

**Science – Year 5/6A Autumn 1**

Living Things and Their Habitats

# **Illustrating Life Cycles**

Session 1

**Resource Pack**

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We refer you to our warning, at the foot of the block overview, about links to other websites.

Examples of botanical illustrations







1. Rosmarin.  
*Rosmarinus officinalis* L.

2 a, b, c. Melisse.  
*Melissa officinalis* L.

3 a, b. Hyssopus.  
*Hyssopus officinalis* L.

Rosaceae. Prunae.



320. *Amygdalus communis* L.

Mandelbaum.



REV. H. L. P. 1848.

*Oxalis enneaphylla* Cav.



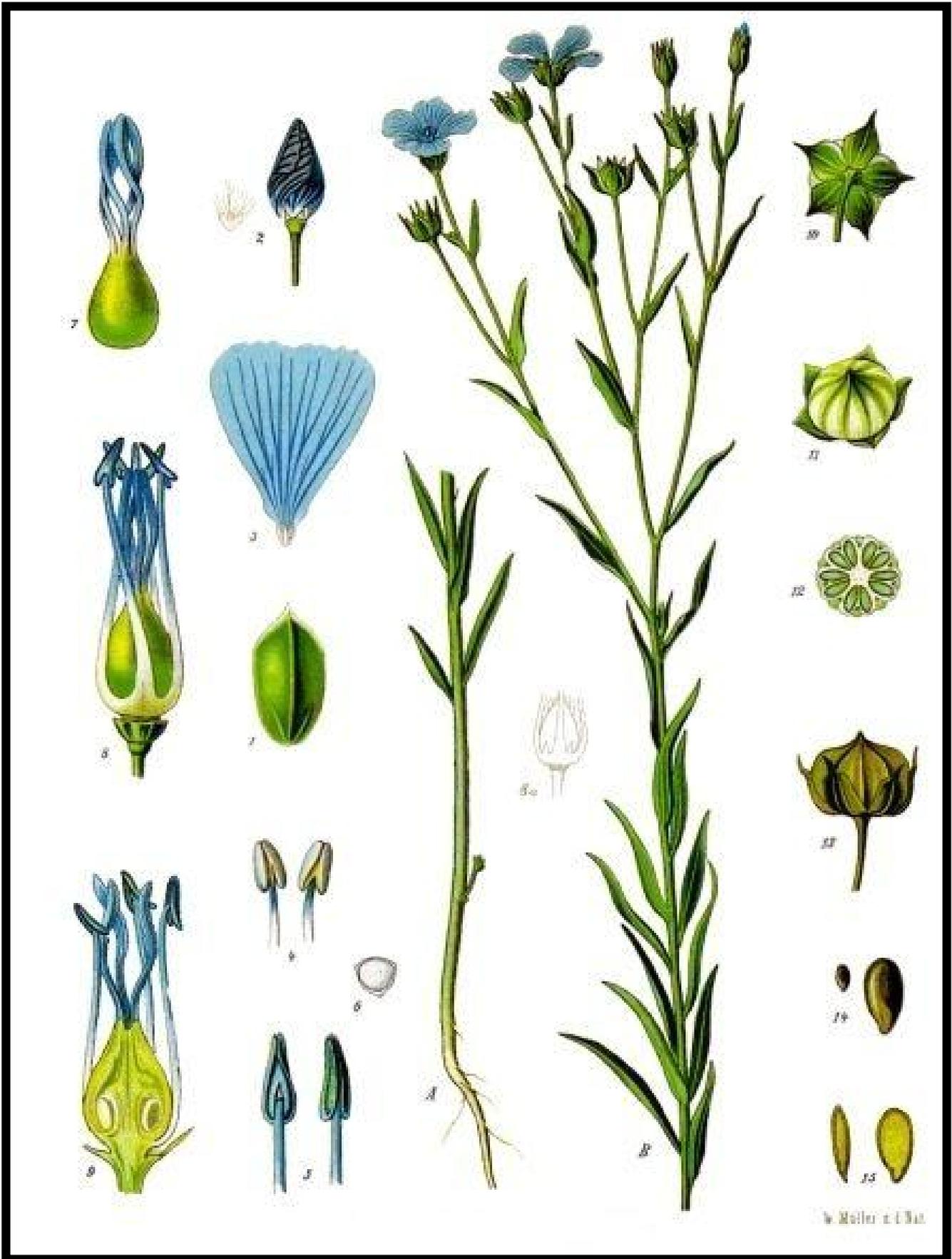


1 a, b. Herbstzeitlose.  
*Colchicum autumnale* L.

