Sustainable Design Project

Students will work in groups to complete this sustainable design project. This project will be used to address issues in the environment, economic and social systems. The goal of this project is for students to design sustainable solutions to real-world challenges while increasing their level of civic and student engagement.

Each group is responsible for meeting every deadline and completing the project based on the following criteria:

1. Group roles are clearly defined **(due by the end of the first class)**

    a. **Project Manager**

    b. **Chief Researcher**

    c. **Chief Designer**

    d. **Secretary**

    e. **Spokesperson**

2. The problem is clearly identified and a solution to this problem is recommended. **(rough draft due March 31st)**

3. The group creates one of the following that addresses their problem and presents their solution in a professional manner: **(Project completion due April 17th)**

    a. Public Service Announcement (PSA) – Commercial

    b. Presentation

    c. Proposal

To assist with this project, seven planning tools have been attached. These are NOT required to be filled out, but they will greatly increase the effectiveness of this project. It is HIGHLY recommended that you complete each of these planning tools IN ORDER.

You may choose one of the three options for your project.

Option 1 – Community Garden

Find a plot of land in Monroe Twp., NJ (it does not matter who owns the land).

- Identify why you chose this plot of land to build a community garden.
- Identify what types of crops you recommend growing there and why?
- Identify how the crops would be distributed.

Option 2 – Consumer Products

Choose a product that has a poor design.

- Create a better design for the product.
- Identify why you chose this design.
- What does this new design do to the cost of the product?

Option 3 – Create your own (must get approval prior to starting)

Develop a sustainable design project

- Identify a problem
- Identify a solution
- Evaluate the affects this new solution would have on the economy, society and the environment.

Grading Rubric

CRITERIA	Very Successful (4)	Successful (3)	Somewhat Successful (2)	Not Yet Successful (1)
Description of Issue	Excellent description of issue including many aspects of the problem. Succinct and very clear focus question.	Good description of issue including several aspects of the problem. Clear focus question.	Understandable though fairly brief description of issue. Focus question stated but not totally clear.	Did not describe the central issue, or did so minimally. Focus question is not clear.
Description of Target Community	Excellent description of the community, supported by research. May include information on geography, demographics, values, and history.	Good description of the community but may not be comprehensive.	Understandable though brief description of the community. May lack in supported research.	Did not describe the community, or did so minimally without any research.
Description of Interest and Knowledge	Excellent description of personal interest, and existing knowledge about the issue.	Good description of personal interest and existing knowledge.	Brief description of personal interest and existing knowledge.	Did not describe personal interest and existing knowledge, or did so minimally.
Collection of Information	Excellent use of note taking and organizational tools.	Good use of note taking and organizational tools.	Fair use of note taking and organizational tools.	Did not use note taking and organizational tools, or did so minimally.
Clarification of Viewpoints	A wide variety of viewpoints on the issue were expressed.	Several different viewpoints on the issue were expressed.	At least two different viewpoints on the issue were expressed.	Only one or no viewpoint was expressed.
Sources of Information	Four or more high quality, verified sources were used and citations were provided.	Three or four verified sources were used and citations were provided.	One or two verified sources were used and citations were provided.	No verified sources were used and citations were not provided.
Presentation of Solution	A solution was presented that was well researched and feasible.	A solution was presented but it was not well researched or not feasible.	A solution was presented but it was not well researched and not feasible.	No solution was presented.
Demonstration of Understanding of Issue	Showed a deep level of understanding of the topic, focus question, and related issues.	Showed reasonable level of understanding of the topic, focus question, and related issues.	Showed fair or partial understanding of the topic, focus question, and related issues.	Did not show a basic understanding of the topic, focus question, and related issues.
Organization	Presentation was very easy to follow and very well organized.	Presentation was clear and organized.	Presentation was understandable but could have been better organized.	Presentation was poorly organized and difficult to follow.
Creativity	Presenter(s) used several novel and interesting ways of presenting important points.	Presenter(s) used at least one novel and interesting way of presenting important points.	Presenter(s) used standard presentation methods, but maintained interest.	Presenter(s) did not maintain interest.
Delivery	Presenter(s) appeared confident, used a professional tone, spoke clearly without reading, made eye contact with audience, and went at a good pace.	Presenter(s) had a slight problem with one of the following: confidence, tone, speaking, eye contact, and pace.	Presenter(s) had a problem with several of the following: confidence, tone, speaking, eye contact, and pace.	Presenter(s) did not show confidence, did not use a professional tone, did not make eye contact, read presentation from notes, and went either too fast or too slow.
Visual Aids	Varieties of visual aids were used and were very neat, clear, and understandable.	Visual aids were neat, clear, and understandable.	Visual aids were somewhat neat, clear, and understandable.	Visual aids were not neat, clear, or understandable.
Teamwork	All participants were active and they coordinated well with each other. They were positive and mutually encouraging.	Most participants were active, some more than others. They worked well together.	Some members of the team clearly did more work than others, and teamwork could have been improved.	Little evidence of teamwork.

