Kings School

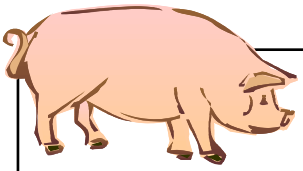
Visiting: Tuesday 22nd, Wednesday 24th April, Tuesday 29th & Wednesday 30th April 2008

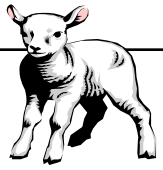
"Investigating modern farming at Sparsholt College Farm"

Background

Sparsholt College Farm is approximately 4 miles NW of Winchester. The farm covers 143 ha (353 acres). Farm livestock includes **dairy** and **beef cows, pigs, deer** and **sheep**. Most of the fields are used to grow crops for animal feed (fodder crops).

The farm has **diversified** to provide college facilities for fish farming, horticulture, horse management, wildlife and conservation programmes.

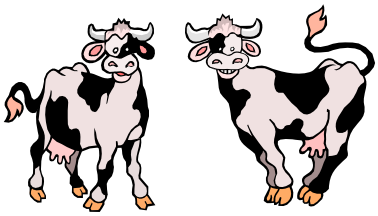




Key Questions

1. How is the land used at Sparsholt ?
2. What factors influence farming at Sparsholt ?
3. How can the farm be managed sustainably ?

www.sparsholtschoolscentre.org.uk



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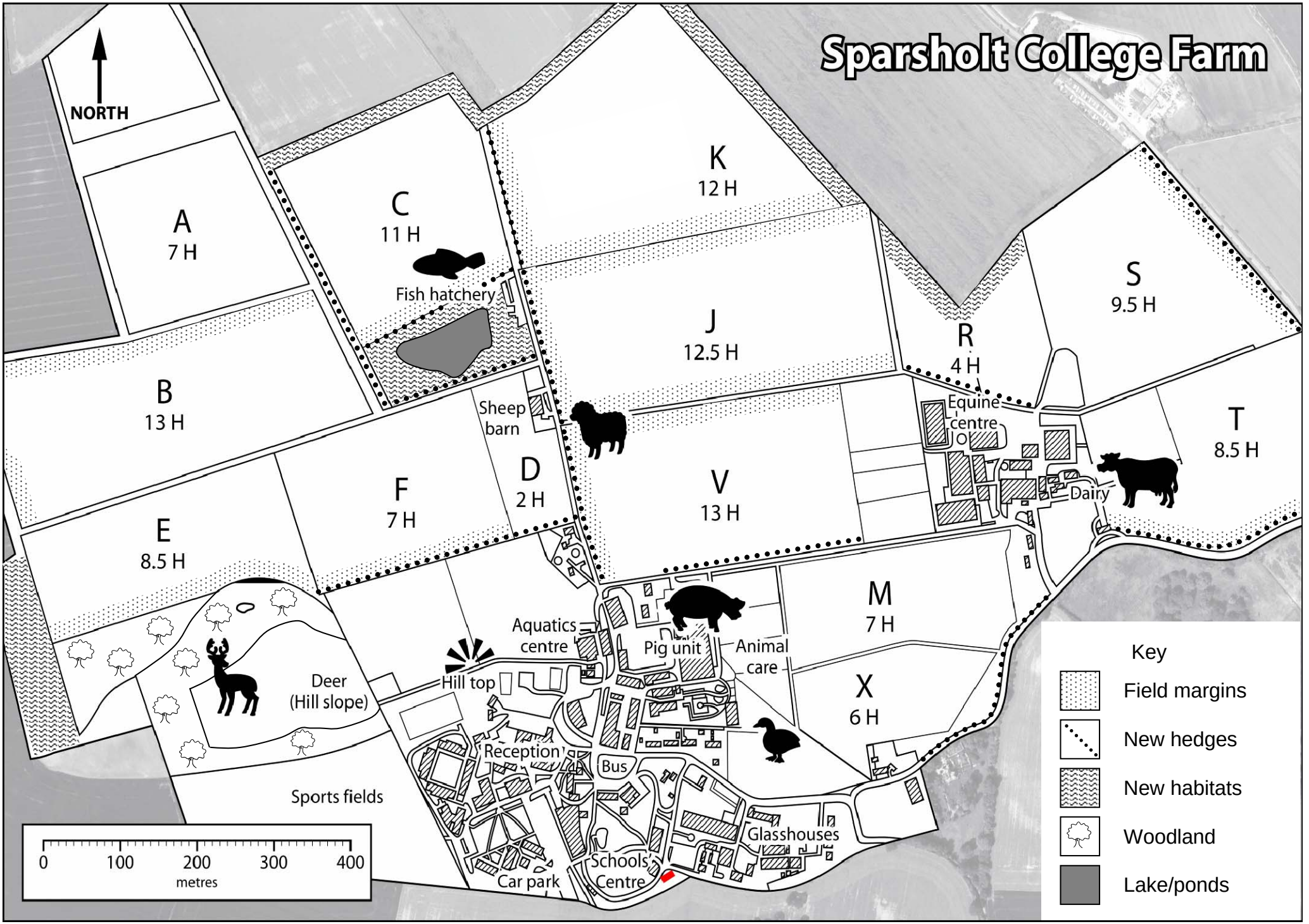

