YEAR 8 SCIENCE – ENERGY TEST REVISION

The following equations may be useful:

$$GPE = m \times g \times h$$

$$KE = {}^1\!/_2\, mv^2$$

1 Define the term ENERGY; _____

2 Classify the following types of energy as either Kinetic (K) or Potential (P) and give 2 examples of each.

	K or P?	TWO EXAMPLES		K or P?	TWO EXAMPLES
Chemical			**Elastic**		
Mechanical (motion)			**Electrical**		
Sound			**Gravitational**		
Radiant (light)			**Thermal (heat)**		

3 Identify which factors affect the total amount of:

    a) Kinetic energy; _____ and _____

    b) Potential energy; _____ and _____

4 a) Explain the difference between an energy transfer and an energy transformation.

_____

_____

_____

b) Complete the following sentences using the words **transferred** and/or **transformed**.

On a table, when you slide a box across it, the chemical energy in your body is

_____ to kinetic energy to move your hand. When you push the box, the kinetic

energy in your hand is _____ to move the box.

5 Define what is meant by *wasted* energy; _____

_____

6 Identify the **units** needed for each of the following in the KE and GPE formulas:

a) mass _____

b) velocity _____

c) time _____

d) height _____

e) gravitational acceleration _____

f) Kinetic energy _____

g) Potential energy _____

7 Draw an energy chain to show what energy transfers/transformations occur during the following processes;

a) A violin makes a sound when you draw the bow across the string. (starting with a person moving the bow).

b) A car driving along a road

8 a) State The *Law of Conservation of Energy*; _____

_____

_____

b) Answer *True or False* for each of the following statements about the Law of Conservation of energy:

_____ The totals of all energy transfers and transformations when work is done must equal the initial energy put into the system.

_____ Energy not used to do work can be given off as waste energy.

_____The energy stored in a stretched spring is equal to the energy required to stretch that spring plus the energy lost as heat to friction.

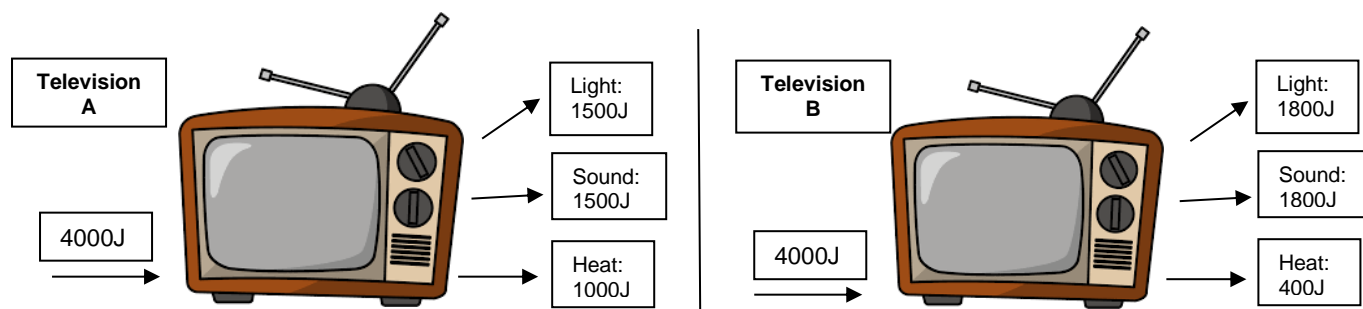**9** Consider the points A, B, C and D on the missile launch diagram below:
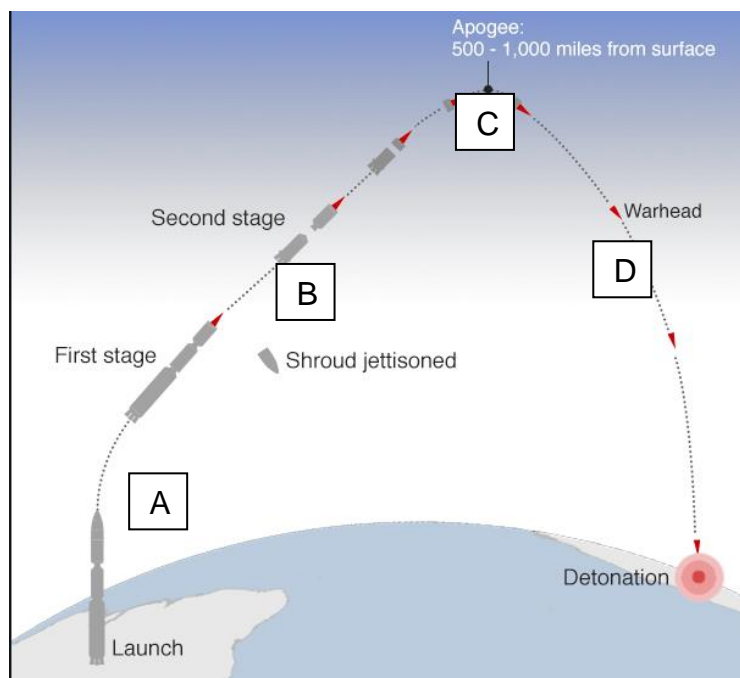
a) At which point (A, B, C or D) does the missile have the **least** gravitational potential energy? Explain. _____

b) At which point (A, B, C or D) does the missile have the **greatest** amount of kinetic energy? Explain. _____

c) At which point (A, B, C or D) does the missile have the **greatest** gravitational potential energy? Explain. _____