2 a, b. Tollkirsche.  
*Atropa belladonna* L.

3 a—c. Seidelbast.  
*Daphne mezereum* L.

4 a—g. Roter Fingerhut.  
*Digitalis purpurea* L.



Gallery questions:

- 1. What can you see in the illustration?*
- 2. Do you think that this illustration represents the plant at a single moment in time?*
- 3. Why do you think so many different structures have been included in the picture?*
- 4. What do you think the artist has had to do to the plant in order to see and draw all of the structures?*
- 5. What art materials and methods do you think the artist has used?*

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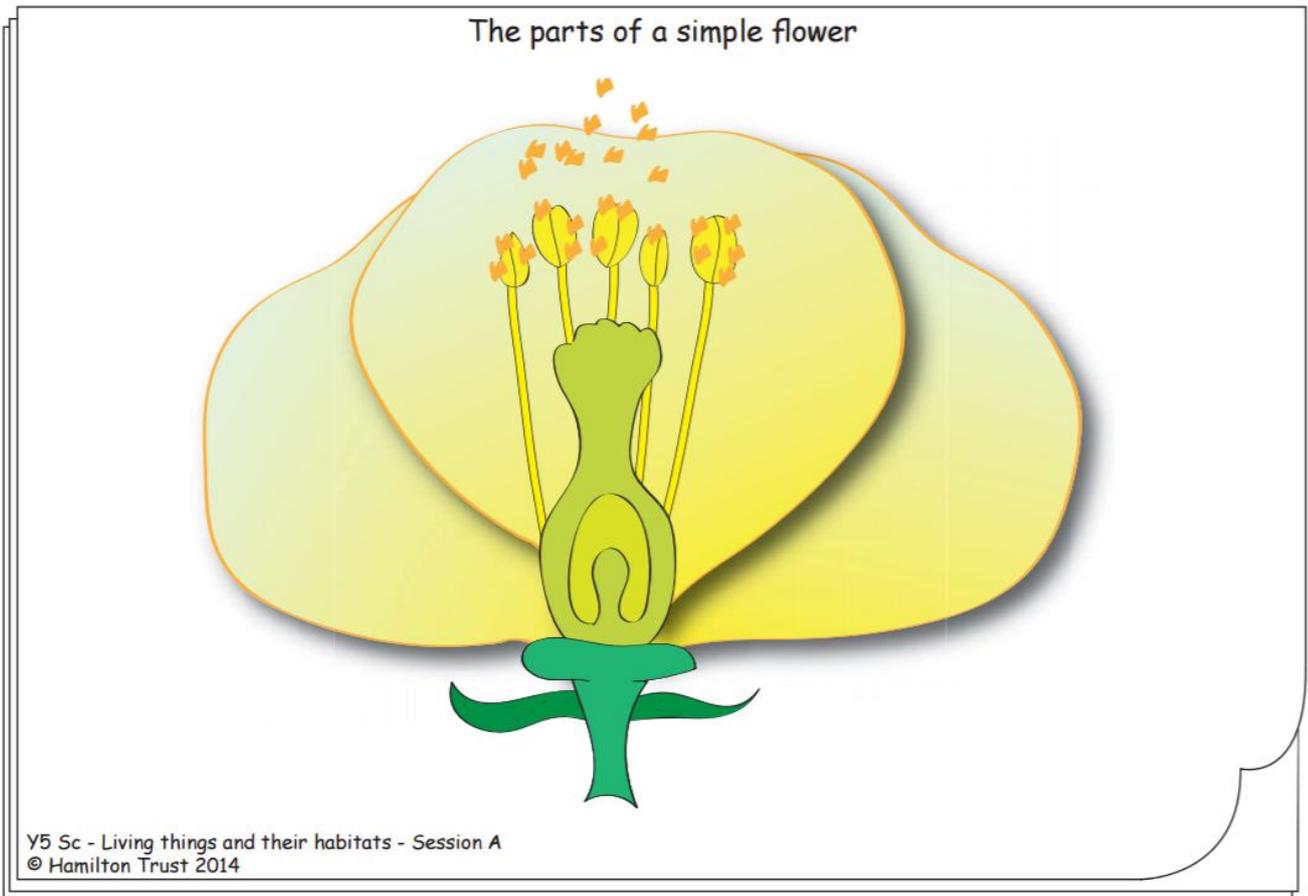
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*Botanical art (not illustration)*



