A	18	9
B	19	8
C	21	10
D	21	8
E	21	8
F	18	7
G	17	10
H	27	7
I	17	9
J	13	9
K	17	9

*Data kindly
supplied
by Megan
Dickens*

1. In which nest was the earliest egg laid?
2. What is the range in the number of eggs in the eleven clutches?
3. Suggest **one** reason why the female at nest H began to lay her clutch of eggs later than the other females?
.....
.....
4. Blue tit females sit on their eggs for about 14 days before they hatch. When might the eggs in nest F be hatching?
.....
5. Occasionally a chick in a nest may die. Suggest **one** reason why this might happen.
.....

Blue tits – KS2, Worksheet 9

Growth rates of blue tit chicks

A scientist weighs each chick in a brood of 7 chicks on various days after they hatch. She puts her findings into a table which you can see here.

Mass (g) of chicks from hatching (Day 1) to Day 13.

Chick	Day 1	Day 3	Day 6	Day 10	Day 13
A	1.6	2.8	5.3	9.2	11.0
B	1.1	2.4	5.7	10.1	11.4
C	2.0	3.1	6.0	9.4	10.7
D	2.1	3.1	6.2	9.7	10.9
E	1.6	2.9	6.2	9.8	11.1
F	1.6	2.8	6.4	9.0	10.3
G	2.0	3.1	5.6	8.9	10.4

*Data kindly
supplied
by Megan
Dickens*

- How many chicks on Day 3 have a mass of 3.1 g?
- On day 1, one chick is about twice as heavy as another chick. Which chicks are they? Chick is about twice as heavy as chick
- Look at the masses of the chicks on Day 1 and Day 13.
 - Which chick's mass increased the least from Day 1 to Day 13?
 - Which chick's mass increased the most from Day 1 to Day 13?
 - Suggest **one** reason why the chick with the greatest increase in mass was able to increase its mass so much?
.....
- Suppose scientists wanted to find out if the first egg laid in a clutch was heavier than the fifth egg. Describe how they would carry out such a study.
.....
.....
- Scientists have found that the heaviest chicks usually live longer when they leave the nest. Suggest **one** reason why this is the case.
.....

`Suggested` answers

Key Stage 1

Worksheet 1a

1. in order – the birds collect materials for the nest; eggs hatch 2 weeks later; as the chicks get bigger, both parents search for food; chicks leave the nest after 17 – 21 days

Worksheet 1b

1. in order – the parent birds find the nestbox; the birds collect materials for the nest; the nest takes shape in the box; a cup is made and the eggs are laid; the eggs hatch about two weeks later; mother keeps the chicks warm and father brings food; as the chicks get bigger, both parents search for food; the chicks grow bigger; chicks leave the box after 17 – 21 days

Worksheet 2

1. and 2. size of bird, shape of beak, the kestrel has claws, the colours and patterns of the feathers, etc.
3. has a hooked beak, has sharp claws, has forward facing eyes (would need another drawing to see this!); looks like other birds of prey, like falcons and eagles.

Worksheet 3a

1. flies, spiders, moths
2. see drawing
3. see drawing
4. easier to digest – can swallow soft objects more easily as they have no sharp edges
5. when < 1 week old they can't swallow large caterpillars – they might choke on a large prey item

Worksheet 3b

1. in hedges, trees and bushes
2. adult moths or butterflies
3. easier to digest – can swallow soft objects more easily as they have no sharp edges
4. see drawing
5. chicks need protein for growth – bread (crusts) may harm or cut very young chicks

Worksheet 4

1. fly have wings, spiders do not; spiders have 8 legs, flies 6; flies have 3 parts to their body, spiders 2
3. i) using a web ii) pouncing on them as they walk by (e.g. wolf spiders)

'Suggested' answers

Key Stage 2

Worksheet 1

1. caterpillar
2. blue tit or sparrowhawk
3. and 4. magpies, shrews, cuckoos, ground beetles (some species), robins, great tits
5. and 6. kestrels, foxes, magpies, woodpeckers, crows, etc.
7. put a bell on the cat's collar to warn birds the cat is near - keep the cat inside during the day - put feeders in positions or places from which a cat could not launch an attack - don't put bird tables close to cover
8. peanuts, sunflower seeds, coconuts, fat balls, water

Worksheet 2

1. b, e, a, f, c, g, d

Worksheet 3

Key: reading across, first line – starling, blackbird, thrush, robin:

next line - blue tit, great tit, greenfinch,

e.g. house sparrow: about 15 cm in length, often in groups, noisy birds, nest in buildings, lay 3-8 eggs which are brown/green with speckles, eat seeds and insects

e.g. wren: about 10 cm in length, brown with upturned tail, very active, usually active on ground and low bushes/trees, lay 5-7 eggs which are pale with speckles

put out bird tables and feeders – provide water – hang up fat balls, coconut – grow native species of flowers, bushes, trees, etc.

