# POSSIBILITIES IN POSTSECONDARY BUCATION & SCIENCE

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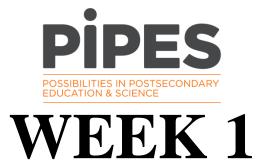
Imagining Possibilities in Postsecondary Education and Science is a five-year project made possible by a Science Education Partnership Award from the National Institutes of Health (NIH) that seeks to make a positive difference in East Tennessee by providing opportunities for rural Appalachian high school 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.

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Day 1

Activity:

- Pre-Survey and Assessments
- Re-introductions and reviews
- Strengths Activity
- Who Am I Activity (Values & Heroes)

#### Materials/Resources:

- Worksheets in Google Drive <u>https://sites.google.com/vols.utk.edu/pipes2021/home</u>
- Strengths Worksheet
- Heroes Worksheet
- Values Worksheets

#### Goals/Objectives:

- To re-introduce the PIPES program to students
- To allow students to learn about themselves and others in the classroom
- To build rapport for future class meetings
- To identify values and personal characteristics and how they relate to career options

Specific Instructions:

- 1. Student Assessments and Pre-Survey: (25 min)
  - a. Explain and administer student assessments. Allow students to complete.
  - b. Make sure students input their **full name**, not a nickname or shortened

version!

2. Facilitator introduction: (5 min)

The class facilitators will introduce themselves and describe the PIPES/IP program

- a. Ask students (returning from 9th grade) how they would explain/describe PiPES.
- b. 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 12th grade.
  - c. 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. First, we had some connections with people who work here. Second, your schools are within easy driving distance of UT. Third, your principals were interested in having us come to your schools. And fourth, 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. Choice one: Values worksheet (10 minutes)

a. Have students locate the Values worksheet in drive.

b. Read through the list of values and select 10 that are most important to you. Class discussion about these values and why they are important.

c. Now, have students cross off 5 of their 10 circled values leaving only the 5 most important ones.

- d. Class discussion: What does this have to do with choosing a career?
- e. If short on time, finish up at beginning of week 2
- 4. Choice two: Activity: Modified dependable strengths exercise (15 minutes)

a. Continuing theme of childhood experiences predicting future goals/interests, have team leader model this first with an unusual experience from 6th grade or earlier

b. Find the sheet in the Google Drive, type 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, so think about a story that you would tell your grandmother. Include as much detail as possible.

c. Facilitators 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

d. When you talked about your good experience, you demonstrated these strengths

- e. Have students pair up and circle strengths in each other's stories
- f. Can wrap up activity in week 2 if necessary
- 5. Wrap Up:

a. Thank students for working, tell them some upcoming activities, we'll be back for the next 4 weeks.

## **Dependable Strengths Exercise (modified)**

- Think about your childhood up to 6<sup>th</sup> 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

## My Strengths

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

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

## Values List – Circle 10

Accountable Achievement Adaptability Altruism Ambition Attitude **Balance** (home/work) Caring Commitment Community Community involvement Compassion Competence Consistency Control Cooperation Correctness Courage Creativity Dependability

Fairness **Financial** stability **Forgiveness** Friendliness Generosity Health Honesty Humility Humor Independence Initiative Inner harmony Integrity Intelligence Intuition Job security Leadership Listener Openness Patience

Recognition Reliability Religion Respectfulne SS Risk Safety Selfactualization Self-reliance Spirituality Spontaneity Strength Success Teamwork Tolerance Unity Vision Wealth Other :





Day 2

Activity:

- Career Party/Holland Code
- Explore STEMM Careers

Materials/Resources:

- COMPUTER USE
- STEMM Careers with Holland Code classroom set

Goals/Objectives:

- Students will link Holland codes to possible careers
- Students will begin to identify possible career paths

Specific Instructions:

• NEW Instructions: Students will use the O\*Net Online Interest Profiler to determine their Holland Codes.

• Begin by asking students if they remember the Holland Code Career Party from last year. When they got up and moved around the room to three different 'parties' and then discussed their Holland Codes and linked them to STEMM careers.

• Reminder: 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.

• Today, we will be using O\*NET Online to take a Holland Code test and find different careers that align with your Holland Code.

• Students need to go to <u>https://www.onetonline.org/</u>, access the drop down menu labeled 'O\*Net Data', and click on 'Interests'. In the blue box, click '<u>Take the</u> <u>O\*Net Interest Profiler</u>'. This will direct them to a quiz that asks them to rank how much they would like to do various tasks. There are 60 statements total, and students must answer them in order. Inform them that marking a task as 'Unsure' will not help their results and they should try to answer each question on the agree or disagree scales. This should take less than 10 minutes.

