This cross curriculum guide links mathematics, language arts, and social studies. The guide is divided into two sections. The first section provides a series of language arts activities and the second social studies activities. Within these two curriculum areas, the activities provided are based on three Square One TV formats: (1) Mathnet, the detective serial that wraps up each episode of the program; (2) the game shows, which integrate mathematics into popular game show formats; and (3) the commercials, which parody television advertisements. Each two-page spread provides two short activities to spark interest and discussion, and a step-by-step activity with a reproducible student page. Follow-up activities are also included. Topics include time, estimation, weights, graphing, and the metric system. The curriculum goals of this program are also included. (KR)
SQUARE ONE TV PRODUCTION

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SQUARE ONE TV is a unique television series about mathematics, produced by the Children's Television Workshop (CTW), the creators of SESAME STREET, THE ELECTRIC COMPANY, and 3-2-1 CONTACT. The first thing you should know about SQUARE ONE TV is that WE WANT YOU TO VIDEOTAPE IT OFF THE AIR, AND USE IT IN THE CLASSROOM. It's perfectly legal, as long as you erase the tapes within three years. SQUARE ONE TV airs Monday through Friday on most member stations of the Public Broadcasting Service (PBS). It’s aimed at the nation’s 14 million eight-to twelve-year-olds. Each half hour show includes several segments, many of which parody familiar television formats, such as game shows, sitcoms, cartoons, music videos, and commercials. SQUARE ONE TV's educational goals may be found in the back of this guide.

Although SQUARE ONE TV was primarily designed for home viewing, you can also use the series successfully in your classroom. The key to in-class use of the series is selecting material that best matches your curricular goals. Most often, this involves the use of segments rather than entire 30-minute programs. The following suggestions are intended to help you make the most of SQUARE ONE TV in your class:

1. Try to tape as many of the SQUARE ONE TV programs off the air as you can. This will give you the broadest possible selection of segments from which to choose. Each show is identified by a reference number that appears briefly before each program.

2. Be sure you preview the segments and review the printed materials before using the segments in class. You may also want to encourage students to watch a whole show at home, so they’ll be familiar with its spirit.

3. When using one of the segments, we suggest you:
   a. Review the segment, prior to in-class use.
   b. Prepare a few questions to help focus students’ attention prior to viewing.
   c. Show an entire segment once or twice to familiarize students with it.
   d. Follow-up watching by using the related activities and extensions provided.

ABOUT THIS TEACHER'S GUIDE

We have created this special Curriculum: Connections Teacher’s Guide to acquaint you with the possibilities for using SQUARE ONE TV to enhance your language arts and social studies teaching. As you challenge your students to make curriculum connections, they learn to see the relationships that exist between disciplines in the world around them.

This teacher's guide is divided into two sections. The first section provides a series of language arts activities. The second section focuses on social studies activities. Within these two curriculum areas, the activities provided are based on three SQUARE ONE TV formats: Mathnet, the detective serial that wraps up each episode of SQUARE ONE TV; the Game Shows, which integrate mathematics into popular game show formats; and the Commercials, which parody tv advertisements.

Each two-page spread provides two short activities to spark interest and discussion, and a step-by-step activity with a reproducible student page that can be the focus of a class-length activity. Follow-up activities—which provide opportunities to enrich or extend ideas—are included for these three SQUARE ONE TV formats.

To provide a model for integrating Mathnet into the classroom, we have selected two week-long Mathnet mysteries and featured one activity for each day's episode. The language arts section focuses on the Mathnet mystery "The Trial of George Frankly" and the social studies section is based on "The Case of the Deceptive Data."

The guide concludes with math bonus activities, based on SQUARE ONE TV commercials. It also contains a teacher's reference section, with helpful information.

