Science 10
Module 4 Blackline Masters

This blackline master CD is designed to accompany Open School BC's ***Science 10*** course. The CD includes student worksheets and materials for teachers to make their own overhead transparencies or photocopies stored as modifiable Microsoft Word documents. The course and blackline master were developed by BC teachers, instructional designers, graphic artists, and multimedia experts.

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Try It Out! (Density Layers) and GP 1.1D 1: Try It Out! Results
GP 1.1D 3: Name That Layer!
SA 1.1

GP 1.2B 1: Oceanic-Continental Plate Boundaries
GP 1.2B 2: Oceanic-Oceanic Plate Boundaries
SA 1.2

Mod 2

GP 2.1A 2: The Number of Subatomic Particles
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GP 2.1A 6: Isotope Practice Activities
GP 2.1B 1: Ionic or Covalent?
GP2.1B 2: Covalent Combining Capacities
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GP 2.2A 1: Comparing Acids, Bases and Salts
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GP 2.2D 1: Naming Covalent Compounds
GP 2.2D 2: Formula Writing for Covalent Compounds
GP 2.2D 3: Names and Formulae of Acids
SA 2.2

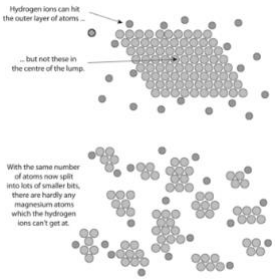
In one document (called "Naming Organic Compounds"), combine the following items from Lesson 2.3B:

- Graphic: Ethane, Ethene, Ethyne
- Graphic: Number Prefixes Used in Organic Compounds
- Table with "number of carbons" and "prefix"

SA 2.3

Symbols Used in Chemical Equations (table from Lesson 2.4A)
GP 2.4A 1: Balancing Equations
GP 2.4B 2: Classifying Reactions
Summary of Reaction Types (table from Lesson 2.4B Summary)

Surface Area and Reaction Rate (from Lesson 2.4D include the following text and the graphic (shown in the screen shot below)
"To illustrate the effect of surface area on reaction rate, let's look at the reaction between magnesium metal and dilute hydrochloric acid). The reaction involves collisions between hydrogen ions (found in the dilute acid solution) and the magnesium metal.
$Mg_{(s)} + 2H^{+}_{(aq)} \rightarrow Mg^{2+}_{(aq)} + H_{2(g)}$ "



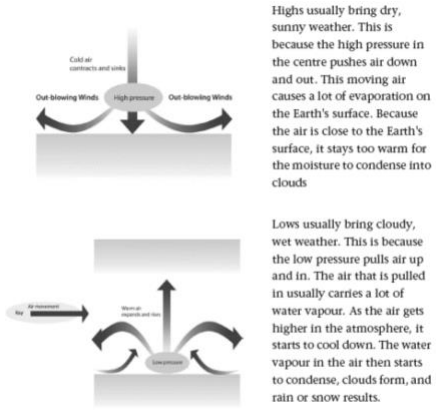
SA 2.4

GP 2.5A 2: Vocabulary Matching Quiz
SA 2.5

Mod 3

Table: States of Matter (from lesson 3.1A)
Try It Out! Heat Transfer (from Lesson 3.1B)
Summary of Heat Transfer (table from Lesson 3.1B summary)
Graphic: Energy From the Sun (from lesson 3.1D)
SA 3.1

High and Low Pressure Systems (as shown in screen capture below)

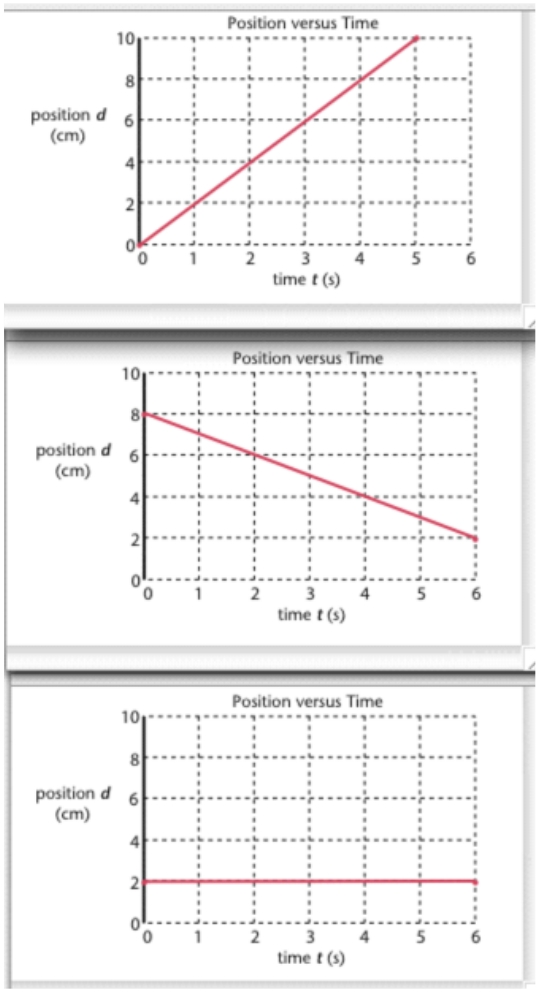


GP 3.2B 1: Weather and Pressure
SA 3.2

SA 3.3

Mod 4

Slope of "Position vs. Time" Graphs (graphics and content from Lesson 4.1D. I set it up below with screen shots to show how I'd like it set up. I only used a table to make it easier for myself – you don't need to use a table.)

