

# KEY TIPS

## 2003-04 Team Problem Solving Future Problem Solving Program

Future Problem Solving (FPS) is a challenging and rewarding activity. Proficiency in FPS is a result of understanding the FPS model and mastering the tools used in problem solving. The following tips are offered to help coaches and students better understand team problem solving.

The FPS *Coach's Handbook* offers a comprehensive overview of the FPS model and suggests activities to introduce generating and focusing tools. The FPSP *Evaluation Primer* provides FPS coaches with insight into the evaluation process. Understanding evaluation improves a coach's skills in teaching FPS. Contact the Future Problem Solving Program or visit the FPSP Web site at [www.FPSP.org](http://www.FPSP.org) for information on the *Coach's Handbook*, the *Evaluation Primer* and other FPSP materials.

### PREPARATION

It is important to prepare for team problem solving. Research is a key component in FPS. Prior to reading the future scene, the teams should have a good understanding and information about the topic. The FPS *Readings, Research and Resources* is an excellent way to initiate research. This book is available through the FPSP international office.

Books, newsmagazines, futuristic periodicals and other helpful information can be found in the school library. The Internet is a great resource for locating information on FPS topics. Field trips and real life experiences are excellent research opportunities. Utilize local experts, invite them to come and talk to the team or take the team to the expert.

- The first activity in FPSP is reading the future scene. Each member of the team should read the future scene silently and record his/her reaction, then discuss the future scene as a team.
- Identify the future scene parameters and vocabulary specific to the future scene.
- What is the charge? Who is challenged, involved or affected within the future scene?
- Relate the future scene to your research. What has changed? What is the same?

### STEP 1 - IDENTIFY CHALLENGES

The key objective in Step 1 is to identify challenges based on the future scene. A challenge is an issue, concern or problem that needs attention or consideration (points of importance). Use your knowledge of the topic to determine challenges that **cause** the future scene or challenges that **result** from the actions within the future scene. Your goal is 16 well-written challenges.

#### STEP 1 – Essentials

1. Student work must relate to the future scene. A future scene is a hypothetical scenario based on current information. In cases where research can be found that contradicts the future scene, the team is still required to problem solve within the boundaries of the given situation.
2. Step 1 challenges are written in statement form. Questions are inappropriate for this step.
3. State challenges in terms of possibility. Challenges are stated with possible terms such as *may*, *might*, etc. Absolute terms, that indicate idea X will be a challenge, deny an important element of projecting into the future; it is impossible to know what will or will not occur in the future. We can only make educated guesses as to possible occurrences, based on an investigation of the resources.
4. Challenges should be clearly worded. A challenge logically relates to the future scene, tells what the concern is and why it is a concern.

5. Students should demonstrate flexibility in their thinking and explore challenges from different perspectives or categories.

### Step 1 – Suggestions

1. Challenges may include those that **cause** the future scene **OR** challenges that **result** from the actions within the future scene. (A challenge does not have to be written as a cause/effect statement). For instance, note the following examples causing and resulting from the future scene on Antarctica:

**Cause:** If ships that bring people and supplies to Antarctica leak fuel or oil, then they could harm many of the animals living in the waters surrounding Antarctica.

**Result:** If sea animals living in the waters surrounding Antarctica (like krill) are harmed by oil spills, then there might be a disruption in the food chain of the animals living near Antarctica which could result in endangerment or even extinction.

**Result:** Tourists visiting Antarctica might not dispose of their trash properly, then their pollution may harm animal habitats endangering Antarctic wildlife.

2. While it is important to identify challenges that result from the future scene, it is even more important to identify the *causes* that *created* the future scene as well as *causes* of the challenges found in the future scene. Think about the distinction between causes and results and make sure your list of concerns in Step 1 includes a significant number of causes.

**Identifying cause is important for getting at underlying issues in a situation. In Step 2 students are asked to identify an underlying problem; significant attention should be given to challenges that cause the future scene.**

3. Teams fail to earn high scores in fluency because information explaining a challenge statement is left "on the problem solving table." In Step 1 students need to explain:
  - **what** the challenge is,
  - **why** it is a challenge and
  - **how it logically relates to the future scene.**

Examine challenge examples *a* and *b* from the future scene on Antarctica:

- a. This challenge statement clearly tells **what** the challenge is, **why** it is a challenge and **how it logically relates to the future scene.**

- *If the use of CFCs continues in 2025 then the ozone layer over Antarctica may be depleted. As a result, increased UV radiation may harm many of the animals and people living in Antarctica.*

- b. The next concern uses facts in the future scene to develop a challenge statement that tells **what** the challenge is, **why** it is a challenge and **how it logically relates to the future scene.**

- *According to the future scene, in 2025, a ship coming to Antarctica leaked oil in the waters around Antarctica. This oil may harm the animals living in these waters if they swallow it or it coats their fur.*

The next two challenge examples *c* and *d* omit some very important information.

