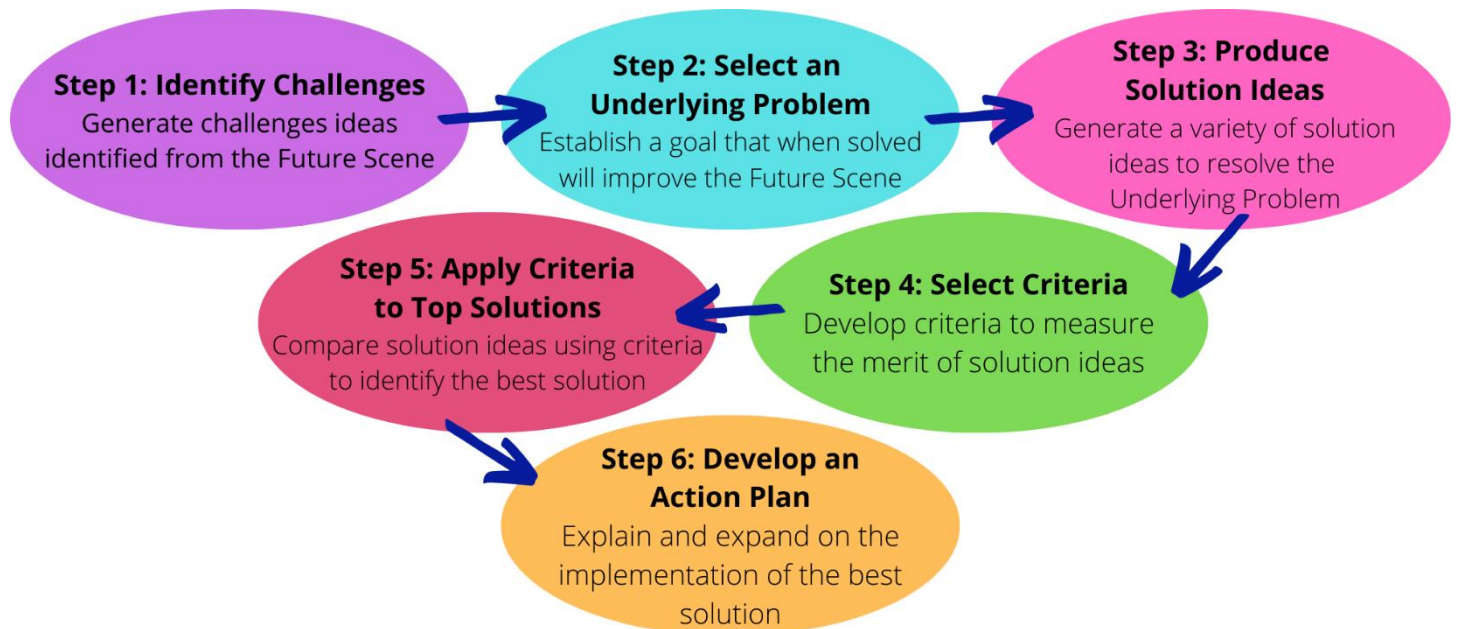




## THE PROBLEM SOLVING PROCESS

Proficiency in Global Issues Problem Solving (GIPS) is a result of understanding the Creative Problem Solving model and mastering the generating and focusing tools used in problem solving. Learning and applying this process enriches students by providing open-ended support to align with a multitude of standards using complex thinking to address real-world problems. Students use primary and secondary resources, conduct research on selected topics, and then apply their knowledge and ideas to a Future Scene as they apply the problem solving model.



Students must analyze the contents to determine what part of their research on the topic does and does not apply to the Future Scene. The ability to be prepared and informed, and thus capable to respond to the Future Scene applying the problem solving process, is integral to GIPS. Students should use their preparation to jumpstart brainstorming and understanding of the Future Scene. Students are rewarded for creative, spontaneous ideas in direct response to the Future Scene. This furthers FP SPI's educational goal of preparing students to respond to complex, real-world situations.

**Research Applied:** Relevant research concepts and terms are used throughout the booklet to demonstrate a solid understanding of the topic, and the likely future events that will result.

- Vocabulary terms and facts specific to the topic.
- Examples and incidents from the research should be woven into student responses.

**Creative Thinking:** Responses showing creativity are those requiring intellectual energy to make mental leaps beyond obvious or commonplace responses.

- A diverse range of ideas.
- Unique ideas.
- Skillful use of the problem solving process.

