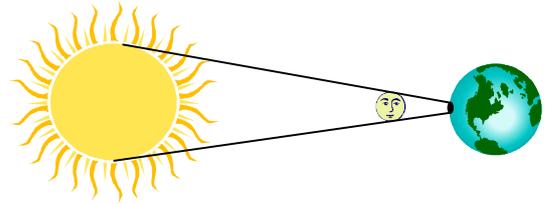


# CURVES

## Eclipse Discussion Sheet

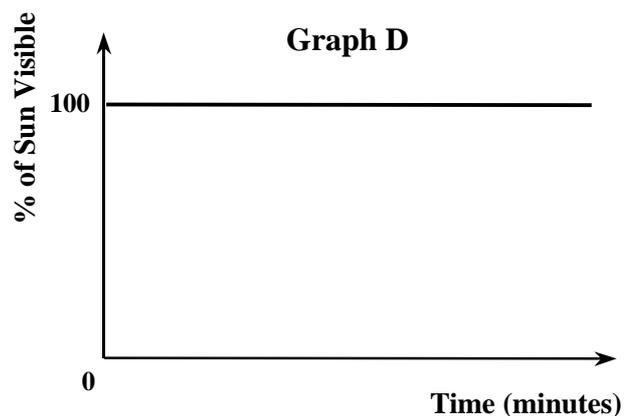
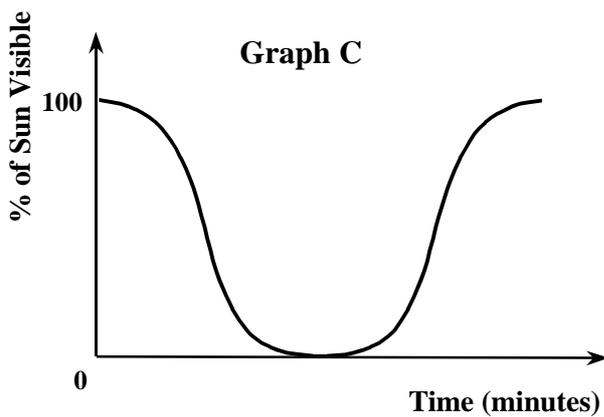
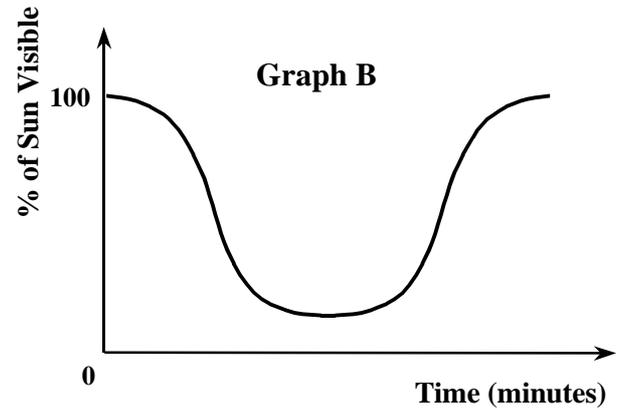
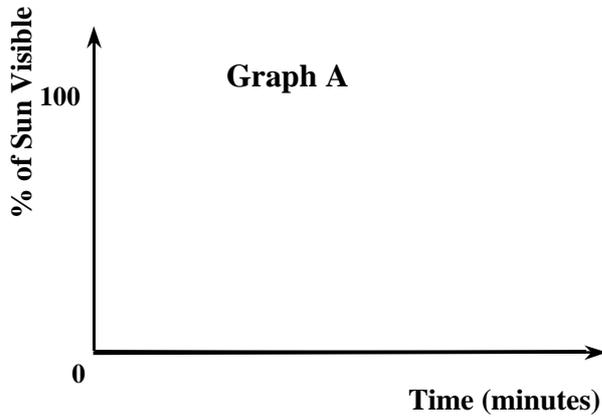


What happened on 11<sup>th</sup> August 1999 at about 11.15 (Greenwich Mean Time)?

Comments from around the world:

- Alderney 'I saw a total eclipse. The sun disappeared completely.'
- NE England 'It went dim for a while but the sun didn't completely disappear.'
- New Zealand 'It was night.'
- South Africa 'We didn't see any eclipse. The sun shone all day.'