- c. The following challenge statement identifies a challenge (depletion of the ozone layer). Does it tell **why** depletion of the ozone is a challenge and **how it logically relates to the future scene** (Antarctica)?

- *If people keep using CFCs in 2025, then the ozone layer could be depleted.*

- d. The following is a statement of fact from the future scene. As a challenge statement it does not tell **what** the challenge is or **why** it is a challenge. We can infer the challenge is the oil spill; however, the team must explain **why** an oil spill is a challenge **logically related to the future scene.**

- *According to the future scene, in 2025, a ship leaked oil in the waters around Antarctica.*

4. Write your challenges as statements, not comparisons. For example, "the challenge of X may be greater in the year 2006 than it is now," does not ask the evaluator to judge the possibility of X

being a future challenge but states that X will be a *greater* challenge in the future than in the present.

5. Expand your fluency and flexibility by using the generating tools such as brainstorming, forced relationships and checklisting. Think in terms of categories. Subdivide the future scene into two or three general subheadings (e.g., for the future scene on Antarctica you might want to divide the future scene into: *Environment* or *Land, Tourism, Man and Antarctic Treaty*.) Then, generate a list of general categories such as recreation, environment, religion, economics, psychological health, animals, education, politics, technology, etc., or use the list on page 12 of this guide. Envision a graph where subheadings go across the top and categories go down the left side. Now, try to find as many challenges as you can for every category in relation to each subheading. **Caution:** Not all categories will apply to every topic and future scene.
6. Demonstrate your research by using terms and concepts in explaining and relating your challenge statements. Citing the source of information is not required, but acceptable.
  - Challenges should include findings from the research as well as students' own thoughts on the topic, based on their analysis of the research or the future scene.
7. If a challenge or concern is mentioned in the future scene, it can be included in the team's list of challenges, provided the team elaborates on what is stated in the future scene to offer greater insight as to **why** something is a challenge. Remember to focus on **causes** of the challenge.
  - a. Restating a fact from the future scene is not enough to earn credit as a challenge.
  - b. The team must develop the fact, telling what the challenge is, why it is a challenge and demonstrate a logical relationship to the future scene.
8. Quality is sometimes more important than quantity. Your goal is 16 well-written challenges. It is up to the team to decide if 12 key challenges, that clearly tell what the challenge is, why it is a challenge, and how it relates to the future scene, are better than 16 challenges that only partially address the what, why and how.

## STEP 2 – SELECT AN UNDERLYING PROBLEM

Step 2 focuses on the important part of the future scene you choose to solve. Consider the different challenges from Step 1 and select one you think will have the most impact on the future scene.

### STEP 2 – Essentials

1. An underlying problem (UP) may be composed of *one challenge or one category of challenges or a compilation of several related challenges* identified in Step 1 you wish to solve in Step 3. An underlying problem that restates the entire future scene is inappropriate.

Effective problem solving means a large challenge is broken down into smaller, more manageable challenges. In other words, it would be very hard to solve all the challenges of Antarctica at once. Instead, it would be easier and more effective if we attack one challenge or one category of challenges at a time.

- a. You might look at one important challenge in your list of 16 challenges in Step 1. A challenge that is an underlying *cause* of the future scene makes an excellent underlying problem.
  - *In 2025, when many tourists are visiting Antarctica and leaving behind damage and destruction, how might we reduce the amount of harm to the continent caused by tourists so Antarctica may remain a pristine environment?*
- b. Another way to select an underlying problem is to address an area or category of concern. For example, we can first attack environmental challenges, then economic challenges, followed by recreation, etc.
  - *A tourist ship developed a leak in its fuel tanks and it took months to clean up. In what ways might we protect Antarctica's animal inhabitants in 2025 so Antarctica's unique species do not become endangered?*

- c. You may have several related challenges in Step 1 you can compile into an important underlying problem. A compilation, or synthesis, can be seen as more than one specific challenge but less than an entire category of challenges. Or it can be a compilation of related challenges that address several different categories.
  - d. Avoid trying to accomplish multiple ideas in your underlying problem.
2. A Step 2 underlying problem is never as large as the future scene. Instead, look for an underlying problem that focuses on one challenge category (or area).
- a. The following are **good examples** of a correctly written underlying problem.
    - i. *Since Antarctica is threatened by expanded tourism, how might we increase the environmental awareness of the tourists in Antarctica in 2025 so Antarctica's environment will be preserved?*
    - ii. *Because tourists have caused damage, how might we reduce the destruction of Antarctica's ecosystem so the food chain will not be disrupted in 2025?*
    - iii. *A tourist ship developed a leak in its fuel tanks and it took months to clean up. In what ways might we protect Antarctica's animal inhabitants in 2025 so Antarctica's unique species do not become endangered?*

The following examples are **weak underlying problems**. Each example **restates the future scene**. Underlying problems like these are considered restatements of the future scene and score low in focus and adequacy.

