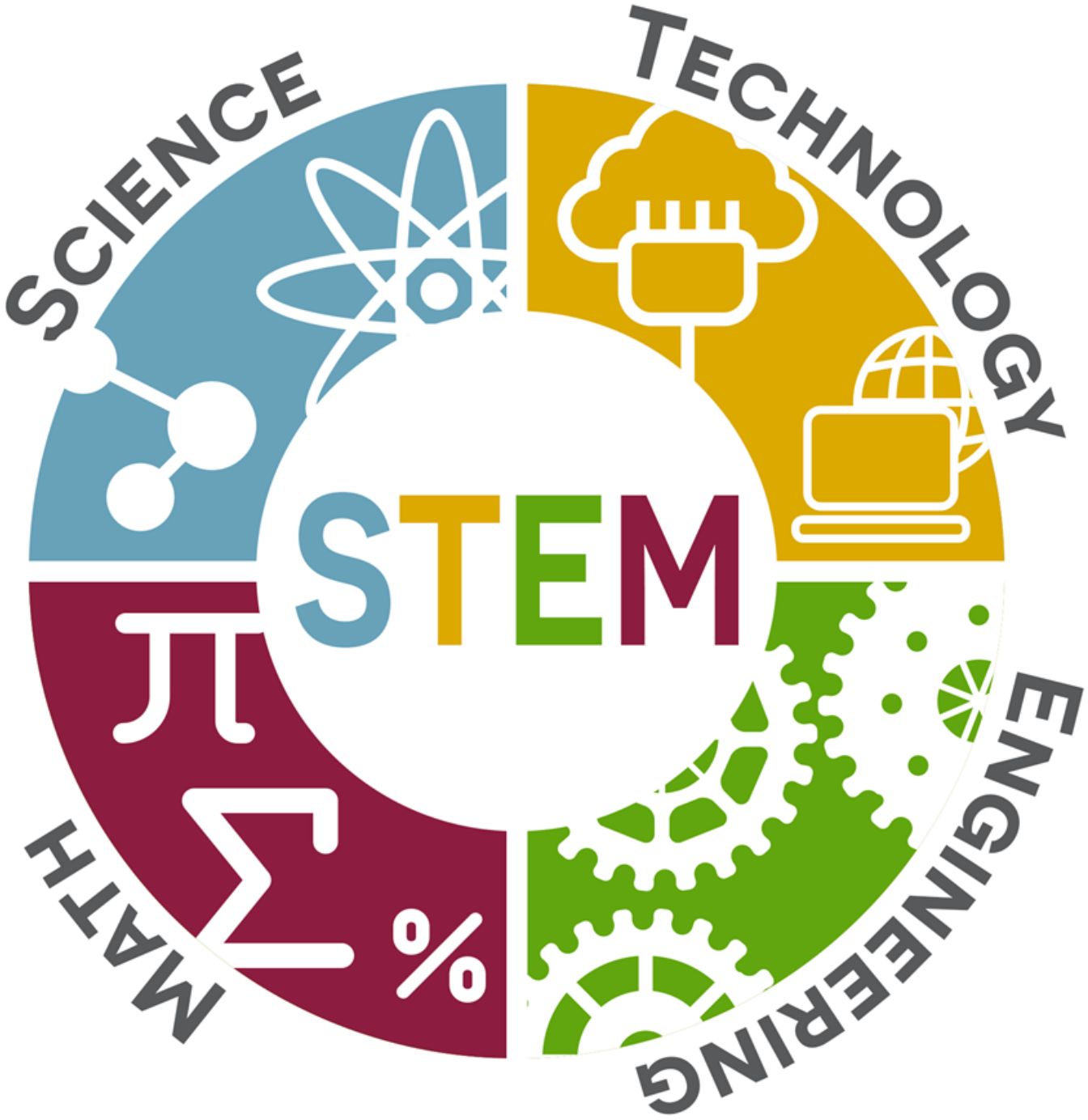
Chapter 6: STEM



Reading Strategy : MATCHING HEADINGS WITH SECTIONS

- Headings in a text can work as guides helping us better understand the organization of a text.
- When matching headings with paragraphs, you must understand the gist or main ideas of each paragraph
- Often the first sentence of each paragraph contains the main idea of that paragraph.

