

CHelsea PHYSIC GARDEN: GLASSHOUSES

Stage 3_Developed Content Outline Issued: 29 July 2020

Area	Area Code	Panel	Panel Code	Word Count	Key Messages
OUTSIDE ALL GLASSHOUSES	EX	Intro to the Glasshouses	INT	150-180 words	1. We are a botanic garden whose 350-year-old history is engrained in this place. 2. Plants contain secrets - they are useful to people as medicine, building material and all sorts of stuff. 3. We need plants for humans to survive. At this time of climate emergency, we do all we can to conserve them 4. Learn how a botanical garden works through the eyes of our gardeners
GLASSHOUSE BAY 3 (Between Glasshouse 2 & 3)	GB3	Glasshouse Descriptor	GD	7-10 words	
GLASSHOUSE BAY 1 (Between Glasshouse 1 & 2)	GB1	Exterior Secondary Panel	NS	130-150 words	
GLASSHOUSE 3: (Pelargoniums)	G3	Glasshouse Explainer (Intro)	GEI	80-100 words	
TROPICAL CORRIDOR	TC	Glasshouse Explainer (Facts)	GEF		5. The science of plants – in all their diversity throughout the world – is fascinating.
GLASSHOUSE 2: (Atlantic Islands)	G2	Glasshouse Explainer (Arrangement)	GEA		
GLASSHOUSE 1: (South Africa)	G1	Secondary Panel	SP	130-150 words	
GLASSHOUSE 4: (Propagation)	G4	Star Plant Label	SL	130-150 words	
PITHOUSE	PH	Star Label	POL	35-50 words	
GLASSHOUSE 5: (Cool Fernery)	G5	Plant Grouping Label	PG	20-30 words	
CONSERVATORY	CO	Plant Label	PL	20 words	
		Glasshouse Mini-Descriptor	MD	7-10 words	
		TTEG Label (Through the eyes of the gardener)	TG	35-50 words	
		Instructional Text	IT	10 words	

CODE	Location/Title	Interpretation Element	Word Count	Key Message/story	Key people	Images	3D/AV/Interactive	Notes
OUTSIDE ALL GLASSHOUSES								
EX_INT1	South of the Cold Frames	Intro to the Glasshouses	150-180 words	<ol style="list-style-type: none"> Glasshouses have been a feature of CPG since 1683, when it boasted the earliest heated glasshouse in England The Glasshouses in this north east quadrant were built in 1902. Glasshouses have always been a tool to deliver what the garden needs. These glasshouses contain frost tender, exotic species of plants that require special and protected growing conditions. The first glasshouse contains Pelargoniums, the other three glasshouses contain plants that grow in different Biomes around the world. Behind you is the Propagation glasshouse and on the far west side of the garden is the Thomas Moore cool fernery. Propagation will be in front of you and will be the first glasshouse. The original Glasshouse boiler (positioned by the Sloane statue) was fuelled by waste leather from local tanneries The tradition of protected growing has continued throughout its history, allowing the cultivation of countless exotic species challenging to grow in the UK climate. Whats in each GH 		<ul style="list-style-type: none"> "You are Here" wayfinding map that locates visitors within the wider garden, explains the contents of the different glasshouses and encourages them to enter through Glasshouse 3 (Pelargoniums) Photographs of early Glasshouses 	<ul style="list-style-type: none"> Audio Tour Introductory Audio - Welcome, instructions, orientation, what you can expect 	<ul style="list-style-type: none"> Audio - Is there someone within the org who you would like to introduce this. It can be a neutral voice instead if not as this is an introductory and explanatory piece. NJ-I was thinking it might be nice to have gardeners do the audio tour. Or perhaps Mary Gibby could do the intro she has worked in these glasshouses in the 1970's and that would link nicely to the interp in there.
EX_INT2	Between GH1 & GH4 - as visitors approach from the Cafe	Intro to the Glasshouses	150-180 words	<ol style="list-style-type: none"> Glasshouses have been a feature of CPG since 1683, when it boasted the earliest heated glasshouse in England The Glasshouses in this north east quadrant were built in 1902. Glasshouses have always been a tool to deliver what the garden needs. These glasshouses contain frost tender, exotic species of plants that require special and protected growing conditions. The first glasshouse contains Pelargoniums, the other three glasshouses contain plants that grow in different Biomes around the world. Behind you is the Propagation glasshouse and on the far west side of the garden is the Thomas Moore cool fernery. The original Glasshouse boiler (positioned by the Sloane statue) was fuelled by waste leather from local tanneries The tradition of protected growing has continued throughout its history, allowing the cultivation of countless exotic species challenging to grow in the UK climate. Whats in each GH When you walk through the glasshouses feel the heat or humidity - let it take you to these warmer climes. 		<ul style="list-style-type: none"> "You are Here" wayfinding map that locates visitors within the wider garden, explains the contents of the different glasshouses and encourages them to enter through Glasshouse 3 (Pelargoniums) Photographs of early Glasshouses 	<ul style="list-style-type: none"> Audio Tour Introductory Audio - Welcome, instructions, orientation, what you can expect 	<ul style="list-style-type: none"> Audio - Is there someone within the org who you would like to introduce this. It can be a neutral voice instead if not as this is an introductory and explanatory piece.
PROPAGATION AREA								
EX_XS1	The Propagation Journey	Exterior Secondary Panel (Facing the Cold Frames and Nursery)	130-150 words 9-12 key messages	<ol style="list-style-type: none"> This is the propagation area - the engine room of the Garden. We propagate new plants by sowing seeds or taking cuttings. We sow most of our seeds in spring and take cuttings throughout the year in the potting shed When the seeds have germinated or the cuttings have put on roots, we plant them in their own pot in the potting shed, to give them their own room to grow. (We compost everything else). As they are still delicate, we move them into Propagation house to receive very close attention in a protected environment. when the roots fill the pot and the temperatures are a bit warmer outside we will move them to the cold frames. In the cold frames they are hardened off during which they adapt to life outside – including growing thicker cuticles to withstand the weather and potential water loss. Once they are adapted they are moved to the nursery area where they exposed to the elements, and must get used to the environment around them. They looked after here until they are planted out in the Garden. When they are planted in the garden, they get a engraved black label with all their information on the nursery label goes back to the Records Manager to record what has been planted and where. We collect new seeds and cutting each year-and the cycle continues. CTA: When you are walking around the Garden look out for big white labels. These will be plants we have propagated that are waiting for an engraved label. 		<ul style="list-style-type: none"> Picture of a nursery label with all the information on it. Picture of the seed bags could be good too. 	<ul style="list-style-type: none"> Plan showing different areas of the Seed Journey? video of seed cleaners. 	
EXT_TG1	Through the eyes of the Gardener	TTEG Label	35-50 words	<ol style="list-style-type: none"> We grow around 10,000 plants a year from seeds and cuttings to make sure we maintain a diverse and interesting collection. We have very little space so everything has to be super organised. It means we have to move trays of pots around frequently to make sure there is protected space for the new plants coming out of prop. This gives us the opportunity to check all the pots and coldframes regularly for our enemies – the slugs and snails. Doesn't matter what you do, they always find a way in. We stamp on them and cut their heads off. Because they are in small pots and growing fast, the water in their pots doesn't last long so we have to water them frequently. On hot days they can be watered up to three times a day. We don't grow them in bigger pots because we don't have the room. 	CPG Gardeners: Nell Jones, Rob Bradshaw	<ul style="list-style-type: none"> Illustrate with photographs of Gardening team today doing these tasks? If we do this TTEG then we could have pictures 	<ul style="list-style-type: none"> Audio Tour Gardeners Voice - Nell interview, an introduction to what you may find out in this tour 	
AT ENTRANCE TO GLASSHOUSE 4: PROPAGATION FROM GARDEN								
G4_GD	Propagation	Glasshouse Descriptor	7-10 words	<ul style="list-style-type: none"> Propagation Growing plants from seeds and cuttings 				

