

Manchester  
Metropolitan  
University

*The home of  
Biological Recording*

# *Difficult Groups for Absolute Beginners*

**Mark Duffell**



**Botanical Society  
of Britain & Ireland**



**Manchester  
Metropolitan  
University**



**Arvensis  
ECOLOGY**

*Inspiring a passion for Plants*

# What is a difficult group?



# What is a difficult group?

Blue = ideal minimum professional level – skills are cumulative up the pyramid

## The Botanical Field Skills Pyramid

**7. Outstanding – good national referee for a limited taxonomic or habitat group – may write monographs, review taxonomic groups, supervise research students' projects on a species**

Green = recorders/field surveyors with national status

**6. Excellent ID skills – likely to be commissioned nationally for surveying a particular group. Likely to publish. Would probably keep a reference collection.**

**5. Very good ID skills – in one group or more – more-or-less totally reliable for a site survey for that group – would expect to identify any rare species or hybrids or take vouchers for ID.**

Would be expected to record at least 75% of their taxa within a site

**Would be expected to know about legislation and automatically have appropriate licence. Always uses scientific names**

**4. Good ID skills in one group – could be commissioned to survey a site for vascular plants but may miss sub-species and hybrids.**

**Reasonable on grasses, sedges and ferns. Member of relevant recording society  
Should automatically submit records. Should use mostly scientific names.**

Ideally, schemes and societies should aim for this as the minimum for active recorders and VC recorders

**3. Reasonable ID skills – some flowering plants, some common grasses, sedges or ferns – an improver. Should be aware of relevant national recording society.  
May be a member. May submit records locally. Uses common names usually.**

Minimum level for FSC tutor. Minimum level for a recorder to have their records accepted. Phase 1 survey level

Can include the 'village expert', and may lead informal walks

**2. Some ID skills – can ID common flowering species, for example but not capable of producing a comprehensive site list. No grasses, sedges or ferns, but some rushes. May have attended on courses but not familiar with collecting and refereeing of voucher specimens. Unlikely to be a member of relevant recording society although may be a member of a local recording group. Uses common names.**

**1. Basic ID skills – can recognize a buttercup, daisy or plantain. No grasses, sedges or ferns. May not have attended any sort of training course in identification, but intends to work/record in that area. Usually not a member of BSBI. Probably unaware that they are at this level but would like to be at one of the above levels (often a recent undergraduate).**

**0. General populace with no current engagement in field botany**

Minimum level for teaching professional ID courses.

Minimum level for agency employee or consultant and for NVC. Minimum level for FSC associate tutor for non-credit teaching

# Some difficult groups

Grasses

*Agrostis* sp.

Sedges

*Carex muricata* agg.

Rushes

*Juncus bufonius* agg.

'Ferns' (Pteridophytes)

*Dryopteris affinis* agg.

Cow Parsley Family

Cow Parsley Family

Yellow 'Dandelions'

*Hieracium/Taraxacum*

Yellow 'Cabbages'

*Cochlearia* sp.

*Limonium* sp.