Graphs can tell the stories:



Choose a graph for each place. Explain your choices.



# CURVES

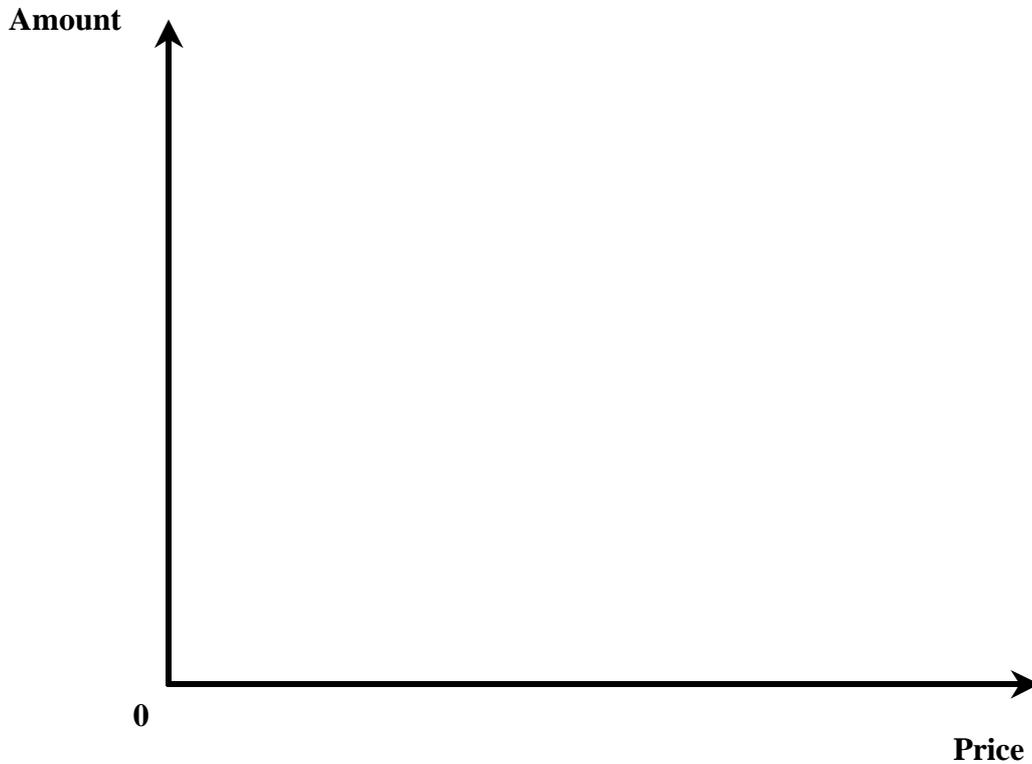
## Sales Discussion Sheet

SALE



When prices go down people buy more.  
The higher the price, the more will be offered for sale.

Using the same axes sketch a curve for each of these statements.



What could the units be for each axis?

What difference would it make if the goods were essentials?

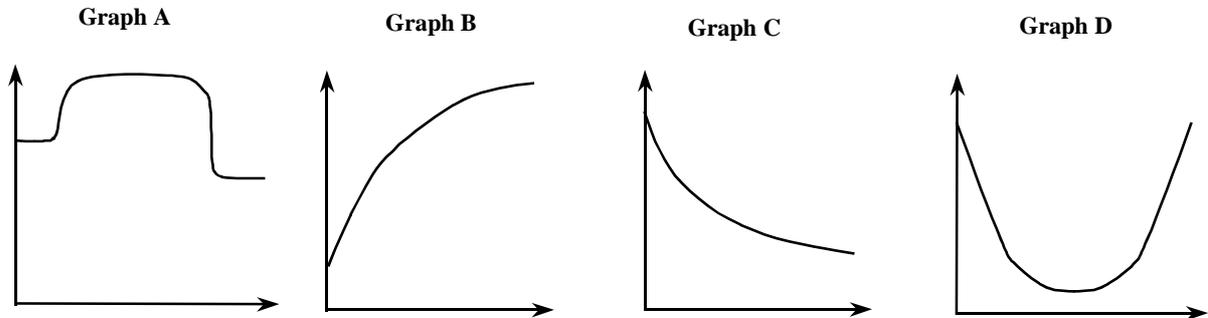
What if they were luxuries?

