



# RHS Qualifications

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<b>Examination:</b>	RHS Level 2
<b>Unit:</b>	Unit 2
<b>Examination date:</b>	June 2023

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## General Introductory Comments

This is the first Unit 2 examination for the new RHS Level 2 Certificate in the Principles of Plant Growth and Development.

The majority of candidates entered for the examination were able to provide answers to all of the questions, which is a key indicator that the paper was accessible.

Centres are reminded that to gain the maximum available marks, candidates should be prepared for the Unit 1 and Unit 2 examinations with guidance on examination techniques, to include time management, the answering of forced answer, short answer and long form answer questions.

This report is authored by senior examiners within RHS Qualifications. Its aim is to summarise the performance of candidates and provide guidance and support to both potential candidates and the teaching staff at RHS approved centres.

## Overview of Examination

### Levels of demand

Questions were set at three levels of demand within this paper.

Questions that require a recall of basic factual knowledge are classified as being **low demand**.

Questions that require the recall of more technical concepts or the application of knowledge are classified as **medium demand**.

Questions that require the recall of advanced technical concepts, the application of these concepts and the integration of these concepts across topics, are classified as **high demand**.

## General comments

An analysis of scripts has indicated that strong candidate responses shared many common characteristics:

- evidenced careful reading of the question
- met the requirements of the command words contained in the question
- provided responses that were fully relevant to the question, and where appropriate made full use of the images provided
- provided responses with the necessary level of information
- were produced with clear, legible handwriting
- used appropriate technical terminology correctly
- gave full scientific names, when providing plant examples
- gave the appropriate number of responses, e.g. name two...
- successfully applied knowledge to new scenarios and situations
- an equivalent level of knowledge across the Topic areas and the Qualification-wide outcomes
- evidenced planning of responses in long form answers
- integrated their long form responses into a number of relevant Topics, and Qualification-wide outcomes.

Candidates and centres are advised to review the above exemplars of good practice as they prepare for future examination series.

## **Section A**

Questions 1 – 20

### **General comments on Section A**

The forced answer questions are designed to test candidate's knowledge and understanding of the concepts covered in the 4 Topics and the 4 Qualification-wide outcomes that make up the unit.

## Section B

Each question is considered separately.

### Question 1

This question required the candidates to review a photograph of a garden.

Part a) of the question required the candidate to state whether the garden in the image is in a formal or informal garden style.

The majority of candidates were able to state that the garden style was formal.

Part b) of the question added a higher degree of challenge to the question, but requiring candidates to identify three distinct features that confirmed that this was a formal garden.

Strong candidate responses gave the required number of features, using technical terms to describe them. The level of detail required was:

- mirroring of key garden features
- the use of symmetry within design
- the use of geometric shapes.

Incorrect candidate responses included:

- limited/reduced colour palette
- the water feature is circular
- there are no winding paths
- the lawns are closely mown.

These were categorised as incorrect responses as they either did not directly relate to the image, or were not distinct features of formal gardens.

## Question 2

This question required candidates to suggest suitable plants for a range of requirements.

Candidates were then asked to justify their plant selections.

### **Encourage wildlife**

Strong candidate responses included suitable plant species, described by their full scientific names. Justifications included the provision of berries as food sources, roosting and nesting spaces, or the provision of pollen and nectar.

All factually correct responses were credited with marks.

### **Climate mitigation**

Strong candidate responses included suitable plant species for climate mitigation, described by their full scientific names. Justifications that included the provision of shade, reduction of wind speed and soil stabilisation. These justifications are correct as they relate to direct mitigations provided by plants, for example, the provision of shade mitigates for intense sun and higher temperatures. Climate change leading to greater wind speed and weather events can be mitigated for by using suitable tree species to reduce wind speed. Finally, weather events with severe rainfall can be mitigated by the use of plants whose roots bind the soil, preventing erosion.

Incorrect candidate responses specified plants for a changed climate, for example suggesting plants that can be used in areas with low rainfall or drought conditions, as these do not offer mitigations.

