



Global Issues Problem Solving

KEY TIPS for Coaches and Students

Future Problem Solving Program International (FPSPI) is a challenging and rewarding program. 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.

- The FPSPI *Coach's Handbook* offers a comprehensive overview of the problem solving model used in GIPS and suggests activities to introduce generating and focusing problem solving tools.
- The FPSPI *Evaluation Primer* provides GIPS coaches with insight into the evaluation process. Understanding evaluation improves a coach's skills in teaching problem solving and expands the knowledge of the problem solving process.

Contact Future Problem Solving Program International or visit www.fpspimart.org for information on the *Coach's Handbook*, the *Evaluation Primer*, and other materials related to Global Issues Problem Solving.

RESEARCH

It is important to prepare for Global Issues Problem Solving by developing solid background knowledge on the current topic.

- The FPSPI *Readings, Research, and Resources (RR&R)* is an excellent source for initiating research. This binder-ready publication or electronic download is available through fpspimart.org.
- Books, news magazines, futuristic periodicals, and other helpful information can be found in the school library or on the internet.



- Field trips, real life experiences, and local experts are excellent means to provide research opportunities.

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THE FUTURE SCENE

Students must utilize analysis skills to identify the details of the Future Scene, a hypothetical scenario based on current information. While coaches may be part of the learning experience during Practice Problems 1 and 2 and provide guidance, each member of the team and/or individual competitor must read the Future Scene and address the Future Scene during competitive problems (Qualifying Problem, Affiliate Bowl/Finals, International Conference).

- Identify the Future Scene parameters (topic, place, and time).
- Relate the Future Scene to the research. What has changed? What is the same?
- Identify the vocabulary, new products, and trends specific to the Future Scene.
- Answer pertinent questions: What is the charge? Who is challenged, involved, or affected within the Future Scene?

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 in the Future Scene that needs attention or consideration (points of importance).

A challenge is a logical cause or effect of the situations in the Future Scene. Knowledge of the topic should be used to determine challenges from the actions within the Future Scene. The goal is 16 well-written challenges. (8 for individuals)

Step 1, Challenges – *Essentials*

1. Student work must relate to the Future Scene as stated. In cases where research can be found to contradict the Future Scene, students are still required to problem solve within the boundaries of the given situation.
2. Step 1 challenges are written in statement form rather than questions.
3. Challenges are stated in terms of *possibility*, using non-absolute terms such as may, might, could, etc. (Absolute terms that indicate an idea “**will be a challenge**” deny an important element of projecting into the future as 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. Using “will” instead of “may” does not negate a challenge, but lowers the Clarity score.)
4. A clearly written challenge has logical cause-effect reasoning and tells what the challenge is, why it is a challenge, and how it logically relates to the Future Scene.
5. Students should demonstrate flexibility in their thinking and explore challenges from different perspectives or categories.

To earn maximum Fluency and Clarity scores 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.

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Step 1, Challenges – Suggestions

Teams/individuals often fail to earn high scores in Fluency because information explaining a challenge statement is not fully explained. Clearly stating the challenge(s) helps an evaluator understand the intent of a challenge.



Challenge examples *a* and *b* from the sample Future Scene on Antarctica provide good examples. (Note: Future Scene is available at the end of this document.)

- 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, 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.*

Challenge examples *c* and *d* omit some very important information and would not receive credit.

- c. The following challenge statement identifies a challenge (depletion of the ozone layer). It doesn't tell why depletion of the ozone is a challenge and how it logically relates to the Future Scene (Antarctica).

• *In 2025, the ozone layer could be depleted.*

- d. The following is a statement of fact from the Future Scene and would not receive credit. 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, students 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.*

Step 1, Challenges – Helpful Hints:

- Fluency and flexibility can be expanded by the use of generating tools such as brainstorming, forced relationships, and the category list. (See *Coach's Handbook*, "Basic Skills & Tools.") The Future Scene can be subdivided into two or three general subheadings (e.g., *Environment* or *Land, Tourism, Man and Antarctic Treaty*) for ideas, and the Category List provided in this guide can be utilized. (**Caution:** Not all categories will apply to every topic and Future Scene.)
- Terms and concepts from research can help to explain and relate the challenge statements. 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. Citing the source of information is acceptable, but not required and time consuming.

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- Reciprocal cause/effect relationships can be used when generating challenges. This relationship forms a chain. In this kind of structure, an effect causes a second effect, which may then cause a third effect, etc. A chain of two effects is usually sufficient for a challenge. The relationships between causes and effects must be logical.
- If a challenge or concern is mentioned in the Future Scene, it can be included in the list of challenges provided that the challenge elaborates on what is stated 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.
 - Restating a fact/concern from the Future Scene is not enough to earn credit as a challenge.
- Quality is sometimes more important than quantity. While the goal is to generate and write 16 well-stated challenges (8 for individuals), it is up to the students to decide if fewer 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 (8) challenges that only partially address the what, why, and how.
- Examples of “Yes” challenges at varying levels of expertise from the Cashless Society Future Scene are provided. More advanced levels have a greater chance of scoring a ‘Yes’ and earning higher flexibility and clarity scores. (Note: Future Scene is available at the end of this document.)

A partial list of signal words that show cause and effect relationships:

because
so
that
if - then
consequently
thus
since
for
for this reason
as a result
therefore
this is how
nevertheless
accordingly

- Novice level - Kids may never learn the value of money in a cashless society.
- Experienced level - Because they will not have actual contact with money, children in Leabeau County may have a hard time learning the value of money.
- Expert level - Without piggy banks, children may never learn the values of saving due to lack of actual physical money. This may cause economic problems in the future because when these children are adults they won't know how to properly save.
- Expert plus - According to Time Magazine, adults heavily in debt were often not taught to save as children so without piggy banks children may never learn the values of saving due to lack of actual physical money. This may cause economic problems in the future because when these children are adults they may not know how to properly save. (Note research added)



- EXTREMES should be avoided. Students sometimes hit the extreme when explaining consequences – proclaiming widespread death, economic ruin, or the end of the world as we know it. Usually many intermediate consequences are possible before such major disasters would overtake us. For example, “cramped quarters in homes or undersea vessels could lead to stress and tension between people” is a reasonable consequence. It is an extreme measure to assert that people might start fighting and everyone would kill each other.

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STEP 2 – SELECT AN UNDERLYING PROBLEM

An Underlying Problem identifies an action goal based on addressing one or more challenges within the Future Scene. An excellent Underlying Problem has a narrowed focus, addresses an important, significant issue from the Future Scene through the action goal (Key Verb Phrase), and identifies a positive outcome of accomplishing that action goal (Purpose).