Roses

Eyebrights

Willows

# Tackling difficult groups?

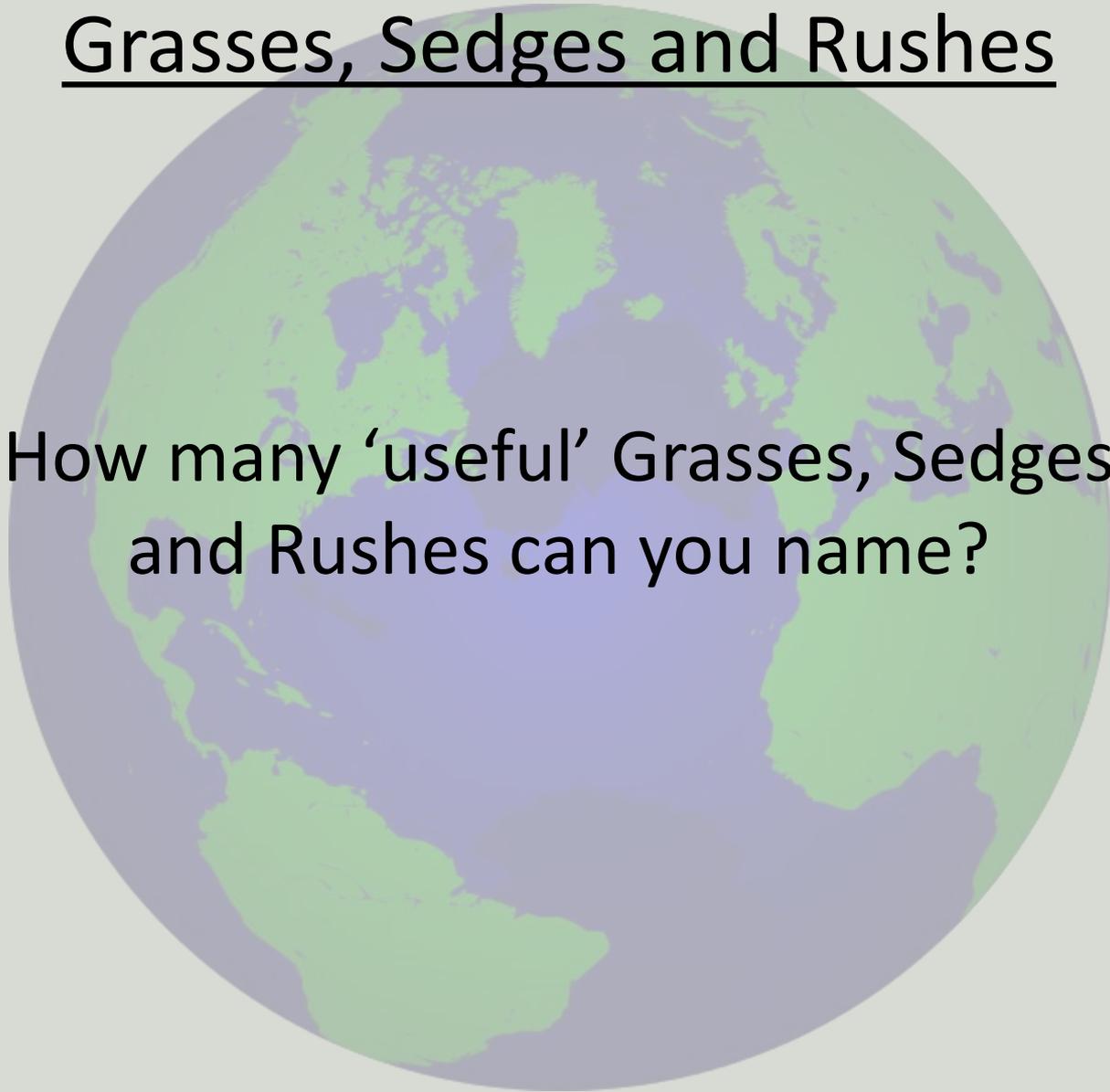
Breaking the ice

Assessment for Learning (AFL)



# Grasses, Sedges and Rushes

How many 'useful' Grasses, Sedges  
and Rushes can you name?





Extract from *Stace, C. 2010. New Flora of the British Isles. 3<sup>rd</sup> Edition. Pages 101-102*

***RANUNCULACEAE*** - Buttercup family

Herbaceous annuals or perennials, sometimes woody climbers; leaves borne spirally or sometimes opposite or whorled, simple or variously compound, usually petiolate, usually without stipules.

Flowers variously arranged, bisexual, hypogynous, usually actinomorphic, sometimes zygomorphic; perianth of 1-2 whorls of free segments, the outer (sepals) often petaloid, of various colours, the inner (petals or honey-leaves) bearing nectaries and often reduced or absent, sometimes (when petals 0) a whorl of sepal-like bracts outside the petaloid sepals; stamens usually numerous, rarely as few as sepals; carpels 1-many, sometimes partially or rarely fully fused, if many usually spirally arranged, with 1-many ovules; fruit usually an achene or follicle, rarely a berry or capsule.

Very variable in floral morphology, but most genera have spirally arranged leaves without stipules and produce a head of achenes or follicles from each flower, which is always hypogynous and often with the sepals more conspicuous than the petals.



