Love Hearts Investigation

Name/s . . . .   **Date . . . .**

Before opening the packet, look at it carefully.

1.   The total weight of the sweets is?   _____

2.   The 'sell by' date is?   _____

3.   How many whole months are left until the 'sell by' date?   _____

4.   What 3D shape is the packet?   _____

Estimate

5.   How many Love Hearts are there altogether?   _____

6.   How many colours are there?   _____

7.   The length of the packet (choose a sensible metric unit).   _____

8.   Now measure the length of the pack.   _____

Open the packet.

9.   How many colours are there?   _____

10. Write down the colours in the table below.

11. Do the colours match those shown on the wrapper?

     If they do not please write a sentence to explain any differences.

     _____

     _____

Count and record

12. Count the number of Love Hearts in each colour. Write the numbers in the table.

13. Count the total number of Love Hearts.

14. Add up all the colours to check your total is the same as your answer to Q13.

Colour	Tally	Number
Total number of sweets		

Now eat all the Love Hearts except one ☺

Love Hearts Investigation

Name/s . . . .   **Date** . . . .

Representing data (ask for graph paper).

15. Draw a pictogram or a bar chart to show the number of colours and the total number of Love Hearts in your packet. Make sure your chart has a title and is coloured and labelled correctly.

Extracting information

16. From your chart, which colour has the highest number of sweets? _____

17. Which colour has the lowest number of sweets?   _____

18. What is the difference between the highest number and the lowest number of sweets? This is the range.   _____

19. Compare your results with other members of your group. Write a few sentences to summarise what you have found out about Love Hearts.

_____

_____

Estimating with metric measures

Choose sensible units and then

20. Estimate the diameter of a love heart sweet.   _____

21. Estimate the thickness of a single love heart.   _____

22. Now measure a sweet accurately.   diameter _____   thickness _____

🖩 *A calculator can only be used for questions 23 and 28*

Calculating with measures *(You will need the answers to Q1 & 13).*

23. Calculate the average weight of one sweet*.*   _____

24. Write the calculation that you did here.   _____

25. Round your answer to the nearest gram.   _____

Working with money and percentages

26. Ask your teacher how much the packet of Love Hearts cost.   _____

27. Estimate the approximate cost of each sweet (to the nearest penny).   _____

28. Use a calculator to work out the exact cost of each sweet.

Give your answer to one decimal place.   _____

29. Shop-keepers buy Love Hearts in boxes of 50 packets. They only pay 70% of the retail price to their suppliers. How much did a box of 50 packets cost the shop-keeper who sold your teacher the sweets?   _____

30. How much profit did the shop-keeper make on one packet of sweets?   _____

Love Hearts – Sample Answers

These answers based on a 'giant' packet of sweets bought in Jan 08 for 25p (other sizes are available).

Before opening the packet, look at it carefully.

1. The total weight of the sweets is? **42g (stated on wrapper)**

2. The 'sell by' date is? **May 09 (on wrapper)**

3. How many whole months are left until the 'sell by' date? **16 (until end of May 09)**

4. What 3D shape is the packet? **Cylinder**

Estimate

5. How many Love Hearts are there altogether? **Accept any sensible answer**

6. How many colours are there? **Accept any sensible answer**

7. The length of the packet (choose a sensible metric unit) **Any sensible answer in cm**

8. Now measure the length of the pack. **12.5 cm /125mm**

Open the packet.

9. How many colours are there? **Six (see note below)**

10. Write down the colours in the table below. **See below**

11. Do the colours match those shown on the wrapper? If they do not please write a sentence to explain any differences.

   The wrapper shows 5 colours. It correctly shows orange, yellow, white and green sweets. It does not show any pink or purple sweets even though these were found in the pack. It also shows blue sweets which were not found in the pack.

   Note: blue sweets do appear in some mini-packs (available in bags of 12)!

