15. Statistics

Analysing and visualising business data

James set up a small online store reselling items that he thinks are likely to be popular amongst his peer group. He created an eye-catching website, grew an engaged audience on social media and carefully chose stock that he felt would be popular amongst his target audience.

Page 5 shows a dashboard of the businesses performance for the first 12 months after launch. Using the dashboard, answer the following questions about the company's performance.

1. Comment on the company's monthly sales performance.

[Using the bar chart]
Monthly sales grew considerably between June and the following March. There was a spike in December which was likely a result of Christmas buying. Sales plateaued in the last three months of the year at just under £3,000 a month.

2. Which month saw the company enjoy the highest sales?

[Using the bar chart]
December had the highest sales with nearly £3,000 in sales.

3. What proportion of total sales were hoodies?

[Using the pie chart]
25% of total sales were hoodies.

4. How much sales revenue did hoodies generate?

[Using the pie chart and total sales table]
25% x £20,575 = £5,143.75

5. In which month were the most logo t-shirts sold?

[Using the stacked bar chart - monthly sales by product]
December saw the most logo t-shirt sales.

6. What is the profit margin for each product the company sells? Profit margin is expressed as a percentage.

Hint: profit margin = profit / sales price and profit = price less cost
[Using the product cost and sales price per item tables]

T-shirt - logo:

- £18 - £16.56 = £1.44
- £1.44 / £18 = 8%

T-shirt - graphic:

- £22 - £21.56 = £0.44
- £0.44 / £22 = 2%

Hoodie:

- £34 - £28.90 = £5.10
- £5.10 / £34 = 15%

Full zip fleece:

- £45 - £40.50 = £4.50
- £4.50 / £45 = 10%

Cap:

- £12 - £10.80 = £1.20
- £1.20 / £12 = 10%

Socks:

- £4.20 - £3.99 = £0.21
- £0.21 / £4.20 = 5%

7. For each graph, state the name of the type of graph used and comment on whether the company has chosen an appropriate way to visualise the data:

   a. Total monthly sales

Bar chart [Any sensible answer is acceptable] Example:
Bar charts can be used to visualise how data has changed over time or to compare different groups of data. This is an appropriate graph for this data as the graph allows the audience to easily see the trend of monthly sales.

   b. Sales mix by product

Pie chart [Any sensible answer is acceptable] Example:
Pie charts are used to show, at a glance, what proportion each category makes up of the whole. This was an appropriate choice of visualisation for sales mix. The graph could be improved by labelling the percent each segment represents.