GLASSHOUSE 4: PROPAGATION							
G4_GE1	Intro to Propagation House	Glasshouse Explainer (Intro)	84 words in total 7 key messages	<ol style="list-style-type: none"> The Propagation House is the place for plants at the beginning of their lifecycle. Seedlings, cuttings and small plants need lots of attention – we give them the perfect conditions to germinate (this includes water, air, heat, light, planted in the correct growing media, at the right depth, in a glasshouse clean from pests and diseases) It is an important feature of a botanic garden that you definitely know the correct identity of each plant. You will see that all the trays of plants have a label – the information on the label includes the unique identifying number of that particular plant, the date it was sown and the name of the plant. One label is used for whole row of seedlings If we lose the label we have to throw away the plants. The colour of the label shows which part of the Garden it will be planted out into so that when we have planting out days we can select all the plants that will go to the same area. 			
G4_GEF		Glasshouse Explainer (Fact)		Fact File <ol style="list-style-type: none"> Temperature: 12 - 20 Humidity: Ambient Ventilation: lots of ventilation - helps keep pests and disease down. Growing Media: replicating the right place for these plants (right plant right place) - when sowing seeds we use a low nutrient mix. When we pot them on, the mix has more nutrients. 			
G4_GEA		Glasshouse Explainer (Arrangement)		<ol style="list-style-type: none"> Each pot is organised by colour code and labelled with a unique identifying number Links to wider Garden: Links to cold frames, nursery. Links to the cycle of seed production 	Spatial Arrangement Plan: showing the Key to colour coding of the post (how plants are organised)		
G4_TG	Through the Eyes of the Gardener	TTEG Label	35 - 50 words	<p>How we create the perfect conditions for plants to grow</p> <p>(labelled diagram showing things visitors can see in the Propthouse)</p> <ul style="list-style-type: none"> Pest traps Heated bench: heated from below (to puts the pots on) to initiate the roots. Heated electric cables in sand Polycarbonate boxes: to create microenvironments e.g. for cuttings to create micro humidity and prevent water loss Keeping the cutting alive and full of moisture will enable it to grow roots Shading on glasshouse: to stop seeds being burnt off Venting: to keep air flow, keep mould away Hose Thermometer: temperature checked once a week (data on GHs temps - graphs kept) Misting bench: to keep tops of seedlings cool Fans: for air movement 	Labelled diagram showing things visitors can see in the Propthouse.	Audio Tour: Gardeners' Voice - how the gardening team and volunteers work together to manage the environment	General Note: Images to be either: florilegium society drawings or commissioned photographs from volunteers of CPG specimens
G3_SP1	Plant Reproduction in flowering plants	Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> Plant reproduction is the process by which plants generate new individuals, or offspring. In flowering plants, pollinators or sometimes the wind or water, transfer pollen (male) to the stigma in flower (female). Showy flowers are to attract pollinators. If successful, the pollen fertilises the female part of the flower and this creates a fruit or seed capsule containing seeds. This is sexual reproduction and just like in humans, it involves the mixing of two sets of genes. This means the plant that germinates from that new seed will have some characteristics of each parent plant but won't be completely the same as either. Vegetative, or asexual reproduction is something that plants can do that humans can't. It is where they produce a new plant that is a clone of itself with exactly the same genes. They do this in a number of ways but one example is the strawberry plant that sends out long stems that lie on the ground and then develop roots and create a new plant. Some plants will even create roots if you pin down sections of leaves. Horticulturists use their knowledge of how plants work to their advantage. They take cuttings from plant stems, leaves and roots and then pot them up because they know that very often these cuttings will send out roots and create new plants. 	Diagrams to show plant reproduction Labelled diagram showing things visitors can see in the Propthouse.	Audio Tour: Gardeners' Voice - how the gardening team and volunteers work together to manage the environment	Audio - Can we use volunteers for this to talk about their work in the garden and the kinds of tasks they do? Audio - Besides Nell, are there other gardeners who may be able/willing to talk engagingly about his process?
G4_SP2	The Seed Cycle	Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> Most of our seeds are collected from June – Sep each year and stored in labelled packets For us it is a yearly cycle – we collect seeds from plants during the year and then store them to use the following year. It's an activity that has happened at CPG for 300 years For some individual plants we have records to show we have completed this cycle for over 75 years. Seeds then cleaned weekly all year round by volunteers playing catchup Seeds are cleaned with sieves, brushes, blown, fluff baskets, rattan basket Seeds are stored in packets with all their information such as unique identifying number, where they were collected and which year and they are then refrigerated or frozen in airtight containers. B. The seed is a living entity and so it always needs fuel to live which it has in what is called the endosperm. Over a long enough time, if the seed is not sown, it will consume all it's reserves whilst it is waiting for the right conditions to germinate. By storing them in airtight containers and at low temperatures, its living processes are slowed right down and this helps keep the seeds fresh so that they will germinate when the gardeners sow them. Seeds are used for the garden, sold in the shop, put on the Index Seminum (lit. Seed List) - and sent out to botanic gardens around the world 	World Map of where seeds have been sent to	<ul style="list-style-type: none"> Flip Book showing or Video showing seed cleaning and labelling process with Volunteers Labelled seed packets Seed Cleaning Equipment (sieves, brushes, blown, fluff baskets, rattan baskets) Printed Index Seminum (oldest?) Different Seed pods and seeds Key Plants that have been sent from CPG to other parts of the World (e.g. Millers sent Cotton to America, Cedars of Lebanon). 	Audio tour - Allison who manages our hort vols can talk about how we work with a volunteer team in seed cleaning
GLASSHOUSE BAY 3 (Between Glasshouse 2 & 3)							

GB3_XS1	Mediterranean Plants	Exterior Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> The glasshouse bays provide a sheltered microclimate for plants that are adapted to hot and dry summers. The soil is unimproved and stony - This is how these plants like it. The soil probably has building materials from when they made the glasshouses! This mediterranean collection is a hangover from a collection of Cretan plants that grew in GH3 but are now on the Pond Rockery Perhaps that is a good indication of climate change but also a way of showing you can grow plants that you think might be tender if you give them the correct growing conditions - shelter, free draining rocky soil. CPG has always benefited from a microclimate caused by the surrounding walls, proximity to the fountains, etc. However, the impact of Climate Change and the heat island effect from the city means we have gradually become warmer as an environment. Twenty years ago we would not have been able to maintain some of these plants outside, but today they are thriving. Milder winters are also seeing us putting less winter protection out for our plants but it does mean that we are also seeing higher pest populations as they don't get killed by a cold winter. We are working with the impacts of the Climate change every day within the Garden. You can see other mediterranean plants in Bee Corner and also the Pond Rockery. CTA: can you find the other mediterranean collections in the Garden? Pond Rockery & Med Wood 					
GB3_XS2	Geranium, Pelargonium or Erodium? What am I?	Exterior Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> Geraniums, Pelargoniums and erodiums all belong to the Geraniaceae family. They are all related to each other as they have a common ancestor but they might be seen more as second cousins or cousins once removed than brother and sister. Like many human families they share some common characteristics - they have similar shaped leaves and familiar flowers just like some human families all have brown eyes. But there are a lot of differences too. So how can you tell them apart? Geranium flowers have five similar petals (actinomorphic- radial symmetry) Pelargonium flowers have two upper petals which are different from the three lower petals. Their flower petals are zygomorphic- which means their symmetry is on a single plane Erodiums have 5 stamen (the male reproductive part of a flower). Pelargonium have 7 stamen. Geranium have 10 stamen. You can see examples of both Geranium and Erodium in GH3 and if you want to learn more about Pelargoniums then go into GH3. In GH3 (ahead of you), we only grow pelargoniums but some people call them geraniums even though they are very different plants and come from completely different parts of the world. The confusion arose in the 1700s when the Swedish botanist Carl Linnaeus grouped the two genera together and people got so used to the idea that the wrong name stuck. Pelargoniums mainly originate from South Africa and are frost tender in this country Geraniums mostly come from temperate regions of the Northern hemisphere and thrive in a damp British winter! 					
GB3_ST1	Geranium ibericum subsp. ibericum.	Star Plant Label	130-150 words 9-12 key messages	<ol style="list-style-type: none"> Geranium ibericum was originally brought back from the Caucasus mountain range near the Black Sea by Joseph Banks a frequent visitor to this Garden in the 1800s. In fact there is a bust to commemorate him on the Pond rockery. The Caucasus region is among the 25 global biodiversity centres and the most diverse temperate area in the Northern hemisphere. The Caucasus harbours a unique and very diverse flora and vegetation, with 25% of endemic species that are only found in the region. It's biodiversity is because it has 3 mountain chains separated by valleys and plains allowing a variety of different microclimate, soil and vegetative conditions, resulting in a broad range of landscapes and unusually high levels of species diversity for the Temperate Zone. Climatic conditions are very diverse, with precipitation ranging from more than 4,000 mm per year in the southwestern Caucasus to less than 200 mm a year in deserts in the eastern Caucasus. More than 6,500 species of vascular plants are found in the Caucasus. A quarter of these plants are found nowhere else on Earth - the highest level of endemism in the temperate world. As many as 400 species of birds are found in the Caucasus, four of which are endemic to this hotspot. The coasts of the Black and Caspian seas are important stop over sites for millions of migrating birds, which fly over the isthmus each spring and autumn between their summer and winter homes. Some plants and plant associations date back to the Tertiary Period, meaning they have been growing there for over 2.5 million years. Just like South Africa, the abundance of relic and endemic plant species in the region is largely due to the fact that the Caucasus was spared glaciation during the last Iceage. 	Diagram of actinomorphic & zygomorphic flower. M				[N] to find a med species and raise up so it can be seen through the window
GB3_ST2	Erodium chrysanthum	Star Plant Label	130-150 words 9-12 key messages	<ol style="list-style-type: none"> Erodium chrysanthum is in the Geraniaceae family along with geraniums and pelargoniums. It is dioecious which means that male and female flowers are on separate plants so effectively you have male and female plants "Dioecious" comes from two Greek words, "di" meaning "two", and "oikos", meaning "house". Dioecy is unusual. Over 90% of flowering plants have both male and female parts contained in each individual flower - bi-sexual.. Some other common dioecious plants include holly, asparagus, yew, mulberry and ginkgo. To see if this if this Erodium is a male or female plant you have to look for stamens or pistils - the male and female reproductive parts of a flower. You need to have both male plants and female plants for the female flowers to be fertilised 8. After fertilisation, the female plants produce the beaked fruits that resemble a stork's bill which is the common name for an erodium. In some dioecious plants, gender can change - for example a yew tree can be male and then start producing the red berries that only female trees produce. Some other plants can change gender many times throughout a season depending on the climatic conditions We have both male and female yews in the Garden which you can see here x and here x. In all the natural world, including humans, there is a huge diversity and most ??? (characteristics?) are not binary. 	Diagram of a flower showing the different parts including the Stamen for visitors to spot. And the numbers on pelargs (7), erodium & geranium (10).				[N] to find a med species and raise up so it can be seen through the window
AT ENTRANCE TO GH3 PELARGONIUMS FROM GARDEN									
G3_GD	Pelargoniums	Glasshouse Descriptor	7-10 words	<ul style="list-style-type: none"> Pelargoniums Taxonomy and Systematics: The science of plant families, naming and relationships 					
GLASSHOUSE 3: PELARGONIUMS									

