Transcript
Blood Interactive

Opening:

Welcome, CSI trainees – thanks for coming to your inservice session on blood as evidence. We've got a short video for you to watch, as a review of what you need to think about when dealing with blood at a crime scene. Afterwards, you'll go out with a couple of experienced officers to a crime scene to see what you can figure out. Let's get started.
All right. You've got your review; now it's time to head out into the field. Detectives Gates and Morgan are going to take you out to a scene that was called in a little while ago.

Travel:

We got a call about a homicide this morning. From what I hear, it's a pretty messy situation – a shooting.
I don't know how many crime scenes you've been to, but this one is going to be full of blood, so you'll need to be extra careful. Remember, blood could be anywhere, so you'll need to be sure to take precautions both before you enter the scene and as you interact with anything – be careful where you walk, what you touch, everything. You don't want to contaminate any evidence.
Our station keeps a bunch of digital cameras charged up and ready to go; I took one on our way out so that we'll be able to document everything we find.
Okay, looks like we're pulling up to the scene.

Hotspots:

Notice that there are blood stains both on this broken lamp as well as next to the lamp. Also, the quantity and shape of the droplets on the floor here can be very significant.
Notice that there are blood stains on the wall. Look at the angle and trajectory of the blood spatter.
Notice the amount of blood on the floor. I can tell by looking at it the victim was definitely shot in the head.
Let's examine the blood on the door handle. It appears to still be wet. We need to determine is this blood is the victim's or the suspect's.
Take a look over there. There are sheets and clothes rolled up outside in the garbage can, and there appears to blood on them.

Closing:

Hey, thanks so much for your help today. CSI is an ongoing learning experience; there are always new techniques to learn to do our jobs better.
I'm sure you're on your way to a great career – good luck.

Video:

There are two important aspects to working with blood-related evidence – the genetic angle, related to the biology of the blood itself, and pattern interpretation of blood found at a crime scene.
Blood is made of four components: Plasma, Red blood cells, White blood cells and Platelets. Plasma is a mixture of water, sugar, fat, protein, and potassium and calcium salts. Red blood cells contain a special protein called hemoglobin, which carries the oxygen we inhale with our lungs to all of the parts of our bodies. White blood cells produce proteins called antibodies that help our bodies fight infections caused by bacteria, viruses, and foreign proteins. Platelets aren't really cells at all; they are just fragments of cells.
Blood may be dripped out, sprayed from an artery, oozed out through a large wound, or flung off a weapon raised to strike another blow. Blood splashes in several different ways: 1. Drops on a horizontal surface 2. Splashes, from blood flying through the air and hitting a surface at an angle 3. Pools around the body, which can show if it's been dragged 4. Spurts from a major artery or vein 5. Smears left by movement of a bleeding person
The pattern of the blood splatters can be examined to find out all sorts of things, such as what type of weapon or impact occurred to cause the bloodstains present; how many times the victim was struck; where the victim was at the time the injuries were inflicted; where the assailant was during and following the assault; whether the bloodstain evidence is consistent with the medical examiner findings; or whether the bloodstain evidence on the suspect and his or her clothing is consistent with the crime scene.
Much of the analysis of blood itself occurs in the lab. Scientists work with high-tech equipment that can reveal a great deal about the victim. Forensic scientists perform two roles in their work. One is to analyze physical evidence found either on a victim, at the scene of a crime, or both, and the other is to compare it to evidence found on the suspect.
DNA is a powerful biological identifier that can be used to determine with a high level of certainty that blood belongs to a specific individual. However, as DNA testing becomes more exact and refined, the test itself requires a more and more "pure" blood sample to work from. If collection at the crime scene is not done with utmost precision, it could cause the DNA test to be inconclusive or invalid. Any type of organism can be identified by examination of DNA sequences unique to that species. Identifying individuals within a species is less precise at this time, although when DNA sequencing technologies progress farther, direct comparison of very

large DNA segments, and possibly even whole genomes, will become feasible and practical and will allow precise individual identification.