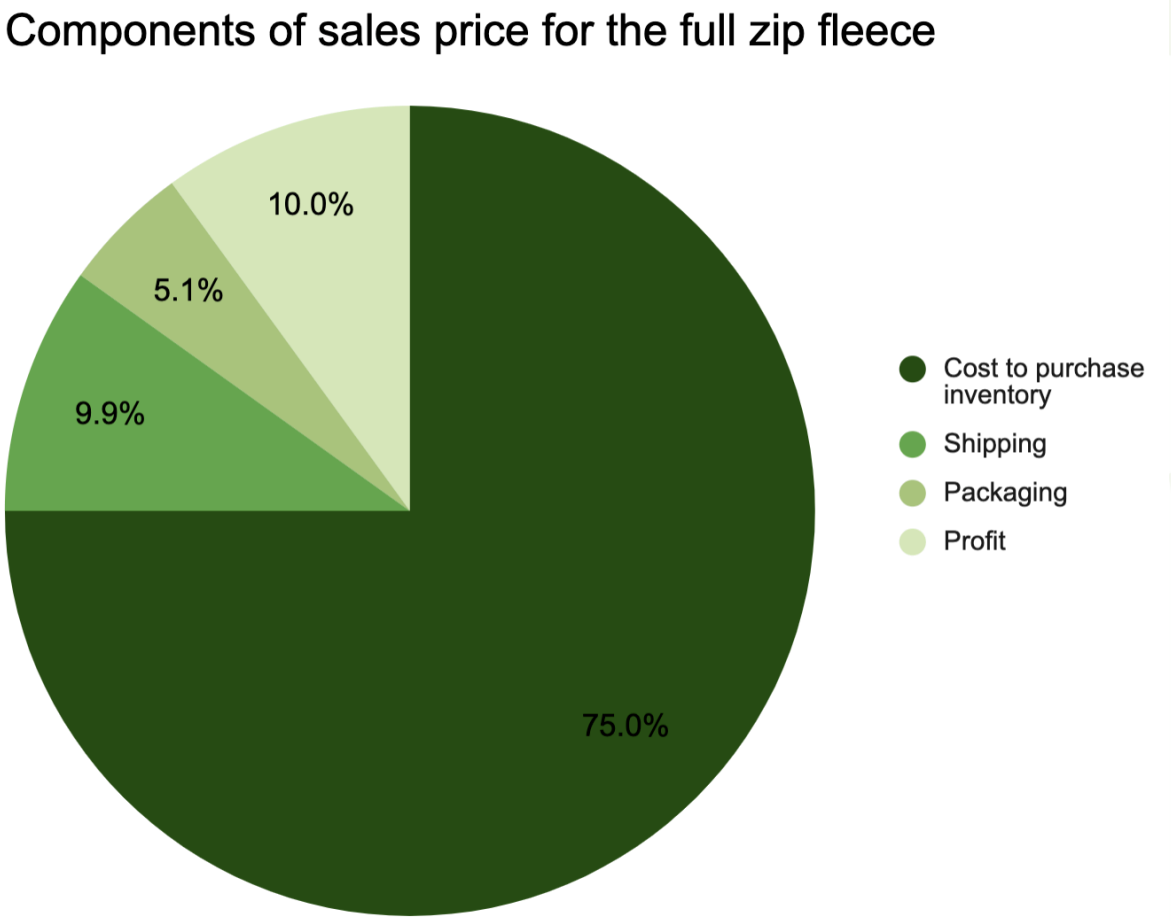
   c. Monthly sales by product

[Stacked] bar chart [Any sensible answer is acceptable] Example:
A stacked bar chart can be used to show comparisons between categories and what proportion of the whole they make up. The business could have represented this in a series of pie charts but it is difficult to compare pie charts to one another so a stacked bar was appropriate.

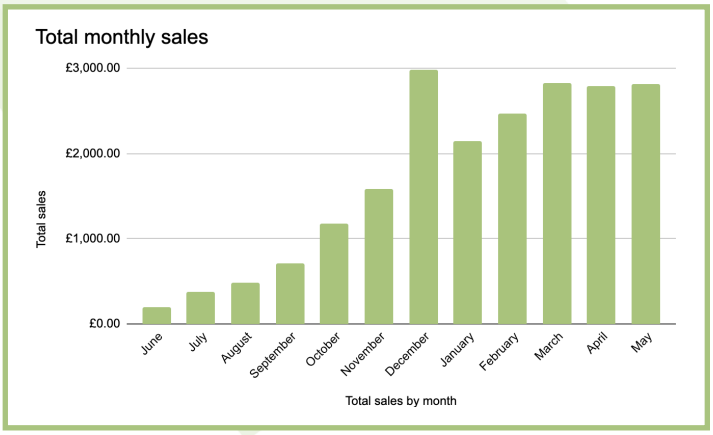
   d. Volume of items sold per month

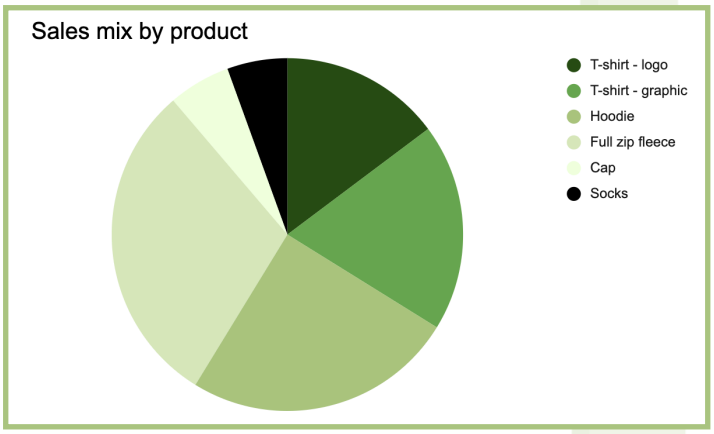
Line graph (smooth) [Any sensible answer is acceptable] Example:
Line graphs are often used to compare data over time. This graph does show data over time, but it is not easy to read as the lines have been smoothed between data points. This data could have been displayed as a stacked bar chart or a more standard line graph with the data points connected by straight lines.

8. Draw a graph that shows the breakdown of the total sales price of the full zip fleece into its associated costs and profit.



Dashboard: Business Performance





	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Total sales	£202	£383	£488	£715	£1,172	£1,587	£2,985	£2,145	£2,463	£2,832	£2,786	£2,817	£20,575

Product costs	**T-shirt - logo**	**T-shirt - graphic**	**Hoodie**	**Full zip fleece**	**Cap**	**Socks**
Cost to purchase inventory	£11.50	£16.50	£22.10	£33.75	£6.80	£1.75
Shipping	£3.26	£3.26	£4.50	£4.45	£3.20	£1.34
Packaging	£1.80	£1.80	£2.30	£2.30	£0.80	£0.90
Total cost per item	**£16.56**	**£21.56**	**£28.90**	**£40.50**	**£10.80**	**£3.99**

Sales price per product	**T-shirt - logo**
T-shirt - logo	£18.00
T-shirt - graphic	£22.00
Hoodie	£34.00
Full zip fleece	£45.00
Cap	£12.00
Socks	£4.20