10 Complete the table below to identify the energy transformation caused by each energy converter:

Main energy form **used**	Energy converter	Main energy form **produced**
	light bulb	
	speaker	
	car	
	bicycle	
	plant	

11 Compare the waste energy of television A with television B shown below and explain which television would be considered the best to use.

| Television A | 4000J | Light: 1500J | Sound: 1500J | Heat: 1000J |

| Television B | 4000J | Light: 1800J | Sound: 1800J | Heat: 400J |

_____

_____

12 Classify the following as a type of potential energy or kinetic energy (use the letters KE or PE)

a. A bicyclist pedaling up a hill _____   **f.** An archer with his bow drawn _____

b. A volleyball player spiking a ball _____   **g**. A baseball thrown to second base _____

c. The chemical bonds in sugar _____   **h**. The wind blowing through your hair _____

d. Walking down the street _____   **i.** Sitting in the top of a tree _____

e. A bowling ball rolling down the alley _____   j. A bowling ball sitting on the rack _____

13 The diagram below shows a basketball after it has been thrown by a player:
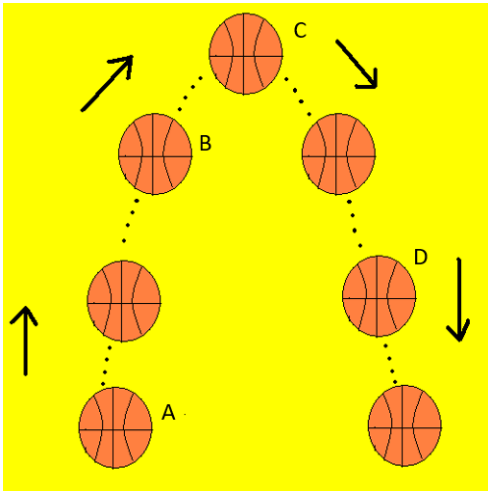
Choose the graph below that best represents the potential and kinetic energy of the ball at each labelled position (A,B,C and D). Explain your choices.

A = graph _____   B = graph _____   C = graph _____   D = graph _____

Graph 1	Graph 2	Graph 3	Graph 4	Graph 5
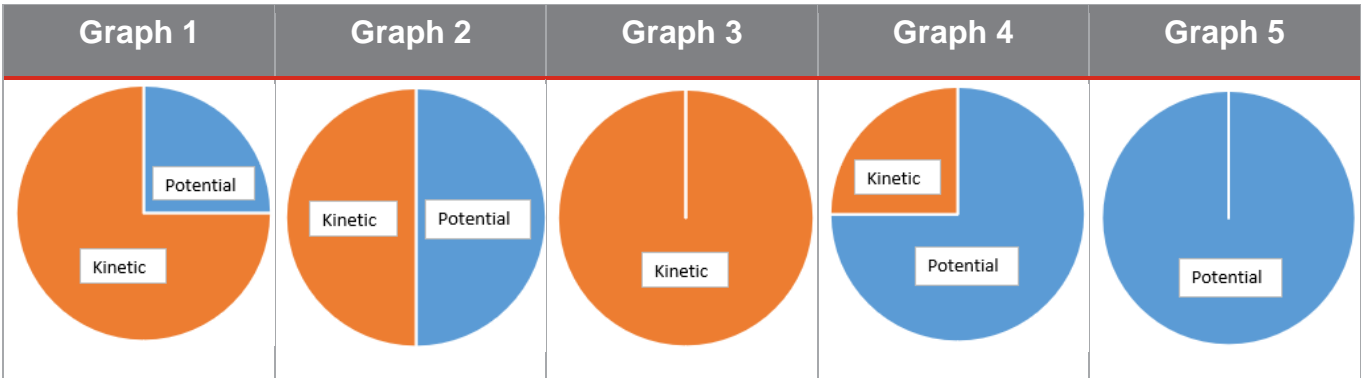
14 Calculate the kinetic energy of a 2.56 kg ball travelling at 16 m/s

15 Fearless Felix is on his balloon 30,000m in the air above the ground. With all his equipment his mass is 145kg. Calculate his gravitational potential energy before he jumps.

16 A rollercoaster is at the top of its climb at 82 metres and weighs 900kg. Calculate the GPE of the roller coaster.

17 Calculate the KE of a bike rider who has a mass of 55kg and riding 3m/s.

18 For each of the following, **identify which type of energy** is being described, **then calculate it.**

    a) You serve a volleyball with a mass of 2.1 kg. The ball leaves your hand with a speed of 30 m/s.

    b) A baby carriage is sitting at the top of a hill that is 21 m high. The carriage with the baby weighs 12kg.

    c) A car is traveling with a velocity of 40 m/s and has a mass of 1120 kg.

    d) A block is sitting on a platform 20 m high. It weighs 79 kg.

    e) A roller coaster is stopped at a 72 m high point and weighs 966 kg.