Curriculum Connections is designed to meet the needs of students with different learning styles. Both individual and cooperative learning activities have been provided. The cooperative learning activities work best if students are placed in mixed ability groups.
The Trial of George Frankly

Writing a Descriptive Paragraph

George tells his boss that he visited "a little bitty island in a great big lake" in the Great North Woods—not much of a description for a one-week, fun-filled vacation. Ask students to help George fill out his picture of Nomanissan Island by writing a paragraph describing his vacation site. To help students imagine what Nomanissan Island might have been like, ask them to think about what George might have seen, heard, felt, smelled, or tasted.

Directions depend on time and sequence words. Using these words, ask students to write directions that lead from the classroom to someplace in the school—but to leave out the last step. Students can switch papers and try to figure out exactly where the directions lead.

WHAT YOU NEED:
copies of the activity page

WHAT TO DO:
step 1: Distribute one copy of the activity page, "It's about Time," to each student.
step 2: Have students read the time and sequence words in the clock on the activity page and use these words to describe an activity they did yesterday—like getting ready for school, or eating lunch.
step 3: Using the activity page, ask students to write a paragraph that incorporates as many of the time words as possible and describes what happened to George in Monday and Tuesday's episodes of the story.
step 4: Have students discover the importance of time and sequence words by rewriting their paragraphs and mixing up the order of the sentences. Ask students to exchange paragraphs with a partner, and put their partner's sentences back in the correct order.

TO TUNE IN TO WEDNESDAY'S SHOW, TURN TO PAGE 6...
It's about time!

once upon a time
next
after a while
suddenly
until
before
soon
at last
next year
someday
first
then
right away
after
finally
The Trial of George Frankly...continued

Newspaper Headlines and Stories

Have the charges against George tarnished his image as a criminal? The newspapers in Tinseltown certainly think so. His trial is front-page news. Have students write a series of headlines about George and his troubles. Topics can include the bank robbery, George as suspect, the evidence against George, the first day of the trial, and the outcome of the trial. Students can pick their own favorite headlines and write news stories describing the who, what, when, why, and where of the day's events.

THURSDAY

CRIMEFIGHTER'S REPUTATION TARNISHED?

CRIMEFIGHTER'S REPUTATION TARNISHED?

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Students can make up a second set of thought balloons for the end of the trial when George enters the courtroom and reveals the truth about the Karamazov brothers. Or students can rewrite the trial's ending. Suppose the Karamazov brothers got away with their scheme? What would happen to George? What would happen to the sneaky Karamazov brothers?
THE CONFESSION

What's on everyone's mind in the courtroom when George makes his startling confession?

DEBBIE WILLIAMS

I CONFESSION!

KATE MONDAY

THE JUDGE

GEORGE'S BOSS
COAX,

CALL

How can you tell how many people have attended a book fair? Sometimes, it's impossible to provide an exact number. That's where estimation comes in. SQUARE ONE TV's game show of estimation, "Close Call," provides entertaining practice with this critical skill. The activities presented here provide writing opportunities based on this game. (See page 24 for "Close Call" game rules and show numbers)

Writing a Letter

Have your students ever written a letter describing a play, movie, or sporting event that they saw? In this activity, students write a letter to a friend describing an episode of SQUARE ONE TV's "Close Call." View an episode with your class and ask students to take notes on how the game is played, the specific manner of problems presented, and other details—such as funny things the host might say or do. Students may need to view the episode more than once. When students notetaking is completed, they can use the information to write a letter to a friend. Students should include their thoughts about why a contestant's estimate was accurate or not.

Writing an Explanation

Watch an episode of "Close Call" with the class. Ask students to pay special attention to the estimates made by contestants. Before the final estimate is made, stop the tape and ask students to write their own estimates, along with an explanation of their reasoning. Invite students to share their strategies with the class. Discuss the different approaches students used to arrive at their estimates. Then finish viewing the estimation problem to discover how close students' answers were to the actual answer. Repeat this exercise for as many estimation problems as you like.

Using Persuasive Writing

Can your students persuade SQUARE ONE TV producers to use estimation problems created in your class? This activity gives them a chance to try.

