

**Designed for:** Year 10 work studies

**Sub-strand(s):**

- Learning to learn
- Work skills
- Career development &

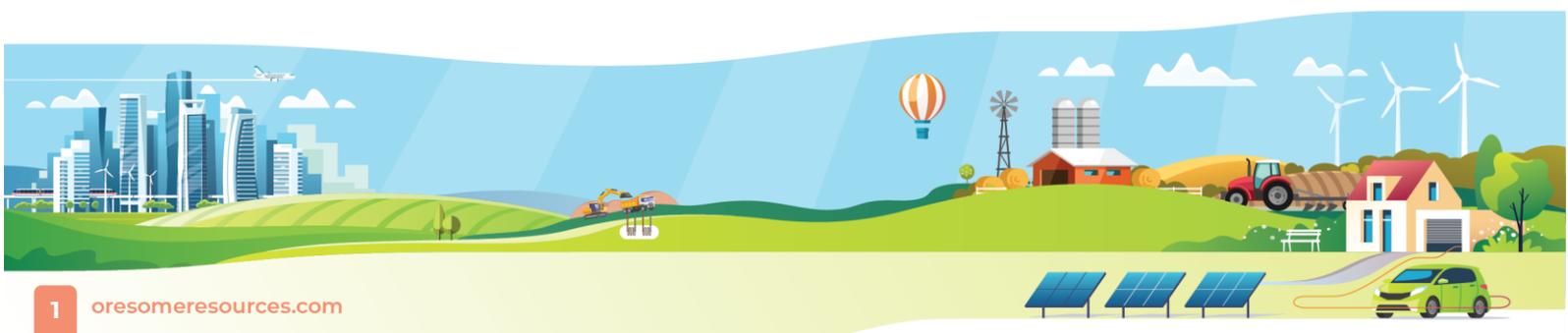
**Content Descriptors:** Mechanical reasoning tests are used by employers to assess the mechanical and technical knowledge of a job candidate. The test requires the use of mechanical principles and concepts to find solutions to problems.

Mechanical reasoning tests are often administered to applicants who are pursuing a role related to engineering, architecture, automotive/heavy vehicle mechanics, technology, mechatronics or some related field that requires a background in mechanical comprehension. Examples are skilled tradespeople such as electricians, welders, and carpenters, transportation trades/ and equipment operators such as truck drivers and heavy equipment operators.

**Context:** The following resources may be used as a mini-unit on the topic indicated or as a prequel to the e-learning QMEA & Blue Dog Apprentice Aptitude test training program. Practice can improve test scores for all types of aptitude tests, so students are urged to try as many types of aptitude tests as possible. Use of calculators at discretion of teacher.

**Instruction for students:** Please read through the instructions carefully and answer as instructed. Students should save the file to their desktop and open it using Adobe Acrobat Reader in order to save the content.

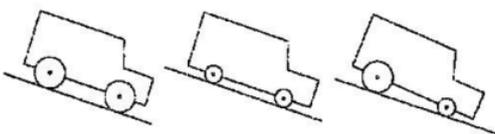
**Disclaimer:** The material contained in these practice resources has been compiled to prepare students who are seeking employment within the mining and energy sector. It is to be used as a guide only and should not be relied upon as a definitive body of work. Students should seek additional sources of assistance and information. No liability or responsibility is taken for any student's aptitude testing outcome.



## Mechanical reasoning

For each of the following questions select and answer:

Q1. Which vehicle would travel fastest downhill?

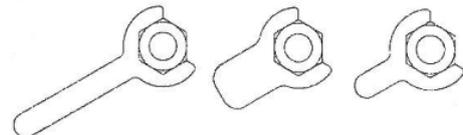


A                      B                      C

Vehicle A                       Vehicle B                       Vehicle C                       All vehicles travel at the same speed

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Q2. Which spanner will turn the nut easiest?

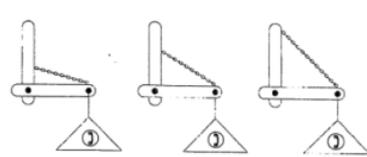


A                      B                      C

Spanner A                       Spanner B                       Spanner C                       All spanners turn with the same effort

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Q3. Which chain will provide the best support for the sign?

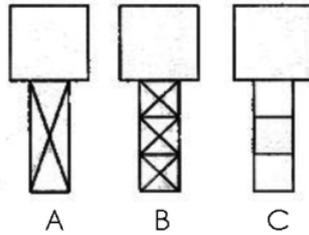


A                      B                      C

Chain A                       Chain B                       Chain C                       All chains provide the same support



Q4. Which tower would be the most stable in a strong wind?



