

PORSMOUTH BEEKEEPERS

Bee Basic Assessment

Answer Guide

8/12/2012

This is just a guide to assist you. Do your own research as well to ensure you are confident you can take the test.

1. Manipulation of a honeybee colony	
The Candidate should be:	Answer may include:
1.1 aware of the care needed when handling a colony of honeybees;	<ul style="list-style-type: none"> ◦ Keep in mind safety of self and, particularly, others (consider proximity to public and precautions to be taken) ◦ Be slow and gentle when manipulating the colony
1.2 aware of the reactions of honeybees to smoke;	<ul style="list-style-type: none"> ◦ Bees fear for the colony, ingest nectar/honey, and in doing so make themselves full, heavy and less inclined to sting
1.3 aware of the personal equipment needed to open a colony of honeybees;	<ul style="list-style-type: none"> ◦ Essential – suit, gloves, smoker, hive tool, spare fuel and lighter ◦ Desirable – bee brush, boxes or bags for removal of brace or drone comb ◦ Occasional use – queen cage, queen marking pen, bee brush, spare or specialist equipment for particular manipulations
1.4 aware of the reasons for opening a colony;	<ul style="list-style-type: none"> ◦ To check if 'queen is OK', there are sufficient stores and no sign of disease ◦ To check the results of previous manipulations ◦ To perform new manipulations to achieve specific objectives
1.5 aware of the need for stores	<ul style="list-style-type: none"> ◦ To provide the bees with food during the late autumn, winter and early spring months and during prolonged poor weather in the 'honey flow' season ◦ Stores primarily means carbohydrate (fondant, sugar syrup, nectar or honey) for the workers but also protein (pollen) for the brood
1.6 aware of the importance of record keeping.	<ul style="list-style-type: none"> ◦ To help manage stocks more effectively by ◦ Reminding you what you found and what you did ◦ Enabling you to plan what needs to be done next ◦ Record information like date, time, weather, queen, queen cells, brood, stores, space, health, temper, varroa, supers, feed etc
1.7 able to open a colony of honeybees and keep the colony under control;	<ul style="list-style-type: none"> ◦ Spend a moment observing bees at the entrance before smoking in order to recognise normal behaviour ◦ Work from behind entrance if 'warm' way, at side if 'cold' ◦ Put roof upturned on floor and supers on roof, with crown board on top to prevent robbing ◦ Check underside of excluder (or crown board) for queen and return her to brood box ◦ Demonstrate that you are aware of the use of cover cloths, which prevent more bees from flying up and help maintain the hive temperature ◦ Demonstrate that you are aware that sometimes using a spray of tepid water can be better than smoke, as the former calms them, while the latter might panic them ◦ Return frames in same order
1.8 able to demonstrate lighting and the use of the smoker;	<ul style="list-style-type: none"> ◦ Show you know what fuels are available, which are coolest and that fresh grass in the top prevents hot ash being blown into the hive ◦ Few puffs at entrance and wait for it to take effect ◦ Keep it alight, keep it close to hand ◦ Occasional use and waiting for it to take effect if the bees become too agitated ◦ Demonstrate use to control bees and drive them down before replacing hive parts ◦ Know how to put it out safely
1.9 able to demonstrate the use of the hive tool;	<ul style="list-style-type: none"> ◦ Keep tool in hand at all times ◦ It can be used for a variety of purposes such as scraper or lever

<p>1.10 able to remove combs from the hive and identify worker, drone and queen cells or cups if present, and to comment on the state of the combs;</p>	<ul style="list-style-type: none"> • Remove an outermost edge frames or dummy board making space to operate • Demonstrate responsible temporary storage of removed frames (perhaps in spare brood box or carefully propped against hive or even leaning against queen excluder which might be leaning up to the hive entrance) • Do not 'roll' bees, but use space made to move frames along then slowly lift them out Once found, some beekeepers temporarily trap the queen in a matchbox or queen cage to avoid losing or damaging her Comb – brood pattern, age/colour of comb, brace comb, spacing See point 5.1 for normal brood and be able to comment on anything out of the ordinary
<p>1.11. able to identify the female castes and the drone;</p>	<ul style="list-style-type: none"> ◦ Females – workers and queen (or presence of queen)
<p>1.12. able to identify brood at all stages;</p>	<ul style="list-style-type: none"> ◦ Eggs, larvae, pupae (sealed in cells)
<p>1.13. able to demonstrate the difference between drone, worker and honey cappings;</p>	<ul style="list-style-type: none"> ◦ Honey cappings are paler and waxier brood cappings are various biscuit shades and look more fibrous in texture ◦ Drone cells have a larger surface area and are deeper (longer) too
<p>1.14. able to identify stored nectar, honey and pollen;</p>	<ul style="list-style-type: none"> ◦ Nectar is clear and uncapped, honey is capped and pollen is uncapped and in a range of colours All three are usually found in an arc around the brood cells or on the outermost frames
<p>1.15. able to take a sample of worker bees in a match box or similar container;</p>	<ul style="list-style-type: none"> ◦ Draw part of an open matchbox over the face of a frame of bees and close it before removing it from the frame
<p>1.16. able to state the number of worker bees required for an adult disease diagnosis sample;</p>	<ul style="list-style-type: none"> ◦ 2-300 dead ones for suspected poisoning most likely found outside the hive 30 or so live ones for disease diagnosis
<p>1.17. able to demonstrate how to shake bees from a comb and how to look for signs of brood disease.</p>	<ul style="list-style-type: none"> ◦ Make space by re/moving two frames Shake bees sharply from frame whilst it is still low in the brood chamber

