Friday, October 26/12
Science 10

Announcements

1. Quiz: Yesterday - Average Acceleration Problems } Rewrite ⇓ ~ Wed lunch
2. Roller Coaster Project
3. Understanding Concepts: Page 393 #2-6, 8, 11, 12
4. ICA: Speed, Time and Acceleration
5. Chapter 10 - Review
   Page 410 - Understanding Concepts #2, 4, 7, 9, 10, 14 } HW

Roller Coaster

1. # of people doing the project
   -> individual, pair, three
   ⇓ roles

2. Presentation:
   -> written report
   -> Powerpoint
   -> Prezi
   -> SMART Notebook
   -> Glogster -> online poster
   -> Poster => bristol board
   -> Video => online
   -> speech
   -> model.

=> Content
   -> deaths *
   -> name
   -> holds records *
   -> g's
   -> highest point
   -> top speed
   -> time for ride.
   -> calculations *
   -> location
   -> first roller coaster *
   -> materials => wood
      => steel
   -> designer.
   -> elements => loop
      => research.

[Dec. 7 | 12]
⇓

Roller Coaster Project

1. How to present information:
   - -> model
   - -> report => written
   - -> PowerPoint
   - -> Poster => online / bristol board
   - -> Comic => online / paper
   - -> Video => from online / made

2. Content:
   - -> Name of roller coaster ①
   - -> Picture of the roller coaster ①
   - -> g's =>
   - -> Time to build
   - -> #People on project *
   - -> Time for ride
   - -> Expense
   - -> highest point
   - -> elements -> loop -> research
   - -> materials => wood => etc.
   - -> designer
   - -> location
   - -> year built
   - -> safety

Due Date: Dec 7/12

=> Share / Present

=> Individual, Pair, Three

Understanding Concepts

1. How can you tell from a speed–time table whether an object is accelerating?
2. How can you tell from a speed–time graph whether an object is accelerating?
3. Sketch a speed–time graph with two separate labelled lines for
   (a) high positive acceleration;
   (b) low negative acceleration.
4. What feature of a speed–time graph communicates
   (a) the acceleration?
   (b) the distance travelled?
5. Two runners, Cathryn and Keir, take part in a fundraising marathon. The graph in **Figure 7** shows how their speeds change for the first 100 s from the start of the marathon.

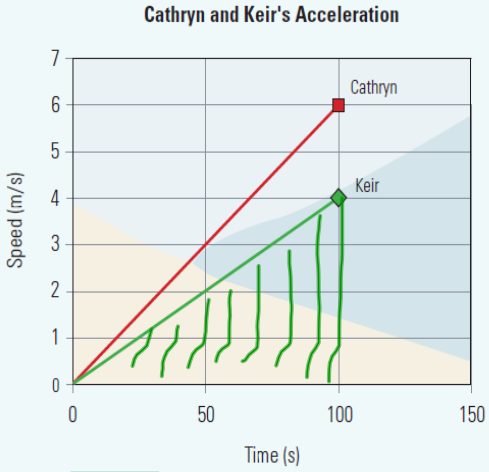


Figure 7

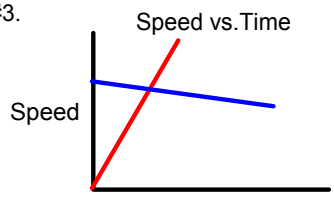
   (a) Which runner has the greater acceleration? Show this by calculating the acceleration of each.
   (b) Which runner is ahead after 100 s? Calculate and compare the distance travelled by each.
6. The cheetah is the fastest land animal and can accelerate rapidly in an attack. **Table 3** shows some typical speeds and times for a cheetah.
   (a) Draw a speed–time graph using the information in **Table 3**.
   (b) Using your graph, calculate the average acceleration of the cheetah.
   (c) Using your graph, calculate the total distance travelled by the cheetah by the end of 2.0 s.