Candidate who suggested the planting of species to sequester carbon were awarded marks, although this is an indirect mitigation, and would not directly benefit the garden owner.

This area has been further considered in the updated 2023 teaching year guidance document, to give both candidates and centres additional guidance.

### **Creation of boundary**

Strong candidate responses included suitable plant species for the use of boundaries, described by their full scientific names. Justifications that included concepts such as dense foliage creating visual barriers, and the use of plant species that clip well.

Part b) of this question then asked candidates to apply their knowledge of biodiversity and sustainability to list four advantages of using plants to create garden boundaries.

Strong candidate responses included:

- the provision of ecosystem services
- the sequestration of carbon
- improved sustainability through reduced transport and manufacturing emissions
- longevity of plant species in comparison to metal or wooden fence structures.

### Question 3

This question was designed to assess candidate knowledge of plant adaptations.

#### **Hirsute leaves**

Strong candidate responses included reduction in water loss from the leaves.

Any suitable plant species, described with its full scientific name received full marks.

#### **Aerenchyma cells**

Strong candidate responses included the use of aerenchyma cells in aquatic plants to allow the diffusion of oxygen in stems and into root tissue. Some candidates stated the role of aerenchyma cells within leaves to enhance buoyancy.

Any suitable plant species, described with its full scientific name received full marks.

#### **Thorns**

Strong candidate responses included, defence against herbivory.

Any suitable plant species, described with its full scientific name received full marks.

#### **Pneumatophores**

Strong candidate responses included gaseous exchange in submerged plant roots.

Any suitable plant species, described with its full scientific name received full marks.

Note: The question required named plant examples. Mangrove was not accepted as a candidate response. The reason for this is that Mangroves are not specific plant species. *Avicennia marina*, is the name of a plant species that can be grown in Mangroves. The importance of reading the examination question carefully is again stressed to prevent candidate errors such as this.

#### Question 4

This question was designed to assess candidate knowledge of both the Horticulture and Society Topic, along with the Qualification-wide topic, Sustainability.

In part a) of the question, candidates were asked to list three types of community horticulture project.

Strong candidate responses demonstrated a secure knowledge of community horticultural projects, suggesting, community orchards, community green spaces, community allotments, or friends groups within urban parks.

Weaker candidate responses included the naming of individual community projects, each of which were checked using internet search engines, to determine if these were appropriate. Other candidates stated allotments as an example of a community horticultural project, or a school garden. To gain marks the link between these projects and the community had to be established. For example, an allotment is not necessarily a community horticultural project, but a community allotment is. Equally, a school garden is not always a community horticultural project, but a community garden within a school setting would be an appropriate candidate response.

In part b) candidates were asked to state one benefit that each community horticultural project could deliver.

Strong candidate responses included concepts that directly related to the type of community horticultural project stated in a). Correct responses included social inclusivity, social cohesion, and provision of food, mental and physical health, along with biodiversity benefits.

Weaker candidate responses were not specific, or were not linked to the community horticultural project referred to in a)

In part c) candidates were asked to explain how the community horticultural project supports each of the three pillars of sustainability.

Candidates with a secure knowledge of the three pillars of sustainability scored high marks in this part of the question. These candidates then correctly applied the appropriate pillar of sustainability, i.e. social, economic, and environmental.

Many candidates were not able to demonstrate a secure knowledge of the three pillars of sustainability, demonstrating gaps in teaching and candidate knowledge.



## Question 5

Part a) of this question required candidates to state two purposes of Biodiversity Action Plans (BAPs).

Candidates who answered this question with reference to either the UK National Biodiversity Action Plans, or more local Biodiversity Action Plans scored equally high marks.

Strong candidate responses included the concept of identifying priority habitats and priority species; informing projects that either protect or that can enhance or create additional priority habitats and support species. BAPs can also be used to inform the management and development of landscapes.

This question identified a significant gap in knowledge, with many candidates relating their answers to nature friendly gardening techniques and so failing to gain high marks.

