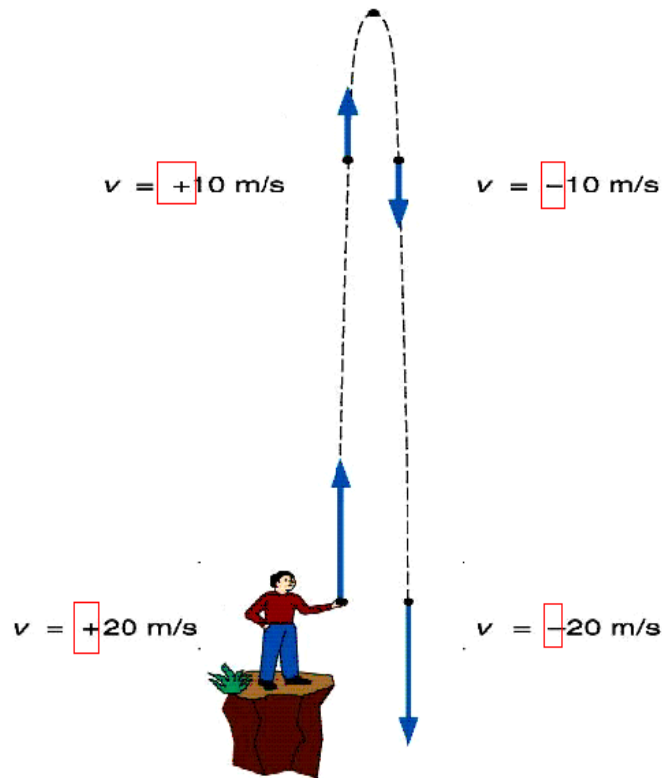# Kinematics 1-D Motion: Straight up: Guided Notes

I. **Throwing a ball upward**

A. Let's think about what's going on here…

B. I altered the path slightly so we could visualize each position the ball passes through.

$v = \boxed{+}10$ m/s $v = \boxed{-}10$ m/s

$v = \boxed{+}20$ m/s $v = \boxed{-}20$ m/s

C. Remember velocity, displacement and acceleration are _____.

D. Their sign tells the _____ they are pointing/moving.

E. Positive = _____. Negative = _____.

F. If the ball is thrown straight up and falls back down on the same path, does it have an x (or horizontal) path?

G. Why or Why not?

II.   Another use of our Kinematics equations: Write and label them here:

   A.   What is the initial speed?

   B.   What is the final speed?

   C.   How long does it take to get to the top?

   D.   How long will it stay in the air?

   E.   How high will it go? (max. ht.)

III.   Notice how we use the same equations in different ways. Diagram a parabola here and label the use of each equation:

IV.   Example 1: A pitcher tosses a baseball straight up, with an initial speed of 12 m/s. How long does the ball take to reach its highest point?

   A.   How high does the ball rise (what is the highest point)?

V.   Example 2: With what speed must a ball be thrown vertically from ground level to rise to a maximum height of 50m? How long will it be in the air?

VI.   Free Fall Reminder!   Rudy drops a pencil down the stairs from the 3rd floor. Where is the pencil 1.5s later? How fast is the pencil falling at 1.5 s?