



Oxford Cambridge and RSA

**Friday 14 June 2019 – Morning**

**A Level in Design and Technology: Product Design**

**H406/02 Problem Solving in Product Design**

**Time allowed: 1 hour 45 minutes**



**You must have:**

- Resource Booklet

**You may use:**

- a scientific calculator
- a ruler
- geometrical instruments



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

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Candidate number

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First name(s)

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Last name

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**INSTRUCTIONS**

- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- The recommended reading time for the Resource Booklet is **35 minutes**.
- Write your answer to each question in the space provided. Additional paper may be used if required but you must clearly show your candidate number, centre number and question number(s).
- Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.

**INFORMATION**

- The total mark for this paper is **70**.
- The marks for each question are shown in brackets [ ].
- Quality of extended responses will be assessed in the questions marked with an asterisk (\*).
- This document consists of **16** pages.



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2\* As identified on page 2 of the Resource Booklet, there is a lack of products and automated solutions on the market to dispense food automatically to small caged pets when owners go away on holiday. A method of delivering a measured amount of food to the small caged pet is required.

The designer working for 'Pets4You' needs to consider the viability of existing solutions in order to develop a successful product that will earn market share.

Compare and contrast the suitability of the existing products shown in Fig. 3 and Fig. 4 of the Resource Booklet for dispensing food to a small caged pet.

In your response you should refer to the list of the owners' requirements listed on page 4 of the Resource Booklet. [12]

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- 3 The designer takes forward the gravity feed method (**Fig. 3**) and develops a concept design shown in **Fig. 5** of the Resource Booklet.

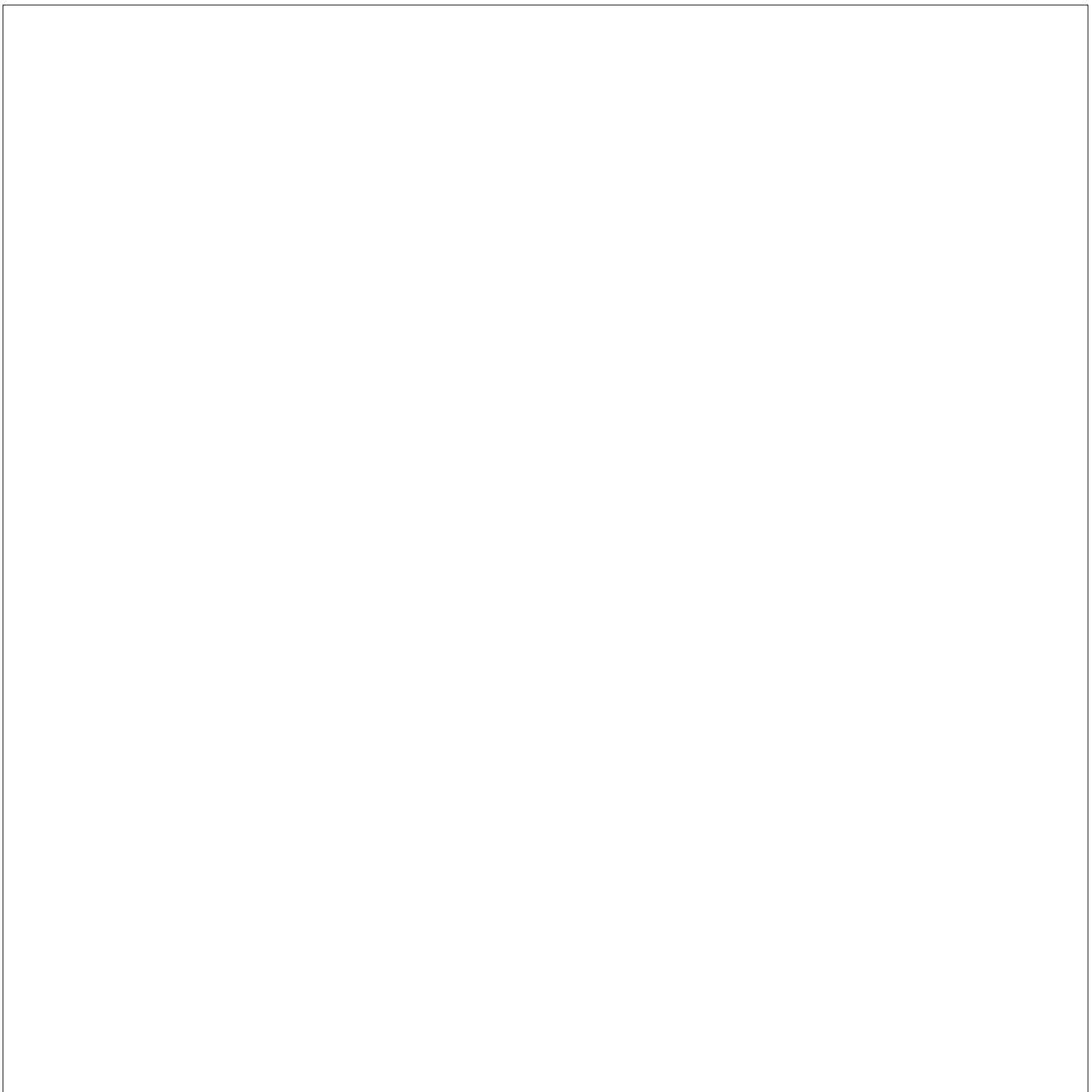
Use sketches and/or notes to outline suitable methods of manufacture and assembly for the features of the concept design.