Slope of "Position vs. Time" Graphs	
Positive Slope A positive slope means a positive constant velocity. The object could be moving • forward • to the right • north • east **Negative Slope** A negative slope means a negative constant velocity. The object could be moving • backward • to the left • south • west **Zero Slope** A horizontal line (zero slope) means that vav = 0. This means that the object is not moving at all	

GP 4.1D 3: Slope and Velocity
SA 4.1

GP 4.2A 2: Acceleration
GP 4.2B 2: Positive Acceleration and Velocity-Time Graphs
GP 4.2C 2: Graphing Negative Acceleration
GP 4.2C 3: Velocity versus Time Graphs
Acceleration Due to Gravity (from Lesson 4.2D. Please include the graphics and text on pg 91-92 describing motion of a ball. If possible, arrange so it fits on one page. Would be nice to have graphic on the left, text on the right. You can shrink the graphics a bit if needed)

SA 4.2

Mod 5

Energy Flow Through an Ecosystem (graphic from lesson 5.1C with sun, producer consumer, decomposer – on pg. 22)
Food Web (graphic from Lesson 5.1C - pg 27)
Food Pyramid (graphic from Lesson 5.1C - pg 30)
GP 5.1D 1: Symbiotic Relationships Chart
SA5.1

GP 5.2B 1: The Nitrogen Cycle
GP 5.2C1: The Phosphorus Cycle
SA 5.2

SA 5.3

SA 5.4

GP 5.5A 1: Looking for the Best "Fit"
Predator-Prey Cycle (graphic from lesson 5.5B showing population cycle of lynx and hare on pg 173)
GP 5.5C 1: Changing Communities
GP 5.5D 1: The Burning Question
SA 5.5

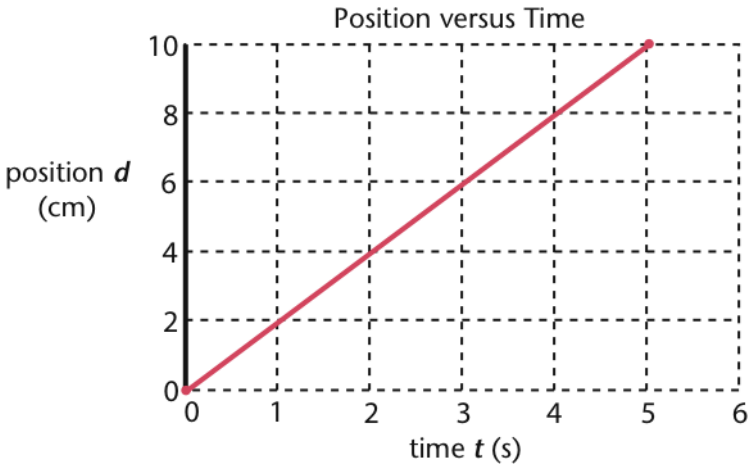
Module 5 Assignment

Slope of "Position vs. Time" Graphs

Position Slope

A positive slope means a positive constant velocity. The object could be moving:

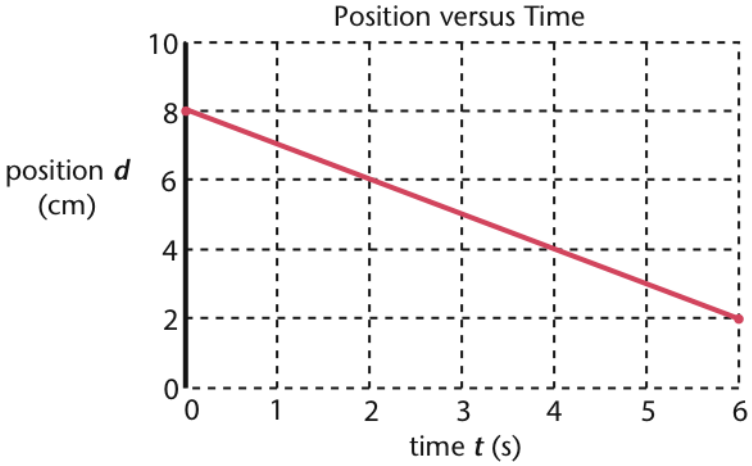
- forward
- to the right
- north
- east



Negative Slope

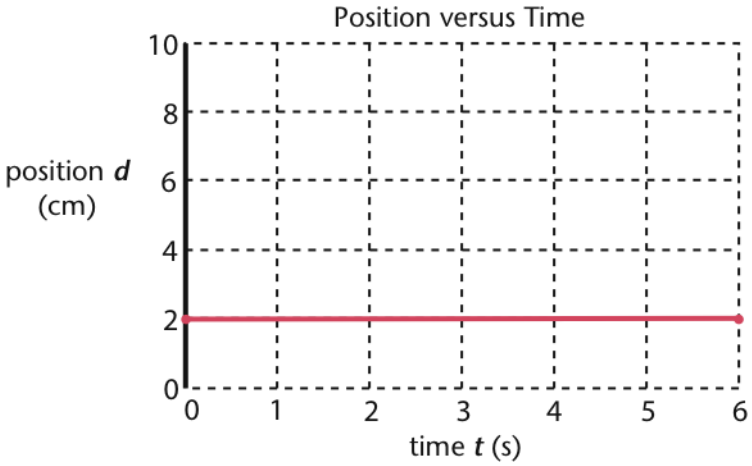
A negative slope means a negative constant velocity. The object could be moving:

- backward
- to the left
- south
- west



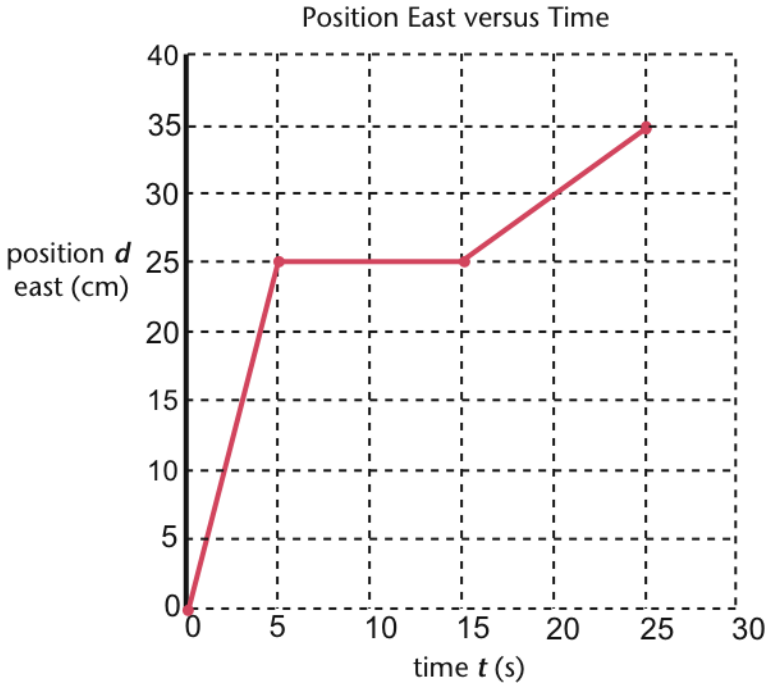
Zero Slope

A horizontal line (zero slope) means that $v_{av} = 0$. This means that the object is not moving at all.