G3_GE1	Introduction	Glasshouse Explainer (Intro)	84 words in total 7 key messages	Glasshouse 3: Pelargoniums 1. Pelargoniums have been grown at the Garden for nearly 300 years 2. The garden was given in perpetuity by Hans Sloane on the condition that it sent 2000 plant samples to the Royal Society, (a scientific society in London). 3. In 1724 Head Gardener Philip Miller submitted 50 dried specimens from the Geraniaceae family cultivated at CPG to the Royal Society, as part of the arrangements of the Sloane Covenant. 4. These specimens are now held in the NHM collection. 5. We grow many of these same species here today 6. The Pelargonium display teaches about: Taxonomy and systematics - the classification and relationships of plants. 7. It also explores the difference between the plant species and plant cultivars. 8. Hybridisation (the process of plant breeding with an individual of another species or variety) has led to today's ornamental species.	Philip Miller, Mary Gibbs	Audio Tour Gardeners' Voices - Reading of the agreement with Royal Society/other letter or documentary evidence			Consider position of intro: inside each glasshouse or outside GH3 (as an introduction to all the GH's) Can we put a logo on the same species submitted by Miller to the Royal Society? Or do we not grow any of the same? FS
G3_GEF	Facts	Glasshouse Explainer (Facts)		Fact File 1. Where in the world these plants grow: The larger majority occurs in South Africa, while a few species occur in tropical Africa, Syria, Australia and on a few islands in the Indian Ocean. 2. Temperature Range: +5c 3. Humidity: low humidity 30 - 45% 4. Ventilation- how much you want the air to come through: Lots of airflow. 5. Growing Media- replicating the right place for these plants (right plant right place): Free draining growing media.					
G3_GEA	Arrangement	Glasshouse Explainer (Arrangement)		How are the plants arranged? What are the groupings? - The species in the centre are all found growing in the wild are grouped according to their scientific classification - The cultivars around the edge are bred by humans and grouped according to their different characteristics: Links to wider Garden: Link to the Order Bed On the geraniaceae bed - have attached map of DOB					
	Species								
G3_PG1	Campylia	Plant Grouping Label		Low growing plants with tufted or rosette habit. Flowers with short floral cup.					
G3_PG2	Chorisma	Plant Grouping Label		Shrubs or subshrubs. Lower petals larger than upper. Leaves simple and sub-succulent					
G3_PG3	Cleome	Plant Grouping Label		Large plants, often with thick, fleshy stems and simple palm-like veined leaves. Petals tend to be similar in size.					
G3_PG4	Curtusina	Plant Grouping Label		Plants with thick semi-succulent stems covered with leaf stalks which do not fall off as the leaves die. Flowers with similar sized petals.					
G3_PG5	Glaucohyllum	Plant Grouping Label		Shrubs or subshrubs often with leathery glaucous leaves. Flowers very irregular.					
G3_PG6	Hoorea	Plant Grouping Label		Stemless plants with tubers. Leaves usually dying down as flowers appear.					
G3_PG7	Isopetalum	Plant Grouping Label		Succulent plant with more or less regular white flowers and undivided leaves					
G3_PG8	Jenkinsonia	Plant Grouping Label		Plants with variale habit. Upper petals always very much larger than lower.					
G3_PG9	Ligularia	Plant Grouping Label		This diverse section contains plants with almost any combination of characters					
G3_PG10	Myrrhidium	Plant Grouping Label		Herbaceous, often short-lived plants. Upper petals always very much larger than lower					
G3_PG11	Otidia	Plant Grouping Label		Succulent plants with incised leaves and irregular, usually white flowers					
G3_PG12	Pelargonium	Plant Grouping Label		Generally quite large shrubs or subshrubs many with aromatic foliage. Flowers with upper petals larger than lower.					
G3_PG13	Peristera	Plant Grouping Label		Annuals or short-lived perennials. Flowers small.					
G3_PG14	Polycactium	Plant Grouping Label		Plants with tubers. Leaves usually present at the same time as flowers.					
G3_PG15	Raniformis	Plant Grouping Label		Leaves simple with long stalks that remain as the leaves die. Flowers irregular.					
G3_PG16	Subsucculentia	Plant Grouping Label		Subshrubs with succulent to woody stems covered with leaf stalks which do not fall off as the leaves die. Flowers with five unequal petals.					
	Cultivars								
G3_PG17	Unique Group	Plant Grouping Label	20-30 words	Unique Group: Shrubby evergreen perennials, many of which have been cultivated since the beginning of the 18th century. They flower in autumn or winter.					
G3_PG18	Stellar Group	Plant Grouping Label	20-30 words	Stellar Group: They have a bushy habit with star-shaped flowers and foliage.					
G3_PG19	Regal Group	Plant Grouping Label	20-30 words	Regal Group: Bushy evergreen perennials and shrubs with round leaves sometimes lobed or partially toothed. Single, rarely double flowers in shades of mauve, pink, purple or white.					
G3_PG20	Angel Group	Plant Grouping Label	20-30 words	Angel Group: Compact and bushy plants, with pansy or viola like flowers.					
G3_PG21	Zonal Group	Plant Grouping Label	20-30 words	Zonal Group: upright bushy succulent stemmed perennials grown for their single or double flowers. Some have attractive foliage. This type is most commonly used for bedding displays.					
G3_PG22	Ivy Leafed plants	Plant Grouping Label	20-30 words	Ivy-leaved group: trailing perennials with stiff fleshy leaves and single or double flowers suited to hanging baskets or containers.					
G3_PG23	Species Hybrids	Plant Grouping Label	20-30 words	Species Hybrid Group: Plants that are the result of a first time cross with two known species. Some date back to the 18th century and others are very recent hybrids.					
G3_PG24	Scented Leaves	Plant Grouping Label	20-30 words	Scented-leaved group: shrubby evergreen perennials and shrubs. Mainly cultivated for their scented leaves, that are often distinctly lobed, toothed, incised or variegated. The scent ranges from lemon to rose, mint or spicy. CTA: gently touch the leaves of this group - what does each one smell like!					
G3_PG25	Zonartic	Plant Grouping Label	20-30 words	Zonartic: a new group with large flowers that has taken many years to breed.					
G3_PG26	Cactus Pelargoniums	Plant Grouping Label	20-30 words	Cactus Pelargoniums: A subgroup of zonal pelargoniums. The petals are curled under longitudinally giving each petal a quill-like or tube-like appearance.					
G3_PG27	Rosebud Pelargoniums	Plant Grouping Label	20-30 words	Rosebud Pelargoniums: A subgroup of zonal pelargoniums. Each flower looks like a unfurling rosebud.					
G3_SP1	How do these plants relate to one another?	Secondary Panel	130-150 words 9-12 key messages	1. All plants have a family tree that shows which other plants they are related to and who their common ancestors are. 2. the science of studying these relationships is called systematics. 3. We used to see how plants were related by how they looked. 4. We now see how they are related using DNA. 5. We are interested in their relationships because it shows us how plants have evolved over time. 6. It is like looking back in history through their DNA. 7. To help us talk about plants with everyone, no matter what language they speak, all plants have a unique two part name - Genus first and then species. 8. this is called the binomial name and is often in latin or greek or can be someone's name. 9. these names often tell you about a plant too - the name Geranium comes from the Greek, Geranos, meaning crane, because the fruit looks like a crane's beak. 10. In this glasshouse the genus is Pelargonium and the second name on the label is species. 11. All the pelargoniums are closely related to each other - probably like cousins. They all belong to the family geraniaceae. 12. The family geraniaceae contains other genera (plural of genus) such as geraniums and erodiums which you can see outside in GH3 and learn more about them.					Graphic or Object Intervention showing how Pelargoniums relate to Geranium Plants and Erodium Plants and invitation to view those examples growing outside. Nell would like to see the whole way from Kingdom down to Species: Kingdom: Plantae, Phylum: https://serc.carleton.edu/integrate/teaching_materials/food_supply/student_materials/805 - quite like this, and this: https://www2.estrellamountain.edu/faculty/farabee/biobk/BioBookDivers_class.html Although between Kingdom and family, it should be clade rather than order etc. Kingdom: Plantae Clade: Tracheophytes Clade: Angiosperms Clade: Eudicots Clade: Rosids Order: Geraniales Family: Geraniaceae Genus: Pelargonium This is because clade shows that they are related rather than a rank which was the old method where the plants weren't necessarily related but were grouped together for one reason or another. Clade is the modern way.

