

**Course Title:**

Future Problem Solving Program

**Length:**

Six months  
Grades 7 & 8

**Schools:**

Pierrepont  
Union

RUTHERFORD PUBLIC SCHOOLS  
Rutherford, New Jersey

GIFTED AND TALENTED DEPARTMENT

FUTURE PROBLEM SOLVING PROGRAM  
MINI-COURSE  
GRADES 7 & 8

**1. Introduction/Overview/Philosophy**

Future Problem Solving is a mini-course designed to provide students with the opportunity to develop the creative thinking skills necessary to adapt to a changing world. Students shall learn specific problem-solving techniques based on Dr. E. Paul Torrance's breakthrough techniques. Future Problem Solving encourages students to employ divergent, flexible, and innovative thinking; it helps students to develop their reasoning ability and to learn the value of obtaining, analyzing, and synthesizing a variety of resources in order to predict future realities. The course begins by introducing techniques through individual and group exercises. During the program, students will research specific problem areas chosen by the Future Problem Solving Program and ultimately apply creative thinking skills in an attempt to solve these future problems. This program encourages the thinking skills necessary to adapt to a changing world while spanning a variety of disciplines and content areas.

**2. Objectives**

- a. Students will be able
  1. To gather and use information for research on the selected Future Problem Solving topics (1.5, 3.1, 3.5, 8.1);
  2. To understand and apply basic and advanced concepts of statistics and data analysis to interpret research topic information (4.1, 4.4, 4.5, 5.3);
  3. To effectively use mental processes that are based on identifying similarities and differences (5.3);
  4. To use divergent, flexible and innovative thinking to formulate potential problems and to generate alternative solutions (5.1, 9.2);
  5. To understand and know how to analyze chronological relationships and patterns to forecast trends (5.1, 6.3, 6.6, 7.2, 8.2);
  6. To develop an awareness of areas of critical concern in modern society (5.4, 5.10, 6.6, 7.2, 8.2);
  7. To cultivate teamwork skills through effective interaction with the members of the problem-solving team (9.2);
  8. To refine oral and written communication skills (3.2, 3.3, 3.4);
  9. To understand the sources, purposes and functions of law and the importance of the rule of law for the protection of individual rights and the common good as it relates to challenges in the development of future societies (6.1, 6.2, 6.3, 6.6, 7.2);

10. To understand the characteristics of different economic systems, economic institutions, and economic incentives as they relate to Future Problem Solving topics (6.5);
11. To develop skills in self-direction and independent learning (9.2).

**3. Course Outline**

The course focuses on the selected topics for the competitive team problem-solving component of the Future Problem Solving Program that are selected each year. For the 2008-2009 school year, topics included space junk, counterfeit economy, pandemic, and Olympic games (State Bowl).

a. Skill Building

Early weeks of the course cover exercises designed to develop and build the skills used in the creative problem-solving process.

1. Brainstorming
2. Categorizing and increasing flexibility
3. Evaluating
4. Analytical and critical thinking

b. Applying the Skills

Each step in the Future Problem Solving process is introduced and analyzed in depth.

1. Researching the topic
2. Identifying challenges
3. Selecting an underlying problem
4. Producing solution ideas
5. Selecting criteria
6. Applying criteria
7. Developing a plan of action

c. Completion of Future Problem Solving Challenges & Scenario Writing

Each of the Future Problem Solving challenges will be addressed using the acquired skills.

#### **4. New Jersey Core Curriculum Content Standards**

The following New Jersey Core Curriculum Content Standards are integrated into this multidisciplinary course:

##### **Visual and Performing Arts List of Standards**

1.5 (History/culture) All students will understand and analyze the role, development, and continuing influence of the arts in relation to world cultures, history, and society.

##### **Language Arts Literacy List of Standards**

3.1 (Reading) All students will understand and apply the knowledge of sounds, letters, and words in written English to become independent and fluent readers and will read a variety of materials and texts with fluency and comprehension.

3.2 (Writing) All students will write in clear, concise, organized language that varies in content and form for different audiences and purposes.

3.3 (Speaking) All students will speak in clear, concise, organized language that varies in content and form for different audiences and purposes.

3.4 (Listening) All students will listen actively to information from a variety of sources in a variety of situations.

3.5 (Viewing and media literacy) All students will access, view, evaluate, and respond to print, nonprint, and electronic texts and resources.

##### **Mathematics List of Standards**

4.1 (Numbers and numerical operations) All students will develop number sense and will perform standard numerical operations and estimates on all types of numbers in a variety of ways.