What would happen to each curve if the manufacturer funded a big advertising campaign?



# CURVES

1

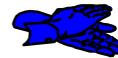


Which of these graph shapes do you think could represent the following. What do you put on each axis? What about the units? Explain what information is given by the points where the curves meet the axes.

(a) Your height since you were born.



(b) The sale of gloves during a year (starting from January).



(c) The water level before, during and just after your bath. (not including filling and emptying the bath)



(d) The value of a car over the last few years.



2 For each of the following sketch a possible graph.

(a) My cup of coffee is cooling down.



(b) Sales of a new type of ice-cream brought onto the market.



(c) The amount of margarine people buy depends on the price of butter.



Give reasons for the shapes of the curves you have drawn.

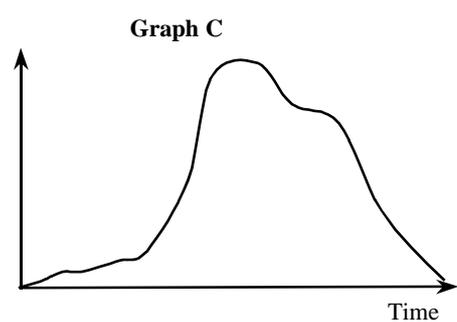
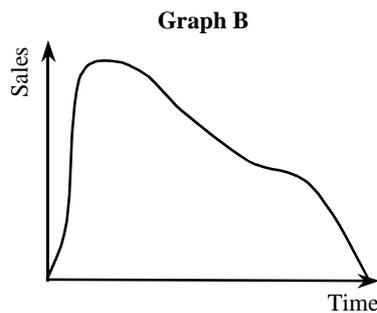
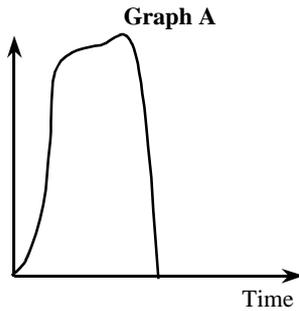


3. The pop group 'Anonymous' have released three CDs.

- CD1 sold slowly at first until it was played on Radio 1.
- CD2 went to number 1 in less than a week.
- CD3 also did well at first, but then the lead singer insulted the fans!



For each CD choose the graph that you think shows how sales went:

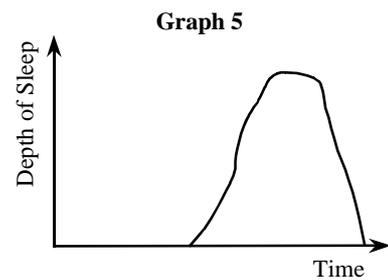
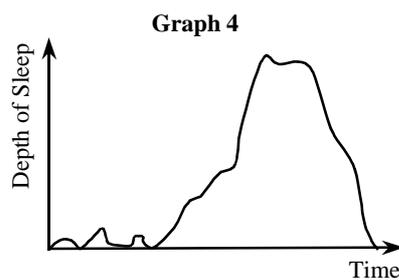
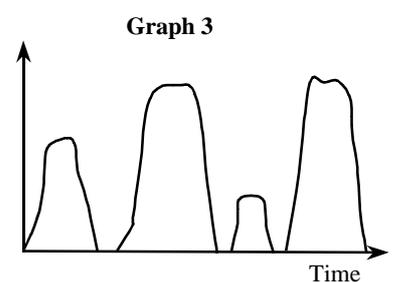
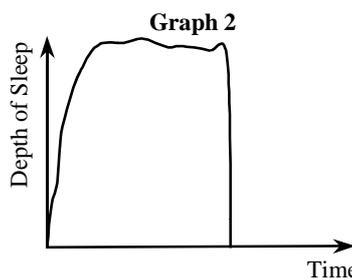
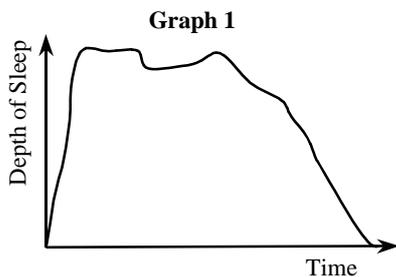


