

PART THREE



CEF Program Overview and Implementation

YOU BE THE CHEMIST ACTIVITY GUIDES: LESSON PLANS FOR MAKING CHEMISTRY FUN

BACKGROUND

The *You Be The Chemist* (YBTC) Activity Guides: Lesson Plans for Making Chemistry Fun are instructional aids designed to engage students in the science of chemistry and to make teaching the subject easier for educators. There are two booklets divided according to grade level, one for grades K-4 and another for grades 5-8. The booklets are available for purchase, separately (\$12 and \$15, respectively) or together (\$20). The Activity Guides use fun, educational concepts to emphasize the importance of chemicals in our everyday lives. Each of the Activity Guides includes the following grade-appropriate information:

- Approximately 30 educator-reviewed lesson plans
- In-depth activity sheets that can serve as classroom lab sheets or homework assignments
- Project extensions and vocabulary lists
- A Resource Guide that includes important chemists, tips for non-chemistry educators to better teach the subject, and safety information

Additionally, animated chemists Newton and Kelvin walk grade K-4 students through some of the basic chemistry concepts. The 5-8 grade Activity Guide includes review games to provide educators with a fun, interactive review of chemistry concepts.

HISTORY

CEF produced the original YBTC Kits for grades K-3 and 4-6 in the mid-1990s. These kits contained simple chemical experiments designed to be instructive, educational, and fun.

To reflect changing educational standards and to offer a more versatile classroom tool, CEF revised the YBTC Kits in 2003-2004. The revised YBTC Kit expanded the grade-level relevance to grades K-8 and added new experiments and other materials. In 2007, another revision occurred, resulting in the creation of the current Activity Guides.

EDUCATIONAL MERIT

The YBTC Activity Guides contain hands-on, student-centered activities that support the Benchmarks for Science Literacy and the National Science Education Standards, the guidelines for grade-appropriate material. These standardized concepts are the basis for statewide assessment exams.

CEF carefully planned the curriculum development of the YBTC Activity Guides, utilizing educator feedback and a review team of chemists, educators, and curriculum specialists. Each booklet features approximately 30 fun and easy-to-use lesson plans that cover topics such as scientific inquiry, the structure of matter, safety, and recycling. In order to make real-world connections to chemistry and create a more teacher-friendly curriculum, experiment materials consist of common, nontoxic household items.

In addition to inquiry-based activities, the guides contain activity sheets, vocabulary, historical connections, and lesson plan extensions. Students and teachers enjoy this fun and educational tool that makes chemistry come alive with real-world references.

INDUSTRY MEMBER BENEFITS

The YBTC Activity Guides provide participating companies with an excellent tool to reach out to local constituents and promote chemical education within their community. Introducing the program to community members helps companies gain more positive recognition in their area while disproving common misconceptions about chemicals and the chemical industry. Face-to-face interaction with the community works to effect long-term change in developing perceptions of the general-public.

Involvement in CEF programs also helps companies fulfill certain aspects of industry responsible management practices, such as the National Association of Chemical Distributors' Responsible Distribution ProcessSM, the American Chemistry Council's Responsible Care[®] program, and the Synthetic Organic Chemical Manufacturers Association's ChemStewards[®].

HOW CAN YOU USE THE YBTC ACTIVITY GUIDES IN YOUR COMMUNITY?

STEP 1

Schools are a great starting place. Identify a local school board member, school principal, or an individual teacher and make contact with that person. You can also use the following steps when approaching after-school programs, such as the Boy and Girl Scouts, Boys and Girls Clubs, science clubs, or faith-based organizations. You may even consider distributing the guides to local libraries to provide a resource for science education. (See the Suggested Activities for Community Outreach section for more ideas on how to distribute the Activity Guides!)

Take time to familiarize yourself with the material included in the guides. A good way to do this is to perform some of the experiments.

STEP 2

Once you've made contact with your targeted group or organization, introduce yourself and your company. Then explain the mission of CEF and why your company supports that mission. For example:

“ CEF was created in 1989 and is dedicated to promoting a greater understanding of the science, value, and benefits of chemistry. CEF's focus is K-8 education, and our programs are designed to encourage the study of science.

