

H2GP SPRINT: PRE-ASSESSMENT

1. What is the purpose of the engineering design process?
 - A. To follow a strict set of instructions
 - B. To solve problems through iterative steps
 - C. To eliminate the need for collaboration
 - D. To design without testing
2. What does a fuel cell do?
 - A. Stores electrical energy
 - B. Converts chemical energy into electricity
 - C. Generates heat for engines
 - D. Burns hydrogen for propulsion
3. Which material is used in electrolysis to produce hydrogen?
 - A. Wood
 - B. Water
 - C. Plastic
 - D. Aluminum
4. What does the term 'gear ratio' refer to?
 - A. The number of gears in a system
 - B. The ratio of output to input teeth on gears
 - C. The speed of the output gear
 - D. The size of the driver gear
5. What is the primary advantage of green hydrogen?
 - A. It is inexpensive to produce
 - B. It generates no carbon emissions
 - C. It uses fossil fuels
 - D. It can only be produced outdoors
6. Which of the following is a measure of central tendency?
 - A. Range
 - B. Mean
 - C. Variance
 - D. Standard deviation
7. What is the purpose of testing a design?
 - A. To finalize the product
 - B. To identify and fix problems
 - C. To showcase the finished product
 - D. To complete documentation
8. A car travels 15 meters in 3 seconds. What is its average speed?
 - A. 3 m/s
 - B. 4 m/s
 - C. 5 m/s
 - D. 6 m/s

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9. If a car accelerates uniformly from 2 m/s to 8 m/s in 2 seconds, what is the magnitude of its acceleration?
- A. 3 m/s^2
 - B. 4 m/s^2
 - C. 5 m/s^2
 - D. 6 m/s^2
10. A gear train has an input gear with 20 teeth and an output gear with 60 teeth. What is the gear ratio?
- A. 1:2
 - B. 2:1
 - C. 3:1
 - D. 1:3

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1. What does standard deviation tell us about trial data?
 - A. The average speed of the car
 - B. The range of data points
 - C. How consistent the data is
 - D. The middle value of the data
2. What is the most important reason to align gears correctly?
 - A. To make the car faster
 - B. To prevent gear slipping or wear
 - C. To improve aesthetic appeal
 - D. To increase torque
3. Which measure of central tendency would be most affected by an outlier?
 - A. Mean
 - B. Median
 - C. Mode
 - D. Standard deviation
4. What happens during electrolysis?
 - A. Water is split into hydrogen and oxygen
 - B. Hydrogen is burned to produce electricity
 - C. Gears are aligned for maximum efficiency
 - D. The car is calibrated for speed
5. How does adjusting the gear ratio affect performance?
 - A. Increases battery efficiency
 - B. Changes speed and torque balance
 - C. Makes the car quieter
 - D. Aligns the axles
6. A car travels 10 meters in 5 seconds. What is its average speed?
 - A. 1 m/s
 - B. 2 m/s
 - C. 5 m/s
 - D. 10 m/s
7. If a car accelerates uniformly from rest to 6 m/s in 3 seconds, what is the magnitude of its acceleration?
 - A. 1 m/s^2
 - B. 2 m/s^2
 - C. 2.5 m/s^2
 - D. 3 m/s^2
8. A gear train has an input gear with 10 teeth and an output gear with 50 teeth. What is the gear ratio?
 - A. 1:5
 - B. 5:1
 - C. 10:1
 - D. 50:1

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9. A car moves with a constant velocity of 3 m/s for 4 seconds. What distance does it cover?
- A. 12 meters
 - B. 6 meters
 - C. 8 meters
 - D. 16 meters
10. Why is it important to test multiple variables separately?
- A. To simplify testing
 - B. To accurately identify cause-effect relationships
 - C. To save time
 - D. To reduce errors