

Stellar Sat Nav

Key Stage 4

Topics covered: Bearings, constellations

Teacher's Notes

In this activity, students will use bearings to plot constellations. They are then asked to think about what they represent.

Equipment: paper, pencil, protractor

Questions to ask the class before the activity:

What is a constellation?

Answer: a constellation is a pattern of stars in the sky. Many different systems were used across the world but the system we use was devised by the Greeks. There are 88 constellations in total.

Name some constellations that you know about.

Answer: the Plough is a common answer – this is actually an asterism which is a smaller pattern of stars. It is part of the larger constellation Ursa Major (Great Bear).

If you are facing north, your bearing is 0° , in which direction are you facing for the following bearings: 90° , 180° , 270° , -45° , -225° ?

Answer: $90^\circ = E$, $180^\circ = S$, $270^\circ = W$, $-45^\circ = NW$, $-225^\circ = SW$

Questions to ask the class after the activity:

Are all of the stars in the sky the same?

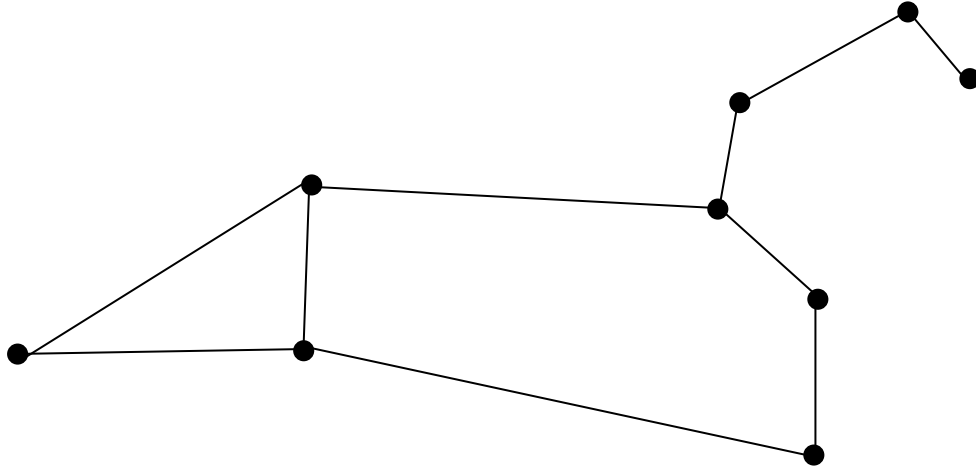
Answer: they all have different colours and sizes. Red stars are much cooler than blue stars.

Would your Sat Nav coordinates work from Andromeda, a galaxy 2.5 million light years away? Why not?

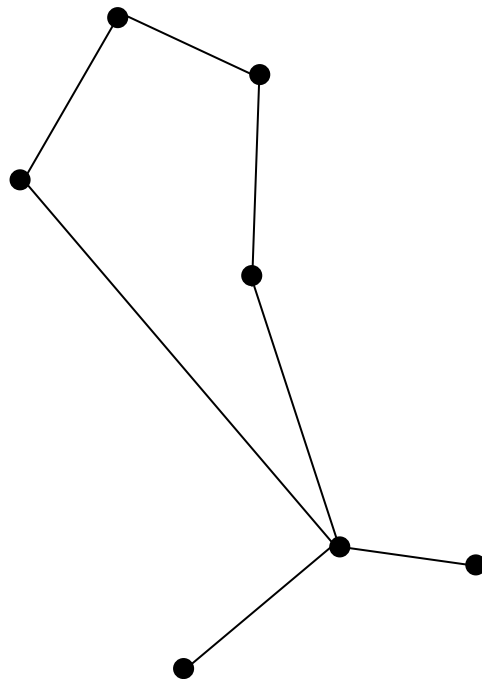
Answer: constellations look different from different positions in space, this is because the stars that make up the constellations are all situated at different distances from Earth.