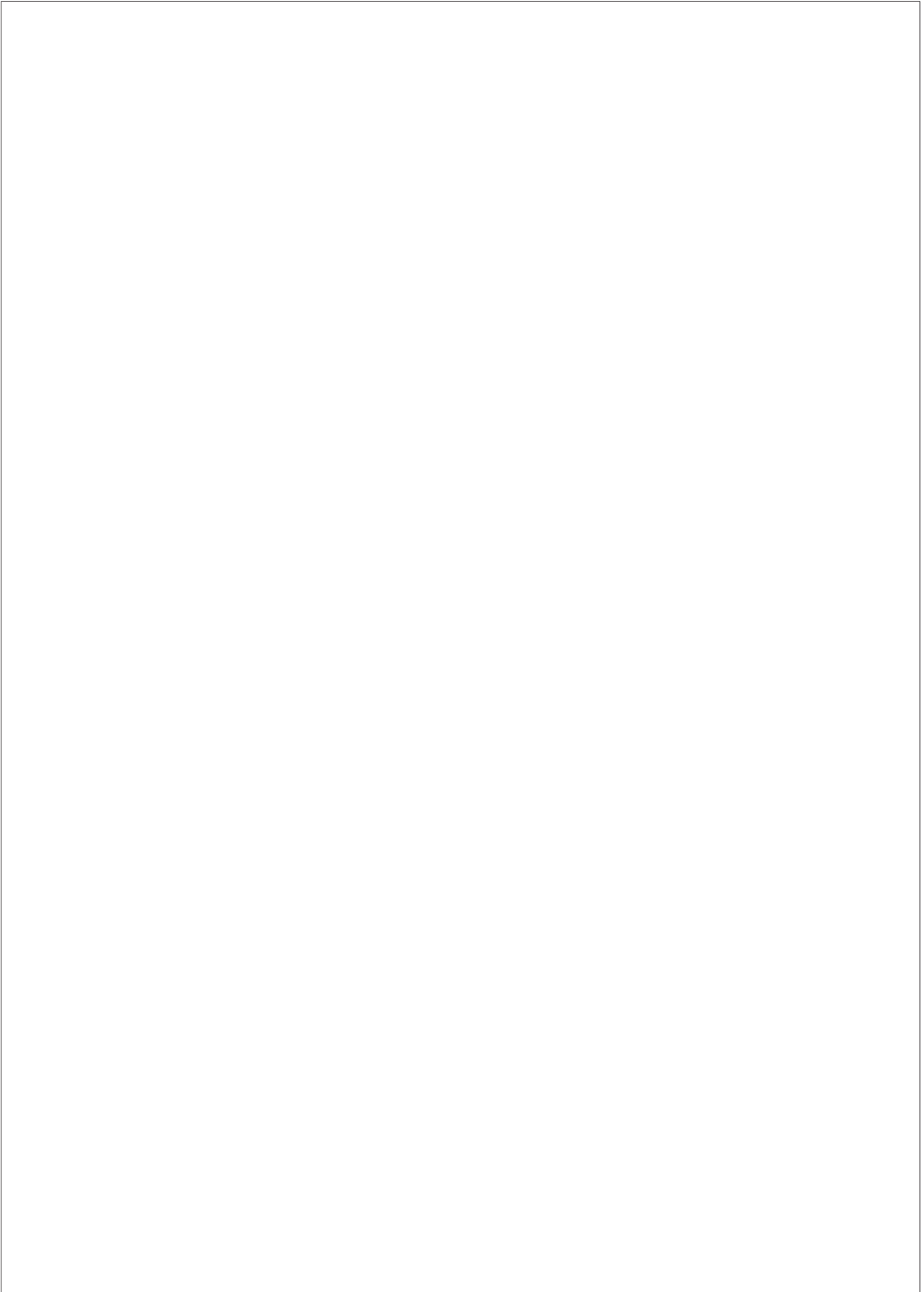
You must focus on all parts of the concept design including the lid, tank (including label) and base.