**opticon**  
23mm DOUBLE **10x**

# Tackling difficult groups?

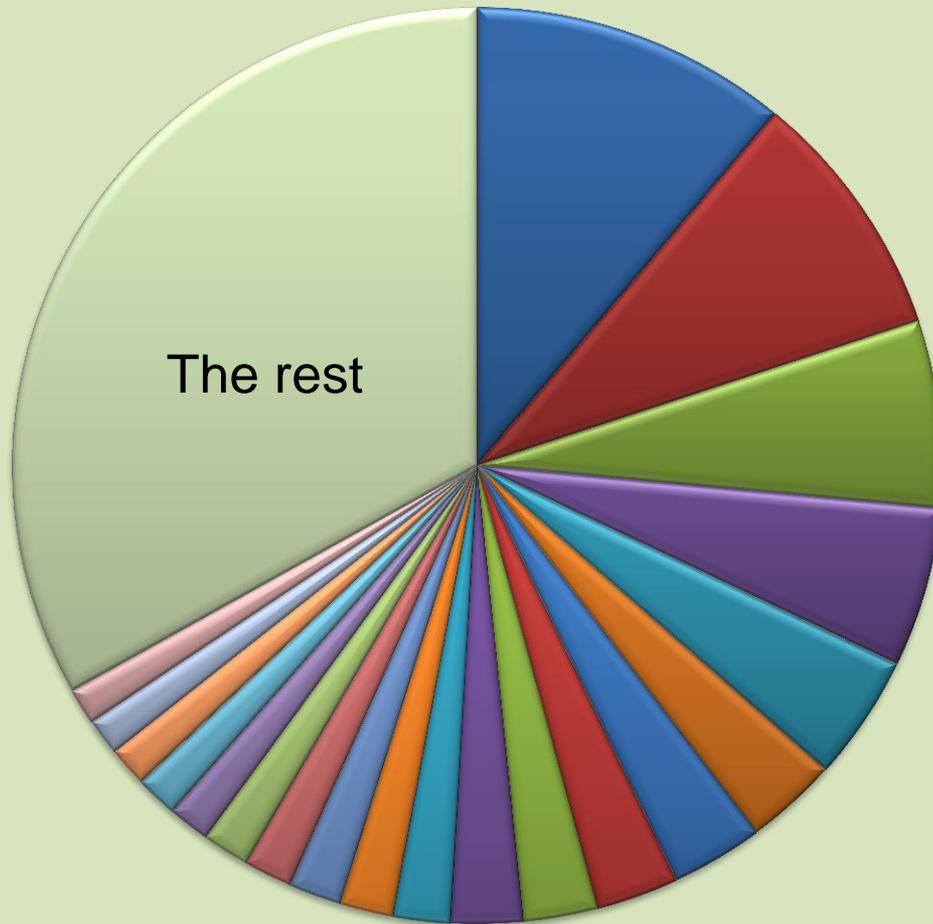
Breaking the ice

Assessment for Learning (AFL)

Introduce the difficult group

Breaking down the difficult group

# 174 UK Plant families



## Top 20 families

- Asteraceae
- Poaceae
- Rosaceae
- Fabaceae
- Brassicaceae
- Cyperaceae
- Caryophyllaceae
- Lamiaceae
- Apiaceae
- Amaranthaceae
- Ranunculaceae
- Boraginaceae
- Polygonaceae
- Veronicaceae
- Alliaceae
- Iridaceae
- Orchidaceae
- Solanaceae
- Orobanchaceae
- Ericaceae

# Top 20 plant families

Rank	Family	No species
1	<i>Asteraceae</i>	417
2	<b><i>Poaceae</i></b>	333
3	<i>Rosaceae</i>	248
4	<i>Fabaceae</i>	213
5	<i>Brassicaceae</i>	166
6	<b><i>Cyperaceae</i></b>	122
7	<i>Caryophyllaceae</i>	121
8	<i>Lamiaceae</i>	108
9	<i>Apiaceae</i>	97
10	<i>Amaranthaceae</i>	94

Rank	Family	No species
11	<i>Ranunculaceae</i>	75
12	<i>Boraginaceae</i>	70
13	<i>Polygonaceae</i>	69
14	<i>Veronicaceae</i>	64
15	<i>Alliaceae</i>	62
16	<i>Iridaceae</i>	55
17	<i>Orchidaceae</i>	55
18	<i>Solanaceae</i>	53
19	<i>Orobanchaceae</i>	49
20	<i>Ericaceae</i>	48

24	<b><i>Juncaceae</i></b>	42
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# Number of Genera, species and hybrids.