An Underlying Problem

Condition	<i>Because a <u>tourist ship</u> developed a leak in its fuel tanks which took months to clean up,</i>
Stem + Key Verb Phrase	<i>in what ways might we protect <u>Antarctica's</u> animal inhabitants in <u>2025</u></i>
Purpose	<i>so Antarctica's unique species do not become endangered?</i>
Parameters	Topic, place, and time from the Future Scene are underlined.

Step 2, Underlying Problem – Essentials

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

- **C – Condition Phrase:** The Condition Phrase is actually a lead-in fact from the Future Scene or related research that is the basis for or cause of the issue selected for the Key Verb Phrase of the Underlying Problem. The Condition Phrase should provide a connection to the Future Scene and the rationale.
- **Stem + KVP - Key Verb Phrase:** Together, the stem (“How might we” or “In what ways might we”) and the Key Verb Phrase, a single action verb or verb phrase with its object, indicate the primary action that will address an issue from the Future Scene. All solution ideas in Step 3 must address the goal of the Key Verb Phrase.
- **P – Purpose:** The Purpose specifies an optimal direction or outcome intended. The Purpose should be singular and give further information about a desired result obtainable from accomplishing the action goal; it is not a repetition of the Condition Phrase or Key Verb Phrase. The Purpose usually begins with “so,” “so that,” or “in order to.”
- **FSP – Future Scene Parameters:** Parameters are conditions that place the Underlying Problem within the confines of the Future Scene. Including parameters of the Future Scene in the Underlying Problem ensures the challenge is a sub-area of the Future Scene. The parameters are stated in each Future Scene and include topic (topic researched or major focus of the Future Scene), place (geographic location involved), and time (the year or a time phrase). The parameters may be placed anywhere in the Underlying Problem.

The condition phrase should NOT be an entire challenge rewritten from Step 1. It should contain primarily facts or a factual summary from the Future Scene or related research.

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2. An Underlying Problem (UP) may be based on *one challenge, on one category of challenges, or on a compilation of several related challenges* identified in Step 1. Solutions to the Underlying Problem will be generated in Step 3.

Effective problem solving means a large issue or 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 to attack one important challenge or one category of challenges at a time.

- 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?*

- 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, taking months to clean. In what ways might we protect Antarctica's animal inhabitants in 2025 so Antarctica's unique species do not become endangered?*

- Several related challenges in Step 1 may be compiled 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.
- Multiple **unrelated** ideas should not be included in the Underlying Problem.

Additional UP Examples Based on Other Future Scenes

Condition	<i>Because children in a <u>cashless society</u> will not have the opportunity to hold their money in their hands or save it in a piggy bank,</i>
Stem + Key Verb Phrase	<i>in what ways might we teach monetary concepts to</i>
Purpose	<i>so they will become financially responsible adults in <u>Leabeau County</u> after <u>2031</u>?</i>
Parameters	Topic, place, and time from the Future Scene are underlined.

Condition	<i>Because it may not be clear in whose hands political and legal authority rests in the unique situation of the colony on <u>Mars</u>,</i>
Stem + Key Verb Phrase	<i>how might we establish institutions necessary for the governance of the colony</i>
Purpose	<i>so immigrants to Mars are protected by the <u>rule of law</u> in <u>2053</u> and <u>beyond</u>?</i>
Parameters	Topic, place, and time from the Future Scene are underlined.

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Step 2, Underlying Problem – *Suggestions*

1. Selection of an issue: Selection of the Underlying Problem is a critical step in the FPS process. When discussing which of the many and varied Step 1 challenges and areas of concern to address in Step 2, teams/individuals should ask themselves these questions, referred to as the **Four I's** which represent areas for students to consider as they thoughtfully make their decision about the Underlying Problem.

Impact - Which area of concern, if solved, would have the greatest impact on the Future Scene?

Influence - Which area of concern can the team/individual have the most influence on because of their knowledge of the topic?

Interest - Which area of concern generates the most interest and enthusiasm?

Imagination - Which area of concern seems most likely to inspire student's imaginations so they can come up with creative, futuristic solution ideas?

2. Research: It is recommended that the Key Verb Phrase selected for the Underlying Problem encourages the use of research. Some students choose Underlying Problems that are appropriate because they arose from legitimate challenges identified in Step 1 but have very little to do with the topic area, the Future Scene, or the research.
 - 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?”
 - While both of these areas are legitimate concerns in dealing with most Future Scenes, the difficulty is that the rest of the booklet will be concerned with *convincing, educating or fund-raising* and not with the specific GIPS topic. This should be kept in mind when selecting the Key Verb Phrase; an area based on a challenge or category of challenges which will maximize utilization of knowledge on the topic area, as well as focused on an important issue in the Future Scene, should be selected
3. Obvious Purpose: The Purpose should be one that would clearly flow from achieving the action goal stated in the Key Verb Phrase. It is not appropriate to rephrase the KVP.
4. Word choice: Words should be chosen carefully so the goals stated in the KVP and Purpose are clear and measurable. Phrases such as *improve the quality of life or provide a successful life* have different meanings to each evaluator. The evaluator may have a difficult time determining if a vague Purpose can be achieved.
5. Significant issue: The Underlying Problem should be an important or significant problem area within the Future Scene. It should be narrow enough to focus attention on a defined area of concern and broad enough to generate many different solution ideas.



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Step 2, Underlying Problem – *Helpful Hints*






The Underlying Problem is the most important step in problem solving. The quality of all subsequent steps relies on an important and well-stated action goal.

Underlying Problem Example: Because our town is within the area called the Sound Tunnel where a sonic shock could occur, how might we organize a plan for preparing our community in order to reduce the number of our citizens who would be injured if this natural disaster were to occur here in 2032?

