

Creating a choropleth map of population density

Choropleth mapping is a useful method to show data on a map. This could be for example, population density or wealth for a specific area. The choropleth map has a range of values represented by one shade of a particular colour. A lighter shade represents a lower range of values whereas a darker shade represents a higher range of values, e.g.



Alternative approaches include using a series of different colours or patterns for the ascending values.

Student tasks

You will create a choropleth map to show population density in Germany.

- Look at the 2015 data table for population density below. Split the data into five equal intervals. Fill in your intervals, e.g. 0 - 99 on the key to the map.
- Decide on the shades for the five intervals. Practice with a coloured pencil until you can get five distinctive shades from one pencil. A darker colour such as red or purple is easier than lighter colours.
- Complete the key using your shading to give each interval a different shade.
- Using the shading key you have made, complete your map using the data below:

Federal states of Germany	Population density per km ²	GDP per capita (Euros)
1. Schleswig-Holstein	179	25,947
2. Mecklenburg-Vorpommern	71	21,404
3. Brandenburg	85	22,074
4. Berlin	3,890	28,806
5. Saxony	227	22,980
6. Saxony-Anhalt	116	22,427
7. Thuringia	138	21,663
8. Bavaria	178	35,443
9. Baden-Württemberg	301	34,885
10. Saarland	400	30,098
11. Rhineland-Palatinate	202	28,311
12. Hesse	281	37,509
13. North Rhine-Westphalia	523	32,882
14. Lower Saxony	166	28,350
15. Hamburg	2,368	52,401
16. Bremen	1,577	42,405

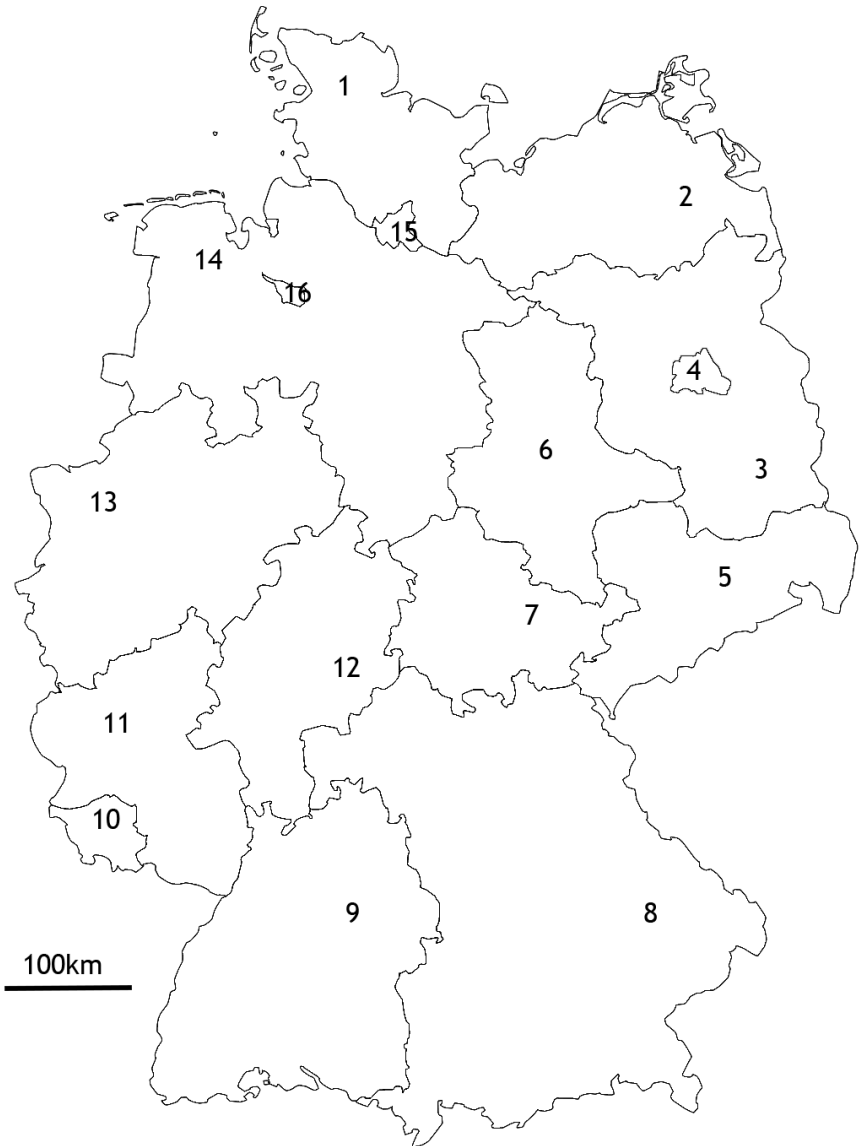
1. Where are the areas of highest and lowest population density? What patterns can you see on the map?
2. What are the advantages and disadvantages of using choropleth shading to show data?

Extension tasks

1. Create an overlay choropleth map to show the GDP per capita data.
2. What patterns can you see with this data?
3. Compare the two patterns. Is there a link between population density and GDP per capita in the federal states of Germany in 2015?

Map to show population density of the federal states of Germany in 2015

- 1. Schleswig-Holstein
- 2. Mecklenburg-Vorpommern
- 3. Brandenburg
- 4. Berlin
- 5. Saxony
- 6. Saxony-Anhalt
- 7. Thuringia
- 8. Bavaria
- 9. Baden-Wuerttemberg
- 10. Saarland
- 11. Rhineland-Palatinate
- 12. Hesse
- 13. North Rhine-Westphalia
- 14. Lower Saxony
- 15. Hamburg
- 16. Bremen



KEY					
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POPULATION DENSITY

(People per km²)



Map used courtesy of Wikipedia, en.wikipedia.org/wiki/States_of_Germany

Teaching notes

Suggested intervals for the key might be 0-99, 100-199, 200-299, 300-399, 400-499 and 500+. You may wish to warn pupils as to inappropriate scales for the key where values overlap in two intervals, e.g. 0-100, 100-200, and 200-300 etc.

Advantages of choropleth shading:

- Give a good visual impression of data over space
- Clearly indicate differences between regions

Disadvantages of choropleth shading:

- There is often variation within a region that a single shade does not take into account. The data is an average for the entire state or region.
- They imply that data changes suddenly at the border between regions.
- It can be difficult to tell the difference between different shades
- They do not show a total value, just a value within a range

Notes for the PowerPoint presentation

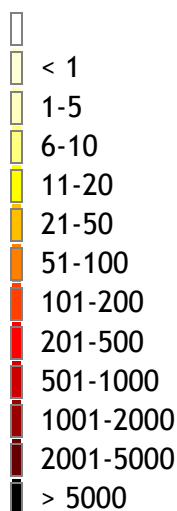
Map 1: World population density (people per km²) by country, 2006. This is a single colour choropleth map. Please note that there is no scale is provided on the original map. Students could also consider the value of an equal area projection for this map.

Map 2: Choropleth map showing the number of cattle in Peninsular Malaysia in 2008. This map uses both colours and shades.

Map 3: Map of U.S. states by unemployment rate, July 2015. This is a two-colour choropleth map but also uses shading. Students could be asked as to the ease of using the map with the two colours and the shading. No scale is provided.

Map 4: Map of population density in France, 2001. The key for this multi-colour choropleth map is provided separately from the map and students could be asked if the map is still useful without it. No scale is provided.

The key is inhabitants per km²



Map 5: Map of population density in Finistère, France 2007. This map uses a variety of colours and shades. No scale is provided. Should the green be replaced by a different colour/shade?