PIPES

POSSIBILITIES IN POSTSECONDARY EDUCATION & SCIENCE

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Imagining Possibilities in Postsecondary Education and Science is a five-year project made possible by a Science Education Partnership Award from the National Institutes of Health (NIH) that seeks to make a positive difference in East Tennessee by providing opportunities for rural Appalachian high school students to explore STEMM careers (science, technology, engineering, math, and medical science) and to promote college awareness. Co-primary investigators from the University of Tennessee, Professors Melinda Gibbons and Erin Hardin, oversee the project.

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Many of the activities in this manual were adapted from or inspired by the Tools for Tomorrow Program from the Boston College Lynch School of Education and Boston Public Schools (Kenny et al., 2004) and the Project H.O.P.E. curriculum from University of Iowa (Ali, 2012). The use of childhood toys as stimuli for the Week 2 Career Party activity (commonly attributed to Bolles, 1990) was developed by Dr. Christine Cork, formerly at the University of Iowa Carver College of Medicine.

9th Grade Curriculum

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WEEK 1

Week 1

Activity: Assessments and surveys, introduction, and get to know each other activity

Materials/Resources:

- PowerPoint Presentation
- Link to Google Site with PowerPoint and student worksheets
- Links to Surveys and Pre-assessment

Goals/Objectives:

- To introduce the IP/PIPES program to students
- To allow students to learn about themselves and others in the classroom
- To build rapport for future class meetings

Specific Instructions:

1. Survey and Pre-Assessment
    a. Provide students with the links to complete the surveys. Instruct students to use their legal name, not a nickname. Also instruct students to answer each question honestly. These surveys allow us to tailor our program to their needs.
    b. Link:
2. Facilitator introduction: (5 min)
   The class facilitators will introduce themselves and describe the PIPES/IP program
    a. The PIPES program was a program for 10th graders at your school. PIPES stands for Possibilities in Postsecondary Education and Science. We are here to help you learn about options after high school; and to learn about science, technology, engineering, math, and medical science, or STEMM, careers. We have expanded PiPES into PiPES/IP. IP stands for Imagining Possibilities. Our goal is to extend the opportunities of PiPES by starting in 9th grade and working with students into 11th grade.
    b. You may wonder why we are doing this at your school? Well, we are working with three high schools in Monroe County and one up in Campbell County for several reasons. Your principals were interested in having us come to your schools. We know that people who live in the more rural counties of Tennessee face a variety of health issues that affect their lives. You are the future of your county, and so we want to make you aware of the many STEMM careers that can help your community. We also want to help answer your questions about types of colleges and post-high school training, how to pay for college, and how to navigate the college-going experience.
3. Venn Diagram icebreaker (20 minutes)
    a. Facilitators model the activity (and kinds of disclosures we want) first, then students will get into groups of three (3) to complete the Venn Diagram Worksheet. Encourage students to find similarities and differences not obvious by looking at each other.

b. Each group will receive a worksheet and be asked to consider ways in which they are alike and different in the following categories:
    i. Gender
    ii. Ethnicity/race
    iii. Where they were born
    iv. Whether their parents went to college
    v. Favorite food
    vi. Favorite type/genre of music
    vii. Three careers they have considered
    viii. Five words they would use to describe themselves
    ix. Where would they most like to travel that they have never been to before
c. Large group discussion
    i. What did you learn from this activity (prompt if needed – how we have some similarities and some differences or could ask each group introduce self and name similarity all had in common and difference)
    ii. What was the most surprising thing you learned from this activity?
    iii. What did you learn about yourself from this activity?

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Week 2

Week 2

Activity: Introduction and Get to Know Each Other

Materials/Resources:

- PowerPoint presentation
- Favorite childhood activities worksheet
- 10-Year Class Reunion

Goals/Objectives:

- To allow students to learn about themselves and others in the classroom
- To build rapport for future class meetings
- To help students identify how their interests relate to potential career choices
- To introduce goal-setting

Specific Instructions:

1. Review what PiPES is, goals, reintroduce facilitators. (5 minutes)
2. Dreams/Goals Activity (10 minutes)
    a. My 10-year class reunion: Imagine you are going to your 10 year high school reunion. You will be in your mid-20's. You will be talking with others about what is happening in your life. Be realistic about your goals but dream a little, too.
        i. Handout: My 10-year class reunion
            1. The job I want in 10 years is:
            2. To get that job, I will have to:
            3. My annual salary will be:
            4. In 10 years I will be driving a:
            5. I will live in:
            6. Three of my most important possessions will be:
            7. My family will consist of:
    b. Brief small group discussions
        i. Assist in facilitating small group discussions. Elicit themes from activity -- how are students defining success? How realistic do they think their dreams are – do the things they wrote down seem possible to them?
3. Favorite Childhood Activities (15 minutes)
    a. Psychologists have found that favorite childhood activities can be related to career interests in your adult life.
    b. Think about what you most enjoyed doing when you were in 1st – 3rd grades -- favorite games, activities, hobbies (be sure to highlight the full range of these, from playing in the mud in the backyard to playing with store-bought toys, video games, etc.) Students may also think about current activities they enjoy, such as TV shows/videos they watch, games they play, or websites (YouTube, gaming sites, shopping) they visit, and list why they enjoy each. (It may be helpful to have students do

at least one childhood activity along with the second prompt to get a variety of answers)

c. Have students complete the worksheet by either drawing a picture or writing about what their favorite activities were/are. Make sure to give students a few minutes to think about their activities.

d. Have students share some of their favorite activities with the class. Mention Holland Code themes that you will be able to bring up next week. “It seems like you really enjoyed playing outside/ playing video games/ doing arts and crafts.”

e. “We will be using these childhood activities to start our activity next week and learn more about how our interests influence potential career choices.”

4. Debriefing (5 minutes)
    a. Allow students to debrief and discuss today’s lessons.
    b. We’re here to help make your dreams a reality. Part of doing that is helping you broaden your horizons, expand the choices you consider and think are possible for you.
    c. Take a Minute: As a way to close our time today and review, take a minute and write down three things that stood out from today’s lesson. (As time allows, have a few students share their responses).
    d. We’re going to spend some time next week helping you understand how your personality and interests give you information about the kinds of STEMM jobs you might like

My 10-Year Class Reunion

Directions: Answer the following questions by thinking about what you would like to tell your friends when you see them again 10 years after you graduate high school (2027 or 2028).

1. In 10 years it will be the year _____ and I will be _____ years old.
2. The job I want in 10 years is _____
3. To get that job, I will have to:
    a. _____
    b. _____
    c. _____
4. In 10 years I will be driving a _____
5. I will live in:
    a. An apartment
    b. A house I rent
    c. A house I own
    d. My parent's/relative's home
    e. Other: _____
6. The thing I will be most proud of by then is _____

    _____

    _____
7. The most important experience I will have had is _____

    _____

    _____
8. Two things I can do starting today to make my plans come true are
    a. _____
    b. _____

WHEN I WAS SIX TO EIGHT YEARS OLD, MY FAVORITE ACTIVITIES WERE:

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WEEK 3

Week 3

Activity:

- Career Party

Materials/Resources:

- Career Party descriptions
- Holland Code Descriptions worksheet
- Career Interests Sheet
- Classroom set of STEMM Careers with Holland Codes
- Posters for each station during career party
- (Optional) Toys, games, etc. to represent each of the Holland themes
- Adult interview homework sheet (1 / student)

Goals/Objectives:

- Students will gain an understanding of their personality and interests
- Students will link Holland codes to possible careers
- Students will begin to identify possible career paths

Specific Instructions:

1. Discussion about favorite childhood activities from last week (5 minutes)
    - What were your favorite activities? What similarities did students notice in their favorite activities? (elicit Holland-theme ideas, without labeling as such. For example, "So it sounds like for you, your favorite activities all involved getting to be outside and use your hands to build and rebuild things, whereas for you, your favorite activities involved being really creative and imaginative…"
    - We are going to expand on how these interests can relate to careers. We are going to focus on career opportunities in STEMM – science, technology, engineering, math, and medical science. Why?
        - Fastest growing job area
        - Some of the best paying jobs
        - Jobs many people don't automatically think of, for lots of reasons.
        - Are we saying you all have to become a scientist? No. But we DO want you to explore STEMM-related careers that you may never have thought of before.
        - STEMM is much broader than most people realize, so our goal is to help you learn about yourself so you can find the STEMM jobs that might be the best fit for you.