CEF is a nonprofit, non-lobbying, and non-regulatory organization and is well positioned to provide community outreach efforts. The Foundation believes that an understanding of science is vital for future intellectual development, and we believe that such an investment in our education systems makes good business sense as well.

CEF's principle is simple: skills and knowledge acquired early on make later learning and understanding easier. CEF has a number of programs that work toward this goal, but today, I want to focus on their flagship program, the *You Be The Chemist* Activity Guides. ”

STEP 3

Tell them that you would like a few minutes of their time to show them this new, nationally recognized instructional tool. Talk about your concerns regarding students' lack of knowledge and interest in the sciences. Explain that as a member of the community and the chemical industry, you are concerned with the state of science education.

You can also talk about the significant advancements in medicine, technology, and basic standards of living that have been made possible through the science of chemistry and chemicals.

STEP 4

Explain that CEF is addressing these concerns through various programs, including the YBTC Activity Guides. You can talk about the collaboration between CEF and your company to bring expanded science curriculum options to schools in a way that is both fun and educational.

Explain that CEF programs encourage students – our future leaders – to seek a greater understanding of the sciences and pursue science-related careers. Participating in CEF programs can easily spark an interest in young minds, leading to our next generation of doctors, scientists, and engineers!

STEP 5

Share a segment of the DVD for grades K-4. We suggest sharing module one of the DVD with educators. It is approximately three minutes long and gives a historical background of chemistry. (If you are focusing strictly on grades 5-8, show them the review games as a fun, interactive way of reinforcing concepts.) For introducing the K-4 or 5-8 Activity Guides, it's a good idea to have materials on hand to demonstrate one of the lessons.

Mention that the YBTC Activity Guides are easy-to-use and inexpensive. Each lesson provides a hands-on activity focused on chemistry concepts or on linking chemistry concepts to other sciences. The lessons are fun, educational, and easy for students and educators to follow. All materials needed for the lessons are common household items, emphasizing the role of chemicals in our everyday lives!

STEP 6

Finally, ask if they would allow you to demonstrate an experiment from the Activity Guide in a classroom setting. If there are any questions you would like CEF to answer, feel free to call us.

Set up recurring in-class sessions in which a representative from your company conducts an experiment with the class to enhance your relationship with your community.

**We promise you,
you will only have to sell
a school once on the
Foundation's programs.**

YOU BE THE CHEMIST CHALLENGE

BACKGROUND

The *You Be The Chemist* (YBTC) Challenge is a fun and educational academic competition designed to engage grade 5-8 students in the science of chemistry. The Challenge promotes the science of chemistry, the benefits of chemicals, and the importance of chemical safety awareness by bringing members of the chemical industry together with the schools and organizations in their local area.

- The study guide material and competition questions comply with the national educational standards and teaching requirements.
- The competitive and rewarding dynamic of the event helps educators get kids excited about learning chemistry.
- The Challenge encourages parental participation in their child's learning experience.
- The Challenge is an easy, fun, and inexpensive program that brings students, parents, educators, community organizations, and the chemical industry together in a celebratory manner.

HISTORY

In 2004, CEF created a question-and-answer academic competition, similar in format to spelling bees and quiz bowls, called the YBTC Challenge. The Challenge tests grade 5-8 students on important chemistry concepts, historical discoveries, and safety awareness tips. Initial competitions were held in Illinois, Texas, and Kentucky and have since been duplicated throughout the country.

EDUCATIONAL MERIT

Based on the Benchmarks for Science Literacy and the National Science Education Standards, the Challenge provides a tool for students to practice essential science concepts that commonly appear in state assessments. The Challenge also combines language arts and history in an exciting and innovative method. Often unfamiliar terms and concepts are addressed in a format that both tests and entertains.

In addition, all material included in the Challenge Study Guide is reviewed by a group of curriculum specialists, chemists, and science educators.

INDUSTRY MEMBER BENEFITS

The YBTC Challenge provides participating companies with an excellent tool to reach out to local constituents and promote chemical education within their community. Introducing the program to community members helps companies gain more positive recognition in their area while disproving common misconceptions about chemicals and the chemical industry. Face-to-face interaction with the community works to effect long-term change in developing perceptions of the public.