G3_SP2	Mary Gibby	Secondary Panel	130-150 words 9-12 key messages	<p>1. The location of this scientific Garden has always been important - right in the middle of the capital city of England where so many scientific institutions have been based and research has been undertaken for 100's of years.</p> <p>2. Botanists often need live plants on which to carry out research and whilst there is a lot of amenity green space in London there aren't too many botanic gardens.</p> <p>3. The diverse collections at CPG have often been used in scientific research over the years.</p> <p>4. In the 1970's Professor Mary Gibby OBE, a renowned botanist, was based at the Garden whilst working for the NHM and used the Pelargonium collection in her research</p> <p>5. Her area of research was plant chromosomes (the structures that carry DNA in the nucleus of every living cell), and what their study could tell us about the relationships of different plant species.</p> <p>6. She started off by studying ferns but then moved on to Pelargoniums which one of the Gardeners, Virginia Nighthale, had begun to build a collection of, partly because they were a favourite of her mother!</p> <p>7. In time, Mary built up a collection of over 100 species pelargoniums and they were kept in the Pit House for many years.</p> <p>8. She discovered that different lineages had different numbers and sizes of chromosomes.</p> <p>9. This allowed her to determine exactly which plants were related to each other and also that pelargoniums fell into two groups based on size of chromosome.</p> <p>10. She then turned her scientific eye to hybridisation in Pelargoniums which had already been established in the 18th and 19th centuries, as growers developed many beautiful cultivars.</p> <p>11. Her research showed that you could only cross (and create hybrids) pelargonium species from the same group.</p> <p>12. The popular scarlet 'geranium' and its relatives (section Ciconium) have relatively large chromosomes, whereas the regal and scented Pelargoniums (many derived from section Pelargonium) have small chromosomes, and hybridization attempts between the two are unsuccessful.</p>	Image of Mary Gibby			NG- we can combine the 2 parent plants and offspring display with the Mary Gibby panel explaining it. Plants: Pelargonium x ardens = a cross of P. lobatum and fulgidum.
G3_ST1	Pelargonium cotyledonis	Star Plant Label	130-150 words 9-12 key messages	<p>1. Pelargonium cotyledonis is the sole species of Pelargonium on the island of Saint Helena.</p> <p>2. IUCN - critically endangered.</p> <p>3. It lives in cliff habitats on arid, near-vertical faces, sometimes with very little soil development, the roots penetrating amongst cracks in the rocks.</p> <p>4. However, the species is also found on broad ledges and in steeply sloping valleys.</p> <p>5. Habitat threat and now fragmented populations that makes it even more at risk.</p> <p>6. Referred to locally as 'Old Man never dies' because it lives to a very old age.</p> <p>7. This plant demonstrates how varied the forms of pelargoniums are.</p> <p>8. This is as a result of plants adapting to their niche habitats.</p> <p>9. You would never know to look at it that it was related to the ordinary red bedding 'geranium'</p> <p>10. P. cotyledonis has a succulent stem where it stores water - this is because it comes from an arid environment with less than 400mm of rain a year.</p> <p>11. It is also adapted to this dry environment by completely shedding its leaves in time of water stress and so dropping evapotranspiration to zero.</p>	Images of star plant in flower/ in fruit			
G3_ST2	Pelargonium triste	Star Plant Label	130-150 words 9-12 key messages	<p>1. This is the first Pelargonium to be recorded as growing in Britain in 1632.</p> <p>2. The specific epithet 'triste' is from the French for sad which was applied because people think both the flowers and foliage are dull.</p> <p>3. Before binomial names it was called Geranium indicum Noctui Odoratum meaning 'Night scented Indian Geranium'.</p> <p>4. It was originally thought to have come from India as plants often arrived in Britain from all over the world having taken quite circuitous routes so that their origin was obscured.</p> <p>5. It is actually from the Cape of South Africa.</p> <p>6. It is a geophytic species that has a large, subterranean tuber with tuberous roots with a rather cracked, woody bark.</p> <p>7. The prostrate leaves are produced directly from ground level with minimal stem growth; they are hairy, divided, and softly feathered, resembling the leaves of a carrot plant.</p> <p>8. Its foliage will die down during the summer heat and it will go dormant - this is an adaptation to arid conditions.</p> <p>9. As soon as the rains come again in the winter, it will put up new foliage.</p> <p>10. Pelargonium triste has tannin-rich tubers, which are used in Namaqualand for tanning leather a rich, reddish brown colour.</p> <p>11. Infusions from the tubers are used for treating dysentery and diarrhoea.</p>			Choose Mary Gibby (Taxonomist for Pelargoniums) 1 x Species & 1 x Cultivar Choose 1 cultivar where we know where the parents are so we can show how they are bred.	
G3_POLI	Pelargonium sidoides	Postcard Label	35-50 words	<p>1. The root of Pelargonium sidoides is used as a traditional medicine by Zulu people in South Africa.</p> <p>2. The WHO definition of a traditional medicine is: <i>Traditional medicine has a long history. It is the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness.</i></p> <p>3. It is used for the treatment of acute respiratory tract infections (ARIs) such as Bronchitis and Tuberculosis.</p>	Images of star plant in flower/ in fruit			
G3_TG1	Glasshouse Latches	TTEG Label	35-50 words	<p>Glasshouse Features</p> <p>1. These glasshouses are designed with special architectural features to suit their function: e.g. Latches (designed to open easily with one hand- whilst holding other stuff), vents, grooved flooring- to damp down and cool the GH, the coal Shutle under the potting shed to power the boiler, vents to cool the glasshouse.</p> <p>2. CTA: can you spot the maker of these glasshouses written on the latches?</p>		Audio Tour Gardener's Voice - why the glasshouses are special, how they function, what to look for		Audio - Neil, would you be willing to do this? Yes.
G3_TG2	Pest Control	TTEG Label	35-50 words	<p>1. Plants like it under glass - nice environment. Same is true for the bugs.</p> <p>2. The bugs usually are more active when the weather is warmer but some overwinter.</p> <p>3. We practice IPM - Integrated pest management. Use the least damaging method of control: a) cultural - grow them well, attend to them well. b) Mechanical - pick off the bugs, squash them, blast them off with water etc. c) use bio controls - other bugs to predate on the bad bugs. d) Use organic sprays e) use chemical spray as the last resort.</p> <p>4. CTA: you can use practice IPM at home and can even buy biocontrols on the internet - such as nematodes for slugs.</p>	Display of empty biocontrol boxes/sachets?	Audio Tour Local Voice - Either a local gardener from anearby allotment talking about how they deal with pests in unusual ways OR insects as a sign of a healthy garden, perhaps a beekeeper from London Honey Company, talking about pollination in the urban centre of London		Audio - Does the garden have links to local amateur gardening groups/allotments? Will the Activity Plan work with any of these that we can bring in? It could be a multitude of voices on the subject of pest control from across the groups that the engagement programme is working with.
AT ENTRANCES (x2) TO TROPICAL CORRIDOR (FROM GH3)								
TC_MD	Tropical Corridor	Glasshouse Mini Descriptor	7-10 words	<p>*Tropical Corridor</p> <p>*Ethnobotany- how humans use plants (with secondary message about negative impact of humans)</p>				
TC_IT	Close the Door Behind You	Instructional Text	10 words	Please Close this door to preserve the humidity.				

TROPICAL CORRIDOR								
TC_GE1	Intro to the Tropical Corridor	Glasshouse Explainer (Intro)	84 words in total 7 key messages	<ol style="list-style-type: none"> The tropical corridor is a hot, humid, glasshouse which contains various edibles, orchids and useful plants from the tropical regions of the world. People think of the tropics as being bright and sunny but lots of these plants live under big trees and need it to be shady. There is a huge diversity of plants in the tropics because it hasn't been subjected to the ice age and there is so much competition that plants have had to adapt and evolve. Plants in the tropics are hugely useful to people and in the past the impact of humans was less as we were fewer. However, now with greater human populations creating climate change the places where some plants used to grow is now inhospitable to them. Additionally humans build cities and use land to grow crops such as palm oil and chocolate. Often this means clearing wild plants from that land. As plants can't get up and move and can't evolve quickly enough, we will see many extinctions. This means we may lose other species, some animals, that rely on that plant too. 			Sound installation of a Tropical Rainforest, 3 or 4 speaker with multi channel sound creating a changing atmosphere as you walk through.	
TC_GEF		Glasshouse Explainer (Facts)		Fact File: Where do I grow <ol style="list-style-type: none"> Where in the world these plants grow : map shows where the Tropics are Temperature Range: greater than 15c year-round Humidity: greater than 70%. The RH measurement on the dial needs to ideally be - anything from 70-80 - depends on the weather, the time of day etc. Ventilation- how much you want the air to come through: Some but not too much as this reduces humidity. Growing Media- replicating the right place for these plants (right plant right place): Many plants like a shady environment as they come from the understory. 			"Where do I grow?" info graphic showing where these plants are found in the globe and highlighting the conditions/ temperature of this specific glasshouse	
TC_GEA		Glasshouse Explainer (Arrangement)		How are the plants arranged? 1. The layout considers a canopy at the top of the glasshouse to provide shade for plants growing lower to the ground (this is most apparent in the summer- and cut back in the winter). There is a display of orchids in the middle and there is a nursery at the end for plants that we are growing from cuttings and seeds. <p>Links to wider Garden: Link showing Ethnobotany Beds in Wider Garden - lots of the tropical species we grow in pots that we overwinter in the Tropical Corridor and then take out in the summer mostly to Edible & Useful and Med Quad.</p>			Spatial Arrangement Plan: showing the different types of plants are their arrangement	
TC_TG	Through the eyes of the Gardener	TTEG Label	35 - 50 words	<ol style="list-style-type: none"> There is a constant trade off between heat, humidity and ventilation. The hotter it is, the more humid it is but you need to ventilate for the health of the plants - this makes it cooler and then less humid..... If you look closely you will see lots of different habitats here - a bog area at the west end, as well as a rocky area and then the tree that the orchids grow in. Each replicating the place that those plants grow in the wild. This helps them to grow well. Our glasshouse gadgets are replacing natural system services that exist in the Tropics Needs to have irrigation system as the rain would normally provide this and plants provide the humidity In rain forest, the nutrition is locked in the plants and the soil is poor. It's like a battle ground, so competitive Ecosystem services: Giving value to what a plant does in an environment. Looking after plants in the glasshouse "Not a dark art - it's experience not instinct". High temperatures provided by heating; high humidity through foggers. The gardeners water in here frequently as the plants are thirsty and often large. As it is hot there are a lot of bugs too so we have to do lots of pest control in here. We create a canopy using plants - to protect the understory plants that aren't used to high levels on sunlight. Some plants like a lot of shade and so we put up shade netting to protect them. We keep the doors closed to keep in the humidity. 				SS to provide map so you can mark this
TC_ST1	Star Plant: Theobroma cacao - Chocolate	Star Plant Label	130-150 words 9-12 key messages	<ol style="list-style-type: none"> HISTORY: Hans Sloane collected chocolate in Jamaica and later, as a clever businessman he sold the idea of hot chocolate to Cadburys (!) INDIGENOUS USE: Cocoa was first used by the early indigenous South Americans. Unfermented cocoa seeds and the seed coat were used to treat a variety of ailments, including stomach aches, diabetes, digestive and chest complaints. Cocoa powder, prepared from fermented cocoa seeds, is used to prevent heart disease. MEDICINAL: Cocoa has been used for an array of medicinal purposes. (IF SPACE) ETHICAL CHOCOLATE PRODUCTION The commercial growth of chocolate is causing deforestation wherever it's grown. Cocoa can be farmed sustainably- by buying sustainable chocolate you can help conserve rainforests 	<ul style="list-style-type: none"> The Aztecs/early indigenous South Americans Hans Sloane 	Images of star plant in flower/ in fruit	Model of a cocoa pod- showing cross section of cocoa seeds in the pods Audio Tour Global Voices - Cocoa Farmer Interview. Spencer from Cocoa runners - would be good to interview him or he could put us in touch with farmers.	needs fact checking Audio - Does the garden have links to chocolatiers or chocolate companies? Can they enable a contact with someone who farms cocoa?
TC_ST2	Star Plant: Cinchona pubescens - Quinine, Red Bark	Star Plant Label	130-150 words 9-12 key messages	<ol style="list-style-type: none"> Quinine has a long history of use by indigenous people in South America for curing fevers. Europeans took their plants and knowledge for medical use. Brought from South America and then taken by the Dutch to Java. Sr Hans Sloane brought Quinine's life-saving compounds to England in 1688 and treated patients for malaria in his London clinic. It is thought that the Europeans took Malaria (an ancient disease) to South America Today if you want take plant knowledge from another source community you have to pay them. This is called the NAGOYA PROTOCOL Quinine's use as the flavouring in tonic water led to the popular drink Gin & Tonic. This was a huge economic success enabling Britain to expand our empire because of the medicinal properties of quinine as a drink. 	<ul style="list-style-type: none"> Hans Sloane indigenous people in South America? 	Images of star plant in flower/ in fruit	Audio Tour Local Voices - London Gin Maker, Desmond from Beekeeper.	Audio - In your shop you have an exclusive Beekeeper Gin (https://www.chelseaphysicgarden.co.uk/shop/beekeeper-london-garden-gin) - would it be an opportunity for you to invite them to contribute a representative for the tour? If not, there are a multitude of smaller local gin makers we could approach.