WHAT YOU NEED: copies of the activity page

WHAT TO DO:

step 1: Together with your class, view an episode of "Close Call," paying particular attention to the kinds of problems presented to the contestants.

step 2: Distribute one copy of the activity page, "Dear Producer," to each student.

step 3: Set the stage—your students are aspiring writers for "Close Call." Students will need to think of an estimation problem based on the drawing on the activity page. Problems might focus on estimating the number of windows, the height of the tallest building, or the distance from one building to another.

step 4: Once students complete their estimation tasks, they can write a persuasive letter, describing their estimation problem in clear and simple terms to SQUARE ONE TV producers. To make sure that their ideas are clear, students can share their letters with a partner. Students can send their letters to: Children's Television Workshop, School Services, Box CCG, 1 Lincoln Plaza, New York, N.Y. 10023.

Follow Up

Have students present their estimation questions to the class. Classmates can try to tackle each other's estimation problems.
Dear Producer,
Commercials are designed to sell different products, using a variety of techniques. In these activities students create their own SQUARE ONE TV commercials. (See page 24 for show numbers featuring SQUARE ONE TV commercials.)

Writing a Testimonial Commercial

When a famous person endorses a product in a commercial, it's called a celebrity testimonial. Have students find examples of testimonial advertising on television and report their findings to the class. View sections of SQUARE ONE TV that feature celebrities such as James Earl Jones and Bobby McFerrin. (See page 24 for show numbers featuring celebrities.) Divide students into groups. Ask groups to choose a celebrity and write a commercial in which that celebrity explains why math is important to her or him. For example, Bobby McFerrin might say, "Fractions help my singing. They tell me how much time to spend on each note, and that gives me rhythm." Have students consider practical applications of math that the celebrities might use in their professions such as graphs, charts, scale, or percentages.

Writing a "Slice-of-Life" Commercial

Testimonials can make products seem exciting because people may admire the celebrities—but it's also nice to know the product is useful to people who aren't celebrities. That's why commercials sometimes use a technique called a "slice-of-life"—snap shots of everyday people using products themselves.

To get students started on their own "slice-of-life" commercials, have them interview classmates about how they use mathematics outside the classroom. Questions might include, "Do you get an allowance? How do you use it?" "Do you keep score playing games?" "Do you ever watch SQUARE ONE TV at home?" When students have completed their interviews, ask them to write a commercial using the interviews in their commercials.

Storyboards can be expanded by writing dialogue. Once students complete their commercials, they can be produced using classmates as performers. Make your own props for the commercials.

WHAT YOU NEED
- copies of the activity page, markers

WHAT TO DO:
step 1: Ask students to go shopping with an adult, and compare prices of similar products of equal weight, for example, soaps, canned foods, or detergents. Students should select one kind of product and list the weights and prices of various brands.
step 2: Give each student two copies of the activity page, "Picture This Product." Explain that they will make a storyboard for a commercial about a product they chose.
step 3: Ask students to analyze how they promote their product over others. For example, they may try to sell it based on lower price, or—if it is more expensive—on the claim of superior quality.
step 4: Students should use one copy of the activity page to plan their commercials. Provide students with the following restrictions: A. The client wants the product shown 75% of the time. B. The producer wants his son in 50% of the commercial. C. The client wants the competitive product shown only 25% of the time.
step 5: Students can draw a picture in each storyboard frame and write an explanatory sentence beneath it. Estimations of the time that each frame represents can be recorded in the space provided.
step 6: Have students make clean copies of their storyboards on the second activity page and post them around the room.
The Case of the Deceptive Data

Understanding Citizenship

George

Frankly isn't just hot under the collar, he's outraged. He tells Kate that he has a right to express his opinion. He reminds her that on important issues, "people have to stand up and be counted." Have students name some different ways people in a community and a nation can express their opinions. (For example: voting, running for office, working for a political candidate, attending a town or city council meeting, writing a letter to the newspaper, or participating in a protest march.) Ask each student to pick a local issue of interest and write a letter to a local official expressing her or his viewpoint.