Chapter 6: Headings

1. STEM: Rewards & Challenges .....
2. STEM Jobs' Needed Qualifications .....
3. Job Market in the Future .....
4. How to Prepare for the STEM Market .....

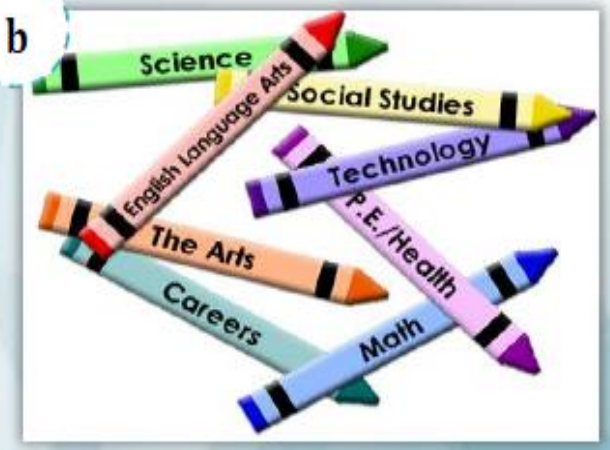
Visual Hints

Look at the following pictures. Try to match each picture with the relevant noun from the box below.

Disciplines	Occupations

a

b



“The future of the economy is in STEM,” says James Brown, the **executive** director of the STEM Education **Coalition** in Washington, D.C. That is where the jobs of tomorrow will be. Data from the US **Bureau** of Labor Statistics (BLS) support that idea. Employment in **careers** related to STEM – science, technology, engineering, and mathematics – **is projected** to grow to more than 9 million between 2012 and 2022. That is an increase of about 1 million jobs over 2012 employment levels.

Overall, STEM occupations are projected to grow faster than the average for all **occupations**. And **wages** in these occupations were generally higher than the median for all occupations in May 2013. BLS projects overall STEM employment to grow about 13 percent between 2012 and 2022. This is faster than the 11-percent rate of growth projected for all occupations over the decade. But projected employment growth **varies** by occupation. Some of these occupations are in technology; others are related to math and engineering (See table 1). BLS data show that workers in the STEM occupations earned a median annual wage of nearly $76,000 – more than double the $35,080 median wage for all workers in May 2013. Many of the top-paying occupations are related to engineering.


STEM

STEM work, like that of most jobs, is both **rewarding** and challenging. You might work on an interesting project that yields meaningful results, for example – but, to complete it, you might need to repeat an experiment many times or **navigate** complex government **regulations.**

Many STEM workers find their jobs **intellectually stimulating**. They enjoy **collaborating** with people who share their **enthusiasm** and working with **cutting-edge** technology. STEM offers a **cooperative**, innovative, and exciting work environment that is **unparalleled**. Depending on the occupation, STEM work may be creative and produce **tangible** results. For example, a biologist might make a discovery in the laboratory and publish that research in a scientific journal. A civil engineering technician may help design a **storage** facility or other structure and then assist in working with the **contractor** who builds it.