<p>KVP – multiple verbs/verb phrases OR multiple objects of the verb are not appropriate</p>	<p><u>Examples of multiple verbs/verb phrases</u></p> <ul style="list-style-type: none"> • ...how might we select and educate jurors... • ...how might we protect the natural habitats of Antarctica’s animals while at the same time allowing tourists to take advantage of Eco tours... <p><u>Examples of multiple objects of the verb</u></p> <ul style="list-style-type: none"> • ...how might we solve the problems of child abuse and drug abuse... • ...how might we provide economic and counseling opportunities... • ...how might we distribute food and jobs... <p><u>Notes on multiple verbs/verb phrases:</u></p> <ul style="list-style-type: none"> • A KVP should contain a single verb or verb phrase with a single object. • Avoid using the words <i>and</i>, <i>or</i>, and <i>while</i> in your Key Verb Phrase to reduce the chance of a multiple verb or multiple objects. • Points will be reduced for the KVP in each of these cases. • Focus score will be reduced, and evaluators will use only the first verb/verb phrase or object when scoring for Adequacy. • To be scored as relevant in Step 3, solution ideas must address both verbs or objects.
<p>KVP – absolute verbs should be avoided</p>	<p><u>Examples</u></p> <ul style="list-style-type: none"> • Verbs such as stop, prevent, eliminate, etc. are not easily addressed in step 3 solutions. <p><u>Notes</u></p> <ul style="list-style-type: none"> • An absolute verb <i>may</i> unnecessarily narrow the focus, thus reducing points for focus. • An absolute verb <i>may</i> be appropriate, depending on the intent defined, thus NOT reducing points for focus. The context of the Future Scene will help the evaluator determine if the absolute verb is appropriate or too narrow.

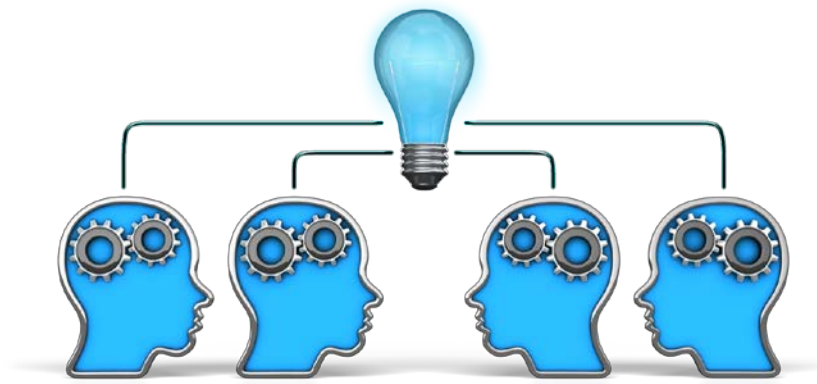


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<p>KVP – restatements of the Future Scene are not appropriate.</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;">  </div> <div style="width: 65%;"> <p><u>Examples</u></p> <ul style="list-style-type: none"> • ...how might we overcome (or develop remedies for, or decrease, or solve) the challenges created by the sonic shocks in our country in the year 2032? • ...how might we reduce the problems resulting from sonic shocks in our country in the year 2032? <p><u>Notes</u></p> <ul style="list-style-type: none"> • A restatement is a KVP that addresses the entire Future Scene in a very general way which is a critical error in the creative problem solving process. The KVP should be a narrowing of the entire Future Scene to one significant area of concern. • A restatement is considered an unqualified KVP because it is so broad and may give a competitive advantage because many solution ideas will be easily relevant. The scoring is intended to counteract this inequity. • Words from the Future Scene charge can be used in the UP, but if the charge is very broad the resulting Key Verb Phrase could be a restatement. • Restatements receive a score of 1 for Focus and Adequacy. Scores may also be lower in Step 6 (Effectiveness and Impact) and in Overall (Creative Strength). </div> </div>
<p>KVP should not broaden or go beyond the facts stated in the Future Scene.</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 65%;"> <p><u>Example</u></p> <ul style="list-style-type: none"> • ...how might we solve the challenges resulting from natural disasters... • ...how might we protect natural environments from tourists... <p><u>Notes</u></p> <ul style="list-style-type: none"> • A score of 1 is given for Focus and a score of 1 is given for Adequacy when broadening occurs. • The Future Scene parameters of topic, place, and time are used when scoring Step 3 Solution Ideas if the parameters included in the UP are not included or are changed. </div> <div style="width: 30%; text-align: center;">  </div> </div>
<p>KVP unrelated to the Future Scene is not appropriate.</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%; text-align: center;">  </div> <div style="width: 65%;"> <p><u>Example</u></p> <ul style="list-style-type: none"> • ...how might we increase participation in the Red Cross... <p><u>Notes</u></p> <ul style="list-style-type: none"> • When the Future Scene is ignored, a score of 1 is given for Focus and Adequacy. • The Future Scene parameters of topic, place, and time are used when scoring Step 3 Solution Ideas, causing scores to be lower in Step 6 – “Effectiveness” and “Impact” and in Overall – “Creative Strength.” </div> </div>

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<p>A Purpose which repeats the KVP is not appropriate.</p>	<p><u>Example</u></p> <ul style="list-style-type: none"> • ...how might we organize a plan for preparing our community so that the community is well prepared... <p><u>Notes</u></p> <ul style="list-style-type: none"> • A score of 1 is given for Purpose and scores of 1-3 are given for Focus and Adequacy. • Evaluators will impose a new Purpose that seems logical to the Future Scene and the KVP for non-competitive rounds ONLY!
<p>A Purpose with multiple verbs, verb phrases, OR multiple objects is not appropriate.</p>	<p><u>Example</u></p> <ul style="list-style-type: none"> • ...in order to reduce the number of our citizens who would be injured and to make them more confident of their safety... <p><u>Notes</u></p> <ul style="list-style-type: none"> • A score of 1 is given for Purpose. • The UP will score lower in focus. • Evaluators will refer only to the first verb/verb phrase or object when scoring Adequacy. • Solution ideas must support both verbs.
<p>A missing Purpose is not appropriate.</p>	<p><u>Notes</u></p> <ul style="list-style-type: none"> • Leaving out the Purpose affects scores in both Steps 2 and 3. • A score of 0 is given for Purpose, and scores of 1-3 are given for Focus and Adequacy. • Evaluators will impose a Purpose that seems logical to the Future Scene and the KVP that is used when scoring solutions for non-competitive rounds ONLY. • In competitive situations such as the Affiliate Bowl or the International Conference, a booklet with no Purpose for the Underlying Problem has a very hard time advancing to top rounds of evaluation.



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STEP 3 – PRODUCE SOLUTION IDEAS



The key objective in Step 3 is to produce many varied and creative solution ideas to solve the Underlying Problem. The team’s goal is 16 (8 for individuals) elaborated solution ideas.

A solution idea, if relevant, addresses the Key Verb Phrase and supports the Purpose, either explicitly or implicitly and does not contradict the Future Scene parameters of topic, place, and time. Flexibility in thinking is demonstrated by suggesting ideas from different perspectives or categories.