Table 3 **Acceleration of Cheetah**

Time (s)	Speed (m/s)
0.0	0.0
0.5	5.0
1.0	10.0
1.5	15.0
2.0	20.0

#2. If the line on a speed-time graph has a positive slope or a negative slope the object is accelerating.

#3.



#4. a) Slope communicates acceleration.
b) Area under the line communicates the distance travelled.

#5. a) Based on the slope of the graphs, Catherine has the greater acceleration.

Cathryn: acceleration = 0.060 m/s^2
Keir: acceleration = 0.040 m/s^2

b) Cathryn: distance = 3.0 x 10^2 m
Keir: distance = 2.0 x 10^2 m

Cathryn is 1.0 x 10^2 m ahead of Keir.

6. a) Graph
b) 10 m/s^2

$A = \frac{1}{2}bh$

$d = A = \frac{1}{2}bh$.

Page 393, #6

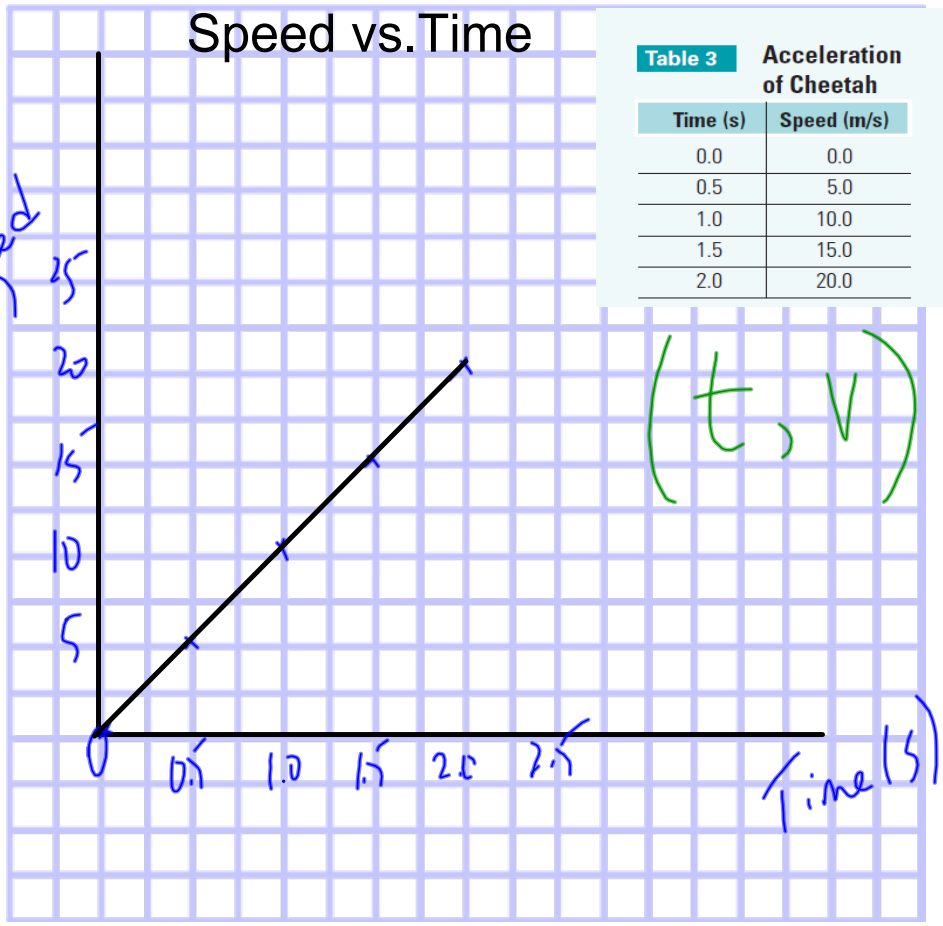


Table 3 Acceleration of Cheetah

Time (s)	Speed (m/s)
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1.5	15.0
2.0	20.0

Speed vs.Time

8. Sketch and label distance–time and speed–time graphs for constant speed and a speed–time graph for constant acceleration (three graphs in total).