Sparsholt College Farm
NORTH
A
7 H
B
13 H
C
11 H
Fish hatchery
K
12 H
J
12.5 H
Sheep barn
D
2 H
F
7 H
E
8.5 H
V
13 H
R
4 H
Equine centre
S
9.5 H
T
8.5 H
Dairy
M
7 H
X
6 H
Aquatics centre
Pig unit
Animal care
Hill top
Deer (Hill slope)
Reception
Bus
Sports fields
Glasshouses
Schools' Centre
Car park
0
100
200
300
400
metres
Key
Field margins
New hedges
New habitats
Woodland
Lake/ponds

Dairy farming at Sparsholt

Inputs

FOOD – how much do cows eat?

- measure out 1 cow's food for a day!

Farm grown	UK grown	Global
grass 7 kg	lupin 2 kg	soya 2 kg
maize 32 kg	cereal mix 5 kg	sugar + citrus 2 kg
straw 0.5 kg	cow cake 5 kg	

~70% of the cow food (by mass) is grown at this farm. Dry food is needed for high yields of milk

Lupin + soya are needed for protein. Lupin can be grown in the UK. Soya is imported from Brazil.

Feedback

Is the system sustainable?

We have 160 Holstein cows

calves and milk

Processes – jobs include

- *milking cows*
- *cleaning barns*
- *preparing straw beds*
- *moving waste*
- *growing food (grass, maize)*
- *feeding & health checks*
- *selecting breeding stock*
- *monitoring pregnancies*

Energy & Water use

How many buildings are heated? No barns
(just the milking parlour for farm staff)

How many tractors are used? 2 or 3

What electrical machinery is in use?

milking, cold store, ventilation in barns, lights

How is water used? drinking & cleaning

Outputs

FOODS – what is produced?

1. Milk

- How much milk does a cow make each day? 28 litres/day.
  – this can be 40 – 50 litres for a high yield cow
- How much are the farm paid for the milk? 27 p per litre. Jan 08 prices

Our milk is transported to Southampton for processing
Watson's Dairy

2. Meat (beef)

- How old are the calves when they are sold? 12 – 18 months.
  Price varies depending upon breed, age and market forces.
- How much is the farm paid?
  £ 300 – 400 per calf.

Our calves are sold at local auctions

Waste – What happens to the manure and slurry?

Slurry is spread onto the fields & grass in Autumn & Spring. Manure is ploughed into the fields.

Pig farming at Sparsholt

Inputs

Outputs

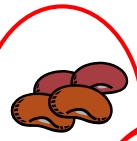
FOOD – adult pigs eat **3kg** food/day

Which of these crops are used to make pig food? (tick)


barley ✓


oats ✓


rape ✓


soya ✓


wheat


maize


sunflower ✓


straw

*Which crops are grown **outside** the UK? (circle the crop name)*


Farm grown


UK grown


Global

Energy & Water use

Are the buildings heated? Yes / (No)

Which fuel is used? electricity

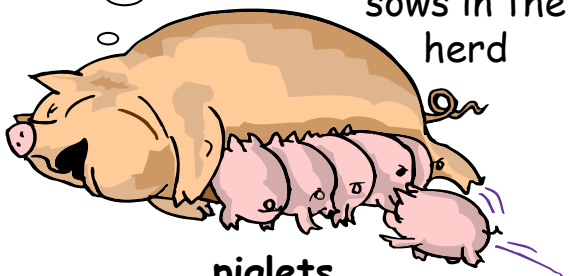
How is water used? drinking & cleaning

How is water use reduced? Push button drink taps. Cleaning waste to slurry store & fields

Feedback

Is the system sustainable?