Step 3, Solution Ideas – Essentials

1. Solution ideas must address, or have a relationship to, the Key Verb Phrase. If the KVP is “...in what ways might we protect Antarctica’s animal inhabitants,” then each solution idea must do exactly that – protect the animals.
2. It must be clear or easily inferred that the solution idea supports the Purpose. If the Purpose is “...so that Antarctica’s unique species do not become endangered,” it should be easy to infer that the idea will contribute to that Purpose.
3. Solution ideas should not contradict any part of the Future Scene parameters of topic, place, and time. The parameters do not need to be stated in the solution idea, but the solution should not be about a different topic, a different place, or a time period other than that of the Future Scene.
4. Solution ideas are written in statement form as definite proposals, using the word “will” rather than “may” or “might.”
5. The solution includes a logical WHO – a person, type of expert, agency, or organization with the capability, power, interest, or expertise to implement the idea.
6. The solution tells WHAT the WHO will do to address the Key Verb Phrase of the Underlying Problem.
7. An elaborated solution idea gives additional details including several of these elements: HOW the solution will work, WHY it’s a good idea, WHAT it will accomplish, HOW/WHY it will fulfill the goals of the Key Verb Phrase and/or Purpose, WHEN it will be completed or a timeline of actions, WHERE the relevant places are for the solution idea to be carried out, etc.



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Step 3, Solution Ideas – Suggestions

1. Logical WHO: The actual *who* in a solution idea should be the *person or agency* that will implement the solution idea. 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 *what* is happening. A lot of parents don't talk to their children about school, so something needs to happen to start them talking. A *who* in this case would suggest the person or people to do that, such as the school guidance counselor. The *who* should be a logical expert, agency, or 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."

WHO's with PIE

A good WHO is a **logical** person, expert, agency, or organization to *undertake the implementation* of the solution.

A good WHO has **PIE** – the

- Power,
- Interest, or
- Expertise

to make the solution happen.

2. Keep the UP in mind: For team problem solving, each team member should have the same action goal in mind before generating solution ideas. Teams and individuals should keep a copy of the Underlying Problem KVP and Purpose in front of them as they go through the remaining steps so they will remember exactly what they are trying to accomplish.

3. Examples: Listed here are several solution ideas for addressing this Underlying Problem:

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 address 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.

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Step 3, Solution Ideas – *Helpful Hints*

1. **Elaboration:** Elaboration credit is awarded to solution ideas that contain significant details in at least three of the **who, what, how, why, when, and where** elements. 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” is not of a substantive nature.)
2. **Generating ideas:** Fluency and flexibility can be expanded by practicing with the category list and brainstorming tools such as force fitting, SCAMPER, morphological matrix, and other creative problem solving tools for generating solution ideas. (See *Coach’s Handbook*, “Basic Skills & Tools”.)
3. **Just repeating:** Repeating the Key Verb Phrase and Purpose in the solution idea does not illustrate how or why the solution would be implemented. How the idea will address the KVP and how/why it will support the Purpose must be explained.
4. **Inventions:** Imaginative inventions are fun, but inventions don’t necessarily happen just because someone says it 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 to award a Relevant.
5. **Futurizing:** Although it’s best to avoid “magical thinking,” it’s a great idea to “futurize” solution ideas as much as possible. Prepare by researching new technologies and future trends using journals such as *The Futurist* or *Scientific American*. Brainstorm potential solution ideas or use those found in research and practice making the ideas more futuristic. If necessary, remember to explain how the futuristic elements will work.
6. Formula writing should be avoided in writing of solutions.



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STEP 4 – GENERATE AND SELECT CRITERIA

Criteria are the standards by which solution ideas are judged. The solution idea that best meets all of the criteria is considered the “best solution” and becomes the basis for the Action Plan; therefore, criteria should address aspects of the solution ideas that will be very important in determining which solution will best accomplish the goals of the Underlying Problem. The key objective in Step 4 is to generate ideas/criteria that serve as yardsticks to determine the creative potential and importance of solution ideas.

Step 4, Criteria – Essentials

1. **Correctly written:** To be considered correctly written, criteria must meet three guidelines:
 - Each criterion must deal with a single standard.
 - Each criterion must include a superlative (best, longest, easiest, fewest, most, greatest, etc.), allowing the solution ideas to be ranked in Step 5.
 - Each criterion must be stated so that the desired outcome is indicated. For example, “Which solution will be the *safest* for passengers,” not “Which solution will be the *least safe* for passengers.”
2. **Relevance:** The specificity of the criteria content is considered. Criteria that are generic and can be applied to a wide variety of topics and situations score lower in points. Criteria that are specific to the research for the topic, Underlying Problem, and Future Scene score more points. Criteria can earn 0-3 points for relevance.
 - 0 points for ideas that are not relevant or duplicate another criterion
 - 1 point for *generic* ideas that can be used with any topic or Future Scene
 - 2 points for generic ideas that are modified with information from the Future Scene
 - 3 points for *advanced* ideas that are specific to the Underlying Problem, the topic research, or the Future Scene

Step 4, Criteria – Suggestions

These examples of criteria are based on this Underlying Problem.

Underlying Problem Example: Z-Prize seekers and space salvage operators are using dangerous, “extreme measures,” to collect space artifacts in 2044, and recently, “clean sweepers” have begun to vaporize any space junk they encounter; how might we improve the process of collecting historical space junk so that the likelihood of valuable space museum artifacts being destroyed is minimized?



0 points – (NR) Not Relevant
A criterion that has no relevance to evaluating solutions for this Underlying Problem
<ul style="list-style-type: none">• Which solution will most convince people to vacation in space?• WSW make the prettiest museum displays?

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KEY TIPS for Coaches and Students

0 points - (D) Duplicate

A criterion that duplicates one of the other criteria being used
 The criterion may not use the exact wording, but will essentially be evaluating solutions based on the same concept. (For demonstration Purposes, these examples are duplicates of the Not Relevant examples.)

- Which solution will result in the most people wanting to be space vacationers?
- WSW look the best in the museum?

1 point - (G) Generic

A criterion that could be applied to nearly any Underlying Problem or Future Scene
 Generic criteria with Future Scene parameters added (topic, place, time) are still rated Generic.

- Which solution will be the safest in 2044? (*time parameter added is still generic*)
- WSW last the longest?
- WSW people accept the most on the topic of space junk? (*topic added; still generic*)

2 points - (M) Modified with Future Scene or Underlying Problem details

A criterion with a core idea that is generic, but with significant details from the Future Scene added
 These details may include stakeholders from the Future Scene; details from the Condition, Key Verb Phrase, or Purpose if used as a time constraint; or other key details from the Future Scene. Future Scene parameters alone (topic, place, time) are not enough to score as Modified.