**Futuristic Thinking:** Discussion and research that extends current knowledge of the topic into the future and that identifies future trends and technologies that may be relevant to the topic are recommended.

- Use of relevant trends from the research.
- An awareness of potential future technologies.
- Development of futuristic, yet workable ideas is essential.

Problem solvers combine research, creativity, and futuristic thinking to effectively work from a Future Scene to a focused Action Plan using the Creative Problem Solving Process. Some Steps of the process lend themselves to a more effective demonstration of these concepts. It is the “Overall” impression that the booklet gives in these three areas that determines the scores.



## RESEARCH

It is important to prepare for Global Issues Problem Solving by developing solid background knowledge on the topic. Having a strong foundation of the current events within a topic and the vocabulary used to discuss that topic is extremely advantageous to problem solvers when they read the Future Scene.

- Books, news magazines, futuristic periodicals, and other helpful information can be found in the school library or on the internet. The [FPSPI Facebook page](#) regularly posts topic-related articles and videos.
- The FPSPI [Readings, Research, and Resources \(RR&R\)](#) is an excellent source for initiating research. It provides research strategies and content for use by the new and experienced coach with students of all ages. For each topic the RR&R includes:
  - Themes and Concepts to guide student research
  - Terms and Definitions to establish an early understanding of topics, with online interactive activities
  - Overview of major trends to look toward the future
  - Questions for Discussion to develop analytical skills
  - Article links and summaries
- The FPSPI [Topic Activity Units](#) engage students in a wide variety of instructional activities incorporating topic research with the six-step process. Each Topic Activity Unit includes:
  - Lesson plans for each step of the problem solving process, applying topic-specific content.
  - Activities developed from best practices to integrate critical thinking.
  - Stand-alone units of study or singular activities may be used as desired for particular Steps within the process.
- Field trips, real-life experiences, and local experts are excellent means to provide research opportunities. Local industry associations and service organizations often have individuals prepared and interested in speaking on a variety of subjects.

FPSPI encourages all students to explore a topic from a variety of angles and perspectives, as they should be looking toward the future and what may happen next, not merely what has already occurred. FPSPI is committed to being inclusive of a range of perspectives and does not endorse any single viewpoint. We strongly advise coaches to review their educational organization’s policies on appropriate content and to screen any materials before making them available to students.



## THE FUTURE SCENE

Student work in their booklet must relate to the Future Scene, a hypothetical “what-if” scenario projected 20-30 years into the future that is based on existing research. The Future Scene operates as the reality within which participant work must take place. GIPS is designed for students to build upon the presented elements of the Future Scene to showcase their own creativity. There are two types of Future Scenes utilized during the FPSPi season: non-competitive and competitive.

Early in the FPS year (Practice Problem 1 and Practice Problem 2), non-competitive Future Scenes are more open-ended and allow students to develop and enhance their creative and critical thinking and problem solving skills. These Future Scenes are often examined by students over time, with instruction and/or guidance from their coach. For these problems, emphasis is placed on learning the problem solving process, and evaluators often provide extensive feedback to help students hone their skills.

Future Scenes become more specific and thus difficult as the FPS competitive season arrives. The Qualifying Problem, Affiliate Bowl, and the International Conference Future Scenes are competitive, and less emphasis is placed on teaching the problem solving process and more on its application to the Future Scene. For these competitive Future Scenes, students do not see the Future Scene until the two-hour competition begins. No research is allowed during this two-hour competition. Competitive Future Scenes are narrower and concentrate on only a portion of the topic. Not all of the student’s research and information is applicable to the Future Scene, and the students must utilize only appropriate information relevant to their work in the GIPS booklet.

### Key Tips for analyzing a Future Scene

- Identify the Future Scene parameters (topic, place, and time).
- Relate the Future Scene to applicable research.
  - What research does or does not apply?
  - What has changed or stayed the same?
- Identify the vocabulary, new products, and trends specific to the Future Scene.
- Consider pertinent questions:
  - What is the charge? What are you being asked to examine?
  - Who is challenged, involved, or affected within the Future Scene?



## STEP 1 – IDENTIFY CHALLENGES

The objective of Step 1 is to identify Challenges based on the Future Scene. Only “Relevant” Challenges receive points. What is meant by a Relevant Challenge?

- It is a single issue, concern, or problem that *may* need attention or consideration.
- It is a point of importance.
- It is a logical cause or effect of the events in the Future Scene that *may* have a chance of occurring.
- It is based on a cause/effect relationship connected to the Future Scene.

