

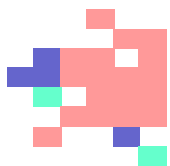
JEFFERSON COUNTY PUBLIC SCHOOLS

Middle and High School Coaches Booklet

Future Problem Solving



September 2010



Janet M. Morris
Coordinator, Academic Competition
Carolyn Brunson, Secretary

Phone: 502-485-3492
Fax: 502-485-6647
Email: janet.morris@jefferson.kyschools.us
Academics, Activities, Athletics
Jerry Wyman, Director
VanHoose Annex
P.O. Box 34020
Louisville, KY 40232-4020

JEFFERSON COUNTY PUBLIC SCHOOLS

SCHOOL ACADEMIC COMPETITION

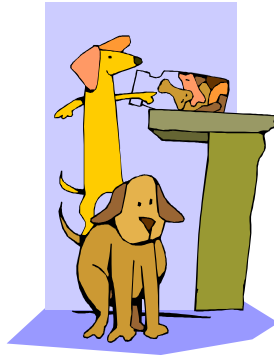
This manual is met to be used as a supplement to the KAAC scoring manual for FPS.

PROBLEM SOLVING

We all have problems to solve, decisions to make. In order to solve these problems and make good decisions, we first have to understand the problem. Who or what is involved in the problem? When and where does the problem occur? Why does it occur? How does it occur? In other words, what *is* the problem? If we fully understand the scope of the problem, we are more likely to come up with a good solution.

In order to do this, we have to:

- gather information
- analyze the specific situation
- define the problem
- generate many possible solutions
- evaluate the solutions
- select a solution
- communicate that solution to the proper audience



Future Problem Solving is a classroom activity designed to help students study the past, explore the present, and investigate the possibilities of the future. It may be used to solve personal problems and problems of society. It may be used as a study tool in all subject areas and to help students understand and focus on environmental and social issues on local, national and global levels.

Future Problem Solving in the classroom can teach sound thinking skills and problem solving processes. It helps teach students how to work in groups, how to share information, how to compromise and how to collaborate.

THE BENEFITS OF TEACHING PROBLEM SOLVING IN THE CLASSROOM

Problem Solving is a team activity that helps students learn to think. It teaches students to examine their own problems and the problems of the world, both critically and creatively. It provides students with strategies for facing everyday problems, individually and collectively. It teaches students how to think about the world in constructive ways; how to analyze situations and focus on and explore potential alternatives to problems.

As members of a problem solving team students learn to work together in an ever-changing environment. This activity gives them practice in compromise, in sharing and in defining and refining ideas. It involves gathering and sharing information; brainstorming ideas; defining a specific problem that, if solved, may lead to the solution of other problems; selecting and improving on a “best” solution; and describing that solution so that others understand.

The problem solving process helps students improve their research skills; improve their thinking skills, both creative and critical; and increase their communication skills, both verbal and written. It helps students learn to function more effectively as a member of a team. It also guides students to become more self-directed and responsible, not only as individuals, but as members of a group, and as members of society.

THE ORIGINS OF FUTURE PROBLEM SOLVING

The Future Problem Solving Program International (FPSPI) was founded by creativity pioneer, Dr. E. Paul Torrance and involves over 250,000 students annually from Australia, Canada, Hong Kong, Japan, Korea, Malaysia, New Zealand, Russia, Singapore, and the United States.

FPSPI offers the following problem-solving components in addition to the competition that is part of Governor's Cup:

Community Problem Solving (CmPS)

CmPS focuses on real community problems. Teams explore local issues and select a CmPS project from environmental concerns, human services, civic/cultural issues or health concerns. A team of middle grade students in Texas focused on relieving the boredom and depression of adolescent hospital patients by creating and delivering "Boredom Buster Kits" to four Houston-area hospitals as well as three hospitals in Eastern Europe.

Scenario Writing

Encouraging creativity, scenario writing allows an individual writer to create a futuristic short story based on one of the five FPSPI topics. Students develop and polish their creative writing skills. FPSPI scenarios are limited to 1500 words and must be placed 20 years in the future.

Junior Division

The Kentucky Association for Academic Competition sponsors a Junior Division in Future Problem Solving. The JR Division is a component of the International FPS Program. The JR Division is offered as a separate competition and is NOT a part of Governor's Cup Competition. A team of students in grades 4-6 may participate in the JR Division of FPS. Since the Governor's Cup State Finals Competition is held simultaneously with JR Division FPS, students MAY NOT participate in both in March if your 6th graders also write for your Governor's Cup team. 6th grade students may not participate in the ELEMENTARY division of Governor's Cup.

Individual FPS

Individual Future Problem Solving (FPS) is held at the Governor's Cup State Finals. It is NOT part of Governor's Cup. Individual FPS competition features one student, rather than a team, who works through the FPS process. Individuals generate 8 challenges in Step 1, and 8 solution ideas in Step 3. Step 2, Step 4, Step 5 and Step 6 are exactly the same as the team competition. Participants have two hours to complete a booklet.

For more information:

To learn more about FPSPI, contact Future Problem Solving Program International.

FPSPI • 2015 Grant Place, Melbourne, FL 32901

Voice: 800.256.1499 or 321.768.0074 • Fax: 321.768.0097

E-mail mail@fpspi.org • www.fpspi.org

The Kentucky Association of Academic Competition is Kentucky's affiliate with FPSPI. To sign up to participate in any of the FPS component competitions that are not part of Governor's Cup, contact KAAC. They can answer many of your questions and can provide you with the resources you need to get started with FPS.

Kentucky Association for Academic Competition

113 Consumer Lane

Frankfort, KY 40601

Phone: 502.223.0088

Fax: 502.223.0430

General E-mail: kaac@kaac.com

HOW DO I PICK MY FUTURE PROBLEM SOLVING TEAM?

Future Problem Solving (FPS) team members must be able to work cooperatively without adult intervention. That makes choosing the right team members extremely important and very difficult. You want students with some leadership ability as well as students who are creative and think outside the box. Also, students who are interested in current events and issues of the day enjoy the research that is necessary for FPS.