Part b) required candidates to explain how BAPs can impact on the creation of gardens.

Strong candidate responses included:

- they can inform garden creation to include priority habitats such as still water, deciduous woodland
- they can inform the retention of priority habitats, for example, old orchards
- they can inform the creation of habitat for priority wildlife as part of the creation of new garden areas.

This question identified a significant gap in knowledge, with many candidates relating their answers to nature friendly gardening techniques and so failing to gain high marks.

Part c) required candidates to explain how BAPs can impact on the maintenance of gardens.

Strong candidate responses included:

- the retention of deadwood to protect habitat
- the timing of operations to avoid periods of hibernation
- the provision/retention of nesting sites for European Hedgehogs.

This question identified a significant gap in knowledge, with many candidates relating their answers to nature friendly gardening techniques and so failing to gain high marks.

## Question 6

Part a) required the candidate to discuss how planting designs can be influenced by colour.

Strong candidate responses related to colour theory, the use of the colour wheel, colour palette and other related concepts. Strong candidates were also able to state plant examples using their full scientific names.

Weak candidate responses did not relate to colour theory and contained few named plant examples. These responses tended to suggest a small range of plants, naming their colours.

Part b) required candidates to discuss how planting designs can be influenced by seasonal interest.

Strong candidate responses related to the scenario, the year-round use of the garden in the community centre. Candidates who scored high marks suggested how plantings could be designed to embrace the concept of seasonal interest. The role of evergreens to provide structure was well considered, along with examples of spring plantings, and transition from season to season. Stronger candidates discussed seasonal interest from the perspective of leaf colour, stem colour, structure, movement, fruit development and flower structure and colour, including dead flower heads.

Weak candidate responses named plants that flower in a particular season and did not link their answer to the role of the garden within a community centre, and the need for year-round seasonal interest.

## Question 7

This question was designed to assess the candidate's knowledge of Health and Safety legislation, as specified in the Qualification-wide outcome.

This question was poorly answered by candidates.

Strong candidate responses were able to list three requirements that the Health and Safety at Work Act (1974) as a specific piece of legislation places on all workplaces, regardless of their size.

Correct answers included:

- adequate training to ensure Health and Safety procedures are understood and adhered to
- adequate welfare provision for staff at work
- safe working environment that is properly maintained.

## Section C

Section C candidate responses are graded against the assessment ladder, which is on the next page of this report. Candidates and centres are advised to review the ladder as this indicates how the assessment decisions are made, when grading long form responses.

Candidate performance in Section C ranges from those candidates who:

- were prepared to produce long form responses
- were taught to logically answer questions
- shared horticultural knowledge that is both relevant to the question and at a good standard of detail

through to candidates who:

- were not prepared for the production of long form responses.
- produced responses that were only partially relevant to the question
- provided responses that were lacking in technical content and detail.

In addition to the assessment ladder candidate responses are also reviewed against the criteria set out below:

### **Indicative content**

- Strength of response.
- Integration.
- Horticultural knowledge.

### **Strength of response:**

Strong candidate responses:

- developed a logical argument to answer the question
- drew on reliable information sources
- were relevant to the question
- expressed clarity of thought
- demonstrated knowledge of horticultural practices.

### **Integration:**

Candidate responses should integrate with other relevant areas of the syllabus.