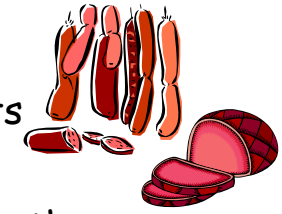
We have 120 'large white' sows in the herd


piglets

Processes – jobs include

- *cleaning out barns*
- *moving waste*
- *monitoring growth*
- *feeding & moving animals*
- *checking animal health*
- *selecting breeding stock*
- *monitoring pregnancies & births*

FOODS – what is produced?



1. Meat

- How **old** are the piglets when they are sold?

5 – 6 (20 weeks!) months.

- How **heavy** is a market size pig?

90 – 100 kg.

- The farm is paid **£1** for each **kg** of meat. How much is this per pig?

£ 90 – 100 per pig

Our pigs are sold locally

What sort of **meats** do pigs produce?

bacon, ham, sausages, pork, gammon

Waste – What happens to the manure and slurry?

Slurry & liquid waste (dirty water) is spread onto the fields & grass in Autumn & Spring. Manure (solid waste/straw from barns) is ploughed into the fields

Sheep farming at Sparsholt

Inputs

FOOD – sheep and lambs feed on **fresh grass** all year round.

In winter, some h a y (dried grass) may be given.

Ewes are fed **0.5kg** of pellets (dry food) a day for 6 weeks before and 6 weeks after lambing.

Lambs are fed pellet food when they are 4 – 12 weeks old to help growth.

Where does most of the sheep food come from? (tick)

Farm grown ✓

UK grown

Global

Energy & Water use

- How long are sheep kept indoors for?

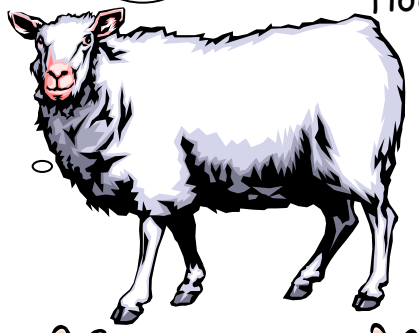
1 day 1 week **2 weeks** 1 month never

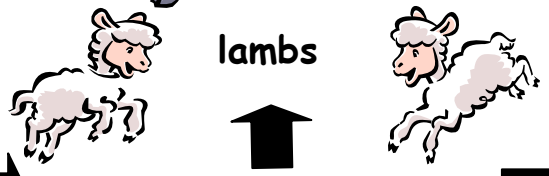
- What machinery is used to farm sheep? Vehicle to get to fields. Shearing equip.
- How is water used? drinking water
- How is water use reduced? Not able to reduce water use, only prevent wastage (eg leaks).

Feedback

Is the system sustainable?

We have 320 ewes in the flock





lambs

Processes – jobs include

- *moving animals to fresh grass & feeding dry food*
- *shearing in May/June*
- *monitoring animal growth*
- *checking animal health*
- *selecting breeding stock*
- *monitoring pregnancies & births*

Outputs

FOODS – what is produced?

1. Meat – we lamb early (Jan) for best (Easter) prices.

- How **old** are the lambs when they are sold?

from 4 – 12 months

- How **heavy** is a market size lamb?

38 – 40 kg (live weight)

(This is for live weight lambs. Dead weight (edible) is 50% less)

- The farm is paid ~**£3** for each **kg** of **edible meat** (dead weight). Only about half of the live weight is edible. How much is this per lamb?

£ 60 per lamb

Our lambs are sold locally

What sort of **meats** do lambs produce?

lamb! (chops, cutlets, rack)

Waste – What happens to the manure and slurry?

Most waste is left in the fields by the sheep! Manure & old straw from indoor lambing can be used on the fields.

Weather, Soils & Land use at Sparsholt

Hill top

Weather

Temperature	Wind speed	Rainfall
'C	kph	mm

Exposed. Very little shelter from any wind direction.

Land use
College buildings, trees, grass and sportsfields (no farming things!)

Soil colour smear

Soil Colour
Black
Dark Brown
Medium Brown
Light Brown (circled)
Coffee
Fudge
White
Orange (circled)

Soil Texture
Smooth & sticky. Lots of clay only a few small stones.

The soil is poorly drained and becomes water logged in winter and dries to a hard 'pan' in the summer.

Soil Moisture
1 Dry
2 (circled)
3
4
5
6
7
8
9
10 Wet

pH of soil
4 4.5 5 5.5 6 **6.5** (circled) 7 7.5 8
Acid *Neutral* *Alkali*

Soil pH is varied, usually acidic. Only a small range of crops would do well in this soil.

Hill slope

Land use
Permanent grassland for grazing deer (& sheep)

Bottom of the Hill

Land use
Crops. In 2007, the field has planted with grass for sheep grazing and silage making.