2. Career Party activity (see worksheet; 15 minutes)

- Transition to career party activity
- Read and post the six career party descriptions
- Point out the various stations around the room. Have students go to the station they are most interested in.
    - Ask a few students to explain why they chose the station they did. How they relate to the favorite childhood activities? Ask students to make a note of the letter of the station they chose – will come back to later.
    - Have students move to a second station, repeat discussion.
    - If time, have students move to a third station – or ask students to talk about what their LAST choice would be?
    - At end, have students write down their three letter code from the activity on their Who am I worksheet

3. Holland Codes and STEMM (10 minutes)
    - Describe the Holland Codes
        - John Holland was a career counseling researcher who believed that there were six personal style types related to career. He believed that people and work environments could be coded or categorized into the six categories. He believed that if people learned their category type, and then entered a career field that matched their type, they would be satisfied in that career. On the other hand, if people entered a career that did not match their type, they might find themselves less satisfied or frustrated with parts of their job.
        - A Holland Code is typically 2-3 letters from six possible options. The Career Party activity helped you tentatively identify your three-letter code. Here is another worksheet to help you make sure the letters you selected are accurate (hand out Holland Code Worksheet)
    - You can use your Holland Code to identify careers that might be a good fit for you. Remember that this activity cannot tell you what career you should enter. It just offers a way to identify careers that match your work personality. You may choose to enter one of these careers, or you may choose to enter a different career. It is all up to you.
    - Relate to STEMM
        - Give them the STEMM related career list (have a classroom set to keep with you)
        - Note three that match your code and record these on your Career Interest Sheet

4. Debriefing (5minutes)
    - Allow students to debrief and discuss today's lessons.
    - Homework: talk to an adult in your family or another adult about his/her current job. Ask:
        - How did you come to enter this job?
        - What do you like about your job?
        - What do you dislike about your job?
        - How are your strengths or values reflected in your job?
        - Do think of your current work as a job or a career?
        - What do you see as the difference between a job and a career?

    - What advice do you have for me as I figure out a career path?
- Wrap Up: Take a Minute: As a way to close today and review what we've done, please complete the Take a Minute Google Form on the Google Site. This is week 3 of the curriculum, and your team leader's name is _____.

Career Party

Directions: Read the following descriptions & choose the one that best matches you.

- Group R: Your friends in this group are talking about everything from sports to raising animals to fixing cars. Everyone in the group enjoys being outdoors and working with their hands, fixing and tinkering with things
- Group I: Everyone in this group is interested in watching, investigating, analyzing, or solving problems. Some say they like science, others enjoy puzzles and computer games. They're definitely good at finding answers.
- Group A: This group of your friends is very creative. Some like to draw and paint, others enjoy doing innovative or unusual things. All of them enjoy using their imagination and creativity in unstructured situations
- Group S: At first you think this group is very loud, but then you realize they just all like to talk. Everyone wants to work with people, some through teaching, others through helping people, while others want to work with people in the medical field
- Group E: Your friends in this group are 'take charge' people who like to persuade others. They're definitely leaders, some are in leadership organizations, and others say they want to own their own business or make a lot of money some day.
- Group C: Even though this group is quieter than the others, you can tell that these students like to talk about how they keep things ordered and organized. Most of your friends in this group like working with numbers and data… and they're really good at it.

Holland Code Descriptions

Realistic	**Investigative**
● Enjoy working with animals, plants, tools, machines, mechanical drawings ● Value practical things you can see, touch, and use ● See yourself as practical, honest, natural ● Like jobs with tangible results (something you can see when you are done) ● Like to work outdoors, enjoy physical activity ● Words that might describe you: Realistic, practical, independent, persistent, athletic, nature lover, mechanical, doer ● Would not enjoy social jobs such as teaching or working with patients	● Enjoy studying and solving math or science problems ● Search for solutions to problems ● Tend to be independent and self-motivated ● Abstract thinkers ● Less social and a strong need to understand the world ● Words that might describe you: thinker, scientific, precise, independent, observant, curious, logical, reserved ● Would not enjoy sales or jobs involving leading and persuading people
Artistic	**Social**
● Creative and expressive ● Value freedom, originality ● Like creative activities such as art, drama, crafts, dance, music, creative writing ● Words that might describe you: creator, imaginative, expressive, open, sensitive, unconventional, original, courageous ● Would not enjoy highly ordered or repetitive activities	● Like to work with people ● Value idealism, kindness, generosity ● Enjoy problem solving through discussion ● Drawn to seek close relationships with others ● Words that might describe you: helper, responsible, kind, forgiving, generous, outgoing, friendly, insightful ● Would not enjoy using machines or tools to achieve a goal
Enterprising	**Conventional**
● Like to manage and persuade others ● Value risk-taking ● Assertive and energetic ● Use verbal skills to lead others ● Words that might describe you: persuader, adventurous, energetic, spontaneous, ambitious, sociable, enthusiastic ● Would not enjoy activities that require careful observation and scientific analysis	● Organized and planful ● Value structure and routine ● Like rules, order, clear guidelines ● Attention to detail, good follow through on others' instructions ● Words that might describe you: organizer, accurate, numerically-inclined, practical, structured, efficient, well-organized, polite ● Would not enjoy unstructured, artistic activities

STEMM Careers with Holland Codes

Realistic

Code	Occupation	STEM Disciplines	Education Needed
ARI	Architectural Drafters	Engineering	Bachelor's degree
CIR	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	Computer Science	Vocational training, on-the-job experience or associate's degree
CIR	Environmental Compliance Inspectors	Life Sciences	Bachelor's degree
CIR	Information Security Analysts	Computer Science	Bachelor's degree
CR	Pharmacy Technician	Biomedical	High School/GED
CRI	Ophthalmic Medical Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
CRI	Phlebotomists	Biomedical	Vocational training, on-the-job experience or associate's degree
CRS	Dental Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree
CSR	Ophthalmic Medical Technicians	Biomedical	Vocational training, on-the-job experience or associate's degree
ECR	Biofuels Production Managers	Life Sciences	Bachelor's degree
ECR	Biomass Power Plant Managers	Life Sciences	Bachelor's degree
ECR	First-Line Supervisors of Food Preparation and Serving Workers	Life Sciences	High School Diploma
ECR	Optician	Biomedical	Vocational training, on-the-job experience or associate's degree
ECR	Quality Control Systems Manager	Biomedical	Bachelor's degree
ER	First-Line Supervisors of Animal Husbandry and Animal Care Workers	Life Sciences	Vocational training, on-the-job experience or associate's degree
ERC	Construction Managers	Engineering	Bachelor's degree
ERC	Farm and Ranch Managers	Life Sciences	Bachelor's degree
ERC	First-Line Supervisors of Aquacultural Workers	Life Sciences	Bachelor's degree
ERC	Nursery and Greenhouse Managers	Life Sciences	Vocational training, on-the-job experience or associate's degree
ERI	Architectural and Engineering Managers	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Physics/Astronomy	Graduate degree

IAR	Astronomers	Physics/Astronomy	Graduate degree
IAR	Biochemists and Biophysicists	Chemistry, Life Sciences, Physics/Astronomy	Graduate degree
IAR	Geneticists	Life Sciences	Graduate degree
IAR	Geneticists	Engineering	Graduate degree
ICR	Bioinformatics Scientists	Biomedical	Graduate degree
ICR	Computer Systems Analysts	Computer Science	Bachelor's degree
ICR	Industrial Safety and Health Engineers	Engineering	Bachelor's degree
ICR	Software Developers, Systems Software	Computer Science, Engineering	Bachelor's degree
ICR	Transportation Planners	Engineering	Bachelor's degree
IR	Aerospace Engineers	Engineering	Bachelor's degree
IR	Animal Scientists	Life Sciences	Graduate degree
IR	Atmospheric and Space Scientists	Physics/Astronomy	Bachelor's degree
IR	Biochemical Engineers	Chemistry	Bachelor's degree
IR	Biomedical Engineers	Biomedical	Bachelor's degree
IR	Biologists	Life Sciences	Graduate degree
IR	Biomedical Engineers	Engineering	Bachelor's degree
IR	Chemical Engineers	Chemistry, Engineering	Bachelor's degree
IR	Electrical Engineers	Engineering	Bachelor's degree
IR	Electronics Engineers, Except Computer	Engineering	Bachelor's degree
IR	Geoscientists, Except Hydrologists and Geographers	Geosciences	Bachelor's degree
IR	Human Factors Engineers and Ergonomists	Engineering	Graduate degree
IR	Hydrologists	Geosciences	Bachelor's degree
IR	Marine Engineers	Engineering	Bachelor's degree
IR	Materials Scientists	Engineering	Graduate degree
IR	Microbiologists	Life Sciences	Graduate degree
IR	Pathologists	Biomedical	Graduate degree
IR	Physicists	Mathematics, Physics/Astronomy	Graduate degree
IR	Soil and Plant Scientists	Chemistry, Life Sciences, Physics/Astronomy	Graduate degree
IR	Veterinarian	Biomedical	Graduate degree
IR	Zoologists and Wildlife Biologists	Life Sciences	Graduate degree
IRA	Marine Architects	Engineering	Bachelor's degree
IRA	Biological Scientists	Biomedical	Graduate degree
IRA	Medical Scientists, Except Epidemiologists	Life Sciences	Graduate degree
IRA	Molecular and Cellular Biologists	Life Sciences	Graduate degree
IRC	Bioinformatics Technicians	Life Sciences	Bachelor's degree
IRC	Chemical Technicians	Chemistry, Life Sciences	Vocational training, on-the-job experience or associate's degree
IRC	Chemists	Chemistry,	Bachelor's degree