Score: ____ out of 52 points

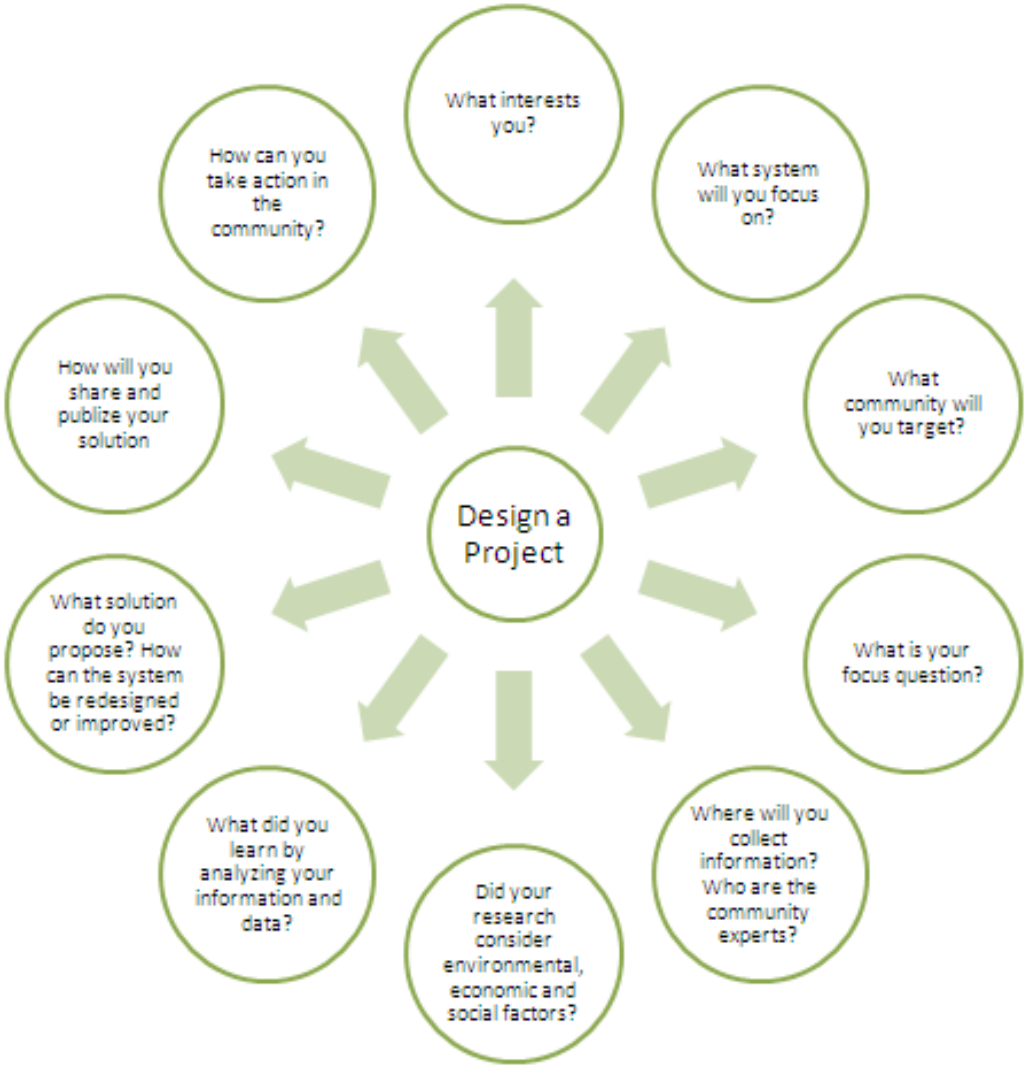
Student Planning Tool #1: Introduction

Name: _____

Date: _____ **Block:** _____

You are about to embark on an exciting challenge—a Sustainable Design Project. As part of this project, you will investigate an issue, problem, or situation that is part of a system in your local community. You will work propose a solution and share your findings.