Guided Practice 4.1D 3
Slope and Velocity

Consider this position-time graph for an object traveling on a straight line in the north direction.



Determine each of the following:

1. The displacement of the object for each section A, B, and C shown.

2. The velocity of the object for each section shown.

Guided Practice 4.2A 2
Acceleration

Read the description of a car's motion below. Then copy the table out into your notebook, and answer the questions that follow.

A car takes off from a stop sign and accelerates forward for ten seconds. During this time, its speed increases at a rate of 9.0 km/h every second. The table below shows some of the data collected during this period.

Time (s)	Car Speed (km/h)	Car Speed (m/s)
0	0	0
1	9.0	
2	18.0	
3	27.0	
4	36.0	
5		
6		
7		
8		
9		
10		

1. Complete the second column of speeds, in km/h.

2. Complete the third column of speeds, in m/s. Remember to convert:
   - # km x 1000 m/km = # m
   - # h x 60 min/h x 60 s/min = # s
   - # m ÷ # s = # m/s

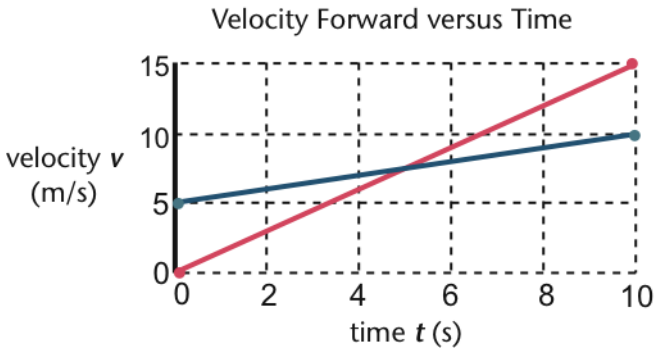
3. If the car continued to accelerate at the same rate for another two seconds, how fast would it be travelling after 12 seconds:

   A. in km/h?

   B. in m/s?

Guided Practice 4.2B 2
Positive Acceleration and Velocity—Time Graphs

Carefully examine the velocity versus time graph below of two objects in motion. Copy the graph into your notebook, and answer the questions that follow. The red line represents Object A, and the blue line, Object B.



1. Which object was already moving when the time started? Explain how you know.

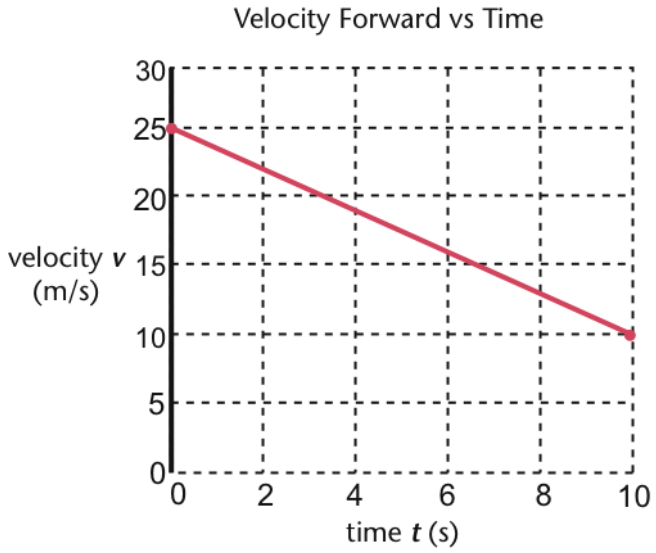
2. At approximately what time were both objects travelling at the same velocity? Explain how you know.

3. Which object was travelling faster at the end of the 10-s time period? How much faster was it travelling than the slower object?

4. Calculate the slope of each line. Which object had the greater acceleration?

Guided Practice 4.2C 2
Graphing Negative Acceleration

Carefully examine the velocity versus time graph below of an object in motion. Copy the graph into your notebook, and answer the questions that follow.



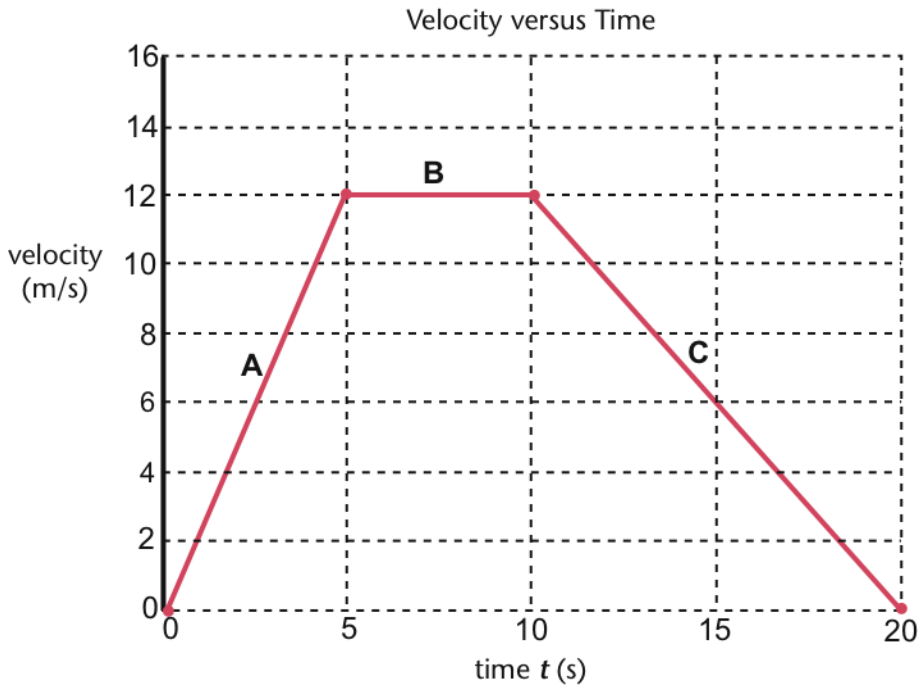
1. How do you know the object is decelerating in the forward direction?