Good Challenges are:

1. Related to the Future Scene.

- Though research trends may point in several directions, students are required to problem solve within the boundaries of the given Future Scene situation.
2. Written as statements, not questions.
  3. Stated in terms of *possibility*, using non-absolute terms such as may, might, could, etc.
    - Using terms of possibility is an important element of projecting into the future as it is impossible to know what will or will not occur in the future.
  4. Based on cause and effect relationships.
    - The relationships between causes and effects must be logical.
    - A Challenge embodies cause-effect reasoning when looking at causes whose effects can be seen in the Future Scene or looking at the Future Scene details as causes and determining what effects may occur.
  5. Clearly specified and presented.
    - Clearly stating each Challenge helps an evaluator understand the intent of a Challenge
    - A long chain of effects within a single Challenge usually means that multiple Challenge ideas have been combined.
    - Challenges written at different levels of expertise, receive points.
  6. Presented from a range of categories or perspectives.
    - Points are awarded for using a range of categories from the FPS Category List.
    - Not all categories will apply to every topic and Future Scene.

Category List for Generating Ideas		
Arts & Aesthetics	Education	Physical Health
Basic Needs	Environment	Psychological Health
Business & Commerce	Ethics & Morality	Recreation
Communication	Government & Politics	Science
Culture and Religion	Law & Justice	Social Relationships
Defense	Miscellaneous 1 & 2	Technology
Economics		Transportation

7. Expanded beyond what is stated in the Future Scene.
  - Challenges stated in the Future Scene may be used by students, provided that they expand on what is in the Future Scene to offer greater insight as to **why** something is a Challenge.
  - Students must develop the fact/concern, extending it to a new level.
8. Not extreme.
  - Students may be extreme when explaining effects –widespread death, economic ruin, or the end of the world. An intermediate consequence is likely more appropriate.

## Mistakes to Avoid in Challenges

- Challenges unrelated to the Future Scene.
  - Not everything learned about a topic will apply to the events presented.
- Underdeveloped Challenge ideas.
  - Be mindful that each Challenge idea must include **WHAT** is the Challenge, **WHY** it is a Challenge, and **HOW** it relates to the Future Scene.
- Facts from the Future Scene.
  - These are important starting points for Challenges. However, students need to expand beyond the information already provided.

## STEP 2 – SELECT AN UNDERLYING PROBLEM

The Underlying Problem (UP) is the most important Step in problem solving because all subsequent Steps rely on an important and well-stated UP. Successful UPs will demonstrate a skillful understanding of the Future Scene and respond to the charge. A UP that has a careful balance between scope and significance makes for a successful booklet.

The objective of Step 2 is to provide a UP that identifies; (1) a single goal based on addressing an issue from the Future Scene; and (2) a reason for accomplishing that goal. An excellent UP has a manageable scope, addresses a significant issue from the Future Scene through the Key Verb Phrase, and identifies a positive outcome (Purpose) of accomplishing the goal.



An Underlying Problem is stated as one question and contains four components.

1. **Condition Phrase:** The Condition Phrase is a lead-in fact or logical extension from the Future Scene or related research that is the basis for the issue chosen.
  - The Condition Phrase should provide a connection to the Future Scene and the rationale for the Underlying Problem as a whole.
2. **Stem + Key Verb Phrase (KVP):** Together, the stem (“How might we” or “In what ways might we”) and the KVP, a single action verb indicates the primary action goal that addresses an issue from the Future Scene.
  - The KVP should be singular.
  - Words should be carefully chosen so the goal stated in the KVP is clear and measurable
  - Phrases such as *improve the quality of life* or *provide a successful life* have different meanings to different people.
  - A vague KVP can be difficult to understand, and also whether or not it is achievable.
  - All Solution ideas in Step 3 must address the objective of the KVP.
3. **Purpose:** The Purpose is the desired outcome that should result from accomplishing the action goal (KVP).
  - The Purpose should be singular.
  - The Purpose usually begins with “so,” “so that,” or “in order to.”
  - The Purpose should not repeat the Condition Phrase or the KVP.
4. **Future Scene Parameters:** The Future Scene parameters place the Underlying Problem within the confines of the Future Scene. These parameters include Topic (major focus of Future Scene), Place (geographic location), Time (date from Future Scene).
  - The parameters should guide the students thinking to identify an issue that is within the Future Scene and will impact the Future Scene when accomplished.
  - The parameters may be placed anywhere in the Underlying Problem.