19 Calculate the kinetic energy of a 3-kilogram ball that is rolling at 2 metres per second.

20 Two objects were lifted by a machine. Object X had a mass of 10 kilograms, and was lifted at a speed of 4 m/sec. Object Y had a mass of 20 kilograms and was lifted at a rate of 8 m/sec.

a. Which object had more kinetic energy while it was being lifted?

b. Which object had more potential energy when it was lifted to a distance of 10 metres?
  Show your calculation.

INVESTIGATION

A pair of students wanted to test which ball material created the loudest sound when they drop it. They conducted an experiment where they dropped the same sized ball from 2m and each ball was made of a different type of material. They recorded the level of sound made by each ball. The results are in the table below.

BALL MATERIAL	Loudness of ball bounce (dB – decibels)		
	TRIAL 1	TRIAL 2	AVERAGE
Rubber	110	150	
Silicon	55	62	
Leather	80	91	
Steel	200	220	

1) Complete the table above by calculating the average sound level of each material.

2) a) State the independent variable for this investigation.

b) State the dependent variable for this investigation.

c) Suggest TWO control variables.

3) Suggest one source of error for this investigation.

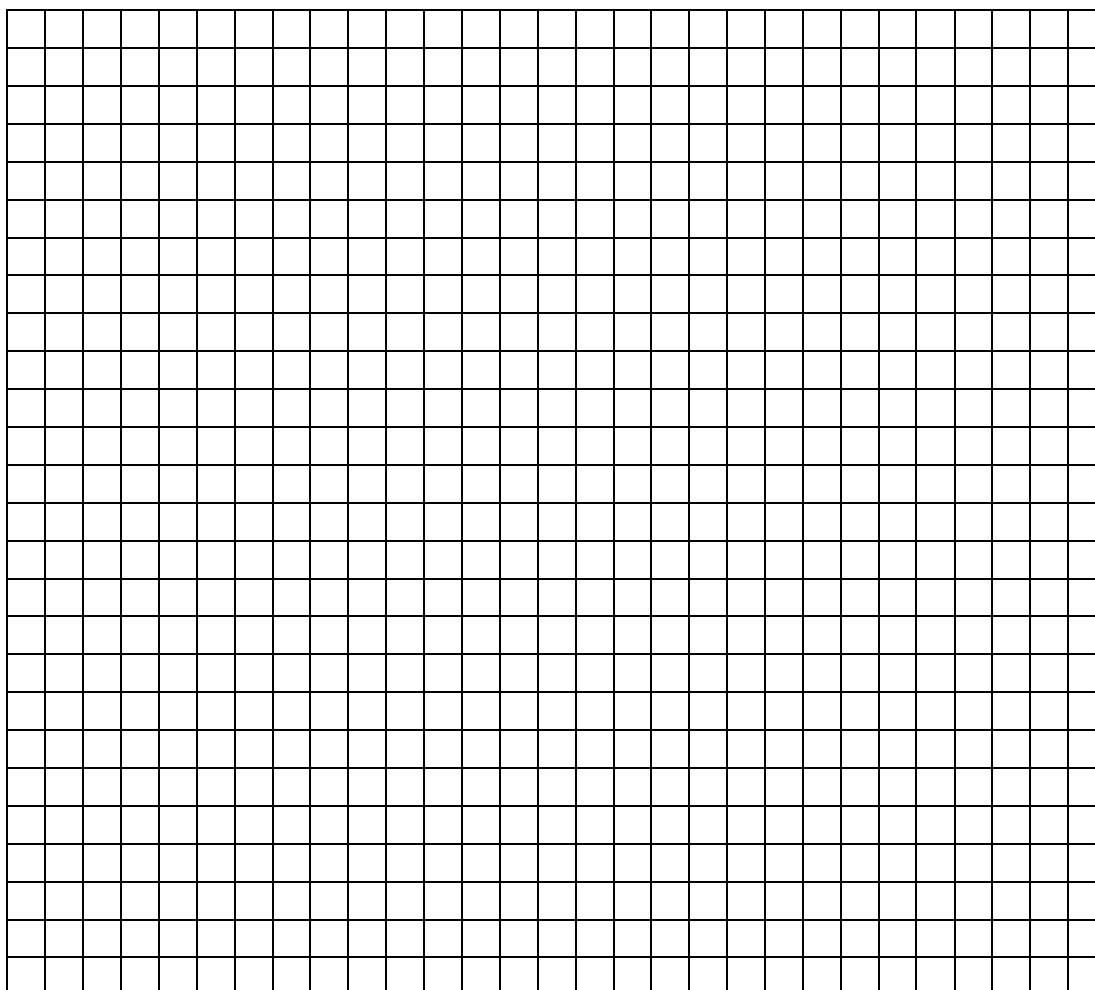4) Suggest one way they could improve the reliability of this experiment.

5) Suggest one way they could improve the validity of this experiment.

6) Graph the average results below.

7) Write a conclusion for this experiment.

_____

_____

_____

GOOD LUCK FOR YOUR TEST!!!!