• Once students have completed the quiz, they will be given their Holland Code. When the majority are finished, ask if they remember their Holland Code from last year and how this one compares?

• Next, they will be taken to a screen that discusses job zones. Have them select a 'Future Job Zone' rather than current because they are thinking about future

careers. Job zones are as follows:

- 1- Little or no preparation needed (May require high school diploma or GED)
- 2- Some preparation needed (Require a high school diploma)

• 3- Medium preparation needed (Vocational school training, on the job experience, or an associate's degree)

• 4- Considerable preparation needed (May require a four-year bachelor's degree)

• 5- Extensive preparation needed (Most require a graduate degree- Master's Degree, Ph.D., M.D., or J.D.

• Once they have selected a job zone, a list of careers that match their Holland Code and selected job zone will appear. Students should identify a career and complete the Career Research Worksheet.

• Facilitators actively circulate in room to make sure students stay on task, to answer questions, etc.

- $\sim 5$  -10 minutes before the end, have a brief wrap-up / large group discussion
  - What did people learn?
  - What careers to they want to learn more about?
  - What surprised them?
  - What questions do they have?

• Wrap Up: Take a Minute: As a way to close our time today and review, open the Google Drive and find the Google Form titled "Take a Minute". Please complete all the questions on the form and submit it, then we will talk about some of your responses. We will be ending each week like this for the rest of our time together.

 $\circ~$  Make sure students know team leader's name and what week of curriculum you are on.

		Caree	r Interests She	eet		
My Holland Code:	Letter 1:	_	Letter 2:		Letter 3:	
Careers that might in	terest 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:					

3. Career:			
Education Level:			
STEMM-Related:	Yes	No	
One-Sentence about	this Career:		
4. Career:			
Education Level:			
STEMM-Related:	Yes	No	
One-Sentence about	this Career:		

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Special Notes on today's lesson/Something you want to remember:

#### **Career Research**

Note for facilitators: This advanced career research worksheet was developed for use with students in honors courses. Students can complete this in addition to the Career Interests Sheet.

TITLE OF OCCUPATION:		
1. Describe the main duties and responsibilities:		
2. What are the education and training requirements?		
3. What is the average wage or salary?		
4. What is the employment outlook?		
5. List other similar or related occupations:		
6. What subjects or courses would help you prepare for this occupation?		
7. Does this occupation deal mainly with people, data, ideas, or things?		
8. This occupation interests you because:		

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#### Day 3

#### Activity: Thinking about PSE

Materials/Resources:

- PSE options sheet
- Employment statistics
- Education and salary graph
- College Lingo Sheet
- List of college-going barriers

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 begin exploring barriers to PSE

Specific Instructions: (20 minutes total for 1-4)

- 1. Start by asking: Who remembers some of the options after you graduate from high school? (We discussed this with our 9th grade classes) Allow the class to discuss, 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
- 2. After all options are listed, have students access the PSE Options Sheet and review the differences between each
- 3. 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
- 4. Why consider attending college?
  - a. Review how many of the careers people have listed require PSE
  - b. Employment statistics
    - i. Healthcare occupations and those associated with healthcare (including mental health) account for 13 of the 30 fastest growing occupations in the next 10 years.
    - ii. Four occupational groups are projected to grow 20% or more
      - 1. Healthcare support (STEMM)
      - 2. Healthcare practitioners (STEMM)