TC_POL1	Plant: Vanilla	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. The Totonac tribe of Mexico is credited with being the first to use vanilla as a flavouring, possibly over a thousand years ago. 2. It was used by the Aztecs to flavour cocoa. 3. Dried vanilla pods are most commonly known for their use in cooking. 4. Vanilla is also used in aromatherapy and its fragrance is said to calm, relax and soften anger, frustrations and irritability. 	The Totonac tribe of Mexico	<p>Audio Tour Local Voices - Mexican chef or cook talking about how they use vanilla in their food Or the story of: The Totonac tribe of Mexico is credited with being the first to use vanilla as a flavouring, possibly over a thousand years ago. Their favourite drink, 'chocolat', was made from powdered cocoa beans, ground corn and vanilla pods. Conquistador Hernan Cortes of Spain introduced vanilla to Europe in the early 16th century. Old Totonac lore says that Xanat, the young daughter of the Mexican fertility goddess, loved a Totonac youth. Unable to marry him due to her divine nature, she transformed herself into a plant that would provide pleasure and happiness. She became the vanilla orchid so that she could forever belong to her human love and his people. The local people still celebrate a vanilla festival to this day.</p>			Audio - Are there any links with Mexico or with culinary experts within CPG?
TC_POL2	Orchids	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. English botanist and gardener John Lindley (1794-1863), who was deemed to be the father of the science of orchids was Head Gardener at CPG in the 1800s. 2. We grow orchids in his honour. 3. The orchid family is the biggest family of flowering plants. 4. Did you know that the vanilla plant was an orchid? 	Curator John Lindley grew Orchids in the 1800s	<p>Henry Oakley - used to be on the Advisory here at CPG - knows a lot about Orchids.</p>			
TC_POL3	Ant plant	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Provides a home and sometimes nutrients for ants in its woody caudex. 2. In return, the ant colonies provide nutrients for the plant with their excreta. 3. Humans have used the boiled caudex to treat swelling and headaches 4. CTA: can you see the holes where the ants go in? 					
TC_POL4	Alpinia officinarum	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Has a long history of use in Traditional Chinese and Thai Medicine predominantly for stomach complaints. 2. Commonly used as a flavouring in curries throughout Thailand and has a strong peppery taste. 3. It used to be a very popular flavouring in Medieval Europe but fell out of favour. 		<p>Audio Tour Local Voices - Chinese Herbalist on how it is used to treat bronchial problems, how they access it and how it is prepared</p>		<p>Audio - We would be looking specifically for a Chinese herbalist rather than a general herbalist here. Any links with practitioners or with Chinese community engagement at CPG?</p>	
TC_POL5	Bixa orellana	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. The fruit of this tree is the source of annatto, a bright yellow natural colouring used in rice, butter, cheese, popcorn, bread and drinks. 2. Traditionally it has also been used as ritual and decorative body painting, sunscreen, and insect repellent. 					
TC_POL6	Canna edulis	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Canna is effective in removing organic compounds from water and is planted in wetlands to clean wastewater from paper mills. 2. The hard seeds were used as bullets during the Indian Rebellion of 1857 and are also used to make percussion instruments. 3. The starchy root is edible 					
TC_POL7	Ceiba pentandra	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. At 60m tall, the Kapok tree is a giant of the rainforest. 2. Its windborne seeds are surrounded by fluffy white hairs which are used to stuff mattresses, cushions and before the invention of synthetic fibres, life jackets. 					
TC_POL8	Coffea arabica	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Coffea arabica originates from Ethiopia despite its name. 2. One of the most important beverages in the Western world. 3. Used traditionally to fight fevers, flu, jaundice, malaria, opium poisoning, necrosis and vertigo 4. CTA: look closely - can you see coffee beans on this tree? 		<p>Audio Tour Local Voices - Coffee roaster in London talking about how they procure coffee, its role today and historically in London with coffee houses as revolutionary meeting points</p> <p>OR</p> <p>Audio Tour Global Voices - Coffee producer in Ethiopia, how the climate creates a distinctive bean and its importance as a crop</p>		<p>Audio - Does CPG have links with coffee suppliers or manufacturers that we can build on? Or with a nearby coffee shop?</p>	
TC_POL9	Colocasia esculenta	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Common name is Taro 2. It is probably one of the oldest cultivated crops. 3. The nutritious tubers are boiled and form a staple carbohydrate food. 4. The young tender leaves may also be blanched. 5. In its raw form, the plant is toxic due to the presence of calcium oxalate, and the presence of needle-shaped raphides in the plant cells. 6. However, the toxin can be minimized and the tuber rendered palatable by cooking or by steeping in cold water overnight. 					
TC_POL10	Murraya koenigi	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Common name: Curry Leaf 2. Origin: India 3. Parts used: Leaves 4. Cullinary: fresh leaves fried with onion in curries such as aavil. 5. Other uses: anti-diabetic used in Ayurvedic medicine. 		<p>Audio Tour Global Voices - Interview with Ayurvedic practitioner, how and why curry leaves and other herbs are used in treatments</p>		<p>Audio - This does not necessarily have to be an Ayurvedic practitioner but could be more broadly with a South East Asian voice about how curry and other spices are thought of medicinally. Are there crossovers with the Activity Programme or with other areas for CPG activity?</p>	
TC_POL11	Dioscorea	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Yams are an important agricultural product in West Africa. 2. The edible tubers can weigh up to 70kg and they store well, even without refrigeration. 3. Several Dioscorea species are also used as sources of diosgenin which is used in the manufacture of medical steroids such a progesterone. 		<p>Audio Tour Local Voices - West African grocer talking sharing yam recipes, the role of food in cultural identity</p>		<p>Audio - There may be links with the Activity Programme here where we can work with communities involved to collect the interview.</p>	
TC_POL12	Eleutheria cardamomum	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Cardamom belongs to the ginger family and originates in southern India and Sri Lanka. 2. In addition to its extensive use in the food industry, essential oil from the seeds is used in perfumes and aromatherapy. 					