4. How did you sleep last night?

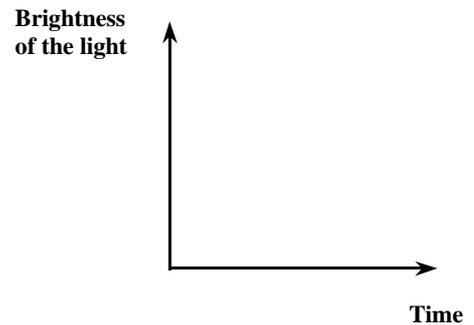


- James: Really well until a pair of cats decided to have a fight in our back garden!
- Karen: I was wide awake! By the time I got to sleep it was nearly morning!
- Libby: Great! I got to sleep straight away and slept 'till morning.
- Mike: I dozed for ages before dropping off.
- Nasir: I kept waking up. Must have been the cheese!

Which graph fits which description?



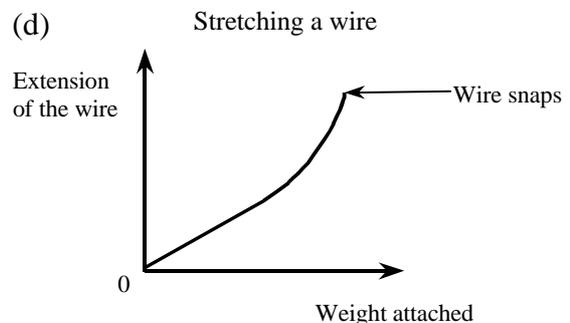
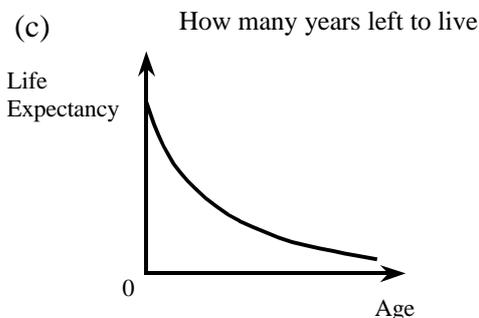
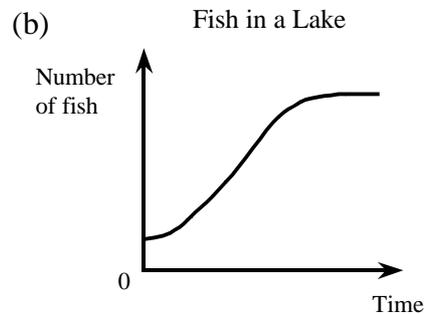
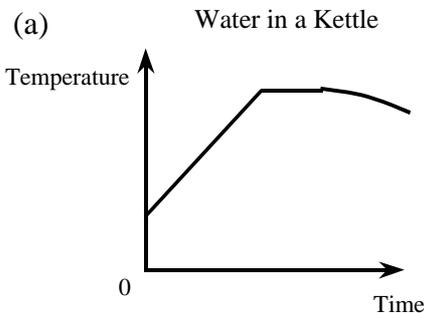
5. For each part copy the axes and sketch a graph.
- (a) I could hardly see the light at first but then it got brighter and brighter.
  - (b) The light kept flashing on and off.
  - (c) The light was bright for a long time then it suddenly went out.
  - (d) The light was very bright at first, but then it faded gradually away until I couldn't see it at all.



- 6 Sketch a graph for each of the following. Put distance travelled on one axis and time on the other. Give reasons for the shapes of your graphs.
- (a) I was walking to the shops when I met a friend. I stopped to talk to him.
  - (b) I was walking to the bus stop when I saw the bus coming. I had to run to catch it.
  - (c) I was doing really well in the race when I tripped over. I picked myself up and limped to the finishing line.
  - (d) I waited for a long time before I realised I'd been stood up. I trudged home thinking of all the things I'd say next time we met!

Here are more graphs which tell a story. Explain them.