- b. Remember **these are weak examples**. Do not follow these examples.
  - i. *Because of the increased tourism, how might we overcome the problems in Antarctica so it will be preserved?*
  - ii. *Since land claims no longer exist, how might we help save Antarctica in 2025 and beyond so it will not be destroyed?*
  - iii. *Because of the many challenges, how might we overcome the challenges of Antarctica in 2025 so it is protected?*
  - iv. *How might we solve (or overcome, or develop remedies for, or reduce) the challenges of Antarctica so ...?*

Without narrowing the future scene, teams misunderstand the FPS process and place themselves in a very precarious position. If an underlying problem restates the entire future scene as described above, the booklet receives scores of one (1) on focus and one (1) in adequacy in Step 2.

3. An underlying problem (UP) is stated as one question and contains four basic components.
- **C – Condition Phrase:** A lead-in phrase that describes the situation(s) in the future scene that is (are) the basis for or cause of the challenge the team chooses as its underlying problem. The condition phrase is based on a fact or situation from the future scene therefore, it must be relevant to the future scene. The condition phrase guides (forces) the team to make a connection to the future scene and the Step 1 challenge(s) used as the focus of the underlying problem. *"A tourist ship developed a leak in its fuel tanks and it took months to clean it up."* (Because or since are options in developing a condition phrase.)
  - **S – Stem:** "How might we..." or "In what ways might we..." and one key action verb in a phrase indicating what to do to solve challenges. The obligatory stem provides a uniform structure for all underlying problems. The key verb phrase (KVP) is one key action verb in a phrase that mandates what must occur in Step 3 to solve the underlying problem. The KVP provides direction for generating solution ideas in Step 3. Relevant solution ideas are those that do what the KVP mandates. For example, from the Antarctica future scene, if your underlying problem begins, *"A tourist ship developed a leak in its fuel tanks and it took months to clean up. In what ways might we protect Antarctica's animal inhabitants in 2025 so Antarctica's unique species do not become endangered?"* (KVP is underlined), then all of your Step 3 solution ideas must *"protect Antarctica's animal inhabitants"* to be considered relevant.
  - **P – Purpose:** The purpose specifies an optimal direction, goal to pursue, or reason for solving the challenge. The purpose provides direction for the KVP. It serves as the ultimate goal of the underlying problem. The purpose is also a condition that must be satisfied for Step 3 solution

ideas to be considered relevant. For example, if your underlying problem (UP) is “A tourist ship developed a leak in its fuel tanks and it took months to clean up. In what ways might we protect Antarctica’s animal inhabitants in 2025 so Antarctica’s unique species do not become endangered?” (P is underlined), then relevant solution ideas must not simply “protect Antarctica’s animal inhabitants” but they must do so in such a way that “Antarctica’s unique species do not become endangered.”

- *Note 1:* The KVP and/or the P must explicitly or implicitly indicate *what the problem is* from Step 1 you select to solve in Step 3. The example above indicates the protection of animal inhabitants is the problem selected.
- *Note 2:* Leaving out the purpose can negatively affect scores in both Step 2 and Step 3. In Step 2 teams lose three (3) points in completeness; and receive focus scores between one (1) and three (3), three is the highest score awarded in focus if there is no purpose. In addition, evaluators will impose a purpose that seems logical to the future scene. Solution ideas in Step 3 are scored for relevance very strictly against the KVP, **the imposed** purpose and the future scene parameters. In competition, a team whose UP has no purpose has a hard time advancing to further rounds of evaluation.
- **FSP – Future Scene Parameters:** Conditions that place your underlying problem within the confines of the future scene. Including parameters of the future scene in your underlying problem insures the challenge is a subarea of the future scene. The parameters are found, of course, in the future scene and include place (geographic location involved), topic (major focus of the future scene) and time (the year).

Relevant solution ideas to your underlying problem will not contradict any part of the FSP. For example, if your underlying problem is, “A tourist ship developed a leak in its fuel tanks and it took months to clean up. In what ways might we protect Antarctica’s animal inhabitants in 2025 so Antarctica’s unique species do not become endangered?” (FSP are underlined), then relevant solution ideas must not simply “protect animal inhabitants” and do so in such a way they will not “become endangered” but they must do so in relation to the place and topic (Antarctica) and time (2025) listed in the future scene. Even if a team forgets to include the FSP in its underlying problem, solution ideas still need to fall within these parameters to be scored relevant in Step 3.