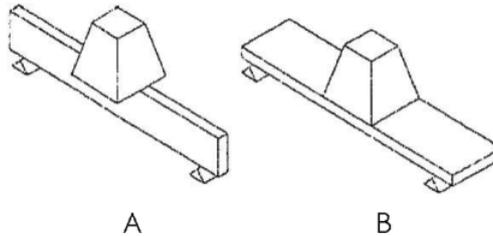
Tower A

Tower B

Tower C

All towers provide the same support

Q5. Which of these two identical sized beams would support the greatest load?

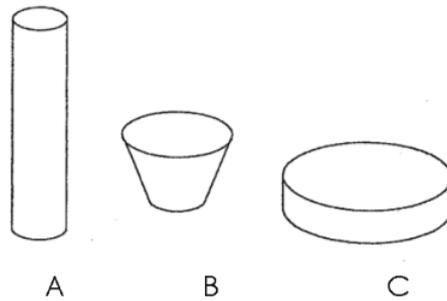


Beam A

Beam B

Both beams provide the same support

Q6. Which container would have the quickest evaporation rate?

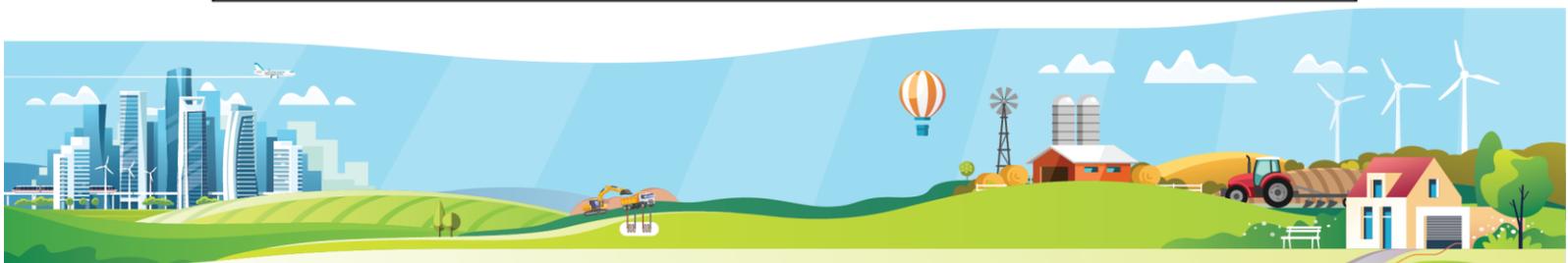


Container A

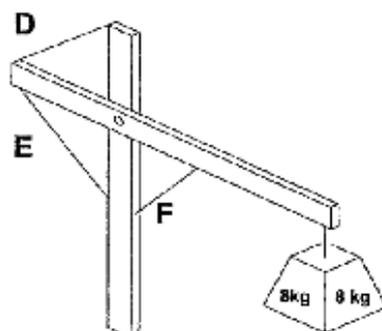
Container B

Container C

All containers evaporate at the same rate



Q7. Which chain would support the weight by itself?



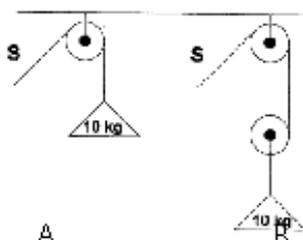
Chain D

Chain E

Chain F

All chains support the weight by itself

Q8. Which load will require the least effort to lift when rope S is pulled?



A

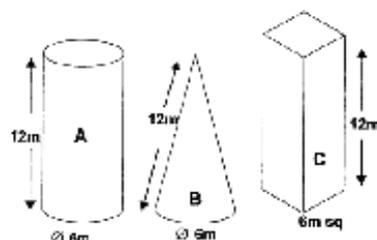
B

Load A

Load B

Both loads require the same effort

Q9. These three blocks are all made of the same material. Which is the heaviest?



Block A

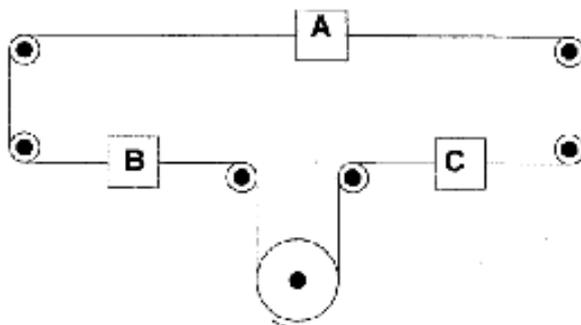
Block B

Block C

All blocks weigh the same



Q10. A, B and C are blocks attached to the belt which runs around the vertical system of rollers. If the belt runs in the direction indicated by the arrow, how will A, B and C move?