4.4 (Data analysis, probability, and discrete mathematics) All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

4.5 (Mathematical processes) All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

##### **Science List of Standards**

5.1 (Scientific processes) All students will develop problem-solving, decision-making and inquiry skills reflected by formulating usable questions and hypotheses, planning experiments, conducting systematic observations, interpreting and analyzing data, drawing conclusions and communicating results.

- 5.3 (Mathematical applications) All students will integrate mathematics as a tool for problem-solving in science, and as a means of expressing and/or modeling scientific theories.
- 5.4 (Nature and process of technology) All students will understand the interrelationships between science and technology and develop a conceptual understanding of the nature and process of technology.
- 5.10 (Environmental studies) All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.

**Social Studies List of Standards**

- 6.1 All students will utilize historical thinking, problem solving, and research skills to maximize their understanding of civics, history, geography, and economics.
- 6.2 (Civics) All students will know, understand and appreciate the values and principles of American democracy and the rights, responsibilities, and roles of a citizen in the nation and the world.
- 6.3 (World history) All students will demonstrate knowledge of world history in order to understand life and events in the past and how they relate to the present and the future.
- 6.5 (Economics) All students will acquire an understanding of key economic principles.
- 6.6 (Geography) All students will apply knowledge of spatial relationships and other geographic skills to understand human behavior in relation to the physical and cultural environment.

**World Languages List of Standards**

- 7.2 (Culture) All students will demonstrate an understanding of the perspectives of a culture(s) through experiences with its products and practices.

**Technological Literacy List of Standards**

- 8.1 (Computer and information literacy) All students will use computer applications to gather and organize information and to solve problems.
- 8.2 (Technology education) All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world as they relate to the individual, society, and the environment.

## **Career Education and Consumer, Family, and Life Skills List of Standards**

9.2 (Consumer, family, and life skills) All students will demonstrate critical life skills in order to be functional members of society.

### **5. Proficiency Levels**

This mini-course is offered to students in grades 7 & 8 who have qualified for the Gifted and Talented Program.

### **6. Methods of Assessment**

#### **a. Student Assessment**

The teacher will provide a variety of assessments which may include, but are not limited to, the following: teacher observation of individual and group exercises, class discussions, research assignments, and evaluation of student products by the state evaluators of the Future Problem Solving Program.

#### **b. Curriculum Assessment/ Teacher Assessment**

The teacher/ Gifted and Talented Department coordinator will review this course and share suggestions for changes with the state coordinator of the Future Problem Solving Program.

### **7. Grouping**

Students self-select this mini-course in grades 7 & 8.

### **8. Articulation/ Scope & Sequence/ Time Frame**

Approximately six months, following the schedule for competition set by the Future Problem Solving Program. Students meet for a 90-minute period each week. If students qualify for the State Bowl (and then possibly for the International Conference), qualifying teams will continue to meet on a schedule to be determined.

### **9. Resources**

#### **a. Speakers**

Speakers may be recruited depending on the topics selected.

#### **b. References**

1. Readings, Research, and Resources, Future Problem Solving Program, published for topics each year.
2. Questions and Answers for Readings, Research and Resources, Future Problem Solving Program, published for topics each year.
3. Preparing a New Generation of Problem Solvers: A Resource Handbook for Future Problem Solving Trainers. Coach's Handbook.

#### **c. Texts**

There is no text for this course. Students read the future scene provided by the Future Problem Solving Program and apply the Future Problem Solving process.

d. **Supplemental reading**

The Reading, Research, and Resources booklet can be reproduced for student teams.

**10. Methodologies**

Methods include but are not limited to :

- Class discussion
- Cooperative learning
- Individual and group research
- Training students in the Future Problem Solving process.

**11. Suggested Activities**

- Word searches
- Objective questioning
- Crossword puzzles
- Brainstorming
- Prioritizing
- Creating criteria

**12. Interdisciplinary Connections**

The Future Problem Solving Program is interdisciplinary in the variety of the topics students explore in the future scenes. Students are also encouraged in creativity and futuristic thinking as they predict trends and outcomes. As a team activity, FPS encourages individual responsibility and cooperation among team members.

**13. Professional Development**

As per the PDP/100 hour statement: the teacher will continue to improve expertise through participation in a variety of professional development opportunities. Specialized professional development for teachers in the Gifted and Talented Department is offered through the Bergen County Consortium of Teachers of the Gifted (BCCTG), the New Jersey Association for Gifted Children (NJAGC), and the Summer Institute for the Gifted (SIG). Coaches in the Future Problem Solving Program are required to attend training and have the opportunity for workshops each fall.