Count and record

12. Count the number of Love Hearts in each colour. Write the numbers in the table.

13. Count the total number of Love Hearts. **27**

14. Add up all the colours to check your total is the same as your answer to Q13.

Colour	Tally	Number
White	ⵑⵑ ⵑⵑ I	11
Yellow	I	1
Green	II	2
Orange	IIII	4
Pink	IIII	4
Purple	ⵑⵑ	5
(Blue)		
Total number of sweets		**27**

Maggie Harnew, 2008 (parts adapted from a Smarties resource contributed by Di Mellor in February 04). Covers many number, measure and data handling curriculum elements from E2 – L1 (page 1- mostly E2-E3, page 2 – mostly E3-L1).

Love Hearts – Sample Answers

Representing data

15. Draw a pictogram or a bar chart to show the number of colours and the total number of Love Hearts. Accept correctly drawn charts (according to students' levels).

Extracting information

16. From your chart, which colour has the highest number of sweets? white

17. Which colour has the lowest number of sweets? yellow

18. What is the range (between the highest and lowest colour)? 11-1 = 10

19. Compare your results with other members of your group. Write a few sentences to summarise what you have found out about Love Hearts.

    Comments will vary. All our packets contained 27 sweets but the distribution of colours varied. For, example in another pack the most common colour was pink (10) and the least common was again yellow (1).

Estimating with metric measures

Choose sensible units and then

20. Estimate the diameter of a love heart sweet. Accept any sensible answer in cm or mm

21. Estimate the thickness of a single love heart. Accept any sensible answer in mm

22. Now measure accurately. diameter 19mm   thickness 4mm (inc. the embossed letters)

Calculating with measures *(You will need the answers to Q1 & 13).*

23. Calculate the average weight of one sweet. 1.56g

24. Write the calculation that you did here. $42 \div 27 =$

25. Round your answer to the nearest gram. 2g

Working with money and percentages

26. Ask your teacher how much the packet of Love Hearts cost. 25p

27. Estimate the approximate cost of each sweet (to the nearest penny). 1p

28. Use a calculator to work out the exact cost of each sweet.
    Give your answer to one decimal place. $25 \div 27 = 0.9259$ (0.9p)

29. Shop-keepers buy Love Hearts in boxes of 50 packets. They only pay 70% of the retail price to their suppliers. How much did a box of 50 packets cost the shop-keeper who sold your teacher the sweets?

    50 x 25p = £12.50. 10% of £12.50 = £1.25, so 70% = 7 x £1.25 = £8.75.

30. How much profit did the same shop-keeper make on one packet of sweets?

    Profit = 30% (i.e. 100% - 70%).

    10% of 25p = 2.5p. So 30% = 3 x 2.5p = 7.5p profit per packet

Love Hearts – Mark sheet and levels

Before opening the packet, look at it carefully.   **(Max 4 marks)**

1. ☐ MSS1/E2.6   Read , estimate, measure & compare weight

2. ☐ MSS1/E2.3   Read and record time in common date formats

3. ☐ MSS1/E2.3   Read and record time in common date formats

4. ☐ MSS2/E2.2   Recognise and name common 2D and 3D shapes

Estimate.   **(Max 4 marks)**

5. ☐ N1/E2.2   Read, write, order and compare numbers up to 100

6. ☐ N1/E2.1   Count reliably up to 20

    HD1/E1.2   Sort and classify objects using a single criterion

7. ☐ MSS1/E2.5   Read , estimate, measure & compare length (cm)

    MSS1/E3.5   Read , estimate, measure & compare length (mm)

8. ☐ MSS1/E2.5   Read , estimate, measure & compare length (cm)

    MSS1/E3.5   Read , estimate, measure & compare length (mm)

Open the packet.   **(Max 4 marks)**

9. ☐ N1/E1.1   Count reliably up to 10

    HD1/E1.2   Sort and classify objects using a single criterion

10. ☐ HD1/E.2.4   Collect simple numerical information

    HD1/E.2.5   Represent information so it makes sense to others

11. ☐ HD1/E2.1   Extract information from simple diagrams (the wrapper)