- Which solution will be the safest for the Z-Prize seekers in space?
- WSW last the longest for the space station museum organizers?
- WSW the space museum benefactors paying for the Z-Prize be most likely to accept?
- WSW be the easiest to implement when we improve the process of collecting historical space junk?



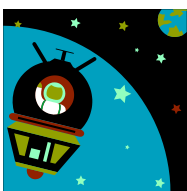
3 points - (A) Advanced: Based on the UP Key Verb Phrase and/or Purpose

A criterion that uses the concept from the Key Verb Phrase or the concept from the Purpose
 Both can be used to create criteria.

- Which solution will best improve the process used in the collection of historic space junk? (Based on KVP)
- Which solution will most effectively minimize destruction of space museum artifacts? (Based on Purpose)

3 points - (A) Advanced: Based on topic research and/or specific to the Future Scene

A criterion that uses concepts from the background research on the topic for this particular Future Scene or is specific to an element of the Future Scene that is not generic
 A criterion based on relevant research *may* have modifying information from the Future Scene, but it is *not* required.



- Which solution will best comply with international laws that govern space? (Space law was part of the research on the Space Junk topic.)
- WSW have the least detrimental effect on the overall environment of outer space? (Space environment is relevant to the topic research.)
- WSW best avoid creating new space junk? (Amount of space junk is definitely an issue in the research.)

GLOBAL ISSUES PROBLEM SOLVING
KEY TIPS for Coaches and Students

3 points – (A) Advanced: A generic criterion justified with Future Scene facts

A criterion that is generic but is justified with *specific facts* from the Future Scene that relate closely to its importance

Specific criteria may also be justified, but it isn't necessary.

- Since the prize-seekers are dodging millions of man-made pieces of junk in many different orbits, which solution will be the safest for them?
- Since the space station museum was just created in 2044 and is beginning to collect space artifacts, which solution will be the most sustainable?
- Because Z-Prize seekers are competing with space salvage operators, “clean sweeper” pilots, and each other, which solution will promote the most cooperation in preserving space museum artifacts?



Step 4, Criteria - Helpful Hints

1. Check for relevance: Is this criterion a valid way to evaluate the solution ideas for this Underlying Problem? Criteria must be relevant before they can earn points.
2. Keep it simple: It's a good idea to include modifying information from the Future Scene in criteria; however, don't go overboard adding too much information. Only generic ideas need to be “modified” or “justified” to earn more points.
3. Don't just add on: Adding the KVP or Purpose to a generic criterion idea is modification, not making it specific. Think of other ways to modify your criteria.
4. Be careful: Adding the KVP or Purpose to a criterion using words like “when” or “while” may be okay if it indicates a time constraint, but be careful that you are not introducing two separate criteria ideas.
5. Words to avoid: Avoid the words “and” and “or” in criteria. Each criterion needs to be a single standard and these words often result in two ideas rather than one.
6. Check for meaning: Some criteria lack meaning. One example of this is “Which solution will be most effective?” Most effective at what? Be sure the meaning is clear.
7. Avoid comparatives: Each criterion needs a superlative, such as “best,” “most,” “easiest,” etc. Comparative words do not rate as “correctly written.” These include better, longer, easier, fewer, more, greater, etc.



8. Use facts for justification: 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.
9. Justifications must have a logical relationship to the criterion: In this example, the justification is not logically related: *Because the Z-Prize is for ten billion dollars*, which solution will be the most humane?

GLOBAL ISSUES PROBLEM SOLVING
KEY TIPS for Coaches and Students



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 Key Verb Phrase and support the Purpose in the Underlying Problem. The evaluation matrix (grid) is used for this Purpose. Applying the criteria to solution ideas is an important focusing tool. Use the evaluation matrix (grid) to apply five criteria to the most promising solution ideas in order to determine the best solution. The best solution then becomes the focus of the Step 6 Action Plan.

Step 5, Apply Criteria with Grid – Essentials

1. Select the 8 (5 for individuals) most promising solution ideas and list them in the solution boxes of the grid. If you have fewer solutions, list all ideas.
2. Considering one criterion at a time, rank each of the solution ideas against all others using that criterion. Repeat the ranking for each of the criteria.
3. In each column, rank the solution ideas from 1 (low) to 8 (high) or to the highest number that equals the number of solutions ideas in the grid (5 for individuals).
4. Use each number once in each column. (Exception: If two ideas rank equally in satisfying a criterion, half points that are mid-way between the two ranks may be used. For example, two ideas that are equal and would have been ranked 5 and 6 may each be ranked 5.5.)
5. Weight a single criterion if it is especially important. In this case each rank must show the weight; if double weighting is used the ranks would range from 2 to 16 (2 to 10 for individuals).
6. Add the ranks across the rows and enter the totals into the final column of the grid.
7. Use the solution idea with the highest points as the basis for the Step 6 Action Plan.
8. If there is a tie for the highest points, choose one or the other. Breaking ties may be done in several ways (see the suggestions). The method used to make the choice may be shown on the grid, but this is *not required*.

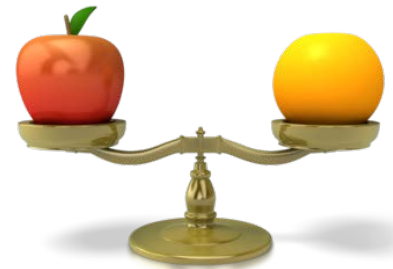


Solution Numbers	Solution Ideas	Criteria					Total
		1	2	3	4	5	
# 1		5	7	8	7	6	33
# 2		4	6	1	3	8	22
# 5		8	8	4	8	7	35
# 9		7	5	2	5	4	23
# 12		1	1	7	6	3	18
# 14		3	4	5	2	2	16
# 15		2	3	6	4	5	20
# 16		6	2	3	1	1	13