"Bossy" students can be a detriment to an FPS team. Please don't confuse bossiness with leadership ability. Bossy students cause arguments among the team members and inspire hard feelings. Good leaders listen to the ideas of others and can evaluate the best course of action to take after hearing many different views. They elicit positive responses from the people they work with and inspire cooperation. Good leaders have a knack for making everyone in the group feel important and their ideas appreciated. They also know when to take a back seat to someone else with more knowledge about a given subject when necessary. As you can imagine, good leaders are hard to find. As an FPS coach, your job is to train students to have these important life skills.

A good team size is 5-6 students. Exactly four students work together in a KAAC competition to complete a booklet, and you are not allowed to compete short-handed. Therefore it is important to have alternates in case a team member cannot compete in a KAAC Saturday competition due to illness, etc.. However, keep in mind that in league play, you are allowed to compete with less than four if necessary. League is for practice, and we do not penalize a short-handed team for a member's absence by not allowing the rest of the team to practice.

Remember, though only four students can participate in Governor's Cup written FPS competition, there are other ways for your team members to compete as individuals. See page 3 of this manual and the KAAC website (www.kaac.com) to investigate other FPS competitions.

HOW DO I RUN MY FPS PRACTICES?

The first step for every FPS coach is to teach the problem solving methods to their students. Those steps are outlined in this booklet. Start with fairly easy scenarios and give them progressively broader and more difficult future scenes as they progress. There are practice prompts at the back of this FPS booklet to get your team started. Use these scenarios to work through practice booklets together. Give your team feedback on their progress.

JCPS uses Governor's Cup topics for FPS league play. See the Academic Competition website's FPS Schedule page for details about when each topic will be used. This will help you to schedule your research for practices.

Go to www.KAAC.com sales link to order valuable FPS resource material, such as the *Readings, Research and Resources Manual (RR&R)*, which has a collection of articles and research on each of the topics for the year. If you get nothing else as an FPS coach, get the RR&R. It is extremely helpful!

RESEARCH!

A portion of each practice should be devoted to research on the current year's topics. (You can vote for the topics you prefer in the spring of each year on the www.fpsp.org website.) Give your team homework to find an article about one of the topics to bring to practice each week. Have the person who brought the article summarize it for the group. You may want to create a booklet that contains their research info. (Remember, students are not allowed to bring research materials with them into the competition room at competitions. They are also not allowed to use research materials found in the room on that day. That

means they need to know their subject very well before the day of competition.) Lead discussions about each topic to find out which students are most knowledgeable about it.

The broad problem solving topics change every year and are selected by FPSPI. The topics are very broad for a reason. Future scenes will be given to the students on competition days. It is up to them to identify the underlying problem in the scene. The background knowledge they gain through their research will help them to make more sense of the future scene and make better decisions about possible solutions.

TEACH PROPER TECHNIQUE

Devote some time to teach your students the proper way to write an underlying problem. If they can master that step, the rest flows much more easily.

THE PROCESS

What is a problem?

A problem is. . . .

- < a broken bike
- < getting a bee sting
- < a big brother who bosses you
- < throwing up
- < the dog eating your shoe
- < not understanding a math problem
- < getting sent to the office
- < being alone and being scared
- < fighting on the bus
- < losing your lunch money
- < forgetting to do your homework



What is a solution?

A solution is. . . .

- < finding out what is wrong with your bike and fixing it
- < putting baking soda on your bee sting
- < writing an agreement with your brother
- < taking medicine for your sick stomach
- < buying the dog a new toy
- < getting a tutor or asking the math teacher for help
- < saying you're sorry and trying to do better in school
- < asking a friend to stay with you when you're alone
- < staying away from people who fight on the bus
- < telling the teacher and remembering to bring enough money tomorrow
- < writing down your homework and remembering the directions



IN THE BEGINNING

Brainstorming is the first step in problem solving. The purpose of brainstorming is thinking up ideas. Good brainstorming has an opening and a closing with an announced time span of three to five minutes.

Teach the entire class how to brainstorm. As a warm up activity, ask them to go in turn around a circle and brainstorm a simple idea. Name as many things as you can that are round. If a student does not give an immediate answer, go on to the next student. Ask students to “piggy back” on other answers.

softball
plate

coin
bowl

bottle top
my head

Another possible warm-up activity: Take one of the items listed above. How many ways can you use it?

Example: PLATE

throw it

eat off of it

roll it

juggle it

use it as a frisbee

cover a bowl



The SCAMPER checklist (Eberle, 1971) is an adaptation of the work of Alex Osborn (1963) and it is a checklist to elaborate on brainstorming.

Substitute:	What could you substitute?
Combine:	What two ideas can you combine?
Adapt:	Adjust something to better fit your purpose.
Modify:	What would happen if you modified it?
Magnify:	What would happen if you made it larger?
Minify:	What would happen if you made it smaller?
Put to new use:	How could you use it differently?
Eliminate:	What can you take away?
Reverse:	What would happen if you turned it around?

The problem solving process utilizes both divergent thinking (brainstorming) and convergent thinking (narrowing the focus to a manageable amount of information).

Before students can embark on the problem solving process, they must learn to BRAINSTORM - think up ideas. Brainstorming is an exercise in “idea-finding.” The object of brainstorming is to produce a large number of ideas, which may suggest a solution to a problem.

IMPORTANT GUIDELINES FOR BRAINSTORMING. . .

- < All ideas are acceptable. Criticism is ruled out.
- < Every idea is valuable - especially some of the “far-out” ideas. Free-wheeling is welcomed. The wilder the ideas, the better.

- < Offbeat and silly ideas may lead to something better. They may trigger an idea that is really good.
- < Combine and elaborate. “Piggybacking” is encouraged - tagging on to others’ ideas. Students should build on others’ ideas.
- < Quantity is the key! The more ideas, the better.

THINK CREATIVELY!