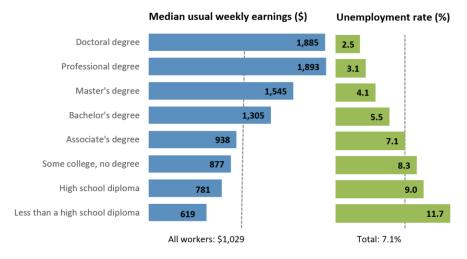
- 3. Construction
- 4. Personal care and service
- iii. 19 of the 30 fastest growing occupations require some form of postsecondary education
- iv. More education typically equals lower unemployment and higher salary
- c. More money
- d. More career options
  - i. Now required by many careers
  - ii. Focus is now on skilled workers
  - 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 may 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. Remind them 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 it's important to 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?
- 5. Barriers Activity (What would keep you from going to college?): (8-10 minutes)
  - i. Label the four corners of the room with Strongly Agree, Agree, Disagree, Strongly Disagree
  - ii. Read statements from college-going barriers scale and have students move into the corner of the room that fits for them/ Have students give thumbs up/thumbs down instead of moving
  - iii. Keep track of which barriers had consistent / inconsistent responses
  - iv. DISCUSS what the activity was like
    - 1. What barriers had they thought about before? Which were new?
    - 2. Which ones were common / idiosyncratic?
  - v. Highlight the common barriers / idea that EVERYONE faces potential barriers doesn't have to stop you, just have to be prepared and know what to do
  - vi. INFORMATION can be key to overcoming barriers. Next time we will be talking much more about PSE, college, ways to overcome some of these common barriers.
- 6. College Lingo (10 Minutes for 6 & 7)
  - a. Have students access the college lingo sheet on the Google Site.
  - b. Define each item on the list, provide examples when able (Ex. "You get an associate's degree from a two year school like Cleveland State.""About how many hours are you in your English Class a week? Then this class would be worth 5 credit hours."

#### 7. Activity: Taboo

- a. Have students close their laptops
- b. Divide class down the middle into two teams
- c. Bring a chair to the front of the room, facing students but away from the whiteboard
- d. Take turns alternating between teams
- e. You will write a College Lingo term on the board. The student in the chair shouldn't be able to see the word. The student's team will then have 1 minute to get their teammate to say the item on the board using only vocal cues. The only rule is that the students giving clues cannot say the item (in part or in full) that is written.
- f. Each team scores 1 point for each correctly guessed term; team with the highest score wins a prize.

#### 8. Debriefing

- a. Wrap Up: Take a Minute: As a way to close our time today and review, open the Google Drive and find the Google Form titled "Take a Minute". Please complete all the questions on the form and submit it, then we will talk about some of your responses. We will be ending each week like this for the rest of our time together.
  - i. Make sure students know team leader's name and what week of curriculum you are on.



#### Earnings and unemployment rates by educational attainment, 2020

Note: Data are for persons age 25 and over. Earnings are for full-time wage and salary workers. Source: U.S. Bureau of Labor Statistics, Current Population Survey.

#### WHAT CAN I DO AFTER HIGH SCHOOL?

- Two-Year Colleges:
  - o 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
  - o Advantages
    - Lower cost- TN Promise
    - Location close to home
    - Smaller class size
    - Flexible class schedules
  - o 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
  - o 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
  - **o** 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
  - o Offer a variety of programs
  - o Closest TCAT is in Athens, TN (Monroe) or Oneida or Jacksboro (JHS)
  - Often provide a path to licensure or certification in areas such as:
    - Administrative office technology
    - Automotive technology
    - Collision Repair
    - Computer Electronics
    - Machine Tool Technology

- Electro Mechanical
- Practical Nursing
- Welding
- o Advantages
  - Train students for a specific type of job
  - Night and weekend courses are available
  - No need to take courses outside your career focus
  - TN Promise will pay tuition
- o 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
  - o Typically includes on-the-job training
  - o Careers may include
    - Construction
    - Electrician
    - plumbing
  - o Advantages
    - You begin work right away
    - Learn as you work
  - o Disadvantages
    - Pay may be minimal at first
- Military:
  - o Entering one of the military branches
  - o Advantages
    - Learn career skills while enlisted
    - Earn money for future college-going
    - Learn skills to become a good worker
  - o Disadvantages
    - May have to travel far from home
    - Can be dangerous
    - Can delay postsecondary education

#### Possible Barriers to Furthering Your Education (Day 5) Four Corners Activity (**use at least one prompt from each category**)

- Not knowing what you want to do career-wise
  - o Don't know what kind of school I want
  - o Don't know what kind of career I want
- Finances
  - Don't have enough money for college
  - o College is too expensive
- Lack of support
  - Friends don't support my plans
  - Parents don't support my plans
  - o Others don't think I be successful in college
- Discrimination
  - o Might be treated differently because of where I live
  - o Others believe that people from where I live don't do well in college
- Lack of role models and knowledge
  - o Parents don't have knowledge about college
  - No one in my family goes to college
  - 0 Don't understand what college life is all about
- Negative role models
  - Pressure to get a job rather than stay in school
  - No one around here goes to college
- Family issues
  - Family responsibilities keep me from going to college
  - Feel guilty about going away to college
  - **o** Don't want to move away
- Lack of guidance
  - o No one to help me understand college-planning
- Lack of preparedness/social skills
  - Takes a long time to finish schooling
  - o Don't think I am prepared enough for college
  - o School is too stressful
  - Would not be able to get into college I want
- Not fitting in
  - Not enough people like me at college
  - Won't fit in at a new school