2. Equipment	
The Candidate should be:	Answer could include:
2.1 able to name the principal parts of a modern beehive;	Know names of components of hives know the main differences between different hive types
2.2 aware of the concept of the bee space and its significance in the modern beehive;	Height of bee 3/8 inch (ie depth of frame lug/top bar) It is the crawlspace needed by the bee to pass easily between two structures – not so small that they will propolise it, not so large they will build brace comb to bridge it Vertically, you must opt for upper or lower bee space system and not mix the two (by mixing different frame types) Hoffman frames are designed to set the correct spacing horizontally – other frames need special plastic or metals pacers See section 2.5 also
2.3 able to assemble a frame and fit it with wax foundation;	Nails across hoffman shoulders Trap foundation wire loops between wedge and top bar and nail within wire loops Some leave the head of the nail protruding a little to allow disassembly for frame cleaning N ails up into both bottom bars
2.4 aware of the reasons for the use of wax foundation;	To encourage bees to build the desired (worker or drone) sized cells in an orderly manner (straight and so removable) Drone foundation in supers discourages bees from storing pollen in them and so permits storage of more honey (this is especially true of the super directly above the brood box
2.5 aware of the spacing of the combs in the brood chamber and super for both	Brood chamber – bee space (11 or 12 frames in a National) Spacing achieved using hoffman frames, castellated spacers, metal or plastic ends Super frames can be set wider, once drawn out, so that more honey is stored per frame (ie foundation and drawn comb reduce from 11/12 to 9) and methods used to achieve this spacing.

3. Natural history of the honey bee				
The Candidate should be:	Answer could include:			
3.1 able to give an elementary account of the development of queens, workers and drones in the honeybee colony ;	<p>Queen</p> <ul style="list-style-type: none"> ◦ Egg – laid in, or moved by workers to, queen cell (like a monkey nut hanging down) ◦ Lava – continuously fed on royal jelly <p>Adult activities</p> <ul style="list-style-type: none"> ◦ 1-5 days after emergence – builds up strength ◦ 5-14 days – series of mating flights ◦ 5 days after mating – starts to lay <p>Workers</p> <ul style="list-style-type: none"> ◦ Eggs – laid in open cells, at first erect, gradually lying down ◦ Larvae – cared for by adult workers – continuously fed (first two days all are fed royal jelly, then get mixture of royal jelly, honey and pollen) ◦ Pupae – in sealed cells, no feeding, develops into adult form and emerges on its own <p>Adult workers graduate through the following tasks</p> <ul style="list-style-type: none"> ◦ 1-2 days after emergence – clean cells and warm brood nest ◦ 3-5 days – feed older lava with honey and pollen ◦ 6-10 days – feed younger lava with royal jelly ◦ 11-18 days – ripen nectar, produce wax and construct comb ◦ 19-21 days – guarding and ventilation, take exercise and orientation flights to learn to fly and locate the hive ◦ 22+ days – forage for nectar, pollen, water or propolise <p>Drones</p> <ul style="list-style-type: none"> ◦ Same development as workers, until they reach adult stage, when only role is to mate with queen 			
3.2 able to state the periods spent by the female castes and the drone in the four stages of their life (egg, larva, pupa and adult);		Queen	Worker	Drone
	Egg hatches	3 days	3 days	3 days
	Lava sealed	8 days	9 days	10 days
	Adult Emerges	16 days	21 days	24 days
	Death	Up to five years – but usually replaced after two years by beekeeper, or at any time if 'considered' necessary by worker bees	About 6 weeks, but 3-6 months or so over winter	Perhaps until the autumn, not over winter
3.3 able to give an elementary description of the function of the queen, worker and drone in the life of the colony;	<ul style="list-style-type: none"> ◦ Queen (1) is only female completely sexually developed ◦ Drones' (about 300) sole function is to fertilize a queen ◦ Workers (30-60k) do everything else – see above 			
3.4 able to give a simple description of wax production and comb building by the honeybee;	<ul style="list-style-type: none"> ◦ Formed from honey/nectar and secreted from eight smallwax glands underneath the abdomen of the bee. The soft wax pours into eight pockets beneath the glands where it solidifies into tiny discs. It is then removed and passed to the mouth where it is worked into hexagonal cells called combs, which are used to form the basic structure of the hive. 			