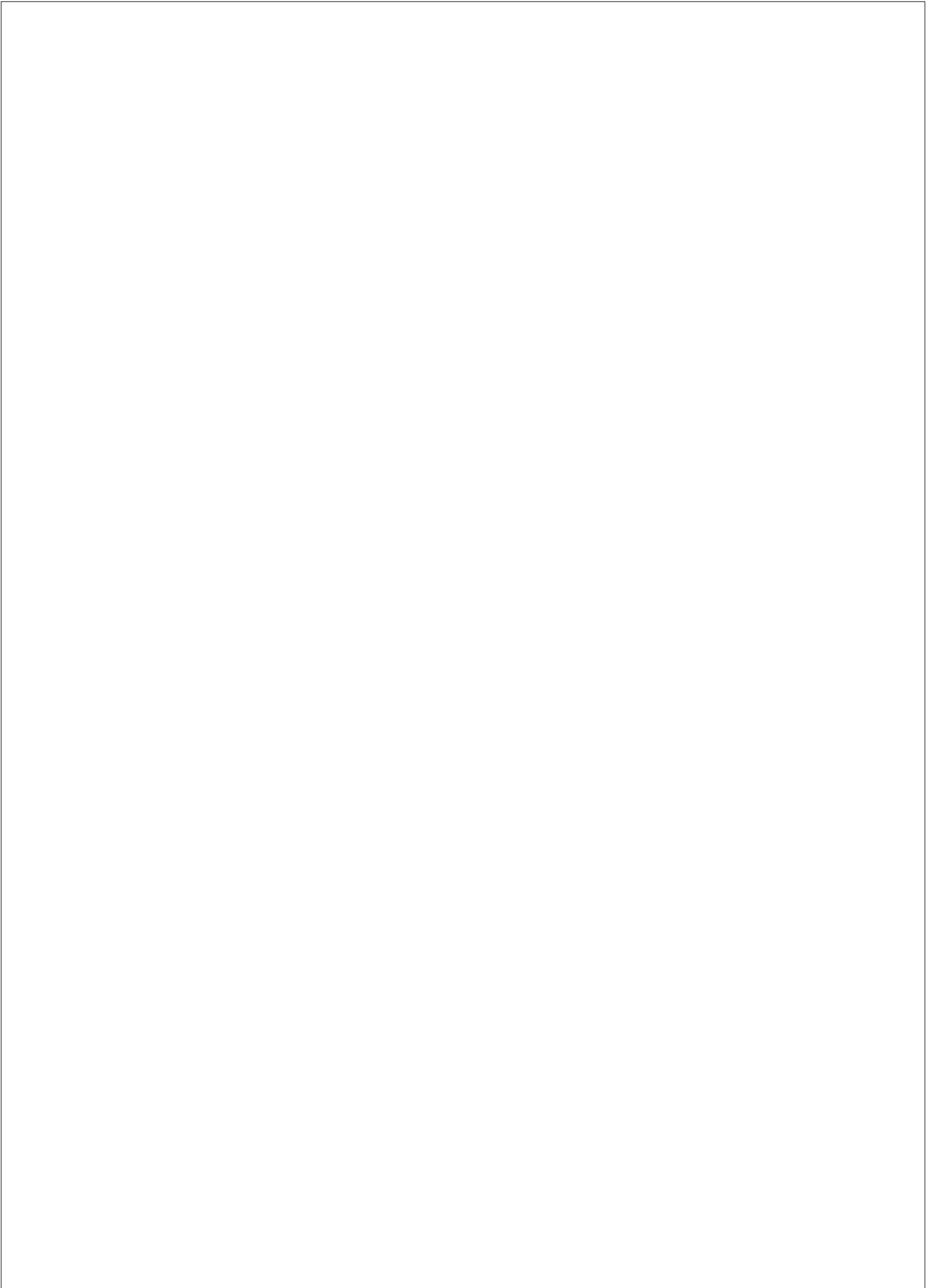
In your response you must include details of:

- materials;
- manufacturing processes;
- finishes;
- assembly methods.

