

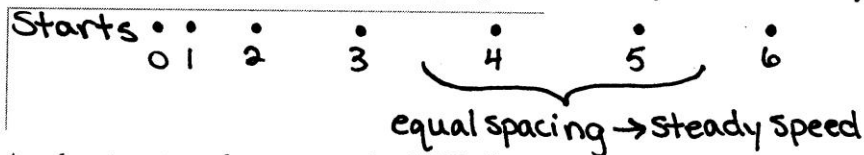
1 Representing Motion

1.1 Motion: A First Look

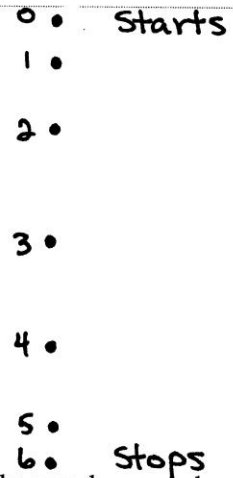
Exercises 1–5: Draw a motion diagram for each motion described below.

- Use the particle model to represent the object as a particle.
- Six to eight dots are appropriate for most motion diagrams.
- Number the positions in order, as shown in Figure 1.4 in the text.

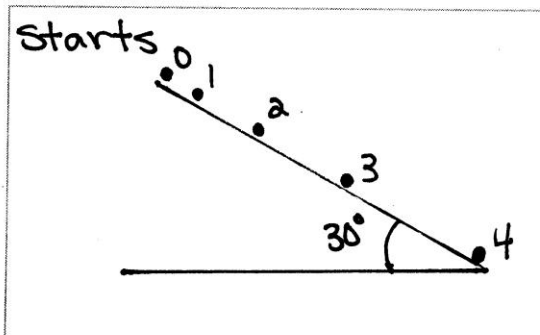
1. A car accelerates forward from a stop sign. It eventually reaches a steady speed of 45 mph.



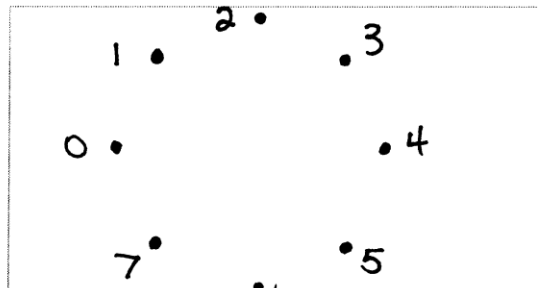
2. An elevator starts from rest at the 100th floor of the Empire State Building and descends, with no stops, until coming to rest on the ground floor. (Draw this one *vertically* because the motion is vertical.)



3. A skier starts *from rest* at the top of a 30° snow-covered slope and steadily speeds up as she skies to the bottom. (Orient your diagram as seen from the *side*. Label the 30° angle.)

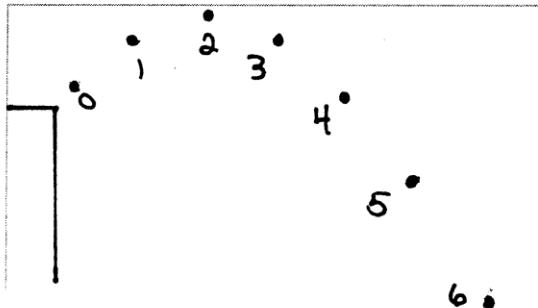


4. The space shuttle orbits the earth in a circular orbit, completing one revolution in 90 minutes.

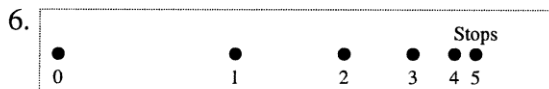


5. Bob throws a ball at an upward 45° angle from a third-story balcony. The ball lands on the ground below.

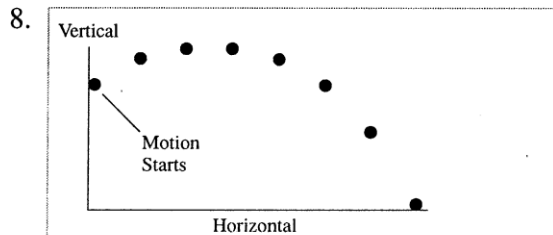
equal horizontal spacing



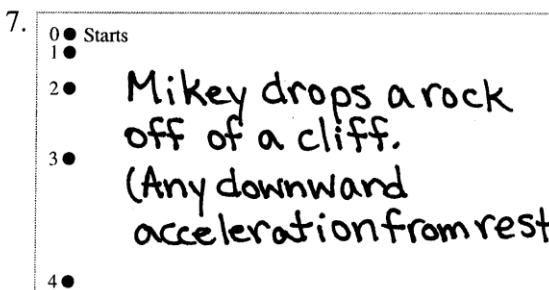
Exercises 6–9: For each motion diagram, write a short description of the motion of an object that will match the diagram. Your descriptions should name *specific* objects and be phrased similarly to the descriptions of Exercises 1 to 5. Note the axis labels on Exercises 8 and 9.



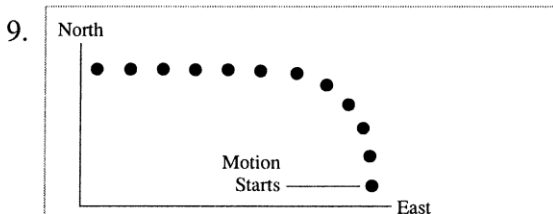
A car breaks to a stop from a speed of 40 km/hr.
(Any linear motion of an object slowing down to a stop.)



Sally launches a water balloon from her second-floor window in an attempt to hit her ex-boyfriend.
(projectile motion)



Mikey drops a rock off of a cliff.
(Any downward acceleration from rest.)



A man walks steadily along a path that turns from north towards the west and continues directly west.
(Any turning from north to west at constant speed.)