Steps for applying the work-energy theorem

Step 1: Draw good pictures of each important *instant* of time. Label them with all known and unknown speeds, positions, angles, masses, etc.

Step 2: Choose a specific object ("the system") whose energy you will analyze.

Step 3: Choose a specific interval of time (with starting and ending points represented by two of your sketches) over which you intend to apply the work-energy theorem.

Step 4: Determine the forces acting on the chosen system during the chosen interval of time. You may need to perform an auxiliary Newton's Second law analysis to help out here.

Step 5: Write the work-energy theorem. $W_{NC} = \Delta E$

Step 6: Work on the left hand side (lhs) of the equation by determining if any of the nonconservative forces do any work during the chosen interval. If so, obtain an expressions for those works (in terms of forces, distances, angles, etc.) and use auxiliary information to simplify the lhs as much as possible.

Step 7: Work on the right hand side (rhs) of the equation by obtaining expressions for the total mechanical energy of the chosen system at the beginning and end of the chosen interval (in terms of speeds, positions, masses, etc.) and use auxiliary information to simplify the lhs as much as possible.

Step 8: Examine your resulting equation to see what you know and what you don't know and figure out where to go from here.