Soil colour smear

Soil Colour
Black
Dark Brown
Medium Brown (circled)
Light Brown
Coffee (circled)
Fudge
White
Orange

Soil Texture
Gritty, lumpy, stony. A coarse soil with a small amount of clay.

The soil is well drained and has good water holding properties (clay & organic matter help with this). Some chalk has been added to the corner of the field to improve drainage.

Soil Moisture
1 Dry
2 (circled)
3
4
5
6
7
8
9
10 Wet

pH of soil
4 4.5 5 5.5 6 6.5 7 **7.5** (circled) 8
Acid *Neutral* *Alkali*

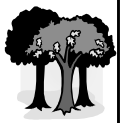
A fertile soil with good nutrient levels. A wide range of crops would do well in this soil.

Weather

Temperature	Wind speed	Rainfall
'C	kph	mm

Some shelter is provided by the woodland & hill slope from South/SW winds.

Choices in Farming – what would you do?

Site & EIA score	Management Choices	Advantages	Disadvantages	Your Choice
Hill Slope **EIA Score**	**What would you choose to do with this land?** a) Stop farming and make the golf course bigger (**diversify**). **b)** You could keep more dairy cows on the farm. You will need to grow crops here to feed them in winter. **c)** Keep it as it is. Look after the woodland & grass and care for the wildlife & deer. 	***a)*** *You could earn more money for the farm.* ***b)*** *Your cows will make more milk. You will make more money.* ***c)*** *The wildlife habitat & soil can be protected (**sustained**).* 	***a)****The woods, wildlife and farm deer will have to go.* ***b)*** *Ploughing up the grass could damage the soil (**erosion**).* ***c)****You will not earn much money from this area.* 	
Field F (bottom of hill) **EIA score**	**What would you choose to grow in this field next year?** **a)** Grow a different crop each year. This is called **crop rotation**.  **b)** You could grow the same crop each year. **c)** Grow the same crop each year and use chemicals (pesticides and weedkillers) to kill the pests & diseases. 	***a)*** *Less pests and diseases in your crop. No need to use chemicals.* ***b)*** *You can use the same equipment every year. You know what you're doing!* ***c)*** *Kill the pests & diseases before they damage your crop.* 	***a)*** *Different machines & skills are needed. This costs more.* ***b)*** *Pests & diseases build up in the soil. These damage the crop & cost you money.* ***c)*** *Pesticides & weed-killers are expensive. They can harm the wildlife & water supply.* 	

Choices in Farming – what would you do?

Site & EIA score	Management Choices	Advantages	Disadvantages	Your Choice
Hedgerow **EIA score**	**This hedgerow (10 years old) is not growing well. What would you choose to do?** **a)** Cut down the hedge and improve the wire fences. **b)** Look after the hedge. Replant, weed and trim.  **c)** Do nothing to the hedge. Leave it as it is.	***a)*** *Wire fences are quick & cheap. They stop livestock escaping.* ***b)*** *A thick hedge stops livestock escaping. Hedges make good wildlife habitats.* ***c)*** *This saves you time and money now.* 	***a)*** *The hedge wildlife and habitat will be lost.* ***b)*** *Hedges cost time & money to look after properly.* ***c)*** *This hedge is thin and your animals could escape.*	
Livestock housing **EIA Score**	What would you do with the waste from the unit? (**manure and slurry**) **a)** Dispose of the waste using a local sewage treatment works. **b)** Store it at the farm. It will rot away naturally (**biodegrade**) **c)** Store the waste and let it rot until it is ready to spread onto the soil. 	***a)*** *The waste will be treated before it reaches our rivers.* ***b)*** *This will cost very little **if** storage is already available.* ***c)*** *This improves the quality of the soil (**fertiliser**) and costs very little.*	***a)*** *Local sewage works cannot cope with this volume of waste* ***b)*** *You will needs lots of storage! There are health issues.* ***c)*** *It is smelly & messy to work with!* 	

How can farms encourage biodiversity?

Some of the habitat improvement activities at Sparsholt are described below.