3.5 aware of the importance of pollination to flowering plants and consequently to farmers and growers;	<ul style="list-style-type: none"> ◦ As bees collect nectar, pollen (plant sperm cells) sticks to their fine hairs. This aids pollination of flowers with each visit by bee ◦ Many agricultural crops are dependent on insect pollination to successfully set seed 		
3.6 able to name the main local flora from which honeybees gather pollen and nectar;	<ul style="list-style-type: none"> ◦ Very early – , crocus, snowdrops, flowering currant, willow, poplar ◦ Spring – fruit blossoms, rape, garden flowers ◦ Summer – field beans, borage, garden flowers, chestnuts, clovers ◦ Autumn – blackberries, willow herbs, balsams, heather, ivy 		
3.7 able to give a simple definition of nectar and a simple description of how it	<ul style="list-style-type: none"> ◦ Nectar is the sugar substance created by flowers to entice pollinating insects to visit ◦ Nectar is up to 80% water 		
is collected, brought back to the hive and is converted into honey;	<ul style="list-style-type: none"> ◦ It is ingested by the bee into its honey stomach and regurgitated back at the hive ◦ Hive bees add enzymes to the nectar to break down its complex sugars and then store it in the comb ◦ Nectar is fanned to evaporate and reduce its water content to about 17%, otherwise the 'honey' will ferment ◦ Finally, when 'ripe' (ready for consumption) it is sealed under a capping of wax 		
3.8 able to give a simple description of the collection and use of pollen, water and propolis in the honeybee colony;		Collection	U se
	Nectar	◦ Carried from flowers in honey stomach of foraging bees then processed into honey by hive bees	◦ Food – carbohydrate for energy
	Pollen	◦ Carried from flowers in pollen baskets on hind legs (will attach to hairs all over bee until 'combed' and 'pressed' into baskets). Converted into 'bee bread' by hive bees for feeding to larvae	◦ Food – protein for growth
	Propolis	◦ Carried from plant wounds and buds in pollen baskets	<ul style="list-style-type: none"> ◦ U se to sealed cracks in hive ◦ Reinforces old comb ◦ Entombs dead animals in hive ◦ Limits bacterial and fungal growth
	Water	◦ Carried in stomach	<ul style="list-style-type: none"> ◦ Mixed with honey before bees eat it or feed to brood ◦ Used to cool hive on hot days – action of evaporation
3.9 able to give an elementary description of swarming in a honeybee colony;	<ul style="list-style-type: none"> ◦ Swarming is when a queen and many of the flying bees leave the hive to establish a new colony ◦ It can be triggered by a reduction in levels of 'queen substance' because the queen is old or because the hive has insufficient room for new brood ◦ The initial swarm is a prime swarm and contains the old queen. If more than one replacement queen hatches, the stronger queen might kill the other/s or drive it/them out, in which case the swarm is called a cast 		
3.10 Able to give an elementary description of the way in which the honeybee colony passes the winter.	<ul style="list-style-type: none"> ◦ Winter workers – large fat bodies, live for six months, cluster in hive to retain warmth, vibrate wing muscles to generate heat ◦ Rotate positions to take 'turns' on the colder outer edge of the cluster ◦ 10-20k workers over winter to regenerate colony in spring ◦ No drones ◦ Queen at centre of cluster 		