	Genera	Species
<i>Poaceae</i>	100	309
<i>Cyperaceae</i>	16	112
<i>Juncaceae</i>	2	42
Totals	<b>118</b>	<b>463</b>

	Families	Genera	Species
All UK	107	517	1,475
GSR	3	118	463

*Juncaceae*: Rush Family

2 genera

*Luzula* (Woodrushes)

9 species

1 hybrid

1 Alien

*Juncus* (Rushes)

25 species

7 hybrids

4 Aliens



## *Juncaceae*: Rush Family

### *Luzula* (Woodrushes)

- Leaves bifacial.
- Pubescent (at least near base when young)
- Ovary with three ovules
- Seed capsule with three seeds

### *Juncus* (Rushes)

- Leaves bifacial to unifacial
- Glabrous
- Ovary with many ovules
- Capsule with many seeds



# Tackling difficult groups?

Breaking the ice

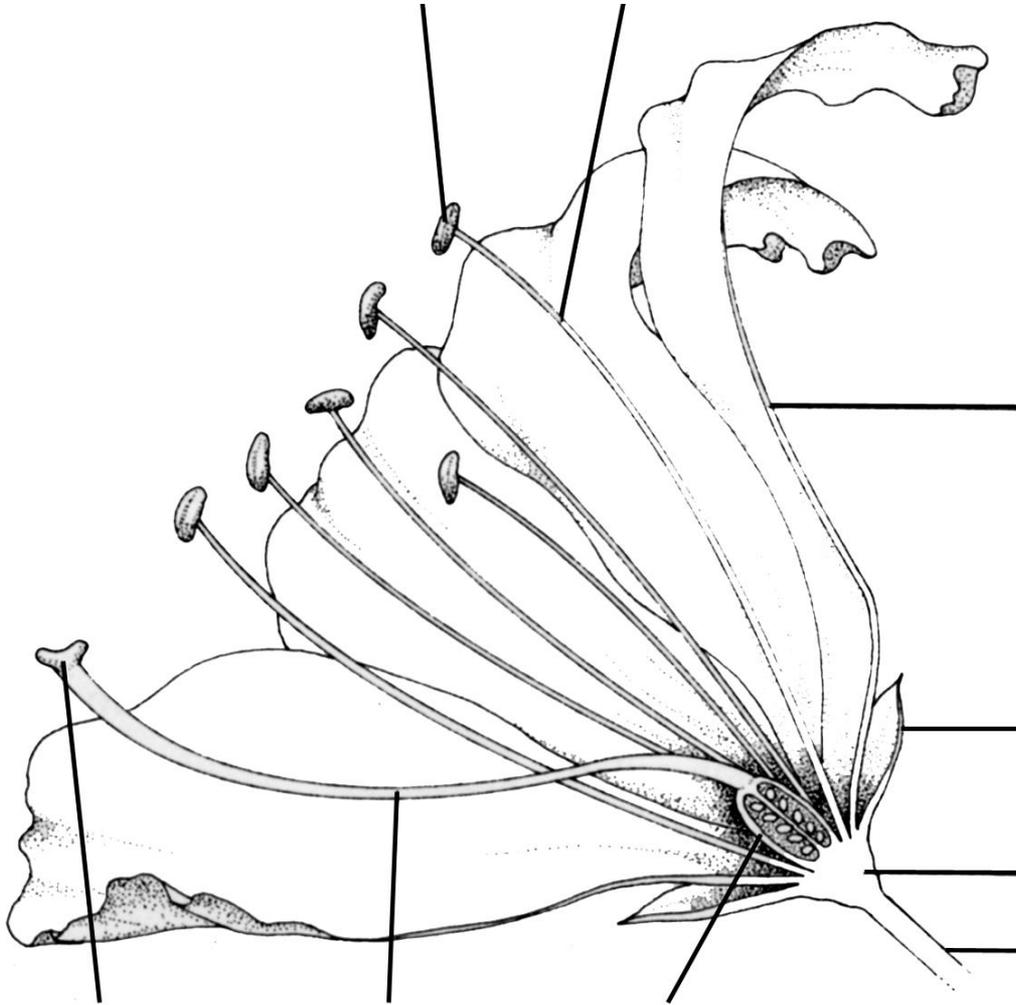
Assessment for Learning (AFL)