Broaden the scope with categories such as:

Art/Humanities	Environment	Politics
Business	Ethics	Recreation
Communication	Government	Religion
Defense	Health	Social Needs
Economics	Housing	Transportation
Education	Law	



BASIC STEPS IN PROBLEM SOLVING

Your team doesn’t have to stick to the topics chosen each year by FPSP. To get additional practice, they may also want to use the problem solving process with topics of their own choosing.

- 1. THE TOPIC is a very broad idea.**
WHERE TO GET IDEAS FOR PRACTICE TOPICS...

Curriculum - Use a content topic from one of your teaching units. If you are studying history, choose a topic from the history period you are studying. For example, if you are studying Kentucky history, select “pioneer times” as your topic. For school units, the topics can address the past, the present, or the future. For competition, prompts will deal only with the present or the future.

School - Identify a problem in your school. Have the students brainstorm what they perceive as problems - noisy cafeteria, fighting on the bus, graffiti in the restrooms, too many students in the halls, etc.

Current Events – Have your team bring in articles on current news stories about events happening at home and abroad. Environmental issues, safety concerns, world hunger, child labor...all of these can be the basis for interesting scenarios.

- 2. GATHER INFORMATION.**

Encourage students on the team to each research a different part of the broad topic. The goal is to learn as much as possible about the topic. Have students share their information with each other.

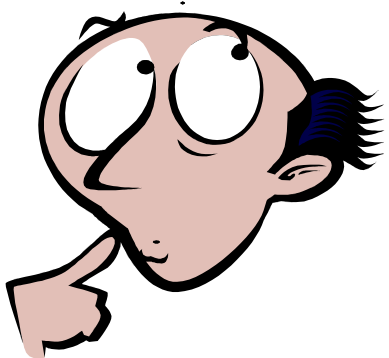
Ask the students to research some or all of the problems they have identified. Have them gather data about the problems they have identified. For example, for the school related problems listed above, you could have the students investigate: On what bus does the fighting occur? When does the fighting occur - before or after school? At what time of day is it the nosiest in the cafeteria? Who supervises the cafeteria?

- 3. NARROW THE SCOPE.** Have the team select one problem. Have them define the problem and create solutions in several different directions.

If the broad topic is “pioneer days,” the specific problem might involve a family crossing the mountains to settle in Kentucky. This is really very much like an open-ended question. However, instead of an answer from an individual, you have a group working together and generating lots of different ideas. Try to find first hand accounts of people from that time, as well as secondary sources.

If your team decides to work on some school issues, such as fighting on the bus, be sure to inform and/or enlist the permission and assistance of the principal and others involved. Interview people in the school involved with the problem at hand.

- 4. BRAINSTORM THE SUBPROBLEMS.** Have the students analyze the situation and list as many of the sub-problems as possible related to that problem.
- 5. IDENTIFY THE MAIN (OR UNDERLYING) PROBLEM** –This is the problem your team will focus on finding solutions to. This may be one of the most difficult steps. What exactly is the problem in this situation? Is there just one problem or is there a combination of several issues? At this point, the students must define the problem. The “problem” might be defined as the cause. The written underlying problem should be a one-to-three sentence statement that defines the problem. It must NOT contain a solution. It may NOT be a restatement of the situation. Remember! The prompt is NOT the problem. If the prompt states that ducks are crossing the road, the problem is not the ducks crossing the road. The problem is that they may get killed or they may cause an accident. Why are they crossing the road? Are they hungry? Do they not know the danger? Are they looking for something?
- 6. BRAINSTORM SOLUTIONS.** Have the students brainstorm as many solutions to the problem (not the situation) that they have defined.
- 7. EVALUATE THE SOLUTIONS.** In order to find the best solutions, students must evaluate their solutions and select the one solution or combination of solutions that will best solve the problem. Ways to evaluate the solution might include: the cost of the solution, the people involved in executing the solution, the ways of communicating the solution, the results if this solution is used. What is the most promising solution? What will give the most benefit to the most people. Is the solution feasible?
- 8. CHOOSE AND DRAW CONCLUSIONS. SUMMARIZE AND DESCRIBE THE “BEST” SOLUTION.** A well written action plans contains answers to all the following questions about how the solution will be implemented:



WHO?

WHAT?

WHEN?

WHERE?

HOW?

JCPS LEAGUE PROCEDURES FOR FUTURE PROBLEM SOLVING

JCPS went to an all written booklet format for league FPS competitions in middle and high school in 2010. League competitions are necessary to help the students prepare for Governor's Cup by giving them the chance to practice the KAAC FPS format. Also, it is helpful to give evaluators more chances to practice scoring booklets before they are asked to do so at Governor's Cup competitions.

The fall league session for FPS consists of three **mandatory** competition sessions. We use a hosting rotation, so the burden of hosting doesn't always fall to the same schools. Because it is a written competition, not presentation style, one large room, such as a library or cafeteria, will suffice for hosting. Teams should be spread far enough apart that they can whisper to each other and not be heard. Teams will meet at the host school, be given a scenario, and will complete a full booklet just as if they were competing at Governor's Cup. The time allotted will be the same as a Governor's Cup competition as well. No more than 4 students may compete on a team. However, schools may have more than one team compete. Coaches who enter more than one team must score more booklets. (1team entered = 2 booklets to score; 2 teams entered = 4 booklets to score, etc.) For league purposes only (NOT for Governor's Cup) teams may compete with fewer than four on a team as long as there is more than one person. The reasoning behind this is that league is for practice, and it is not helpful if a whole team is not allowed to practice because a teammate was ill on a competition day.

After the time is up, the host school will make two copies of each booklet to randomly give to the coaches to score. They will also be given score sheets and an envelope addressed to the Office of Academic Competition. Coaches must return the scored booklets and score sheets by the deadline the following week. Coaches may not score their own teams' booklets. Included in the hosting packet will be the score sheets and addressed envelopes for the coaches to return the score sheets and booklets to the office by the deadline, which will be one week after the competition. The score sheets will be returned to the coaches to be used for feedback on their team's progress.