4. Beekeeping		
The Candidate should be:	Answer could include:	
4.1 able to give an elementary description of how to set up an apiary;	Site <ul style="list-style-type: none"> ◦ Consideration for the public ◦ Availability of forage and water ◦ Environment – wind, sun, damp, frost pocket, flooding, livestock ◦ Access and space for the beekeeper 	Set up <ul style="list-style-type: none"> ◦ Hive stand ◦ Position wrt high barrier to make bees go up ◦ Warning notices
4.2 able to describe what precautions should be taken to avoid the honeybees being a nuisance to neighbours and livestock;	<ul style="list-style-type: none"> ◦ Consider flight paths to main areas of forage and to water and of cleansing flights ◦ Erect barriers to encourage bees to fly up out of hive above head height ◦ Avoid sites bordering roads where pedestrians or riders might pass ◦ Keep only good tempered bees ◦ Build good relations with locals, giving talks and showing them the bees – try to gain their interest, cooperation, support and respect ◦ Take steps to prevent swarming 	
4.3 able to describe the possible effects of honeybee stings on humans and able to recommend suitable first aid	Effects <ul style="list-style-type: none"> ◦ Local reactions (urticaria) – pain, itching, redness, swelling and heat ◦ General reaction (anaphylaxis) – systemic shock including breathing difficulties, swelling of lips, tongue or eyelids, vomiting, dizziness, pain 	
treatment;	<ul style="list-style-type: none"> ◦ Note: it is good practice to carry a mobile phone to inspections and know the grid reference of your apiary in case of an unexpected bad reaction 	
	Treatment – mild reaction <ul style="list-style-type: none"> ◦ Remove sting by scraping of sideways with hive tool ◦ Remain calm ◦ Puff smoke on site of sting to minimise stinging response by other bees ◦ Take aspirin or antihistamine as appropriate 	Treatment – severe reaction <ul style="list-style-type: none"> ◦ Move away from hive ◦ Remove sting ◦ Administer Epipen if one is carried and has been authorised by sufferer ◦ Sit and remain calm ◦ Loosen clothing ◦ Deep breathing ◦ Recovery position ◦ Ambulance
4.4 able to give an elementary description of the annual cycle of work in the apiary;	<ul style="list-style-type: none"> ◦ Winter – clean, mend, replace, store equipment -check food levels and top up as necessary – possible varroa treatment – check for wind and pest damage ◦ Spring – continue to check food levels if spring weather is poor – return queen excluder – regular inspections – swarm prevention and control– add supers – monitor varroa levels ◦ Summer – continue inspections – continue varroa IPM (see 5.5) – replace old frames – make up nucs – replace queens ◦ Late summer -remove honey – varroa treatment ◦ Autumn – combine weak colonies – remove excluder -supply winter food -prevent robbing – make secure for winter 	

4.5 able to describe the preparation of sugar syrup and how and when to feed bees;	Preparation ◦ Dissolve 2lb sugar in 1pint hot water (strong solution) ◦ Allow to cool	Feeding ◦ Contact or reservoir feeder in eek ◦ Evening (prevent robbing) ◦ Provide room to store sugar ◦ Undertake in spring and autumn or when building wax ◦ For modified National hive need at least six outer frames full of stores to over winter
4.6 aware of the need to add supers and the timing of the operation;	◦ Add super when previous one is full of bees, not honey ◦ Include some drawn comb if possible ◦ Add above existing supers for speed of application or below existing supers if you plan to remove some full ones ahead of the rest	
4.7 able to give an elementary account of one method of swarm control;	Prevention ◦ Use strain of bee less likely to swarm ◦ Use young queens ◦ Provide ample room ◦ Ensure good ventilation ◦ Inspect for queen cells at least every nine days	Control ◦ Creation of a nucleus/artificial swarm (know how to do this) ◦ Making more space (add supers, rearrange of brood frames) ◦ Clipping of queen wings ◦ Excluder like device at entrance of hive ◦ Bailey comb change ◦ Remove queen cells (unless bees have already swarmed)
4.8 able to describe how to take a honeybee swarm and how to hive it;	◦ Initial contact – honey bees or not, address, height, position and size of cluster ◦ Liaise with owner – what will happen, time to attend, cost, clear area of people ◦ Prepare equipment – ladder, secateurs, bed sheet, skep or sturdy box, string, smoker, fuel, matches, protective clothing ◦ Collection – detach/knock swarm into box, invert box on sheet, raise up box edge to allow flying bees to rejoin the swarm, return late in day, re-invert box, tie up sheet to make bee tight ◦ Disposal– re-hive on clean frames and new foundation, feed 48 hours later, re-queen if swarm shows adverse tendencies ◦ Notes – until the comb has been drawn out and the queen starts laying, put a queen excluder between the brood box and its floor to deter absconding. Also, this is a good time for a chemical varroa treatment as there is no brood and no honey	
4.9 able to describe the signs of a queenless colony and how to test if a colony is queenless;	◦ Absence of eggs, then later absence of larvae and ultimately all brood ◦ Possibly presence of queen cells in combination with absence of eggs/brood ◦ Laying workers – more than one egg per cell or laid on side of cell ◦ Observation at hive entrance shows that bees not taking in pollen ◦ Test by adding frame with eggs from another hive and see if queen cells are built	
4.10 able to describe the signs of laying workers and of a drone laying queen;	Laying workers ◦ Disorganised brood pattern ◦ More than one egg per cell ◦ Eggs on side rather than base of cell (shorter abdomen) ◦ It's thought that laying workers exist in most colonies, but that worker 'police' remove eggs considered abnormal	◦ Drone laying queen ◦ Rare because usually superseded – happens more often in nucs. Reasons: ◦ Too old – run out of sperm ◦ Not properly mated ◦ Not mated ◦ Deformity or abnormality ◦ Low brood nest temperature