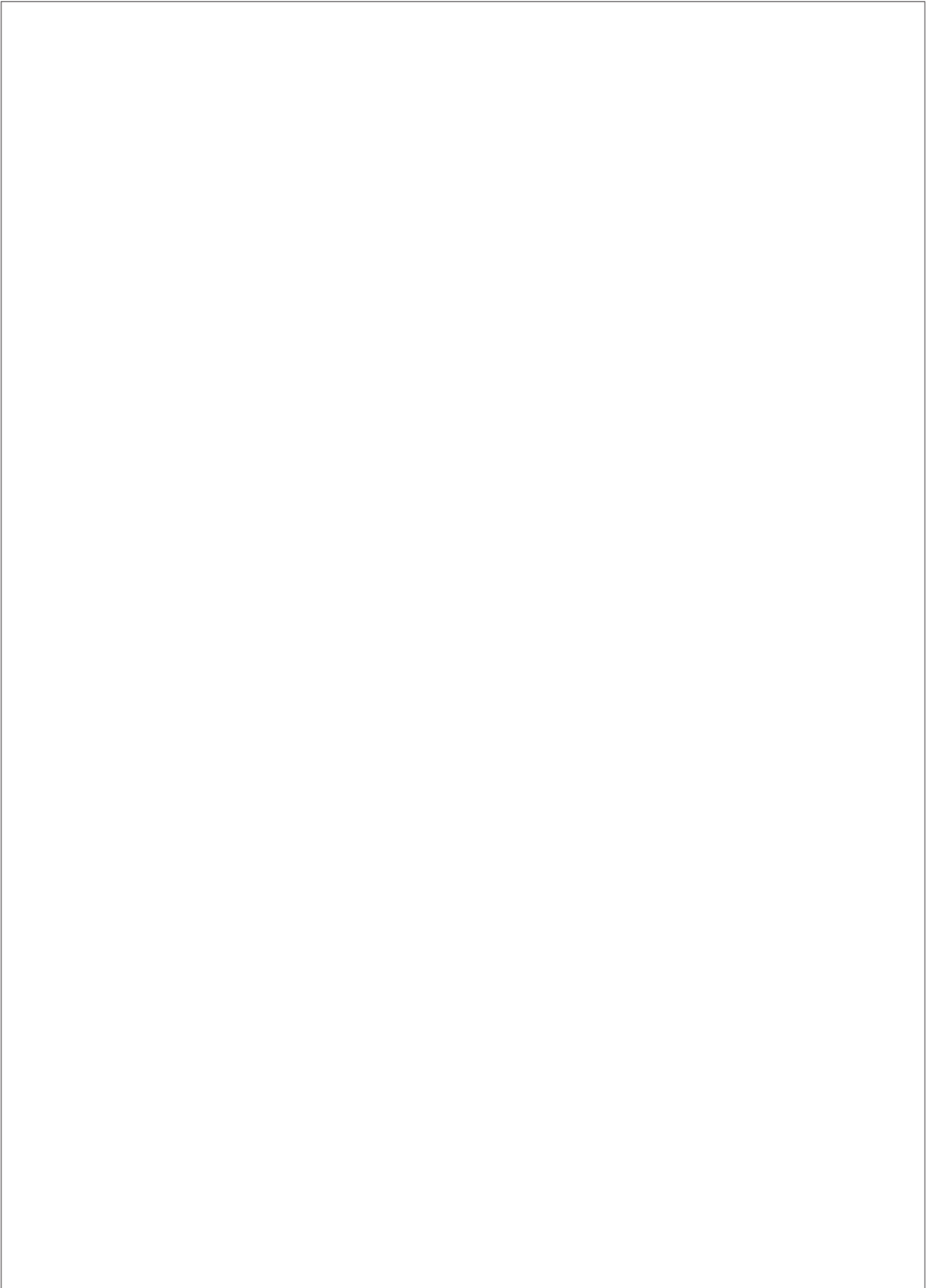
[16]











- 4 Pets4You has teamed up with a supplier of pet food. It wants to encourage consumers to purchase pre-packaged tanks of pet food with a re-fill service.