Graphing Public Opinion

Poor Mike Pliers isn't the only person who has his popularity measured regularly. Pollsters have been measuring the popularity of American Presidents ever since the 1940s. Beginning with President Franklin Roosevelt, the Gallup Poll has asked the same question to a sample of the American public every two weeks: "Do you approve or disapprove of the way (President's name) is handling the job of President?" Presidents usually begin with a high approval rating in their "honeymoon" period, which eventually takes a downward slide. However, this is not always the case. In this activity, students compare approval ratings of U.S. Presidents reelected to a second term of office and research how current events are linked to a President's popularity.

WHAT YOU NEED:

copies of the activity page, three different colored pencils for each student

WHAT TO DO:

step 1: Distribute one copy of the activity page, "In the Public Eye," to each student. Explain that the table provides data from the Gallup Poll on the approval rating for three different U.S. Presidents who were all reelected to a second term of office.

step 2: Have students use the data in the table to create one line graph showing the American public's opinion of each of these Presidents. Students should use a different colored pencil for each President—as shown in the answer key below—and fill in the legend with the appropriate colors.

step 3: When students have completed their graphs, ask them to compare the approval ratings for the three Presidents. How are they alike? How are they different?

step 4: To learn more about the factors influencing public opinion, ask students to research events that took place in specific years of each of these President's first terms.

ANSWER KEY:

EISENHOWER

NIXON

REAGAN
In the public eye

Use information in chart A to plot line graph B showing each President's approval rating. Use a different colored pencil for each President.

A.

<table>
<thead>
<tr>
<th>President</th>
<th>Years of 1st Term</th>
<th>Inauguration</th>
<th>End of 1st Year</th>
<th>End of 2nd Year</th>
<th>End of 3rd Year</th>
<th>End of 4th Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwight D. Eisenhower</td>
<td>1953-1957</td>
<td>68%</td>
<td>66%</td>
<td>68%</td>
<td>75%</td>
<td>79%</td>
</tr>
<tr>
<td>Richard M. Nixon</td>
<td>1969-1973</td>
<td>59%</td>
<td>59%</td>
<td>52%</td>
<td>49%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Ronald Reagan</td>
<td>1981-1985</td>
<td>51%</td>
<td>49%</td>
<td>41%</td>
<td>54%</td>
<td>59%</td>
</tr>
</tbody>
</table>

B.

Presidential Approval Ratings

Legend: Eisenhower ☐ ☐ ☐ ☐ Nixon ☐ ☐ ☐ ☐ Reagan ☐ ☐ ☐ ☐
The Case of the Deceptive Data...continued

Analyzing Demographics

Jerry Lyer, President of the Mike Pliers Fan Club, wonders why anyone cares about how many people watch the 'Mike Pliers show.' Kate explains that advertisers want as many people as possible to watch their commercials. They also want viewers who are most likely to buy their products. Ask students to watch a cartoon program on Saturday morning and the national news in the evening, and to keep a list of the products that are advertised during each program. How are the products advertised on Saturday morning different from those advertised during the news? What do the commercials reveal about the television audience? Do all cartoon programs feature the same advertisements? Are some products specifically targeted for girls or for boys? Have students identify these products and the cartoon programs where these commercials appear. What might students assume about the audience of these cartoons?

Analyzing Polls

Wellworth Watching sent the ratings of the 'Mike Pilers' show into a nose dive by tampering with rating boxes on viewers television sets. For more often, poor survey or sampling methods are the cause of false or misleading conclusions. Ask students to look through magazines and newspapers to find opinion polls. The polls can be analyzed using these questions.

1. What is the size of the sample? A claim that 75% of voters questioned want Ann Adams for School President may lead readers to the wrong conclusions if only four out of 50 possible voters made up the sample.
2. All answered the survey? A roll of Dancers Magazine readers may result in different answers to questions about favorite activities than a poll of Baseball Digest readers.
3. Who conducted the survey? If a newspaper survey conducted by the Vicious Vinnie Fan Club shows 'Vinnie is the leading candidate for mayor, be suspicious.

F.Y.I.