Introduce the group

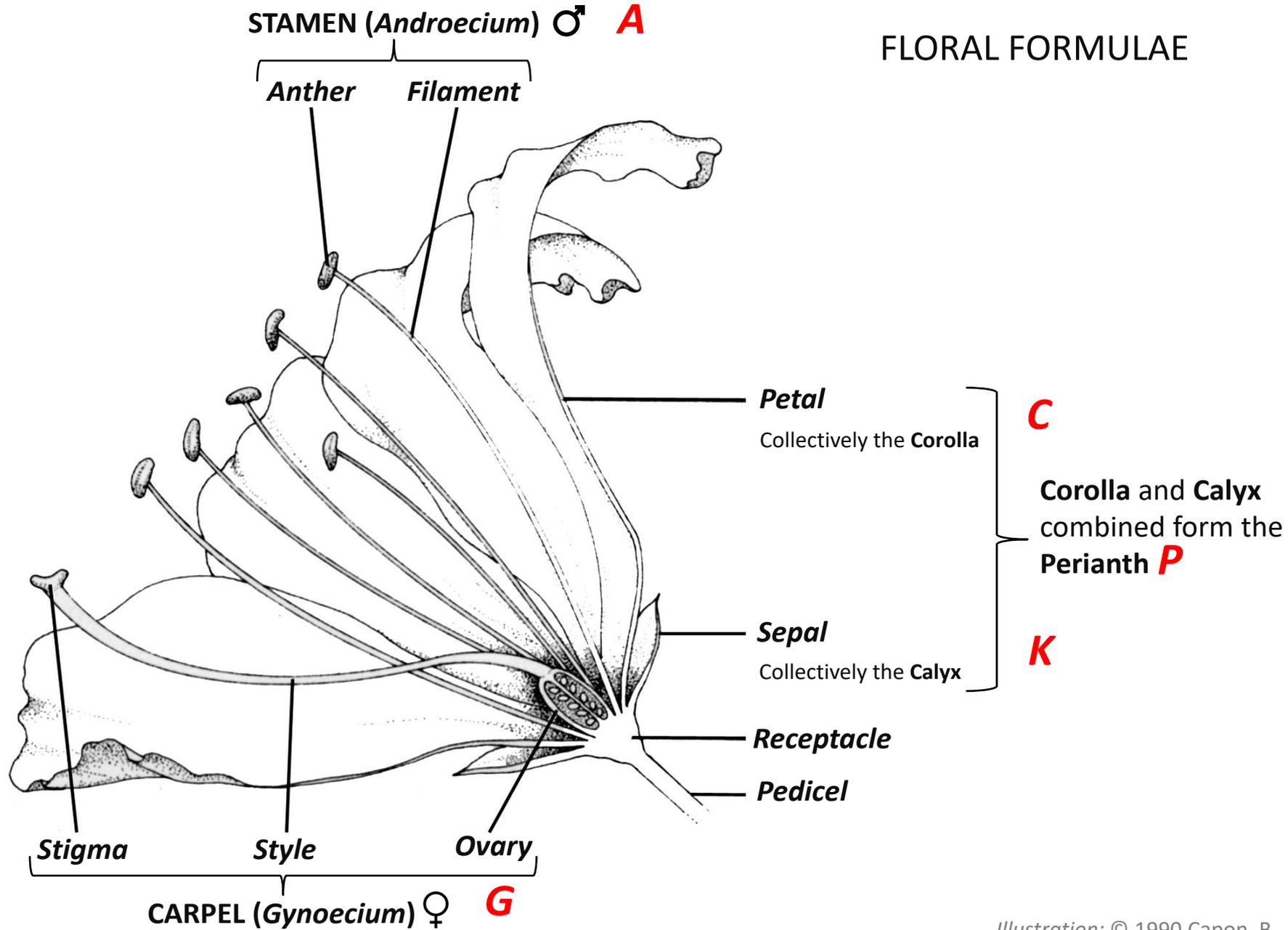
Breaking down the group

Naming of parts

# Parts of a 'perfect' Flower



# Parts of a 'perfect' Flower





## Exercise 2: Specimen A

Dissect the flowers of Specimen A, identifying the individual parts of the flower along with the numbers of each part. Fill in the table below and highlight the relevant terms.

