Activity 1: To Accelerate or Not To Accelerate

Question Group 1
Question #1
A rightward-moving bicycle increases its speed from 2.0 m/s to 12.0 m/s.
Is the bicycle accelerating?

Question #2
A rightward-moving motorcycle increases its speed from 5.0 m/s to 25.0 m/s.
Is the motorcycle accelerating?

Question #3
A rightward-moving car increases its speed from 10.0 m/s to 20.0 m/s.
Is the car accelerating?

Question Group 2
Question #4
A rightward-moving bicycle slows down from 12.0 m/s to 2.0 m/s.
Is the bicycle accelerating?

Question #5
A rightward-moving motorcycle slows down from 25.0 m/s to 5.0 m/s.
Is the motorcycle accelerating?

Question #6
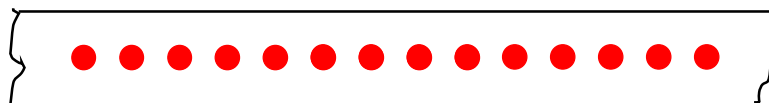A rightward-moving car slows down from 20.0 m/s to 10.0 m/s.
Is the car accelerating?

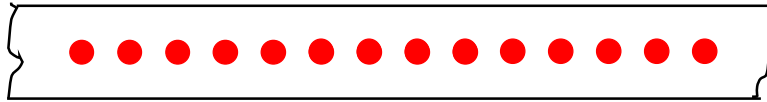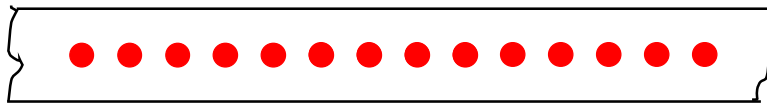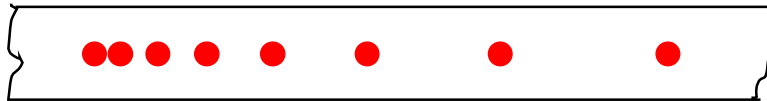**Question Group 3**
Question #7
The dot diagram represents the motion of a bicycle as it moves from left to right.
Is the bicycle accelerating?

Question #8

The dot diagram represents the motion of a motorcycle as it moves from left to right.
Is the motorcycle accelerating?

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Question #9

The dot diagram represents the motion of a car as it moves from left to right.
Is the car accelerating?

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Question Group 4
Question #10

The dot diagram represents the motion of a bicycle as it moves from left to right.
Is the bicycle accelerating?

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Question #11

The dot diagram represents the motion of a motorcycle as it moves from left to right.
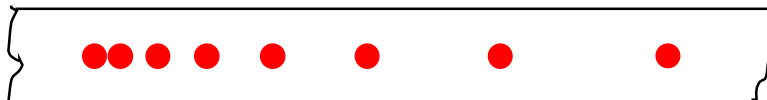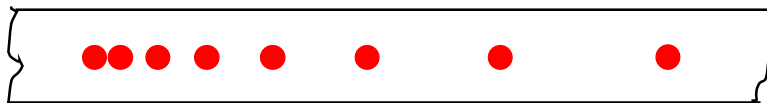Is the motorcycle accelerating?

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Question #12

The dot diagram represents the motion of a car as it moves from left to right.
Is the car accelerating?

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Question Group 5
Question #13
The velocity-time table represents the motion of a bicycle as it moves from left to right.
Is the bicycle accelerating?

Time (s)	Velocity (m/s)
0.0	2.0
1.0	4.0
2.0	6.0
3.0	8.0
4.0	10.0
5.0	12.0

Question #14
The velocity-time table represents the motion of a motorcycle as it moves from left to right.
Is the motorcycle accelerating?

Time (s)	Velocity (m/s)
0.0	5.0
1.0	10.0
2.0	15.0
3.0	20.0
4.0	25.0

Question #15
The velocity-time table represents the motion of a car as it moves from left to right.
Is the car accelerating?