2. Does the object ever stop in the time interval shown? Explain how you know.

3. Determine the acceleration of this object.

Guided Practice 4.2C 3
Velocity versus Time Graphs

Carefully examine the velocity versus time graph below of an object in motion. Copy the graph into your notebook, and answer the questions that follow. Note that there are three distinct segments of the graph: A, B, and C.



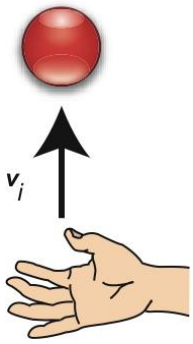
1. Which segment shows positive acceleration? Zero acceleration? Negative acceleration? In each case, explain how you know.

2. Is the object ever stationary during the time interval shown? If so, state the time when this occurs.

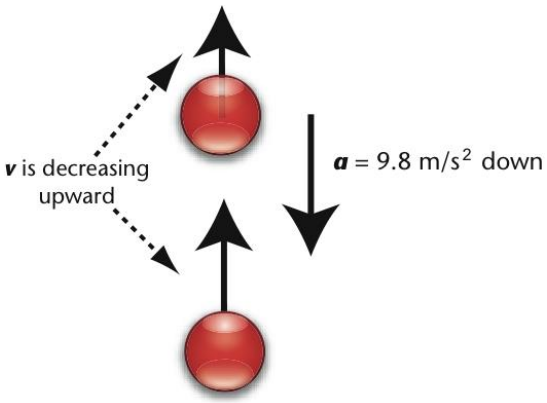
Acceleration Due to Gravity

Gravity is defined as a pulling force that causes falling objects to accelerate downward to the Earth's surface. This rate of change in velocity close to Earth has been measured to be approximately –9.8 m/s^2. This number is sometimes called *acceleration due to gravity*.

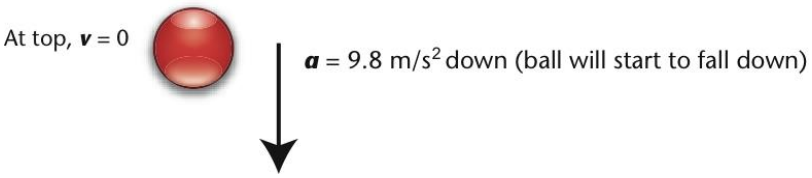
Note that the value is *negative*—this is because the acceleration is *down*. Let's examine this fact in more detail. Take your ball, toss it straight up into the air and catch it. How would you describe the ball's motion during its "flight?"



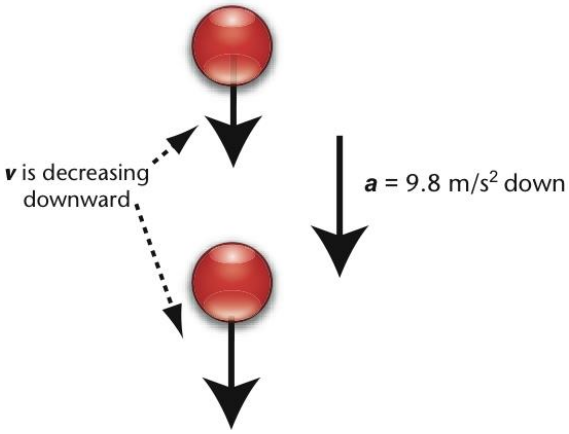
The ball leaves your hand at some initial upward velocity, v_i.



As the ball rises, its upward velocity decreases, at a rate of 9.8 m/s^2. This means the ball's acceleration is 9.8 m/s^2 downward, or –9.8 m/s^2.



At its maximum height, the ball has momentarily stopped. For a single moment in time, its instantaneous velocity is zero. However, gravity is still doing its work, as the ball immediately begins to speed up in the *down* direction.



On the way down, the ball's downward velocity increases at the same rate of 9.8 m/s^2 until you catch it. In other words, the acceleration of –9.8 m/s^2 has not changed, regardless of which way the ball is travelling.

Section Assignment 4.1 Part A
Graphing Uniform Motion I

Your objective in this activity is to find a relationship between the motion of an object and the time taken for the object to move. To find this relationship, you will be plotting a line graph on a grid, and analyzing its shape. Before you begin, you need to be familiar with how to "build" a line graph correctly. Refer to the General Rules for Graphing section of your SOS package for details on how to set up a proper graph.

There are two parts to this formal lab. In Part 1, you will play an animated video of three cyclists travelling on a level road. For each cyclist, you will record data and plot a graph from the information collected. In Part 2, you will analyze the data and answer questions.

This is a formal lab that you will need to submit as part of your section assignment. Be sure to refer to the SOS instructions on how to properly write up a formal lab in your SOS package.

Once you are familiar with proper graphing techniques, continue to the procedures below. If you have any questions, please contact your instructor for more information.

To refer to the SOS instructions on how to properly write up a formal lab, go to:

Science 10 Media CD > SOS package > **Toolbox #2**

What you will need —

- pencil
- ruler
- graph paper

Procedures —

1. Copy the following three data tables into your notebook. You will fill in these tables with data from the virtual lab.

Table 1

Time at Chosen Position (s)	Position of Cyclist A (m)
0	0

Section Assignment 4.1 Part B
Graphing Uniform Motion II

In this part of the activity, you will analyze the three graph lines drawn in Part A, and find a relationship between the motion of an object and the time taken for the object to move. Remember, this is a formal lab that you will need to submit as part of your section assignment. Again, refer to the SOS instructions in your SOS package on how to properly write up a formal lab.

