Oxford Cambridge and RSA

Friday 14 June 2019 – Morning

A Level in Design and Technology: Product Design

H406/02 Problem Solving in Product Design

Resource Booklet

Time allowed: 1 hour 45 minutes

INSTRUCTIONS

- You must read this Resource Booklet through before answering any questions.
- The recommended reading time for this Resource Booklet is **35 minutes**.
- This Resource Booklet is to be used when answering all questions.
- The question paper tells you when to refer to the information contained in this Resource Booklet.

INFORMATION

- Do not send this Resource Booklet for marking, it should be retained in the centre or recycled. Please contact OCR Copyright should you wish to re-use this document.
- This document consists of **8** pages.

© OCR 2019 [603/1131/9]
DC (ST/SG) 187933/2

OCR is an exempt Charity

The stimulus in this booklet relates to issues and opportunities encountered with the care and well-being of small domestic pets.

The following article from a news website raises an issue that is having a major impact on the pet industry in the UK.

Pets in the Doghouse as Ownership Falls

When it comes to the cost of owning a pet, many people in the UK are finding that there is just not enough money in the 'kitty'. Modern economic pressures mean that fewer households now own a pet. Just 56% now have one, down from 63% five years ago. Guinea pigs in particular have fallen out of favour. In 2012, 10% of households kept them but the level is now down to 7%.

Market Research

In response to this worrying trend, the Pet Retailer's Association undertook research with a range of stakeholders, including pet owners and retailers, to identify what factors (other than cost) might be contributing to the decline in ownership of small caged pets.

The most common response related to a shortfall in the market for products or automated solutions, with the purpose of dispensing food automatically to small caged pets when owners go away on holiday. A limited range of products is currently available.

Design Opportunity

In response to the research, a manufacturer 'Pets4You' wants to develop a range of products that will address this market research finding and complement its existing range of hutches and cages. It hopes by seizing this design opportunity that the following aims can be secured:

1. The care of small pets when owners are on holiday will become easier/more reliable.
2. The overall cost of caring for a small pet when on holiday will be reduced as there is no need for a costly 'pet sitter'.
3. Sales from the new range of products will compensate for the lack of sales of cages until the declining market in small caged pets improves.

Pets4You commissions a designer to start work on ideas generation for the new range of products. The designer chooses to base initial ideas and concepts on guinea pigs as guinea pig ownership numbers have declined significantly in recent years. Initial research is undertaken into guinea pigs (see **Fig. 1** below) and the types of cages currently available on the market to house them such as the Skyline Maxi Small Pet Cage shown in **Fig. 2** opposite. By undertaking this initial research into these animals and the current products available the designer is confident this will help identify new design opportunities.

Guinea Pig Facts

a breed of guinea pig

A healthy weight of a guinea pig is between 700 and 1200 g.	Guinea pigs are between 20 and 25 cm long.	The life span of a guinea pig is between 4 and 7 years.

Fig. 1

Skyline Maxi Small Pet Cage

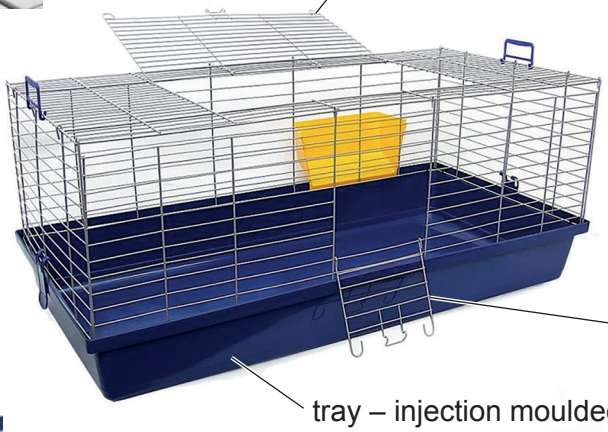
Dimensions: 1190 × 590 × 470 mm
(l × w × h)

carry handle – injection moulded polypropylene

bars – zinc-free non-toxic powder coated mild steel wire

hay holder – injection moulded polypropylene – clips onto horizontal bars

top door – 580 × 350 mm (l × w)



front door – 220 × 170 mm (l × w)

tray – injection moulded polypropylene 165 mm deep

vertical bars: 3.2 mm diameter

horizontal bars – 2 mm diameter

29 mm – bar separation

clip – injection moulded polypropylene – attaches cage to tray

a typical water bottle suitable for guinea pigs – attached to cage using a plastic coated steel wire clip

sleeping compartment – bought accessory

litter tray – bought accessory

food bowl – bought accessory

hay basket – hay is transported by the guinea pig into the sleeping compartment

water bottle – bought accessory

Fig. 2 (not to scale)