Note: These competitions (Including the scoring of the booklets on time) are mandatory in order to receive full pay as an FPS coach in middle and high school. Please make sure you and your team can attend and participate on the posted competition dates.

MIDDLE SCHOOL LEAGUE POINTS

League points will be awarded for all three FPS competitions at the middle school level. Points will be awarded by place of finish. 5 points for first place, 4 points for second place, etc. Every effort will be made to have all teams compete against each other during the league season. League points will be awarded for all three FPS competitions.

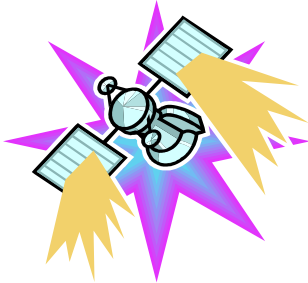
If a school enters more than one team, league points will be earned only by their highest scoring team. No double points will be offered, nor will a school's second team be allowed to knock another school's team down in the ranking for league points. Coaches must return the scored booklets and score sheets by the deadline the following week. When we receive score sheets, we will average the scores and rank the competing teams.

Points will be awarded for league standings based on the averaged score (each booklet will have been scored by two different evaluators). Score sheets must be returned by the deadline listed, or the evaluator's team will receive no league points for FPS for that competition.

Develop underlying problems

Have your team write several underlying problems from prompts.

THIS IS THE PROMPT:



Advertisement in popular US parenting magazine, Sept., 2015: Parents, your fears are over! Never again will you be afraid of losing a child or child abductors! The answer is in the new microchip implant from Global Positioning Satellites, Inc. With the implant, you will always know the location of your child at every minute of the day or night! Used successfully for years to keep tabs on pets, this system is a tried and true safety precaution. Lost children can be tracked down to within a few yards in minutes via satellite. The chip can be implanted beneath the skin at birth and contains unique identity codes for your child. But wait! There's more! This

model is better than any previous prototype because it allows you, the parent to set limits for your child. The small wristband you wear works as a receiver. So, you don't want your son playing with that trouble-maker down the street? You can set the chip to send you a warning when that child is within 100 ft. of your son! Who says you can't pick your kids' friends! A certain store off limits to your daughter? Set the chip to send you a signal if she enters the premises. The possibilities are endless! Let your parenting worries be over. Have your child implanted today!



BRAINSTORM POSSIBLE PROBLEMS

- Abductors could locate and cut out the chip.
- Children would have no privacy.
- What's to keep abductors from using the device to locate certain kids they want to abduct? It could actually help abductors find kids to hold for ransom.
- Stores could use each child's code to detect when they enter and leave and what they purchased. This info could be used to target ads at them the next time their code is detected entering the store.
- Children may come to resent their parents because they are given so little freedom.
- Children may actually begin removing their own or each other's chips creating serious health risks and infections.
- Some children may have allergic reactions to the silicon in the chips.
- Long term use may cause cancer.
- The surgery to implant the chip could be painful and possibly even dangerous to the child.
- The chip could malfunction and have to be surgically removed causing the need for additional pain and suffering.

WHAT PROBLEM DO YOU CHOOSE TO SOLVE?

Children may begin to resent their parents because they are given so little freedom.

WRITING AN UNDERLYING PROBLEM

- Read the prompt.
- Underline the key words and phrases in the prompt.
- Brainstorm problems related to the underlined words.
- Select one or two specific problems.
- State what this problem may cause.
- Write a clear and concise statement stating the problem and the possible outcomes if the problem is not addressed.
- Complete the underlying problem by adding any necessary qualifying phrase(s).

An underlying problem may include one problem or a combination of problems. If the underlying problem includes more than one problem, the solution must address all of the issues mentioned in the problem.

In order to write a good underlying problem, students should brainstorm (16 required by FPS) several problems related to the prompt. These problems may be related to, but not limited to, education, philosophy, transportation, communication, physical health, mental health, emotional health, business, economy, societal values, politics, government, and/or technology. After brainstorming the problems related to the prompt, the students should categorize their problems and check to see how many of the categories they have identified.

Using the list of problems, students must evaluate and decide on the one or combination of problems they choose to solve. Writing the underlying problem using the Future Problem Solving vocabulary is the next task. In FPS, the language is always the same.

The first step in writing an underlying problem is the **CONDITION PHRASE**. This tells the current condition of the problem you will address from the future scene.

Next is the **STEM**. You always begin your underlying problem with the phrase - “How might we”... Notice that the word “might” implies possibility not certainty. Be sure that if the “we” your team is referring to in this phrase is *themselves* (the future problem solving team from XYZ School), that the solution they choose is something they can actually *do* themselves.

After the stem comes the **KEY VERB PHRASE**. Students should choose the verb that best describes the intention of the problem. The verb should be **ACTIVE**, not passive. Use a soft verb, not an absolute verb. Don’t use verbs like: cease, end, solve, or eliminate. These things are often impossible to accomplish. For instance, it would be impossible to **END** crime, but it is possible to **DÉCREASE** the crime rate. **DÉCREASE** is a good example of a soft verb.

SUGGESTED ACTION VERBS FOR UNDERLYING PROBLEMS:

organize, appreciate, enrich, satisfy, arrange, motivate, appease, assemble, enjoy, encourage, extend, prepare, approach, inspire, supply, order, converge, renew, grow from, change, revive, plan, experience, substitute, reward, increase, distribute, restore, evolve, schedule, exchange, improve, adapt, develop, switch, amend, alter, amplify, generate, upgrade, build, produce, endeavor, start, establish, commence, strive, enlarge, disclose, originate, enhance, express, attempt, magnify, expand, invent, manage, mature, initiate, launch, perform, convey, handle, become, conduct

After selecting the verb, it is time to write the PURPOSE. This is the reason for the action. Questions to ask yourself to help you write the purpose:



WHY ARE YOU MAKING THE CHANGE?

WHAT WILL YOU ACHIEVE?

WHAT IS YOUR DESIRED OUTCOME?

There should be ONLY ONE purpose.

Select words and phrases that describe the action to be taken and the group or person that will take the action. It may be a combination of actions, that if taken, can result in addressing several problems.