4. The underlying problem used in the above example has been broken down into the five basic components shown below:

- A tourist ship developed a leak in its fuel tanks and it took months to clean up. (**C**) – How might we (**S**) – protect Antarctica’s (**FSP**) animal inhabitants (**KVP**) – in 2025 (**FSP**)– so Antarctica’s (**FSP**) unique species do not become endangered? (**P**)

The following two examples are from two different future scenes:

- a. Because children in a cashless society (**FSP**) will not have the opportunity to hold their money (**FSP**) in their hands or save it in a piggy bank (**C**) – in what ways might we (**S**) – help children to learn monetary concepts (**KVP**) – so they will become financially responsible adults (**P**) – in Leabeau County after 2031? (**FSP**)
- b. Because children lack exposure to other children (**C**), – how might we (**S**) – socialize children (**KVP**) – to become well-adjusted citizens (**P**) – of our community through the use of a home computer education system (**FSP**) in the year 2005? (**FSP**)?

- *Note 3:* Delineation of **C, S, KVP, P** and **FSP** in the previous examples is offered for illustration. Do not include these in the actual team booklet.

5. Multiple verbs usually occur in an underlying problem because more than one key action verb is used; the word **and** in an underlying problem should be a red flag to teams and evaluators.

- *IWWMW decrease tourism and reduce pollution on the continent of Antarctica...?*

Some multiple underlying problems occur, however, because of the existence of multiple objects in combination with a single verb in the key verb phrase. Examples of this are:

- a. *HMW reduce child abuse and drug abuse...?*
- b. *HMW provide economic and counseling opportunities...?*

c. *HMW distribute food and jobs...?*

- *Note 4:* If a multiple key verb phrase exists in a booklet, evaluators are instructed to refer only to the first verb in the underlying problem when scoring focus and adequacy in Step 2. In Step 3 however, solution ideas must be relevant to everything mentioned in the underlying problem to score as relevant solution ideas.

## **STEP 2 – Suggestions**

1. Selection of the underlying problem is a critical step in the FPS process. The **Four I's** represent areas for a team to consider as they thoughtfully make their decision about the underlying problem. When discussing which of the many and varied Step 1 challenges to attack (solve) in Step 2, the team should ask themselves these questions, referred to as the Four I's:
  - a. **Impact** - Which challenge, if solved, would have the greatest impact on the future scene?
  - b. **Influence** - Which challenge can we have the most influence on because of our knowledge of the topic?
  - c. **Interest** - Which challenge generates the most interest and enthusiasm among our team members?
  - d. **Imagination** - Which challenge seems most likely to inspire our imaginations so we can come up with creative, futuristic solution ideas?
2. When you determine an underlying problem, remember the following tips:
  - a. Select a Step 1 challenge or category of challenges you feel is a very important aspect of the future scene and a challenge you wish to solve.
  - b. The condition phrase defines the specific part or parts of the future scene that serve as the catalyst for the area of concern you choose to solve. State the condition that indicates what the challenge is from Step 1.
  - c. Choose a singular, active, key verb phrase that clearly mandates what you must do in Step 3 to solve this challenge.
  - d. Add one purpose that gives a specific goal (reason) to your key verb phrase mandate.
  - e. Avoid using the words *and*, *or* and *while* in your underlying problem. This will reduce your chance of a multiple key verb phrase and/or multiple purpose.
  - f. Include those elements that place your underlying problem within the parameters of the future scene.
  - g. Be as concise as possible. Read it aloud. Is it clear? Does it make sense to you?
  - h. Avoid an underlying problem that restates, broadens or does not identify a challenge from the future scene.
3. It is recommended in your underlying problem you choose a challenge area that allows you to utilize your research. Some teams choose underlying problems that, while appropriate, because they arose from legitimate challenges identified in Step 1, have very little to do with the topic area, the future scene or the research.
  - a. The two most frequent examples of this are “How might we convince the public we must solve problem X?” and “How might we raise funds to solve problem X?”
  - b. Both of these areas are legitimate concerns in dealing with most future scenes. The FPS process allows you to focus on either one of these in the underlying problem (UP).
  - c. The difficulty which results is the rest of your booklet will be concerned with *convincing* or *fund-raising* and not with the specific FPS topic. You won't utilize your research or any information your team discussed in preparing for completion of the booklet.
  - d. It is recommended you keep this in mind when selecting your UP and try to select a challenge or category of challenges which will maximize utilization of your knowledge on the topic area, as well as focus on important issues in the future scene.