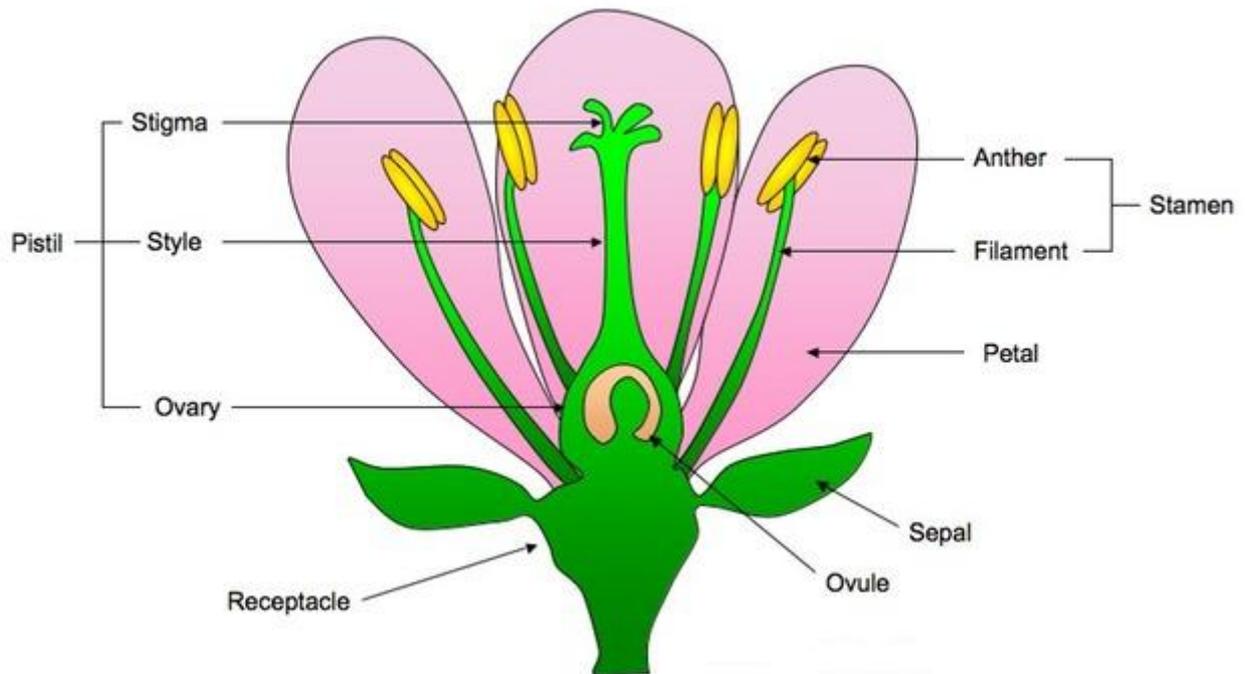


**Unlabelled flower with labels to add in**



<b>Petal</b>	<b>Pollen</b>	<b>Anther</b>
<b>Sepal</b>	<b>Pistil</b>	<b>Sepal</b>
<b>Stamen</b>	<b>Style</b>	<b>Receptacle</b>
<b>Stigma</b>	<b>Filaments</b>	<b>Stem</b>
<b>Ovule</b>	<b>Ovary</b>	