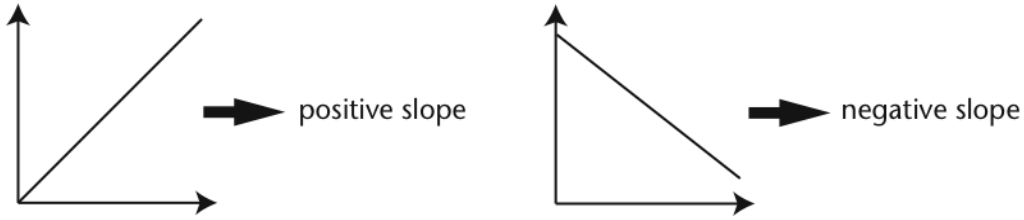
To refer to the SOS instructions on how to properly write up a formal lab, go to:

Science 10 Media CD > SOS package > **Toolbox #2**

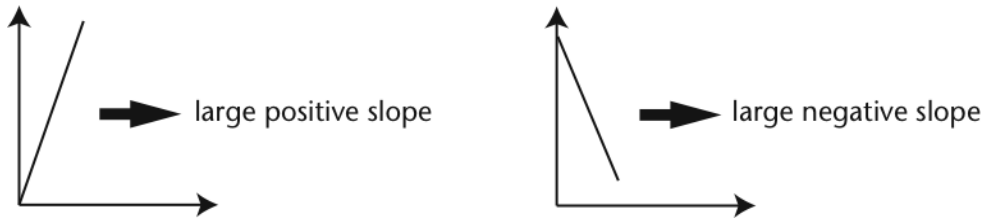
Analysis of Graph Data:

In this part of the lab, you will be finding the *slope* of each line graph drawn. The slope of a graph describes whether the line goes up, down, or straight across (horizontal). A slope value also describes how steep the line is. For example:

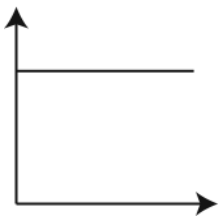
- A positive number means an uphill slope, while a negative number means a downhill slope.



- A large positive number means a steep uphill slope, while a large negative number means a steep downhill slope.



- A slope of 0 is a horizontal line.



Before proceeding, refer to the General Rules for Graphing section of your SOS package for details on how to calculate the slope of a graph.

Section Assignment 4.1 Part C
Multiple Choice Quiz

Complete the following quiz by choosing the best answer.

1. Under which condition is distance equal to displacement?
   A. when an object's starting and finishing positions are the same.
   B. when an object travels one way in a straight line.
   C. when an object travels in a circular path.
   D. when an object moves forward, then backward at the same speed.

2. Which term represents the length of path travelled by an object?
   A. distance
   B. displacement
   C. uniform motion
   D. rate of change

3. Which of the following quantities can be read directly off a vehicle's speedometer?
   A. average speed
   B. average velocity
   C. instantaneous speed
   D. overall displacement

4. Which of the following terms can always be used to describe an object moving at a constant speed in the same direction?

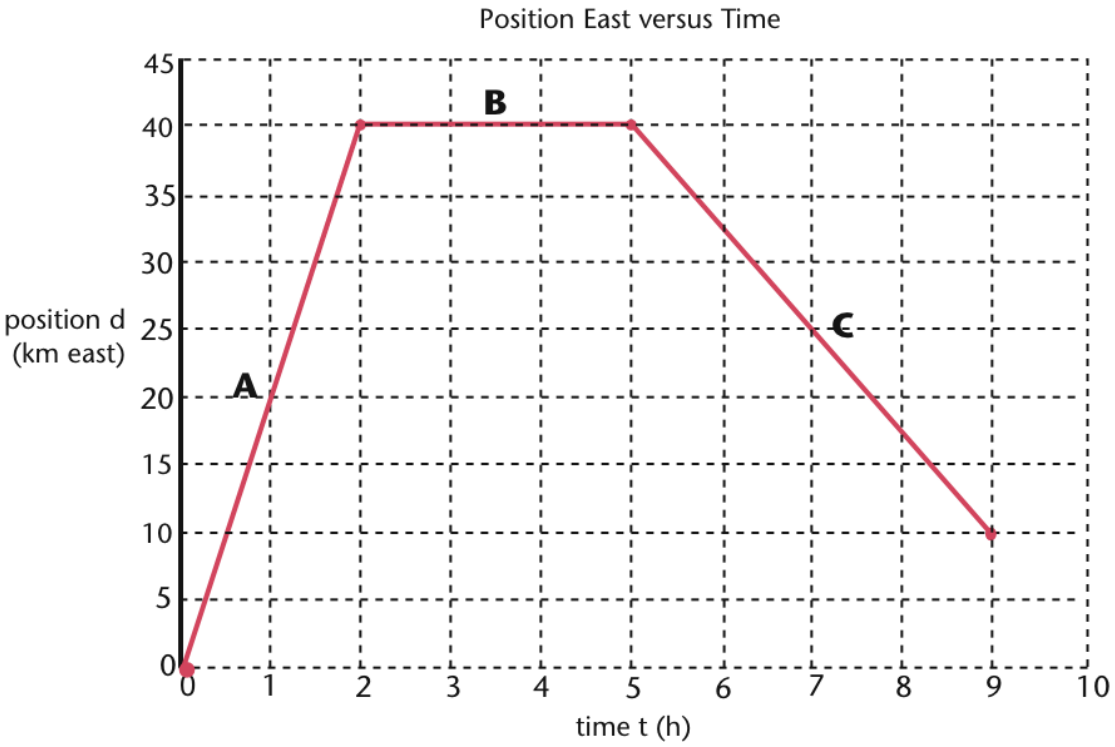
I	average velocity
II	constant velocity
III	uniform motion

   A. I only
   B. II only
   C. I and III only
   D. II and III only

Section Assignment 4.1 Part D
Graphing Analysis and Uniform Motion Calculations

Answer the following questions to be handed in.