    ☐   *Max of 2 marks for Q11 (for a clear and well written explanation)*

Count and record   **(Max 3 marks)**

12. ☐ N1/E2.1   Count reliably up to 20

13. ☐ N1/E2.2   Read, write, order and compare numbers up to 100

14. ☐ N1/E2.3   Add and subtract 2-digit whole numbers

    HD1/E3.3   Make observations and record information in a tally

Representing data   **(Max 5 marks)**

15. ☐ HD1/E3.4   Organise and represent information in different ways so it makes

    sense to others. (Suggest 1 mark for attempting chart or pictogram

    and 1 mark for each point below)

☐ Know how to present data in charts, tables and diagrams

☐ Know how to use a simple scale to represent data in a bar chart or pictogram

☐ Understand the different elements in charts, e.g. the title, axis, scale, key

☐ Label diagrams and charts   **20 max marks for Q1-15**

Love Hearts – Mark sheet and levels

Extract information   (Max 5 marks)

16. ☐ HD1/E3.1   Extract numerical info from lists, tables, diagrams, simple charts.

17. ☐ HD1/E3.1   Extract numerical info from lists, tables, diagrams, simple charts.

18. ☐ HD1/L1.4   Find the range for a set of data.

19. ☐ HD1/L1.1   Extract and interpret information (e.g. in tables, charts, diagrams)

   ☐   *Max of 2 marks for Q19 (for a clear and well written explanation)*

Estimating with metric measures   (Max 4 marks)

Choose sensible units and then

20. ☐ MSS1/E3.5   Read , estimate, measure & compare length (diameter)

21. ☐ MSS1/E3.5   Read , estimate, measure & compare length (thickness or depth)

22. ☐ MSS1/E3.5   Read , estimate, measure & compare length (diameter)

   ☐ MSS1/E3.5   Read , estimate, measure & compare length (thickness or depth)

Calculating with measures *(You will need the answers to Q1 & 13).*   (Max 3 marks)

23. ☐ N2/L1.11   Use a calculator to calculate efficiently using whole numbers,
                   fractions, decimals and percentages

24. ☐ N1/E3.9   Use and interpret +, -, x, ÷ and = to solve practical problems

25. ☐ N2/L1.7   Approximate decimals by rounding

Working with money and percentages   (Max 8 marks)

26. ☐ MSS1/E1.1   Recognise and select coins and notes

27. ☐ N1/E3.8   Estimate answers to calculations

28. ☐ N2/L1.11   Use a calculator to calculate efficiently using whole numbers,
                   fractions, decimals and percentages

   ☐ N2/L1.7   Approximate decimals by rounding

   Max of 2 marks for Q28 (one for correct answer, one for correct rounding)

29. ☐ MSS1/L1.1   Add, subtract, multiply and divide sums of money and record

   ☐ N2/L1.9   Find simple percentage parts of quantities and measurements

     N2/L1.10   Find simple percentage increase and decrease

30. ☐ N2/L1.9   Find simple percentage parts of quantities and measurements
   ☐ N2/L1.10   Find simple percentage increase and decrease