7

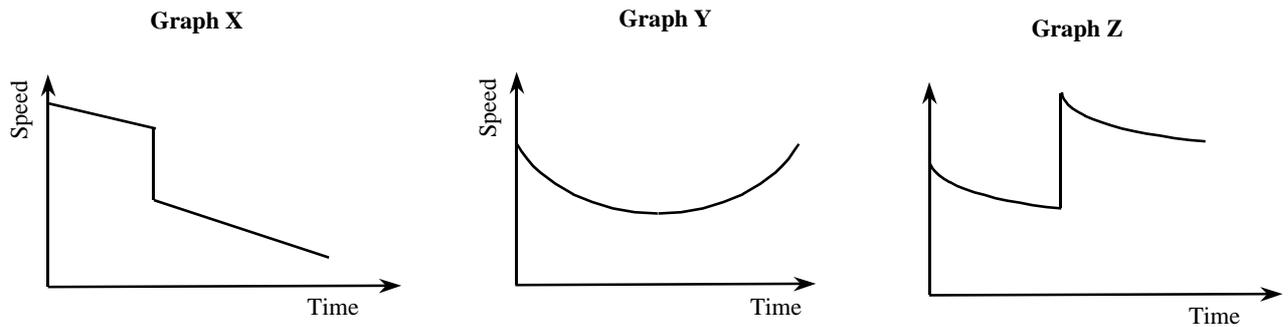


8. Balls

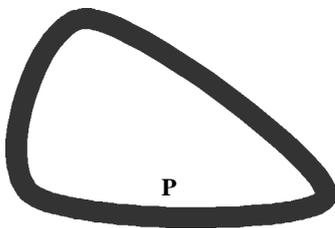


A football is lobbed from one player to another.  
 After being hit a snooker ball rebounds from a cushion.  
 A tennis ball is returned by a player.

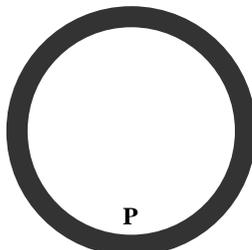
Each graph shows the speed of one of these balls during the motion described.  
 Which graph is which?



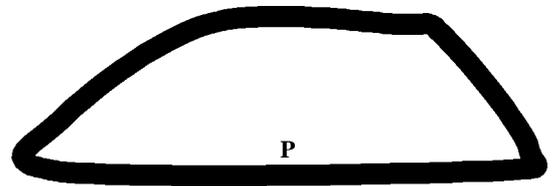
9. The sketches show some simple racing circuits. The graphs show the speed of a motorbike during one clockwise lap of the circuit with zero time taken when the motorbike passes the point marked P. For each circuit say which graph you think represents the speed.



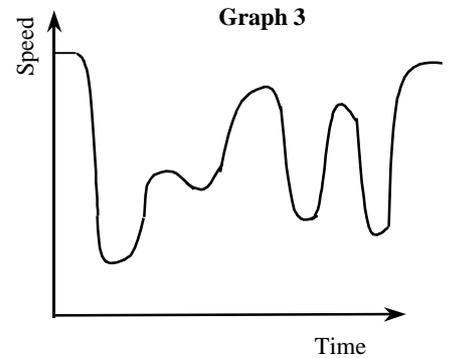
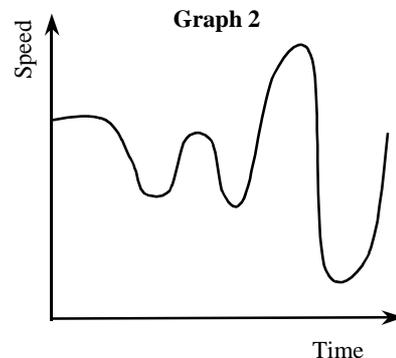
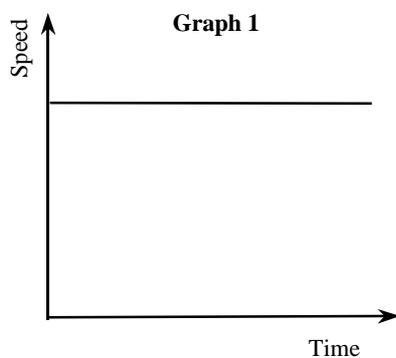
Circuit A



Circuit B



Circuit C



Design a simple circuit of your own and sketch a possible speed time graph.  
 Explain your choice of graph shape.