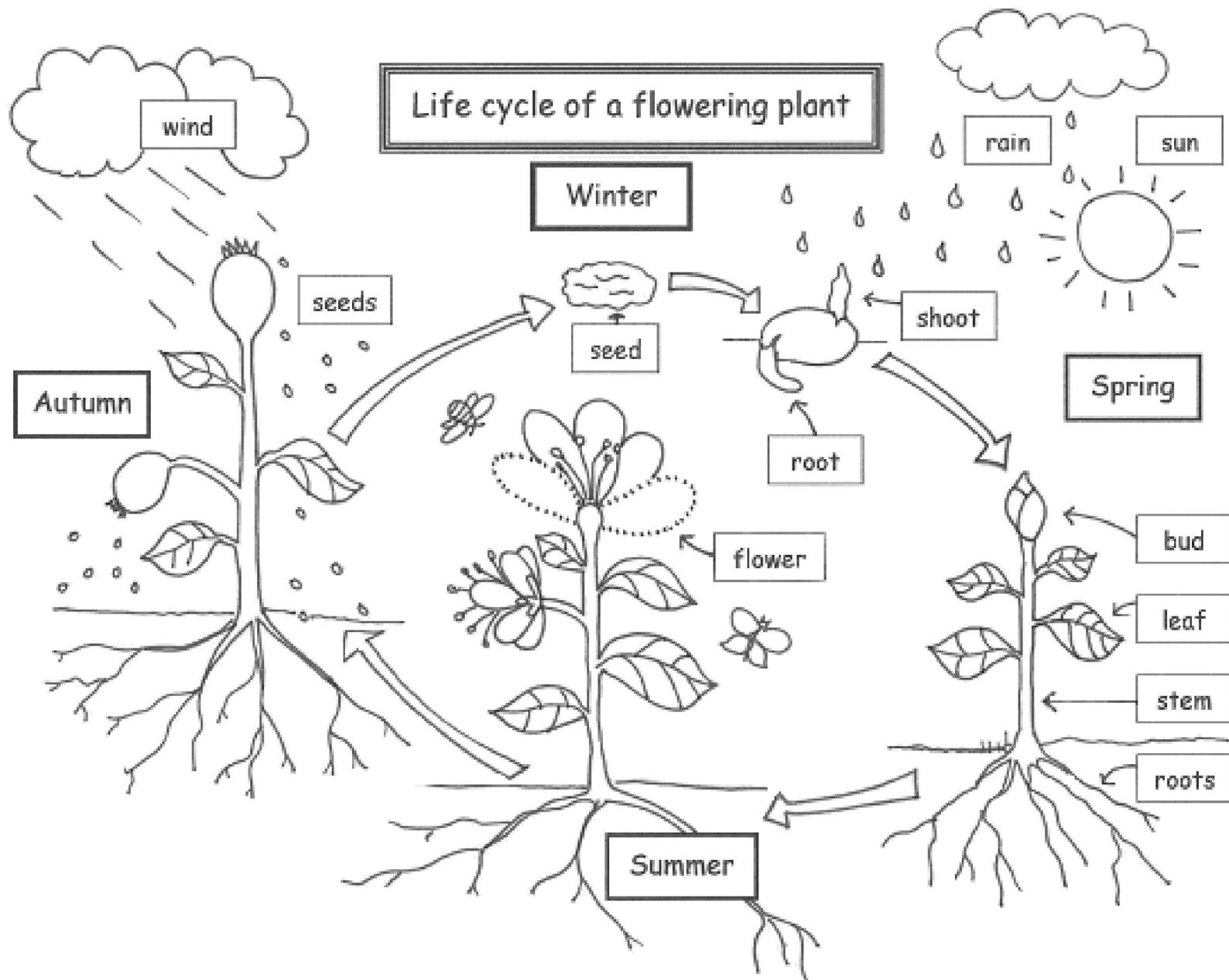
## Labelled flower



The **stamen** consists of the anther and the filament.

