

Science, Technology, Engineering & Mathematics

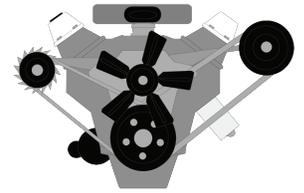
People in the Science, Technology, Engineering & Mathematics cluster work in areas such as research, testing and development. They like to solve problems. They are curious. They ask questions and search for answers.

Science, Technology, Engineering & Mathematics

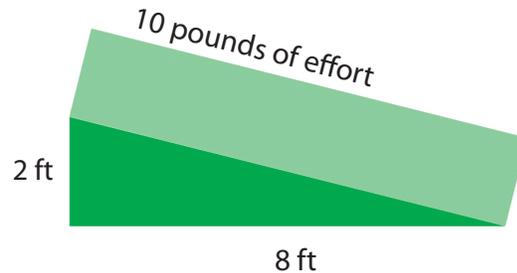
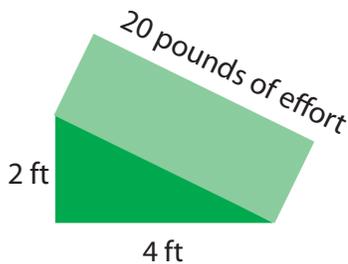
Mechanical Engineers ■ Industrial Engineers ■ Conservation Scientists ■ Chemists
■ Environmental Scientists & Specialists, Including Health

Mechanical Engineers

Mechanical engineers design, build and test mechanical products. They want to know how things work. Mechanical engineering deals with anything that moves. They design and test mechanical products. This includes cars, rockets, engines and robots. They know about things like motion, energy and force. They like solving problems.



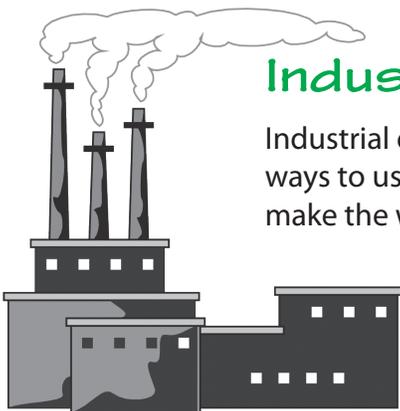
Machines make it easier for people to do work. Some machines have only one or two parts. They are called simple machines. An inclined plane is a simple machine. It has slanted surface that connects a lower level to a higher level. Ramps, steps and slides are inclined planes. It's easier to move things up a ramp than to lift something straight up. Look at the ramps below and answer the questions.



True or false?

The first ramp is steeper than the second one _____

The second ramp will make it easier to push a rock to the top, but you have to go farther _____



Industrial Engineers

Industrial engineers find ways to make companies run smoothly. They figure out better ways to use workers, machines and information. They help employers save money. They make the workplace better for workers. Some might make sure a hotel chain offers the same things in each of its hotels. They might decide if a job should be done by a person or a machine.

Industrial engineers use problem solving skills a lot. Use your problem solving skills to answer the problem below:

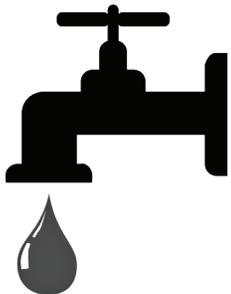
There are 24 students going on a field trip to the zoo. They will be put into small groups. Each group is led by an adult. An adult can only have four kids in his or her group. How many adults need to go on the field trip?

School Rules: (How much education do you need?)

| Occupation | High School | Some Beyond High School | Associate Degree | Bachelor's Degree | Advanced Degree |
|--|-------------|-------------------------|------------------|-------------------|-----------------|
| Mechanical Engineers | | | | ✓ | |
| Industrial Engineers | | | | ✓ | |
| Conservation Scientists | | | | ✓ | |
| Chemists | | | | ✓ | |
| Environmental Scientists and Specialists | | | | ✓ | |

Conservation Scientists

Conservation scientists manage and protect natural resources like water and soil. They help landowners find the best use of land and livestock without hurting the environment. They help stop soil erosion. They teach producers how to save soil and water.



Turning off the faucet when brushing your teeth can save about one gallon of water per week if you brush your teeth three times a day. How many gallons could be saved in one year if a class of 26 students turned off the water each time they brushed?



If every student in a class of 26 turned off the faucet when brushing for one week, the class could save _____ gallons of water in one year!

Chemists

Chemists study matter. Matter is what scientists call everything you can touch, see, feel or smell. Chemists work with chemicals. They figure out ways chemicals can help people. Chemists have created things like medicines, paint and makeup.

Chemists work with elements. Elements are the building blocks of all matter. There are more than 100 elements in the universe. Each element is part of the periodic table. Elements on the period table are represented by letters. Below are some rows of the periodic table. Use the table to figure out the names of the elements.



| | | | | | | | |
|---------------|-----------------|----------------|---------------|-----------------|-------------|----------------|-------------|
| H Hydrogen | | | | | | He Helium | |
| Li Lithium | Be Beryllium | B Boron | C Carbon | N Nitrogen | O Oxygen | F Fluorine | Ne Neon |
| Na Sodium | Mg Magnesium | Al Aluminum | Si Silicon | P Phosphorus | S Sulfur | Cl Chlorine | Ar Argon |

O _____ H _____ Ne _____

C _____ Cl _____ Na _____



Bonus Activity: Find a complete periodic table and use the symbols to form words. The symbols must be used as they appear on the periodic table. You may use the symbols more than once in a word, but you cannot mix up the letters. See the example below.

Example: C+Ar = Car



Environmental Scientists & Specialists, Including Health

Environmental scientists and specialists work to protect the planet Earth. They figure out how people can make things in ways that do not hurt the environment, animals or people. They work on solutions to environmental problems like pollution and acid rain. They test the air, water and soil to make sure they are safe.

List four things you can do to help the planet.

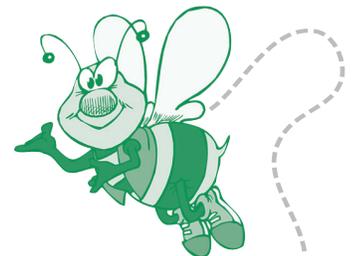
1. _____
2. _____
3. _____
4. _____

How Much Does it Pay?

| | | | | | |
|--|---|---|---|---|---|
| More than \$ 30.00 |  |  | |  | |
| \$ 25.00-\$ 30.00 |  |  |  |  |  |
| \$ 20.00-\$ 25.00 |  |  |  |  |  |
| \$ 15.00-\$ 20.00 |  |  |  |  |  |
| Less than \$ 15.00 |  |  |  |  |  |
| Average Hourly Wage in South Dakota (2018) | Mechanical Engineers | Industrial Engineers | Conservation Scientists | Chemists | Environmental Scientists & Specialists, Including Health |

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