The UP is the basis for the remaining steps of the problem solving process. It is very important that students develop their UP thoughtfully, so as to be successful when writing the remainder of their booklet. Several essential questions to consider when writing a strong UP include:

### Is it important?

- The UP should address a significant aspect of the Future Scene. Good UPs, if accomplished, will make a significant impact on the Future Scene situation.

### Is it manageable?

- Goals that are immense are daunting, making it difficult to develop Solutions. “Ending world hunger” is an excellent objective, but so massive it is easy to give up before you even start. “Improving access to food” is manageable, will make a difference, and can be achieved in many ways.

### Is it what we were asked to do?

- Each Future Scene contains a directive or call to action commonly referred to as the “charge”. While many UPs are possible, the best ones will respond to the charge provided within the Future Scene.

### Is it only a portion of the entire Future Scene?

- The issue identified in the Underlying Problem should be a smaller part of the entire Future Scene.
- It should narrow the Future Scene without trivializing any part of it.
- The issue must be derived from a Challenge or cluster of Challenges generated in Step 1.

### Are there many ways to solve this problem?

- Step 3 requires students to identify a variety of ways to solve the UP. If a cursory examination of the issue has them struggling about where to begin, they should select a different area of concern.

### Are we interested in solving this problem?

- Students should be excited about solving the UP. Issues that are engaging promote a variety of creative and futuristic ways to address the UP.

## **Mistakes to Avoid in an Underlying Problem**

- Too many goals.
  - Identify a single Key Verb Phrase and a single Purpose for a successful UP.
  - Each Solution idea in Step 3, must address all elements of the UP.
- Absolute verbs.
  - Absolutely accomplishing something may be is the most desirable thing, but it very hard to achieve. While improving or reducing something are much more attainable.
- No reason for taking action.
  - Without a Purpose, there is no reason for implementing Solution ideas.
- Fix the whole thing.
  - Students should synthesize the information to identify a single area of concern from the Future Scene. Restating all the issues of the Future Scene in the UP is a critical error in the problem solving process.
- Moving beyond the Future Scene.
  - Students are tasked with responding to the situation they are provided with, not moving outside of it, or undoing it.



## **STEP 3 – PRODUCE SOLUTION IDEAS**

The key objective of Step 3 is to produce many varied and creative Solution ideas to solve the Underlying Problem. Only Solution ideas determined to be “Relevant” receive credit. What is meant by a Relevant Solution?

- It addresses or has a relationship to the Key Verb Phrase.
- It supports the Purpose, either explicitly or implicitly
- It operates within the context of the Future Scene (topic, place, and time).

Good Solutions:

1. Are written in statement form as definite proposals, using “will” rather than “may” or “might.”

2. Directly respond to the KVP and Purpose stated in the UP. Indicate what the Solution will accomplish. Explain why or how it will fulfill the goals of the UP.
  - Students should refer back to the UP throughout generating ideas and writing Solutions so that they remain focused on their established objectives.
  - Solutions are scored based on their relevance to the written UP. Students should keep a copy of the Underlying Problem in front of them as they go through the remaining Steps, so they will remember exactly what they are trying to accomplish.
  - Just repeating the KVP and Purpose in the Solution idea does not illustrate why the Solution would be implemented. How the idea will address the KVP and how/why it will support the Purpose must be provided.
  - It must be clear or easily inferred that the Solution idea supports the Purpose.
3. Solution ideas should not contradict the Future Scene.
  - Solution ideas must operate within the Future Scene parameters of topic, place, and time.
  - The parameters do not need to be stated in the Solution idea.
4. A Solution idea does not have to resolve the Underlying Problem completely, but it must show a relationship to the UP.
  - This is why students are encouraged while writing their UP to not select an absolute verb. If an absolute verb is used in Step 2, it is difficult for students to generate Solution ideas that will satisfy the KVP.
5. Presented from a range of categories or perspectives.
  - Points are awarded for using a range of categories from the FPS Category List.