Food Dispensers

Having undertaken some initial research, the designer decides to focus on the development of food dispensers for use when owners are away from home and unable to feed their small caged pets.

Guinea pig owners are surveyed to identify their requirements for an automated food dispensing product.

Owners' Requirements

- Deliver a measured amount of dry food once per day.
- Be suitable for 2, 3, 4 or 5 day holidays.
- Fit inside a standard size small pet cage such as the Skyline Maxi Small Pet Cage in **Fig. 2**.
- Pass through the front or top hatch of a cage so that the cage does not have to be removed from the tray.
- Be easy to remove and clean.
- Refillable from outside of the cage without having to remove the food dispenser.
- Keep each meal separate to minimise damage or contamination from water or guinea pig litter.

Existing Products

Two existing food dispensers have been identified by the designer. Both products enable pet owners to leave their pets for short holidays knowing that food will be dispensed to them whilst they are away.

Guinea Pig Gravity Feeder £15.49

Dimensions when lid is closed: 130 × 140 × 210 mm (l × w × h)

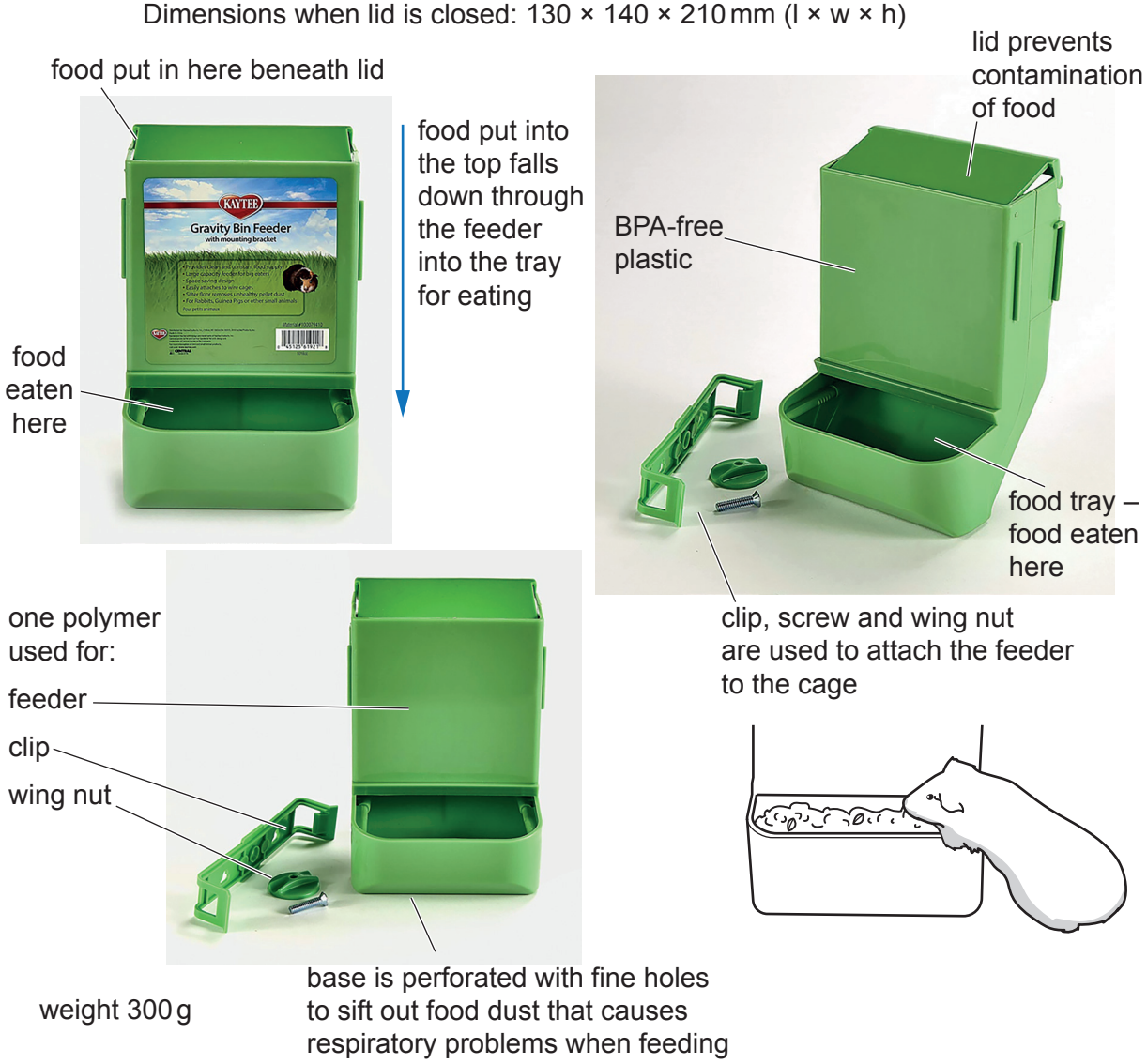


Fig. 3 (not to scale)

5 Meal Feeder £50.99

Dimensions when lid is closed: 460 × 380 × 130 mm (l × w × h)

© Radio Systems Corporation, www.store.petsafe.net. Item removed due to third party copyright restrictions. Link to material: https://store.petsafe.net/5-meal-timed-pet-feeder

weight: 1.5 kg
batteries: 4 × D size

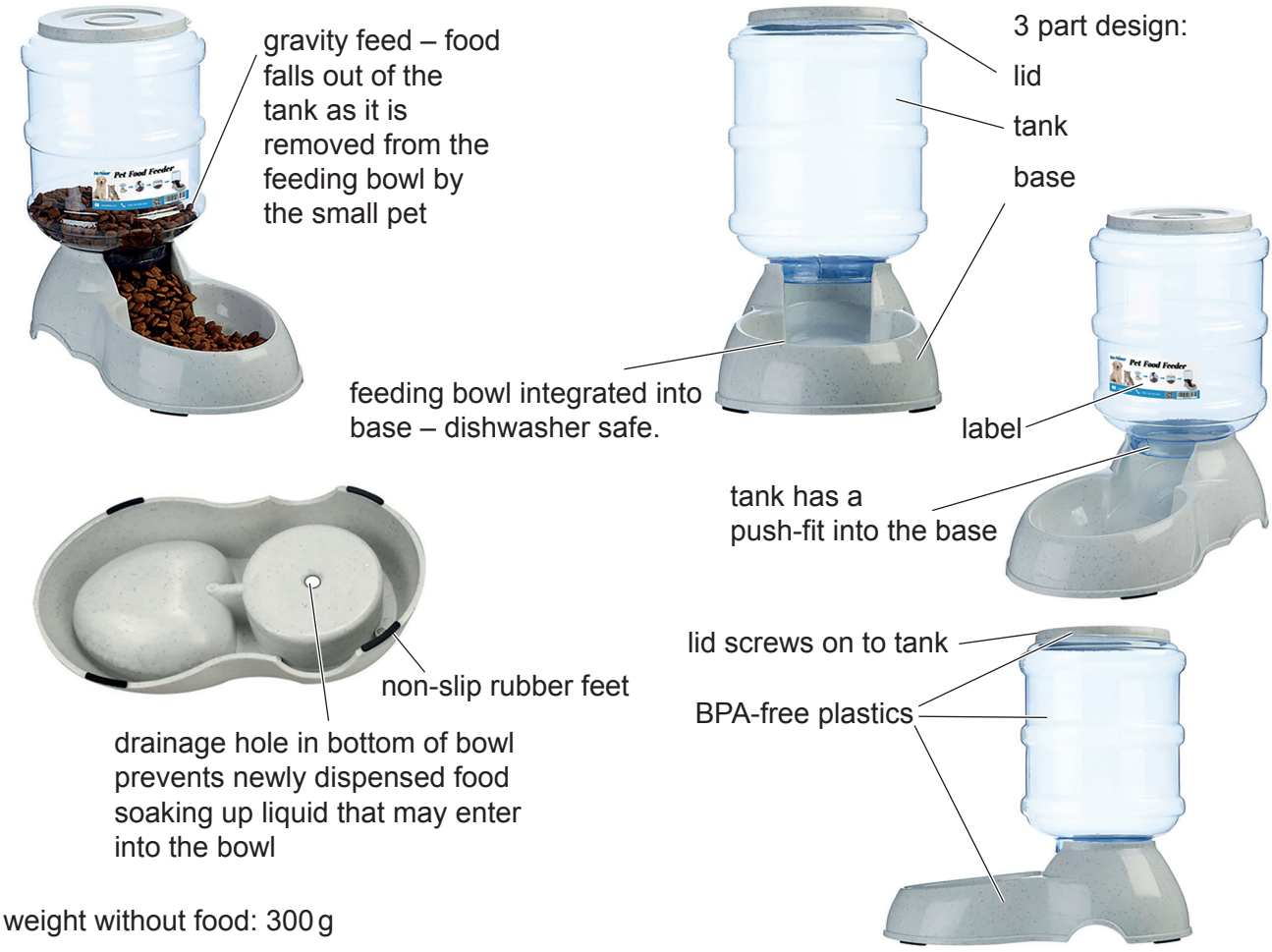
Fig. 4 (not to scale)