4. In searching for just the right verb, avoid using absolute verbs such as *guarantee*, *ensure*, *eliminate*, or *prevent*, because they set you up for failure in Step 3. In competitive scoring, an absolute verb is scored as a restatement. (Refer to the action verbs on page 108 in the *FPSP Coach's Handbook*.)
  - a. As an illustration, how many solution ideas can you think of which *prevent pollution*?
  - b. Qualified terms such as *reduce*, *alleviate*, *improve* or *increase*, will be much more practical for generating solution ideas in Step 3.
  - c. Substitute the word *prevent* with *reduce* and you will find it considerably easier (and more realistic) to generate solution ideas that *reduce pollution*.
5. **"Formula writing" (plugging information into a predetermined format) shows a lack of creativity and evaluators tire of reading it.** Avoid this in the underlying problem by thinking about a time parameter which offers something more than the formulaic "in the year 2025."  
The following UP examples are from future scenes on high school dropouts and transportation.
  - How might we encourage students to stay in school so they can be better prepared to contribute to their community *after graduation*? (italics signify time parameter) **or**
  - How might we decrease congestion at SoCal Airport to increase on-time arrivals for passengers *when they travel through SoCal*?
6. **Choose words carefully so the goals stated in your KVP and purpose are clear and measurable. Phrases such as *improve the quality of life* or *successful life* have different meanings to each evaluator and it can be difficult to determine if a solution idea can achieve them.**
7. The purpose should be one that clearly results from achieving the goal stated in the key verb phrase. It should be more than a rephrasing of the KVP. A purpose that restates the condition phrase or restates the future scene scores low in focus.
8. The underlying problem should be narrow enough to focus attention on a challenge and broad enough to generate many different solution ideas.
9. The underlying problem should be an important or significant problem area within the future scene.

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

Produce many, varied and creative solution ideas to solve the underlying problem. Use brainstorming variations, force fitting, SCAMPER, morphological matrix and other tools for generating solution ideas. Your goal is 16 elaborated solution ideas.

#### **STEP 3 – Essentials**

1. Solution ideas must be relevant to both the key verb phrase and the purpose to be scored relevant; they also must occur within the confines of the future scene parameters (FSP).
  - More specifically, a solution idea must answer the key verb phrase **and** have an implied or stated connection to the condition phrase and purpose to be considered relevant.
    - *Note 5:* If there is no purpose in the UP, the evaluator must interpret your purpose. In competitive evaluation, the evaluator imposes a purpose logical to the future scene. A UP with no purpose does not explain **how** or **why** the solution idea solves the challenge.
2. Make sure each team member has the same goal in mind before you begin generating solution ideas.
  - Keep a copy of the underlying problem in front of you as you go through the remaining steps so you will remember exactly what you are trying to accomplish.

### STEP 3 – Suggestions

1. Expand your fluency and flexibility by using brainstorming, force fitting, SCAMPER, morphological matrix and categories. For example, generate a list of general categories such as economics, physical health, politics, technology, etc. (or use the list on page 12 of this guide). Then try to think of solution ideas that address the underlying problem from these different perspectives.
2. Step 3 solution ideas are stated as definite proposals, we will do idea X. Do not state your solution idea in terms of possibility, perhaps we might do idea X. Step 1 challenges are stated in terms of possibility.
3. To earn elaboration credit, elaborate all of your solution ideas; use **who**, **what**, **how** and **why** (a pronoun such as we, they, he, she, etc. is not sufficient to count as a who). While it is helpful to include *when* and *where*, these will only be counted toward elaboration if they are of a substantive nature ("in the year 2025 in Antarctica" are not of a substantive nature).
  - **Who** indicates who will implement the solution idea. Identify the group or person to carryout the solution.
  - **What** indicates what the solution idea is.
  - **How** describes how the solution idea will work.
  - **Why** indicates why the solution idea will solve the UP (KVP & purpose), **or** what you will accomplish by implementing the solution idea.
4. When you elaborate your solution ideas, try to avoid formula writing. Think of different people or groups of people who might really be able to get your solution idea implemented; do not use the same "who" over and over. Explain how or why your concept is a solution idea instead of repeating the key verb phrase and purpose.
5. Remember the *who* in your solution idea is the *who* that will get your solution idea started. For example, in a solution idea for stress, such as: "parents will talk to their children about school so they won't be stressed out," parents are part of the *what*. A lot of parents don't talk to their children about school, so something needs to happen to start them talking. A *who* for elaboration, in this case, would suggest the person or people to do that, maybe the school guidance counselor or the PTA.
6. Listed below are several solution ideas for solving the UP, *Because tourists are causing damage, how might we discourage the tourists who visit Antarctica in 2025 from taking rock samples from Antarctica home with them, so they do not destroy Antarctica's natural environment?*
  - a. The following solution idea relates to the key verb phrase and purpose of the underlying problem.
    - *Delta will charge an extremely high fee for tourists who want to carry rock samples from Antarctica back on the plane with them. Thus the tourists will be discouraged from taking rock samples because they won't want to pay to take them home with them and Antarctica's natural environment will be preserved.*
  - b. This example tells *who* will do *what* so the solution idea will solve the UP. It also tells *how* the plan works and *why* or *how* it achieves the purpose.
    - *In 2025, General Electric will invent a robot to guard rock formations in Antarctica so tourists will be discouraged from taking the rocks home with them. Therefore, Antarctica's natural environment will remain in its natural place.*
  - c. This last solution idea explains the KVP and purpose in the UP, but **it does not explain how** the solution idea will work.
    - *In 2025, tourists will take animals from Antarctica home with them instead of rock samples. This will protect Antarctica's natural environment.*

7. Think creatively and futuristically. **Imaginative inventions are fun, but must include how or why explanations. An invention can't happen just because someone says it will.** Use your knowledge and research to bring new approaches to existing ideas.