1. Examine the following chart showing a trip taken to the store.



Determine the following:

A. the total distance travelled (1 mark)

B. the overall displacement for this trip (1 mark)

C. the velocity for the three intervals **A**, **B**, and **C** (3 marks)

D. the average velocity for the entire trip (1 mark)

2. A bowling ball is rolled on a level floor at 6.0 m/s. How far will it travel after 4.5 s? (2 marks)

3. A dog runs along a straight track at 8.0 m/s. How long will it take to run 36 m? (2 marks)

4. A jogger runs 960 m in 5.0 minutes. What is her speed, in m/s? (3 marks)

Marks
13

Section Assignment 4.2 Part A
Graphing Change in Velocity I

Here is another activity in which your objective is to find a relationship between the motion of an object and the time taken for the object to move. In this activity you will be collecting data on a skateboarder's velocity and time. You will then be using this data to plot a graph of velocity versus time. Be sure to review the "General Rules for Graphing" section of your SOS package for details on how to set up a proper graph.

For details on how to set up a proper graph, go to:

Science 10 Media CD > SOS package > **Toolbox #14**

There are two parts to this formal lab. In Part 1, you will play an animated video of a skateboarder increasing and decreasing her speed while travelling on a level road. Velocity and time data will be used to plot a graph from the information collected. In Part 2, you will analyze the data and answer questions.

This is a formal lab that you will need to submit as part of your section assignment. Be sure to refer to the SOS instructions on how to properly write up a formal lab in your SOS package.

Go to:

Science 10 Media CD > SOS package > **Toolbox #2**

Once you are familiar with proper graphing techniques, continue to the procedures below. If you have any questions, please contact your instructor for more information.

What you will need —

- pencil
- ruler
- graph paper

Procedures —

1. Copy the following data table into your notebook. You will fill in this table with data from the virtual lab.

Section Assignment 4.2 Part B
Graphing Change in Velocity II

In this part of the activity, you will analyse the graph drawn in Part A. You will also find a relationship between the velocity of an object and the time taken for the object to move. Remember, this is a formal lab that you will submit as part of your section assignment. Again, refer to the SOS package instructions on how to properly write up a formal lab.

To refer to the SOS package instructions on how to properly write up a formal lab, go to:

Science 10 Media CD > SOS package > **Toolbox #2**

Analysis of Graph Data:

In this part of the lab, you will be finding the *slope* of each graph line drawn. Remember, the slope of a graph provides the following information:

- A positive number means an uphill slope, while a negative number means a downhill slope.
- A large positive number means a steep uphill slope, while a large negative number means a steep downhill slope.
- A slope of 0 is a horizontal line.

Don't forget to refer to the General Rules for Graphing section of your SOS package for details on how to calculate the slope of a graph. As you know, the slope of a velocity versus time graph is equal to the acceleration of an object. This is because you are finding the change in velocity ($y_2 - y_1$) divided by the time interval ($x_2 - x_1$).

For details on how to calculate the slope of a graph, go to:

Science 10 Media CD > SOS package > **Toolbox #14**

1. The line of this graph has three distinct slopes. To start, determine the slope of the Stage 1 line that you plotted. Show all work for finding slope *directly on the graph*! Record the value of this slope in your notebook. Be sure to include units.

2. Determine the slope for Stage 2. Record this value, again including proper units.

3. Finally, find the slope of the Stage 3 portion of your line. Be careful here! If plotted correctly, this slope should be "downhill," and will have a negative value.

Questions

1. During which section was the acceleration of the skateboarder positive? Explain how you know.

2. Explain why Stage 3 had a negative slope.

Section Assignment 4.2 Part C
Multiple Choice Quiz

Complete the following quiz by choosing the best answer.

1. Which of the following is a correct unit to describe acceleration?

   A. m

   B. h

   C. m/s

   D. cm/s^2

2. A toy car travelling along on a straight highway is showing a negative change in velocity. Which of the following statements could be used to describe the car's motion?

I	travelling forward, speeding up
II	travelling forward, slowing down
III	travelling backward, speeding up
IV	travelling backward, slowing down

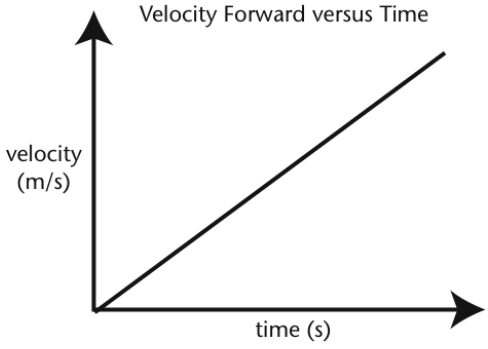
   A. II only

   B. III only

   C. I and IV only

   D. II and III only

3. What does the slope in the following graph show about the motion of an object?



   A. uniform motion

   B. constant velocity

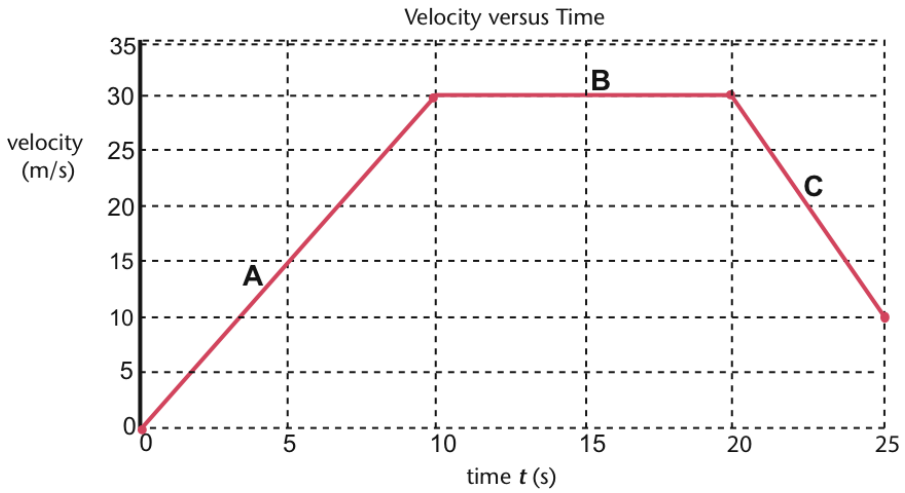
   C. constant acceleration

   D. increasing acceleration

Section Assignment 4.2 Part D
Graphing Analysis and Acceleration Calculations

Answer the following questions to be handed in.