GLOBAL ISSUES PROBLEM SOLVING
KEY TIPS for Coaches and Students

Step 5, Apply Criteria with Grid – *Suggestions*

1. Keep it short: Enter only a few key words for each solution, just enough to jog the memory; the number of each solution idea (from Step 3) can be provided to give the evaluator easy reference to the complete wording of that solution idea.
2. Best, then worst: In ranking each solution idea against a criterion, it may be easier to determine the best solution ideas (8, 7) and then the least effective solution ideas (1, 2). Then work to the middle.
3. Fewer solutions: If fewer than 8 solution ideas (5 for individuals) are generated in Step 3, enter all of the ideas in the grid. The highest points then equal the number of ideas. (Example: If you have 7 ideas in the grid, the best one is ranked 7.)
4. Weighting: If one criterion is more important than the others, its value can be increased to give it more “weight.” Weighting a criterion means it carries more weight in determining your Action Plan. For example, if criterion #1 is twice as important as all others, it can be weighted as 2X, which means all of the ranks under that criterion are multiplied by 2. Thus, instead of entering the numbers 8 through 1 below that criterion, the numbers 16, 14, 12, 10, 8, 6, 4 and 2 (10-2 for individuals) would be entered on the grid.
5. Breaking a tie: If after completing the grid two or more solution ideas tied for the best solution, the tie should be broken. Any of these methods may be used for breaking the tie. It is helpful to let the evaluator know how the tie was broken, but it is not required. Some examples include the following:
 - Introduce a sixth criterion and evaluate the tied solutions with that criterion.
 - Go back and weight one or more criteria.
 - Eliminate all other solution ideas and have a head-to-head play-off between the tied solution ideas using your original five criteria.
 - Decide which one is better and state a reason.



Step 5, Apply Criteria with Grid – *Helpful Hints*



1. Double-check addition: Addition for the totals in the grid should be double-checked to be certain no mathematical errors have occurred. Use a calculator to add up the totals. If the sum is 180 (75 for individual grid with 5 solution ideas), the grid is most likely completed correctly.
2. Double-check for best solution: Be absolutely certain that you have found the highest scoring solution to use for the Action Plan. Only 1 point is awarded if not done properly.
3. Don't manipulate: The grid should not be manipulated. It is inappropriate to assign the same rank to each solution idea for every criterion. It is unlikely that each solution idea would receive the same rank from five different criteria.

GLOBAL ISSUES PROBLEM SOLVING
KEY TIPS for Coaches and Students



STEP 6 – DEVELOP AN ACTION PLAN

An Action Plan is a *proposal* for solving the Underlying Problem. The Action Plan should explain in detail the *who, what, how, why, where, and when* of the solution idea. 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 demonstrates how it addresses the area of concern of the Underlying Problem and how it positively impacts the Future Scene.

Step 6, Action Plan – Essentials

1. The Action Plan **MUST** focus primarily on the best solution as identified by using the evaluation matrix (grid) in Step 5.
2. The Action Plan should first introduce the basic idea, similar to what was written about it in Step 3 – Solution Ideas.
3. The Action Plan may include one or more of the other solution ideas, as long as they are purely supportive and not a main focus.
4. Many additional facets may be added to the idea at this point, with the goal of showing a complete plan and strategies for implementation of the best solution.
5. The Action Plan *may* describe timelines and tasks, details on how the solution will operate, potential obstacles and how to overcome them, how the plan will address the Underlying Problem, how/why it will have a positive impact on the Future Scene, etc.



Step 6, Action Plan – Suggestions

1. Connect the plan: Tie the Action Plan back to the Underlying Problem, the Future Scene, and the topic.
2. Develop the plan: Write at least 3 complete paragraphs for your plan.
 - Include information on who will carry out the plan, what will be done, and how it will work.
 - Include ideas about the effectiveness of the plan (how well it solves the Key Verb Phrase and supports the Purpose), the impact of the plan (the ways in which it will affect the Future Scene), and the humaneness of the plan (how productive and positive the plan will be if achieved).
 - As an option, describe obstacles that may occur and how they might be overcome.
3. Be creative and persuasive: Sell the idea!

GLOBAL ISSUES PROBLEM SOLVING KEY TIPS for Coaches and Students

Step 6, Action Plan - *Helpful Hints*

1. 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 due to one of these reasons:

- The criteria are not adequate,
- The rank-ordering of solution ideas in the grid needs work,
- The favorite solution idea is being mistaken for the best solution.

2. Other solutions - Be careful if using other solution ideas as part of the Action Plan. Another idea or two from the grid is acceptable if truly supporting the best solution idea and not overshadowing it, but the overall plan should be a unified effort to address the Underlying Problem.

3. Elaborate - The original solution idea may be used as the starting point for the Action Plan, but the plan should go well beyond that idea with many details.



GLOBAL ISSUES PROBLEM SOLVING KEY TIPS for Coaches and Students



OVERALL

The overall scores reward problem solvers who can combine research, creativity, and futuristic thinking to effectively work from a Future Scene to a focused Action Plan using the creative problem solving process.

Evaluators are looking for work that shows evidence of preparation, but that also demonstrates a spontaneous and creative response to the Future Scene. “Memorizing” developed ideas ahead of time and force fitting them to the Future Scene is in opposition to the principles of Future Problem Solving.

Research Applied measures the application of research throughout the booklet. Practice with embedding research terms, concepts, and information into the steps of the problem solving process is recommended.

- Vocabulary terms and facts specific to the topic studied are an indicator of research.
- Examples and incidents from the research may be woven into the challenges, solutions, and Action Plan.
- Criteria selected may mirror key issues encountered in the relevant topic research.
- Application of knowledge from other areas of study may also be relevant.

Creative Strength measures the creative, productive thinking in evidence throughout the booklet. Practice with a variety of creative thinking tools for generating ideas is recommended.

- Unique ideas that earned originality points indicate a strong level of creativity.
- Skillful use of the problem solving process and spontaneous response to the Future Scene are indicators of creative thinking.
- High scores on the creativity scales of fluency, flexibility, and elaboration are signs of creative strength.
- Responses showing creativity are those requiring intellectual energy to make mental leaps beyond obvious or commonplace responses.

Futuristic Thinking measures the ability of students to put themselves into the time frame of the Future Scene. 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 is recommended.

- A demonstrated understanding of relevant trends from the research is evidence of futuristic thinking.
- An awareness of potential future technologies exhibits knowledge of future trends.
- Development of futuristic, yet workable ideas is essential. Trivial, magical, or unworkable ideas are not evidence of futuristic thinking.



GLOBAL ISSUES PROBLEM SOLVING
KEY TIPS for Coaches and Students

Spontaneous Response to the Future Scene

The educational goal of Global Issues Problem Solving is to prepare students to respond to real world challenges using problem solving skills. With this in mind, problem solvers should respond directly and creatively to the Future Scene. While preparation and practice is important, memorizing “pre-packaged” challenges, Underlying Problems, solutions, criteria, and action plans and making them fit the Future Scene does not meet the educational goals of the program. Here is a comparison of spontaneous versus pre-packaged preparation.