Involvement in CEF programs also helps companies fulfill certain aspects of industry responsible management practices, such as the National Association of Chemical Distributors' Responsible Distribution ProcessSM, the American Chemistry Council's Responsible Care[®] program, and the Synthetic Organic Chemical Manufacturers Association's ChemStewards[®].

AWARDS & RECOGNITION

Students who win Local and/or State Challenges will receive prizes as determined by Local and State Challenge Organizers. National Challenge winners and participants will receive prizes to be determined by CEF and the National Challenge sponsors. These prizes include educational savings bonds, chemistry sets, gift cards, and other chemistry and Challenge-related rewards.

National Challenge champions and participants will be featured on the CEF Web site and receive a trophy or plaque designating their achievement. Local media will be invited to attend the National Challenge and will be contacted afterwards. Additional promotion ideas will be considered.

HOW CAN YOU USE THE YBTC CHALLENGE IN YOUR COMMUNITY?

STEP 1

Schools are a great starting place. Identify a local school board member, school principal, or individual teacher and make contact with that person. You can also use the following steps when approaching after-school programs, such as the Boy and Girl Scouts, Boys and Girls Clubs, science clubs, or faith-based organizations.

You may want to relate the Challenge to the YBTC Activity Guides and consider presenting schools and organizations that participate in the program with a complimentary 5-8 grade booklet.

STEP 2

Introduce yourself and your company. Then, introduce CEF and your company's involvement in CEF. For example:

“ CEF was created in 1989 and is dedicated to promoting a greater understanding of the science, value, and benefits of chemistry. CEF's focus is K-8 education, and our programs are designed to encourage the study of science.

CEF is a nonprofit, non-lobbying, and non-regulatory organization and is well positioned to provide community outreach efforts. The Foundation believes that an understanding of science is vital for future intellectual development, and we believe that such an investment in our education systems makes good business sense as well.

CEF's principle is simple: skills and knowledge acquired early on make later learning and understanding easier. CEF has a number of programs that work toward this goal, but today, I want to focus on their *You Be The Chemist* Challenge program. ”

STEP 3

Tell them that you would like a few minutes of their time to show them this new, nationally recognized educational tool. Talk about your concerns regarding students' lack of knowledge and interest in the sciences. Explain that as a member of the community and the chemical industry, you are concerned with the state of science education. You can also talk about the significant advancements in medicine, technology, and basic standards of living made possible through the science of chemistry and chemicals.

STEP 4

Explain that CEF is addressing these concerns through various programs, including the YBTC Challenge. It is important to mention the collaboration between CEF and your company in an effort to bring to schools an expanded science curriculum option that is fun, complies with science standards, and brings the community together.

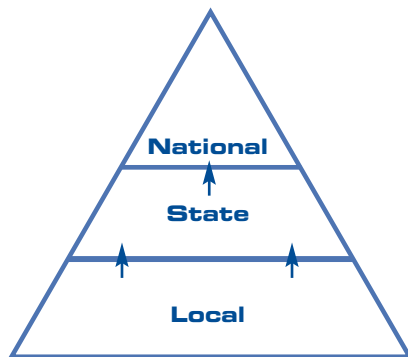
Explain that CEF programs encourage students – our future leaders – to seek a greater understanding of the sciences and pursue science-related careers. Participating in CEF programs can easily spark an interest in young minds, leading to our next generation of doctors, scientists, and engineers!

STEP 5

Distribute CEF's Challenge promotional piece (available by contacting the CEF office), show them photos of Challenges by visiting the CEF Web site (www.chemed.org), or show them the Challenge Study Guide.

HOW A YBTC CHALLENGE WORKS

There are three levels in the YBTC Challenge:



The YBTC Challenge starts with local-level competitions held in communities across the country. Chemical companies partner with educators and community organizations in the areas in which they operate.

CEF creates the Challenge study guide and question material and distributes the information to Local Challenge Organizers. A Local Challenge Organizer may be a chemical industry member or a school district representative who has agreed to organize a Challenge site in his/her community.