Design Concept

The designer takes forward the gravity feed method (**Fig. 3**) and develops a concept design of a product that could be sold at low cost when manufactured in large batches of 1000.

Guinea Pig Pet Feeder £12.99

Dimensions when lid is closed: 200 × 120 × 200 mm (l × w × h)



weight without food: 300 g

Fig. 5 (not to scale)

Pet Food

The design of the guinea pig pet feeder enables retailers to sell pre-packaged tanks of pet food and provide a re-fill service. Pets4You considers deals it could offer to try and encourage consumers to bulk buy its pet food. An average guinea pig eats **30 grams** of food per day. Pets4You is considering the following deals:

pre-packaged tank of pet food

Food Product	Mass of tank content (g)	Cost (£)	Bulk buy offer
Crispy Muesli	400	2.49	Buy 4 tanks and have a 60% reduction on the 5th tank
GP Pet Science	350	1.99	Buy 3 tanks and get the third tank at half price
Farm Food Feast	450	2.99	Buy 3 tanks and get £1.50 off each tank

Fig. 6

© OCR 2019

Pet Accessories

The concept design in **Fig. 5** goes into live production and proves to be a real success in boosting Pets4You sales.

Pets4You wants to build on this success and is considering further diversification of its product range through the design and manufacture of other cage based accessories. A member of the design team starts to work on a concept design named 'Chewy' as shown in **Fig. 7** below which not only provides a food/treat dispenser but also has a series of chewable toys that keep a small pet's teeth at a manageable length.

Chewy features:

- Encourages pet to be active.
- Feed/treat dispenser.
- Chewable toy carrots – removable for pet to chew.
- Scope to release alternatives to the chewable toy carrots, e.g. parsnips, beetroot and thus extend the product range life span.
- Improves aesthetics of the cage.
- Bolts onto wire cages to improve stability and allow the Chewy to be elevated within the cage.
- Compact.
- Suitable for small pets such as rabbits, guinea pigs and hamsters.
- Inedible, non-toxic materials.