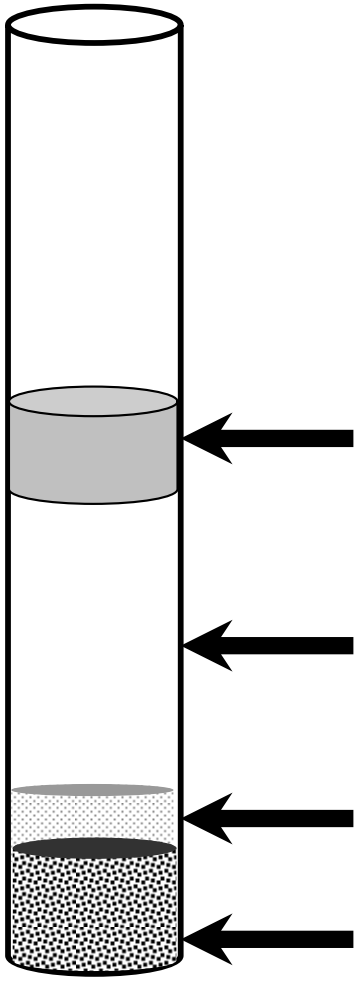
- **Show where these activities are taking place by completing the farm map overleaf.**
- **Match the name of the activity to the correct description (one has been done for you).**

Field Margins	New Habitats	Ponds & Lakes	Woodland	Hedgerows

	The **edges of fields** are planted with grass and meadow species. The plants provide food, shelter and cover for hibernating minibeasts and mammals.
Log piles & dead wood	Dead trees are left standing and **fallen wood** is left on the ground in the woodland to provide a habitat for woodlice, millipedes, centipedes and fungi. It can also be used for nesting by small mammals and birds.
	These provide a **living 'fence'** and a wildlife corridor around field edges. A wide range of plant and animal species are found in here.
	Some **field areas** are not planted with farm crops. Instead they are managed to encourage wildflowers which offer food and shelter to insects, birds and mammals.
	Well designed areas encourage a wide **range of water life** including insects and amphibians (frogs, toads and newts) and birds.
	As the **trees and shrubs** mature, a variery of wild flowers, insects, birds and small mammals are supported. Some of these areas can be very old (ancient) but new ones are also being created every year.

Note: Special initiatives such as the Environmental Stewardship scheme encourage farmers to balance their commercial and environmental interests ensuring farms and wildlife can work together. Sparsholt farm is under the single payment system, but is working towards entry level stewardship. Longer term the farm is aiming for higher level stewardship.

Soil pH Testing (acid/alkali)



6. Do not empty tube – return to box for disposal at centre.

5. Allow tube to settle.
Check colour against chart.

4. Indicator solution to 2nd line
GENTLY move tube to mix

3. Distilled water to 1st line
SHAKE WELL – hold bungs!

2. 2 small spoons of white powder
(barium sulphate)

1. ~ 1 cm depth of soil

START

Data Collection - 2008

- suggested Primary and Secondary sources

1. How is the land used at Sparsholt?

Primary data:

- Land use mapping at Sparsholt -*What is where and why?*
  - What crops are grown and why?

Secondary Data:

- Cropping plans for past years at Sparsholt
- Aerial photograph of landscape and website 'Virtual Tour'
- Information from 'Farm and Estate Guide 2006/2007' on website.

2. What factors influence farming at Sparsholt?

Primary data:

- Weather, soils and land use *data collection to compare the hill top, hill slope and bottom of the hill – What effect do physical factors have on farming at Sparsholt?*
- Timeline for Field F - *How has this field been used over the years?*
  - Does landuse change? Why?

Secondary Data:

- Weather data – annual temperatures and rainfall
- Soil map of farm – in 'Farm and Estate Guide 2006 /2007'.

3. What are the advantages & disadvantages of different farming systems?

Primary data:

Livestock Farming at Sparsholt - *what do we keep? How? Why?*

- Environmental Impact Assessments (*EIA's) – How do farm activities affect the countryside?*
- Sustainable Choices at Sparsholt – *What has to be considered when decisions are made on the farm? Who or what is affected by these decisions?*

Secondary Data:

- Farm Studies **www.face-online.org.uk** **www.foodandfarming.org.uk**

4. How can the farm be managed sustainably?

Primary data:

- Livestock Farming at Sparsholt – How are these methods sustainable?
- Environmental Impact Assessments – How is the environment affected?
- Sustainable Choices at Sparsholt – What choices would you make?

Secondary Data:

- Choices in Farming – What would you do? (*issues including the use of pesticides, fertilisers & conservation of soils & wildlife can be discussed. Pupils consider the advantages & disadvantages of different management choices*)
- Organic vs. conventional information sheet
- Fact File: An Organic Farm Fact File: Hedges
- Chemicals – Friend or Foe? Choosing fertilisers - Activity sheets
- Farm Studies **www.face-online.org.uk** **www.foodandfarming.org**
- Other useful sources: **www.fabflour.co.uk** **www.countrysidefoundation.org.uk** **www.soilassociation.org** **www.countrylearning.org.uk** **www.leafuk.org**