

# Summary and questions

## Part 3 of 3

- You learned these essential design skills: first angle orthographic projection, the concept of drawing three different views, different line types.
- You progressed to more advanced design skills, more complex 3D objects drawn in orthographic projection with instruments. A design problem: a flight of stairs and a wheelchair ramp; a design brief: included specifications, sketches and a plan.
- You learned the following about structures: forces can be static or dynamic; loads can be even or uneven; the strength of materials under the action of forces; tension, compression and bending of beams; properties of various construction materials.
- Investigation skills: you read a scenario, identified a problem, investigated solutions and learned about bidding for a tender.
- Design skills: you sketched, evaluated and adapted your ideas, wrote a design brief and drew a flow chart.
- Making skills: you did working drawings.
- Costing: you drew up a real-life budget.
- Making skills: you made a model of a viable solution to the problem.
- Evaluation skills: you created an evaluation instrument and used it to evaluate other teams' work.
- Communication skills: you presented a tender bid.



Illustration for Project 10: a ramp and stairs

- 14 Give three reasons why is it important to know what types of forces act on structures?
- 15 Name five well-planned steps you can follow when you are trying to find a solution to a problem.
- 16 Name five important properties of building materials.
- 17 Where will corrosion of metal be grouped? Choose the correct group: physical, mechanical or chemical.
- 18 Make a free-hand sketch of the paper outlay for a first angle orthographic projection.
- 19 Study the figure on page 58 alongside. Is this a user-friendly entrance for everyone? Defend your view by answering the following questions:
  - a Is the ramp design sensible and user friendly? Why?
  - b For what reasons are the steps not a user-friendly and safe design?
  - c Are both designs safe to use, even when it rains?

## ANSWERS

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