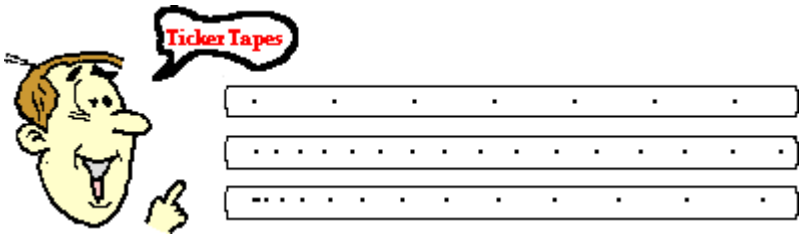
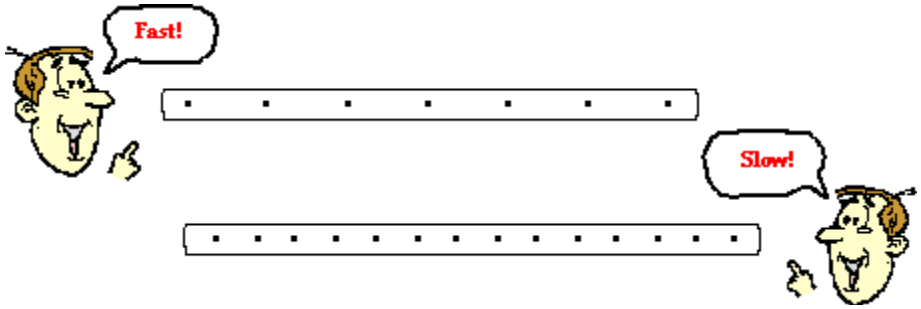
7. Ticker Tape Diagrams

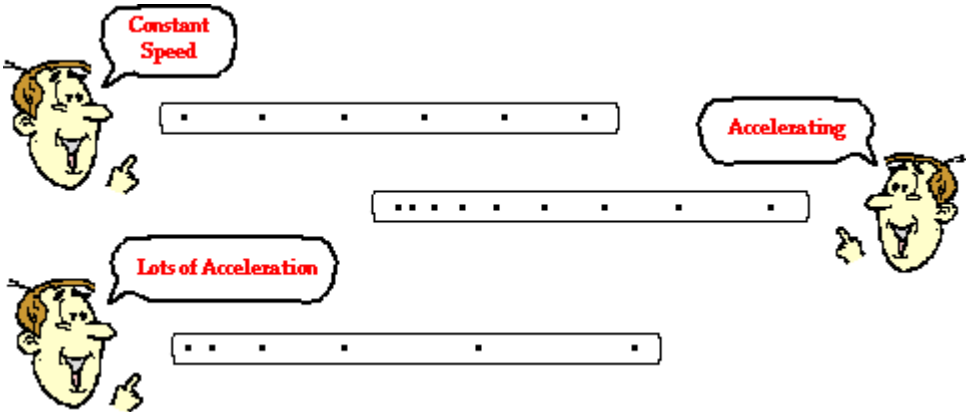
A common way of analyzing the motion of objects in physics labs is to perform a **ticker tape analysis**. A long *tape* is attached to a moving object and threaded through a device that places a tick upon the tape at regular intervals of time - say every 0.10 second. As the object moves, it drags the tape through the "ticker," thus leaving a trail of dots. The trail of dots provides a history of the object's motion and therefore a representation of the object's motion.



The distance between dots on a ticker tape represents the object's position change during that time interval. A large distance between dots indicates that the object was moving fast during that time interval. A small distance between dots means the object was moving slow during that time interval. Ticker tapes for a fast- and slow-moving object are depicted below.



The analysis of a ticker tape diagram will also reveal if the object is moving with a constant velocity or accelerating. A changing distance between dots indicates a changing velocity and thus an acceleration. A constant distance between dots represents a constant velocity and therefore no acceleration. Ticker tapes for objects moving with a constant velocity and with an accelerated motion are shown below.



And so ticker tape diagrams provide one more means of representing various features of the motion of objects.

Check Your Understanding

Ticker tape diagrams are sometimes referred to as oil drop diagrams. Imagine a car with a leaky engine that drips oil at a regular rate. As the car travels through town, it would leave a trace of oil on the street. That trace would reveal information about the motion of the car. Renatta Oyle owns such a car and it leaves a signature of Renatta's motion wherever she goes. Analyze the three traces of Renatta's ventures as shown below. Assume Renatta is traveling from left to right. Describe Renatta's motion characteristics during each section of the diagram. Click the button to check your answers.

1. 

2. 

3.