Using the data in **Fig. 6** of the Resource Booklet, calculate the amount of food in grams (g) needed for an average guinea pig for three months and identify which food product would therefore secure best value. Show your working.

Assume that one month is 31 days.

Amount of food needed ..... g

Best value product .....

[6]

**5** Pets4You is looking to diversify its product range.

A designer has been working on a concept named 'Chewy' as shown in **Fig. 7** of the Resource Booklet.

In order to more thoroughly evaluate the commercial viability of the Chewy product, Pets4You has agreed with a popular retail chain to sell a trial batch of 4000 Chewys through its pet stores.

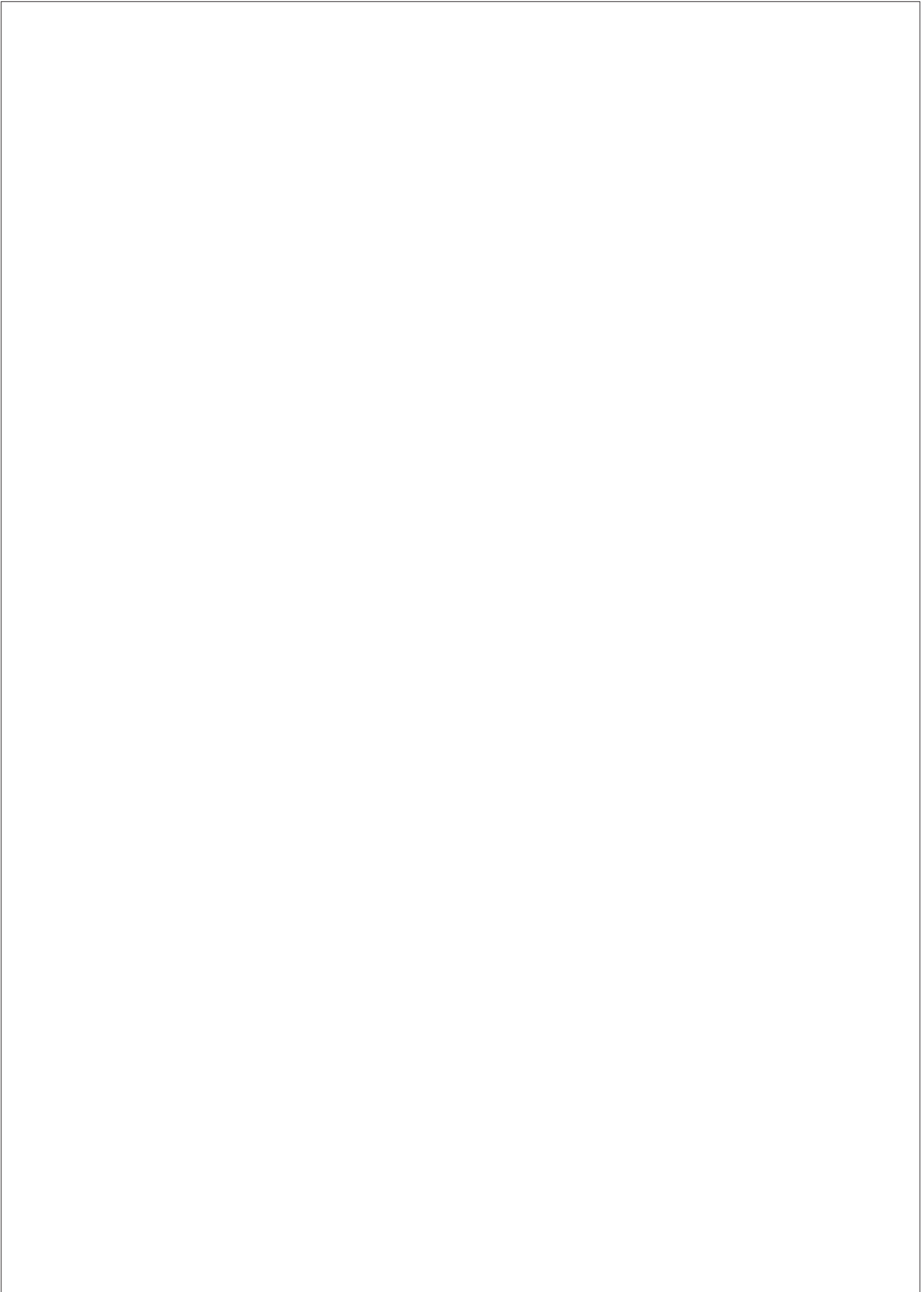
Use sketches and/or notes to show how the trial batch of 4000 Chewys could be manufactured.