		Physics/Astronomy	
IRC	Computer and Information Research Scientists	Computer Science	Graduate degree
IRC	Computer Hardware Engineers	Computer Science, Engineering	Bachelor's degree
IRC	Cytogenetic technologist	Biomedical	Bachelor's degree
IRC	Environmental Engineers	Engineering, Environmental Science	Graduate degree
IRC	Environmental Science and Protection Technicians, Including Health	Environmental Science	Bachelor's degree
IRC	Environmental Scientists and Specialists, Including Health	Environmental Science	Bachelor's degree
IRC	Food Scientists and Technologists	Life Sciences	Bachelor's degree
IRC	Industrial Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
IRC	Mathematical Technicians	Mathematics	Bachelor's degree
IRC	Mechanical Engineers	Engineering	Bachelor's degree
IRC	Mechatronics Engineers	Computer Science, Engineering	Bachelor's degree
IRC	Microsystems Engineers	Engineering	Bachelor's degree
IRC	Nuclear Engineers	Engineering	Bachelor's degree
IRC	Petroleum Engineers	Engineering	Bachelor's degree
IRC	Photonics Engineers	Physics/Astronomy	Bachelor's degree
IRC	Product Safety Engineers	Engineering	Bachelor's degree
IRC	Software Developers, Applications	Computer Science, Engineering	Bachelor's degree
IRC	Validation Engineers	Engineering	Bachelor's degree
IRE	Agricultural Engineers	Engineering, Life Sciences	Bachelor's degree
IRE	Environmental Restoration Planners	Life Sciences	Graduate degree
IRE	Fire-Prevention and Protection Engineers	Engineering	Bachelor's degree
IRE	Materials Engineers	Engineering	Bachelor's degree
IRE	Mining and Geological Engineers, Including Mining Safety Engineers	Engineering	Bachelor's degree
IRE	Nanosystems Engineers	Physics/Astronomy	Bachelor's degree
IRE	Soil and Water Conservationists	Life Sciences	Bachelor's degree
IRE	Water/Wastewater Engineers	Engineering	Bachelor's degree
IRS	Dentist	Biomedical	Graduate degree
IRS	Nuclear Medicine Technologists	Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
ISR	Allergists and Immunologists	Biomedical	Graduate degree
ISR	Dermatologists	Biomedical	Graduate degree
ISR	Diagnostic Medical Sonographer	Biomedical	Vocational training, on-

			the-job experience or associate's degree
ISR	Physician	Biomedical	Graduate degree
R	Fishers and Related Fishing Workers	Life Sciences	High School/GED
RC	Chemial Equipment Operators and Tenders	Chemistry	High School Diploma
RC	Chemical Plant and System Operators	Chemistry	High School Diploma
RC	Cooks, Institution and Cafeteria	Life Sciences	High School Diploma
RC	Fallers	Life Sciences	High School/GED
RC	Food Batchmakers	Life Sciences	High School Diploma
RC	Log Graders and Scalers	Life Sciences	Vocational training, on-the-job experience or associate's degree
RC	Wind Turbine Service Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Aircraft Mechanics and Service Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Civil Drafters	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Civil Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Electromechanical Equipment Assemblers	Engineering	High School Diploma
RCI	Forest and Conservation Workers	Engineering, Life Sciences	Vocational training, on-the-job experience or associate's degree
RCI	Nuclear Equipment Operation Technicians	Engineering, Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
RCI	Nuclear Monitoring Technicians	Engineering, Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
RCI	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	Engineering	Vocational training, on-the-job experience or associate's degree
REC	Computer Network Support Specialists	Computer Science	Bachelor's degree
REC	First-Line Supervisors of Agricultural Crop and Horticultural Workers	Life Sciences	Vocational training, on-the-job experience or associate's degree
REC	Telecommunications Engineering Specialists	Computer Science	Vocational training, on-the-job experience or associate's degree
RI	Animal Breeders	Life Sciences	Vocational training, on-

			the-job experience or associate's degree
RI	Automotive Master Mechanics	Engineering	Vocational training, on-the-job experience or associate's degree
RI	Electronics Engineering Technicians	Computer Science, Engineering	Vocational training, on-the-job experience or associate's degree
RI	Fish and Game Wardens	Life Sciences	Bachelor's degree
RI	Manufacturing Engineers	Engineering	Bachelor's degree
RI	Mechanical Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RI	Transportation Engineers	Engineering	Bachelor's degree
RI	Veterinary Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Aerospace Engineering and Operations Technicians	Engineering	Bachelor's degree
RIC	Agricultural Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIC	Automotive Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Automotive Specialty Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Avionics Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Biological Technicians	Life Sciences	Bachelor's degree
RIC	Civil Engineers	Engineering	Bachelor's degree
RIC	Computer User Support Specialists	Computer Science	Vocational training, on-the-job experience or associate's degree
RIC	Electrical Engineering Technicians	Computer Science, Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Electrical Engineering Technologists	Engineering	Bachelor's degree
RIC	Electromechanical Engineering Technologists	Engineering	Bachelor's degree
RIC	Electronics Engineering Technologists	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Environmental Engineering Technicians	Engineering, Environmental Science	Bachelor's degree
RIC	Food Science Technicians	Life Sciences	Vocational training, on-the-job experience or

			associate's degree
RIC	Histotechnologists	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Logging Equipment Operators	Life Sciences	High School/GED
RIC	Mechanical Engineering Technologists	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Medical Equipment Repairers	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Medical and Clinical Laboratory Technicians	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Precision Agriculture Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIC	Security Management Specialists	Computer Science	Bachelor's degree
RIE	Forest and Conservation Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIE	Foresters	Engineering, Life Sciences	Bachelor's degree
RIE	Range Managers	Life Sciences	Bachelor's degree
RS	Radiologic Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
RSC	Surgical Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
SCR	Medical Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree
SCR	Nursing Assistants	Biomedical	High School Diploma
SIR	Agricultural Sciences Teachers, Postsecondary	Life Sciences	Graduate degree
SIR	Chemistry Teachers, Postsecondary	Chemistry, Geosciences	Graduate degree
SIR	Chiropractor	Biomedical	Graduate degree
SIR	Dietetic Technicians	Life Sciences	High School Diploma
SIR	Emergency Medical Technician and Paramedic	Biomedical	Vocational training, on-the-job experience or associate's degree
SIR	Engineering Teachers, Postsecondary	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Physics/Astronomy	Graduate degree
SIR	Physical Therapist	Biomedical	Graduate degree
SIR	Physician Assistant	Biomedical	Graduate degree
SIR	Respiratory Therapist	Biomedical	Vocational training, on-

			the-job experience or associate's degree
SR	Occupational Therapy Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree
SRA	Park Naturalists	Life Sciences	Bachelor's degree
SRC	Dental Hygenist	Biomedical	Vocational training, on-the-job experience or associate's degree
SRC	Radiation Therapist	Biomedical	Vocational training, on-the-job experience or associate's degree
SRE	Farm and Home Management Advisors	Life Sciences	Graduate degree
SRI	Athletic Trainer	Biomedical	Bachelor's degree
SRI	Physical Therapist Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree

Investigative

Code	Occupation	STEM Disciplines	Education Needed
CI	Clinical Data Managers	Biomedical	Bachelor's degree
CI	Database Administrators	Computer Science	Bachelor's degree
CI	Statisticians	Life Sciences, Mathematics	Graduate degree
CIE	Actuaries	Mathematics	Bachelor's degree
CIR	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	Computer Science	Vocational training, on-the-job experience or associate's degree
CIR	Environmental Compliance Inspectors	Life Sciences	Bachelor's degree
CIR	Information Security Analysts	Computer Science	Bachelor's degree
CRI	Ophthalmic Medical Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
CRI	Phlebotomists	Biomedical	Vocational training, on-the-job experience or associate's degree
ECI	Computer and Information Systems Managers	Computer Science	Bachelor's degree
EI	Biofuels/Biodiesel Technology and Product Development Managers	Environmental Science, Life Sciences	Bachelor's degree
EI	Natural Sciences Managers	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Mathematics,	Graduate degree

