Principal Life Cycle Stages

Mitigation: This phase of the lifecycle tries to reduce the vulnerability of disaster impacts. Helps reduce things like injuries, and loss of life and property. Examples of changes a community would do are things like building code.

Preparedness: This is the understanding how a disaster might impact a community and how education on the matter could help. This stage also includes outreach and training programs of how to respond and recover from a disaster.

Response: This stage addresses the immediate threats from the disaster. This includes saving lives, clean up, damage assessment, and starts the resource distribution. This has two stages which include the immediate reactions and the second which eventually gets to conducting repairs, restoring utilities, and finishing the clean up.

Recovery: This is the rebuilding of all aspects of the impact on a community and also the return of the local economy. This is split into two periods called the short-term and the long-term. The short-term can last anywhere from six months to about one year. The long-term period can take up to decades to where the community is back to where they were before the disaster.

Natural Disaster - Haiti 2010 Earthquake

2010 Haiti Earthquake

Mitigation- The Red Cross supplied a plethora of tarpaulins to shelter the victims of the Haitian earthquake.  
Preparedness - Haiti, especially in Port au Prince, were not prepared for an earthquake. All of the buildings were structurally unsound. Because of the two to structurally sound water towers that withstood the earthquake, it was proven that there could have been significantly less damage if Port au Prince built its buildings with more integrity. In regards to Red Cross, they were only prepared to give shelter for the victims. Red Cross did not account for the rebuilding of the civilians’ houses, the egregious hurricane weather, nor diseases like cholera that were to follow.

Response- The Red Cross responded fast to the earthquake in an impressive amount of time.  
Recovery- Shelter relief program’s recovery processes were very slow and procrastinated. The Red Cross did not start rebuilding house till almost a year later. In addition the following constraints elongated the recovery process: shelter, lack of structural integrity, institutional limitations, lack of civilian registration, poverty, high population density from the urban setting of Port au Prince, bad transportation systems for relief equipment, and insecurity due to theft, assaults and murders.
C: The Red Cross came to the aid of the affected Haitians in a respectable amount of time. They provided tarpaulins for shelter from hurricanes and had their branches around the world donate money to help disaster relief.

Decisive Role- We thought that the mitigation stayed to the life cycle was the decisive factor in both short and long term outcomes from this natural disaster. This is because the buildings were not structurally sound enough to withstand an earthquake. As a result, there were far more injuries and casualties that had to be dealt with. 15% of Port au Prince’s 2.5 million person population was killed and 1.5 million of the survivors were left homeless.

Concept Map

Human Made Disaster - BP Oil Spill 2010

Mitigation - They put a cement and shoe track barrier at the bottom of the well to contain hydrocarbons. They tested the pipes in a negative pressure test. They had an emergency route that would direct the well flow to a mud-gas separator, this should have been directed overboard. The rig had fire and gas systems to prevent fire and explosions aboard the rig. They
also put in place a blowout preventer which would activate automatically to seal the well incase the crew operated controls were dismantled.

**Preparedness** - President Obama signed the Executive Order officially forming the Gulf Coast Ecosystem Restoration Task Force. This order set up a task force that educates people and makes community involvement a higher priority when involved with the oil spill. They set up meetings with the public. The first one was in Florida on November 8th, 2010.

**Response** - Physical barriers were set up to trap oil pockets from spreading and then people used skimmers to absorb as much of the leaked oil as possible. Dispersants were dumped into the Gulf of Mexico to help the oil disperse into the water that could then be evaporated or broken down by bacteria in deep ocean. Dispersants are chemicals that break down the oil into smaller particles that mix with water more easily. 1.4 million gallons of various chemical dispersants were dispersed into the Gulf of Mexico throughout the duration of cleanup.

**Recovery** - New England Aquarium (NEA) provided rehabilitation for animals affected by the oil spill. Efforts were made to seek out alternative relocation sites for future oil spills affecting marine life. The National Zoo were tasked with aiding the relocation efforts. Animals covered in oil were rescued from the oil filled pockets. Workers cleaned off the affected animals to the best of their ability with heavy duty soap.

**Decisive Role** - The mitigation step played the most important role because it was the step that failed. If it did not fail then the rest of the oil spill would not have occurred.

**C:** Disaster shelter systems: The shelter was namely for aquatic animals and birds as this was the group affected mostly by the oil spill. They created an aquarium for rehabilitation. Also shelter in the form of a more permanent address was tasked to the National Zoo who relocated the animals where they needed to be.

Equipment deployed: To clean up the oil spill they set up barriers to keep the oil from spreading and skimmed the surface to get as much oil out as possible. They also used dispersants to help dispers the oil into the water. They also deployed a mini robot to research oil after dispersants were dumped into the gulf.
**Process Flow Diagram**

**Oil Spill Disaster**

**Preparedness**
- President Obama signed the Executive Order officially forming the Gulf Coast Ecosystem Restoration Task Force.
- They had an emergency route that would direct the well flow to a mud-gas separator.
- They also put in place a blowout preventer which would activate automatically to seal the well in case the crew-operated controls were dismantled.

**Mitigation**
- The rig had fire and gas systems to prevent fire and explosions aboard the rig.
- Cement and shot track barrier were place at the bottom of the well to contain hydrocarbons.
- NewEngland Aquarium (NEA) provided rehabilitation for animals affected by the oil spill.

**Response**
- This order set up a task force that educates people and makes community involvement a higher priority when involved with the oil spill.
- Physical barriers were set up to trap oil pools from spreading.
- Dispersants were used to help the oil disperse into the water.
- People used skimmer to absorb as much of the leaked oil as possible from the trapped locations.

**Recovery**
- Dispersants are chemicals that break down the oil into smaller particles that mix with water more easily.
- 1.4 million gallons of various chemical dispersants were used in the Gulf of Mexico.
- Efforts were made to seek out alternative relocation sites for future oil spills affecting marine life.

The National Zoo were tasked with aiding the relocation efforts.
Harley Davidson’s V-Rod was an evolutionary engineering feat that changed the motorcycle industry. The company had to build a new model bike from the ground up by using the engineering design process. After 6 grueling years, the V-Rod was born.

Throughout the lifecycle of consumer goods, they go through essential stages in their life that impact the rest of their journey. The lifecycle of a Hershey’s chocolate bar shows the importance of each stage and how it needs to go through each stage to end up where it has to be.

The study of a single use camera demonstrated how it worked and what made things work. Research of a recyclable camera show where parts go and which are reused for future cameras.
The world’s exponentially increasing use of non-renewable resources will eventually run out. In other words, the use of electricity is unsustainable at the moment. The only way to continue the lifestyle we are living now for generations to come would be switching to sustainable energy. However, at the moment alternative energies like wind, hydro, and solar are costly and not effective enough.

Over the course of human history, natural disasters have plagued and punished the human race, but humans are not perfect either. On top of natural disasters, humans have created disasters that tarnished the earth as well, such as the Haitian earthquake in 2010 and the BP oil spill in 2010 as well, which was caused by humans. This proves that humans can be just as lethal as mother nature herself.