

Item 30. Use and understand the principles of simple machines; sound fluid and heat dynamics, basic aerodynamics, aircraft structure, and theory of flight. (Level 2)

Project 1

Purpose: To acquaint the student with basic physics and how they apply to aviation

References:

- (1) 14 CFR Federal Aviation Regulations for Aviation Maintenance Technicians, Aviation Maintenance Technician Handbook – General, Volume 1 (FAA-H-8083-30), Chapter 3

Equipment and Tools Needed:

- (1) Computer

Supplies and Materials Needed:

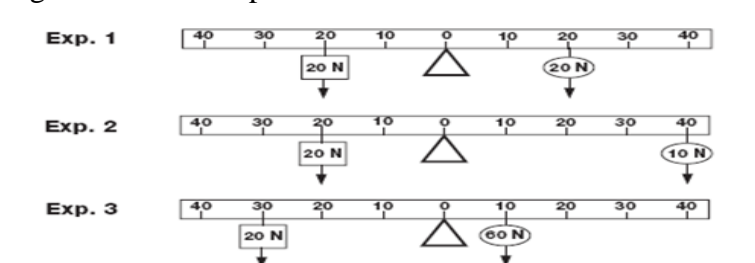
- (1) Calculator
- (2) Paper
- (3) Pen or pencil

Procedure:

Complete following procedure on project 1

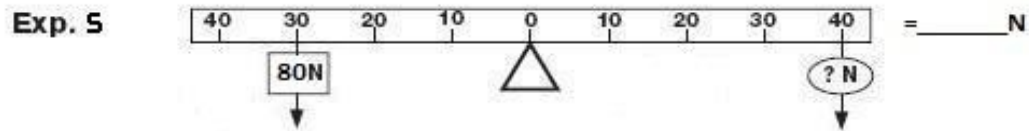
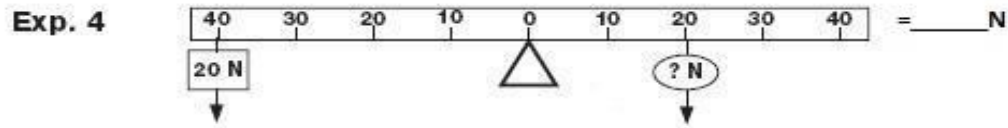
Project 1 Item 30. Use and understand the principles of simple machines; sound fluid and heat dynamics, basic aerodynamics, aircraft structure, and theory of flight. (Level 2)

- (1) Refer to following chart for the experiments with a class 1 lever.

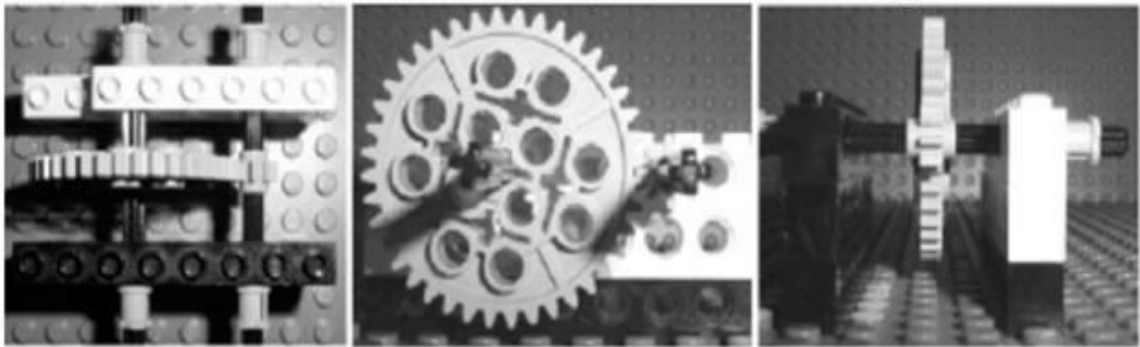


Look at experiment #1. The force of the load (20 Newton) and its distance from the fulcrum (20 Centimeters). The force of the effort (20 Newton) and its distance from the

fulcrum (20 Centimeters). Everything balances. In experiment #2, the load is at the same location, but now the effort was only 10 Newton, and it was way out at 40 Centimeters. And everything still balanced. In experiment #3 the load is 30 Centimeters from the fulcrum, and the effort 10 Centimeters from the fulcrum, it requires an effort of 60 Newton to lift the load.



(1) Mesh an 8-tooth gear with a 40-tooth gear.



Orthographic views of an 8-tooth gear meshed with a 40 tooth gear.

Calculate the gear ratio for your setup. _____

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Project 2

Purpose: To acquaint the student with basic physics and how they apply to aviation sound.

References:

- (1) 14 CFR Federal Aviation Regulations for Aviation Maintenance Technicians, Aviation Maintenance Technician Handbook – General, Volume 1 (FAA-H-8083-30), Chapter 3
- (2) Grainger digital sound measuring manual

Equipment and Tools Needed:

- (1) Digital sound measuring meter
- (2) Snap-on tool box

Supplies and Materials Needed:

- (1) Paper
- (2) Pen or pencil

Procedure:

Complete following procedure on project 2

Project 2 Item 30. Use and understand the principles of simple machines; sound fluid and heat dynamics, basic aerodynamics, aircraft structure, and theory of flight. (Level 2)

- (1) Discuss principles of sound as they affect the hanger, and measure the actual decibels for the following:
 - Grinding a piece of steel
 - Hitting the welding table with a hammer
 - Opening the hanger door
 - Engine running on the Cessna 402C from 100 feet
 - Closing a door on the Cessna 402C
 - Pneumatic drill
 - Radio
 - Rivet being set or pounded using a rivet gun

Cape Cod Community College AMTS

Practical Project Guide for AMT 119 General Curriculum, Subject Item 30

Part 147, Appendix B, Subject J Basic Physics

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Project 3

Purpose: To acquaint the student with basic physics and how they apply to aircraft structures

References:

- (1) 14 CFR Federal Aviation Regulations for Aviation Maintenance Technicians, Aviation Maintenance Technician Handbook – General, Volume 1 (FAA-H-8083-30), Chapter 3
- (2) Cessna 402C Limitations and Systems Manual

Equipment and Tools Needed:

1. Snap-on tool box

Supplies and Materials Needed:

1. Paper
2. Pen or pencil

Procedure:

Complete following procedure on project 3

Project 3 Item 30. Use and understand the principles of simple machines; sound fluid and heat dynamics, basic aerodynamics, aircraft structure, and theory of flight. (Level 2)

- (1) Discuss aircraft structures and how they affect flight characteristics. Compile a list of structures, materials and moving parts for the wing of the Cessna 402C.
- (2) Discuss aircraft structures and how they affect flight characteristics. Compile a list of structures, materials and moving parts for the tail of the Cessna 402C.

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