A}

Graphing Voting Habits

The Math-netters now know that Wellworth Watching was well worth watching, at least long enough to uncover his deceptive data. Understanding data and using it properly are often tricky. In this activity, students discover how different conclusions can arise from seemingly similar information.

WHAT YOU NEED:
copies of the activity page

WHAT TO DO:
step 1: Distribute one copy of the activity page, "Graphs Are Well Worth Watching," to each student.
step 2: Explain that graph A shows the number of people who voted in each Presidential election between 1950 and 1988. What conclusions can students draw from this graph?
step 3: Chart B shows the percentage of people eligible to vote who actually voted in each Presidential election year. What do students conclude from this data? Have students make bar graph C using this information.
step 4: Ask students to compare their bar graphs with the graph in box A. How do the conclusions they draw from each graph differ? Has the percentage of Americans voting in presidential elections been rising or falling since 1960? How 'bout the number of American voters?

ANSWER KEY:
A. Number of actual voters in Presidential elections (in millions)


B. Percentage of eligible Americans who voted

<table>
<thead>
<tr>
<th>Election Year</th>
<th>% of Americans</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>62.8</td>
</tr>
<tr>
<td>1964</td>
<td>61.9</td>
</tr>
<tr>
<td>1968</td>
<td>60.9</td>
</tr>
<tr>
<td>1972</td>
<td>55.2</td>
</tr>
<tr>
<td>1976</td>
<td>53.5</td>
</tr>
<tr>
<td>1980</td>
<td>52.6</td>
</tr>
<tr>
<td>1984</td>
<td>53.1</td>
</tr>
<tr>
<td>1988</td>
<td>50.2</td>
</tr>
</tbody>
</table>

C. Percentage of American Voters

SQUARE ONE TV'S "Piece of the Pie" takes an inventive look at analyzing survey information and organizing it into a pie chart. In these three activities, students use their knowledge of United States geographic regions, cities, and current events to create a "Piece of the Pie." (For "Piece of the Pie" game rules and show numbers turn to page 24.)

Public Opinion Survey

Students can collect and analyze their own data by conducting a class-wide survey using these questions: 1. What is one quality you think is important in a President? (Possible answers may include: good decision-maker, intelligent, honest, hard-working, experienced in government.) 2. What is the most serious problem our country has today? (Possible answers may include: drugs, pollution, violence/crime, war, homeless people, education.) 3. What is one way citizens can help their country? (Possible answers may include: obey laws, don't litter, recycle, vote, do volunteer work, pay taxes.) Have students determine the top five responses, discard the less popular choices, and create a pie chart showing the results. View an episode of "Piece of the Pie" and review the game rules. Have students write questions and answers for the show, based on the data they've collected, and play the game with another class.

Asking Questions Based on U.S. Regions

View an episode of "Piece of the Pie" with students, asking them to pay special attention to the questions asked of the contestants. Students can try writing questions for the show that would have different answers, depending upon which region of the United States was surveyed. For example, the question, "What inter sports do you participate in most often?" would receive different responses from those living in the Northeast than from those living in the Southeast. Encourage students to think very carefully about how they phrase their questions.
1. Name a city with tall buildings.
2. Name a city by water.
3. Name a city with a lot of rainfall.

Legend:
A = New York City, New York
B = Miami, Florida
C = Chicago, Illinois
D = New Orleans, Louisiana
E = Seattle, Washington

Explanation:

Statement:
Public Service Announcements (PSA's) and political advertisements are two ways that citizens can learn about important social issues. In these activities, students write PSA's and political advertisements—SQUARE ONE style. (See page 24 for show numbers featuring SQUARE ONE TV commercials.)

PSA's about the Environment

Take two students into small groups and have them discuss examples of waste and pollution. They should pay particular attention to examples in which minor offenses accumulate into a very big problem. For example, how much paper might students in school waste in a year? How much gasoline might be wasted because communities don't provide public transportation? Once groups have selected an issue, ask them to write a PSA that gets across the message. The PSA should identify the problem and dramatize the relationship between individual acts and the solution to the problem.