Include at least TWO PARAMETERS somewhere in your underlying problem. These include giving the time, place, or topic.

THE STRUCTURE OF THE UNDERLYING PROBLEM IS ALWAYS THE SAME IN FUTURE PROBLEM SOLVING. MEMORIZE IT!

CONDITION PHRASE...STEM...KEY VERB PHRASE...PURPOSE....PARAMETERS

UNDERLYING PROBLEM

CONDITION:

BECAUSE children with locator chip implants in the United States in the year 2015 could grow resentful that they are given so little trust and freedom..

STEM:

HOW MIGHT WE,

KEY VERB PHRASE:

ENCOURAGE the parents to use the locator chips only in cases of emergency

PURPOSE:

SO THAT, a sense of trust can be built between parent and child.

(Note how the parameters are fit into the beginning of the sentence. Their location is not important. Parameters can be in any part of the underlying problem as long as they are included *somewhere*.)

BRAINSTORM SOLUTIONS TO THE UNDERLYING PROBLEM

- Prepare pamphlets that contain information about the need for parent/child trust to distribute outside implant centers.
- Bring a lawsuit for invasion of privacy against the parent of a child with a chip to set a precedent.
- Start a website that contains info about the negative psychological effects of “smothering” children by using locator chips.
- Arrange a protest march, which includes chipped teens at a community center or school against overuse of locator chips.
- Learn to reprogram the chips, tamper with them, or remove them so that parents realize kids need to cooperate with them for the system to work.

DEVELOP CRITERIA

Criteria →	1. Easiest to do	2. Safest for teens	3. Quickest to implement	4. Most affordable	5. Most positive publicity for the cause	Total number of points
↓ Alternatives						
Prepare pamphlets	4	4	4	2	3	17
lawsuit	3	3	1	1	2	10
website	2	5	3	5	5	20
protest march	5	2	5	3	4	19
reprogram the chips	1	1	2	4	1	9

Develop a chart like the one above and decide on the criteria to evaluate solution ideas. Criteria should focus on a single dimension, demonstrate a measure of degree, and indicate the desired direction. Criteria can be either STOCK or TARGET.

STOCK CRITERIA: Are relevant in measuring concerns to most any problem. They are non-specific to the future scene, underlying problem, or solutions.

TARGET CRITERIA: Are specific to the future scene and underlying problem. They show greater insight and are more effective in evaluating the solution idea that is the best to use for the action plan. At least three criteria in your chart should be target criteria in written competition.

Rank each possible solution on a scale from 1-5. 1 is most unfavorable, 5 is best. *Do not repeat numbers down the columns.* Total across each row to determine which solution is best.

EVALUATE YOUR SOLUTIONS

- Research information will be needed for the pamphlets.
- It would be important to have some leading psychologists supporting the cause. Quotes from them would be very effective on the website.
- Arranging the protest would require advertising in advance and getting a permit from the city government. Signs need to be made.
- Tampering with the chips might cause some negative effects on your health. Leakages into your system from the faulty chip could be serious depending on the materials the chip is made of.
- Removing the chip could be painful and may lead to infections.
- Websites require technological expertise to create. It's important to recruit teens with that ability to the cause.
- Removing/Tampering with the chip makes a statement, but may cause parents to be LESS trusting than before.



SO.... WHAT CAN YOU DO?

SOLUTION

Who? We...

What? ...will design a website that contains information about the negative psychological effects of using locator chips in children...

When? ...that will be up within six weeks.

Where? ...The URL (internet address) will be advertised on posters throughout schools and in the community.

How? ... We will enlist the help of students in computer classes in the local high school and include links to articles supporting our cause. The site will also include quotes from famous psychologists about trust building between parent and child.

Conclusion: When they see the website, parents in the United States in the year 2015 will think about the need for trust and allow their teens more privacy in their daily lives by only using the chip in emergencies.

RESEARCH

Included in the booklet should be some specific data or research. Students should cite their source.

Examples: We found out that many psychologists agreed with our position that teens need to feel trusted by their parents. "Rebellious teens are often the victims of smothering by well-meaning, but over-zealous parents," says Dr. Sheila Feldman in her article "Stemming the Rebellion" from *Psychology Today*....

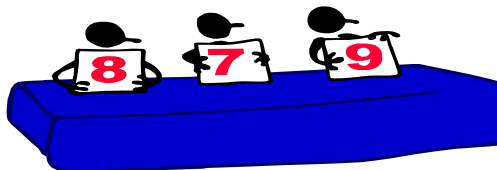
OR We have discovered that we are not the only ones worried about the effects of global positioning satellite technology on future teens. In the article "Is Big Brother Watching Us?" from *Technology World*, the author expresses many of the same fears.



SCORING

Teams will be scored on specific criteria. **Teams are NOT expected to have perfect scores!** It is important that the judges be consistent above all. The judges' score sheets will be averaged to determine the final score.

Does the booklet show logical reasoning and evidence of research? Is the solution original or unusual? Does the booklet demonstrate the use of higher-level, creative and critical-thinking skills?



The problem solving coaches from each participating school will score the booklets. The host school's coach will act as the head judge. All judges should be familiar with the topic and the scoring sheet prior to competition. Coaches should attend KAAC FPS training as soon as possible to prepare for league play. A copy of the KAAC scoring manual is available as a free download from www.kaac.com.

NOTE: Scorers should be completely impartial when judging. They should NOT show undue partiality for their own school's team when judging, not be deliberately harsh with another team. All judging should be consistent.



TO ALL JUDGES . . .

1. Keep the underlying problem in mind. Do students address this problem or do they address the broad topic?
2. Do they elaborate on the solution they state? Is the action plan complete, answering every question?
3. Fill out the score sheet COMPLETELY. Make sure to check your math before returning the booklets and score sheets to the office.

SAMPLE PROBLEM SOLVING TOPIC: ENVIRONMENT

Subtopics might include:	School Waste Ozone	Recycling Clean Water Community
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ON THE DAY OF COMPETITION:

Students will be given an envelope with the prompt that focuses on one of the subtopics and the following instructions.

