



West Suffolk Beekeepers' Beginners' Course

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Session 1: Natural History

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By the end of this session...

- Be able to identify the bees in a hive
- Understand the function of the worker, queen and drone
- Begin to understand the bee life cycle
- Know some of the duties of bees within the hive

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The Life Cycle of a Honey Bee



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Superorganism

Individuals
Division of labour
Superintelligence



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2 Castes 2 Sexes

- Queen – Fertile female
- Worker – Infertile female
- Drone – Fertile male



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Honey bee castes and sexes

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Natural History

★ Know the development, timings and longevity for a:

- > queen
- > worker
- > drone

Know the:

- > roles of the queen in the colony
- > roles of drones in the colony
- > roles of workers and age relationship

Explain how wax is produced and used

Explain how a colony passes through winter

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Development – egg to adult

Worker 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

Queen 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Drone 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

egg larva prepupa pupa imago

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	Egg	Larva (open)	Pupa (capped)	Total	Days to maturity	Total to maturity
Queen	3	5	8	16	5	20
Worker	3	6	12	21	0	21
Drone	3	7	14	24	12	36

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Birth of a Bee

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Summer & Winter bees

Summer bees
 Up to 2000 a day
 6 weeks
 Exhaustion
 Away from colony


Winter bees
 About 20 a day
 Up to 6 months
 Disease and old age
 Adaptation

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Worker

Purpose - age related tasks 

Identification

- Smaller than queen or drone
- Barbed sting
- Wax glands
- Pollen basket
- Wings reach tip of abdomen

Life cycle

- Emerges day 21
- Lifespan 6weeks/6 months

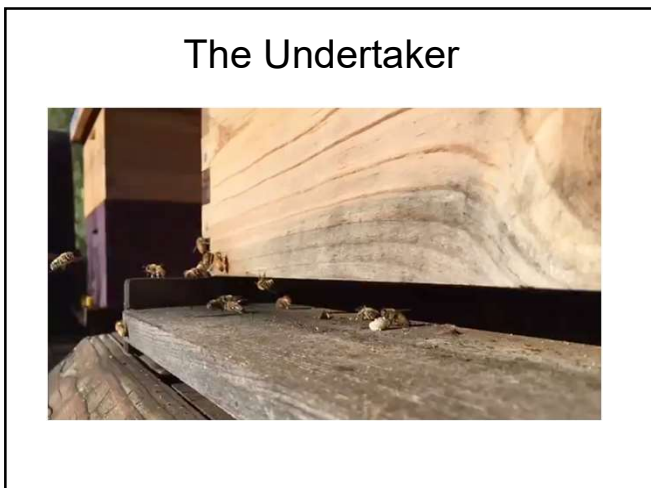
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Days		Duties	Speciality	
1-2	young bee	cleans cells, helps maintain hive temperature		house bee
3-5	nurse bee	Gorges on pollen and honey, feeds older larvae		
6-11		feeds younger larvae and queen on royal jelly	hypopharyngeal glands developed & very active	
8-12	first orientation flights: hive marking			
12-21	wax maker	general domestic duties, comb building, ripening nectar, hive ventilation, etc	wax glands fully developed & very active	flying bee
18-21	guard bee	guarding capability	venom glands fill up the venom sac	
22-43	forager bee	collects pollen, nectar, propolis and water	field/foraging bee	

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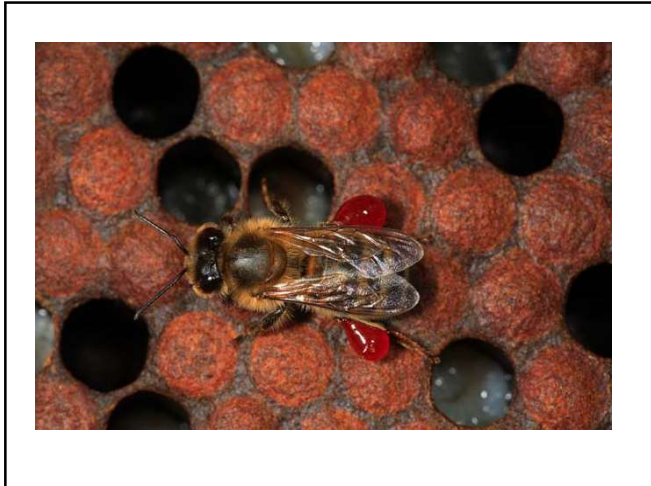
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Workers - division of labour with age