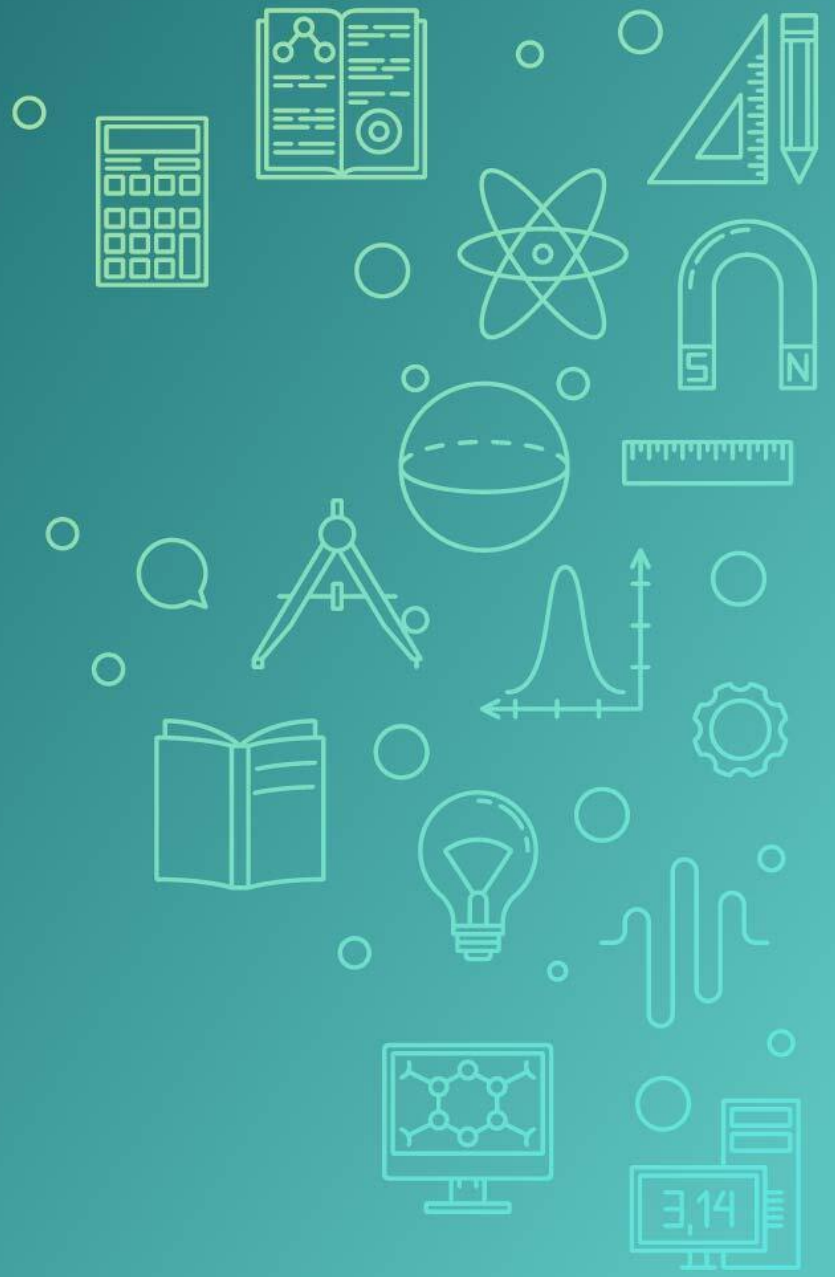
Table 1. Selected STEM occupations with fast employment growth, projected 2012–22

Occupation	Employment growth, projected 2012–22 (percent)	Employment		Median annual wage, May 2013	Typical entry-level education[1]
		2012	Projected 2022		
Information security analysts[2]	37%	75,100	102,500	$88,590	Bachelor's degree
Operations research analysts	27	73,200	92,700	74,630	Bachelor's degree
Statisticians	27	27,600	34,900	79,290	Master's degree
Biomedical engineers	27	19,400	24,600	88,670	Bachelor's degree
Actuaries[3]	26	24,300	30,600	94,340	Bachelor's degree
Petroleum engineers	26	38,500	48,400	132,320	Bachelor's degree
Computer systems analysts	25	520,600	648,400	81,190	Bachelor's degree
Software developers, applications	23	613,000	752,900	92,660	Bachelor's degree
Mathematicians	23	3,500	4,300	102,440	Master's degree
Software developers, systems software	20	405,000	487,800	101,410	Bachelor's degree
Computer user support specialists[4]	20	547,700	658,500	46,620	Some college, no degree
Web developers	20	141,400	169,900	63,160	Associate's degree
Civil engineers	20	272,900	326,600	80,770	Bachelor's degree
Biological science teachers, postsecondary	20	61,400	73,400	75,740	Doctoral or professional degree
Environmental science and protection technicians, including health	19	32,800	38,900	41,700	Associate's degree