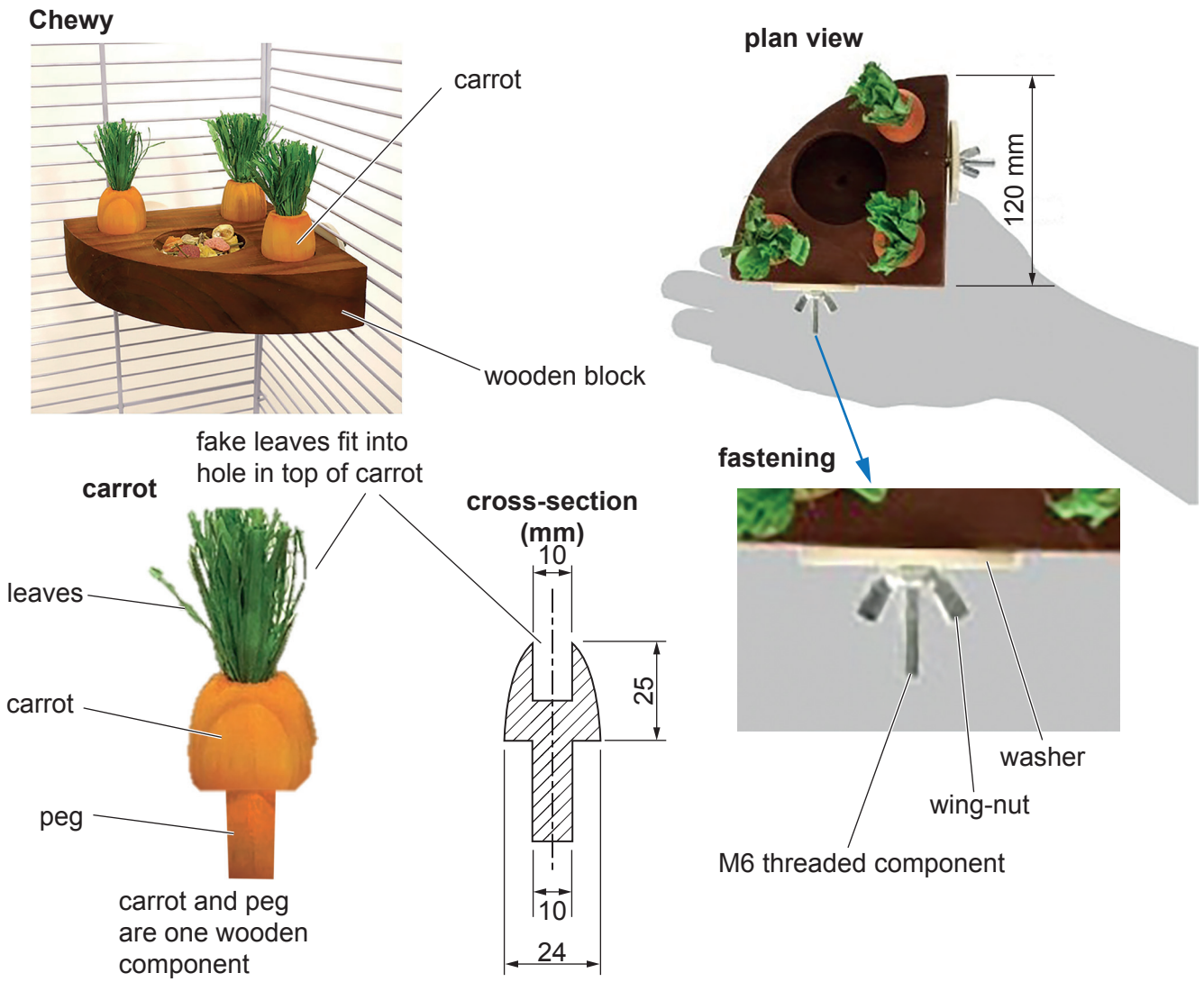


Fig. 7 (not to scale)

Commercial Viability

A prototype of the Chewy, shown in **Fig. 7**, was used as a demonstration model in a chain pet store named Petzone. It generated a lot of interest from the employees and potential customers. Pets4You believes it has hit upon a potential new best seller.

In order to more thoroughly evaluate commercial viability of the Chewy product, Pets4You would like to sell a trial batch through a popular retail chain of pet stores.

Petzone is the largest retailer in the country with over 40 large stores in retail parks. An agreement is made for an initial batch of 4000 Chewy products to be sold through its stores.

OCR
Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© OCR 2019