INSTRUCTIONS FOR STUDENTS

Prepare a written statement on the problem, using the Future Problem Solving format, to address the prompt. REMEMBER! The Future Scene is NOT the problem.

PROBLEM SOLVING PROMPT

In the year 2010, XYZ Middle School is located in an area of Harbortown, USA that looks bad. People do not feel safe. Parents are hesitant to send their students to the school because they don't like the looks of the area and they don't like the gangs hanging out on the street corners. The school must do something to improve its image or students will quit coming to the school.

This prompt deals with several potential problems. Define a problem related to this prompt and suggest a solution to that problem.

Beginning the Project

In the process of getting ready for the Problem Solving competition, the students on the problem solving team will have researched several different subtopics. One of these subtopics might be the community surrounding the school. In order to study that component, the students on the problem solving team took a walk around the neighborhood. They recorded what they saw, documenting the litter, uncut grass and peeling paint. "When it looks bad, it feels bad," said one student. "Does anybody in this neighborhood care what it looks like?" said another student. Why did the area look so bad? If the area looked better, would people be more willing to send their students to that school? Could they possibly affect the area around the school? What would happen if they did? Is there a reason that the area looks so bad? What kinds of things affect this prompt? What are the problems outlined in the prompt and the problems that may have caused the situation?

Brainstorm Problems

- No one mows the grass in the public areas.
- The people in the neighborhood are old and they can't do the work.
- It is a busy street and people throw things out of car windows.
- There aren't any trash cans.
- The stores are closed because there is no business in this area.
- The houses are old and they haven't been repaired.
- Older kids hang out on the street corners after school and leave candy wrappers and soft drink cans.
- There are no flowers planted.
- The trees are old and some of them are dying.

Write the Underlying Problem

CONDITION: BECAUSE parents in Harbortown, USA in the year 2010 do not want to send their kids to school in an unattractive and seemingly unsafe neighborhood,

STEM: HOW MIGHT WE

KEY VERB: IMPROVE the appearance of the neighborhood surrounding the school

PURPOSE: SO THAT people living in the neighborhood and students attending the XYZ Middle School will perceive the area as more safe?

PARAMETERS: Are included in the underlying problem above. Can you pick them out? (Time, place, and topic)

Brainstorm Solutions

- Pick up trash.
- Put up signs asking people not to throw trash.
- Change the traffic patterns so the street won't be so busy.
- Mow the grass.
- Paint the houses.
- Talk to the people who live in the houses about fixing them up.
- Talk to the housing authority about helping people fix up their houses.
- Ask the police to make more frequent visits to the area to discourage the gangs.
- Sweep the sidewalks.



Develop a SOLUTION on which to base your presentation

We will organize a clean-up campaign to make the area around XYZ school look more attractive and safe and parents will be more willing to send their students to a school that looks safe.

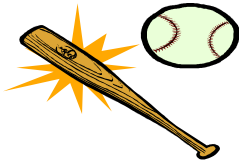
The campaign will begin when the students take weekly walks and pick up the trash around the school. The students will also design flyers and deliver them to all of the residents in the neighborhood asking them to pick up trash in their yards. The students will contact Habitat for Humanity and ask them if they will assist the older people in the neighborhood by painting and repairing their houses. The students will contact the county works department and ask them to mow the common areas and install additional trash cans. They will also contact the local police department and ask them to visit the area more often, keeping the gangs off the streets.

SAMPLE BEGINNER SCENARIOS

For each of the following prompts, brainstorm problems related to the prompt; write an underlying problem; brainstorm solutions; and develop your solution taking into the following: safety, time involved, people and equipment necessary, cost, ethical consideration and other criteria. Explain who, what, when, where, and how.

The New Dress Code

Your school just voted in a very strict new dress code two weeks before school started. Your school has never had a dress code before. Identify some of the problems related to this situation. What are the problems? What is the main problem? Write an underlying problem. What are some of the possible solutions to the main problem? Prepare a 4-6 minute presentation illustrating your problem and your solution.



The Ball Game

Your brother is the star of the local softball team. During the season, the whole family goes to his ball games three times a week. At the end of the season, the team plays in a tournament. They play every night until they lose. They have played two nights this week and will play again tonight. You have a big project due at school. You really don't want to tell your parents because they might make you stay home from the game. Brainstorm some of the problems related to this situation. Select a main problem and brainstorm possible solutions. Prepare a presentation to illustrate your problem and solution.



The Neighborhood Bully

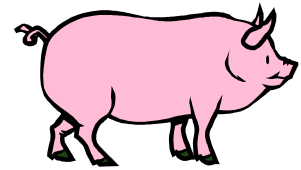
There is a boy who lives down the street who is bigger than you. The rest of the kids in the neighborhood look up to him. You really don't like him, but you are afraid of him and you are afraid of losing your friends if you are not friends with him. When no one else is around, he bullies you. You are afraid to tell, because you don't think people will believe you and you don't want to be a tattletale. There are several problems in this situation. What can you do about it?



School Lunches

You have a new cafeteria manager at your school. She is very concerned about the health of the students. She believes that lunches should be good for you and is very careful to include all of the right foods in the lunch program. Some days, the students at your school waste a lot of food because they don't like what has been prepared. What is the problem here? What are some of the possible solutions? What is the best solution?

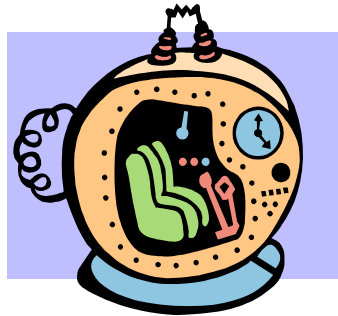
The Pet Pig



Your older brother has a dog. While you love the dog, he belongs to your brother. You want a pet of your own. You really want a potbellied pig. Your mother has said, "No!" Your father seems to be considering it. Brainstorm all of the things you would have to consider if you got a pig. Prepare a check list. Make a presentation to convince your mother and father to let you have a pig.

