"Duck and Cover" is the name of a 9 minute Civil Defense movie created in 1951. As a film fixed in time, some of the scenes seem quaint, as they don't apply in the same way today (a child asking a total stranger for help for example).

It is important to remember that in 1951 there were only about one dozen small (fission) atomic weapons in existence. The Hydrogen bomb had not yet been demonstrated. The global atomic war (for which this film is often dismissed as providing useless protection against) was not yet a possibility. If the Soviet Union had wanted to attack America, their only option would have been to fly their half-dozen bombs in, at about 300mph, with propeller powered aircraft.

The Duck and Cover movie was intended as an educational tool for schools (it was originally to be called "Civil Defense for Schools"), and it was filmed in the same style used for, and perfected in, World War 2 military training films. The target audience of the film was children of about 8 years of age, and like other school films about safety, it was intended to help save childrens lives. The information presented in the film was developed jointly by several Ivy League universities, and represented what they believed (given the circumstances of persons having limited ability to prepare) were the best techniques for survival.

The movie was never intended to be a stand-alone. The movie was supposed to only be an introduction to the subject of Civil Defense (a.k.a., the "Woody-Woodpecker movie that astronauts used to show before a talk about outer space). It was assumed that children watching the film would have many questions, so there was also a teaching guide and several handouts to go along with the film.

It is important to note that the biggest concern was blast damage (overpressure knocking you down, heat burning your skin, and flying debris hitting you). Having just experienced air raids against civilian cities in WW2, there was direct knowledge of what did and did not save lives during a bomb blast. The most effective technique was known as "Duck and Cover". In fact, this technique is still effective, and is taught by the American Red Cross in areas where earthquakes and tornados are a probability (the Red Cross calls their technique "DROP, COVER, and HOLD ON"). Ducking and Covering has already saved lives during earthquakes, tornados, hurricanes, and explosive volcanic eruptions!

==========

But how effective is Duck and Cover against an atomic blast? Here is an abridged article by a T. J. Nelson discussing this very issue. Do keep in mind the following facts as you read this article:

Within the last half century, there have already been 521 -known- above-ground nuclear detonations. Total explosive force has been approximately 480 megatons. At this time in history, the most likely atomic bomb explosion will be from a terrorist fission device, of a scale -smaller- than a typical A-bomb circa 1951.

==========

Duck and Cover
by: T. J. Nelson

The idea of "duck and cover" seems quaint today, partly because it reminds us of a bygone era, and partly because it follows the general rule, first recognized by comedians, that anything containing the word 'duck' is intrinsically funny. (It shares this distinction with the word 'banana'). The "duck and cover" program, which was initiated in the days before H-bombs and ICBMs, was a reasonable course of civil defense at the time.

The idea that a nuclear war would end all life on the planet has become very widespread. The cold fact is, ducking and covering is excellent advice. In general terms, here are the facts you should know:

BLAST
Blast is a pressure differential which creates compressive forces on buildings and on the human body. The lethal blast radius, which is the distance within which more than half the people would be killed, is about 2-3 miles for a 1 megaton explosion and up to 10 miles for a really large explosion (25 megatons). This is the distance where the pressure differential is 5 p.s.i. or greater, and ducking and covering probably won't help. This radius increases with the cube root of the energy output, and depends on various specific details about the topography and the bomb itself. However, even in a total nuclear war, it is simply false that everyone would die. Given world inventories of 20-30,000 bombs with a total force of roughly 13,800 megatons, and a total inhabitable land mass of 51 million sq. mi., all of the earth's population could never be close enough to be killed by a blast, even if every bomb in existence were detonated in a maximally destructive pattern. Most people would still be outside the blast radius, where ducking and covering is not a bad idea at all.

RADIATION
When you're ducking and covering, you increase the probability that topographical features such as hills, building foundations, and cars, will be between you and the radiation source. Remember that most of the gamma rays, which travel in a strict straight line, are emitted in the first few seconds, and taper off over a period of a few minutes. They are mostly emitted from the center, that is, the brightest part of the explosion. They are absorbed by the ground or other objects in their path. So every bit of ground that blocks you from this radiation source reduces its intensity. If you're too close, you will die. But if not, ducking and covering could make a big difference. In fact, the exposure to gamma rays, heat, ultraviolet, and fast neutrons in the first few minutes are the greatest dangers to those outside the immediate blast radius.

Incidentally, radiation falls off as the square root of the distance from the source (actually slightly faster, because of absorption). This means the radiation danger from a very small bomb, such as one that might be detonated by a terrorist, covers a wider range than the blast damage, while for a larger bomb, the reverse is true. About 35% of the energy of a nuclear weapon is emitted as heat. This would cause severe burns, and the intense light would be blinding--hence the importance of "covering".

DEBRIS
A nuclear explosion is followed by a wave of debris pushed outward from the center. There is also debris from collapsing structures. When you're ducking and covering, you also greatly improve your chances of avoiding this debris.

MULTIPLE EXPLOSIONS
For various reasons, an enemy would not detonate more than one nuclear bomb simultaneously. They would most likely be spaced apart by at least a few minutes. Thus, if you were ducking and covering, you would be partially protected from the second one.

FALLOUT
Fallout is produced if the explosive fireball touches the ground. If someone tells you that cancer or birth defects from fallout is a certainty for anyone who survives the initial attack, they are misinformed. Yes, the risk is much higher. But even in Hiroshima, only a relatively small portion of the survivors of Hiroshima ever contracted cancer. The risk of cancer is much higher if you're exposed to the original radiation source. For example, a dose of 50 rem, about 1/10 of a fatal exposure, will cause a cancer fatality in somewhere between 0.4 and 2.5 percent of those exposed. Again, if you happened to duck and cover, your chances of getting cancer, becoming sterile, or transmitting birth defects to your children would be greatly reduced.

Radiation sickness, not cancer, is the main worry from fallout. Fallout occurs in a narrow, directional pattern, mostly downwind of the blast. From a 1 megaton blast, unprotected people standing in the open for a long enough period of time could receive a lethal dose of radiation (900 Rem) up to 90 miles away if they were directly downwind. People upwind would receive a much smaller dosage. The radioactivity in fallout decays to 1/1000 of its original levels within two weeks.

NUCLEAR WINTER
The "nuclear winter" scenario that the late Carl Sagan was so fond of promoting is really just a speculative hypothesis. The theory of nuclear winter was based on a fundamental misunderstanding of scale. Although everyone agrees that a limited nuclear exchange would have negligible effect on climate, Sagan and a few others had suggested that an all-out nuclear war might raise enough dust particles into the stratosphere to partially block out sunlight, which would lower the earth's temperature and kill all plant life. This conclusion has been thoroughly discredited (see the Fall 1986 issue of Foreign Affairs). Skeptics also point out that a volcano releases orders of magnitude more dust than any nuclear explosion, and the largest volcanoes historically have only reduced temperatures by a few degrees. In fact, it's almost impossible to predict the effects of nuclear explosions on climate, let alone how many people would die from it; but even in the worst possible case the human race would almost certainly survive, and a great many people would continue to live healthy lives.