1. Examine the following chart showing the velocity versus time of a car travelling on a highway.



Determine the following:

A. What was the maximum speed of the car? (1 mark)

B. During which time interval (A, B, or C) was the car:

- speeding up? (1 mark)
- accelerating in the south direction? (1 mark)
- showing uniform motion? (1 mark)

C. Calculate the acceleration for the three intervals A, B, and C. (3 marks)

D. Describe the motion of the car during interval C, in as much detail as possible. (2 marks)

2. A marathon runner, near the end of the race, increases his velocity from 1.0 m/s to 1.4 m/s in a time of 2.5 s. What is his acceleration during this time interval? (2 marks)

3. A tennis ball is held stationary and then dropped from the roof of a tall building. What will be its velocity after 3.0 s? (3 marks)

4. A student driver is travelling at 22.2 m/s and sees a school zone ahead. Using her brakes, she accelerates at $-2.8\ m/s^2$ to reduce her velocity to 8.2 m/s. How much time did it take to change her velocity? (2 marks)

Marks
16

4. Katie is accelerating on her bicycle. In terms of displacement, which of the following statements correctly describes her motion?

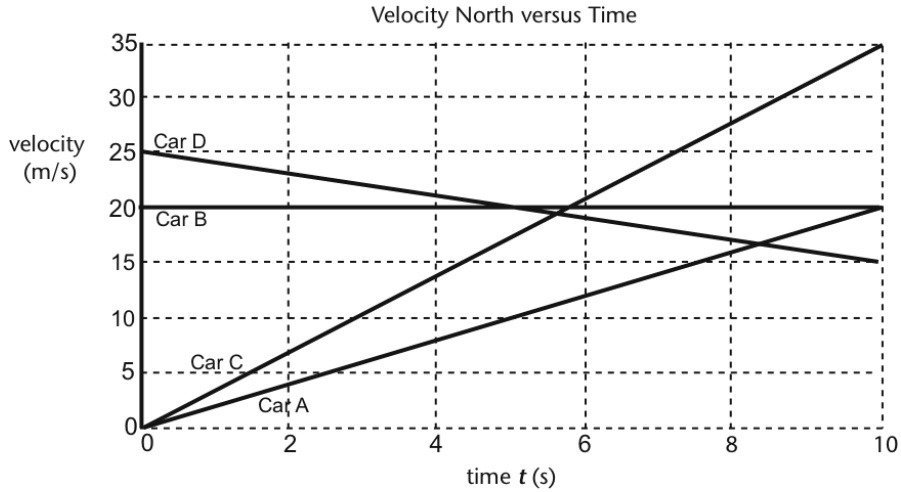
   A. Her displacement is increasing every second.

   B. Her displacement is decreasing every second.

   C. Her displacement every second remains constant.

   D. There is not enough information to answer this question.

Use the following information to answer questions 5–8.



5. Which car is travelling with zero acceleration?

   A. Car A

   B. Car B

   C. Car C

   D. Car D

6. Which car showed the greatest change in velocity?

   A. Car A

   B. Car B

   C. Car C

   D. Car D

7. Which of the following is a correct comparison of velocity over the ten-second period?

   A. Car C was always travelling at a faster velocity than car B.

   B. Car A never travelled at the same velocity as car B.

   C. Car D was always slower than the other three cars.

   D. Car A was always travelling at a slower velocity than car C.

8. What is the acceleration of Car D?

   A. $-10\ m/s^2$

   B. $-1\ m/s^2$

   C. $1\ m/s^2$

   D. $10\ m/s^2$

9. A motorcycle increases its speed by 12.6 km/h every second. What is its acceleration in m/s^2?

   A. $3.5\ m/s^2$

   B. $12.6\ m/s^2$

   C. $45.4\ m/s^2$

   D. $12\ 600\ m/s^2$

10. A golf ball and a t-shirt both fall off the balcony of an apartment at the same time. The ball hits the ground first, before the shirt. Why does this happen?

    A. Gravity causes the golf ball to fall faster than the shirt.

    B. The golf ball is heavier than the shirt.

    C. More air particles collide with the shirt as it falls than the golf ball.

    D. Gravity has no effect on the shirt.

Marks
20

3. What does the slope in Stage 2 tell you about the skateboarder's motion during that section?

Marks

Parts A and B will be completed separately, but submitted and marked together. (30 marks)

Table 1

	Time at Chosen Speed (s)	Speed of Skateboarder (m/s)
Stage 1: Speeding Up	0	
	10	
Stage 2: Coasting		
	20	
Stage 3: Slowing Down		
	28	

2. Now go to the virtual acceleration lab to collect your data. Follow the instructions provided in the virtual lab, and be sure to collect enough data points to fill the given table.

   Once you have collected enough data for each stage of the skateboarder's ride, return to the procedures and complete the final steps.

   Go to:

   Science 10 Media CD > Module 4 > *Kinematics Lab* and select the *Acceleration Lab*

3. Using the data you collected, you will plot a graph of velocity versus time for the skateboarder's ride. Please use graph paper and note the following points:
   - You will be performing slope calculations directly on this graph, so make your graph large. It should take up at least half of the page.
   - Velocity, in m/s, is placed on the *y* axis. The scale should read from 0 to 6.
   - Time, in seconds, is placed on the *x* axis. The scale should read from 0 to 28.
   - All points, including (0,0), should be plotted on the graph.
   - You should be able to make out three distinct straight lines on this graph. Use a ruler to draw three 'best-fit' straight lines through the points. Label these three lines "Stage 1," "Stage 2," and "Stage 3."

Remember to refer to your SOS package for more information on how to construct a proper graph.

Remember to keep this part of the lab in a safe place. You will continue with Part B in the next lesson.

ASSESSMENT GUIDELINES

Note:

Parts A and B will be completed separately, but submitted and marked together. (30 marks)

If you have any questions concerning this activity, be sure to contact your instructor for more information.