# Assessment ladder (for information)

Band	Mark range	Summary	Description
4	12 - 15	Fully developed (Total)	<p><b>A highly detailed, comprehensive, fully relevant response, addressing all aspects of the question</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No irrelevant or incorrect material or observations at the top end of the mark range: otherwise only very minor errors/omissions (which do not detract from an otherwise strong response)</li> <li><input type="checkbox"/> Full integration/clear links demonstrated with other appropriate topics as required: a holistic approach</li> <li><input type="checkbox"/> Advanced current professional horticultural knowledge/principles demonstrated (and evidence of advanced material beyond the specification at the top end of mark range)</li> <li><input type="checkbox"/> Consistent use of correct and appropriate technical language.</li> </ul>
3	9 - 11	Mainly developed (Solid)	<p><b>A reasonably detailed and fairly comprehensive response, with mostly relevant observations, addressing most of the key elements of the question</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Some minor evidence of irrelevant or incorrect material or observations (in what is otherwise a good response), with occasional lack of detail/omissions at times</li> <li><input type="checkbox"/> Secure evidence of some appropriate integration with other topics but some linked topic areas are occasionally overlooked or incorrect associations are made: a partially holistic approach</li> <li><input type="checkbox"/> Current professional horticultural knowledge/principles demonstrated most of the time, with occasional errors, but largely appropriate explanations and application</li> <li><input type="checkbox"/> Correct and appropriate technical language demonstrated most of the time, with some minor errors.</li> </ul>
2	6 - 8	Rudimentary (Basic)	<p><b>A largely basic response with some relevant observations, addressing some key elements of the question</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Some significant evidence of irrelevant or incorrect material and frequent lack of detail, with some key areas overlooked</li> <li><input type="checkbox"/> Occasional evidence of correct integration with other topics, but many areas are overlooked and incorrect associations made: little evidence of a holistic approach</li> <li><input type="checkbox"/> Current professional horticultural knowledge/principles demonstrated some of the time, but with frequent errors, and only basic explanations or application</li> <li><input type="checkbox"/> Correct and appropriate technical language only partially demonstrated but limited. Some key errors.</li> </ul>
1	0 - 5	Undeveloped (Unsatisfactory)	<p><b>A largely poor response with few relevant observations, addressing few of the key elements of the question</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Material is largely irrelevant or incorrect and lacking in any detail, with many key areas overlooked</li> <li><input type="checkbox"/> No, or very little evidence of correct integration with other topics, with many areas overlooked and incorrect associations made: no evidence of a holistic approach</li> <li><input type="checkbox"/> No or little evidence of current professional horticultural knowledge/principles demonstrated, with poor or incorrect explanations or application</li> <li><input type="checkbox"/> Little (if any) technical language demonstrated. Often incorrect. Key errors.</li> </ul>

## Question 1

This question was supported by an image of an Arts and Crafts garden, and required the candidates to explain how the Arts and Crafts movement continues to influence garden design today. This was a popular question which was selected by a large number of candidates.

When grading candidates, markers took account of either breadth or depth of knowledge, crediting candidates who gave narrower, but highly detailed answers with the equivalent mark as candidates who discussed a wider range of considerations.

Candidates who scored marks in the higher bands considered a wide range of relevant factors, these included:

- an explanation/definition of the essential characteristics of an Arts and Crafts garden:
  - respect of craftsmanship
  - use of natural and hand-crafted elements
  - the use of local materials
  - a place to connect with nature
  - a leisure space with venues or garden rooms
  - inspiration taken from the landscape around the garden
  - romantic plants and plantings
  - abundance of flowering plants in beds and borders
  - the concept of manual labour and working outside being linked to wellbeing
- a discussion on how these attributes are applied in garden design today
- Best Practice is integrated through the use of named gardens/designers, or plant examples
- Sustainability is integrated through the connection with nature, the use of local materials, the respect for hand tools, and hand finishes to features.

Candidates who scored marks in the lower bands often gave a very limited description/investigation into the features of Arts and Crafts gardens, and did not consider the role of Arts and Crafts gardens as inspiration within garden design today.

## Question 2

This question required candidates to explore how edible landscapes exploit plant adaptations.

When grading candidates, markers took account of either breadth or depth of knowledge, crediting candidates who gave narrower, but highly detailed answers with the equivalent mark as candidates who discussed a wider range of considerations.