[1] Unless otherwise specified, occupations typically require neither work experience in a related occupation nor on-the-job training to obtain competency.
[2] In addition to the education specified, this occupation typically requires less than 5 years of work experience in a related occupation.
[3] In addition to the education specified, this occupation typically requires long-term on-the-job training for workers to obtain competency.
[4] In addition to the education specified, this occupation typically requires moderate-term on-the-job training for workers to obtain competency.

Source: U.S. Bureau of Labor Statistics, Employment Projections program (employment, projections, and education data) and Occupational Employment Statistics survey (wage data).

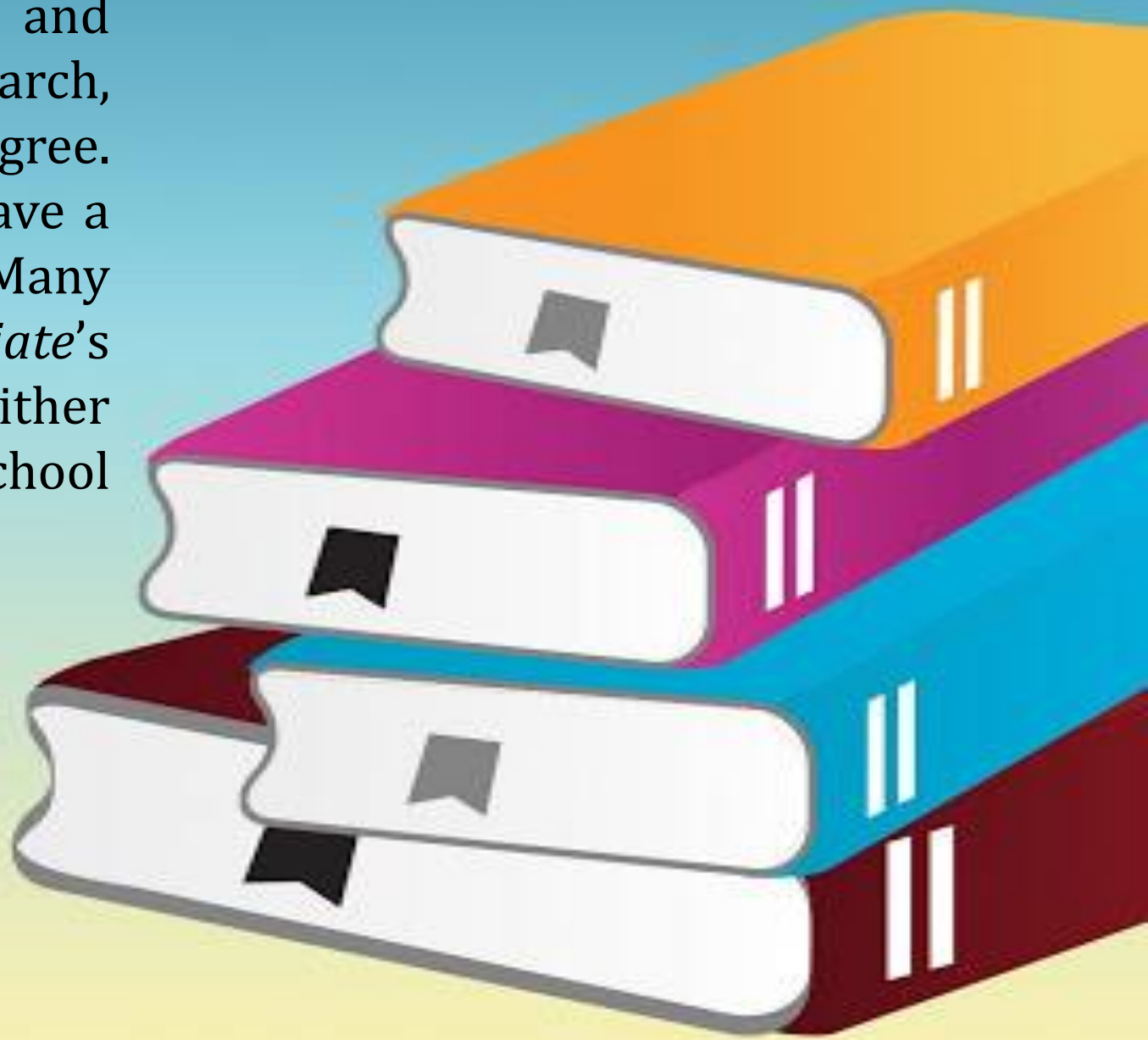
Workers in STEM occupations also enjoy the variety of problems they solve. Every problem is a **unique** challenge to **figure out.** Even if you use similar skills, the way you apply them is different. Because many STEM fields involve rapid change, workers' professional development is also dynamic. There is always something more to learn. Do not expect an end. However, as rewarding as STEM work may be, it can sometimes be demanding and **tedious.** For example, projects may take hundreds of hours over weeks or months to complete. And routine tasks may include cataloging data, filling out paperwork, and documenting observations.