Stellar Sat Nav: Answers

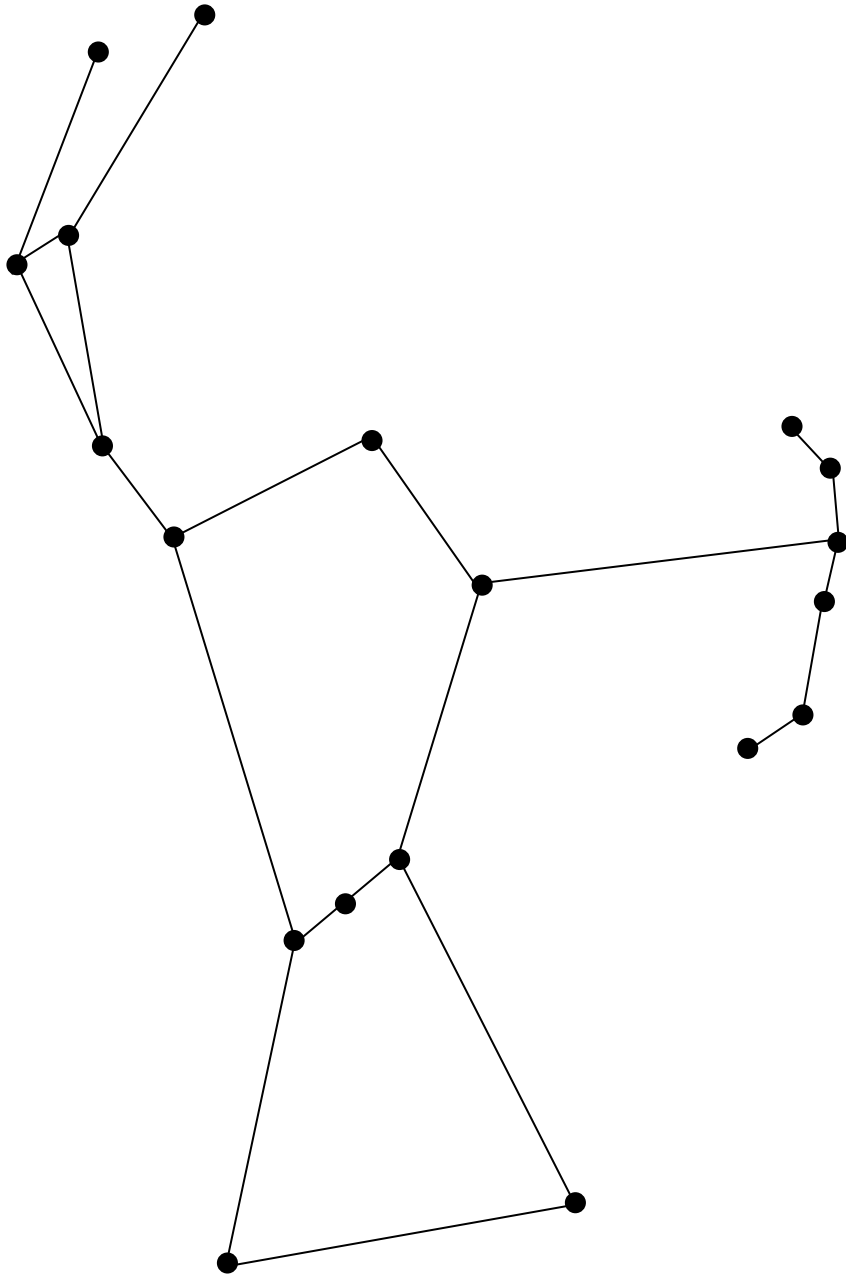
Leo



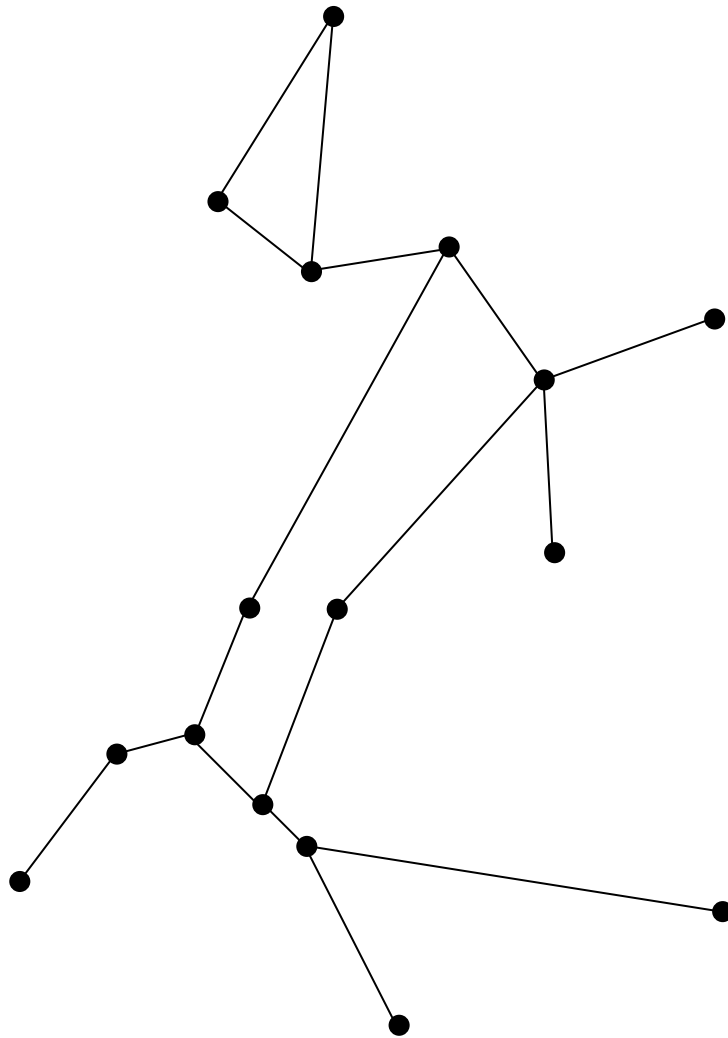
Bootes



Orion



Canis Major



Activity: Stellar Sat Nav

Use the sat nav coordinates below to visit the stars.
Draw the pattern of stars below and identify the constellation you have drawn.



Constellation One

Start at star 1. Follow the directions below and label the stars:

Star 1 to Star 2: Take a bearing of 269° (south-west) and travel 3.6 cm. You have arrived at Star 2.

Star 2 to Star 3: Take a bearing of 32° (north-east) and travel 4.5 cm. You have arrived at Star 3.

Star 3 to Star 1: Take a bearing of 182° (south) and travel 2.25 cm. You have arrived at Star 1.

Star 1 to Star 4: Take a bearing of 102° (south-east) and travel 6.95 cm. You have arrived at Star 4.

Star 4 to Star 5: Take a bearing of 0° (north) and travel 2.1 cm. You have arrived at Star 5.

Star 5 to Star 6: Take a bearing of 312° (north-west) and travel 1.8 cm. You have arrived at Star 6.

Star 6 to Star 7: Take a bearing of 10° (north-east) and travel 1.5 cm. You have arrived at Star 7.

Star 7 to Star 8: Take a bearing of 61° (north-east) and travel 2.55 cm. You have arrived at Star 8.

Star 8 to Star 9: Take a bearing of 140° (south-east) and travel 1.2 cm. You have arrived at Star 9. Return to Star 6.