<p>4.11 aware of the dangers of robbing and how robbing can be avoided;</p>	<p>Dangers</p> <ul style="list-style-type: none"> ◦ Debilitates and depletes hive of bees and stores – if not detected, can lead to starvation over winter ◦ Leads to fighting 	<p>Prevention</p> <ul style="list-style-type: none"> ◦ Feed during evenings ◦ Feed all hives in apiary at same time ◦ Inspect quickly and if it starts, continue inspection another day ◦ Do not attract foreign bees by spilling fondant or sugar syrup ◦ Keep exposed hive parts covered during manipulations ◦ Reduce entrance in later summer and during periods of feeding, to allow bees to repulse robbers ◦ Keep hive in good condition and mend any holes or damage ◦ If it gets out of control, stop up entrance completely with grass or leaves, remove later or next day
<p>4.12 able to describe one method of uniting colonies;</p>	<ul style="list-style-type: none"> ◦ This is achieved by positioning one brood box on top of another and allowing the bees to gradually grow accustomed to one another ◦ Earlier in day, ensure no brace comb at bottom of the brood box which is to be placed above the other and, if necessary, remove the unwanted queen ◦ In the evening, remove roof and supers from 'bottom' hive, place newspaper beneath queen excluder. Some people make small pilot holes or slashes in the paper ◦ Position 'top' brood box directly on the queen excluder. If your remaining queen is in this upper box, apply another queen excluder, but better that she is in the lower box ◦ If returning any supers to the stack, ensure that there is a layer of paper separating components from different colonies ◦ Replace roof etc ◦ As bees chew through newspaper their scents will amalgamate without fighting ◦ About 7 days later, combine colony in one brood box (ensuring queen is present). Remove surplus frames without brood, and use any surplus frames with brood in another colony, having shaken all bees off both ◦ Some people use a crown board fitted with porter bee escapes to move worker bees down from the upper brood box to the one below, but this is inappropriate if the queen is in the upper brood box, or if there are supers above both brood boxes 	
<p>4.13 able to describe a simple method of queen introduction;</p>	<p>Why</p> <ul style="list-style-type: none"> ◦ To change behavioural problems ◦ To eliminate certain diseases ◦ To deal with poor productivity ◦ To reduce likelihood of swarming ◦ To re-queen a queenless colony 	<p>How</p> <ul style="list-style-type: none"> ◦ Colony should be receptive – remove existing queen if present and leave queenless for 24 hours ◦ Colony should not have been queenless for more than 7-9 days in case of virgin queens ◦ New queen should be placed in introduction cage and inserted centre of brood nest to eat through a fondant plug ◦ Minimise stress to new queen, retain her attendants until last minute
<p>4.14 aware of the reasons for uniting bees and the precautions to be taken;</p>	<p>Why</p> <ul style="list-style-type: none"> ◦ To create one strong stock from two weak ones ◦ To introduce queenless bees to a 'queen right' colony ◦ To reduce colony numbers in autumn 	<p>Precautions</p> <ul style="list-style-type: none"> ◦ Remove one queen (oldest, least productive or poorest characteristics) or they will fight each other ◦ Remove brace comb or one brood box will not fit snugly on top of the other ◦ Do in evening when flying bees are in hive or you will make the flying bees from the 'top' brood box homeless ◦ Separate bees from different colonies with newspaper or the workers will fight ◦ Leave alone for 7 days or you will undo the exercise