		Physics/Astronomy	
EIC	Brownfield Redevelopment Specialists and Site Managers	Environmental Science	Bachelor's degree
ERI	Architectural and Engineering Managers	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Physics/Astronomy	Graduate degree
IAR	Astronomers	Physics/Astronomy	Graduate degree
IAR	Biochemists and Biophysicists	Chemistry, Life Sciences, Physics/Astronomy	Graduate degree
IAR	Geneticists	Life Sciences	Graduate degree
IAR	Geneticists	Engineering	Graduate degree
IC	Biostatisticians	Life Sciences	Graduate degree
IC	Computer Programmers	Computer Science	Bachelor's degree
IC	Financial Quantitative Analysts	Computer Science	Bachelor's degree
ICA	Mathematicians	Mathematics	Graduate degree
ICE	Computer Network Architects	Computer Science	Bachelor's degree
ICE	Industrial Engineers	Engineering	Bachelor's degree
ICE	Operations Research Analysts	Computer Science, Mathematics	Graduate degree
ICR	Bioinformatics Scientists	Biomedical	Graduate degree
ICR	Computer Systems Analysts	Computer Science	Bachelor's degree
ICR	Industrial Safety and Health Engineers	Engineering	Bachelor's degree
ICR	Software Developers, Systems Software	Computer Science, Engineering	Bachelor's degree
ICR	Transportation Planners	Engineering	Bachelor's degree
ICS	Pharmacist	Biomedical	Graduate degree
IE	Climate Change Analysts	Environmental Science	Graduate degree
IEA	Industrial-Organizational Psychologists	Life Sciences	Graduate degree
IEC	Business Intelligence Analysts	Computer Science	Bachelor's degree
IEC	Water Resource Specialists	Engineering	Bachelor's degree
IR	Aerospace Engineers	Engineering	Bachelor's degree
IR	Animal Scientists	Life Sciences	Graduate degree
IR	Atmospheric and Space Scientists	Physics/Astronomy	Bachelor's degree
IR	Biochemical Engineers	Chemistry	Bachelor's degree
IR	Biomedical Engineers	Biomedical	Bachelor's degree
IR	Biologists	Life Sciences	Graduate degree
IR	Biomedical Engineers	Engineering	Bachelor's degree
IR	Chemical Engineers	Chemistry, Engineering	Bachelor's degree
IR	Electrical Engineers	Engineering	Bachelor's degree
IR	Electronics Engineers, Except Computer	Engineering	Bachelor's degree

IR	Geoscientists, Except Hydrologists and Geographers	Geosciences	Bachelor's degree
IR	Human Factors Engineers and Ergonomists	Engineering	Graduate degree
IR	Hydrologists	Geosciences	Bachelor's degree
IR	Marine Engineers	Engineering	Bachelor's degree
IR	Materials Scientists	Engineering	Graduate degree
IR	Microbiologists	Life Sciences	Graduate degree
IR	Pathologists	Biomedical	Graduate degree
IR	Physicists	Mathematics, Physics/Astronomy	Graduate degree
IR	Soil and Plant Scientists	Chemistry, Life Sciences, Physics/Astronomy	Graduate degree
IR	Veterinarian	Biomedical	Graduate degree
IR	Zoologists and Wildlife Biologists	Life Sciences	Graduate degree
IRA	Biological Scientists	Biomedical	Graduate degree
IRA	Marine Architects	Engineering	Bachelor's degree
IRA	Medical Scientists, Except Epidemiologists	Life Sciences	Graduate degree
IRA	Molecular and Cellular Biologists	Life Sciences	Graduate degree
IRC	Bioinformatics Technicians	Life Sciences	Bachelor's degree
IRC	Chemical Technicians	Chemistry, Life Sciences	Vocational training, on-the-job experience or associate's degree
IRC	Chemists	Chemistry, Physics/Astronomy	Bachelor's degree
IRC	Computer and Information Research Scientists	Computer Science	Graduate degree
IRC	Computer Hardware Engineers	Computer Science, Engineering	Bachelor's degree
IRC	Cytogenetic technologist	Biomedical	Bachelor's degree
IRC	Environmental Engineers	Engineering, Environmental Science	Graduate degree
IRC	Environmental Science and Protection Technicians, Including Health	Environmental Science	Bachelor's degree
IRC	Environmental Scientists and Specialists, Including Health	Environmental Science	Bachelor's degree
IRC	Food Scientists and Technologists	Life Sciences	Bachelor's degree
IRC	Industrial Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
IRC	Mathematical Technicians	Mathematics	Bachelor's degree
IRC	Mechanical Engineers	Engineering	Bachelor's degree
IRC	Mechatronics Engineers	Computer Science, Engineering	Bachelor's degree
IRC	Microsystems Engineers	Engineering	Bachelor's degree
IRC	Nuclear Engineers	Engineering	Bachelor's degree

IRC	Petroleum Engineers	Engineering	Bachelor's degree
IRC	Photonics Engineers	Physics/Astronomy	Bachelor's degree
IRC	Product Safety Engineers	Engineering	Bachelor's degree
IRC	Software Developers, Applications	Computer Science, Engineering	Bachelor's degree
IRC	Validation Engineers	Engineering	Bachelor's degree
IRE	Agricultural Engineers	Engineering, Life Sciences	Bachelor's degree
IRE	Environmental Restoration Planners	Life Sciences	Graduate degree
IRE	Fire-Prevention and Protection Engineers	Engineering	Bachelor's degree
IRE	Materials Engineers	Engineering	Bachelor's degree
IRE	Mining and Geological Engineers, Including Mining Safety Engineers	Engineering	Bachelor's degree
IRE	Nanosystems Engineers	Physics/Astronomy	Bachelor's degree
IRE	Soil and Water Conservationists	Life Sciences	Bachelor's degree
IRE	Water/Wastewater Engineers	Engineering	Bachelor's degree
IRS	Dentist	Biomedical	Graduate degree
IRS	Nuclear Medicine Technologists	Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
IS	Audiologist	Biomedical	Graduate degree
IS	Dietitians and Nutritionists	Life Sciences	Graduate degree
IS	Epidemiologists	Life Sciences	Graduate degree
IS	School Psychologists	Life Sciences	Graduate degree
ISA	Clinical Psychologists	Life Sciences	Graduate degree
ISA	Neuropsychologists and Clinical Neuropsychologists	Life Sciences	Graduate degree
ISA	Psychologists, All Other	Life Sciences	Graduate degree
ISR	Allergists and Immunologists	Biomedical	Graduate degree
ISR	Dermatologists	Biomedical	Graduate degree
ISR	Diagnostic Medical Sonographer	Biomedical	Vocational training, on-the-job experience or associate's degree
ISR	Physician	Biomedical	Graduate degree
RCI	Aircraft Mechanics and Service Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Civil Drafters	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Civil Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Electromechanical Equipment Assemblers	Engineering	High School Diploma
RCI	Forest and Conservation Workers	Engineering, Life Sciences	Vocational training, on-the-job experience or

			associate's degree
RCI	Nuclear Equipment Operation Technicians	Engineering, Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
RCI	Nuclear Monitoring Technicians	Engineering, Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
RCI	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	Engineering	Vocational training, on-the-job experience or associate's degree
RI	Animal Breeders	Life Sciences	Vocational training, on-the-job experience or associate's degree
RI	Automotive Master Mechanics	Engineering	Vocational training, on-the-job experience or associate's degree
RI	Electronics Engineering Technicians	Computer Science, Engineering	Vocational training, on-the-job experience or associate's degree
RI	Fish and Game Wardens	Life Sciences	Bachelor's degree
RI	Manufacturing Engineers	Engineering	Bachelor's degree
RI	Mechanical Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RI	Transportation Engineers	Engineering	Bachelor's degree
RI	Veterinary Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Aerospace Engineering and Operations Technicians	Engineering	Bachelor's degree
RIC	Agricultural Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIC	Automotive Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Automotive Specialty Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Avionics Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Biological Technicians	Life Sciences	Bachelor's degree
RIC	Civil Engineers	Engineering	Bachelor's degree
RIC	Computer User Support Specialists	Computer Science	Vocational training, on-the-job experience or associate's degree
RIC	Electrical Engineering Technicians	Computer Science, Engineering	Vocational training, on-the-job experience or

			associate's degree
RIC	Electrical Engineering Technologists	Engineering	Bachelor's degree
RIC	Electromechanical Engineering Technologists	Engineering	Bachelor's degree
RIC	Electronics Engineering Technologists	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Environmental Engineering Technicians	Engineering, Environmental Science	Bachelor's degree
RIC	Food Science Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIC	Histotechnologists	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Logging Equipment Operators	Life Sciences	High School/GED
RIC	Mechanical Engineering Technologists	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Medical Equipment Repairers	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Medical and Clinical Laboratory Technicians	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Precision Agriculture Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIC	Security Management Specialists	Computer Science	Bachelor's degree
RIE	Forest and Conservation Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIE	Foresters	Engineering, Life Sciences	Bachelor's degree
RIE	Range Managers	Life Sciences	Bachelor's degree
SEI	Business Teachers, Postsecondary	Computer Science, Mathematics	Graduate degree
SI	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	Geosciences, Mathematics, Physics/Astronomy	Graduate degree
SI	Biological Science Teachers, Postsecondary	Life Sciences	Graduate degree
SI	Health Specialties Teachers, Postsecondary	Life Sciences, Physics/Astronomy	Graduate degree
SI	Occupational Therapist	Biomedical	Graduate degree
SI	Physics Teachers, Postsecondary	Mathematics, Physics/Astronomy	Graduate degree
SIA	Counseling Psychologists	Life Sciences	Graduate degree