There are many different ways in which Local Challenges can take place and competitions will differ depending on the size and makeup of each location. Local Challenges utilize the Qualifying Exam questions and/or Regional questions, depending on the format(s) chosen. Some examples of Local Challenge formats include the following:

- Scantron tests taken in the classroom
- Computer-administered tests in the classroom and/or school-wide
- A “bee”-style verbal competition held after school in a classroom or auditorium
- A “bee”-style verbal competition held in an individual classroom during school
- A “bee”-style verbal competition held at a local host facility, such as a library or company meeting room
- Classroom- or auditorium-style format using an electronic key-pad system

How local-level competitions take place is completely up to the organizing companies. Contact CEF for more details.

COSTS

The cost of competitions varies depending on the size, format, and prize amounts. Prizes can range anywhere from a \$50 gift certificate to a \$1000 savings bond, and may even be as simple as a trophy or tickets to a local science museum. Other costs may include employee time, venue (most likely your local school will let you hold your event there for free), any refreshments you may want to provide, and any marketing materials you may want to purchase from CEF.

For an example of how to get a Challenge going in your community, see our Detroit and Washington, DC *You Be The Chemist* Challenge success stories on pages 72-75.

HOW TO PREPARE FOR A LOCAL YBTC CHALLENGE

SELECT AN ORGANIZER

Choose one company representative who will serve as the Local Challenge Organizer. This person will serve as the main contact between CEF, the sponsoring company, and the school.

REGISTER YOUR SITE

Fill out a Challenge registration form (found on the CEF Web site) and submit it to CEF. After you have registered your Challenge, you will be given the password to access the Challenge Organizer portion of the CEF Web site.

UTILIZE THE CEF WEB SITE

CEF's Web site, www.chemed.org, will be an important tool in the process of organizing your Challenge. On the site, you will find all of the important documents for organizing a Local Challenge, including an overview, the rules, the registration form, and marketing materials.

The Web site also includes all necessary study guide and question materials to conduct your Challenge. Organizers are only to distribute the information to participating educators as necessary. Please use your discretion when distributing this information.

ORDER CHALLENGE MARKETING MATERIALS

These materials include colorful stickers, pencils, notepads, and water bottles. You can also personalize T-shirts, posters, and other marketing pieces or giveaways using CEF creative assets. Contact the CEF office for more information.

COORDINATE EVENT LOGISTICS

Consider what logistics are necessary to carry out your event. This could include venue, prizes, judges, and moderators.

PROMOTE AND PUBLICIZE

Use the steps in the Media Guide section to promote and publicize your event.

STATE YBTC CHALLENGE

Each State Challenge will vary. The CEF staff will work with all Local Organizers in a state to create a state competition with the input of each site. State Challenges are usually held in central locations utilizing the same format as the National YBTC Challenge competition.

NATIONAL YBTC CHALLENGE

Held every June, the National YBTC Challenge is the culmination of the Local and State Challenges held throughout a Challenge cycle. Participants, guests, and industry members join together to celebrate chemistry and the efforts of participating students.

Each State Challenge winner and a chaperone receive complimentary travel to and lodging in the competition host city (contact CEF for specific details). In addition to the *challenge* of the competition, participants receive exciting prizes. In previous years, prizes have included the following:

- Thames & Kosmos CHEMC3000 chemistry kits
- Gift certificates to the Discovery Channel Store
- Educational magazine subscriptions
- YBTC Challenge T-shirts, bags, and other giveaways
- Educational savings bonds

Participants, chaperones, and industry members are also able to explore the city, enjoy local restaurants, and relax as they visit a local science museum!

YOU BE THE CHEMIST LESSON PLAN COMPETITION

BACKGROUND

The *You Be The Chemist* (YBTC) Lesson Plan Competition awards prizes for lesson plan submissions from teachers across the country, showcasing innovative investigations and exciting chemistry experiments. The Lesson Plan Competition offers a format for educators and industry members to:

- Reward innovative teaching techniques.
- Promote best practices among educators.
- Develop teaching resources for educators.
- Help promote CEF's work with education.