4.15 able to describe a method used to clear honeybees from supers;	<ul style="list-style-type: none"> ◦ Crown board fitted with porter bee escapes and inserted below supers to be cleared ◦ Other escape mechanisms – cone, rhombus, curtain or Canadian escapes ◦ Other clearance methods – mechanical blowing, use of chemical, use of bee brush
4.16 able to describe the process of extracting honey from combs and a method of straining and bottling of honey suitable for a small scale beekeeper;	<ul style="list-style-type: none"> ◦ Possible need for warming – warming cabinet ◦ Uncapping supers – possible use of uncapping tray and knife ◦ Insertion into manual or electric extractor (centrifugal device used to spin honey from cells in frames) ◦ Straining through mesh and straining cloth in a tank Storage in buckets – settling (bubbles up, debris down) Decant into jars
4.17 aware of the need for good hygiene in the handling of honey for human consumption;	<ul style="list-style-type: none"> ◦ Use food grade S/S or plastic containers ◦ Hand, hair, clothing and environmental hygiene ◦ Honey free from mould insect debris and other substances foreign to the composition of honey ◦ Water content must be less than 20% Honey should not have been heated excessively which destroys its enzymes ◦ New, sterile or sterilised honey jars and lids
4.18 aware of the legal requirements for the labelling and sale of honey;	<ul style="list-style-type: none"> ◦ Description and illustrations should not mislead ◦ Hone must come entirely from identified source ◦ Include name and address of produce, packer seller ◦ Mandatory to include country of origin Best before date – suggest 2 years ◦ Lot number needs to be used unless a best before is date specified ◦ Honey must be sold in specific quantities – figures must be < 4mm high
4.19 able to give an elementary account of the harvesting of beeswax.	<ul style="list-style-type: none"> ◦ Save all old comb, capping and pieces of wax ◦ Wax floats to top of heated honey ◦ Old comb/wax should be rendered separately from new, since new comb yields higher quality wax ◦ Store wax in a way which protects from wax moth Melt wax in soft water – do not boil Strain through lint into suitable container lubricated with liquid soap to aid release ◦ Cool slowly ◦ Can be exchanged for foundation with some suppliers
4.20 aware of the need for good apiary hygiene	<ul style="list-style-type: none"> ◦
4.21 Aware of the need for regular brood comb replacement	

4.22 Aware of the various web based resources	BBKA and Bee base websites
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5. Disease, Poisoning and Pests		
The Candidate should be:	Answer could include:	
5.1 able to describe the appearance of healthy brood;	<ul style="list-style-type: none"> ◦ Single eggs laid in base of cell ◦ Pearly white, C-shaped, segmented larvae lying in a bed of milky brood food ◦ Larvae of same age/size should be together ◦ Capping colour varies (digestive biscuit colour) dry looking, slightly convex, without perforations ◦ Even brood pattern (wall to wall apart from wires), few empty cells 	
5.2 able to describe the signs of the bacterial diseases American Foul Brood (AFB) and European Foul Brood (EFB) and the fungal disease Chalk Brood (CB) and describe their effects upon the colony; Brood diseases		Signs
	AFB	<ul style="list-style-type: none"> ◦ Affects only sealed brood ◦ Sunken cappings ◦ Uneven pepper pot pattern ◦ Scales at bottom of cells ◦ Decomposing 'ropey' larvae ◦ Greasy perforated cappings
	EFB	<ul style="list-style-type: none"> ◦ Affects mainly unsealed brood ◦ Discoloured yellow brown larvae in abnormal positions with melted appearance ◦ Cell contents not ropey ◦ Bad smell
	CB	<ul style="list-style-type: none"> ◦ Affects only sealed brood ◦ Perforated cappings ◦ Hard white/grey chalk-like remains – mummies – easily removed and rattle
		Effects
		<ul style="list-style-type: none"> ◦ Disease progresses steadily, until most of brood affected and unable to replace its adult bees, therefore dying out. <p>Treatment</p> <ul style="list-style-type: none"> ◦ Incineration of comb and bees ◦ Scorching of hive parts
		<ul style="list-style-type: none"> ◦ Debilitates but does not necessarily kill colony for months or even years. Treatment ◦ Shook swarms ◦ Antibiotics ◦ Destruction of weak colonies
		<ul style="list-style-type: none"> ◦ Healthy colonies can tolerate
5.3 able to describe methods for detecting and monitoring the presence of varroa (a mite) and describe its effect on the colony including awareness of the effect of associated viruses;	<p>Detection</p> <ul style="list-style-type: none"> ◦ Sudden decrease in adult bee population (but few dead bees present) ◦ Bees with deformed wings and abdomens ◦ Numerous mites on bees, in pupae and on hive floor – use mesh floor and Defra calculators 	<p>Effect on colony</p> <ul style="list-style-type: none"> ◦ Little at low infestations ◦ Slow replacement of bees ◦ Foraging, brood rearing and defence processes break down <p>◦ Ultimately, complete collapse</p>