Marks for the lab are as follows:

Marks	Description
5	proper and neat write-up
3	data table for 3 segments of skateboarder's motion
15	graph for skateboarder, including labels, title, points, and line drawn properly, work shown for finding all three slopes: 12 marks (5 marks each for 1st and 3rd segments, 2 marks for middle segment)
5	questions correctly answered
2	conclusion

Marks
30

5. A car travels 15 km west, then turns around and drives 12 km east. What is the car's overall displacement?

   A. 3 km east

   B. 3 km west

   C. 27 km east

   D. 27 km west

6. Which term is used to describe the rate of change in *distance*?

   A. displacement

   B. velocity

   C. speed

   D. uniform motion

7. A motorized go-cart can travel at 27 km/h. What is its speed in m/s?

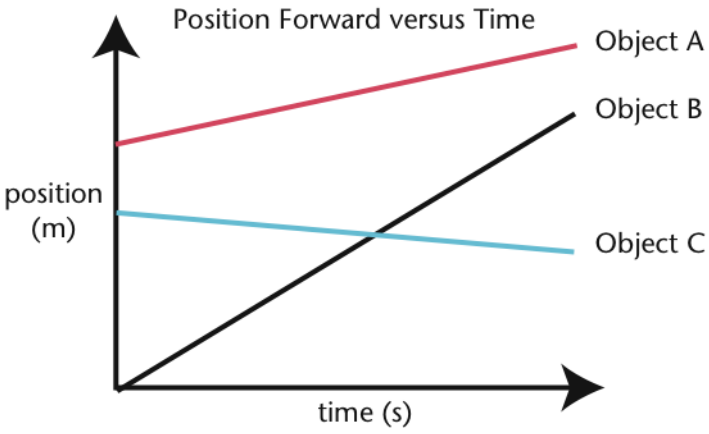
   A. 7.5 m/s

   B. 9.72 m/s

   C. 75 m/s

   D. 97.2 m/s

Use the following position versus time graph to answer questions 8–10.



8. Object A has the greatest velocity.

   A. The statement is supported by the information given.

   B. The statement is refuted by the information given.

   C. The statement is neither supported nor refuted by the information.

9. Object C is travelling backwards.
    A. The statement is supported by the information given.
    B. The statement is refuted by the information given.
    C. The statement is neither supported nor refuted by the information.

10. All three objects were travelling at the same time.
    A. The statement is supported by the information given.
    B. The statement is refuted by the information given.
    C. The statement is neither supported nor refuted by the information.

Marks
20

To refer to the SOS instructions on how to calculate the slope of a graph, go to:

Science 10 Media CD > SOS package > **Toolbox #14**

In this activity, the slope of a position-time graph tells you the velocity of a moving object. This is because you are finding the change in position (y_2 - y_1) divided by the time interval (x_2 - x_1).

1. Determine the slope of the "Cyclist A" line that you plotted. Show all work for finding slope directly on the graph! Record the value of your slope for Cyclist A in your notebook. Be sure to include units.

2. Determine the slope of the "Cyclist B" line, in the same way as you did for Cyclist A. Record this value, again including proper units.

3. Finally, find the slope of the "Cyclist C" line. Be careful here! If plotted correctly, this slope should be "downhill," and will have a negative value.

Questions:

1. Which cyclist had the greatest speed? Explain how you know.

2. Explain why Cyclist C had a negative slope.

3. A fourth cyclist completes the 60-m stretch of road by travelling at a constant velocity of –3 m/s.
   A. In which direction was this cyclist heading?
   B. Describe how the slope of a position-time graph would appear for this cyclist, compared with the other cyclists.

4. Suppose cyclist A increased his speed (that is, he sped up) constantly for the 60-m distance. How would the slope of his position-time graph appear?

Conclusion:

From your results in this activity, write down a statement about what you learned in this lab. Refer to instructions in your SOS package if you are unsure of how to write out a proper conclusion. Once you are finished, attach both parts of the lab and submit it with your section assignment.

Marks
30 total marks for Part A and Part B

Table 2

Time at Chosen Position (s)	Position of Cyclist B (m)
0	0

Table 3

Time at Chosen Position (s)	Position of Cyclist C (m)
0	60

2. Now go to the virtual velocity lab to collect your data. Follow the instructions provided in the virtual lab, and be sure to collect at least six data points for each cyclist. (Note that each cyclist's position is his distance from the start flag.)

   Once you have collected enough data for each cyclist, return to the procedures and complete the final steps.

   Go to your:

   Science 10 Media CD > Module 4 > *Kinematics Lab* and select the *Velocity Lab*

3. Using the data you collected, you will plot a graph of position versus time for each of the three cyclists. Please use graph paper and note the following points:
   - You will be plotting three lines on this graph (and performing slope calculations), so make your graph large. It should take up most of the page.
   - Position, in metres, is placed on the y axis. The scale should read from 0 to 60 in equal increments.
   - Time, in seconds, is placed on the x axis. The scale should read from 0 to 12 in equal increments.
   - Create an appropriate and descriptive title for your graph.

4. Starting with the data in Table 1:
   - Plot all seven points, including (0,0).
   - Use a ruler to draw a best-fit straight line through the points.
   - Label this line 'Cyclist A'.

5. Repeat step 4 using the data in Table 2 (be sure to label your line ‘Cyclist B’).

6. Repeat step 4 using the data in Table 3 (be sure to label your line ‘Cyclist C’).

Remember to keep this part of the lab in a safe place. You will continuewith Part B after the next lesson.

ASSESSMENT GUIDELINES

Note:

Parts A and B will be completed separately, but submitted and marked together. (30 marks)

Make sure you have completed all work from both parts of this activity. This includes the write-up, graphs, questions and conclusion. Once completed, turn in the completed activity with your work from this section assignment.

If you have any questions concerning this activity, be sure to contact your instructor for more information.

Marks for the lab are as follows:

Marks	Description
5	proper and neat write-up
3	data tables for 3 cyclists
15	graphs for 3 cyclists, including labels, title, points and line drawn properly, work shown for finding slope
5	questions correctly answered
2	conclusion

Marks
Marks for Part A are included with Part B

3. Determine the acceleration for each segment shown.

4. Describe the overall motion of the object, from $t = 0$ to $t = 20$ s.