Term	Definition
A.A.	Associate of arts, earned at most two-year colleges
Associate's Degree	Degree awarded to graduates of a two-year community college (A.A)
ACT	American College Testing, measures aptitude in English, math, reading,
	and science reasoning
Advisor	School official assigned by the college, who helps you choose the right courses for your major
B.A. or B.S	Bachelor of arts or bachelor of science, earned at four-year colleges
Bachelor's Degree	Degree awarded to graduates of a four-year college – B.A. or B.S.
Credit Hour	Number of hours assigned to a specific class, usually related to the
	number of hours per week you are in that class
Expected Family	Amount that indicates how much a family's financial resources should be
Contribution (EFC)	available to help pay for school
FAFSA	Free Application for Federal Student Aid – application required for all
INISA	types of financial aid
Fees	Charges that cover costs beyond tuition, including athletic activities,
1005	clubs, and special events
Financial Aid	Money available from various sources to help students pay for college
General Education	Classes that give students basic knowledge on a variety of topics; usually
Classes	required for college graduation
Grant	Type of financial aid that does not have to be repaid
Loan	Type of financial aid that must be repaid, typically after the student
Louir	finishes school
Major	Your primary area of study, related to the job you want after graduation
Merit-Based	Financial aid given to students who meet requirements not related to
	financial need, usually based on academic performance or extracurricular
	involvement
Need-Based	Financial aid given to students who are determined to be in financial need
	based on their income and family assets
Pell Grants	Federal need-based grants that do not need to be repaid
Private University	University that is privately-funded, usually costing more in tuition.
·	Examples near you include: Carson Newman College, Johnson
	University, Lee University, Lincoln Memorial University, Maryville
	College, and Tennessee Wesleyan College
Public University	University partially funded by the government, often called State schools
	or universities. Examples near you include: University of Tennessee
	Knoxville, East Tennessee State University, University of Tennessee
	Chattanooga, and Tennessee Tech University
SAT	Scholastic Aptitude Test, which measures mathematical and verbal
	reasoning
Scholarships	Need- or merit-based financial awards that typically do not need to be
	repaid
Syllabus	Description of a course that also lists dates for exams and assignments
Tuition	Amount of money that colleges charge for classroom instruction

## College Lingo





Week 4

Activity:

- Draw a scientist
- STEMM Videos
- STEMM Majors Discussion
- STEMM and Your Community

Material/Resources:

- Blank paper
- Markers and crayons

Goals/Objectives:

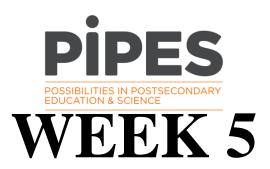
- Students will consider their biases and preconceived ideas about scientists
- Students will learn about STEMM careers

Specific Instructions:

- 1. Questions from last time?
- 2. Draw a Scientist (10-15 minutes)
  - a. Ask each student to draw a picture of what they see as a scientist
  - b. Ask them to list 5 words about what a scientist looks like and what a scientist does
  - c. Write the words on the board
  - d. Discussion:
    - i. How did you learn these descriptions?
    - ii. Do you think they are accurate?
- 3. Show video on STEM fields: STEM Careers: Inspire the Next Generation of Innovators
- 4. Show video on research at UTK: <u>https://www.youtube.com/watch?v=xnkpMesypJQ</u>
- 5. Discussion:
  - a. How has science and technology changed how we communicate, are entertained, find out information?
  - b. Generate a list of objects that we use on a regular basis today that parents did not have when they were in high school
  - c. Discuss how these were all created by scientists
- 6. STEMM majors (US Dept of Commerce, 2011)
  - a. Science, Technology, Engineering, Math, and Medical Science careers
  - b. STEMM occupations are projected to grow by 8% between now and 2029 (compared to 3.7% for non-STEMM occupations)
  - c. STEMM workers earn 26% more than their non-STEMM peers
  - d. 2/3 of STEMM workers have a college degree
  - e. Average hourly earnings by educational attainment:
    - i. HS diploma or less:
      - 1. STEM: \$24.82
      - 2. Non-STEM: \$15.55
    - ii. Some college or associate degree:

- 1. STEM: \$26.63
- 2. Non-STEM: \$19.022
- iii. Bachelor's degree
  - 1. STEM: \$35.81
  - 2. Non-STEM: \$28.27
- 7. Discussion of STEMM career options (2 year, 4 year, graduate level)
- 8. How can STEMM careers help your community? Health issues in your community (15 minutes)
  - a. DO NOT share these statistics with the class; they are to help you guide the conversation. Example- "What about access to health care?" "What about drug use?"
  - b. (Appalachian counties rank below national norm on health care access and cost
  - c. 48% of Appalachian counties rank in lowest quintile of healthcare reimbursement
  - d. Residents die younger from preventable causes (19% higher preventable mortality rates)
  - e. Higher rates of decay-related tooth loss
  - f. Fewer dental providers
  - g. Higher rates of chronic illness
    - i. COPD
    - ii. Cancer
    - iii. Strong
    - iv. Diabetes
    - v. Obesity
  - h. Higher rates of meth use)
- 9. Discussion
  - a. Do you know people affected by any of these health issues?
  - b. How do these health issues affect their lives? Your lives?
  - c. What can you do to help address these health issues? Reflect on Who am I worksheet, dreams and goals.
    - i. Highlight variety of career opportunities that would relate to these community needs
      - 1. PA, nurse, physician, dentist
      - 2. Biomedical researcher
      - 3. Behavioral health specialist
- 10. Next time is our last meeting come with any final questions, thoughts, etc.
- 11. Wrap Up: Take a Minute: As a way to close our time today and review, open the Google Drive and find the Google Form titled "Take a Minute". Please complete all the questions on the form and submit it, then we will talk about some of your responses. We will be ending each week like this for the rest of our time together.
  - a. Make sure students know team leader's name and what week of curriculum you are on.

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Day 5

Activity:

Material/Resources:

- Goal setting handouts (1 per student)
- Program evaluations (1 per student)

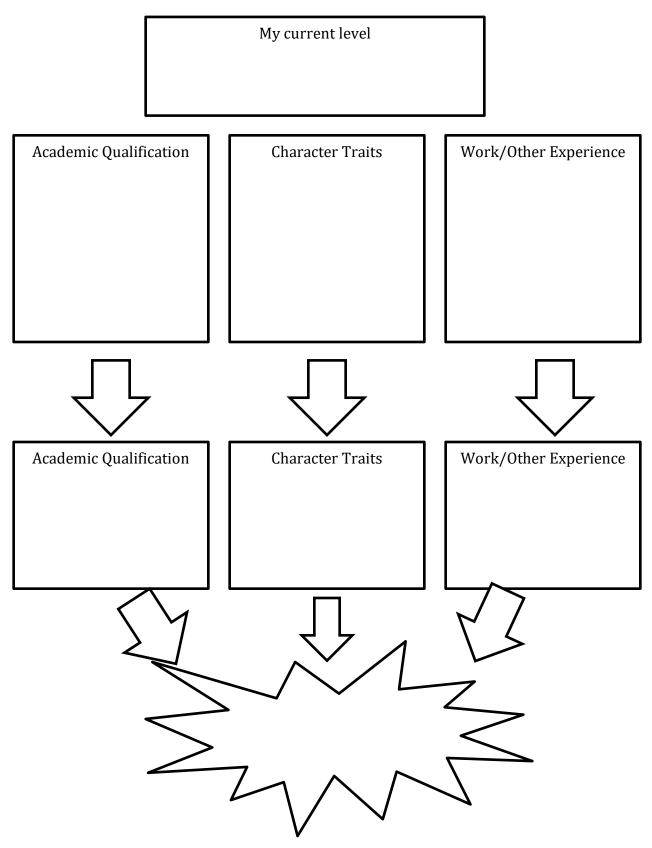
Goals/Objectives:

• Students will begin to create a plan for reaching their goals

Specific Instructions:

- 1. Begin wrap-up
  - a. Questions people brought?
  - b. We've covered a lot of topics in the past few weeks exploring who you are, what your goals are, what kinds of careers might be a good fit for you, what college is all about.
- 2. Goal-setting and planning have students complete the goal-setting worksheet (15-20 minutes)
  - a. What are their next steps?
- 3. 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
- 4. Final reflection
  - a. What was the most important thing they learned?
  - b. Look back over materials from the program, especially worksheets from early on. What, if anything, has changed? Are dreams / aspirations different? Are they thinking about any new careers?

# **Achieving My Ambition**



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