Brood and adult pests	<ul style="list-style-type: none"> ◦ Other abnormalities (bald brood, poor pattern, patches of dead/neglected brood) 	
5.4 aware of acarine (a mite) and nosema (a protozoan) and their effect upon the colony; Adult diseases	<p>Acariosis</p> <ul style="list-style-type: none"> ◦ Infestation of trachea ◦ Clusters of bees appear confused and disorientated in front of hive ◦ Bees climbing hive front and blades of grass but unable to fly ◦ K wing (hooks holding wing pairs together become detached) ◦ Shortens lifespan of overwintering bees (spring dwindling) and leads to colony demise ◦ No approved treatments, just keep bees strong 	<p>Nosemosis</p> <ul style="list-style-type: none"> ◦ Infection of gut ◦ Acerbated by poor weather confinement (spotting) ◦ Shortens lifespan ◦ Queens are less prolific ◦ No approved treatments, just avoid cross contamination and maintain healthy stocks
5.5 able to describe ways of controlling varroosis using one registered product and one recognised biotechnical method plus basic knowledge of the problems arising from pyrethroid resistant mites;	<p>Registered products</p> <ul style="list-style-type: none"> ◦ Bayvarol (pyrethroid strips) ◦ Apistan (pyrethroid strips) ◦ Apiguard gel <p>Implications of resistance</p> <ul style="list-style-type: none"> ◦ Pyrethroids fail to work – perhaps development of thicker cuticle, which will be and inherited trait ◦ Avoid by using specified dose for specified time. Treat as little as necessary and alternate treatments ◦ Practice IPM 	<p>Biotechnical methods</p> <ul style="list-style-type: none"> ◦ Drone brood removal ◦ Comb trapping ◦ Artificial swarm ◦ Open mesh floors ◦ Icing sugar <p>Unauthorised varroacides</p> <ul style="list-style-type: none"> ◦ Oxaic acid ◦ Lactic acid ◦ Formic acid ◦ Essential oils / thymol
5.6 aware of the current legislation regarding notifiable diseases of honeybees;	<ul style="list-style-type: none"> ◦ Get second opinion from experience beekeeper (Defra handbook recommends this, but inspector encouraged immediate contact with CSL) ◦ Beekeeper suspecting presence of AFB or EFB in colony for which they are responsible is: <ol style="list-style-type: none"> 1) legally required to contact Central Science Laboratory N BU to have colony officially examined by CSL inspector, or submit a sample and 2) should place apiary under self imposed standstill ◦ Do what the inspector tells you ◦ Other notifiables – Small Hive Beetle and Tropilaelaps (neither yet in U K) 	
5.7 aware of the national and local facilities which exist to verify disease and advise on treatment;	<ul style="list-style-type: none"> ◦ National Bee Unit (part of DEFRA) or Beebase ◦ Regional and Seasonal Bee Inspectors 	
5.8 aware of where to obtain assistance if any poisoning by toxic chemicals is suspected;	<ul style="list-style-type: none"> ◦ Recognised by 100s dead bees outside entrance ◦ Collect three samples of 200-300 bees and store in freezer ◦ Contact spray liaison officer ◦ Send one sample to CSL and keep other two for legal reasons 	

5.9 able to describe how comb can be stored to prevent wax moth damage;	<ul style="list-style-type: none"> ◦ Don't leave wax exposed to attract moths ◦ Prepare frames before storage ◦ Spray with Certan ◦ Deep freeze for 24 hours ◦ Store wet supers ◦ Wrap in cling film, or tape up joints ◦ Protect from mice
5.10 able to describe how mice and other pests can be excluded from the hives in winter	<ul style="list-style-type: none"> ◦ Mouse guards ◦ Wire netting to protect from woodpeckers

Here are some points arising from recent assessments, most of these points tend to occur every year.

Use of Smoker – Even if the colony is very calm and placid you need to demonstrate to the assessor that you can use the smoker effectively to control the bees and move them out of the way before inserting the hive tool or your fingers to remove frames and also to ensure no bees are trapped between the side bars or brace comb when replacing the frames. You do need to watch the effect of the smoke on the bees. Dont over smoke as the bees will become agitated.

Use of Hive Tool – The chisel end is for separating the main components of the hive and removing burr and brace comb from the top bars and queen excluder. The other end whether standard or J-tool must be used to separate the frames.

Handling the frames – These should be kept reasonably vertical not held horizontally above the hive to inspect. The comb in large frames and below the bottom bars on shallow frames used for drone brood culling can break away. Maintain working space created after taking out dummy board and ensure replaced frames are keep tight together. When closing up **move all frames in one go (NOT individually)** to minimise the risk of crushing bees between the side bars. Insert the hive tool **chisel end down** on the side wall of the hive and press the other end against the outer top bar. **Use smoker before closing final gap.**

Obtain a matchbox sample of bees for disease diagnosis – There's a better than even chance you'll get asked to do this – so do practise beforehand. Older bees are required so it's easiest to temporarily close the hive entrance and take the sample from the front of the hive.

Shake bees from frame for disease inspection – Make sure there is enough space in the hive for shaking the frame to avoid banging the frame and jarring the hive. It needs a sharp shake to dislodge most of the bees.

Placement of queen excluder and first frame – Even after checking the queen excluder and first frame it's possible to miss the queen so place these near the front of the hive so the bees can get back in and not on the supers or you may find your brood nest has gone up one storey.

