

PROJECT LEAD THE WAY

PLTW

Introduction to Engineering

What Do Engineers Do?

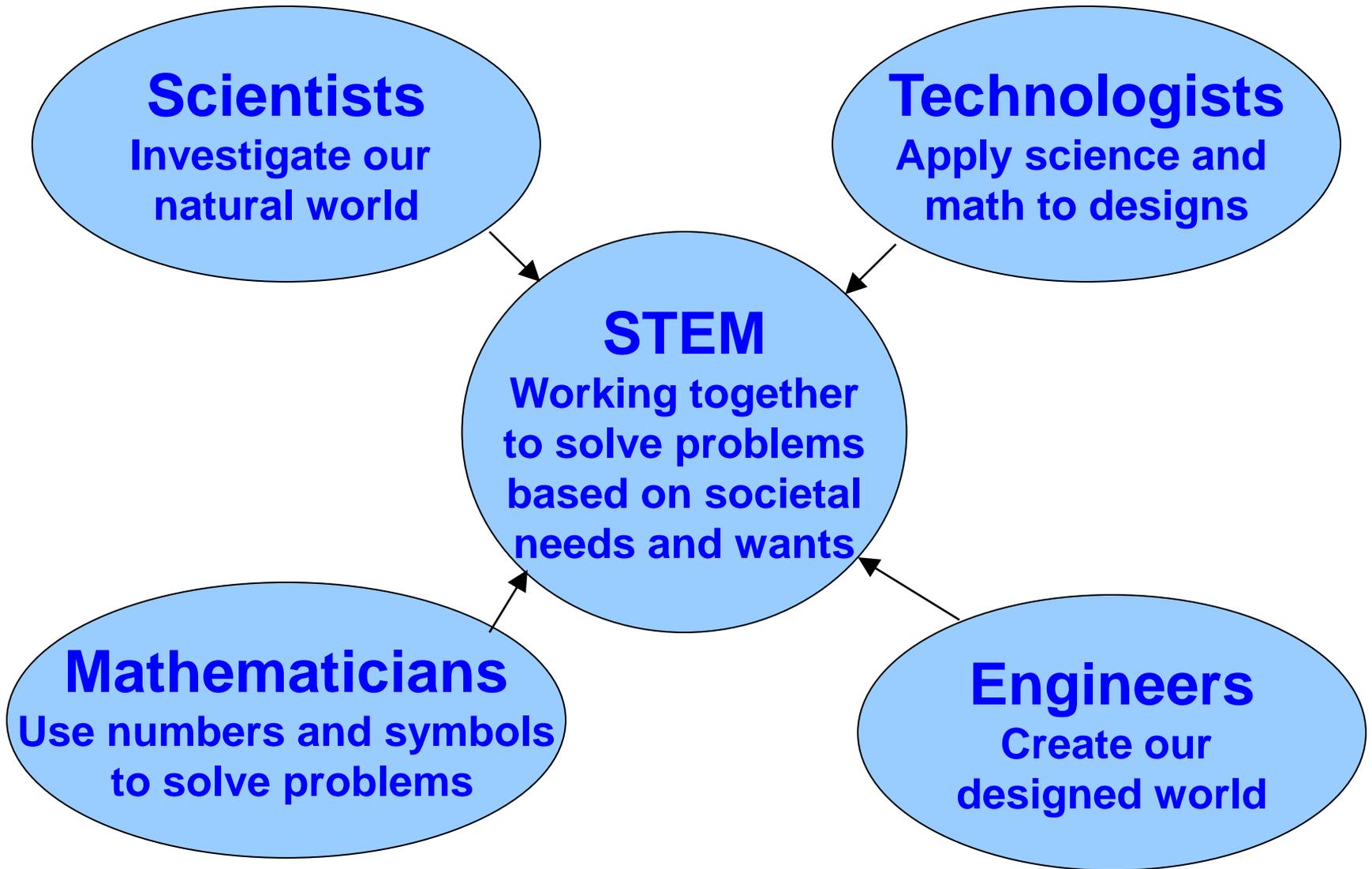
What is **S**cience?

What is **T**echnology?

What is **E**ngineering?

What is **M**athematics?

What is **STEM**?



How are they all needed to Create a Product?

Example	Science	Technology	Engineering	Math
<p>Pencil</p> 	<p>Discovery of graphite and the fact that rubber (eraser) will remove graphite</p>	<p>Creating a writing device that doesn't use ink</p>	<p>Designing a device with graphite insert, exterior holder, and attached eraser</p>	<p>What is the optimal length, diameter, or shape for the device?</p>

Problems That Solve Our Needs and Wants



What are our human needs?

PHYSICAL NEEDS:

- Basic shelter
- Basic clothing
- Can you think of more?

BIOLOGICAL NEEDS:

- Water
- Food
- Can you think of more?

PSYCHOLOGICAL NEEDS:

- Family
- Friends
- Can you think of more?

Problems That Solve Our Needs and Wants



What are our human wants?

PHYSICAL WANTS:

- Nice house
- Nice car
- Nice clothes
- Can you think of more?

BIOLOGICAL WANTS:

- Fresh water
- Fancy food
- Healthy living
- Can you think of more?

PSYCHOLOGICAL WANTS:

- Talk with family
- See friends
- Entertainment
- Can you think of more?



Engineering

Engineering uses scientific, technological, and mathematical knowledge to solve practical problems.

Engineers Can Do Anything

- **Invent** – Develop a new product, system, or process that has never existed before
- **Innovate** – Improve an existing technological product, system, or method

Invent

Design

Build

Analyze

Create

Orchestrate

Conceive

Improve

Evaluate

Engineers Work to Solve Many Kinds of Problems

- An electrical engineer may design a GPS for your vehicle.
- A pharmaceutical/chemical engineer may find a cure for disease.
- A computer engineer may build a computer the size of your watch.
- A mechanical engineer may create a robot to discover water on a planet.
- An agricultural engineer may evaluate the effects of global warming on food production.

Engineers make our lives better

Discussion Questions

- What product or system would make your life better?
- Is this an invention or an innovation?
- What type(s) of engineer(s) might work on this project?



Image Resources

Microsoft, Inc. (2008). Clip Art. Retrieved September 10, 2008, from <http://office.microsoft.com/en-us/clipart/default.aspx>