Being Prepared and Spontaneous	Being Pre-packaged (Canned)
<ul style="list-style-type: none"> • For practice, writing multiple Underlying Problems related to challenges encountered in the research. • In competition, developing a UP based on the Future Scene charge and details. 	<ul style="list-style-type: none"> • Having completely prepared an Underlying Problem and “force-fitting” or adapting it to the Future Scene. • Possibly working with multiple teams and individuals so that all are planning to use the same UP idea.
<ul style="list-style-type: none"> • For practice, brainstorming ahead of time multiple solution ideas for the practice UPs; brainstorming details for some of the solution ideas. • In competition, adapting known ideas and generating new and unusual ideas. 	<ul style="list-style-type: none"> • Having prepared ahead of time multiple solution ideas to the one selected UP. • Preparing ideas that can easily be applied to any Future Scene on the same topic. • Each team member prepared to write very specific ideas.
<ul style="list-style-type: none"> • Applying research to areas specific to the Future Scene. 	<ul style="list-style-type: none"> • Loosely tying general ideas from research to the Future Scene.
<ul style="list-style-type: none"> • For practice, generating criteria to multiple practice UPs, especially those using issues from the research. • In competition, generating criteria to fit the UP and the Future Scene situation. 	<ul style="list-style-type: none"> • Planning criteria to fit a pre-selected Underlying Problem and solution idea.
<ul style="list-style-type: none"> • In competition, using criteria to determine the best solution idea for the Action Plan. • Generating and writing an Action Plan based on research. 	<ul style="list-style-type: none"> • Pre-selecting, planning, and practicing the Action Plan before competition. • Ignoring criteria to begin writing the Action Plan before Steps 1-5 are complete.

CATEGORY LIST

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

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. Arts & Aesthetics 2. Basic Needs 3. Business & Commerce 4. Communication 5. Defense 6. Economics 7. Education 8. Environment 9. Ethics & Religion | <ol style="list-style-type: none"> 10. Government & Politics 11. Law & Justice 12. Miscellaneous 13. Physical Health 14. Psychological Health 15. Recreation 16. Social Relationships 17. Technology 18. Transportation |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Evaluation Criteria for Global Issues Problem Solving

Step 1 / Challenges

- Y** *Yes!* This is a possible challenge.
- P** *Perhaps* this is a challenge. Explain more completely.
- W** *Why* is this a challenge? The evaluator cannot see the connection.
- S** This is a *solution* idea instead of a challenge.
- D** This challenge is a duplicate – too similar to another one.

Fluency measures the quantity of *Yes* challenge ideas.

Flexibility measures the number of different categories covered by the *Yes* challenges.

Clarity measures the quality of the writing and the cause-effect reasoning in the challenges.

Originality is awarded for innovative ideas not generated by most other teams.

Step 2 / Underlying Problem

Completeness considers **Condition Phrase, Stem+Key Verb Phrase, Purpose, and parameters** to evaluate that the required elements in the UP are present.

Focus looks at the scope of the UP and whether it is too broad or too narrow.

Adequacy judges the importance of the UP and the impact on the Future Scene.



Step 3 / Solution Ideas

- R** This is a *Relevant* solution that addresses the Key Verb Phrase of the UP and supports the Purpose.
- P** *Perhaps* this is a solution. Explain more completely.
- W** *Why* is this a solution? Does not seem to address the KVP and Purpose.
- D** This solution idea is a duplicate – too similar to another one.

Fluency measures the quantity of *Relevant* solution ideas.

Elaboration rates the number of *Relevant* solutions with three areas of significant detail.

Flexibility rates the number of different categories covered by the *Relevant* solutions.

Originality is awarded for *Relevant* innovative ideas not generated by most other teams.

Step 4 and 5 / Criteria and Grid

Correctly Written judges the structure of a single standard, superlative, and desired outcome.

Relevance judges whether the criteria are generic to any UP or specific to this UP.

Correctly Used judges to what extent the grid is completed accurately.

Step 6 / Action Plan

Relevance measures the relationship of the plan to the Underlying Problem KVP and Purpose.

Effectiveness evaluates how well the plan successfully solves the UP.

Impact determines to what extent the plan will have a positive impact on the Future Scene.

Humaneness measures the productive, positive potential of the plan.

Development of Plan measures how well a comprehensive, workable plan has been presented.

Overall

Research Applied rates the application of research shown throughout the booklet.

Creative Strength measures the creative, productive thinking shown in the booklet.

Futuristic Thinking evaluates how well the team has addressed issues of the future.

GLOBAL ISSUES PROBLEM SOLVING
KEY TIPS for Coaches and Students

Evaluation Criteria
Future Problem Solving Program International

Identify Challenges (Step 1)

Fluency1 2 3 4 5 6 7 8 9 10
 Flexibility1 2 3 4 5 6 7 8 9 10
 Clarity1 2 3 4 5 6 7 8 9 10
 Originality3 x ____ = ____

Select an Underlying Problem (Step 2)

Condition Phrase.....0 1 2
 Stem & KVP.....0 1 2 3
 Purpose0 1 2 3
 Future Scene Parameters0 1 2
 Focus1 2 3 4 5 6 7 8 9 10
 Adequacy1 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
 Flexibility1 2 3 4 5 6 7 8 9 10
 Originality3 x ____ = ____

Select and Apply Criteria (Steps 4 & 5)

Correctly Written.....0 1 2 3 4 5
 Relevance0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
 Correctly Used.....1 2 3 4 5

Develop an Action Plan (Step 6)

Relevance1 2 3 4 5
 Effectiveness1 2 3 4 5
 Impact.....1 2 3 4 5
 Humaneness.....1 2 3 4 5
 Development of Action Plan1 2 3 4 5 6 7 8 9 10

Overall

Research Applied1 2 3 4 5 6 7 8 9 10
 Creative Strength1 2 3 4 5 6 7 8 9 10
 Futuristic Thinking.....1 2 3 4 5 6 7 8 9 10

GLOBAL ISSUES PROBLEM SOLVING
KEY TIPS for Coaches and Students

Antarctica
1993-94 Second Practice Problem

Future Problem Solving Program International
Middle/Senior Division

As you and your teammates stepped onto the huge Eco tour 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 that 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 Eco tour. You will assist in research in marine biology, geology, the atmosphere, and ecology. You will also serve as Eco watchers: Take careful notes of anything that 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 Eco tour. 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 Antarctica Treaty voted to end all land claims on the continent. Shortly after that and to loud protests, a group of businesspeople 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 prepare your enrichment program.

