

What Is Universal Design and Accessibility?

Worksheet

Universal design is the practice of designing environments to be usable by all people, to the greatest extent possible, without adaptation; accessibility standards (like a maximum 1:12 ramp slope) set the specific dimensions that make this possible.

Questions

1. What is the maximum recommended slope for a wheelchair ramp?
A) 1:4
B) 1:8
C) 1:12
D) 1:20
2. A ramp must rise 45 cm to reach a doorway. What is the minimum ramp length at a 1:12 slope?
A) 270 cm
B) 450 cm
C) 540 cm
D) 45 cm
3. Which of these is NOT one of the 7 Principles of Universal Design?
A) Equitable use
B) Low physical effort
C) Maximum ornamentation
D) Tolerance for error
4. What is the purpose of a curb cut?
A) To drain rainwater faster
B) To let wheelchairs and strollers cross between street and sidewalk
C) To slow down traffic
D) To mark a pedestrian crossing
5. A wheelchair ramp needs to rise 60 cm to reach a raised entrance. What is the minimum ramp length required under the 1:12 slope rule?
6. A hallway is being designed for wheelchair accessibility. Accessibility standards require a minimum clear door width of 81 cm. If a door frame is 90 cm wide, is it compliant?
7. A wheelchair needs a clear turning circle of 150 cm diameter in a bathroom. If the available space is 140 cm × 140 cm, does it meet the standard?
8. Define: What is universal design?
9. Define: What is the maximum slope for an accessible ramp?
10. Define: What is a curb cut?

Answer Key

1. C) 1:12 — A 1:12 slope means 12 units of horizontal ramp length for every 1 unit of vertical rise — the standard maximum for accessible ramps.
2. C) 540 cm — $L = R \times 12 = 45 \times 12 = 540$ cm.
3. C) Maximum ornamentation — Maximum ornamentation isn't a universal design principle; the seven focus on usability, flexibility, and low effort, not decoration.
4. B) To let wheelchairs and strollers cross between street and sidewalk — Curb cuts ramp the sidewalk down to street level so wheelchair and stroller users don't have to step up or down.
5. Maximum slope = 1:12, meaning 12 cm of ramp length per 1 cm of rise. Minimum length = rise $\times 12 = 60 \times 12 = 720$ cm = 7.2 m
6. Clear opening width = frame width – hardware/hinge allowance (~5 cm) Clear width = $90 - 5 = 85$ cm 85 cm > 81 cm minimum → compliant
7. Required turning diameter = 150 cm Available space = 140 cm $\times 140$ cm (smaller than 150 cm) 140 cm < 150 cm → does not meet the minimum turning radius requirement
8. Designing products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation.
9. 1:12 — 1 unit of rise for every 12 units of ramp length (about 8.3%, or roughly 4.8°).
10. A ramped cut in a sidewalk curb that lets wheelchairs, strollers, and carts transition between street and sidewalk levels.

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