The following diagram shows the questions you will be investigating for each step of your Sustainable Design Project. As you progress from one step to the next, make note of the date you move onto a new step in the process.



Student Planning Tool #2: Considering Your Own Interests

Name: _____

Date: _____ **Block:** _____

1. What kinds of things interest you?

2. What do you know how to do well?

3. What problems or issues do you see in the world that you would like to help change?

What is a System?

A system is a group of interacting, interrelated, and interdependent components that form a complex and unified whole. Systems are everywhere. For example, a classroom, a predator/prey relationship, and the ignition system in a car are all systems. Some systems are "nested" within larger systems. For example, the circulatory system is nested within the system we know as the human body. A system is a collection of "things" in which the whole is greater than the sum of its parts.

4. Read through the table below. Consider which of the following systems interest you most.

SYSTEM	EXAMPLE ISSUES
Built Environment	• "Green" building design and construction • Sick building syndrome • Parks and green spaces
Climate Change	• Global warming and its affects on agriculture • Global climate change and the affects of severe weather
Energy	• Alternative energy sources (solar, wind, etc.) • Biofuels (biodiesel, ethanol, etc.) • Energy conservation
Water Quality & Conservation	• Water pollution in local waterways • Water conservation

Air Quality	• Air pollution from cars, boats, trains, ferries, and cruise ships • Woodstoves and outdoor burning • Wildfires
Waste Management	• Composting and worm bins • Recycling • Electronic waste
Workplace Health & Safety	• Ergonomics • Health and safety hazards at work
Voting & Civic Action	• Voting • Volunteerism • Activism
Food & Farm	• Nutrition • Organic gardening and farming • School gardens • Obesity epidemic
Technology	• Cradle-to-grave pathway of electronic waste • Cradle-to-cradle principles
Cultural Preservation	• Places of cultural importance • Local history
Media, Music, and Art	• Film, music, and art festivals • Art installations
Parks & Natural Areas	• Non-native plant species • Developing neighborhood “pocket” gardens • Community gardening plots
Forestry	• Urban forests • Biosolid fertilizers • Soil erosion and water quality protection
Environmental Health & Justice	• Asthma and tobacco smoke • Diabetes and obesity • Inequitable concentration of polluting industries located in neighborhoods with low incomes or people of color • Lack of “green” businesses, open space, and safety

5. Choose the system that you would like to be the focus of your Sustainable Design Project. Write the system below:

   System: _____

6. What other students in your class are also interested in the same system?

7. You will be doing the Sustainable Design Project as a group project, choose who will make up your group. Write all the group member names below:

Student Planning Tool #3: Identifying Your Target Community

Name: _____

Date: _____ **Class/Period:** _____

You have already considered your interests to help you choose the system on which to focus your Sustainable Design Project. Write the name of your chosen system or topic below:

System/Topic: _____

Now you need to determine the target community for your project. A **community** is a group of people who are somehow brought together by shared values, beliefs, goals, geography, or other factors. A community can take on many different forms, such as an entire city, a neighborhood, a school, a seventh-grade class, or the residents of an apartment building.

In order to answer the questions below, you will need to conduct some research on your targeted community.

1. What community will be the focus of your Sustainable Design Project? This is the community in which your system occurs and/or the community that will be affected by your project.

2. Who makes up your targeted community? Describe the defining characteristics of the community? Who are the people? Ages? Ethnic/Racial background? Population?

3. What makes this community unique? Is there anything special about its history? Is it facing a current problem?

4. What are the core values of this community? (Economic status, education, family, beliefs, work, etc.). How do you know?

5. Who are the decision-makers in this community? (This may be specific people, groups, businesses, organizations, or government agencies).

6. What environmental issues is this community currently facing?

7. What social issues is this community currently facing?

8. What economic issues is this community currently facing?

9. Who do you think are the experts in the community for the different issues you listed above? Where else could you go to find more information on these issues?