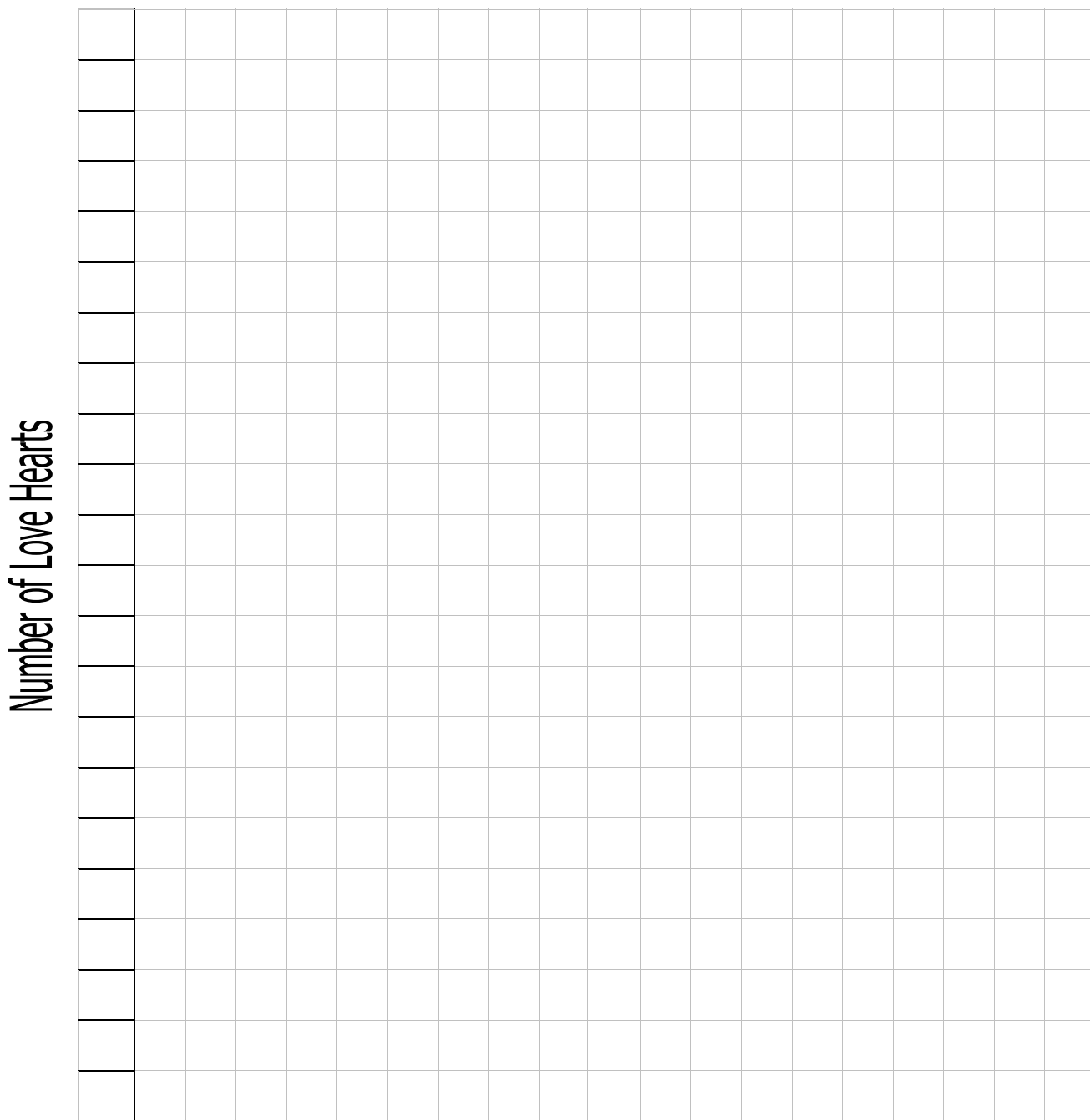   **20 max marks for Q16-40**

Tutor's comments

Total marks   / 40   *Level guide: 2-5 Entry 1, 6-15 Entry 2, 16-25 Entry 3, 26+ level 1*

# Love Hearts Investigation

Bar Chart

Number of Love Hearts (vertical axis label)

Draw a **large** bar chart to show the number of Love Hearts in each colour.

- Give your chart a **title.**
- Use a ruler and coloured pens.
- Draw a scale on the **vertical axis**.
- Label each bar of your chart.

Maggie Harnew, 2008. Love Hearts investigation. Optional paper for Question 15.