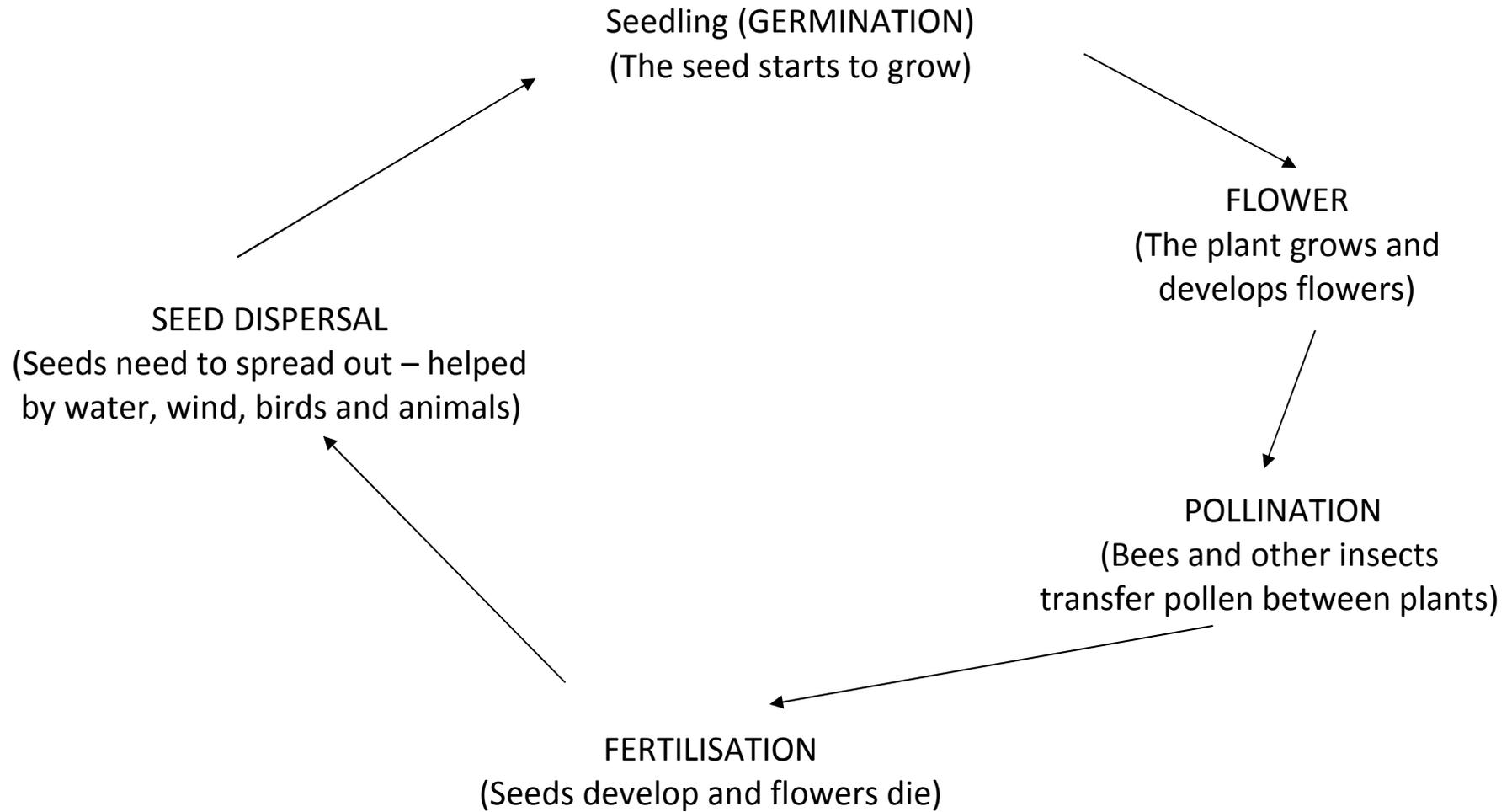
The **carpel** consists of the stigma, style and ovary. The pistil is a fused group of carpels.

The **receptacle** is a thickened part of the stem from which the flower organs grow.



## Flowering plant life cycle

Reproduction is the process by which a plant produces seeds to make a new plant.