#### **STEP 4 - GENERATE and SELECT CRITERIA**

Generate ideas/criteria that serve as yardsticks to determine the creative potential and importance of solution ideas. Generate and select criteria which will measure the comparative quality (relevance and/or validity) of solution ideas.

##### **STEP 4 – Essentials**

1. Address only one concern/dimension with each criterion.
  - a. What are you measuring? Cost, acceptance, etc.
  - b. Avoid the use of "and" in a criterion.
2. In writing your criteria, use superlatives, "st" words (e.g. least, most, greatest, fewest, etc.).
  - a. *Which solution idea is the easiest to implement?*
  - b. *Which solution idea provides the greatest social benefit?*
3. Phrase your criteria to indicate a desired direction.
  - a. In other words, ask, *Which solution idea is the easiest to implement?* instead of, *Which solution idea is the hardest to implement?*
  - b. Ask, *Which solution idea provides the greatest social benefit?* instead of, *Which solution idea provides the greatest social harm?*
4. Develop **target** criteria by considering the condition phrase, KVP or purpose in writing each criterion.

##### **STEP 4 – Suggestions**

1. Make sure each criterion is written correctly, begin with *Which solution idea...* and phrase each in the form of a question.
2. Include **target** criteria among the five you develop. **Target** criteria relate directly to your underlying problem (as opposed to **stock** criteria, which relate to any underlying problem, e.g., criteria dealing with cost, side effects and acceptability).
3. A **target** criterion measures how well your solution idea does what the underlying problem mandates. For example, if your underlying problem is, *A tourist ship developed a leak in its fuel tanks and it took months to clean up. In what ways might we protect Antarctica's animal inhabitants in 2025 so Antarctica's unique species do not become endangered?* One target criterion would be, *Which solution idea will be the safest to implement in protecting Antarctica's animal inhabitants?*
  - a. A target criterion is specific to the condition phrase; or
  - b. A target criterion is specific to the KVP; or
  - c. A target criterion is specific to the purpose; or
  - d. A target criterion is relevant to the population or process. Please note population and process are not the same as future scene parameters of time, topic and place.
4. Make a stock criterion a target criterion by relating it back to your underlying problem and include aspects of the KVP or purpose. Instead of asking, *Which solution idea costs the least?* Ask, *Which solution will be most cost efficient in the preservation of Antarctica's endangered animals?*

## **STEP 5 - APPLY CRITERIA to SOLUTION IDEAS**

Determine which solution would make the best action plan. Applying the criteria to your solution ideas is an important focusing tool. Use a grid to apply five criteria to the ten most promising solution ideas in order to determine the best action plan.

### **STEP 5 – Essentials**

1. If you have up to 16 solution ideas in Step 3, select your 10 most promising solution ideas and list them in the 10 solution idea blanks of the grid. If you have 10 or fewer, list them all.
2. Based on each criterion, rank order your solution ideas from 10 (best) to 1 (least effective). Make sure you use each number between 10 and 1 only once, in each vertical column. If two solution ideas tie, add the next two ranks and divide by two. (i.e.  $6 + 7 = 13$ , divide by 2 for ranks of 6.5)
3. Add across the grid to total the ranks given to each solution idea. Double-check your addition for the totals in the grid to make certain you did not make a mathematical error.
  - The solution idea with the highest total rank is the solution idea used to develop your action plan.

### **STEP 5 – Suggestions**

1. Don't waste time rewriting each solution idea completely in the small space provided in the grid. Enter only a few key words, just enough to jog your memory and then include the number of the solution idea (from Step 3) to give the evaluator easy reference to the complete wording of that solution idea.
2. In ranking each solution idea against a criterion the team may find it easier to determine the best solution idea and then the least effective solution idea (10 and 1, 9 and 2), alternating back and forth, rather than trying to identify the best, next best, etc. (10, 9...).
  - If you have fewer than 10 solution ideas, rank the solution ideas based on the number you actually have, such as 8 (best), 7, 6... etc.
3. If you feel one criterion is more important than the others you may want to increase its value or give it more "weight." Weighting a criterion means it carries more weight in determining your action plan. For example, if you feel criterion #1 is twice as important as all others, you would weight it as 2X which means all of the ranks under that criterion are multiplied by 2. Thus, instead of entering the numbers 10 through 1 below that criterion, you would enter the numbers 20, 18, 16, 14, 12, 10, 8, 6, 4 and 2.
4. Double-check your addition for the totals in the grid to make certain you have not made a mathematical error.
5. Do not manipulate the grid. It is inappropriate to assign the same rank to each solution idea for every criterion. It is unusual for each solution idea to receive the same rank from five different criterion.
6. If after completing the grid you have two or more solution ideas tied for the action plan, break the tie. Methods for breaking the tie include: introduce a sixth criterion, go back and weight one or more criteria, eliminate all other solution ideas and have a head-to-head playoff between the tied solution ideas (using your original five criteria). It would be useful to write a note to the evaluator explaining how you broke the tie.

