

**Unit 2 Test
Engineering Challenge**

1. List the steps in the problem solving process and what you did for each step for the LEGO Engineering Challenge. (Step 1 is given below)

A. Problem Solving Step: Identify and Define the Problem

LEGO Project : Design and construct of vehicle that is capable of competing in a mountain tug of war.

B. Problem Solving Step: _____

LEGO Project: _____

C. Problem Solving Step: _____

LEGO Project: _____

D. Problem Solving Step: _____

LEGO Project: _____

E. Problem Solving Step: _____

LEGO Project: _____

F. Problem Solving Step: _____

LEGO Project: _____

2. Define the term **speed** and give two examples and write them out (example: KPH = Kilometer per hour)

Define: _____

Example 1: _____

Example 2: _____

3. Define the term **torque** *and* draw a gear ratio the shows torque:

Define: _____

Drawing: (label the Drive/Motor, Driven/wheel.)

4. In order to gain torque you should

- A. Have a small drive gear and a large driven gear
- B. Have a large drive gear and a small driven gear
- C. Use a Differential
- D. Use a bigger motor.

5. Wheel-base is the

- A. Size of the wheels from the ground up
- B. Life of the tread on a wheel
- C. Distance from one wheel to another
- D. Hardness of the rubber on a tire

6. Chassis is the

- A. Amount of power from the motor
- B. Frame or under-carriage of a vehicle
- C. Speed/Torque Ratio
- D. Gearing up

7. Describe why it is important for Engineers to keep a design journal.

8. List 3 *applications* of a Chain Drive (Try to list examples not in your notes)

- A. _____
- B. _____
- C. _____

9. List 3 *applications* of a Right Angle Transmission (Try to list examples not in your notes)

- A. _____
- B. _____
- C. _____

10. List 3 *advantages* of a Belt (pulley) Drive

- A. _____
- B. _____
- C. _____

11. List the seven resources of Technology and tell me how they were used or how they apply to the LEGO vehicle engineering project.

(1 example is listed below)

A. **Resource:** Energy

LEGO Project : Energy was used during the LEGO project. The power supply used 9 volts of DC electricity to give power to our motor.

B. **Resource:** _____

LEGO Project: _____

C. **Resource:** _____

LEGO Project: _____

D. **Resource:** _____

LEGO Project: _____

E. **Resource:** _____

LEGO Project: _____

F. Resource: _____

LEGO Project: _____

G. Resource: _____

LEGO Project: _____

12. Tell me one problem you had during the LEGO All Terrain Vehicle project and what you did to solve it.

Problem: _____

Solution: _____

Measurement:

13. Measure the following lines using the English/Standard method.

(use inches and simplify to the closest 1/16")

A. _____ Measure starting here _____

B. _____ Measure starting here _____

C. _____ Measure starting here _____

D. _____ Measure starting here _____

E. _____ Measure starting here _____

Bonus Question: List a famous inventor and an invention that they are famous for

Inventor: _____

Invention: _____