Time (s)	Velocity (m/s)

0.0	10.0
1.0	12.0
2.0	14.0
3.0	16.0
4.0	18.0
5.0	20.0

Question Group 6
Question #16
The velocity-time table represents the motion of a bicycle as it moves from left to right.
Is the bicycle accelerating?

Time (s)	Velocity (m/s)
0.0	5.0
1.0	5.0
2.0	5.0
3.0	5.0
4.0	5.0

Question #17
The velocity-time table represents the motion of a motorcycle as it moves from left to right.
Is the motorcycle accelerating?

Time (s)	Velocity (m/s)
0.0	25.0
1.0	25.0
2.0	25.0

3.0	25.0
4.0	25.0

Question #18

The velocity-time table represents the motion of a car as it moves from left to right.
Is the car accelerating?

Time (s)	Velocity (m/s)
0.0	15.0
1.0	15.0
2.0	15.0
3.0	15.0
4.0	15.0

Activity 2: Getting Direction on Acceleration

Question Group 7:
Question #19
A rightward-moving bicycle is speeding up.
What is the direction of the bicycle's acceleration?

Question #20
A rightward-moving motorcycle is speeding up.
What is the direction of the motorcycle's acceleration?

Question #21
A rightward-moving car is speeding up.
What is the direction of the car's acceleration?

Question Group 8:
Question #22
A rightward-moving bicycle is slowing down.
What is the direction of the bicycle's acceleration?

Question #23
A rightward-moving motorcycle is slowing down.
What is the direction of the motorcycle's acceleration?

Question #24
A rightward-moving car is slowing down.
What is the direction of the car's acceleration?

Question Group 9:
Question #25
A downward falling skydiver is speeding up.
What is the direction of the skydiver's acceleration?

Question #26
A downward falling baseball is speeding up.
What is the direction of the baseball's acceleration?

Question #27
A downward moving elevator is speeding up.
What is the direction of the elevator's acceleration?

Question Group 10:
Question #28
A downward falling skydiver is slowing down.
What is the direction of the skydiver's acceleration?

Question #29
A downward moving roller coaster is slowing down.
What is the direction of the coaster's acceleration?

Question #30
A downward moving elevator is slowing down.
What is the direction of the elevator's acceleration?

Question Group 11:
Question #31
A northward-moving race car is slowing down.
What is the direction of the race car's acceleration?

Question #32
A northward-moving sprinter is slowing down.
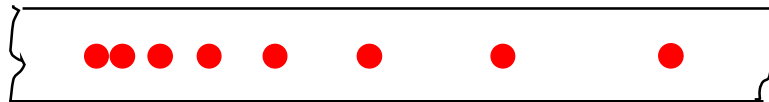What is the direction of the sprinter's acceleration?

Question #33
A northward-moving truck is slowing down.
What is the direction of the truck's acceleration?

Question Group 12:
Question #34
The dot diagram represents the motion of a rightward-moving race car.
What is the direction of the race car's acceleration?
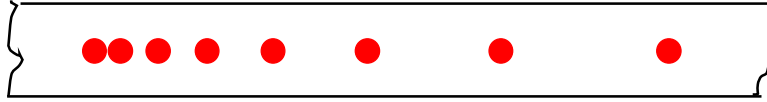

Question #35
The dot diagram represents the motion of a rightward-moving sprinter.
What is the direction of the sprinter's acceleration?
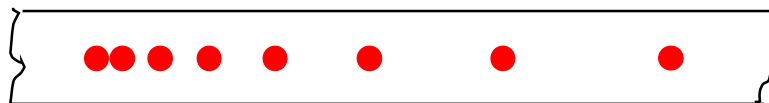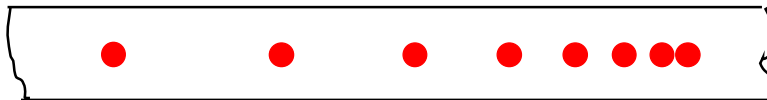

Question #36
The dot diagram represents the motion of a rightward-moving truck.
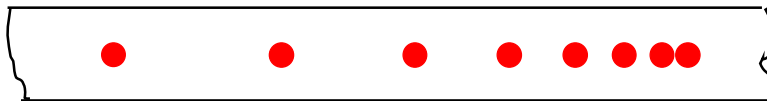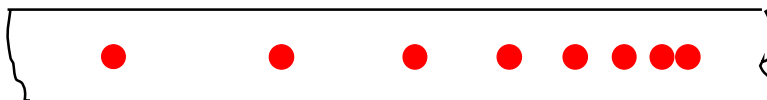What is the direction of the truck's acceleration?

