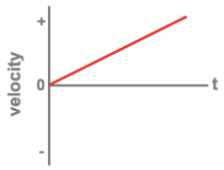
Velocity-Time Graphs: Changing Velocity Motion

Lesson Notes

Graphs for Speeding Up Objects

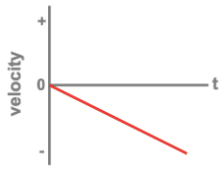
An object moving to the right (+ dir'n) and speeding up.

Time (s)	Velocity (m/s)
0	0
1	10
2	20
3	30
4	40
5	50



An object moving to the left (- dir'n) and speeding up.

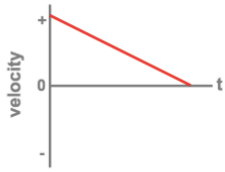
Time (s)	Velocity (m/s)
0	0
1	-10
2	-20
3	-30
4	-40
5	-50



Graphs for Slowing Down Objects

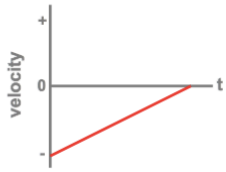
An object moving to the right (+ dir'n) and slowing down.

Time (s)	Velocity (m/s)
0	50
1	40
2	30
3	20
4	10
5	0



An object moving to the left (- dir'n) and slowing down.

Time (s)	Velocity (m/s)
0	-50
1	-40
2	-30
3	-20
4	-10
5	0

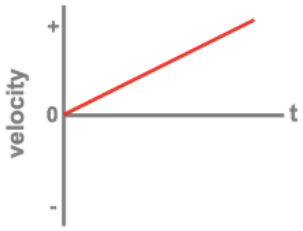


General Principles for Changing Velocity Motions

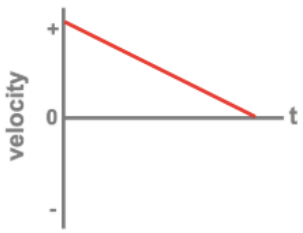
- Moving in the + direction (i.e., a + velocity) is represented by a line above the time axis.
- Moving in the - direction (i.e., a - velocity) is represented by a line below the time axis.
- Speeding up is represented by a line that moves away from the time axis.
- Slowing down is represented by a line that moves towards the time axis.
- The slope is an indicator of the acceleration of the object.

Summary

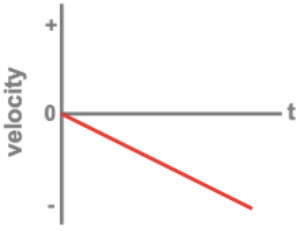
+ Velocity
+ Accel'n
Speeding up



+ Velocity
- Accel'n
Slowing Down



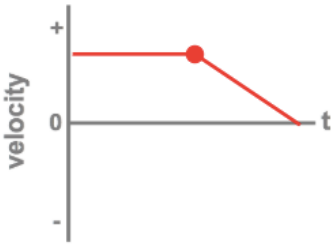
- Velocity
- Accel'n
Speeding up



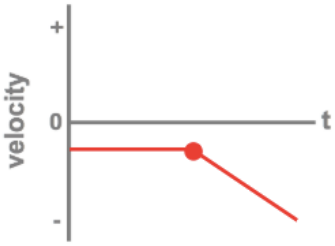
- Velocity
+ Accel'n
Slowing Down

Analyzing Multi-Stage Motions

Describe the two stages of each of these three multi-stage motions:



Description:



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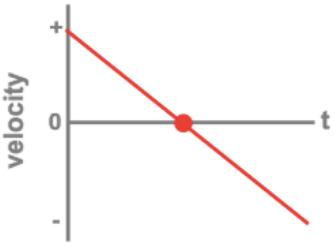
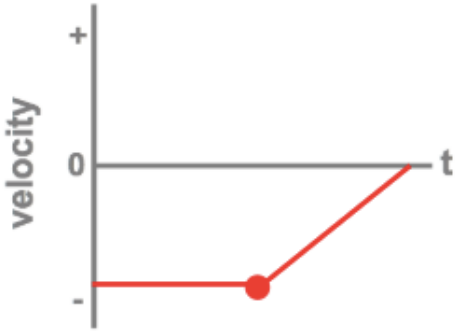


Description:

Your Turn to Practice

Analyze the velocity-time graphs and describe the corresponding motions.



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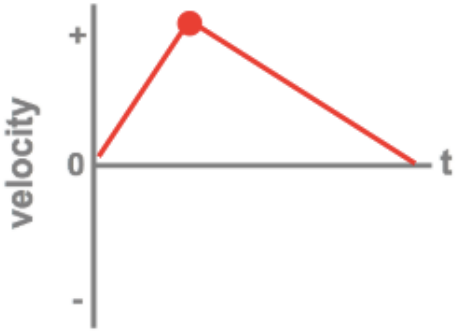

Description:

What does a velocity-time graph look like when an object is …

a. … stopped?

b. … changing directions?

c. …speeding up and then later slowing down?