Along with having a technical foundation, **prospective** STEM workers must have strong thinking and communication skills. People focus so much on math and science that they often ignore these skills. Ability to consider problems in different ways and then being able to explain a solution clearly is **essential** for success in STEM occupations. Critical and creative thinking also help STEM workers in problem solving to detect mistakes, gather relevant information, and understand how different parts or systems interact with each other. STEM workers also need thinking skills to develop innovative, **cost-effective** solutions. Workers who think creatively may approach a problem differently – for example, by **adapting** knowledge from other disciplines.

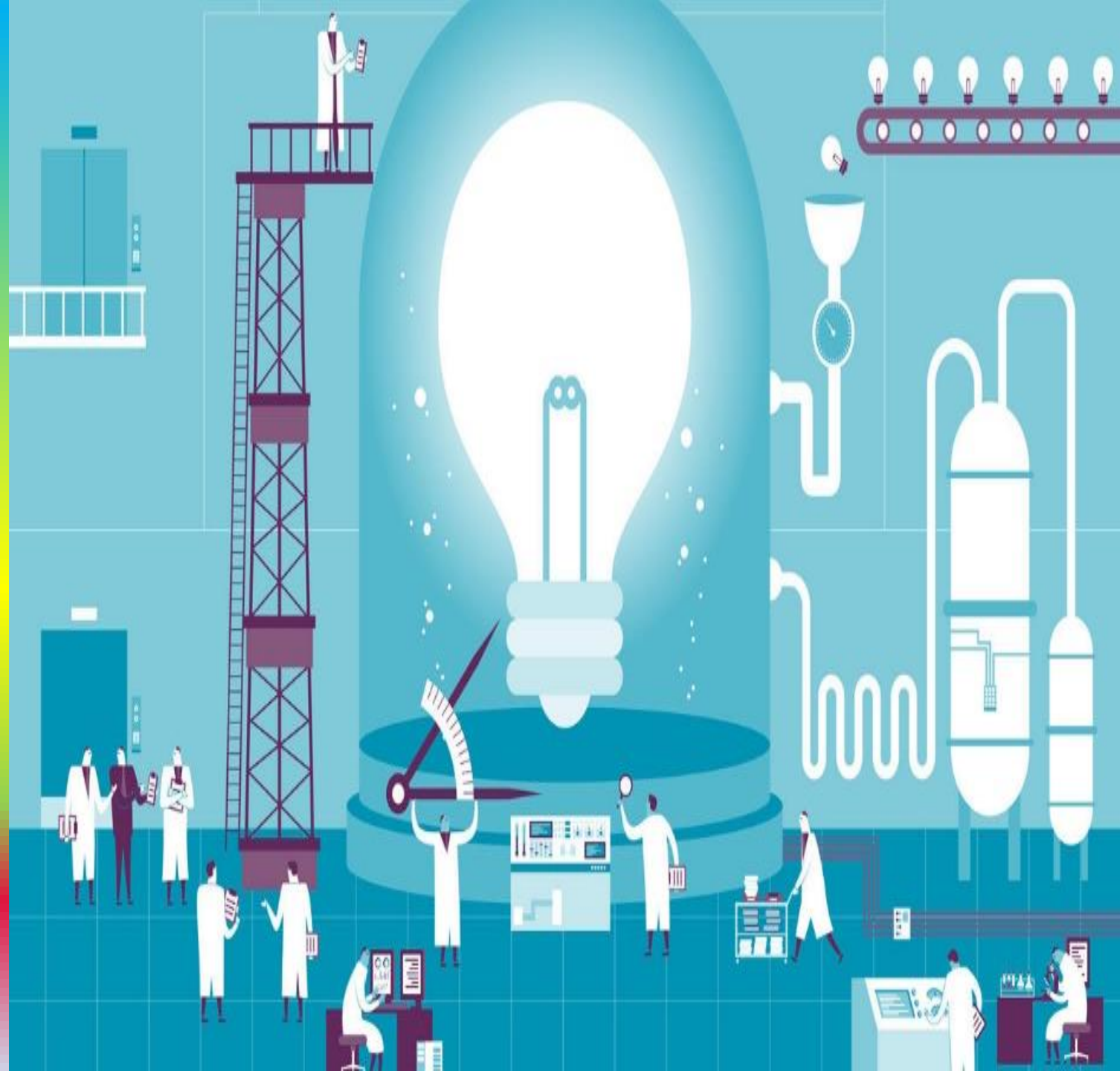
Communication skills are important too for working well with others and **conveying** information clearly, both orally and in writing. **Flaws** in communication are a common source of **conflict**. You will usually work with or for someone else, so having these skills will make you **stand out**. Communication skills include technical writing, public speaking, interpersonal communication, and the ability to explain difficult concepts simply. Learning some of these skills may seem **intimidating** at first, but practice helps.

Many STEM occupations **require** at least a bachelor's degree. More technical and advanced jobs, including those in research, usually require a master's or doctoral degree. But STEM is not only for people who have a bachelor's or graduate degree. Many occupations typically require an *associate*'s degree, and a small number require either some college but no degree or a high school diploma or **equivalent.**



In some STEM occupations, work experience in a related occupation is required at the entry level. For example, computer and information systems managers usually need at least 5 years of experience, first **honing** their technical skills in lower-level roles before moving to management. Even in occupations that do not require it, however, work experience often **sets you apart**. Companies want to **bring you up** to speed so you can be productive quickly. But there are so many skills you do not learn in school that you can only learn on the job. STEM workers **advise** you to look for internship, volunteer, and research opportunities as early as possible. Getting experience before graduation can help you **determine** whether a STEM career will be right for you. It is important to find something that excites you because working in STEM means making an investment in a **passion**.

As you broaden your experience, you should also **broaden** your network. Your network is more important than your **résumé** and should include mentors, business **colleagues**, and instructors. Develop a network by meeting people through work, volunteer, and internship positions; joining a club or working on a research project; and participating in job fairs, industry events, and online discussion boards.



JUST IN CASE NO ONE HAS TOLD YOU TODAY...

1. YOU'RE DOING A GREAT JOB!
2. YOU CAN GET THROUGH THE DIFFICULT DAYS
3. YOU'RE NOT ALONE
4. THINGS WILL GET BETTER
5. YOUR BEST IS MORE THAN ENOUGH