Love Hearts Investigation

Pictogram
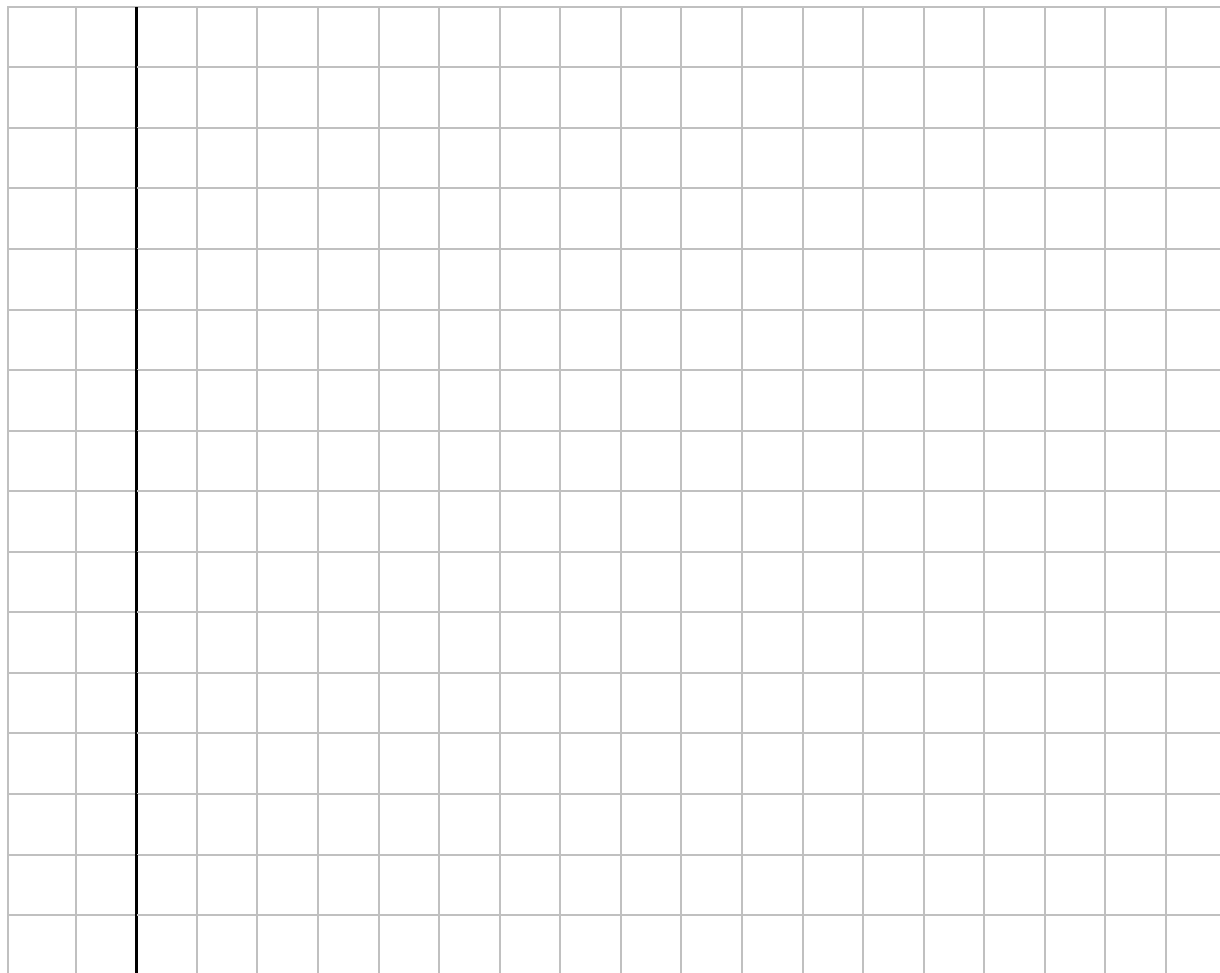
KEY

_____ Love Hearts

Draw a pictogram to show the number of Love Hearts in each colour.

- Give your pictogram a title.

- Choose a sensible picture to use.

- Decide how many Love Hearts are represented by each picture.

- Complete the **key**.

- **Label** the pictogram.