Speed

11. Clayton sets out on his motorcycle. His speed at different times is shown on the graph in **Figure 8**.

Time

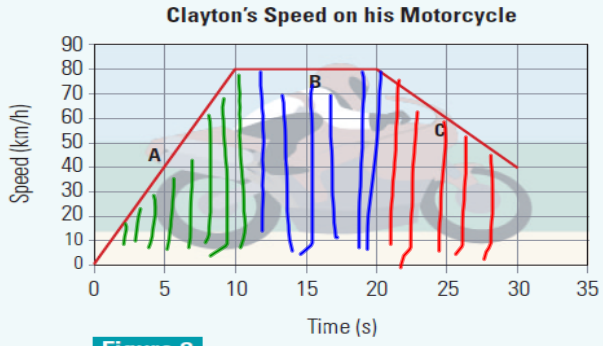


Figure 8

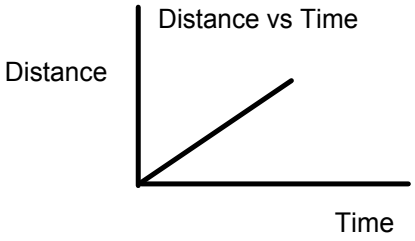
(a) Calculate the accelerations during each of the time intervals, A, B, and C.

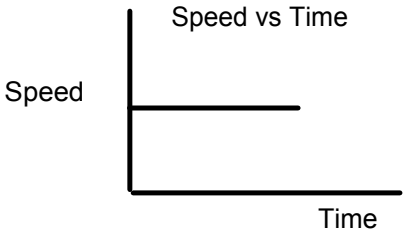
(b) Without calculating, list the time intervals during which the distances travelled are, in order, from largest to smallest.

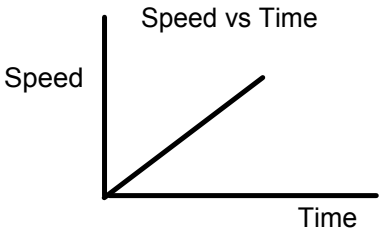
Reflecting

12. What assumption have you been making about acceleration in this chapter?

8. Graphs







11. Interval A: 8.0 m/s^2
Interval B: 0 m/s^2
Interval C: -4.0 m/s^2

12. We've assumed acceleration is constant.

Chapter 10 - Review

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2. Match the type of speed in the first column of Table 1 with its definition in the second column.

Table 1 Definitions of Speed

Type	Definition
A. constant speed	1. a speed calculated over the entire trip
B. average speed	2. a speed at a particular moment in time
C. instantaneous speed	3. a speed that does not change over time

4. Properties of a graph, such as slope and area, usually have some significance. Copy Table 2, and state what the slope or area represents, if anything, for the property indicated. If there is no significance, write "none."

Table 2 Features of Graphs

Type of Graph	Slope	Area under Line
distance-time		
speed-time		

7. A motorboat accelerates from rest to a final speed of 6.0 m/s in a time of 3.0 s. What is the average acceleration of the motorboat?

9. A mallard duck, resting on the water, takes off and reaches a speed of 35 km/h in 4.0 min. Calculate the average acceleration of the duck.

10. While pulling a barge, a tugboat accelerates at 0.10 m/s^2 to produce a 5.0 m/s change in speed of the barge. How long did this take?

14. The speed and time record for a high-speed dragster is shown in Table 4.

Table 4 Speeds of a Dragster

Time from Start (s)	Instantaneous Speed (m/s)
0.0	0.0
1.0	9.8
2.0	19.8
3.0	29.6
4.0	39.6
5.0	49.5

(a) Plot and label a speed–time graph of this information.
(b) Using your graph, determine the average acceleration of the dragster.
(c) How far did the dragster travel from 0 to 5.0 s?