## **STEP 6 - DEVELOP an ACTION PLAN**

Develop the highest ranking solution idea into an action plan. This is the chance to develop and explain the details of how your plan will solve your underlying problem and positively impact the future scene.

### **STEP 6 – Essentials**

The solution idea which receives the highest total in the grid is your action plan, no ifs, ands, or buts. This solution idea must be the primary focus of your proposal in Step 6.

- If you disagree that the highest scoring solution idea is your action plan, it is usually due to one of three reasons:
  - a. Your criteria are not adequate;
  - b. Your rank-ordering of solution ideas in the grid needs work; or
  - c. You are mistaking your favorite solution idea for your action plan.

### **STEP 6 – Suggestions**

1. Develop your action plan by relating it back to the underlying problem. Demonstrate how your action plan will achieve what you set out to achieve in Step 2. The action plan represents your proposal for solving the problem identified in Step 2.
2. Explain in detail the *who, what, how, why, where* and *when* of your action plan.
  - *Who will carry out the plan or be involved?*
  - *What will be done to solve the problem - when will results begin - will it continue?*
  - *Where will the plan be implemented?*
  - *Why will this positively impact society?*
  - *How will the action plan be carried out?*
  - *How does it positively impact the UP?*
  - *How does it positively impact the future scene?*
  - *How does it positively impact the topic?*
3. You may add new facets to your action plan at this point, as long as each addition represents a subpart of your action plan. Combining your two highest scoring solution ideas is not recommended, unless your second highest scoring solution idea fulfills the first sentence in this paragraph – it usually doesn't.
4. Try to develop three complete paragraphs in developing your action plan.
  - a. Think of your solution idea as an overview of your plan.
  - b. Fully develop and elaborate the action plan.
  - c. Expand the solution idea by telling why and how the plan solves the underlying problem.
    - a. Tell who will be supporters of the action plan and who the resisters will be.
    - b. Describe any obstacles to overcome in implementing the action plan.
    - c. Explain why and how this plan has a positive impact on the future scene, topic and society.

## **OVERALL**

Evaluators assess the team's application of research, futuristic thinking, and creative strength in the overall section of the FPS scoresheet. Futuristic thinking assesses the team's ability to:

- a. Put themselves in the time frame of the future scene, and
- b. Extrapolate relevant trends/technologies from their research as they identify futuristic problems and create workable, futuristic solution ideas.

Teams should demonstrate an understanding of how the topic, challenges, and/or solution ideas would impact future society.

## FPSP Suggested Categories

Use these categories to broaden your scope in generating challenges and solution ideas.

- |                                     |                                  |
|-------------------------------------|----------------------------------|
| <b>1. Business &amp; Commerce</b>   | <b>10. Arts &amp; Aesthetics</b> |
| <b>2. Transportation</b>            | <b>11. Physical Health</b>       |
| <b>3. Social Relationships</b>      | <b>12. Psychological Health</b>  |
| <b>4. Environment</b>               | <b>13. Basic Needs</b>           |
| <b>5. Education</b>                 | <b>14. Defense</b>               |
| <b>6. Technology</b>                | <b>15. Economics</b>             |
| <b>7. Recreation</b>                | <b>16. Law &amp; Justice</b>     |
| <b>8. Government &amp; Politics</b> | <b>17. Communication</b>         |
| <b>9. Ethics &amp; Religion</b>     | <b>18. Miscellaneous</b>         |

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# ANTARCTICA

## Sample FPS Future Scene – 1994

*As you and your teammates stepped onto the huge ecotour ship, you knew you were taking the trip of your lives. Now, thinking back, you recall some of the captain's early-morning messages.*

*Sunday, October 31, 2025*

"Welcome aboard the "Ellsworth Clipper!" As we leave New York Harbor, I'll remind you we'll reach the Antarctic Peninsula directly below the tip of South America in about two weeks. I'm delighted to see your excitement about our ecotour. You will assist in research in marine biology, geology, the atmosphere and ecology. You will also serve as ecowatchers: Take careful notes of anything you believe could threaten Antarctica. By the way, you'll be interested in a news bulletin we just received: All nations have signed an agreement banning mining and military operations in Antarctica for the rest of this century. As an added feature of our tour, we'll have evening enrichment programs to prepare you for your activities when we reach the continent. Tonight's program will be: 'Antarctica-The Earth's Thermostat.'"

