

Describing Motion with Diagrams






Read from **Lesson 2** of the **1-D Kinematics** chapter at **The Physics Classroom**:

- <http://www.physicsclassroom.com/Class/1DKin/U1L2a.html>
- <http://www.physicsclassroom.com/Class/1DKin/U1L2b.html>
- <http://www.physicsclassroom.com/Class/1DKin/U1L2c.html>

MOP Connection: Kinematic Concepts: sublevel 5

Motion can be described using words, diagrams, numerical information, equations, and graphs. Using diagrams to describe the motion of objects involves depicting the location or position of an object at regular time intervals.

- Motion diagrams for an amusement park ride are shown. The diagrams indicate the positions of the car at regular time intervals. For each of these diagrams, indicate whether the car is accelerating or moving with constant velocity. If accelerating, indicate the direction (right or left) of acceleration. Support your answer with reasoning.

| | | Acceleration: | |
|----|---|---------------|-------|
| | | Y/N | Dir'n |
| a. |  <p>Reason: _____</p> | | |
| b. |  <p>Reason: _____</p> | | |
| c. |  <p>Reason: _____</p> | | |
| d. |  <p>Reason: _____</p> | | |
| e. |  <p>Reason: _____</p> | | |

- Suppose that in diagram D (above) the cars were moving leftward (and traveling backwards). What would be the direction of the acceleration? _____ Explain your answer fully.

1-D Kinematics

3. Based on the oil drop pattern for Car A and Car B, which of the following statements are true? Circle all that apply.
- Both cars have a constant velocity.
 - Both cars have an accelerated motion.
 - Car A is accelerating; Car B is not.
 - Car B is accelerating; Car A is not.
 - Car A has a greater acceleration than Car B.
 - Car B has a greater acceleration than Car A.



4. An object is moving from right to left. Its motion is represented by the oil drop diagram below. This object has a _____ velocity and a _____ acceleration.
- rightward, rightward
 - rightward, leftward
 - leftward, rightward
 - leftward, leftward
 - rightward, zero
 - leftward, zero



5. Renatta Oyle's car has an oil leak and leaves a trace of oil drops on the streets as she drives through Glenview. A study of Glenview's streets reveals the following traces. Match the trace with the verbal descriptions given below. For each match, verify your reasoning.

Diagram A:

Diagram B:

Diagram C:

| Verbal Description | Diagram |
|---|---------|
| i. Renatta was driving with a slow constant speed, decelerated to rest, remained at rest for 30 s, and then drove very slowly at a constant speed. Reasoning: _____ _____ | |
| ii. Renatta rapidly decelerated from a high speed to a rest position, and then slowly accelerated to a moderate speed. Reasoning: _____ _____ | |
| iii. Renatta was driving at a moderate speed and slowly accelerated. Reasoning: _____ _____ | |