Identify eggs – You really do need to be able to see eggs otherwise there is no way you can tell if the colony is queenright or if there is some other problem that needs your closer attention. Make sure you have the light coming over your shoulder so you can clearly see the contents of the brood comb. If the light is poor because of low cloud cover or tree canopy then take an **LED torch** so you can see into the cells. If your eyesight is not so good use a **magnifying glass**.

Diagnosis of queenlessness – This just requires the use of a test comb of eggs from another colony. There have been many instances in the past couple of years where the queen has stopped laying for periods of time because of the bad weather or colony starvation.

Foul Brood Diseases – All the visual signs for both AFB and EFB need to be recognised and not confused between these two diseases. The high levels of stress on colonies from the bad weather this year has seen a high incidence of EFB across the county so it is imperative that any changes to healthy brood – larvae and sealed – are recognised as early as possible. Try and understand the effect the disease is having on the larvae as this will help recognise the early signs.

AFB - Affects only sealed brood, Sunken cappings, Uneven pepper pot pattern, Scales at bottom of cells, Decomposing 'ropey' larvae and Greasy perforated cappings.

EFB - Affects mainly unsealed brood, Discoloured yellow brown larvae in abnormal positions with melted appearance, Cell contents not ropey and Bad smell

Notifiable diseases – It is not adequate just to call the Bee Disease Inspector if you suspect either of the foulbroods. Do remember to **reduce the entrance** to minimise the risk of the colony being robbed and prevent spread of the disease.

Nosema – Is NOT dysentery it is an Infection of gut. Acerbated by poor weather confinement (spotting), Shortens lifespan, Queens are less prolific, No approved treatments, just avoid cross contamination and maintain healthy stocks

Two species – Apis and Ceranae Apis = Fungi / Parasite Ceranea = New Spanish strain bees die away from hive.

Sometimes there may be signs of spotting and faecal staining on the hive. If you know what the disease is doing to the adult bees then this should help you working out the answer.

Feeding sugar – The strength of sugar syrup and the type of feeder used is different dependent on its intended purpose. 2lb to 1 Pint in Spring and autumn. 1lb to 1 Pint in summer.

Swarm Control – This is about assessing your general knowledge on swarm control – such as why bees swarm, what happens when the colony swarms, management to minimise swarming.

Prevention - Use strain of bee less likely to swarm, Use young queens, Provide ample room, Ensure good ventilation, Inspect for queen cells at least every nine days.

Control - Creation of a nucleus/artificial swarm, Making more space, Clipping of queen wings, Excluder like device at entrance of hive, Bailey comb change, Remove queen cells (unless bees have already swarmed)

Artificial Swarm Method – Each step involved in whichever method has to be described in the correct sequence. Unless this has been practised beforehand it's very easy to get things muddled with the parent colony and swarm ending up in the wrong places or the queen in the wrong place. Think about what end goal is and why each step is there.

What's needed:

An extra brood box with frames and foundation or drawn comb; cover board; roof; and enough space around the original hive to carry this procedure out.

Step 1.

Subdue the bees with smoke and remove the roof, cover board, and super from the original hive. Replace the cover board directly on the brood box to calm the bees. Now move the original brood box and floor about a meter to a side of the original location. Next position the extra floor and extra brood box with frames and foundation on the site of the original hive and take out the centre two frames, keep these handy for later use.

Step 2.

Go through the frames in the original hive carefully and find the queen. Take the frame with the queen on it, check it for queen cells, remove any found, and place the frame with queen and young bees into space in extra brood box on the original site. Select another frame from the original hive that has sealed brood and a good quantity of young bees, check it for queen cells and remove any found, then place this in the remaining space in the extra brood box. Put the original queen excluder, super, cover board and roof on to close up this 'artificial swarm'.

Step 3.

Move the frames in the original hive together and fill the end gaps with the two frames put aside earlier. Close up this hive with a cover board and roof and either relocate it or turn the whole hive 180 degrees with the entrance facing way from the artificial swarm hive.

Ok, a quick recap on what we've done. We have taken the queen along with young bees and sealed brood and put them in a new hive on the original location, creating an 'artificial swarm'. The remaining original frames, brood and young bees will emulate a hive that has just swarmed, but on a new location. It may have queen cells but if not young bees will create new emergency queen cells where necessary. The adult flying bees will return to the original location and boost the numbers in the 'artificial swarm' to what it would normally be. Both hives will be busy from here on.

Step 4-A.

If there were no queen cells in the original hive, after about five days go through the hive and check for the presence of emergency queen cells that the young bees should have created. Select the cell with the fattest looking grub and destroy the rest. Or...

Step 4-B.

If there were queen cells left in the original hive, select the best and destroy any others. Leave both hives now to do what comes naturally.

This procedure leaves you with two choices: to allow both hives to develop into full colonies over the summer; or to get rid of one queen near autumn and unite the hives to produce a strong hive for wintering.