SIA	Environmental Science Teachers, Postsecondary	Environmental Science	Graduate degree
SIA	Home Economics Teachers, Postsecondary	Life Sciences	Graduate degree
SIA	Mathematical Science Teachers, Postsecondary	Mathematics	Graduate degree
SIA	Psychology Teachers, Postsecondary	Life Sciences	Graduate degree
SIA	Speech-Language Pathologist	Biomedical	Graduate degree
SIC	Computer Science Teachers, Postsecondary	Computer Science	Graduate degree
SIC	Nurses	Biomedical	Vocational training, on-the-job experience or associate's degree
SIR	Agricultural Sciences Teachers, Postsecondary	Life Sciences	Graduate degree
SIR	Chemistry Teachers, Postsecondary	Chemistry, Geosciences	Graduate degree
SIR	Chiropractor	Biomedical	Graduate degree
SIR	Dietetic Technicians	Life Sciences	High School Diploma
SIR	Emergency Medical Technician and Paramedic	Biomedical	Vocational training, on-the-job experience or associate's degree
SIR	Engineering Teachers, Postsecondary	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Physics/Astronomy	Graduate degree
SIR	Physical Therapist	Biomedical	Graduate degree
SIR	Physician Assistant	Biomedical	Graduate degree
SIR	Respiratory Therapist	Biomedical	Vocational training, on-the-job experience or associate's degree
SRI	Athletic Trainer	Biomedical	Bachelor's degree
SRI	Physical Therapist Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree

Artistic

Code	Occupation	STEM Disciplines	Education Needed
ARI	Architectural Drafters	Engineering	Bachelor's degree
IAR	Astronomers	Physics/Astronomy	Graduate degree
IAR	Biochemists and Biophysicists	Chemistry, Life Sciences, Physics/Astronomy	Graduate degree
IAR	Geneticists	Life Sciences	Graduate degree
IAR	Geneticists	Engineering	Graduate degree

ICA	Mathematicians	Mathematics	Graduate degree
IEA	Industrial-Organizational Psychologists	Life Sciences	Graduate degree
IRA	Marine Architects	Engineering	Bachelor's degree
IRA	Biological Scientists	Biomedical	Graduate degree
IRA	Medical Scientists, Except Epidemiologists	Life Sciences	Graduate degree
ISA	Clinical Psychologists	Life Sciences	Graduate degree
ISA	Neuropsychologists and Clinical Neuropsychologists	Life Sciences	Graduate degree
ISA	Psychologists, All Other	Life Sciences	Graduate degree
SA	Architecture Teachers, Postsecondary	Engineering	Graduate degree
SIA	Counseling Psychologists	Life Sciences	Graduate degree
SIA	Environmental Science Teachers, Postsecondary	Environmental Science	Graduate degree
SIA	Home Economics Teachers, Postsecondary	Life Sciences	Graduate degree
SIA	Mathematical Science Teachers, Postsecondary	Mathematics	Graduate degree
SIA	Psychology Teachers, Postsecondary	Life Sciences	Graduate degree
SIA	Speech-Language Pathologist	Biomedical	Graduate degree
SRA	Park Naturalists	Life Sciences	Bachelor's degree

Social

Code	Occupation	STEM Disciplines	Education Needed
ICS	Pharmacist	Biomedical	Graduate degree
IRS	Dentist	Biomedical	Graduate degree
IRS	Nuclear Medicine Technologists	Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
IS	Audiologist	Biomedical	Graduate degree
IS	Dietitians and Nutritionists	Life Sciences	Graduate degree
IS	Epidemiologists	Life Sciences	Graduate degree
IS	School Psychologists	Life Sciences	Graduate degree
ISA	Clinical Psychologists	Life Sciences	Graduate degree
ISA	Neuropsychologists and Clinical Neuropsychologists	Life Sciences	Graduate degree
ISA	Psychologists, All Other	Life Sciences	Graduate degree
ISR	Allergists and Immunologists	Biomedical	Graduate degree
ISR	Dermatologists	Biomedical	Graduate degree
ISR	Diagnostic Medical Sonographer	Biomedical	Vocational training, on-the-job experience or associate's degree

ISR	Physician	Biomedical	Graduate degree
RS	Radiologic Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
RSC	Surgical Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
SA	Architecture Teachers, Postsecondary	Engineering	Graduate degree
SCR	Medical Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree
SCR	Nursing Assistants	Biomedical	High School Diploma
SEI	Business Teachers, Postsecondary	Computer Science, Mathematics	Graduate degree
SI	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	Geosciences, Mathematics, Physics/Astronomy	Graduate degree
SI	Biological Science Teachers, Postsecondary	Life Sciences	Graduate degree
SI	Health Specialties Teachers, Postsecondary	Life Sciences, Physics/Astronomy	Graduate degree
SI	Occupational Therapist	Biomedical	Graduate degree
SI	Physics Teachers, Postsecondary	Mathematics, Physics/Astronomy	Graduate degree
SIA	Counseling Psychologists	Life Sciences	Graduate degree
SIA	Environmental Science Teachers, Postsecondary	Environmental Science	Graduate degree
SIA	Home Economics Teachers, Postsecondary	Life Sciences	Graduate degree
SIA	Mathematical Science Teachers, Postsecondary	Mathematics	Graduate degree
SIA	Psychology Teachers, Postsecondary	Life Sciences	Graduate degree
SIA	Speech-Language Pathologist	Biomedical	Graduate degree
SIC	Computer Science Teachers, Postsecondary	Computer Science	Graduate degree
SIC	Nurses	Biomedical	Vocational training, on-the-job experience or associate's degree
SIR	Agricultural Sciences Teachers, Postsecondary	Life Sciences	Graduate degree
SIR	Chemistry Teachers, Postsecondary	Chemistry, Geosciences	Graduate degree
SIR	Chiropractor	Biomedical	Graduate degree
SIR	Dietetic Technicians	Life Sciences	High School Diploma
SIR	Emergency Medical Technician and Paramedic	Biomedical	Vocational training, on-the-job experience or associate's degree

SIR	Engineering Teachers, Postsecondary	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Physics/Astronomy	Graduate degree
SIR	Physical Therapist	Biomedical	Graduate degree
SIR	Physician Assistant	Biomedical	Graduate degree
SIR	Respiratory Therapist	Biomedical	Vocational training, on-the-job experience or associate's degree
SR	Occupational Therapy Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree
SRA	Park Naturalists	Life Sciences	Bachelor's degree
SRC	Dental Hygenist	Biomedical	Vocational training, on-the-job experience or associate's degree
SRC	Radiation Therapist	Biomedical	Vocational training, on-the-job experience or associate's degree
SRE	Farm and Home Management Advisors	Life Sciences	Graduate degree
SRI	Athletic Trainer	Biomedical	Bachelor's degree
SRI	Physical Therapist Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree

Enterprising

Code	Occupation	STEM Disciplines	Education Needed
ECR	Optician	Biomedical	Vocational training, on-the-job experience or associate's degree
ECR	Quality Control Systems Manager	Biomedical	Bachelor's degree
ER	First-Line Supervisors of Animal Husbandry and Animal Care Workers	Life Sciences	Vocational training, on-the-job experience or associate's degree
ERC	Construction Managers	Engineering	Bachelor's degree