TC_POL13	Manilkara zapota	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Sapodilla or chicle is the source of the white gummy latex which was boiled to make the first chewing gum. 2. Very few modern chewing gums use chicle because it is expensive to harvest 3. Zig-zag gashes are cut in the bark and the latex trickles down into collecting buckets. 						
TC_POL14	Milletia pinnata	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. The seeds of the Milletia are exceptionally high in oil 2. They have traditionally been used to produce lamp oil and soap making. 3. The tree is drought tolerant and can grow in areas where most crops fail. 4. Many villages in India have begun using Milletia oil as a biofuel for small scale electricity generation. 			Audio Tour Global Voices - Either someone working on a project which is using biofuel for electricity generation in India OR a researcher at somewhere like Imperial College who can talk about the kind of micro-generation projects enabled by biofuels using locally accessible and produceable plants			Audio - Do you have links with any energy (preferably sustainable) companies or suppliers? Or any international development charities who may work in supporting energy sufficiency in rural communities?
TC_POL15	Pepper, Piper nigrum	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Black, white and green pepper corns all come from Piper nigrum, one of the world's most popular spices. 2. It grows wild in the mountains of Keral S.W. India and is now cultivated throughout the tropics. 3. Black pepper is produced by briefly cooking the unripe drupes in hot water before drying them in the sun. 			Audio Tour Local Voices - An interview with a chef from Gordon Ramsey's restaurant next to the garden on base spices used in cooking			Audio - Do you have links with any of the nearby restaurants? Or, this could be an interview with the chef in your restaurant?
TC_POL16	Piper betle	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. The primary use of betel leaf is as a wrapper for the chewing of areca nut or tobacco, where it is mainly used to add flavour. 2. It may also be used in cooking, usually raw, for its peppery taste. 3. The root is used in local medicine for indigestion. 						
TC_POL17	Pitcher Plants	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Native to South East Asia, pitcher plants such as these Nepenthes are carnivorous masters. 2. The pitcher is a leaf adaptation and holds a cocktail of digestive enzymes and rainwater. 3. Once trapped, the insects are broken down and provide nutrients to the plant. 						
TC_POL18	Nepenthes ampullaria	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Traps as Treats: The pitchers of Nepenthes ampullaria are used to hold sticky rice and are sold as a popular snack in parts of Malaysia. 2. This edible packaging is a suitable biodegradable container and is a positive solution to reducing plastic usage. 			Audio Tour Local Voices - A young activist speaks about how reducing the use and reliance on plastics is fundamental to a healthy and sustainable planet			Audio - Do you have any contacts with in the organisation for with youth panels who might be contacted? I have contacts in Climate Declares Emergency and XR if needed.
TC_POL19	Plinia cauliflora	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. The fruit of the Jabuticaba tree grows directly on the trunk and main branches. 2. They are used to make wine and other drinks in Brazil. 3. This plant produces several potent anti-cancer compounds including jacobincin. 4. It is extremely slow growing and its beautiful bark makes it a popular subject for bonsai training. 			Audio Tour Global Voices - Researcher talking about how this plant is used to create anti-inflammatory and anti-cancer compounds			Audio - Do you have links with pharma companies or university researchers that could be explored?
TC_POL20	Psidium cattleianum	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. This plant is native to Brazil 2. The red fruits of the Strawberry guava are edible and reminiscent of passion fruit. 3. They make a delicious jam or tart filling. 4. The seeds can be roasted as a coffee substitute and tea can be made from the leaves. 						
TC_POL21	Rauvolfia vomitoria	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. As its name suggests, all parts of this plant are poisonous and can cause you to be violently sick. 2. Rauvolfia is grown in plantations as a source of Reserpine which, until recently was used to treat high blood pressure and psychotic symptoms. 						
TC_POL22	Tamarindus indicus	Postcard Label	35-50 words	<ol style="list-style-type: none"> 1. Tamarind has sausage shaped hairy fruits which contain a tangy pulp which is used as a spice in curries and pickles. 2. It is one of the ingredients in Worcestershire sauce. 3. In many Buddhist temples the pulp is used as a metal polish- it removes the tarnish from brass and copper statues. 			Audio Tour Local Voices - how it is used as a folk medicine (for constipation, headaches and fevers)			Audio - As tamarind is so widespread we will hopefully be able to bring in a voice from the audience work you are doing through the Activity Plan.
TC_TG2	Through the eyes of the Gardener	TTEG Label	35 - 50 words	<ol style="list-style-type: none"> 1. This area of the Tropical Corridor we are propagating plants that will grow and replace plants in the future. 2. Because many tropical plants get very big quickly we have to constantly replace them with smaller ones and this is why we do a lot of propagation. 			Audio Tour Local Voices - Youth activist talks about the nature of climate emergencies as a global threat and how campaigning on a national level feeds into this			Audio - Do you have any contacts with in the organisation for with youth panels who might be contacted? I have contacts in Climate Declares Emergency and XR if needed.
AT ENTRANCE TO GH2 ATLANTIC ISLANDS (FROM WIDER GARDEN)										
G2_GD	Atlantic Islands	Glasshouse Descriptor	7-10 words	<ul style="list-style-type: none"> • Atlantic Islands • Island Flora and Habitat Loss 						
AT ENTRANCE TO GH2 ATLANTIC ISLANDS (FROM TROPICAL CORRIDOR)										
G2_MD	Atlantic Islands	Glasshouse Mini-Descriptor	7-10 words	<ul style="list-style-type: none"> • Atlantic Islands • Island Flora and Habitat Loss 						
G2_IT	Close the Door Behind You	Instructional Text	10 words	Please Close this door to preserve the humidity						
AT ENTRANCES (x2) TO TROPICAL CORRIDOR (FROM ATLANTIC ISLANDS)										
TC_MD	Tropical Corridor	Glasshouse Mini-Descriptor	7-10 words	<ul style="list-style-type: none"> • Tropical Corridor • Ethnobotany- how humans use plants 						
TC_IT	Close the Door Behind You	Instructional Text	10 words	Please Close this door to preserve the humidity						
GLASSHOUSE 2: ATLANTIC ISLANDS										
G2_GE1	Intro to Glasshouse 2	Glasshouse Explainer (Intro)	84 words in total 7 key messages	<ol style="list-style-type: none"> 1. This glasshouse contains plants that form part of the Atlantic Islands (Macronesian) Collection e.g. the Canaries, St Helena, Cape Verde- off the coast of Africa 2. Most of these plants are uniquely adapted to grow on their home island and are very susceptible to threats, often from humans, like habitat destruction. 3. Islands are small so once species lose their space they have nowhere to go and can then go extinct. 4. Lots of the plants in here are wild collected and so are often used for research by scientists. 5. This glasshouse always looks at its best in the spring as many of the plants will be flowering. 6. This is because in their natural habitat the summer season is so hot that many of these plants stop growing and just tick over until the rains come again in the autumn. 7. In the northern hemisphere many plants adapt to the seasons in a similar way, but they are trying to avoid the cold of the winter and so may lose their leaves or retreat underground. 			Audio Tour Ambient Sound - Sound of island habitats and sea. N.J. I have also asked Mark Carine @ NHH if he would be ok to be interviewed as expert on island flora. He has agreed.			

G1_GE1	Intro to Glasshouse 1	Glasshouse Explainer (Intro)	84 words in total 7 key messages	<ol style="list-style-type: none"> Southern Africa is home to some of the world's most biodiverse habitats. This glasshouse displays plants from two of those regions - The Karoo and the neighbouring The Cape Floristic Region (CFR) - global biodiversity hotspots. The CFR has the highest concentration of plant species in the world. It contains an estimated 9 500 species, of which 70% do not grow anywhere else in the world (these are called endemic plants) The Succulent Karoo has the richest succulent flora in the world with around 1800 species. This area of the world was untouched by the ice ages of the pleistocene which lasted for millions of years. This means that these plants have been evolving to suit a niche within their changing habitats over a very long time when many others were wiped out by the cold temperatures. The history of plant life on this planet is found within those plants and that is why this area is so important. With the current climate change these very special plants with their evolutionary history which can tell us so much about the history of our world, are under threat as they can't evolve quickly enough to meet this climatic challenge. 		Audio Tour Gardeners' Voice - The attraction of this habitat and its biodiversity, why it is a common area to represent in botanical gardens and the kinds of research that come from its study. Robbie Blackhall-Miles - a botanist - knows a lot about this habitat and could talk well about it.		Focus on Biodiversity FS
G1_GEF		Glasshouse Explainer (Facts)		<p>Fact File: Where do I grow</p> <ol style="list-style-type: none"> Where in the world these plants grow - South Africa Temperature Range - 5 - 25c Humidity - low Ventilation- how much you want the air to come through - lots - fynbos in particular thrive in quite strong winds. Growing Media- replicating the right place for these plants (right plant right place) - many of these plants needs an acidic soil - like the proteas. 	"Where do I grow" info graphic showing where these plants are found in the globe and highlighting the conditions/ temperature of this specific glasshouse			
G1_GEA		Glasshouse Explainer (Arrangement)		<p>How are the plants arranged? (arrangement tbc) We will interpret 3 key habitats: Fynbos, Succulent Karoo & Drakkenberg Mountains.</p> <p>Links to wider Garden: Links to relevant geographical areas in the garden- We grow many South African plants in the beds outside the Curator's house.</p>	Spatial Arrangement Plan: showing the different types of plants are their arrangement			SS to mark South African beds outside the Curator's House on a map
G1_TG	Through the Eyes of the Gardener	TTEG Label	35 - 50 words	<ol style="list-style-type: none"> The plants from these two regions have very different care routines. All need good ventilation (we may be putting in forced ventilation in here). Fynbos: Lots of the plants are in the proteaceae, restionaceae and ericaceae (heather) families and they can be tricky to look after. They like a like soil that isn't enriched and definitely not high in phosphorous. Succulent Karoo: these plants need higher temperatures and less water. They are easier to look after but you have to be careful not to overwater them. 	Audio Tour Gardeners' Voice - The attraction of this habitat and its biodiversity, why it is a common area to represent in botanical gardens and the kinds of research that come from its study			
G1_SP1	Succulent Karoo	Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> The succulent karoo is an arid habitat in southern Africa. The region is extremely dry in summer and the temperature often rises above 40c. Rain falls in winter and varies from 20 to 290 mm per year. It has the richest succulent flora in the world and accounts for approximately 1/3 of the world's succulent species. The main threats to this habitat include mining and overgrazing. Ostriches are native to this area and are farmed for their meat and plumage. Competition for the land for agriculture such as this has led to the decline of the habitat that is rich in these plant species. The flora consists mainly of dwarf succulent plants and annual plants which are often in the daisy family (Asteraceae) The succulents have adapted by storing water in their stems and other parts of the plants to survive the arid environment. The annual asteraceae flowers, commonly known as Namaqualand daisies, put on a spectacular flower display each year covering vast stretches of the landscape in the southern spring-time (August-September) There are probably thousands of seeds per square metre from more than 4,000 species just sitting in the soil awaiting late winter rains in South Africa. These annuals are adapted to germinate, grow, flower and set seed during the rainy winter and to survive the long dry summer as seed. 				
G1_SP2	Fynbos	Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> Fynbos is a habitat in Southern Africa and the plants are one of the things that define it. Fynbos is dominated by plants that have adapted to the presence of fire. Fire has a double impact on fynbos - it plays a role in germination and it also acts as a mineralizing agent. Some fynbos species die during fire and regenerate from seed stored in the canopy e.g. Serotinous proteaceae. Other species build up seed stores in the soil, such as <i>Minetes splendendus</i>. Germination of the seed is stimulated directly through heat or smoke, or indirectly through changed environmental conditions. Other species can re-establish by sprouting from a woody root-stock after fire, stimulating new growth to occur. Thus fire-stimulated germination could very well be an evolutionary response to the increased availability of nutrients and other resources and the reduced competition after fires. Smaller plants often can't compete with larger shrubs and trees but have the opportunity to germinate and flower after fire removes some of the competition. Thus fire can enhance the diversity of fynbos. 	Audio Tour Global Voices - Farmer / Conservationist talking about the role of fire in sustaining the landscape and upcoming challenges in managing it		Audio - Having a voice of a conservationist here would be exciting - do you have any links in South Africa which may help us find one?	
G1_ST1	FYNBOS STAR PLANT - Protea sp.	Star Plant Label	130-150 words 9-12 key messages	<ol style="list-style-type: none"> About 92% of all Protea species occur only in the Cape Floristic Region. Protea species have an amazing variety of plant size, habit, flower size and colour. It was named after the Greek god Proteus, who could change his shape at will. It is another example of the huge biodiversity within this part of the world. A total of 1,736 fynbos plants are now critically endangered, endangered or vulnerable. While many mountainous areas have been set aside for conservation, the natural vegetation of the region's lowlands has increasingly been removed to make way for agriculture, resort development and urban expansion. Why should we care? Well, once a plant is extinct, you can't get it back - it will be part of an ecological web that we probably don't even know about. The implications of extinction can be far ranging to other species - including some of our food crops. For example, a plant goes extinct which causes a dependant insect population to decline. This insect population normally predaes on a crop pest. This means that a crop is now infested and so harvest yields will be low. Climate change and biodiversity are often talked about together -the difference is that with the will to do it, we can tackle carbon emissions and human caused climate change but once plants are extinct we can't get them back and we will lose those 10's of thousands of years of evolutionary information and processes. 	Images of star plant in flower/ in fruit- Commissioned photograph?			