Question Group 13:
Question #37
The dot diagram represents the motion of a rightward-moving race car.
What is the direction of the race car's acceleration?

Question #38
The dot diagram represents the motion of a rightward-moving sprinter.
What is the direction of the sprinter's acceleration?

Question #39
The dot diagram represents the motion of a rightward-moving truck.
What is the direction of the truck's acceleration?

Question Group 14:
Question #40
The velocity-time table represents the motion of a bicycle.
What is the direction of the bicycle's acceleration?

Time (s)	Velocity (m/s)
0.0	10.0, left
1.0	8.0, left

2.0	6.0, left
3.0	4.0, left
4.0	2.0, left

Question #41
The velocity-time table represents the motion of a motorcycle.
What is the direction of the motorcycle's acceleration?

Time (s)	Velocity (m/s)
0.0	20.0, left
1.0	16.0, left
2.0	12.0, left
3.0	8.0, left
4.0	4.0, left

Question #42
The velocity-time table represents the motion of a car.
What is the direction of the car's acceleration?

Time (s)	Velocity (m/s)
0.0	24.0, left
1.0	20.0, left
2.0	16.0, left
3.0	12.0, left
4.0	10.0, left

Activity 3: Adding Value to Acceleration

Question Group 15:
Question #43
A westward-moving bicycle increases its speed from 2.0 m/s to 12.0 m/s in 4.0 seconds.
What is the magnitude (i.e., value) and direction of the acceleration?

Question #44
A westward-moving motorcycle increases its speed from 5.0 m/s to 25.0 m/s in 2.5 seconds.
What is the magnitude (i.e., value) and direction of the acceleration?

Question #45
A westward-moving car increases its speed from 10.0 m/s to 20.0 m/s ini 2.0 seconds.
What is the magnitude (i.e., value) and direction of the acceleration?

Question Group 16:
Question #46
A westward-moving bicycle slows down from 10.0 m/s to 4.0 m/s in 3.0 seconds.
What is the magnitude (i.e., value) and direction of the acceleration?

Question #47
A westward-moving motorcycle slows down from 24.0 m/s to 12.0 m/s in 3.0 seconds.
What is the magnitude (i.e., value) and direction of the acceleration?
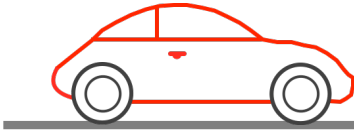

Question #48
A westward-moving car slows down from 26.0 m/s to 10.0 m/s in 2.0 seconds.
What is the magnitude (i.e., value) and direction of the acceleration?
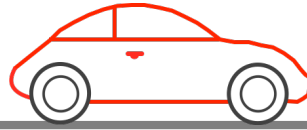

Question Group 17:
Question #49
Velocity and time information for a rightward-moving car are shown.
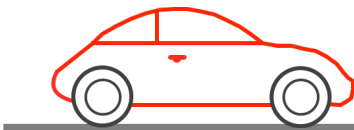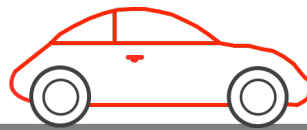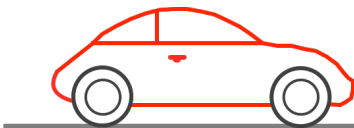What is the magnitude (i.e., value) and direction of the acceleration?
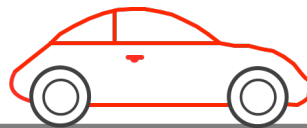
t = 0.0 s
v = 3.0 m/s

t = 3.0 s
v = 12.0 m/s

Question #50
Velocity and time information for a rightward-moving car are shown.
What is the magnitude (i.e., value) and direction of the acceleration?

t = 0.0 s
v = 2.0 m/s

t = 2.5 s
v = 12.0 m/s

Question #51
Velocity and time information for a rightward-moving car are shown.
What is the magnitude (i.e., value) and direction of the acceleration?

