

Wordsworth High School



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GRADE 9 TECHNOLOGY ACTIVITIES.

TERM 2

2020

PNEUMATIC SYSTEMS & HYDRAULIC SYSTEMS (JULY)

1. Revision Activity 1.1 (Read Pg 37 - 39)
 - a) What is used in Pneumatic systems to do an activity?
 - b) What is used in Hydraulic systems to do an activity?
 - c) What formula do we use to calculate pressure?
 - d) Fill in the blanks:
According to the formula for pressure, : The larger the area, the _____
the pressure and the smaller the area, the _____ the pressure.
2. Action Research Activity 2 Pg 39. Follow the instructions and do the experiment with the different size Syringes, you are told what you will need. Answer questions 11 – 16 in your exercise book.
3. Pascal's Principal (Law) Pg 40 – 42
Carefully read the notes on "Pascal's Law", "Basic principles of Hydraulics" and "Hydraulics and Mechanical advantage" in the above given pages.
 - a) What does Pascal's tell us about pressure in a hydraulic system?
 - b) Summarize the basic principles of hydraulics.
 - c) In a hydraulic system, what creates force multiplication?
 - d) The input cylinder (Master) has an area of 200 mm². A force of 10 newton's (N) is applied to move piston A by 50 mm. if the slave cylinder is 100 mm², calculate the distance that piston B will move and what the force at that point will be.
4. The Hydraulic Press
Carefully read the notes on the Hydraulic Press, its uses and how it works.
 - a) Activity:
Copy the systems diagram of a Hydraulic press on Pg 45
 - b) Answer the 3 Questions on Act 1 on Pg 46
5. The Hydraulic Jack
Carefully read the notes on the Hydraulic Jack then do the following:
 - a) Act 2 and Act 3 both on Pg 49

MECHANICAL SYSTEMS AND CONTROL.

(JULY)

6. The Pulley Systems (Pg 51 – 55)
 - a) Fixed Pulley
Qn:Why is it called a Fixed Pulley?
 - b) Moveable Pulley
Qn:Why is it called a Moveable Pulley?
 - c) Compound Pulley
Qn:Why is it called a Compound Pulley
 - d) Block and Tackle
Qn:Describe a Block and Tackle

Investigation: (Pg 55 – 61)

In your own words, briefly explain what each of the Control Mechanisms are and what they are used for:

- a) Ratchet and Pawl
 - b) Disc Brake
 - c) Bicycle Brake
 - d) Cleat

7. Revision of Gears. Read and revise on the following gears listed below (Pg. 63 – 70)
 - a) Spur Gears
 - equal size
 - unequal size
 - idler gear
 - velocity ratio and force
 - b) Bevel Gears
 - equal size – axis rotating and 90°
 - unequal size – axis rotating and 90°
 - velocity ratio and force
 - c) Rack and Pinion – (automatic gates and steering rack)
 - d) Worm Gear System–reduction in speed and increase in force

*In your books, answer ONLY the first 2 questions in each of the following Activities:

- a. Act 1 Pg 64
- b. Act 2 Pg 66
- c. Act 3 Pg 69
- d. ALL 6 questions on Pg 70

8. Evaluation Skills – Items in the modern kitchen and Garage.
Case Study: On Pg 71 are a number of pictures of kitchen and Workshop mechanisms. Select 2 from each group and give SPECIFICATIONS for each one by referring to the points on Pg 72
9. Artistic Drawing:
 Following the instructions on Pg 73 – 79, draw a wooden block in Single Vanishing Point Perspective. On it include the following below:
- Show Texture of wood grains
 - Show colour
 - Show shadow
 - Draw Single Vanishing Point Perspective of inside of classroom.

PAT ACTIVITY

SCENARIO

Read the Scenario on Pg 81 and answer the questions that follow:

ACTIVITY I

DESIGN BRIEF

(AUGUST)

- 1) A design brief consists of an identified problem concerning the project to be made, from the scenario, and a possible solution. From the scenario above, write a design brief. (5)
 - 2) Give **3** specifications (Pg 83) that you identify in the scenario. (3)
 - 3) Identify **2** constraints you will face when solving the problem. (2)
- [10]**

MAKING OF PRODUCT.

(AUGUST)

- i) Make model of the Lifting Mechanism. It must be according to the Design Brief. (100)

EVALUATE

(AUGUST)

- ii) Evaluate the model in terms of its effectiveness. (5)
- iii) Communicate with family and friends. (10)