GI_ST2	KAROO STAR PLANT- Lithops - living stones.	Star Plant Label	130-150 words 9-12 key messages	<ol style="list-style-type: none"> This dish contains succulent plants from the Aizoaceae family Most of the plant is below ground to protect from the heat. They have translucent windows in the top of the two swollen leaves to let in light to the buried part of the plant to photosynthesise. The size of the windows depends on how extreme the environment is - the hotter it is, the smaller the window. They don't have the chlorophyll on the surface as it is green - not good for camouflage and also as the photosynthetic apparatus is crucial to the plant they have it low down in the ground to protect it. The whole plant looks like a stone so that is camouflaged In these extreme environments they would be a tasty and juicy snack for a herbivore if they were more visible. 	Images of star plant in flower/ in fruit- Commissioned photograph?	Audio Tour Gardeners Voice - The attraction of this habitat and its biodiversity, why it is a common area to represent in botanical gardens and the kinds of research that come from its study. Robbie Blackhall-Miles - a botanist - knows a lot about this habitat and could talk well about it.						
GI_ST3	DRAKENSBERG STAR PLANT - Aloe polyphylla	Star Plant Label	130-150 words 9-12 key messages	<ol style="list-style-type: none"> The spiral aloe is endemic to the Kingdom of Lesotho in the Drakensberg mountains. It grows in high, mountainous, grassy slopes. Here it clings to rocky crevices and well-drained scree slopes. It is listed as CITES Appendix I, the highest level of threat. It has become an endangered species for three main reasons: a) excessive collection from unscrupulous plant hunters taking plants and seed from the wild. b) overgrazing c) road building threatening their habitat and making them more accessible to unscrupulous collectors. The species is prized for the clockwise or counterclockwise spiral arrangement of its leaves - spiral phyllotaxy which is a solution to maximize photosynthetic capability. because the populations of Aloe polyphylla are so small and fragmented, there are not significant populations of the malachite sunbird to pollinate them - this is adding to the threat. It is illegal to buy them in Lesotho except from licensed sellers. 	Images of star plant in flower/ in fruit- Commissioned photograph?							
GI_POL1	Bowiea volubilis	Postcard Label	35-50 words	<ol style="list-style-type: none"> These plants climb by scrambling over other plants. Stores water and nutrients in its bulb and goes dormant over winter when conditions are not right for it. The scrambling stems are actually it's inflorescences (flower structure - think a long scrambling daffodil). In southern Africa this species faces severe threat due to the medicinal market. Herbalists constantly rate this species as one of the top six medicinal species to have become scarce as a result of over-utilization 								
GLASSHOUSE BAY 2 (Between Glasshouse 1 & 2)												
GB2_X51	South African Plants	Exterior Secondary Panel	130-150 words 9-12 key messages	<p>South African Plants</p> <ol style="list-style-type: none"> The glasshouse bays provide a sheltered microclimate for tender plants that thrive in hot dry conditions and with extra protection during the winter. Bay 2 provides protection to further plants from the South African Collection, related to the collection in Glasshouse CPG has always benefitted from a microclimate caused by the surrounding walls, proximity to the streams, etc. However, the impact of Climate Change means we have gradually become warmer as an environment. Twenty years ago we would not have been able to maintain some of these plants outside, but today they are thriving. Milder winters are also seeing us putting less winter protection out for our plants. We are working with the impacts of the Climate Emergency every day within the Garden. 								
GB2_ST1	Elegia tectorum	Star Plant Label	130-150 words 9-12 key messages	<ol style="list-style-type: none"> This plant was traditionally used for thatching the specific epithet 'tectorum' meaning roof. It grows in the fynbos which is a habitat in Southern Africa and the plants are one of the things that define it. Fynbos is dominated by plants that have adapted to the presence of fire. The above-ground parts of the plant are completely killed when fire sweeps through the fynbos The underground rhizome, however, survives and vigorously sends up new shoots taking advantage of nutrients that have been released after the fire. This species has declined extensively in some areas of South Africa because of urban and agricultural expansion. Each stem is banded with chocolate bracts that lighten to a warm golden color before being shed. The flowers of the plants in this family are very small and insignificant - this is because they are wind pollinated and so don't need to attract pollinators. Scientists think they were around in the Cretaceous period - 60 million years ago. This means they were around long before grasses and possibly the only grass like flowering plant around when the dinosaurs walked the Earth. 								
GB2_ST2	Aloidendron dichotomum	Star Plant Label	130-150 words	<ol style="list-style-type: none"> From Namaqualand in South Africa. Listed as vulnerable on the IUCN red list. Common name is quiver tree This refers to the San people's use of the hollowed branches to make quivers to hold their hunting arrows. The roots are used in traditional medicine for asthma and tuberculosis. The plant has been tested for bioactivity against the malaria parasite (Plasmodium falciparum) and inflammatory responses. Aloe dichotoma is threatened by the effects of climate change. Researchers in South Africa have shown that its distribution has shrunk during the last century and it has not yet been found in areas expected to become suitable with the changing climate. 								
GB2_X52	Glasshouses of the Future	Exterior Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> CPG has just finished conserving the Glasshouses and making their use more sustainable for the future. This might include: heating with a ground source heating, installation of PV panels, rainwater harvesting, monitoring of gas and water inputs, airflow mapping The main improvement we have proposed is significantly increasing rainwater harvesting. Other improvements will be much better monitoring systems. This way we won't ever overheat the glasshouses unnecessarily nor vent them unless we need to. These original glasshouses were made out of Burmese teak - this is a protected species now so we have restored with reclaimed teak (or it might be something else) which is sustainable. We have done a full audit of the plants to ensure they need to be grown under glass with those high inputs and that they fully contribute to our mission and values. CPG has always had its own microclimate. But plants can grow outside in this garden today that in the past would only have been inside the glasshouse. Go and see the tender plants growing in the macronesian beds on Swan walk With global warming will glasshouses of the future need to be cooler than outside? CTA: do you collect rainwater at home to water your garden? It's so easy to capture water from your roof into a waterbutt. 	e.g. Images showing PV panels and cross section of Ground Source pump if you have it							
PIT HOUSE												