HISTORY

In 2003, CEF sponsored the first nationwide YBTC Lesson Plan Competition. To build on the success of the 2003 competition, CEF has worked with organizations, such as the National Science Teachers' Association, to promote the award for even more successful competitions in recent years.

EDUCATIONAL MERIT

Submitted lesson plans must be original and include experiments that feature nontoxic household items. CEF has set this requirement to emphasize the presence of chemicals in common items and to provide a real-world connection to chemistry for teachers and students.

The three submission categories are based on the Benchmarks for Science Literacy and the National Science Education Standards. Submitted plans must illustrate a topic in the categories of Scientific Inquiry, Structure of Matter, or Human & Environmental Chemistry.

All activities should be hands-on and student-centered. In addition to being nontoxic, the materials included for the experiments should be readily available in grocery stores or all-purpose stores. CEF encourages the inclusion of writing activities, graphics projects, or historical context in the lessons.

AWARDS & RECOGNITION

The Foundation will award one first-place prize of \$1,000 and two runner-up prizes of \$500 and \$250 in each of the three categories. The first 50 submissions will also receive a complimentary *You Be The Chemist* Activity Guide set. In addition, each school of the three first-place winners will receive \$250 for science education materials. Winners will be included in CEF publications and on the Web site where appropriate.

INDUSTRY MEMBER BENEFITS

The Lesson Plan Competition provides companies with an excellent tool to reach out to local educators and to promote their important role in chemistry education within their community. Introducing the program to local educators helps companies gain more positive recognition in their area while disproving common misconceptions about chemicals and the chemical industry. Face-to-face interaction with the community works to effect long-term change in developing perceptions of the public.

Involvement in CEF programs also helps companies fulfill certain aspects of industry responsible management practices, such as the National Association of Chemical Distributors' Responsible Distribution ProcessSM, the American Chemistry Council's Responsible Care[®] program, and the Synthetic Organic Chemical Manufacturers Association's ChemStewards[®].

RULES & JUDGING

Contest rules and judging criteria are featured on the next page. For the most up-to-date information, please contact the CEF office at 703/527-6223, e-mail us at comments@chemed.org, or visit our Web site at www.chemed.org.

HOW CAN YOU PROMOTE THE YBTC LESSON PLAN COMPETITION IN YOUR AREA?

STEP 1

Schools are a natural starting place for the competition. Identify a local school board member, school principal, or an individual teacher to approach. Introduce the program to that person. Explain the competition and ask him/her to post the Lesson Plan Competition flyer (available by request from CEF) in the teachers' lounge or in a lobby or staff bulletin board. Local libraries often have community bulletin boards where flyers could be posted as well.

STEP 2

When promoting CEF's other *You Be The Chemist* programs, mention the Lesson Plan Competition – everyone is interested in winning money!

Direct those you speak with towards the CEF Web site, www.chemed.org. All necessary and up-to-date information can be found there. The following pages detail the competition categories, rules, and format.

YOU BE THE CHEMIST LESSON PLAN COMPETITION SUBMISSION CATEGORIES

Submitted lesson plans must illustrate a topic in the following categories:

SCIENTIFIC INQUIRY

This category includes lessons or activities that will highlight evidence and reasoning, demonstrate simple investigations, or address scientific theories and/or avoiding bias in science.

STRUCTURE OF MATTER

This category includes lessons or activities that define and describe atoms and molecules, the conservation of matter, and the states of matter. This category can also address the different types of mixtures, the nature of a chemical reaction, the effects of temperature on matter, or that particles of matter are too small to be seen.

HUMAN & ENVIRONMENTAL CHEMISTRY

Activities in this category should illustrate the presence of chemistry and chemicals in the human body and/or the environment. This category can include such topics as recycling, food chemistry, and pharmaceuticals.

PUBLICATION

The nine (9) winning lesson plan entries will be published on the Chemical Educational Foundation Web site at www.chemed.org.

JUDGING

Competition judging will be completed by a panel consisting of educators and professionals in the fields of chemistry and education. Each entry will be judged on its scientific and educational merit, its scientific objective, its adherence to the Lesson Plan Competition Guidelines and Format, the extent of its student-centered activities, and its ability for modification. CEF staff and family members are prohibited from participation in the competition. CEF reserves the right to choose judges and make the final decision on winners.

