



Unit 4 – Mechanical Systems

Complete each of the following questions, relating to the specific learner outcomes, covered this year in Grade 8. The questions in this review reflect what you should have mastered and will be tested on in the **Final Achievement Exam**. The answers will be covered in class.

Part 1 – Simple Machines

Describe different **simple machines**.

Explain how simple machines help people perform tasks easier.

Identify the **3 different classes of levers**. (p. 271)

Class 1	Class 2	Class 3
Examples	Examples	Examples

What is **work**? (p. 276)

How is work **calculated**? (p. 276)

Explain why machines make '**work**' easier.

Part 2 – Mechanical Advantage

What is **mechanical advantage**? (p. 278)

How is mechanical advantage **calculated**?

How can machines be **adapted** to suit specific needs? (p.283)

What is **ergonomics**? (p.283)

Part 3 – Pulleys

Describe the different **types of pulleys** and give examples of each.

What is a **winch** and how does it work?

What is a **wheel and axle** and how does it work?

What are **gears** and how do they work?

What is a **gear train**? (Illustrate an example)

Illustrate different **types of gears**.

Driver gear	Follower gear
Multiplying gears	Reducing gear
Wheel and pinion	Chain and sprockets

Part 4 – Energy Transformation and Transmission in Machines

Describe the difference between **potential** and **kinetic** energy.

How is energy **transformed** in a machine?

How is energy **transferred** in a machine?

How do **frictional forces** affect the operation and **efficiency** of a machine?

What is 'waste energy'? (p.36)

Part 5 – Pressure

What is **pressure**? (p. 40)

How is pressure **calculated**?

What devices use the **pressure principle**? (p. 48-49)

What is **Pascal's Law**?

What happens when a fluid is **compressed**?

What are **hydraulic systems**?

What **devices** use hydraulic systems? (Explain how)

What are **pneumatic systems**?

What **devices** use pneumatic systems? (Explain how)

What is a **subsystem**?

Part 6 – Machine Timeline

How have mechanical devices changed over time, as a result of **advancements** in science, or technology?

How have changes in society and the environment influenced changes in science and technology?