Category List for Generating Ideas		
Arts & Aesthetics	Education	Physical Health
Basic Needs	Environment	Psychological Health
Business & Commerce	Ethics & Morality	Recreation
Communication	Government & Politics	Science
Culture and Religion	Law & Justice	Social Relationships
Defense	Miscellaneous 1 & 2	Technology
Economics		Transportation

6. An elaborated Solution idea contains at least three significant areas of detail, beyond the basic solution idea.
  - WHO will implement the Solution
  - HOW the Solution will work
  - WHY it solves the Underlying Problem

Solution ideas are a great place to demonstrate research, creativity and futuristic thinking. Just because it is not possible today does not mean it will not be possible in the future. Have fun and try new ideas. Build off of what is possible today and take it where it could be. While generating Solution ideas it is very important that students keep them focused on their UP. Several essential concepts to consider when writing a strong Solution are:

Using an appropriate WHO in Solution ideas is important. The actual *who* in a Solution idea should be the *person or agency* that will implement the Solution idea. The *who* should be a logical expert, agency, or relevant organization. A celebrity may not be the appropriate person to create educational materials. Children of the world will not pass legislation. A pronoun such as we, they, he, she, etc. is not sufficient to count as “who.”

Imaginative inventions are fun, but inventions do not necessarily happen just because someone says they will. Sometimes inventions are “magical thinking” or in opposition to the laws of nature. Some level of explanation about how the invention will work may be needed.

Communicate with your teammates. It is easy for ideas about educating, fundraising, new technology, etc. to sound alike. Knowing what everyone in the group is working on will help to prevent duplicate ideas.

Futurizing is fun and great for Solutions. Prepare by researching new technologies and future trends. Brainstorm potential Solution ideas or use those found in research and make the ideas more futuristic. If necessary, remember to explain how the futuristic elements will work.



## STEP 4 – GENERATE & SELECT CRITERIA

The key objective of Step 4 is to generate ideas/criteria that serve as measurement standards to determine the creative potential and importance of Solution ideas. Criteria are the standards used to compare Solution ideas. The Solution idea that best addresses all of the Criteria is considered the “best Solution” and becomes the basis for the Action Plan.

Criteria should address aspects of the Solution ideas that will be important in determining which Solution will best accomplish the goals of the Underlying Problem. Criteria play an important role in the problem solving process. The development of Criteria provides reasoning and structure to the decision-making process.

### Mistakes to Avoid in Solutions

- Solution ideas that do not have a clear connection to the Key Verb Phrase and Purpose of the Underlying Problem. More information may be needed to make the connection.
- Solution ideas that are not related to the Underlying Problem. Remember Step 3 is a direct response to the goals (KVP and Purpose) identified in Step 2.
- Statements that do not describe a Solution Idea OR the idea is unclear.

Criteria should be written to satisfy four guidelines.

- Focus on a single standard
- Demonstrate a measure of degree using a superlative
- Indicate the desired outcome
- Recognizable as a question

The specificity of the Criteria content is considered. All Criteria, even those that are not Correctly Written, are considered for their content. There are two categories of Criteria that receive points:

Criteria that are specific to the Underlying Problem, Future Scene, and research for the topic score more points.

**Generic:** A Criterion that could be applied to nearly any Underlying Problem or Future Scene.

- Criteria that are generic and can be applied to a wide variety of topics and situations score lower in points.

**Targeted:** A Criterion that applies only to the designated UP and is significant in solving the UP

- Can be based on the Key Verb Phrase
- Can be based on the Purpose
- Can be specific in itself to the Underlying Problem
- Can be specific to topic research that relates to the UP



- Can be justified with relevant Future Scene facts that relate to the UP

Thoughtful word choice impacts the meaning of Criteria very quickly.

- Keep ideas clear and succinct to make sure that only one idea is addressed in each Criterion.
- Words like “and,” “or,” “when,” “while,” and “so that” often serve to introduce a second concept. Successful Criteria will address only one area.

Check for meaning: Some Criteria lack meaning.

- Consider the example “Which Solution will be most effective?” Most effective at what? Be sure the meaning is clear.

Use facts for justification: The justification for the importance of a generic concept

- A justification for a generic idea begins with Since... or Because... What follows must be *facts* from the Future Scene, *not assumptions*.
- Be sure that your justification is actually stated in the Future Scene and has a logical relationship to the Criterion.
- Is written at the beginning of the criterion.

### Mistakes to Avoid in Criteria

- Adding the UP to a generic concept. Adding the KVP or Purpose to a criterion does not change the concept being measured by the criterion.
- Too much information. Criteria must be singular in order to receive credit. Often as ideas are elaborated to Modify or Justify Generic concepts, multiple elements are introduced.
- Ambiguous. Remember the reason for Criteria. They are there to make a decision. If their meanings are ambiguous, they cause decision making to be more difficult.