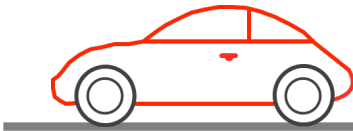t = 0.0 s
v = 4.0 m/s

t = 2.0 s
v = 20.0 m/s

Question Group 18:
Question #52
Velocity and time information for a leftward-moving car are shown.
What is the magnitude (i.e., value) and direction of the acceleration?

t = 4.0 s
v = 4.0 m/s

t = 0.0 s
v = 20.0 m/s

Question #53
Velocity and time information for a leftward-moving car are shown.
What is the magnitude (i.e., value) and direction of the acceleration?
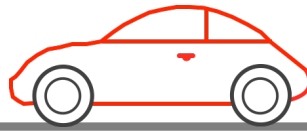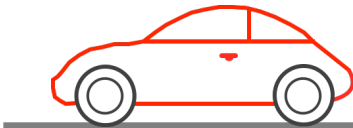
t = 2.0 s
v = 4.0 m/s

t = 0.0 s
v = 20.0 m/s

Question #54
Velocity and time information for a leftward-moving car are shown.
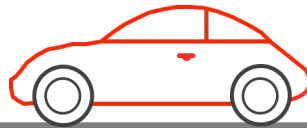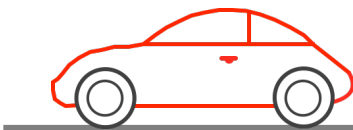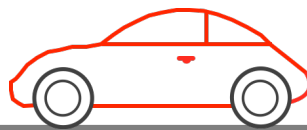What is the magnitude (i.e., value) and direction of the acceleration?

t = 4.0 s
v = 4.0 m/s

t = 0.0 s
v = 16.0 m/s

Question Group 19:
Question #55
The velocity-time table represents the motion of a leftward-moving car.

What is the magnitude (i.e., value) and direction of the acceleration?

Time (s)	Velocity (m/s)
0.0	24.0, left
1.0	20.0, left
2.0	16.0, left
3.0	12.0, left
4.0	8.0, left

Question #56
The velocity-time table represents the motion of a leftward-moving car.
What is the magnitude (i.e., value) and direction of the acceleration?

Time (s)	Velocity (m/s)
0.0	20.0, left
1.0	16.0, left
2.0	12.0, left
3.0	8.0, left
4.0	4.0, left

Question #57
The velocity-time table represents the motion of a leftward-moving car.
What is the magnitude (i.e., value) and direction of the acceleration?

Time (s)	Velocity (m/s)
0.0	26.0, left
1.0	20.0, left
2.0	14.0, left

3.0	8.0, left
4.0	2.0, left

Question Group 20:
Question #58
The velocity-time table represents the motion of a rightward-moving motorcycle.
What is the magnitude (i.e., value) and direction of the acceleration?

Time (s)	Velocity (m/s)
0.0	24.0, right
0.5	20.0, right
1.0	16.0, right
1.5	12.0, right
2.0	8.0, right

Question #59
The velocity-time table represents the motion of a rightward-moving motorcycle.
What is the magnitude (i.e., value) and direction of the acceleration?

Time (s)	Velocity (m/s)
0.0	24.0, right
0.5	22.0, right
1.0	20.0, right
1.5	18.0, right
2.0	16.0, right

Question #60
The velocity-time table represents the motion of a rightward-moving motorcycle.

What is the magnitude (i.e., value) and direction of the acceleration?

Time (s)	Velocity (m/s)
0.0	26.0, right
2.0	20.0, right
4.0	14.0, right
6.0	8.0, right
8.0	2.0, right