**Teacher Notes**

**Unit** Intermediate Level, Handling and interpreting data

**Skills used in this activity:**  
Interpretation and sketching line graphs

**Preparation**

For the class you need:

- a copy of the discussion sheets (pages 1 and 2) for each student or copies of the statements and graphs on OHP or the board
- a copy of the exercise (pages 3 – 5) for each student

**Notes on the Activity**

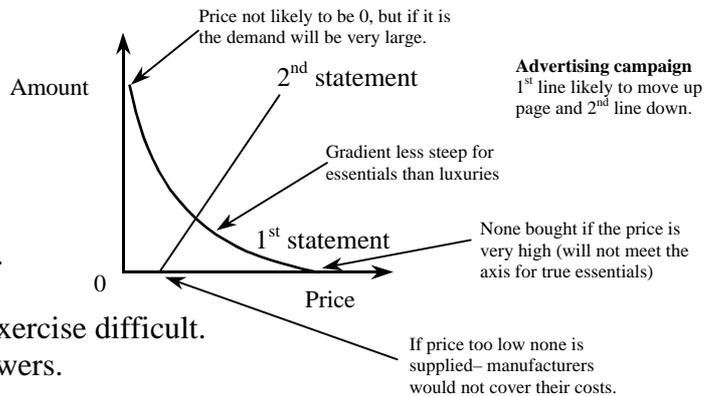
The activity focusses on the shapes of curves.  
The discussion sheets can be used, together or separately, to introduce the topic.

**Answers for the Eclipse Discussion Sheet :**

Alderney – Graph C, NE England - Graph B, N. Zealand – Graph A, S. Africa – Graph D  
A lot of time could be spent discussing these curves and possible variations. (eg what would happen if there were clouds in S Africa, what would happen at dawn in N Zealand)

**Answers for the Sales Discussion Sheet:**

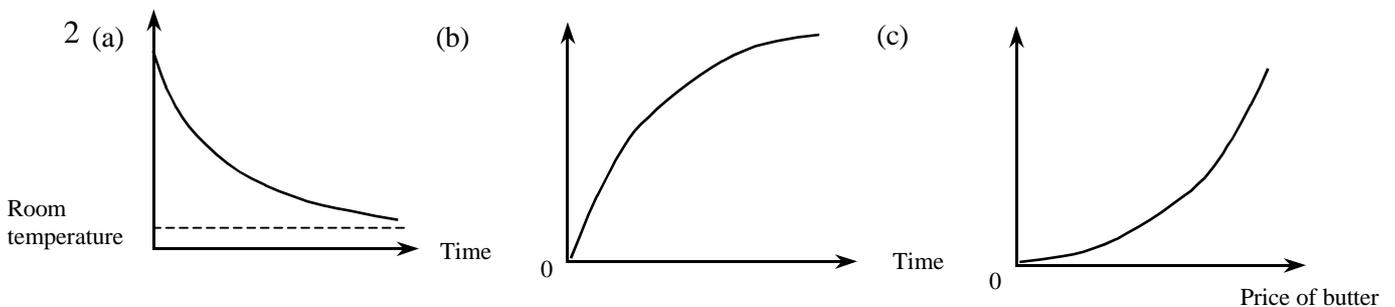
Straight lines or curves as shown (shape, gradient, intercepts etc depending on the commodity bought).  
Again a lot of time could be spent discussing the questions suggested and related ideas (eg point of intersection).



Students may find some questions in the exercise difficult.  
Allow time for a full discussion of the answers.