Trip in Time #1

You are going for a ride in a time machine. You were supposed to go forward 100 years, but your space capsule hit an electric wire and you ended up going back 100 years. You know and understand everything you know and understand today, including computers, television, etc. What are some of the problems that will occur. Brainstorm the problems you will have living in that time period and the problems that will occur because you know so much more than any of the other people of that time. Write an underlying problem and give a presentation.



Trip in Time #2

You are going for another ride in a time machine and this time, you get it right! You go forward in time 100 years. You will only know and understand the things you know and understand today, including computers, television, etc. What are some of the problems that will occur. Brainstorm the problems you will have living in that time period and the problems that will occur because you know so much less than any of the other people of that time. Write an underlying problem and make a presentation.

REQUIREMENTS FOR EACH DIVISION FOR GOVERNOR'S CUP WRITTEN FPS:



	INDIVIDUAL ALL DIVISIONS	MIDDLE GRADE/HIGH SCHOOL DIVISION
STEP 1	8 Challenges	16 challenges
STEP 2	1 Underlying Problem	1 Underlying Problem
STEP 3	8 Solutions	16 solutions
STEP 4	5 Criteria	5 Criteria (3 target)
STEP 5	4 Solutions	8 Solutions
STEP 6	1 Action Plan	1 Action Plan
Time to Compete	120 Minutes	120 Minutes

Brainstorming Tools for Steps 1 and 3:

Think of ideas that relate to these categories in order to generate ideas in steps 1 and 3.

Business and Commerce
 Social Relationships
 Education
 Recreation
 Ethics and Religion
 Physical Health
 Basic Needs
 Economics
 Communication

Transportation
 Environment
 Technology
 Government and Politics
 Arts and Aesthetics
 Psychological Health
 Defense
 Law and Justice
 Miscellaneous

GLOSSARY OF TERMS

Action Plan (Step 6)- Proposal for solving the Underlying Problem (UP). The basis comes from the highest scoring solution from Step 5 but is now expanded to explain in detail the who, what, how, why, where, and when of the solution idea. Will most often consist of three or more paragraphs, but may be presented in a unique format. This is the culminating work of the Future Problem Solving Booklet.

Category (Steps 1 and 3)- A list of 18 different topics that are used to assist students to generate ideas from a variety of sources.

Challenge (Step 1)- A challenge is an issue, concern, or problem that needs attention or consideration, which relates to the Future Scene.

Charge– Directive, found in the Future Scene, that indicates to students the goal of the Future Scene.

Condition Phrase (Step 2)- A lead-in phrase that describes the situation in the Future Scene that is the basis for the challenge chosen in the Underlying Problem.

Criteria (Steps 4 and 5)- Statements or questions used by the team to evaluate solution ideas. Criteria should be focused on a single dimension, demonstrate a measure of degree, and indicate the desired direction. Criteria may be classified as Stock or Target.

Future Scene (Fuzzy, Prompt)- A hypothetical, what if, scenario based on current information or ideas.

Future Scene Parameters (FSP) (Step 2)- Elements that place the UP within the parameters of the Future Scene, including time, place, and topic. Could be described as the setting of the Underlying Problem.

Grid (Steps 4 and 5)- Table used in evaluation of solution ideas. Solution receiving highest score must be used for Action Plan in Step 6.

Key Verb Phrase (KVP) (Step 2)- One key verb in a phrase connected with only one object, that mandates what will be done to solve the UP. The key verb phrase will occur most often after the stem.

Purpose (Step 2)- The outcome expected from the directive set forth by the key verb phrase.

Solution (Step 3)- Proposal ideas that are stated in definite terms that solve the Key Verb Phrase and make a connection to the purpose.

Stem (Step 2)- Use of the phrase, “How might we” or “In what way might we”, in the UP.

Topic– Related subjects that allow students to research and prepare for the Future Problem Solving competitions.

Underlying Problem (UP) (Step 2)- A challenge that identifies and states a very important issue within the Future Scene to solve. The UP is made up of the following components: Condition Phrase, Stem, Key Verb Phrase, Purpose, and Future Scene Parameters.

To order resource books on this year’s topics visit www.fpsp.org and look at their catalog.

SAMPLES OF SCENARIOS USED IN PAST LEAGUE SEASONS

FUTURE SCENE-ORPHANED CHILDREN

MG/HS

In 2020 the tension between India and Pakistan escalated again to the point that both countries were massing troops at their borders. These two countries have a long history of conflict that began in the 1940s when the British withdrew from the region dividing the subcontinent into India and Pakistan. The cause of the conflict was centered on the inclusion of the Kashmir region with India. The population of Kashmir was predominantly Muslim, and Pakistan wanted the area included in its state. However, Kashmir wanted to be declared an independent state. The continued rhetoric between India and Pakistan has fueled the tension. India has denounced Pakistan for their support of terrorist groups; Pakistan has supported Kashmir in its struggle for independence. Since 1947 there have been five major wars in this region. The United Nations has intervened several times to negotiate peace. Both India and Pakistan have a large military presence stationed along the border and there has been continuous fighting in the region. Many residents have fled the area because of the military occupation along each border.

Both India and Pakistan became nuclear capable early in the twenty-first century. Although both countries claim that they would not be the first to use these weapons, the rest of the world is concerned that this continuous conflict may lead to one of these countries starting a nuclear war. With the intervention of the U. N. and the United States, an uneasy truce has existed for 20 years. Presently, in 2040, tensions between the two countries are increasing. The Kashmir freedom fighters and terrorist groups from Pakistan have been attacking villages along the India border. India has threatened retaliation using Intermediate Range Ballistic Missiles (IRBM). As the conflict escalated, many citizens of both countries began evacuating children and the elderly to refugee camps in surrounding countries, such as China, Nepal, Myanmar, and Afghanistan. These camps were meant to be temporary, so they were not supplied with medical services, nor were they set up for easy food and supply distribution. Many of the refugees planned to return home in just a few days. However, fighting increased in frequency and intensity. Before the U. N. could intercede to defuse the situation, India fired five IRBMs and ten Surface to Surface Missiles (SSM). Karachi and Islamabad were destroyed. Pakistan retaliated with ten IRBMs that destroyed parts of Bombay and New Delhi. Ten days later when peace was finally brokered by the U. N., over five million people perished directly from the bombing and 15 million were suffering from radiation poisoning.