## Key Facts Sheet

### Flowering plants

- The stamen consists of two main parts: anther and filament
- The stigma, style and ovary are together called the carpel or pistil (a fused group of carpels)
- The ovule(s) is/are found inside the ovary
- Remember the stigma as female (where the ovule/egg is found), and stamen as male (where the pollen is produced)
- The pollen, produced by the stamen, must come into contact with the carpel of the same or another plant (self/cross-pollination) – note that self-pollinators tend to be genetically weaker while cross-pollinators are genetically stronger
- The mixing of male and female materials (gametes) results in fertilisation, which results in seeds being formed and distributed. The seeds then grow into a new plant that contains genetic material from both parent plants

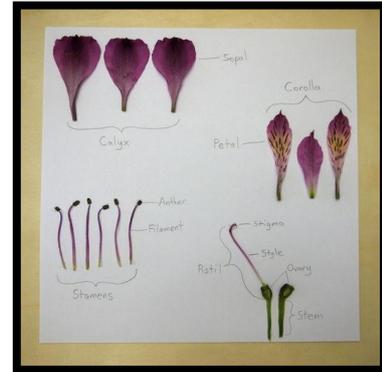
## Guidance for flower dissection

*N.B. please check for any pollen allergies before starting*

*Gladiolus or sweet peas are good (cheap) options for the main simple flower as they have multiple flower heads on one stem. Y6 should also dissect a more unusual or complex flower for comparison, such as a dahlia or chrysanthemum – see what is available that looks more unusual.*

### Equipment:

- Flower
- Tweezers
- Knife
- Plain A4 paper
- Double-sided tape



### Dissection instructions:

1. Secure the flower stalk with Blu-Tack or Plasticine and explore the flower with a magnifying glass.
2. Start at the base, and remove the sepals (using fingers or tweezers) and place on your piece of paper.
3. Remove the petals, and try to identify your plant as either a monocot or a dicot. Monocotyledons have petals in multiples of three and the leaf veins are parallel, while dicotyledons have petals in multiples of four or five and the leaf veins are branching.
4. Next remove the stamens, and examine the pollen using the magnifying glass and note its shape.
5. Now remove the carpels or pistil and cut it in half lengthwise (be careful to keep your fingers out of the way), and use your magnifying glass to examine the inside of it. You should be able to identify the style and might be able to see tiny eggs, or ovules, in the pistil's ovary.
6. Arrange the flower structures on double-sided sticky tape, on the piece of paper, either in the form of an 'exploding' flower, or arranged in lines or 'clumps'.
7. Once completed, label each part (**Y6 – include an overview of the function of each structure in terms of sexual reproduction and note any features that might promote pollination, such as colour, in your labels**).
8. Cover the dissected flower with sticky-backed plastic to protect it.
9. **Y6: now investigate some more unusual flowers, dissecting them to identify their reproductive structures.**

### Virtual Dissection

You can also dissect flowers online:

- Simple: <https://www.youtube.com/watch?v=yLL7iEpgxZA>
- Complex: Interactive virtual plant dissection lab, Chinese University of Hong Kong: <http://www.cuhk.edu.hk/bio/IVPDL/>

## Guidance for botanical illustration (using watercolour pencils)

### **Equipment**

Watercolour pencils  
Water  
Paintbrushes  
High quality drawing/painting paper

### **Background research instructions:**

*Y6 – you will need to research the life cycle of your plant to find images of it in seed, germination and cotyledon stages as well as final stages. Your illustrations should show how the plant reproduces and its life cycle, including descriptive annotations of features that promote: germination, flowering, pollination, fertilisation, seed dispersal as well as describing the reproductive processes.*

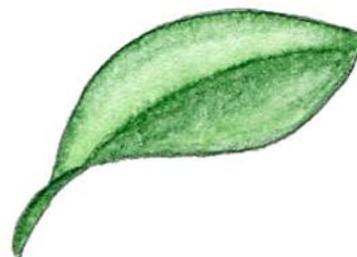
*Y5 – look online for examples of your flower in the seed, germination and cotyledon stages as well as final stages (hint: search images for the flower name that you have dissected and the stage). Your illustrations should show how the plant reproduces and you should annotate features that promote: germination, flowering, pollination, fertilisation and seed dispersal. You will have discussed the reproductive processes during your dissection and can include this detail here.*

### **Watercolour pencil skills**

Use the **continual tone method** to colour, pressing harder for deeper tone and lighter for lighter tone. Use different colour pencils to create colour layering.