Worksheet 4

1. blackbird, thrush, crow, magpie, owl, etc. – wren and goldcrest (accept long-tailed tit, as it is the long tail that makes the bird greater in length)
2. blue – white – yellow – plumage
3. feeders – other nuts, fat, sunflower seeds, coconut, etc.
4. moss – May

5. 4 - 15 eggs is the typical range quoted in books
6. 14 days (accept ± 2 or 3 days)
7. caterpillars
8. 17 – 20 days is the typical range quoted in books – parents
9. weasels, magpies, sparrowhawks, cats, etc.
10. brood

Worksheet 5

1. it is stout so can be used to pull back the bark that has started to peel – it is short and stubby so that it can be used to lever up any small split in the bark
2. they can fasten round the twigs to give the bird a good grip – they have three toes pointing forward and one backwards so they have a good balance on a twig or branch
3. i) study several birds as they arrived at, say, a bird table where the nuts were suspended and record which foot was used (most useful if the birds were individually ringed to allow for identification)
ii) accept any number in the range 10 – 30
iii) to check if each bird was consistently using the same foot, otherwise record the ratio of left foot use to right foot use

Worksheet 6

1. twigs and buds – one third (approx.)
2. there is very little food on the ground in winter – most ground insects/larvae are likely to be in the soil rather than under the leaf litter – most insect food and spiders are likely to be in the tree in winter, hiding in crevices in the bark
3. leaves – caterpillars, aphids, spiders, flies (adults and larvae)
4. gardens – coconut, fat, seeds, nuts,
5. they are searching for food items (prey) hiding in crevices and gaps – these are likely to be spiders, insects (adults and larvae)
6. sparrowhawk, cat, weasel - see drawing

`Suggested` answers

Worksheet 7

1. 10 eggs
2. 30 nests
3. 19 nests
4. 355 nests
5. more than one female laid the eggs – the pair of blue tits now occupying the nest may have taken over an abandoned nest and there were eggs in the nest material already there
6. the food brought to the nest by the parents is shared between more chicks and so each gets less and is lighter – in a big brood of nestlings the largest chick may take proportionately more because of the competition for food and so the smallest get very little and this lowers the average mass of the chicks
7. so that a chick can stretch upwards on its legs to increase the chance of the parent giving it the food item – well developed legs would allow a chick to move around the nestbox and get in a favourable position for feeding or perhaps intercept a parent with food at, or near, the nestbox entrance
8. a female cuckoo couldn't get through a hole in a nestbox to lay an egg – if a cuckoo could squeeze into a hole in a tree, blue tits might be able to detect a cuckoo egg as a `foreign` egg and either reject the egg or abandon the nest

Worksheet 8

1. J
2. 3 eggs (7 – 10 eggs)
3. she may have found a mate later – the pair may have found a nest site later – the female might have been underweight (light) and so needed to feed before she laid her eggs
4. May 2 (accept 2 days either side of this date)
5. might not be sufficient food available in their territory – parents may not be able to supply enough for all the chicks – weather may be poor – a chick may succumb to disease or parasites – a chick may lose out to its siblings when begging for food

Worksheet 9

1. 3 chicks
2. chick D is about twice as heavy as chick B
3. i) G
ii) B
iii) it might have been able to get in a good position in the nest to take food from parents – it might have been very loud and persistent in giving begging calls
4. would look at the broods in several nests (say 10 or more) and weigh the first and fifth eggs – then calculate mean mass of the first and fifth eggs and see if they differed – or simply weigh the eggs and record how many times the first egg was heavier than the fifth egg
5. usually they are stronger fliers and so might be better able to fly off if a predator attacks – they have greater physical reserves to survive the first few days when the parents still feed them but the chicks may be scattered around the garden/woodland and more difficult to find