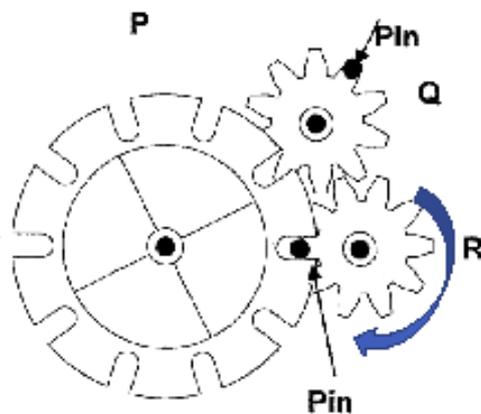
A, B and C move to the left

A, B and C move to the right

A and B to the left and C to the right

A to the left, B and C to the right

Q11. Wheel R turns and drives wheel Q. R and Q both have pins which fit into the slots in wheel P. If R continuously turns clockwise as shown by the arrow. P will...



Turn clockwise continuously

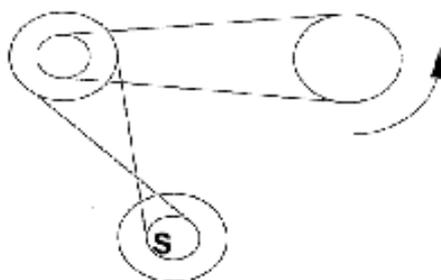
Turn anticlockwise continuously

Turn to and fro

Stay still

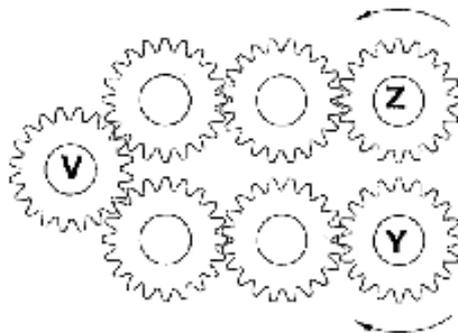


Q12. If the wheel is turned in the direction of the arrow, which direction will wheel S move?



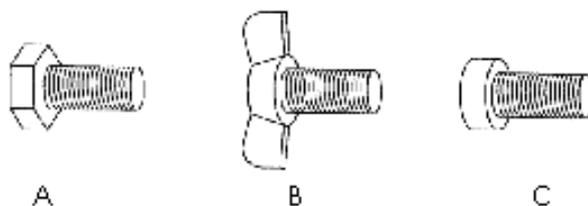
- Move either clockwise or anticlockwise
  Clockwise
  Anticlockwise

Q13. If gear Y turns clockwise and gear Z turns anticlockwise at the same time as shown by the arrows, gear V will...

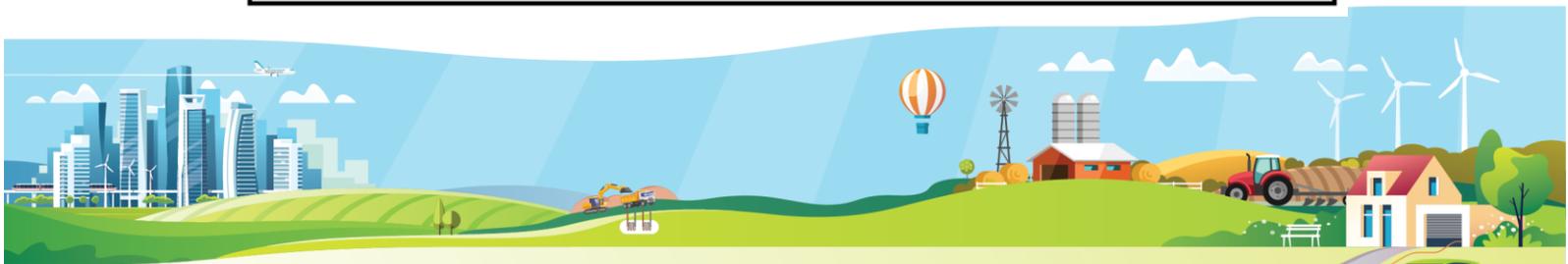


- Turn clockwise
  Turn anticlockwise
  Turn to and fro
  Jam the mechanism

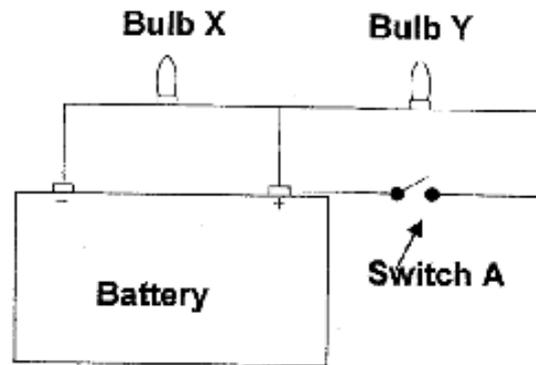
Q14. Which screw would be the easiest to turn by hand?