ERC	Farm and Ranch Managers	Life Sciences	Bachelor's degree
ERC	First-Line Supervisors of Aquacultural Workers	Life Sciences	Bachelor's degree
ERC	Nursery and Greenhouse Managers	Life Sciences	Vocational training, on-the-job experience or associate's degree
ERI	Architectural and Engineering Managers	Chemistry, Computer Science, Engineering, Geosciences, Life Sciences, Physics/Astronomy	Graduate degree
IRE	Agricultural Engineers	Engineering, Life Sciences	Bachelor's degree
IRE	Environmental Restoration Planners	Life Sciences	Graduate degree
IRE	Fire-Prevention and Protection Engineers	Engineering	Bachelor's degree
IRE	Materials Engineers	Engineering	Bachelor's degree
IRE	Mining and Geological Engineers, Including Mining Safety Engineers	Engineering	Bachelor's degree
IRE	Nanosystems Engineers	Physics/Astronomy	Bachelor's degree
IRE	Soil and Water Conservationists	Life Sciences	Bachelor's degree
IRE	Water/Wastewater Engineers	Engineering	Bachelor's degree
REC	Computer Network Support Specialists	Computer Science	Bachelor's degree
REC	First-Line Supervisors of Agricultural Crop and Horticultural Workers	Life Sciences	Vocational training, on-the-job experience or associate's degree
REC	Telecommunications Engineering Specialists	Computer Science	Vocational training, on-the-job experience or associate's degree
RIE	Forest and Conservation Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIE	Foresters	Engineering, Life Sciences	Bachelor's degree
RIE	Range Managers	Life Sciences	Bachelor's degree
SRE	Farm and Home Management Advisors	Life Sciences	Graduate degree

Conventional

Code	Occupation	STEM Disciplines	Education Needed
CEI	Auditors	Computer Science	Bachelor's degree
CEI	Risk Management Specialists	Mathematics	Bachelor's degree
CI	Clinical Data Managers	Biomedical	Bachelor's degree
CI	Database Administrators	Computer Science	Bachelor's degree
CI	Statisticians	Life Sciences, Mathematics	Graduate degree
CIE	Actuaries	Mathematics	Bachelor's degree

CIR	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	Computer Science	Vocational training, on-the-job experience or associate's degree
CIR	Environmental Compliance Inspectors	Life Sciences	Bachelor's degree
CIR	Information Security Analysts	Computer Science	Bachelor's degree
CR	Pharmacy Technician	Biomedical	High School/GED
CRI	Ophthalmic Medical Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
CRI	Phlebotomists	Biomedical	Vocational training, on-the-job experience or associate's degree
CRS	Dental Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree
CSR	Ophthalmic Medical Technicians	Biomedical	Vocational training, on-the-job experience or associate's degree
EC	Pharmaceutical and Medical Equipment Sales	Biomedical	Bachelor's degree
ECI	Computer and Information Systems Managers	Computer Science	Bachelor's degree
ECR	Biofuels Production Managers	Life Sciences	Bachelor's degree
ECR	Biomass Power Plant Managers	Life Sciences	Bachelor's degree
ECR	First-Line Supervisors of Food Preparation and Serving Workers	Life Sciences	High School Diploma
ECR	Optician	Biomedical	Vocational training, on-the-job experience or associate's degree
ECR	Quality Control Systems Manager	Biomedical	Bachelor's degree
EIC	Brownfield Redevelopment Specialists and Site Managers	Environmental Science	Bachelor's degree
ERC	Construction Managers	Engineering	Bachelor's degree
ERC	Farm and Ranch Managers	Life Sciences	Bachelor's degree
ERC	First-Line Supervisors of Aquacultural Workers	Life Sciences	Bachelor's degree
ERC	Nursery and Greenhouse Managers	Life Sciences	Vocational training, on-the-job experience or associate's degree
ESC	Clinical Nurse Specialists	Biomedical	Graduate degree
IC	Biostatisticians	Life Sciences	Graduate degree
IC	Computer Programmers	Computer Science	Bachelor's degree
IC	Financial Quantitative Analysts	Computer Science	Bachelor's degree
ICA	Mathematicians	Mathematics	Graduate degree
ICE	Computer Network Architects	Computer Science	Bachelor's degree
ICE	Industrial Engineers	Engineering	Bachelor's degree
ICE	Operations Research Analysts	Computer Science, Mathematics	Graduate degree

ICR	Bioinformatics Scientists	Biomedical	Graduate degree
ICR	Computer Systems Analysts	Computer Science	Bachelor's degree
ICR	Industrial Safety and Health Engineers	Engineering	Bachelor's degree
ICR	Software Developers, Systems Software	Computer Science, Engineering	Bachelor's degree
ICR	Transportation Planners	Engineering	Bachelor's degree
ICS	Pharmacist	Biomedical	Graduate degree
IEC	Business Intelligence Analysts	Computer Science	Bachelor's degree
IEC	Water Resource Specialists	Engineering	Bachelor's degree
IRC	Bioinformatics Technicians	Life Sciences	Bachelor's degree
IRC	Chemical Technicians	Chemistry, Life Sciences	Vocational training, on-the-job experience or associate's degree
IRC	Chemists	Chemistry, Physics/Astronomy	Bachelor's degree
IRC	Computer and Information Research Scientists	Computer Science	Graduate degree
IRC	Computer Hardware Engineers	Computer Science, Engineering	Bachelor's degree
IRC	Cytogenetic technologist	Biomedical	Bachelor's degree
IRC	Environmental Engineers	Engineering, Environmental Science	Graduate degree
IRC	Environmental Science and Protection Technicians, Including Health	Environmental Science	Bachelor's degree
IRC	Environmental Scientists and Specialists, Including Health	Environmental Science	Bachelor's degree
IRC	Food Scientists and Technologists	Life Sciences	Bachelor's degree
IRC	Industrial Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
IRC	Mathematical Technicians	Mathematics	Bachelor's degree
IRC	Mechanical Engineers	Engineering	Bachelor's degree
IRC	Mechatronics Engineers	Computer Science, Engineering	Bachelor's degree
IRC	Microsystems Engineers	Engineering	Bachelor's degree
IRC	Nuclear Engineers	Engineering	Bachelor's degree
IRC	Petroleum Engineers	Engineering	Bachelor's degree
IRC	Photonics Engineers	Physics/Astronomy	Bachelor's degree
IRC	Product Safety Engineers	Engineering	Bachelor's degree
IRC	Software Developers, Applications	Computer Science, Engineering	Bachelor's degree
IRC	Validation Engineers	Engineering	Bachelor's degree
RC	Chemical Equipment Operators and Tenders	Chemistry	High School Diploma
RC	Chemical Plant and System Operators	Chemistry	High School Diploma

RC	Cooks, Institution and Cafeteria	Life Sciences	High School Diploma
RC	Fallers	Life Sciences	High School/GED
RC	Food Batchmakers	Life Sciences	High School Diploma
RC	Log Graders and Scalers	Life Sciences	Vocational training, on-the-job experience or associate's degree
RC	Wind Turbine Service Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Aircraft Mechanics and Service Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Civil Drafters	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Civil Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RCI	Electromechanical Equipment Assemblers	Engineering	High School Diploma
RCI	Forest and Conservation Workers	Engineering, Life Sciences	Vocational training, on-the-job experience or associate's degree
RCI	Nuclear Equipment Operation Technicians	Engineering, Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
RCI	Nuclear Monitoring Technicians	Engineering, Physics/Astronomy	Vocational training, on-the-job experience or associate's degree
RCI	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	Engineering	Vocational training, on-the-job experience or associate's degree
REC	Computer Network Support Specialists	Computer Science	Bachelor's degree
REC	First-Line Supervisors of Agricultural Crop and Horticultural Workers	Life Sciences	Vocational training, on-the-job experience or associate's degree
REC	Telecommunications Engineering Specialists	Computer Science	Vocational training, on-the-job experience or associate's degree
RIC	Aerospace Engineering and Operations Technicians	Engineering	Bachelor's degree
RIC	Agricultural Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIC	Automotive Engineering Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Automotive Specialty Technicians	Engineering	Vocational training, on-the-job experience or

			associate's degree
RIC	Avionics Technicians	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Biological Technicians	Life Sciences	Bachelor's degree
RIC	Civil Engineers	Engineering	Bachelor's degree
RIC	Computer User Support Specialists	Computer Science	Vocational training, on-the-job experience or associate's degree
RIC	Electrical Engineering Technicians	Computer Science, Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Electrical Engineering Technologists	Engineering	Bachelor's degree
RIC	Electromechanical Engineering Technologists	Engineering	Bachelor's degree
RIC	Electronics Engineering Technologists	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Environmental Engineering Technicians	Engineering, Environmental Science	Bachelor's degree
RIC	Food Science Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIC	Histotechnologists	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Logging Equipment Operators	Life Sciences	High School/GED
RIC	Mechanical Engineering Technologists	Engineering	Vocational training, on-the-job experience or associate's degree
RIC	Medical Equipment Repairers	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Medical and Clinical Laboratory Technicians	Biomedical	Vocational training, on-the-job experience or associate's degree
RIC	Precision Agriculture Technicians	Life Sciences	Vocational training, on-the-job experience or associate's degree
RIC	Security Management Specialists	Computer Science	Bachelor's degree
RSC	Surgical Technologist	Biomedical	Vocational training, on-the-job experience or associate's degree
SCR	Medical Assistant	Biomedical	Vocational training, on-the-job experience or associate's degree
SCR	Nursing Assistants	Biomedical	High School Diploma
SIC	Computer Science Teachers, Postsecondary	Computer Science	Graduate degree