GLOBAL ISSUES PROBLEM SOLVING KEY TIPS for Coaches and Students

Cashless Society 1996-97 Qualifying Problem

Future Problem Solving Program International Junior Division

Dinner was always lively for the Jungs – mother, Shih-li; 15-year-old, Jen-hai; 12-year-old, Ranna; Grandma; and Granddad. This evening, Granddad wasn't home, but Ranna's friend, Ashley, was there.

"I heard some news today," Shih-li began. "Leabeau County has been chosen for the first all-out test of the cashless society. Everyone is going to have to use stored-value cards, credit cards, or electronic money for all transactions that take place within this county."

"That means no cash or checks?" asked Ashley. As Shih-li nodded yes, Ashley went on. "It's going to be confusing and hard on my family. Dad has been out of work three years. My parents don't have any credit cards. We use cash mostly. We don't even own a computer. Mom gets us smart cards at the bank for the few things we kids need to buy — she thinks it's safer for us than carrying cash. But, it's been hard for my sister who spent all her card on makeup last week — it was empty before she realized it. And, my little brother is too young to remember a PIN, so his card is never locked."

"Those are real concerns, Ashley," said Shih-li. "We need to explore the challenges of the pilot test and how they might affect each of us. Let's start by identifying what we use now."

The group was quick to identify a variety of methods of exchange they used:

- *Cash and checks.* Used by the Jungs mostly to exchange money between families, such as Jen-hai paying back a small loan from a friend; used as a regular form of exchange by some other families, such as Ashley's.
- *Stored-value cards*, such as the DigiCash Smart Card. Used for every-day expenses such as school lunches and other small purchases; loaded by ATM or computer; balance read by an inexpensive card scanner owned by many families; 'locked' with a 16-digit PIN to avoid unapproved use.
- *Credit cards.* Used for most purchases over MO.
- *Electronic bill-paying.* Many bills pre-approved and paid automatically from the Jungs' bank account.
- *DigiDollar Units (DDU) and CyberChange Units (CCU).* True e-currency, existing only online and not handled by banks; purchased from DDU or CCU and stored on a home computer; used by sending the units in an e-mail-order to businesses, with not all e-stores accepting all types of e-currency. (Grandma noted, though, that she couldn't get used to the idea of e-currency, since it "doesn't really exist except on computer.")

Just then, Granddad rushed in. "Sorry I'm late, but listen to what happened today. I got an e-bill from 'Earth on Link' that said we were past due in paying \$175. I immediately sent electronic payment from our bank to the bank listed in the e-bill, and then realized that our online service is called 'Earth on Line.' I'm afraid I've been taken for a ride. I know the systems are almost completely secure these days, and we've got good laws that regulate transactions, but there are still a lot of other problems!"

Leabeau County in 2013 is sitting on the edge of a very different economic system: the cashless society. Help the group continue their analysis of the cashless society and its meanings for the individual citizens of Leabeau County in 2013.

GLOBAL ISSUES PROBLEM SOLVING KEY TIPS for Coaches and Students

Space Junk 2008-2009 Qualifying Problem

Future Problem Solving Program International Middle/Senior Division

Commander Bretta Brutan and her crew closely examined the debris they had just pulled from the retrieval portal. "It's only a frozen lump of rocket fuel," a crew member moaned. Brutan shrugged, "Jettison it. We already have a sample of that." Brutan's spaceship, the Astralorbitor, was created for the sole purpose of collecting valuable space artifacts and her crew wasn't about to weigh down their ship with duplicates or worthless junk.

In 2007, Google's Lunar X-Prize opened the door for privately funded teams to compete in the race to conquer space. Now, in 2044, over thirty privately owned spaceships are in orbit, with more on the way. Their goal? The Z-Prize: A ten billion dollar prize for collecting the most significant historic artifacts floating in space. Z-Prize money is donated by benefactors dedicated to supplying artifacts for a recently created space station museum. The orbiting museum is the logical destination for space tourists who can optimize a trip into space by viewing space history as well.

The museum currently houses a multitude of small items, and its developers plan to use ion thruster technology to change the orbit of large historic items to bring them near the museum. But ion thrusters take months to change the orbits of large artifacts, and prize-seekers like Commander Brutan are too impatient for that. They are racing to cash in on the large items by tethering them to their spaceships and towing them to orbits near the museum. Commander Brutan boasts, "Vanguard 1 was launched in 1958 and is still in orbit, and the defunct Hubble telescope is out there, too. When we deliver these relics, just think what historians can learn - and, of course, we'll definitely win!"

The goal of winning is shared by other Z-Prize competitors who are using extreme measures to be the first to reach and deliver these prized artifacts. Mid-space collisions are an ever-present danger. Early in the competition, two prize-seeking spaceships collided, killing all on board. Recently, the Astralorbitor's tether destroyed a Chinese communication satellite. But most prize-seekers share Brutan's philosophy, "The reward is worth the risk." Museum personnel are dismayed at this attitude, yet can't help but be excited about the number of historically valuable items the prize-seekers will deliver.

Brutan's crew faces competition not only from other Z-Prize seekers but also from a growing number of space salvage operators who want to capture and sell junk to the highest bidder. Space junk is not necessarily "junk" since its estimated total value is three trillion dollars! Commander Brutan worries that some of the most desirable artifacts will be captured by salvage operators before she can get to them. But she is even more concerned about the recent appearance of spaceships known as "clean sweepers." Using cutting-edge technology, the "clean sweepers" are determined to create easier access to the moon. They use costly lasers to vaporize any space junk they encounter, with no concern about its value or historical significance. They envision the profits from mining the moon to be far greater than what either the Z-Prize or salvaging would generate.

The Astralorbitor also faces an increase in new space objects: updated weather and communication satellites, telescopes, and a vast number of military weapons - many launched by countries new to the space environment. In addition, the prize-seekers are dodging millions of man-made pieces of junk in many different orbits. Recently, the space station museum had to be boosted into a different orbit in order to avoid a derelict rocket.

Most scientists are appalled by the profit-motivated space travelers. Many scientists warn about human exposure to space debris before it can be studied in depth. They point out that some debris can be radioactive or contain other dangerous elements. One of the Z-Prize ships recently returned to Earth with most of the crew suffering from unexplained illnesses.

While Brutan and others race to win the Z-Prize, heated debate continues. The orbiting museum developers argue the value of space junk and its historical significance. As Future Problem Solvers, you are asked to use the six-step problem solving model to address the issues dealing with the space station museum as it builds its collection of artifacts.