- Screw A
  Screw B
  Screw C
  All screws turn by hand the same

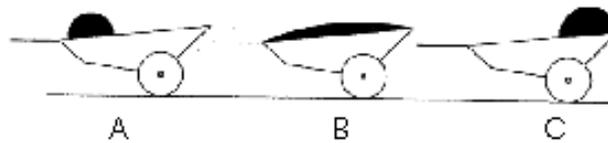


Q15. If switch A is closed what will happen?



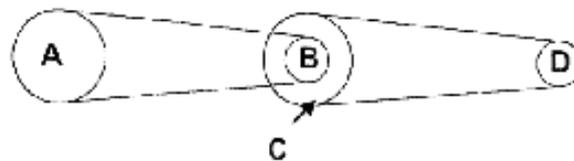
- X and Y will light up     
  Only Y will light up     
  Only X will light up     
  Neither X or Y will light up

Q16. Which wheelbarrow will be the easiest to lift?



- Wheelbarrow A     
  Wheelbarrow B     
  Wheelbarrow C     
  All wheelbarrows will take the same effort

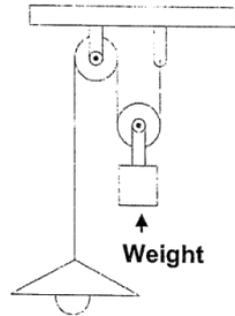
Q17. The diameter of pulleys A and C are 100mm and pulleys B and D are 50 mm. When pulley A makes a complete turn, pulley D will turn:



- Twice     
  Four times     
  Six times     
  Eight times

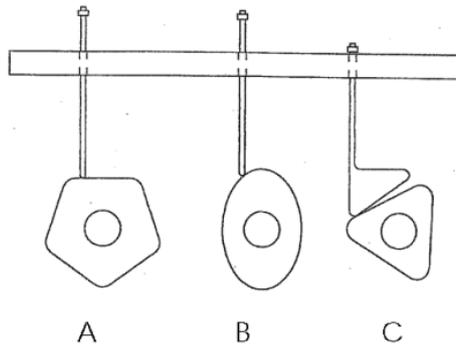


Q18. To raise this light 120mm, the weight must be moved:



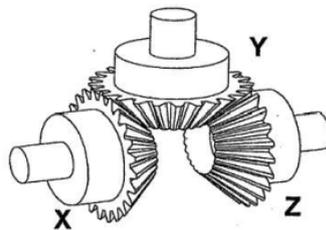
- Up 60mm     
  Up 120mm     
  Down 60mm     
  Down 120mm

Q19. As wheels A, B and C turn, each wheel drives a slide rod up and down. Which of the wheels can only turn in one direction?



- Only A     
  Only B     
  Only C     
  All of A, B and C

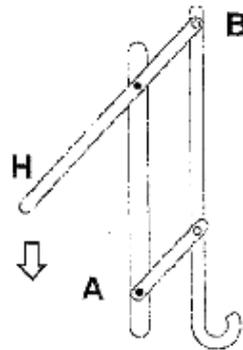
Q20. If the gear X turns and drives gear Y, gear Z will:



- Turn at the same speed as X     
  Turn slower than X     
  Turn faster than X     
  Remain stationary



Q21. If handle H is pulled down, as shown by the arrow how will the hook move?



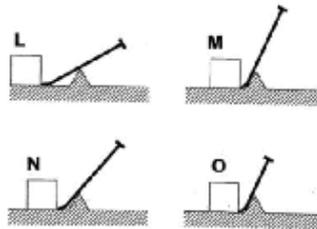
Closer to fixed point A, Closer to non-fixed point B

Closer to fixed point A, same distance from non-fixed point B

Same distance from fixed point A, closer to non-fixed point B

Same distance from fixed point A, same distance from non-fixed point B

Q22. Which box would be the most difficult to move with the crowbar?



L only

M only

N only

O only