**Answers to Exercise** (N.B. The sketches give only a rough indication of the shapes)

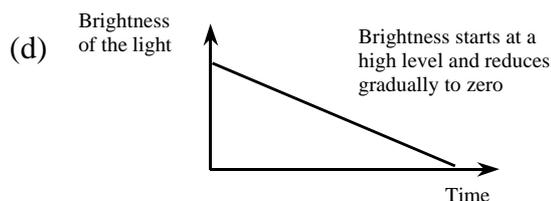
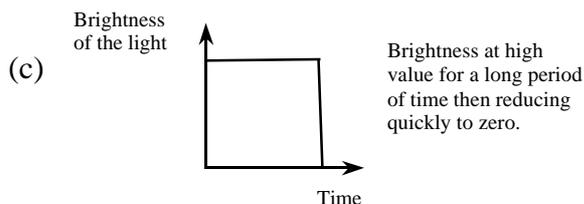
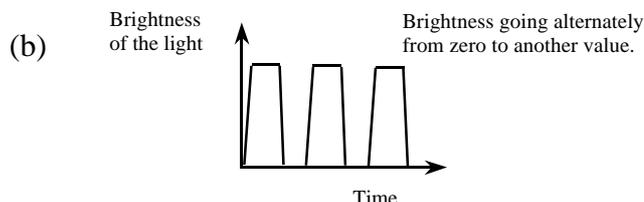
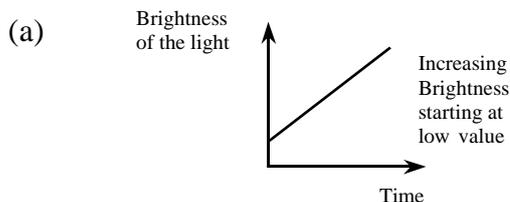
- 1 (a) Graph B (b) Graph D (c) Graph A (d) Graph C



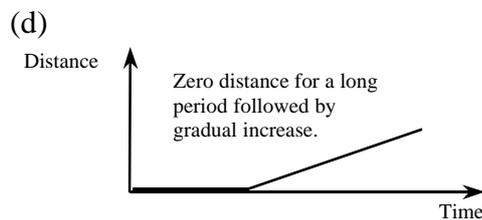
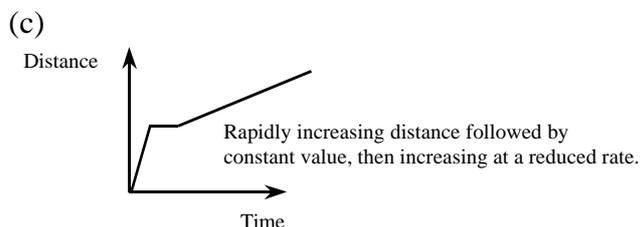
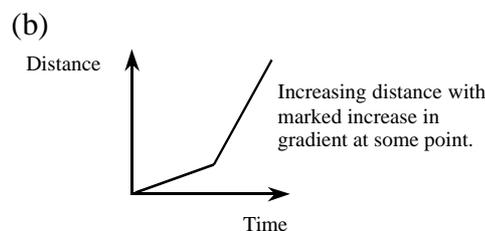
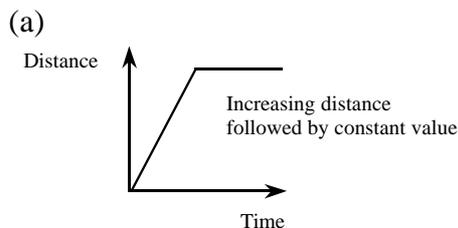
- 3 CD1 Graph C CD2 Graph B CD3 Graph A  
4 James: Graph 2 Karen: Graph 5 Libby: Graph 1 Mike: Graph 4 Nasir: Graph 3



5 Straight lines or curves with features indicated below:



6 Straight lines or curves with features indicated below:



- 7
- (a) Temperature steadily increases, then remains constant for short time when kettle boils. Kettle is then switched off and water begins to cool down.
  - (b) Small number of fish initially in the lake. Population increases slowly at first then more quickly and steadily. Eventually rate of increase of population slows down and population approaches a constant size.
  - (c) At birth life expectancy is high but reduces with age. The rate of decrease reduces so that at an elderly age life expectancy is low and almost constant.
  - (d) When no weight is attached there is no extension in the wire. At first the extension is proportional to the weight attached, but later the wire stretches more for each additional weight until the wire snaps.

8 Graph X – Snooker ball

Graph Y – Football

Graph Z – Tennis ball

9 Circuit A – Graph 2

Circuit B – Graph 1

Circuit C – Graph 3