Student Planning Tool #4: Developing Your Focus Question

Name: _____

Date: _____ **Block:** _____

You now have chosen the system and the community that you will be focusing on for your Sustainable Design Project. Write your chosen system and community on the lines below:

System/Topic: _____

Community: _____

Next, you will be developing your focus question. A **focus question** has three parts. First, you need to define the main issue, problem, or situation that you will be investigating for your Sustainable Design Project. Second, you need to identify the particular question that you have about that issue, problem, or situation. Third, you need to propose a design solution.

1. What questions do you have about your chosen system?

2. What questions do you have about your chosen community?

3. What do you already know about the system?

4. Is there a particular topic or part of the system that you want to focus on, rather than the entire system?

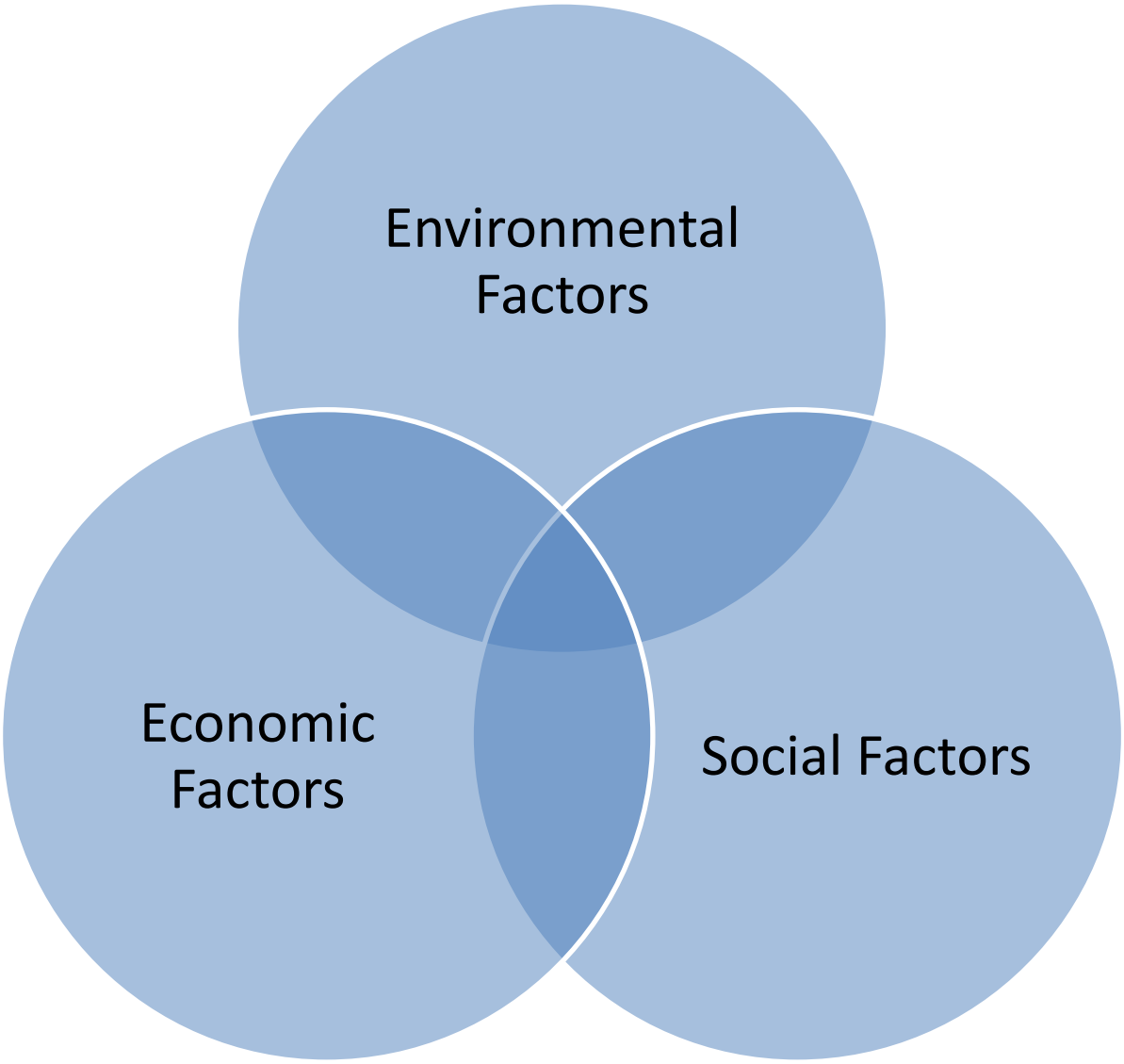
5. What issue, problem, or situation do you want to help solve that is a part of your chosen system or topic?