SIC	Nurses	Biomedical	Vocational training, on-the-job experience or associate's degree
SRC	Dental Hygienist	Biomedical	Vocational training, on-the-job experience or associate's degree
SRC	Radiation Therapist	Biomedical	Vocational training, on-the-job experience or associate's degree

Career Interests Sheet

My Holland Code: Letter 1: ____ Letter 2: ____ Letter 3: ____

Careers that might interest me:

1. Career: _____

Education Level: _____ STEMM-Related: Yes No

One-Sentence about this Career: _____

_____

_____

_____

2. Career: _____

Education Level: _____ STEMM-Related: Yes No

One-Sentence about this Career: _____

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3. Career: _____

Education Level: _____ STEMM-Related: Yes No

One-Sentence about this Career: _____

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4. Career: _____

Education Level: _____ STEMM-Related: Yes No

One-Sentence about this Career: _____

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_____

5. Career: _____

Education Level: _____ STEMM-Related: Yes No

One-Sentence about this Career: _____

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WEEK 4

PIPES

POSSIBILITIES IN POSTSECONDARY EDUCATION & SCIENCE

Week 4

Activity: Thinking about PSE and how STEMM careers can address community challenges

Materials/Resources:

- Prizes for students who complete HW
- PSE options sheet
- Employment statistics
- Education and salary graph

Goals/Objectives:

- Students will learn about available postsecondary options
- Students will understand the differences between different PSE options
- Students will link PSE options with career goals
- Students will explore how STEMM can assist their community

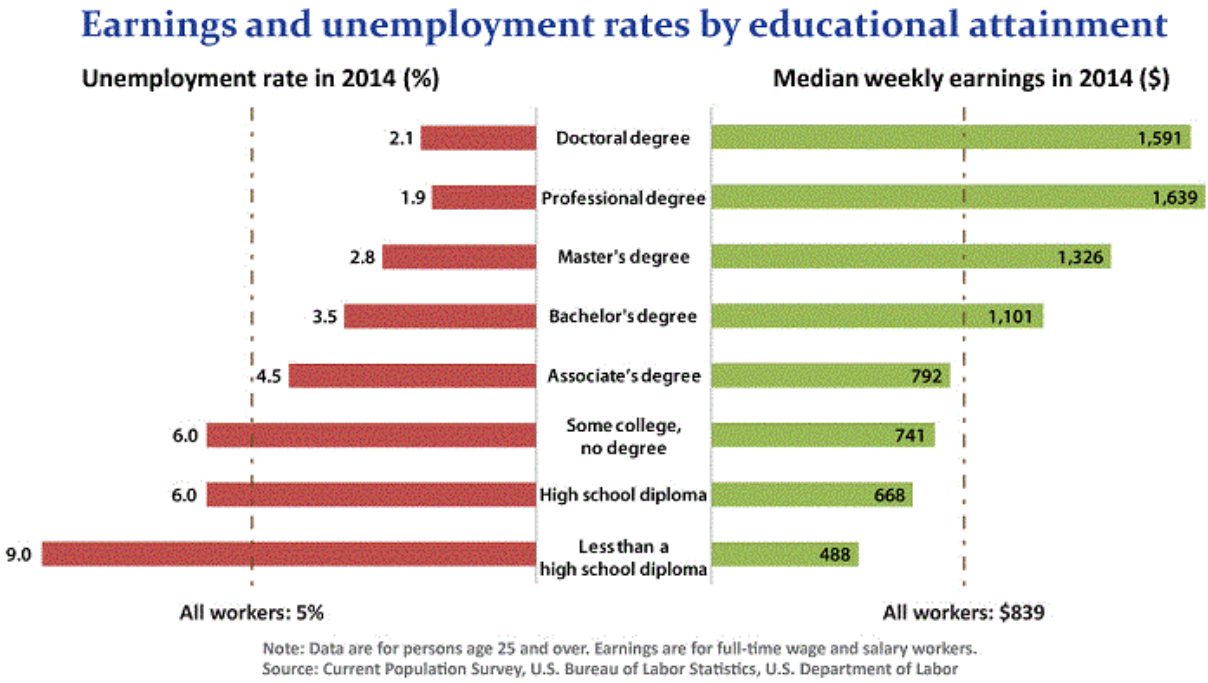
Specific Instructions:

1. Discussion about homework from last week (10 minutes)
    a. Who did the homework? (have example interviews/careers in the event of low HW participation).
    b. What did you learn about the careers of those around you?
        i. Write on board
            1. How they entered the career
            2. Likes about career
            3. Dislikes about career
            4. How job/career builds on personal strengths
            5. Job versus career?
            6. Advice about career planning
        ii. What themes do you see?
            1. Highlight ways in which the adults did / did not see their job fitting with their strengths, values, etc., and what that meant for them
2. Show STEMM Video https://youtu.be/XZvU_FASw7E (5min)
   Navigate a brief class discussion on how they see STEMM in their community? What STEMM careers are in or not available in their community?
3. PSE Options (15-20min)
   Start by asking: What are the options after you graduate from high school? Make a list of the board of responses, making sure the following are included:
    a. Straight to work
    b. Military
    c. Apprenticeship
    d. Trade school (such as Tennessee School of Beauty or HVAC school)

e. Two-year community college (such as Walters State)
f. Two-year community college and then transfer to four-year college
g. Four-year college or university

4. After all options are listed, give students the PSE Options Sheet and discuss the differences between each
5. How do you choose the best option?
    a. Depends on career choice
    b. More education typically leads to more money and benefits (show graph)
    c. May depend on what your parents want you to do
    d. May depend on what you can afford
6. Why consider attending college?
    a. Tally on board how many of the careers people have listed require PSE
    b. Employment statistics
        i. 1/3 of new jobs will be in health care or social assistance
        ii. Four occupational groups are projected to grow 20% or more
            1. Healthcare support (STEMM)
            2. Healthcare practitioners (STEMM)
            3. Construction
            4. Personal care and service
        iii. 19 of the 30 fastest growing occupations require some form of postsecondary education
        iv. More education typically equals lower unemployment and higher salary
    c. More money
    d. More career options
        i. Now required by many careers
        ii. Focus is now on skilled workers
        iii. World of work is different from when your parents were in school – now there are less jobs available for those with only a high school diploma, and the jobs that do exist provide only a low hourly wage and lack benefits
    e. Benefits (health insurance and retirement) – discuss why these are important
    f. Learn problem-solving and critical thinking skills
    g. More connections/networking
    h. Point out that even if they don't think college is the best choice for them right now, that might change. Important to keep as many options as possible open, which means important take things seriously now. If they blow off ACT now, and then decide later they want to go to college versus take ACT seriously now, and then decide not to go. What's better?
7. Debriefing (5minutes)
   Allow students to debrief and discuss today's lessons.

8. Wrap Up: Take a Minute. (5 minutes)
    a. Wrap Up: Take a Minute: As a way to close today and review what we've done, please complete the Take a Minute Google Form on the Google Site. This is week 3 of the curriculum, and your team leader's name is _____.



WHAT CAN I DO AFTER HIGH SCHOOL?