18 – 21 days
guard duty



21 days – death nectar collection
21 days – death pollen collection
21 days – death water & propolis collection


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The Guard Bee



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Drone



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Drone

Primary purpose is to mate



Identification

- large wings
- large compound eyes
- long antennae extra segment 11
- no sting
- no pollen basket

Life cycle

- Emerges day 24
- Life span 40-50 days

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The drone's legacy?

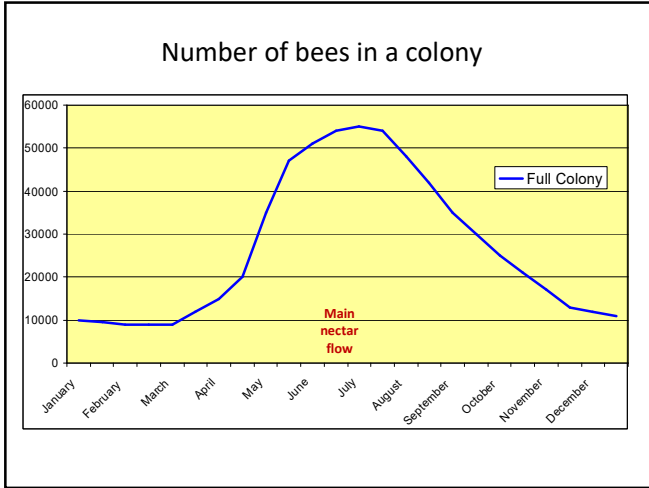
Multiple mating ensures genetic diversity

Carries the queen's genes forward

Ensures the continuation of a colony

Design ensures no cross - breeding

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Number of bees in a colony

~50,000 workers

~10,000 workers

1 queen
but in winter

1 queen

~2000 drones

0 drones

Courtesy of Clive de Bruyn

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Important Facts for later

	Egg	Larva (open)	Pupa (capped)	Total	Days to maturity	Total to maturity
Queen	3	5	7	16	5	20
Worker	3	6	12	21	0	21
Drone	3	7	14	24	12	36

Queen 3:5:7

Worker 3:6:12

Drone 3:7:14

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Write the age related tasks of the worker in the box:

Age (days)	Task
Day 1-2	
Day 3-5	
Day 3-15	Feeds younger larvae/queen
Day 6-11	
Day 8-12	wax production
Day 12-21	
Day 18-21	
Day 22 -death	

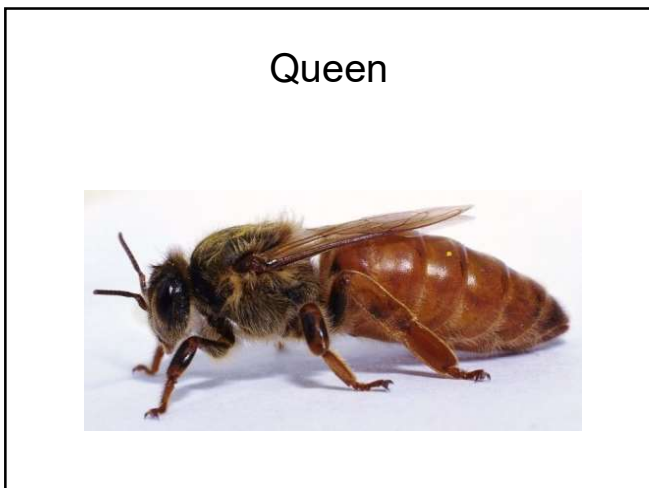
Fill in the boxes:

Identification	Queen	Worker	Drone
purpose		age related tasks	
sex			
abdomen (shape)			
legs			
sting			
antennae			
eyes			
pollen basket	N		
wax glands			N

How many days?