6. Review your answers to questions #1-5 above. Circle words or phrases that stand out to you and seem to capture your interest and curiosity about your chosen system and community. Use these words to help guide you in choosing the specific focus of your Sustainable Design Project and in crafting your focus question.

7. From what you now know about your chosen system and community, choose the issue, problem, or situation that you want to be the focus of your Sustainable Design Project. Briefly describe the issue, problem or situation:

8. Use the diagram on the next page to examine your chosen topic through the lenses of environmental, social, and economic factors. First, choose two colors of pens to use on the diagram.

    a. Use one color of pen to list examples of how the topic is currently affecting these three factors.
    b. In another color of pen, list examples of how these three factors are currently affecting the topic.


Environmental Factors
Economic Factors
Social Factors

9. Develop your focus question:

   a. What is the main issue, problem, or situation that you will be investigating?

   b. What specific question do you have about that issue, problem, or situation? Write your focus question in the box below:

10. What design solution will you propose to help solve the issue, problem, or solution?

Student Planning Tool #5: Collecting Information

Name: _____

Date: _____ **Block:** _____

Identifying What You Need

1. What information and/or skills do you need in order to answer your focus question? Keep in mind the following types of information and skills:
   - Maps, photographs, and videos
   - Interviews and anecdotes
   - Surveys
   - Scientific data
   - Books, newspaper articles, journal articles, and websites
   - Specific skills (such as map reading, carpentry, gardening, etc.) _____
   - Observations
   - Other:_____

Choosing Sources of Information

As you begin the research and investigation phase of your project, you will need to find credible sources of information. You will need to find sources of information to help you understand and apply the different principles of sustainable design, including:

- Low impact methods
- Energy efficiency
- Quality and durability
- Cradle-to-cradle life cycle design for recycling and reuse
- Biomimicry
- Service substitution
- Local and renewable resources
- Carbon footprint
- Environmental health
- Environmental justice
- Human needs and quality of life
- Design for change

2. List at least two credible websites related to your project:

3. List at least two non-internet resources related to your project:

Considering Stakeholders

Consider how your project might affect different groups of people. These are the **stakeholders** who have an interest in the outcome of your project, because they will be impacted positively or negatively.

4. Identify at least four stakeholders for your project (such as “elementary school students who use the playground,” or “people who visit the food bank each week.”) Try to include people who might be most concerned with the three different aspects of sustainability: environment, economy, and society. Then, develop a list of positive and negative impacts these stakeholders might experience as an outcome of your project. Record your thoughts in the table below:

Stakeholders	Positive Impacts	Negative Impacts

Identifying Community Experts
Identify community experts who can help you by answering questions, providing information, teaching you new skills, or mentoring you. You might consider choosing one of the stakeholders that you listed above as one of your community experts.

Community experts may include people from:

- Local businesses
- Industry
- Government agencies and municipalities
- Faculty, staff, and students from local colleges and universities
- Community-based organizations
- Neighborhood council
- Citizen activists

5. What are three overall goals that you hope to achieve by meeting with these community experts?

    1.

    2.

    3.

Student Planning Tool #6: Developing Sustainable Design Solutions

Name: _____

Date: _____ **Block:** _____

You have been investigating a particular problem, issue, or situation within a system. Now it is time to apply your research and learning toward solving the problem through your Sustainable Design Project.

1. How can you re-design the system in order to solve the problem or to make it better? Think of a few design solutions and briefly describe them in the table below.

2. Investigate the pros and cons of each of your proposed design solutions. You may need to do some research or talk to community experts in order to fully evaluate the impacts of each solution. Be sure to consider impacts (both positive and negative) to the environment, economy, and society. List the pros and cons in the table.

Proposed Solution	Pros	Cons

3. After considering the pros and cons and doing any necessary research, choose the design solution you will develop a plan for and/or implement. Write it on the line below:

Chosen Design: _____

4. Decide how you will create your design solution and how you will communicate it to other people. What will be the best format for displaying and explaining your design solution? Who is your intended audience, and what format will work best for them?

