HOLY CROSS

Physical Sciences: Friction & Simple Machines Topic Test

Year 7 Science

Assessment weighting: 10%

Name: SOLUTIONS

Time allowed:

There is no separate reading time for this paper.
Working time: One Period

Materials required/recommended for this paper

To be provided by the supervisor
Standard items: This Question/Answer booklet
Special items: Nil

To be provided by the candidate
Standard items: Pens, pencils, eraser, ruler, highlighter
Special items: Nil

Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

	Score	Marks Available
Multiple Choice		11
Short Answer		15
Total		26

Section 1 - Multiple Choice

(10 marks)

CIRCLE ONE CORRECT ANSWER

1. Which of the following things can a force do?
   A. Start motion
   B. Stop motion
   C. Change the direction of motion
   D. Change the shape of an object
   E. All of the above

2. Force is measured in units of:
   A. kilograms.
   B. grams.
   C. newtons.
   D. centimetres

3. A simple machine is best described as a device that:
   A. performs tasks without human assistance.
   B. makes a physical task easier.
   C. uses electricity to do work.
   D. is controlled by a computer.

4. The turning point of a lever is:
   A. its centre.
   B. the load.
   C. the fulcrum.
   D. the base.

5. The push or pull on a lever needed to cause movement is called the:
   A. effort.
   B. load.
   C. force.
   D. fulcrum.

6. Which **TWO** of the following are inclined planes?
   A. A level table top
   B. A screw
   C. A gear
   D. A wedge
   E. A pulley

7. The centre of a wheel and axle is the:
   A. axle. ← Allow A as well.
   B. pulley.
   C. wheel.
   D. pivot. ← Best answer

8. A second-class lever has:
   A. the effort between the load and fulcrum.
   B. the fulcrum between the effort and load.
   C. the load between the effort and fulcrum.
   D. two fulcrums.

9. Which of the following is NOT a lubricant?
   A. Ball bearings
   B. Oil
   C. Butter
   D. Grease

10. The more pulleys in a system, the:
   A. greater the distance you have to move.
   B. greater the force you need to apply.
   C. less you need rope.
   D. less distance you have to move.

11. A ramp is:
   A. a machine.
   B. not a machine, but is used by machines.
   C. a fourth-order lever.
   D. a device involving rollers used to move heavy objects.

Section 2 - Short Answer (15 marks)

PLEASE ATTEMPT EVERY QUESTION

1. Explain how a ramp reduces the effort required to lift a load.

- Force required is less. (1)
- The distance travelled is longer. (1)
- Shifts the load to the same height with less effort.

(2 marks)

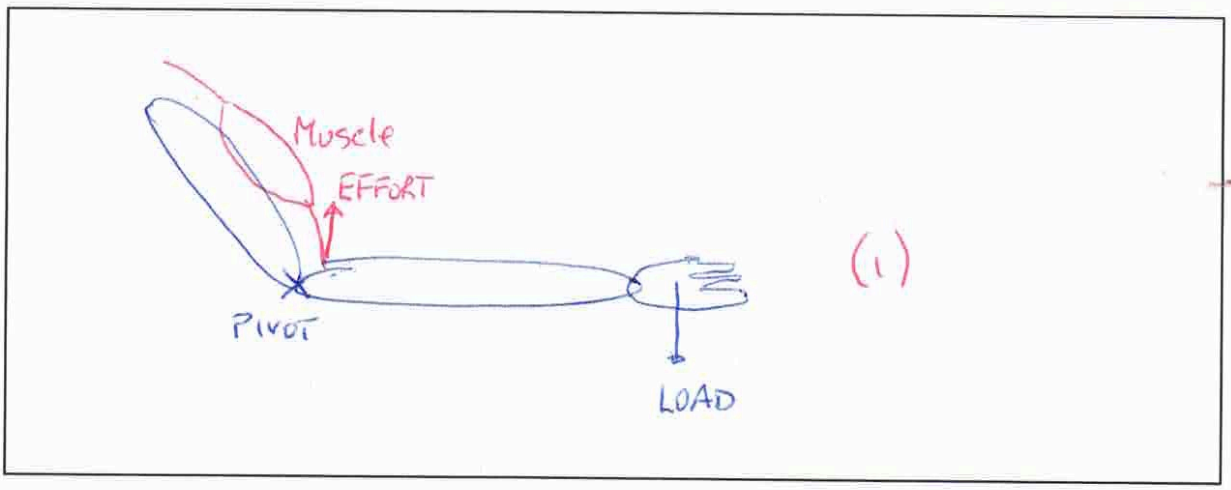
2. The human body has many levers.

a. **State** one lever in your body
b. **Explain** how it can be used as a simple machine.
c. **Use** a labelled diagram to help you.

a. arm (1)

b. • Load is in the hand.
• Bicep muscle applies effort to the forearm. } (1)

c.

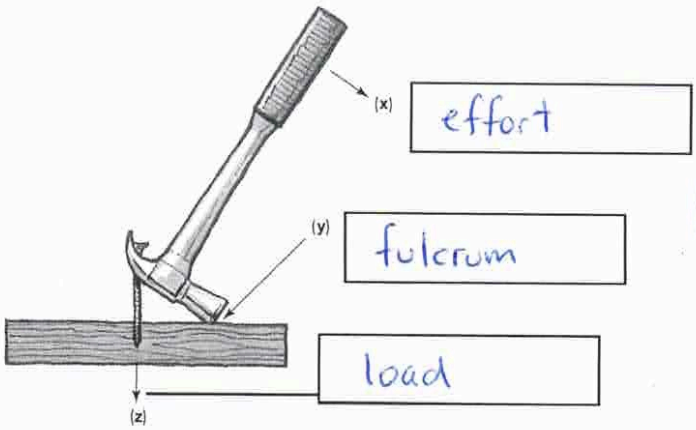


(1)

(3 marks)

3. A hammer is an example of a simple machine.

a. Use these words to label the diagram: **fulcrum, effort, load**



[1 mark each]

(3 marks)

4. Tennis players often wear sweat bands around their wrists.

a. Why do they do this?

- Absorbs sweat before it reaches their hand.
- Have maximum friction (grip) on the handle.

(2 marks)

b. If they did not wear the cloth band, what might happen?

- Sweaty hand reduces friction.
- Racquet may fly out of their hand.

5. Give an example of a situation where **friction** makes a task more difficult, and **suggest** a method of reducing the friction in that situation.

Task that friction makes more difficult

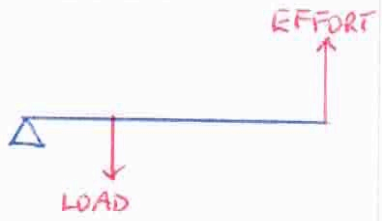
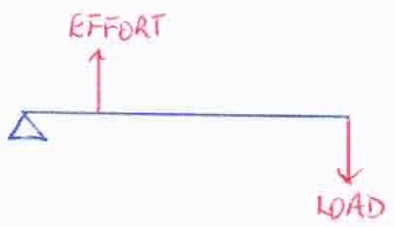
- Bearings on skate board are dry and stiff. (1)

I can reduce friction in this task by:

- Lubricate with graphite (1)

(2marks)

6. Use a diagram to explain the difference between first class, second class and third class levers.

First class lever	Second class lever	Third class lever
		

[1 mark each]

(3 marks)

END OF TEST