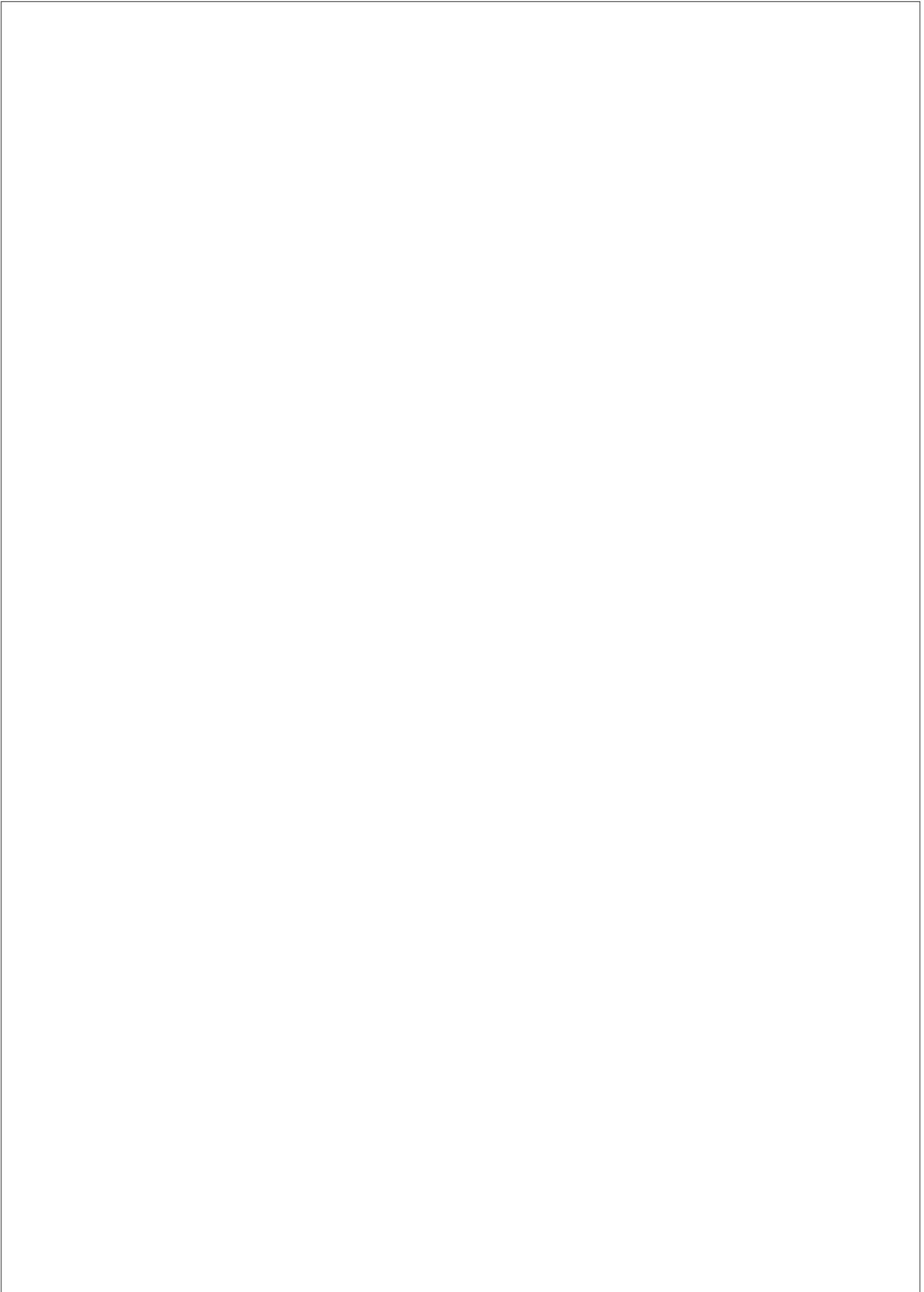
In your response you should include details of:

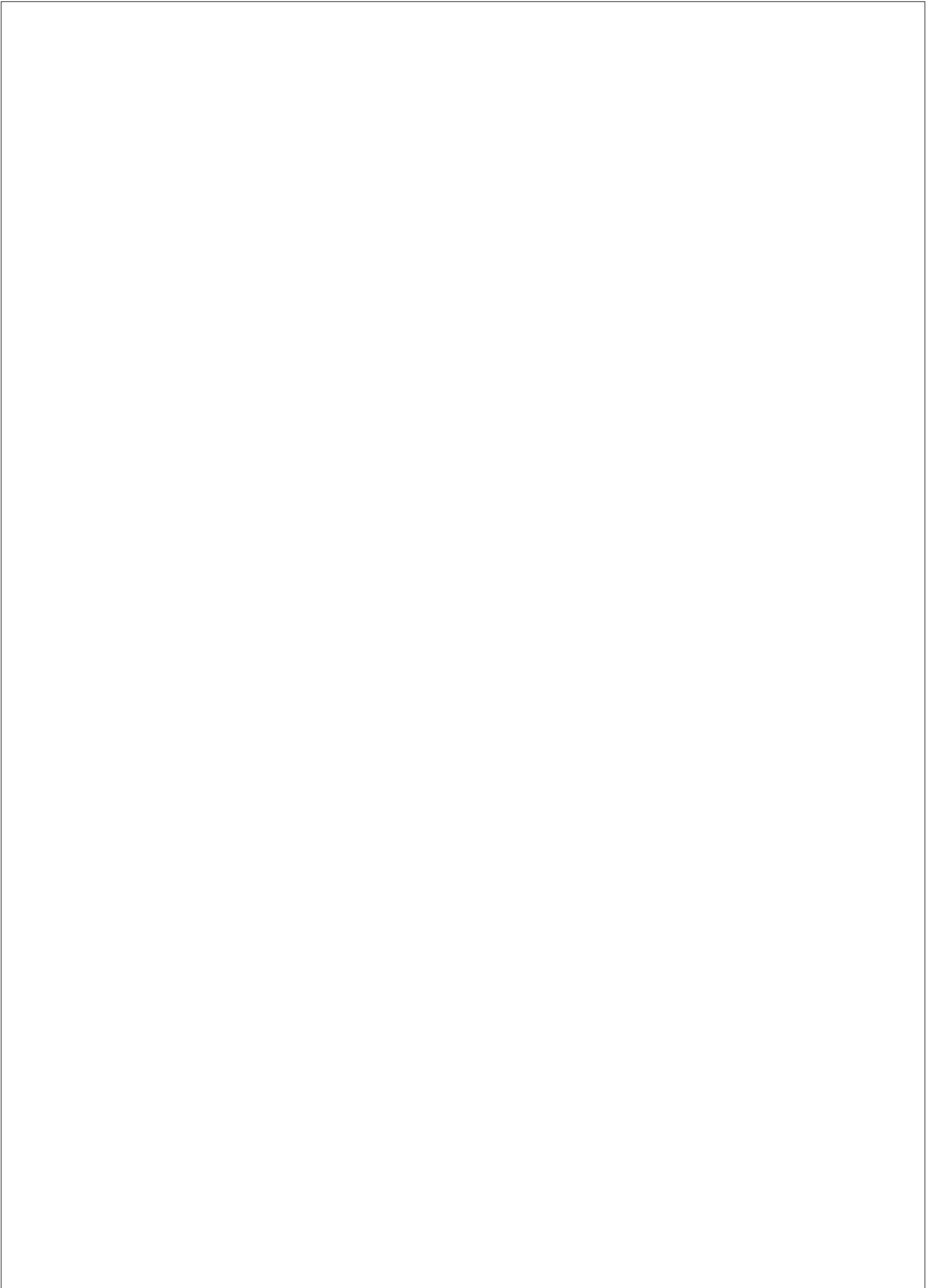
- materials;
- methods of manufacture;
- how the M6 threaded component would be attached to the wooden block.

Refer to information on **page 7** of the Resource Booklet.

**[16]**







6\* Pets4You feels that it has hit upon a potential best seller with the Chewy product.

It needs the initial trial batch of the Chewys as highlighted on **page 8** of the Resource Booklet to be successful and is therefore considering the overall marketing strategy for this product.

Critically examine the methods that could be used to create more demand for the Chewy product and maintain a longer product popularity.

In your response you should make reference to the following stakeholders and their needs:

- customers;
- Petzone (retailer);
- Pets4You (manufacturer).

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**END OF QUESTION PAPER**



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