Depending on your system issue and design solution, any of the following may be appropriate:

- Scale model or prototype
- Map or flow chart
- PowerPoint presentation
- Poster
- Speech or lecture
- Video
- Website
- Interview
- Diorama
- Graphs or charts
- Survey
- Informative brochure
- Museum exhibit
- Animation
- Blog or wiki
- Newspaper article or letter to the editor
- Photojournalism essay
- Theatrical performance
- Musical composition
- Artwork
- Mural
- Mock town meeting
- Mock newscast
- Board game
- Lesson plan
- How-to manual
- Other:_____

Student Planning Tool #7: Preparing for your Presentation

Name: _____

Date: _____ **Block:** _____

Target Audience:

1. Consider the audience to whom you would like to make your final presentation. Depending on your chosen Sustainable Design Project topic, your audience may include groups such as:

   - Students
   - Parents of young children
   - School district officials
   - School PTA members
   - Community groups
   - Professional associations
   - Business owners
   - Commuters
   - Farmers
   - City planners
   - Other:_____

2. Describe the target audience for your presentation:

3. What will they already know about your topic?

4. What will they most want to know about your topic?

5. Will your audience need translation or interpretation? How can you ensure their active participation?

Presentation Format:

6. What format will you use for presenting your Sustainable Design Project to your target audience? Consider the needs of your target audience and the format that will best convey your information to them. Also keep in mind that you want to be creative and have fun with your presentation.

- Scale model or prototype
- PowerPoint presentation
- Poster
- Speech or lecture
- Video
- Website
- Interview
- Diorama
- Survey
- Informative brochure
- Museum exhibit
- Animation
- Blog or wiki
- Newspaper article or letter to the editor
- Photojournalism essay
- Theatrical performance
- Musical composition
- Artwork
- Mural
- Mock town meeting
- Mock newscast
- Board game
- Lesson plan
- How-to manual
- Pre & post reflection
- Other:_____

7. What visual aids will you use during your presentation? Visual aids may include some of the following:

- Photograph
- Map
- Flow chart
- PowerPoint software
- Video
- Audio recording
- Chart or graph
- Scale model
- Website
- Poster
- Slideshow
- Other:_____

Presentation Elements:

8. As you plan how you will present the findings of your Sustainable Design Project, keep in mind the following presentation elements. No matter what format you choose for your presentation, it should include—in some shape or form—the presentation elements listed below. Use this checklist to keep track of these elements as you develop your presentation.

- Identification of your chosen system.
- Description of your chosen community.
- Description of your chosen issue, problem, or situation.
- Statement of your focus question.
- Description of your interest and existing knowledge about the topic.
- Explanation of environmental, economic, and social impacts.

- Summary of the information you collected.
- Summary of your analysis of the information you collected.
- Identification of the stakeholders and their viewpoints.
- Description of your proposed solution and how you approached redesigning the system, issue, problem, or situation.
- If you created some kind of product or model, include a description of it.
- Statement of the answer(s) to your focus question.
- Call to action explaining how your audience can get involved or enact change.
- Citation of your information sources, in correct bibliographic format.

Presentation Tips:

If you are creating some kind of visual aid or display:

- Make it attractive by using color, graphics, and large lettering. Neatness counts.
- Use as many pictures, graphs, and tables as possible, rather than too much text.
- Organize your information by using titles, subtitles, and bullets.
- Leave some white space so that it does not look too crowded with text and graphics.

If you are using PowerPoint or other presentation software:

- Use as many pictures, graphs, and tables as possible, rather than too much text.
- Do not include a script for what you will say; instead, include a few bullet points that you can expand on as you talk.
- Use 16 point font or larger.
- Do not use fancy animations or slide transitions that detract from your presentation.
- Use the visual aid or PowerPoint as talking points.

If you are delivering a speech or talk:

- Practice, practice, practice! Practice on many different people or even to the mirror!
- Time your presentation and note the length of each section.
- Memorize the main points of your talk so that you do not have to read from your notes.
- Make eye contact with your audience.
- Use your hands to make gestures and emphasize your point, but do not overdo it.
- Talk slowly and do not forget to breathe.
- Smile, relax, and use friendly body postures (do not cross your arms over your chest).