## STEP 5 – APPLY CRITERIA TO SOLUTION IDEAS

The key objective of Step 5 is to determine which Solution is the best one to address the Underlying Problem. The Evaluation Matrix (grid) is used to apply the Step 4 Criteria to the most promising Solution ideas in order to determine the best Solution. The best Solution then becomes the basis of the Step 6 Action Plan.

With Solution ideas and Criteria prepared, the Evaluation Matrix can be completed to determine the Best Solution.

1. Select the most promising Solution ideas (8 for teams, 5 for individuals).
  - List them on the Evaluation Matrix.
2. Compare the Solution ideas.
  - a. Consider one Criterion at a time (1 per column).
  - b. Rank each of the Solution ideas 1 (low) to 8 (high) against the others for that Criterion.
  - c. Use each number once in each column.
    - Repeat this comparison process for each Criterion.
3. Add the ranks across the rows and enter the totals into the final column of the grid.
4. Use the Solution idea with the highest points as the basis for the Step 6 Action Plan.

It is important that only one Solution idea “win” the grid and be developed into your Action Plan in Step 6. Improper use of the grid (i.e., ignoring the outcome, or using multiple Solution ideas) leads to receiving only 1

point. The highest scoring Solution must be the one presented in Step 6. Consider these concepts before completing the Evaluation Matrix:

**Be realistic.** When comparing Solution ideas honestly consider how they compare to each other for a given Criterion. The Criteria were developed to guide this decision, considering five different concepts. Apply them accurately to the Solution ideas to identify the best overall Solution to become the Action Plan.

**Best, then worst:** In ranking each Solution idea against a Criterion, it may be easier to determine the best Solution ideas and then the least effective Solution ideas. Then work to the middle.

**Break ties:** If, after completing the grid, there is a tie for the highest scoring Solution, the tie must be broken. Only one Solution idea can be the basis for the Action Plan.

## Mistakes to Avoid in the Evaluation Matrix

- **Not truly the best Solution.** If the highest scoring Solution idea does not represent a good or logical plan to address the Underlying Problem, it is usually because:
  - The Criteria are not adequate.
  - The favorite Solution idea is being mistaken for the best Solution.
- **Don't manipulate the grid.** Using the grid appropriately will determine the best Solution to be the basis of your Action Plan.
- **Inaccurate mathematics.** Double-check addition to be sure that the best Solution is accurately identified.



## STEP 6 – DEVELOP AN ACTION PLAN

The key objective of the Action Plan is to present a comprehensive proposal for solving the Underlying Problem. The Action Plan demonstrates how it addresses the Underlying Problem and how it positively impacts the Future Scene. The Action Plan should explain in detail who, what, how, why, where, and when the Solution idea will be implemented. Developing an Action Plan involves moving from creative ideas into action; a new idea is incomplete until it is a workable idea.

The Action Plan is the culmination of the problem solving process. Use all the knowledge that has been gained researching the topic, analyzing of the Future Scene, responding to the UP, and selecting the best Solution to inform the explanation of the Action Plan.

The Action Plan must be based on the best Solution as identified in Step 5.

- It should introduce the basic idea, similar to what was written about it in Step 3, before expanding on that concept.

The development and presentation of the Action Plan can occur in a variety of ways and formats. Consider the following questions for the development of the Action Plan.

How does the Action Plan...	Who will ...	What...
<ul style="list-style-type: none"> <li>• respond to the UP?</li> <li>• impact the Future Scene?</li> <li>• address the Criteria?</li> </ul>	<ul style="list-style-type: none"> <li>• implement the plan?</li> <li>• be involved in the plan?</li> <li>• oppose the plan?</li> <li>• benefit from the plan?</li> </ul>	<ul style="list-style-type: none"> <li>• will be accomplished?</li> <li>• will Success look like?</li> <li>• obstacles will be faced?</li> </ul>

The box at the top of the Step 6 page is a convenient place to explain how the Action Plan addresses the Criteria, but it is not required for the discussion to be located there. Those explanations may also be written into the text of the Action Plan.

### **Mistakes to Avoid in the Action Plan**

Only restating the Solution idea.

- The Action Plan should elaborate well beyond the initial idea presented in Step 3.

Claiming perfection.

- It is okay, and even encouraged to admit that the Action Plan is not perfect. Acknowledging obstacles provides an opportunity to explain your Action Plan in more depth.

Combining multiple Solutions.

- It is acceptable to incorporate aspects of other Solution ideas to support or expand the Action Plan. However, these need to be incorporated only as support, not the focus of the Action Plan.