Star 6 to Star 3: Take a bearing of 273° (west) and travel 5.4 cm. You have arrived at Star 3. You have reached your destination.

Constellation Two

Start at star 1. Follow the directions below and label the stars:

Star 1 to Star 2: Take a bearing of 50° (north-east) and travel 2.76 cm. You have arrived at Star 2.

Star 2 to Star 3: Take a bearing of 320° (north-west) and travel 6.6 cm. You have arrived at Star 3.

Star 3 to Star 4: Take a bearing of 30° (north-east) and travel 2.64 cm. You have arrived at Star 4.

Star 4 to Star 5: Take a bearing of 115° (south-east) and travel 2.04 cm. You have arrived at Star 5.

Star 5 to Star 6: Take a bearing of 182° (south) and travel 2.76 cm. You have arrived at Star 6.

Star 6 to Star 2: Take a bearing of 162° (south-east) and travel 3.96 cm. You have arrived at Star 2.

Star 2 to Star 7: Take a bearing of 98° (south-east) and travel 1.68 cm. You have arrived at Star 7. You have reached your destination.

Constellation Three

Start at star 1. Follow the directions below and label the stars:

Star 1 to Star 2: Take a bearing of 145° (south-east) and travel 2.4 cm. You have arrived at Star 2.

Star 2 to Star 3: Take a bearing of 83° (north-east) and travel 4.8 cm. You have arrived at Star 3.