*Wednesday, November 17, 2025*

"Attention, all passengers: We are approaching the Antarctic Peninsula. Grab your holocorders and look starboard for some of the most vividly colored icebergs you will ever see. The deep, glowing blues and jade greens indicate these majestic travelers have been at sea a long time. The patches of black are groups of penguins. During the next week, we'll sail down the coast of the Peninsula and make our first landfall at Faraday, one of 20 science bases in this area. This morning, we will stop near the area where the tourist ship, "Snobird," developed a leak in its fuel tanks. As you recall, cleanup of the oil is taking months. This is where some of you will help us take samples of seawater to measure levels of phytoplankton. Tonight's enrichment program is: 'From Seals to Seabirds: A Look at Some of the Polar Natives.'"

*Monday, November 23, 2025*

"Good morning, shipmates! During the night, we anchored off Faraday. At 10 a.m., we will begin transporting you aboard our Zodiac IIs to land. Please go over the checklist of items you will need. Remember, a summer day here still means below-freezing temperatures. Also, the safety of the area we will visit is very important. Bring back everything you take - don't leave even an MVP wrapper! You will be working with scientists at Faraday. Please be careful of the scientific instruments; simply leaving a door open can ruin months of experiments. Tonight's enrichment program is: 'Antarctica as Natural Laboratory - The Last (Almost) Pristine Place on Earth.'"

*Tuesday, December 1, 2025*

"I hope you're enjoying our ecotour. Today you're in for a contrast: we're going to visit a different kind of polar tourism. Two years ago, the countries of the Antarctic Treaty voted to end all land claims on the continent. Shortly after that and to loud protests, a group of business people with no ties to the Treaty staked a land claim and built a large resort area on the Peninsula. Let me read one of their tour ads to you: 'Fly to Antipodal Paradise. Travel along Amundsen's trail to the South Pole in the comfort of hovertrains. Ski and ice bike at the bottom of the world! We'll equip you with a picnic lunch and a geology hammer, so you can gather your own rock sample souvenirs!' Quite different, isn't it? Following your visit, tonight's program will be: 'Governing Antarctica: How and Who?'"

*Tomorrow, the "Ellsworth Clipper" leaves Antarctica to return to New York Harbor. On the return trip, it will be your team's turn to present an enrichment program on what you see as one of the major areas of concern about Antarctica. You have attended the enrichment programs on the topics given above, and programs on many other topics, as well. Use your knowledge and problem solving skills to examine the challenges faced by Antarctica and develop an action plan.*

## Evaluation Criteria Future Problem Solving Program

### Identify Challenges (Step 1)

Fluency ..... 1 2 3 4 5 6 7 8 9 10  
 Flexibility ..... 1 2 3 4 5 6 7 8 9 10  
 Clarity ..... 1 2 3 4 5 6 7 8 9 10  
 Originality ..... 3 x \_\_\_\_\_ = \_\_\_\_\_

### Select an Underlying Problem (Step 2)

Completeness ..... 0 1 2 3 4 5 6 7 8 9 10  
 Focus ..... 1 2 3 4 5 6 7 8 9 10  
 Adequacy ..... 1 2 3 4 5 6 7 8 9 10

### Produce Solution Ideas (Step 3)

Fluency ..... 1 2 3 4 5 6 7 8 9 10  
 Elaboration ..... 1 2 3 4 5 6 7 8 9 10  
 Flexibility ..... 1 2 3 4 5 6 7 8 9 10  
 Originality ..... 3 x \_\_\_\_\_ = \_\_\_\_\_

### Select and Apply Criteria (Steps 4 & 5)

Correctly Written ..... 0 1 2 3 4 5  
 Applicability and Relevance ..... 0 1 2 3 4 5 6 7 8 9 10  
 Correctly Used ..... 1 2 3 4 5

### Develop an Action Plan (Step 6)

Relevance ..... 1 2 3 4 5  
 Effectiveness ..... 1 2 3 4 5  
 Impact ..... 1 2 3 4 5  
 Humaneness ..... 1 2 3 4 5  
 Development of Action Plan ..... 1 2 3 4 5 6 7 8 9 10

### Overall

Research Applied ..... 1 2 3 4 5 6 7 8 9 10  
 Creative Strength ..... 1 2 3 4 5 6 7 8 9 10  
 Futuristic Thinking ..... 1 2 3 4 5 6 7 8 9 10

Rank \_\_\_\_\_ Total \_\_\_\_\_