Use this space to stick down the individual parts using sellotape (as shown by tutor).

Floral Symmetry (circle):      Actinomorphic (regular) / Zygomorphic (irregular).

Floral formulae code	Floral part	Number of parts present	Fused/Free?
K	Sepals	4	Free
C	Petals	4	Free
A	Stamen	4+2 or 6	Free
G	Ovary*	Superior	Fused
	Stigma	2	

\*either Superior or Inferior

Write the **floral formula** for this specimen:

Using Stace (2010) **key out** from Page 56. Write down each stage.

Using the 'Summary of family characters sheet' select the family:

**Major Plant families, their characters and floral formulae**

Family	Number of		Typical Floral formulae (UK)	Typical characters
	Genera	Species, subspecies & hybrids		
<p><b><i>Amaranthaceae</i></b>  <b>Goosefoot</b> (incl. <i>Chenopodiaceae</i>)</p>	12	76	* P3-5 A3 <u>G</u> 2	<p>Inflorescence usually cymes                      Flowers with 1 whorled perianth, ovary with 1 ovule and 2-3 styles                      Fruit an achene or 1 seeded capsule</p>
<p><b><i>Apiaceae</i></b>                      (Umbellifers)   <b>Cow Parsley</b></p>	50	83 sp., 12 ssp., and 3 hybrids	† or * K0-5 C5 A5 $\hat{G}$ (2)	<p>Inflorescence an <b>umbel</b> (often compound)                      Sepals either very small or absent  <b>Stylopodium</b> (enlargement of the style base)  <b>Fruit shape diagnostic</b>                      Leaves alternate, compound, pinnate with <b>sheathing bases</b></p>
<p><b><i>Asteraceae</i></b>                      (Compositae)   <b>Daisy</b></p>	104	281 sp., 39 ssp., and 42 hybrids	† or * K <sup>pappus-0</sup> [C(5) A(5)] $\hat{G}$ (2)	<p>Inflorescence a capitulum                      Bracts (phyllaries) surround the capitulum acting like sepals.                      Flowers present in 3 forms: Disc, ray and tubular.  <b>Ovary is inferior; fruit often topped by a pappus of hairs (from modified calyx)</b>                      Leaves variable, often in a basal rosette.</p>
<p><b><i>Boraginaceae</i></b>   <b>Borage</b></p>	22	56 sp., 2 ssp., and 11 hybrids	* K(5) [C(5) A5] <u>G</u> (2).	<p>Leaves usually alternate                      Flowers in scorpidal cymes, actinomorphic (zygomorphic in <i>Echium</i>)                      Fruit formed from 2 carpels that each split with a septum to form two single seeded nutlets.                      Fruit a cluster of 1 seeded nutlets</p>
<p><b><i>Brassicaceae</i></b></p>				<p>Inflorescence either a raceme or corymb</p>

Using Stace (2010) **key out** from Page 56. Write down each stage.

**General Key (Page 56)**

1 →								

**Letter Key (e.g. Key B)**

1 →								

What family did you key it out to?

# Keying out in Stace (2010)

1 → If plant free-floating then with clearly differentiated stems and leaves



Plant consisting of floating or submerged  $\pm$  undifferentiated pad-like fronds  $\leq 10(15)$ mm...

**LEMNACEAE**  
**Duckweeds**



[www.plant-identification.co.uk](http://www.plant-identification.co.uk)



[www.uwgb.edu](http://www.uwgb.edu)

# Keying out in Stace (2010)

1 → 2 → 3 → 4 → 5 →



If tree the not with single terminal rosette of compound leaves; if seedlings then not with leaves ribbed alternately on each surface.

Trees with unbranched stem and terminal rosette of huge pinnate or palmate leaves; or seedlings with leaves ribbed alternately on each surface

***ARECACEAE***

**Palm family**



# Tackling difficult groups?

Breaking the ice

Assessment for Learning (AFL)

Introduce the group

Breaking down the group

Naming of parts

Summarising day

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