Candidates who scored marks in the higher bands considered a wide range of relevant factors, these included:

- defining the principles of edible landscapes
- the naming of a wide range of plant adaptations to include:
  - the role of bulbs, for example the cultivation of Onions
  - the role of succulents, for example the use of edible (*Opuntia* sp.) Cactus leaves
  - the role of tendrils, for example in the cultivation of Peas
  - the role twining stems, for example in the cultivation of Runner Beans
  - the exploitation of stem tubers, for example Potatoes
  - the role of runners in the cultivation of Strawberries
  - the role of rhizomes in the cultivation of Ginger and Hops
  - the role of tap roots in the cultivation of carrots and parsnips.

Candidates who scored marks in the lower bands tended to produce responses with a limited range of plant adaptations, or provided incorrect information, for example stating potato as a root tuber.

### Question 3

This question required candidates to use their knowledge of community horticulture, citizen science and biodiversity to explain how a new community garden can be developed to meet a given scenario.

When grading candidates, markers took account of either breadth or depth of knowledge, crediting candidates who gave narrower, but highly detailed answers with the equivalent mark as candidates who discussed a wider range of considerations.

Candidates who scored marks in the higher bands considered a wide range of factors that were directly relevant to the scenario and the requirements of the question, these included:

- Discussion of the principles of community horticulture appropriate to the question:
  - the documented benefits of gardens to general human health and wellness
  - the concept of using plants to reduce stress levels
  - the role of community horticulture in pollution mitigation
  - the creation of tranquil places away from urban noise pollution
  - the documented mental health benefits of community horticulture
- Discussion of the principles of biodiversity to include:
  - the provision of habitat for amphibians, and birds
  - the provision of habitat for insects and other wildlife
  - the role of the above in food webs
  - the creation, maintenance, and enhancement of habitat
- Discussion of the principles of citizen science to include:
  - the role of major citizen science projects in measuring and monitoring biodiversity
  - the role of specific citizen science projects, for example the RSPB Big Garden Birdwatch, which publishes regional results showing species status year on year.

Candidates who scored marks in the lower bands tended to discuss the general principles involved in the setting up of a community garden, rather than applying their knowledge of community horticulture, citizen science and biodiversity as required by the question.



## Question 4

This question required the candidate to discuss how a knowledge of Sustainability and Best Practice can help to minimise the negative effects of horticulture on the environment, with reference to a named horticultural situation.

When grading candidates, markers took account of either breadth or depth of knowledge, crediting candidates who gave narrower, but highly detailed answers with the equivalent mark as candidates who discussed a wider range of considerations.

As this question was broad in scope, candidates were asked to relate their responses to a named horticultural situation. This part of the question was included to encourage candidates to give a more focused, detailed, and horticulturally relevant answer to the question.

Candidates who scored marks in the higher bands considered a wide range of relevant factors, these included:

- A review of the negative impacts of horticulture on the environment, which reflect the named horticultural situation:
  - the concept of carbon footprints and carbon release from soil cultivation
  - the extraction of minerals/materials, for example rock phosphate in fertiliser manufacture, the extraction of peat
  - single use plastics
  - the impact of the extraction of water/mains water usage on the environment
  - the impact of heating glasshouses to produce plants
  - the creation of waste
- A review of how a knowledge of Sustainability can mitigate the above points:
  - the measurement of negative impacts
  - the reduction of negative impacts, for example purchasing smaller, locally grown, bare root plant material
  - the reduction and elimination of emissions from machinery, including preference to human power and electrical power over fossil fuels
  - limits of inputs, for example, reduced fertiliser, elimination of fertiliser, the move to peat free growing media
  - reduction/elimination of single use plastics
  - reduced water usage through water capture, and the application of right plant, right place, eliminating the need for irrigation
  - the use of air source heat pumps, with renewable energy/solar power in plant production
- A review of how a knowledge of Best Practice can mitigate the above points:
  - the concept of reviewing the work of other gardens in this area
  - the development and application of new approaches and techniques
  - the review of data to inform right plant, right place.

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Candidates who scored marks in the lower bands either did not name a horticultural situation, or provided general responses, lacking in detail, which did not relate to the named horticultural situations where this was provided.

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