Soak your brush in water and swipe over the pencil colour to turn the pencil to watercolour.

**Continual tone method** is where you rub the pencil along the paper. You should complete a light pencil sketch first and then add in the tone afterwards. When moving the pencil to make the tone, make the movement from your elbow rather than just your hand as this will produce a more even tone. The type of paper you use will also affect the tone.



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EXAMPLE OF WATERCOLOUR PENCIL

Guidance from:

[http://www.aucklandmuseum.com/CMSPages/GetAzureFile.aspx%5C?path=/aucklandmuseum/media/main/visit\\_us/whats\\_on/exhibitions/2009\\_exhibitions/wonderland/education/wonderland\\_botanical\\_illustration\\_guide\(2\).pdf](http://www.aucklandmuseum.com/CMSPages/GetAzureFile.aspx%5C?path=/aucklandmuseum/media/main/visit_us/whats_on/exhibitions/2009_exhibitions/wonderland/education/wonderland_botanical_illustration_guide(2).pdf)

### **Further links for botanical illustration examples**

<http://www.nhm.ac.uk/our-science/departments-and-staff/library-and-archives/collections/women-artists.html>

<http://www.botanicalartandartists.com/scientific-botanical-illustration.html>

<http://www.botanicalartandartists.com/permanent-collections-uk.html>

<http://www.botanicalartandartists.com/rhs-botanical-art-exhibitions.html>

<http://www.nhm.ac.uk/discover/the-art-of-scientific-illustration.html>

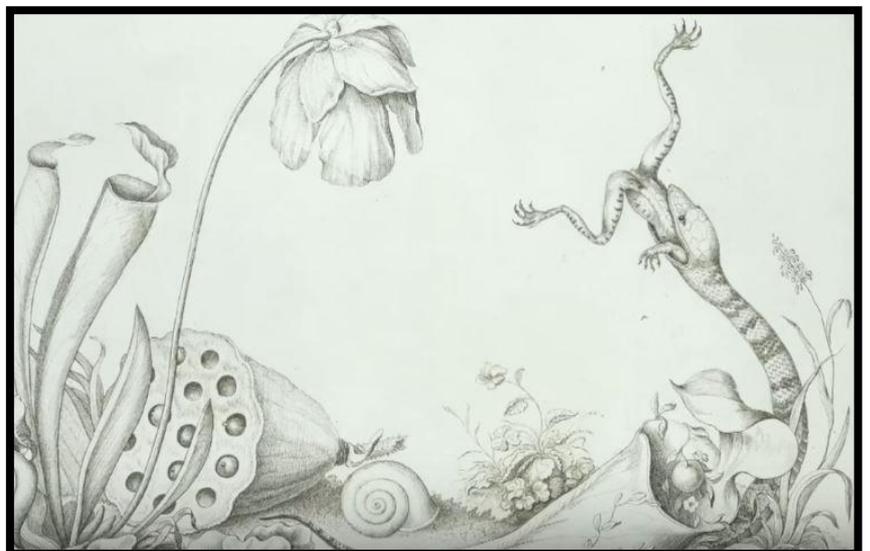
<http://www.rhsprints.co.uk/category/8558/botanical-plates>

## Forms of illustration

**Linnaean illustrations** show the specimen in isolation and include various key features of the plant or animal life cycle, often in a magnified form.



**Ecological illustrations** include the environmental context of the specimen as well as life cycle features, showing the interactions of other plants and animals with the focus specimen.



### Homework guidance – collage boards

You will be creating a series of collage boards for each 'group' of plants and animals that you study during this block.

In order to create these collage boards please see if you can find some images (either online or from magazines) to cut out and bring in.

Once the collage boards are full you will take a digital image of them and incorporate them into your book of illustrations as cover pages.



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