PH_GD	The Pit House	Glasshouse Descriptor	7-10 words	<ul style="list-style-type: none"> The Pit House Plants are stored here over winter 					
PH_XS1	The Pit House	Exterior Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> Plants are stored here over winter and it is also a dry propagation house for succulents. If you look inside, you will see a collection of strange looking plants called Welwitschia mirabilis plants. These plants only ever have 2 leaves that just get longer and more shredded by the elements as time goes on. They can live 100's of years and get as tall as 1.5m but the length of the leaves can be up to 4m. Instead of producing flowers they produce cones - just like some trees. In the 1980's scientists carried out research using these plants. They are still trying to find out whether these strange looking plants could be the link between flowering and non flowering plants. Just next to this glasshouse, where the nursery is now, there used to be another pit glasshouse. Pit glasshouses are thermally efficient as they retain heat by being sunk in the ground. The second pit glasshouse was removed in ??? as it fell into disrepair. 		Plan of site of old pit glasshouse/picture?			
OUTSIDE GLASSHOUSE 5 (Fernbed)									
G5_XS1	Pteridomania	Exterior Secondary Panel	130-150 words	<ul style="list-style-type: none"> During the Victorian era, every strata of society fell in love with ferns Those who lacked a garden displayed them in small indoor glasshouse or albums filled with dry pressings. Fern motifs were to be found everywhere including on rugs, tea-sets, furniture and custard cream biscuits! In the Victorian age, botany was one of the few avenues of science open to women. In fact, botanical trips were considered so healthy and wholesome that women were even allowed out unchaperoned! Pteridomania encouraged more and more women to head out into the wild to collect and catalogue ferns. During this period, many very important ferns were collected by female botanists. 	examples of Women Botanists needed	Early photograph of Victorian women collecting Ferns			<ul style="list-style-type: none"> Neil to look up etymology of Pteridomania Peris = Greek for fern. [N] to create New Fernbed outside the cool fernery
G5_XS2	Fern reproduction	Exterior Secondary Panel	130-150 words 9-12 key messages	<ol style="list-style-type: none"> The fern reproduction lifecycle is very different to flowering plants. Some botanists call them cryptogams because the way they reproduce sexually is hidden. For a flowering plant the sexual reproduction happens inside the plant and this will produce a seed that can grow into a plant. Ferns have two stages of life to complete their lifecycle - The sporophyte form which can produce spores (similar to flowering plant seeds) and the gametophyte form which can't produce spores but produces sex cells. The spores produced by a fern carry only one set of chromosomes in their cells. When these spores land on the ground, in the right conditions, they produce a gametophyte which is a little heart shaped plant. The gametophyte has both sex cells - sperm and eggs. Where there is water the sperm will swim to the egg and fertilise it. This means that now the fertilized egg has two different sets of chromosomes. This grows into a new plant, the sporophyte that is genetically different from the gametophyte. It grows out of the top of the gametophyte. The sporophyte is what we would generally recognise as a fern. When the sporophyte fern fronds reach maturity they release spores and the cycle starts again. 		<ul style="list-style-type: none"> Images of Spores on underside of the leaves of a fern that's in front of you. https://www.thoughtco.com/fern-life-cycle-4158558 good picture of a bulbil on this page http://1.bp.blogspot.com/_mFm838BFqBE/TUVRoMnk2IAAAAAAAAAAE/6o7a90Mk_H4/s1600/woodwardia-hijuelo.jpg 			
AT ENTRANCE TO GLASSHOUSE 5: FERNHOUSE FROM GARDEN									
G5_GD	The Thomas Moore Fernery	Glasshouse Descriptor (x 2)	7-10 words	<ol style="list-style-type: none"> Thomas Moore Fernery Plants evolved over millions of years 					
GLASSHOUSE 5: THOMAS MOORE FERNERY									
G5_GEI	Intro to Glasshouse 5	Glasshouse Explainer (Intro)	84 words in total 7 key messages	<ul style="list-style-type: none"> Themes: Plant Evolution The Thomas Moore Fernery provides a cool, humid, shaded environment for 'lower plants' (the first plants to evolve) The Fern house was built in 1907 by our curator Thomas Moore who influenced the huge enthusiasm for collecting ferns that occurred at that time. The current arrangement displays principles of plant evolution and plant adaptations. Lower plants do not have flowers - these evolved later. Looking at these plants is like looking back in time. Plants like them and their relatives were in existence millions of years ago. 	Thomas Moore				<ul style="list-style-type: none"> Cool Fernhouse WRITTEN AS DRAFT TEXT
G5_GEF				<ul style="list-style-type: none"> Fact File: Where do I grow Where in the world these plants grow : Map needed- to show ferns are everywhere- pan global Temperature Range - 8 - 20c Humidity - high Ventilation- how much you want the air to come through - Growing Media- replicating the right place for these plants (right plant right place) 		"Where do I grow?" info graphic showing where these plants are found in the globe and highlighting the conditions/ temperature of this specific glasshouse			WRITTEN AS DRAFT TEXT
G5_GEA				<ul style="list-style-type: none"> How are the plants arranged? West side= Chronological arrangement of plants (loosely chronological e.g. early and later land plants), East Side = Adaptations Links to wider Garden: Links to the Fern Bed outside 		Spatial Arrangement Plan showing the different types of plants are their arrangement			WRITTEN AS DRAFT TEXT
G5_TG	Through the Eyes of the Gardener	TTEG Label	50-70 words	<ol style="list-style-type: none"> Rainwater harvesting directly into water butt: ferns like it really moist. We only use rainwater on the filmy ferns (as tap water has too many salts and other stuff) because they are so delicate This Glasshouse is not heated. During hot weather we damp down the floor so that the heat evaporates and makes it humid for the plants We put shading that we put on the glass in May These plants need a lot of water 				Audio Tour: Gardeners Voice - Maintaining the atmosphere of the fernery, how they control it, the needs of the plants inside	WRITTEN AS DRAFT TEXT
G5_SP1	Evolution- The Rise of Land Plants	Secondary Panel	130-150 words	<ol style="list-style-type: none"> Plants are the most important thing on earth and if plants hadn't colonised, there would be no land life 500mya algae in the sea started to evolve into plants that could live on land the first land plants were simple organisms: mosses, hornworts and liverworts that still needed constant moisture to survive Over time, plants became able to take up water, enabling them to grow further away from direct water sources (it also meant their stems were stronger and they could grow taller) 140mya flowering plants were able to dominate (today they account for 90% of all living plant species on Earth) Did you know? Most of the oil, coal and gas we use today comes from the ferns and cypads that dies millions of years ago 				Sound Installation around central pools - From life to land. Ambient sound of primordial swamp life	WRITTEN AS DRAFT TEXT
G5_SP2	Evolution- The Rise of Land Plants	Secondary Panel (Timeline)	tbc	(Edited version of existing timeline text)					WRITTEN AS DRAFT TEXT

G5_ST1	Star Plant 1: Trichomanes speciosum – Killarney Fern	Star Plant Label	130-150 words		nb. (No flowers or fruit)	Fred Rumsey at the NHM is an expert on ferns and knows a lot about this plant.			WRITTEN AS DRAFT TEXT
G5_ST2	Star Plant 2: Salvinia Natans	Star Plant Label	130-150 words	<ol style="list-style-type: none"> 1. Adapted to floating in the water - by containing pockets of air in its fronds. 2. All plant life started in water but over time they moved onto land. 3. It blocks light into water and so where it is an invasive species this can be a problem for other plants in the water. 4. The superhydrophobic Salvinia natans has led to research into fluid drag reducing "Salvinia Effect" surfaces which could be applied to the boat hull. 5. This would help the boat move more easily through the water and use less energy. 6. Hence making a more sustainable mode of transportation. 7. Salvinia natans has two leaves lying flat against the surface of the water, and a third submerged leaf which functions as a root. 	nb. (No flowers or fruit)				
G5_POL1	Stangeria eriopus	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Cycads are an extremely old group of plants. 2. They are known to have been present at least 280 million years ago from the dating of fossils found in China. 3. They were most abundant in the Jurassic Period between 201-145 million years ago, when dinosaurs were on the Earth. 4. IUCN - Vulnerable - over collection for medicinal purposes & habitat threat. 	nb. (No flowers or fruit)				
G5_POL2	Stag's Horn Fern	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Epiphytes - using other plants as supports to get up to the light. 2. Also uses a modified frond to attach it to the tree. 					
G5_POL3	Adiantum capillus-veneris	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. The maidenhair fern was the main ingredient of the popular cough syrup 'Capillaire' which was in use until the mid nineteenth century. 2. This fern has also had a wide range of traditional medicinal treating ailments as diverse as dandruff, snakebites and alcoholism. 					
G5_POL4	Alpine Ferns	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. These ferns grow at a high altitude. 2. They are squat with strong root systems for stability in high winds. 3. A sticky surface coats their fronds to prevent drying out and to provide protection against frost. 4. Their fronds are often pale to reflect the high levels of damaging UV light. 					
G5_POL5	Aquatic Ferns	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. A few ferns are adapted to thrive in water. 2. One species, Salvinia natans is able to retain dry pockets of air under the fronds to aid buoyancy. 3. Another Azolla filiculoides works with cyanobacteria in the water to fix nitrogen, helping it to grow rapidly and colonise large areas. 					
G5_PO6	Asplenium scolopendrium	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Commonly known as the hart's tongue fern after its supposed resemblance to the tongue of the male red deer. 2. Formerly used in ancient and medieval medicine to treat dysentery, diarrhoea and obstruction of the spleen. 					
G5_PO8	Dioon spinulosum	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Alongside ferns, cycads were one of the major plant groups that first grew to dominate the earth. 2. Once so prevalent, they are now believed to be the most endangered group of living things on Earth. 3. This is due to destruction of their tropical habitats and over-collection by plant hunters. 		Audio Tour Local Voices - Interview with custodian of an endangered fern habitat in the British Isles		Audio - Do you have any links to conservationists working in British fern habitats?	
G5_P10	Epiphytic Ferns	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Epiphytic ferns grow above ground using other plants or objects for support. 2. This helps them to reach light in gloomy environments. 3. They are not parasitic because they absorb their nutrients and moisture from the air around them. 4. These ferns have thick root systems which enables them to cling to their support. 					
G5_P11	Equisetum hyemale	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Horsetails are not true ferns but are known as fern allies. 2. Like ferns, they have spores instead of seeds. 3. The stems of this horsetail contain silica and so it can be used for scouring metal but also polishing brass and hardwood. 4. During the Middle Ages it was used to polish knights' armour. 				NG- perhaps we need to have a label for the other fern allies - such as liverwort??	
G5_P12	Lithophytic Ferns	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Lithophytic ferns grow on rocks or stony soil. 2. It is a challenging environment as both water and nutrients are in short supply. 3. Some survive by growing in protected crevices or on moss patches. 4. Others, growing on dry exposed rock, have adapted to feed on the nutrients in rain water and their own dead tissue. 5. CTA: lift up a frond carefully and see if you can see the sori 					
G5_P18	Resurrection Plant	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Growing in the desert, this plant has adapted to enter a period of dormancy during extreme dry conditions. 2. It stops photosynthesising and loses up to 95% of its water contents. 3. It looks dead. 3. When the rain returns it reawakens, unfurling green fronds. 					
G5_P19	Stangeria eriopus	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Originally thought to be a fern, this genus was identified as a cycad by Thomas Moore (CPG Curator) in 1851 after it was sent from Durban Botanical Gardens in South Africa where it is now part of a major conservation project. 2. This cycad is threatened in the wild because of over collection. 3. It is used as a traditional medicine in South Africa. 					
G5_P110	Stomatolites	Postcard Label	35 - 50 words	<ol style="list-style-type: none"> 1. Cyanobacteria were one of the first photosynthesising organisms on earth and through this process they generated oxygen. 2. In fact, they produced so much that it reacted with the light from the sun and created our ozone layer. 3. The ozone layer filters out 98% of the sun's UV light and it is this that has made the planet habitable for all types of organisms. 4. CTA: imagine earth before plants had created soil - it was a rocky place with water and that's about it! 					
AT ENTRANCE TO CONSERVATORY (IN WIDER GARDEN)									

