**Developing New Technology -** Improving People’s Lives

**Understanding Technology**

* **Technology** – is the use of science to solve problems and make people’s lives easier
* **Engineer** – person who designs, constructs, or operates new forms of technology.

**Steps of the Design Process**

* **Technological Design** – is the process (steps) of inventing and building products and systems that can meet human needs and solve problems.
* There is a **4 step process** to solve people’s problems.
* **Problem Identification**
* **Solution Design**
* **Implementation**
* **Evaluation**

**Step 1: Problem Identification**

* Identify a problem that technology might solve.
* Example: Estimated close to one billion cars worldwide.

**Step 2: Solution Design**

* Engineers come up with ideas of how **technology** can solve this problem. It is a lot like a **hypothesis** in the scientific method.
* The **design solution or product** should:
  + Meet a human need
  + Use scientific principles
  + Be suitable for use by one or more persons
* **Possible solutions** for air pollution might include cars that run entirely on electricity, or partly on electricity and partly on gasoline. These types of cars are called Hybrid Cars.
* The **proposal explains** how the car might work and include drawings and models.
* There would be a **list of needed materials** and how much they think it might **cost** and potential **benefits and risks**

**Step 3: Implementation and Testing**

* Once given the OK engineers starting putting the plan into action.
* 1st they build a **prototype,** which is a “working” model of a new technology. They will build several models before getting the perfect one.
* 2nd is the **performance testing**, which is taking the prototype out into the real world and see how it works.

**Step 4: Evaluation**

* This step is similar to analyzing your experiment using the scientific method.

**Questions to answer**

* Does the design work as planned?
* How can the success of the design be measured?
* Does the design solve the problem and meet people’s needs?
* Have risk been minimized?
* How can the design be improved?
* What was learned that could help produce a better design?

**Risk and Benefits**

* **Benefits –** are ways in which the technology meets people’s needs.
* **Risks** – include how the technology may harm or endanger people or the environment
* Scientists, government agencies, and citizens **decide if the benefits outweigh the risks**

**Bioengineering**

* **Bioengineering** – is the development of **technology** in the fields of biology and medicine.
* Bioengineer – is the engineer who helps people stay healthy, grow food and make other materials they need.
* They use science of living things to create new technology

**Bioengineering and Medicine**

* **Bioengineers** have developed many tools that help doctors diagnose diseases and other medical problems.
* **CAT scanners** - is a way of **X-raying** a mass in the body that allows for one to see three-dimensional views of the mass.
* **MRI** - An MRI (or **magnetic resonance** imaging) scan is a radiology technique that uses magnetism, radio waves, and a computer to produce images of body structures. The MRI scanner is a tube surrounded by a giant circular magnet. The patient is placed on a moveable bed that is inserted into the magnet.

**Bioengineering in Medicines**

* Medicines – insulin helps control sugar levels in people who suffer from diabetes. The insulin used to come from cows and pigs, today bacteria in labs make human insulin which is safer for the patients.
* The bioengineered insulin is also easier to produce in large amounts.

**Bioengineering and Devices**

* These devices help people with disabilities.
* The Adaptive Device is a device that is changed, or adapted, for use by a disabled person.
  + A voice-activated computer
  + A motorized wheelchair
  + Assistive Device-is a device that helps a person or organism with daily life
    - Hearing Aids
    - Artificial Limbs