- Two-Year Colleges:
  - Offer Associate's degrees
  - Can be public or private
  - Train students for immediate entry into the job marker OR
  - Prepare students to transfer to a four-year college or university
  - Advantages
    - Lower cost
    - Location close to home
    - Smaller class size
    - Flexible class schedules
  - Disadvantages
    - Fewer social activities and ways to connect to campus
    - No on campus housing
    - Must be an independent learner
    - Can be hard to transfer to a four-year college as a junior

- Four-Year Colleges:
  - Offer Bachelor's degrees
  - Students take courses in general education plus specialized areas
  - Advantages
    - Four-year degrees often lead to higher-paying jobs
    - Learn critical and abstract thinking skills
    - Opportunities for social interactions and on-campus living
    - Offer a wide variety of courses
  - Disadvantages
    - Can be costly, especially if it is a private university
    - Can be far from home
    - May feel different from others at the school

- Career or Technical Schools (TCATs in Tennessee):
  - Provide courses that allow you to start a career in a specific field
  - Offer a variety of programs
  - Often provide a path to licensure or certification in areas such as:
    - Auto mechanic
    - Cosmetology
    - Truck driver
    - Computer programming
  - Advantages
    - Train students for a specific type of job

        - Night and weekend courses are available
        - No need to take courses outside your career focus
    - Disadvantages
        - Private technical schools can be very expensive
        - Courses typically do not transfer to a four-year college
        - May not be close to home
        - No on campus housing

- Apprenticeships:
    - Office education and training specifically targeted to a career field
    - Typically includes on-the-job training
    - Careers may include
        - Construction
        - Electrician
        - plumbing
    - Advantages
        - You begin work right away
        - Learn as you work
    - Disadvantages
        - Pay may be minimal at first

- Military:
    - Entering one of the military branches
    - Advantages
        - Learn career skills while enlisted
        - Earn money for future college-going
        - Learn skills to become a good worker
    - Disadvantages
        - May have to travel far from home
        - Can be dangerous
        - Can delay postsecondary education

PIPES

POSSIBILITIES IN POSTSECONDARY EDUCATION & SCIENCE

WEEK 5

Week 5

Continue to explore self and careers; strengths

Materials/Resources (will depend on activity(ies) planned):

- Who am I summary worksheet (1 / student)
- IF in computer lab:
    - Examples of strengths posters that the facilitators have completed
    - Links to clipart websites
- IF not in computer lab:
    - Examples of strengths posters that the facilitators have completed
    - Large sheets of paper
    - Printouts of clip-art and other images
    - Scissors
    - Glue sticks
    - Markers, crayons, etc.
- Strengths worksheet

Goals/Objectives:

- Students will understand the characteristics they have and want to develop
- Students will identify their personal strengths
- Students will relate characteristics and strengths to career options

Specific Instructions:

1. Activity option: Modified dependable strengths exercise (patented exercise; ~20 minutes)
    - Continuing theme of childhood experiences predicting future goals / interests, have facilitator model this first with an unusual experience from 6th grade or earlier
        - Take out a piece of paper, write about a good experience from 6th grade or earlier that you enjoyed, were proud of, and thought you did well. We are going to share this, think about something you would be willing to tell your grandmother about. Write down in as much detail as possible.
    - Facilitators model next step: Pair up – have them listen to the other's story and circle the strengths they heard from the story – on the strengths worksheet
        - When you talked about your good experience, you demonstrated these strengths
        - Have students pair up to circle strengths in each other's stories
2. Activity option: Strengths poster (15-20 minutes)
    a. Create a strengths poster related to your career
    b. What strengths would you bring to the career choice?
    c. Show examples of facilitators' career posters (electronic or paper)
    d. During activity, facilitators circulate to keep students on task, answer questions

    e. Ask for volunteers to share their posters with the rest of the class. Prompt with questions about how students know what their strengths are, how they relate to careers, etc.
3. Putting it all together: Who am I?
    a. Have students continue working on the Who am I worksheet (will not be completed, Heroes & Values continue to 10th grade)
    b. Discuss how understanding self (strengths, interests, etc.) is helping them think about career options
4. Debrief: Allow students to debrief and discuss today's lessons. Final reflection
    a. What was the most important thing they learned?
    b. Look back over materials from the program. What, if anything, has changed? Are dreams / aspirations different? Are they thinking about any new careers?
5. Wrap Up: Take a Minute: As a way to close today and review what we've done, please complete the Take a Minute Google Form on the Google Site. This is week 5 of the curriculum, and your team leader's name is _____.
6. Evaluation (10 minutes)
    a. Our next steps are to make sure that this program is as useful as possible, so we need their feedback
    b. Pass out evaluation sheet

My Strengths

Circle 6 – 8 personal strengths from the list below. Pick the characteristics that best represent your strengths.

Adaptability	Kindness	Straightforward
Bravery	Knowledgeable	Task-Oriented
Building Relationships	Leadership	Teamwork
Caring	Love of Learning	Time Management
Communication Skills	Open-Mindedness	Tolerance
Computer Skills	Optimistic	Trustworthy
Creativity	Orderly	Warmth
Curiosity	Organized	Work Ethic
Determination	Originality	Working Alone
Empathy	Patient	
Energetic	Persistence	
Generosity	Persuasiveness	
Honesty	Positive Attitude	
Hopefulness	Problem-Solving	
Humor	Responsible	
Inspiring	Serious	
Intelligent	Spirituality	

Dependable Strengths Exercise (modified)

- Think about your childhood up to 6th grade
- Identify a good experience that comes to your mind
    - Something specific that you
        - Did well
        - Enjoyed
        - Are proud of
- Draw this experience or write a short description of it here:

- Now, pair up with someone and listen to their story
- Using the strengths worksheet, circle the strengths you heard from their story
- Share these strengths with your partner

Heroes

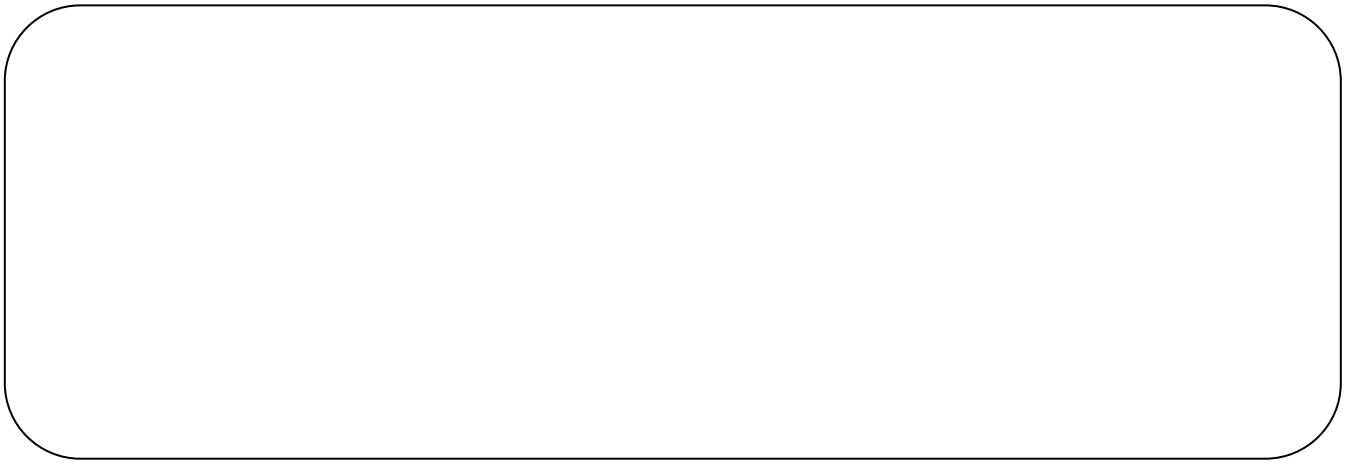
Think back to when you were a child, about 6-8 years old (kindergarten – third grade). Who were your heroes? Other than your mom or dad, who did you admire? These can be real people you knew or famous people you didn't know personally, make-believe people like superheroes or cartoon characters.

When I was a child, I admired _____

Because……

When I was a child, I admired _____

Because……



When I was a child, I admired _____

Because……

Accountable
Achievement
Adaptability
Altruism
Ambition
Attitude
Balance (home/work)
Caring
Commitment
Community
Community involvement
Compassion
Competence
Consistency
Control
Cooperation
Correctness
Courage
Creativity
Dependability
Determination
Diversity
Fairness
Financial stability
Forgiveness
Friendliness
Generosity
Health
Honesty
Humility
Humor
Independence
Initiative
Inner harmony
Integrity
Intelligence
Intuition
Job security
Leadership
Listener
Openness
Patience
Perseverance
Recognition
Reliability
Religion
Respectfulness
Risk
Safety
Self-actualization
Self-reliance
Spirituality
Spontaneity
Strength
Success
Teamwork
Tolerance
Unity
Vision
Wealth
Other :
_____

Values List – Circle 10

Who am I?

Use this page to summarize what you learn about yourself from today's activities. You will add to this worksheet in future weeks, so please don't lose it!

MY HEROES

What two or three things do my heroes all have in common?

MY PERSONAL STRENGTHS

What do I and others see as my personal strengths?

MY VALUES

What 4-5 values are the most important to me?

MY PERSONALITY AND INTERESTS

What is my Holland Code?

Your name: _____

Who you interviewed: _____

1. What is your current job?

2. How did you come to enter this job?

3. What do you like about your job?

4. What do you dislike about your job?

5. Do you think of your current work as a job or a career?

6. What do you see as the difference between a job and a career?

7. What advice do you have for me as I figure out a career path?