CONTEST RULES

As applicable to the 2008 competition; these rules are subject to change, so please view the CEF Web site for the most up-to-date contest rules.

1. All Lesson Plan Entries (“Entries”) must be written in English and not previously published in any educational magazine or journal.
2. All Entries must be complete and include all information required in the Lesson Plan Format. Entries that do not conform to the format will not be accepted or considered for an award.
3. Entries must include the category name and page number on the top-left corner of each page. The contestant’s name, address, e-mail address (if any), phone number, and school affiliation should appear in the “Submitted by” section.
4. Entries should be age appropriate for a K-8 audience. Science experiments described in the Entries must not require the use of specialized tools, ingredients, or lab equipment.
5. All experiment materials must be nontoxic and commercially available household items.
6. 2007 Lesson Plan Competition contestants may submit a new plan to the 2008 competition.
7. Each contestant may submit only one Entry per category. Each contestant must select the category to which his/her Entry will be judged and specify the category on his/her Entry.
8. Entries must be typed on white 8.5 by 11 inch paper or submitted electronically to the following e-mail address: comments@chemed.org.
9. Entries will not be returned to the contestant.
10. All Entries must be postmarked no later than December 20, 2008. E-mailed submissions must be sent no later than 11:59p.m. on, December 20, 2008.
11. A first-place, second-place, and third-place Entry in each category will be selected as a winner. Each first-place Entry will win \$1,000, each second-place Entry will win \$500, and each third-place Entry will receive \$250. A \$250 check will also be awarded to the school of each first-place winner in each category.
12. The first 50 entrants will receive a complimentary set of CEF’s *You Be The Chemist* Activity Guides. See CEF’s Web site, www.chemed.org, for more information.
13. All Entries submitted for the competition become the property of CEF. Each contestant agrees to assign and transfer to CEF all of the contestant’s right, title, and copyright interest related to the Entry produced or developed for the competition. The contestant represents that the Entry is an original work of authorship and that the contestant has the right to convey all rights to CEF.

SOLUTIONS AND PRODUCT STEWARDSHIP BULLETINS

BACKGROUND

The Chemical Educational Foundation (CEF) provides a variety of educational bulletins on various consumer and industry-related topics. CEF is constantly updating these bulletins and expanding the series further to include pertinent information regarding industry and consumer chemical safety awareness.

HISTORY

Since its inception, CEF has provided informational bulletins on topics of interest to members of the chemical industry. The Foundation's Product Stewardship bulletins offer industry members an easy-to-use tool for educating employees, business leaders, and community groups.

Realizing the need to broaden the audience that industry leaders can reach, CEF developed *Solutions* bulletins. These consumer-oriented publications provide a broader approach, exemplifying CEF's mission to educate all about the benefits and importance of chemicals in our everyday lives.

EDUCATIONAL MERIT

CEF's Product Stewardship bulletins offer industry members information on topics that include responsible packaging, chemical safe handling, and proper disposal, as well as information about pertinent community organizations such as Local Emergency Planning Committees.

Current *Solutions* bulletins provide a wealth of information to consumers and educators about chemical safety awareness. Responsible use, safe handling, storage, and proper disposal are the themes of these bulletins.

INDUSTRY BENEFITS

CEF has also instituted a program by which Foundation contributors can have their own logo printed on the back of the bulletin(s) of their choice. CEF bulletins provide companies with an excellent tool to reach out to local constituents to promote the importance of chemical education within their community.

Utilizing CEF bulletins in the community helps companies gain more positive recognition in their area while disproving common misconceptions about the chemical industry. Face-to-face interaction with the community works to effect long-term change in developing perceptions of the public.

Distributing CEF bulletins also helps companies fulfill certain aspects of with industry responsible management practices, such as the National Association of Chemical Distributors' Responsible Distribution ProcessSM, the American Chemistry Council's Responsible Care[®] program, and the Synthetic Organic Chemical Manufacturers Association's ChemStewards[®].