	Queen	Worker	Drone
egg			
larva	5		
pupa		12	
emerges			24
matures			
lifespan			
No. in colony in winter			
No. in colony in summer			2,000

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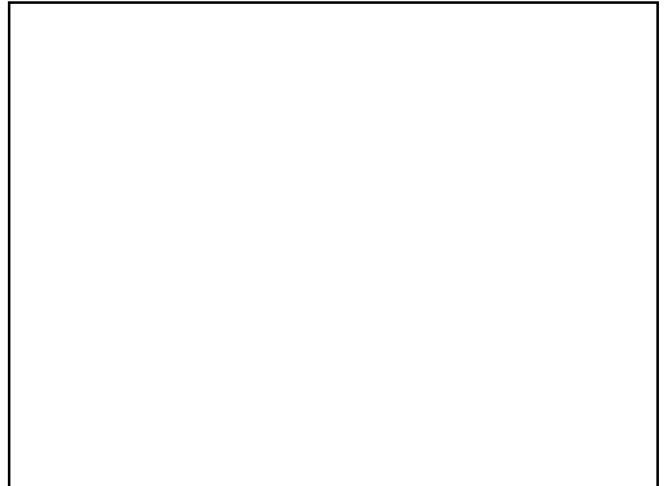
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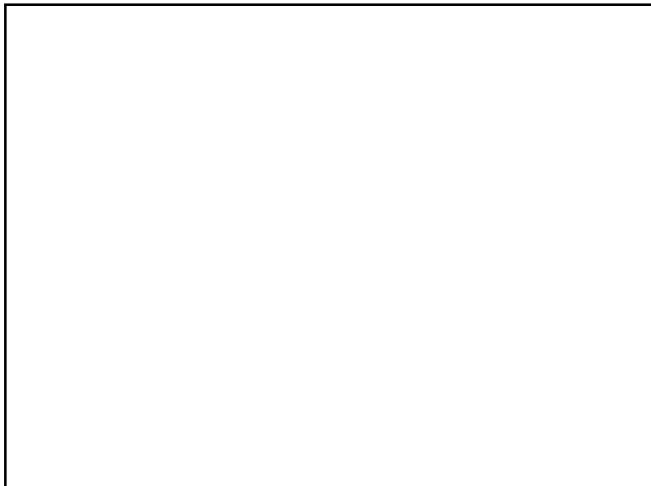
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Next session: February 13th

- ❖ The Beekeeping Year - Jane
- ❖ Beeconomics
- ❖ Siting an Apiary- Kevin

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Larval development

Ex: Biology of the Honeybee by Mark Winston
NB: Worker and drones are laid in cells that are approximately horizontal whereas queens are laid and developed in cells that hang downwards

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Answers.....

What can you remember?

Write the age related tasks of the worker in the box:

Age (days)	Task
Day 0-2	cell cleaning
Day 2-3	feeding the brood
Day 3-15	attending the queen
Day 6-18	honey processing
Day 12-20	hive construction
Day 15-25	hive ventilation
Day 18-25	guard duty
Day 20 - death	nectar, pollen, water and propolis collection

Individual life cycles

	Queen	Worker	Drone
Eggs hatch on day	3	3	3
Larva develops for (days)	5	6	7
Cells sealed on day	8	9	10
Pupa develops for (days)	8	12	14
Adults emerge after (days)	16	21	24
Life expectancy of adult	Potentially 4-5 years	6 weeks (summer) 6 months (winter)	40-50 days

Fill in the boxes:

Identification purpose	Queen	Worker	Drone
sex	F	F	M
abdomen (shape)	Large, pointed		blunt
legs	long		short
sting	unbarbed	barbed	none
antennae			long
eyes			large
pollen basket	N	Y	N
wax glands	N	Y	N

How long....?

	Queen	Worker	Drone
egg	3	3	3
larva	5	6	7
pupa	8	12	14
emerges	16	21	24
matures	4		14
lifespan	1-5yrs		40-50 days
No. in colony in summer	1	c 50,000	c 2,000
No. in colony in winter	1	c 10,000	0

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