For each of these, we aren’t going to solve the problems yet – just figure out how to get the info out of the problem so that we know how we’re going to solve them! So we’re focusing on pulling the variables (remember, SHUT = **S**tated variables, **H**idden variables, **U**nknowns and **T**arget variables) and then figuring out useful equations to use

1. A bullet in a gun is accelerated from the firing chamber to the end of the barrel at an average rate of 6.20 x 105 m/s2 for 8.10 x 10-4 s. What is the final velocity of the bullet as it leaves the barrel of the gun? (This is also called the muzzle velocity.)

**Stated variables**

**Hidden variables**

**Unknowns**

**Target variables**

**What equations can I use with this info to solve for my Target variables?**

1. A student backs her car out of her parking spot with an acceleration of 1.40 m/s2. How long does it take her to reach a speed of 2.00 m/s? If she then brakes to a stop in 0.800 s, what is her acceleration then?

**Stated variables**

**Hidden variables**

**Unknowns**

**Target variables**

**What equations can I use with this info to solve for my Target variables?**

1. A toy car starts from rest (a complete stop) and steadily speeds up, reaching a speed of 12 m/s after 6 s. How far does the toy car travel? What is the acceleration of the car?

**Stated variables**

**Hidden variables**

**Unknowns**

**Target variables**

**What equations can I use with this info to solve for my Target variables?**

1. You throw a ball straight up with an initial velocity of 15.0 m/s. It passes a tree branch on the way up at a height of 7.0 m. How much additional time elapses before the ball passes the tree branch on the way back down?

**Stated variables**

**Hidden variables**

**Unknowns**

**Target variables**

**What equations can I use with this info to solve for my Target variables?**

1. A diver bounces straight up from a diving board, avoiding the board on the way back down toward the water, falling feet first into the pool. She starts with a velocity of 4.00 m/s and her takeoff point is 1.80 m above the pool. What is her highest point above the board? How long a time is she in the air? What is her velocity when her feet hit the water?

**Stated variables**

**Hidden variables**

**Unknowns**

**Target variables**

**What equations can I use with this info to solve for my Target variables?**

1. A car starts from rest, steadily speeds up to 40 m/s in 15 s, moves at a constant speed for 30 s, then comes to a halt in 5 s. What is the acceleration in the first segment?

**Stated variables**

**Hidden variables**

**Unknowns**

**Target variables**

**What equations can I use with this info to solve for my Target variables?**

1. A rock is dropped from a bridge and steadily speeds up as it falls. It is moving at 30 m/s when it hits the ground 3 s later. What is the acceleration? How tall is the bridge?

**Stated variables**

**Hidden variables**

**Unknowns**

**Target variables**

**What equations can I use with this info to solve for my Target variables?**