Star 3 to Star 4: Take a bearing of 355° (north-west) and travel 1 cm. You have arrived at Star 4.

Star 4 to Star 5: Take a bearing of 317° (north-west) and travel 0.8 cm. You have arrived at Star 5. Return to Star 3.

Star 3 to Star 6: Take a bearing of 193° (south-west) and travel 0.8 cm. You have arrived at Star 6.

Star 6 to Star 7: Take a bearing of 190° (south-west) and travel 1.8 cm. You have arrived at Star 7.

Star 7 to Star 8: Take a bearing of 236° (south-west) and travel 0.8 cm. You have arrived at Star 8. Return to Star 2.

Star 2 to Star 9: Take a bearing of 197° (south-west) and travel 3.8 cm. You have arrived at Star 9.

Star 9 to Star 10: Take a bearing of 153° (south-east) and travel 5 cm. You have arrived at Star 10.

Star 10 to Star 11: Take a bearing of 260° (south-west) and travel 4.6 cm. You have arrived at Star 11.

Star 11 to Star 12: Take a bearing of 12° (south-east) and travel 4.4 cm. You have arrived at Star 12.

Star 12 to Star 13: Take a bearing of 50° (north-east) and travel 0.8 cm. You have arrived at Star 13.

Star 13 to Star 9: Take a bearing of 50° (north-east) and travel 0.8 cm. You have arrived at Star 9. Return to Star 12.

Star 12 to Star 14: Take a bearing of 343° (north-west) and travel 5.6 cm. You have arrived at Star 14.

Star 14 to Star 15: Take a bearing of 323° (north-west) and travel 1.6 cm. You have arrived at Star 15.

Star 15 to Star 16: Take a bearing of 335° (north-west) and travel 2.8 cm. You have arrived at Star 16.

Star 16 to Star 17: Take a bearing of 21° (north-east) and travel 3.2 cm. You have arrived at Star 17. Return to Star 15.

Star 15 to Star 18: Take a bearing of 349° (north-west) and travel 3 cm. You have arrived at Star 18.

Star 18 to Star 19: Take a bearing of 31° (north-east) and travel 3.6 cm. You have arrived at Star 19. You have reached your destination.

Constellation Four

Start at star 1. Follow the directions below and label the stars:

Star 1 to Star 2: Take a bearing of 216° (north-west) and travel 1.5 cm. You have arrived at Star 2.

Star 2 to Star 3: Take a bearing of 32° (north-east) and travel 2.85 cm. You have arrived at Star 3. Return to Star 1.

Star 1 to Star 4: Take a bearing of 81° (north-east) and travel 1.8 cm. You have arrived at Star 4.

Star 4 to Star 5: Take a bearing of 145° (south-east) and travel 2.1 cm. You have arrived at Star 5.

Star 5 to Star 6: Take a bearing of 70° (north-east) and travel 2.4 cm. You have arrived at Star 6. Return to Star 5.

Star 5 to Star 7: Take a bearing of 177° (south-east) and travel 2.25 cm. You have arrived at Star 7. Return to Star 5.

Star 5 to Star 8: Take a bearing of 222° (south-west) and travel 4.05 cm. You have arrived at Star 8.

Star 8 to Star 9: Take a bearing of 201° (south-west) and travel 2.85 cm. You have arrived at Star 9.

Star 9 to Star 10: Take a bearing of 147° (south-east) and travel 0.75 cm. You have arrived at Star 10.

Star 10 to Star 11: Take a bearing of 99° (south-east) and travel 5.55 cm. You have arrived at Star 11. Return to Star 10.

Star 10 to Star 12: Take a bearing of 153° (south-east) and travel 2.7 cm. You have arrived at Star 12. Return to Star 9.

Star 9 to Star 13: Take a bearing of 315° (north-west) and travel 1.35 cm. You have arrived at Star 13.

Star 13 to Star 14: Take a bearing of 255° (south-west) and travel 1.05 cm. You have arrived at Star 14.

Star 14 to Star 15: Take a bearing of 217° (south-west) and travel 2.1 cm. You have arrived at Star 15. Return to Star 13.

Star 13 to Star 16: Take a bearing of 22° (north-east) and travel 1.8 cm. You have arrived at Star 16. You have reached your destination.