Billions of dollars flowed into the area to help the countries. Medical aid, food, and temporary shelters were brought in by the U. N., U. S., Europe, Britain, and other countries. While aid was flooding in to help these countries deal with the massive loss of life and destruction of the infrastructures in their largest cities, another concern was on the horizon. What was to be done to help the children that had been evacuated before the bombing had started? It was estimated that 17 million children were living in the temporary refugee camps. Over ten million of these children, ranging in age from 17 years to 3-months, would have no home or parents to return to. Many of the countries that were temporarily sheltering the children were already dealing with an over-burdened social structure that was working with their own population of orphaned children. A joint commission of UNICEF and the Worldwide Orphans Foundation (WWO) has called an emergency meeting to address these concerns. As a member of a problem solving team, you have been asked to work with this commission. Use your skills to brainstorm possible concerns, choose an underlying problem, and brainstorm solutions to this problem. Develop criteria to evaluate these solutions. Choose the best solution and develop an action plan based on this solution.

FUTURE SCENE-FOOD DISTRIBUTION

MG/HS

In 2015 a major, global food crisis occurred because of the changing weather patterns. Midwestern areas in the United States, South Africa, and South America that were the major producers of wheat and corn were devastated by a new disease. The fungus, *Ustilago tritici*, which causes the wheat and corn disease called smut, underwent a genetic mutation that infected crops that had been bred to resist such diseases. The weather patterns that once provided long, sunny days were now producing cool, humid weather with fine, misting rains that lasted for days. This unusual weather created an ideal breeding ground for this new fungus. Wheat and corn fields were transformed into a black powder that was easily spread by the wind to infect other fields.

Globally, 75% of the wheat and corn crops were lost to this disease. The impact on the world population was catastrophic. Even with countries depleting their grain storage to provide for their population, millions of people died from malnutrition, especially children and the elderly. Scientists worked relentlessly to develop crops that were immune to this new disease. Scientists warned that not only was the changing weather partly to blame for the development of this mutated fungus, but also the loss of biodiversity in cultivated plants. According to Robert Zeigler, a plant pathologist working for the International Rice Research Institute (IRRI), there has been a 75% loss of plant diversity in the last century. Although there are over 30,000 edible plant species, humans only cultivate approximately 200 for food. From this, humans receive 60% of their dietary calories from wheat, corn, and rice. The varieties that humans do cultivate were chosen because of their increased yield and their resistance to disease. This also means that a country's crops could be very susceptible to disease. Once the disease was eradicated, scientists looked to the Global Seed Vault, which has stored over 10,000 seed samples from more than 300 species of cultivated plants and their wild relatives, to supply new seeds for cultivation.

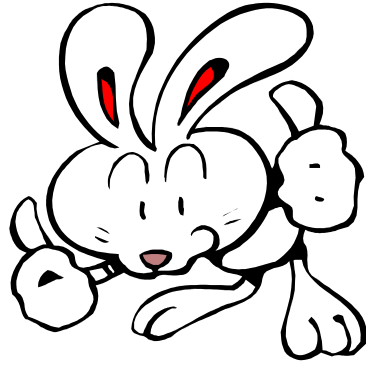
Presently, in 2040, the U.N. Food and Agriculture Organization working with the Global Crop Diversity Trust (GCDT) funded by the Gates Foundation are examining this global crisis. They hope to develop a plan that could divert this type of disaster from occurring again. Your problem solving team has been recruited to join this group. Use your problem solving skills to brainstorm challenges that this group could encounter. Determine the underlying problem and brainstorm solutions to this problem. Create criteria to evaluate these solutions and develop an action plan based on your best solution.

From: NASA and the European Space Agency (ESA)
To: All controlling officers of Earth Space Ports
Re: Emergency suspension of all flights
Date: June 15, 2036

ATTENTION!! All Con Officers: Effective immediately. All space flights, inbound and outbound from Earth are suspended. The Chinese test of their new anti-missile laser to destroy old satellites has created a cloud of space debris that has increased the debris field by 44%. This is far greater than the amount created in 2007 when they tested their first anti-satellite laser which increased the amount of space debris in orbit by 10%. At that time there was a narrow corridor which was used by NASA and the European Space Agency (ESA) for launches to the Moon and Mars Colonies. That corridor is now closed. The debris from the break up of the Chinese satellite has caused a cascading effect in which the satellite debris has bombarded existing debris breaking it into smaller pieces. Thousands of debris pieces have moved into the corridor effectively cutting off all shipping to the colonies. Both colonies have reported that enough supplies have been stockpiled and with careful rationing can support their population for five years. All resources will be used to develop a plan to clear the corridor and to reinstate shuttle and cargo launches.

From: NASA and the European Space Agency (ESA)
To: All controlling officers of Earth Space Ports
Re: Reinstatement of space launches
Date: October 20, 2040

ATTENTION!! All Con Officers: NASA and the ESA have successfully cleared a launch corridor. The Kessler Scoop has collected over 200,000 pieces of debris ranging in size from a tennis ball to a refrigerator. A solar sling was used to fling these pieces toward the sun for incineration. Special shielding will protect ships from the smaller pieces that remain in orbit. This is a temporary solution to the problem. The development of the Kessler Scoop was extremely expensive, over 30 billion dollars, and must be continuously repaired. It has taken three years just to clear this narrow corridor. Scientists estimate that it would take over three centuries to clear the rest of the debris with a cost of over 500 trillion dollars. The corridor will remain open if no more debris is added to the existing mass. Scientists and government representatives from every space faring country are meeting now to address this challenge. Your problem solving team has been asked to participate in this process.



**Now you are ready to start your team in the right direction with
FPS.**