Have teams do live skits or television commercials based on their storyboards. Use a large cardboard box to make a wide-screen television frame and have groups perform their commercials for the class with the audio portion performed by an announcer chosen by each team.

PSA's about Unit Pricing

Just as commercials try to inform consumers about products, PSA's are a good way to get information to the public about issues of social importance—community events, health hazards, non-profit organization activities, or consumer economics. Have students visit the supermarket with an adult to discover that detergents often come in different size containers and that the price per ounce often varies. Discuss the concept of unit pricing, and have students write a PSA that helps consumers understand unit pricing and that cautions consumers to purchase wisely. The PSA should identify the sponsor and where a listener can write or call for more information.

Political Commercials

In this activity, students will combine mathematics and politics to make their own political commercials.

WHAT YOU NEED:
copies of the activity page, markers

WHAT TO DO:
step 1: Discuss political advertising with the class. If possible, view some recorded examples and discuss techniques candidates use.
step 2: Tell students that they will make storyboards of their own political advertisements for competing candidates.
step 3: Divide students into production teams and have each team imagine a candidate with an issue like "the United States should use only the metric system," or "there is no point in having fractions, and decimals, and percents."
step 4: Distribute four copies of the activity page, "Vote for Me," to each production team. Teams should create two storyboards—one for their own candidate, and one for their candidate's opponent, who presents an alternative viewpoint on the issue.
step 5: Teams draw pictures in the storyboard frames, making sure that the video portion of the commercial makes the audio portion clear. The time that each frame represents should be recorded in the space provided.
step 6: Have teams trade activity pages and offer suggestions to each other about how the commercial might be improved. Teams then trade papers back and make clean copies of their storyboards, using helpful suggestions.

A vote for Tina is a vote for the metric system!
Where can you find commercials that promote mathematics? Only on SQUARE ONE TV! These activities help students apply information shown in three SQUARE ONE TV commercials. (See page 24 for show numbers featuring specific SQUARE ONE TV commercials.)

Making a Bar Graph

View “Data Headache: Bar Graph” with the class. Mrs. Tuttle has been trying to keep track of her monthly expenses but hasn’t been able to get organized. Does your class have a similar problem? For one week, have each student keep track of his or her daily spending. Collect and total the data each morning. The following week, students can make bar graphs to display the results. Are daily totals always about the same? Repeat the process for a second week. Do the new graphs show similar spending patterns?

Making a Pie Chart

View “Data Headache: Pie Chart” with the class. This weary cab driver has the same kind of problem as Mrs. Tuttle. The taxi business generates a lot of information, but offers no way to organize it. Enter the pie chart! The percentage of his expenses displayed, this cab driver can go back to watching television. What kinds of expenses do your students have—lunch, toys, school supplies? Help the class organize their expenses into categories and represent the results in a pie chart.

Using a Map

Maps can be used as a source of mathematical questions. In this activity, students will measure, estimate, calculate, and get experience with scale drawings.

WHAT YOU NEED:
- copies of the activity page
- pencils, rulers, calculators

WHAT TO DO:
1. View “The Map” with students. Discuss the ways in which math is used.
2. Distribute one copy of the activity page, “Down to Scale,” to each student. Be sure to point out the scale in the lower right-hand corner.
3. Ask students to find the shortest route between A and B on the map. About how many inches is it? Make sure students stay on the road. How many miles do these inches represent?
4. Have students complete the first column of the chart on the activity page.
5. Working individually or in small groups, have students complete the chart by finding the shortest distance between points.

Answer Key:

<table>
<thead>
<tr>
<th>Estimation Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>MON</td>
</tr>
<tr>
<td>50¢</td>
</tr>
</tbody>
</table>

ESTIMATES WILL VARY WITHIN A FEW MILES, MINUTES OR FRACTIONS OF AN INCH.

Make a poster by starting with a map of your city, town, community, or state. Highlight notable locations. How do people typically go from one of these locations to another? Do they walk, go by car, or take a plane? How fast do they go and what are typical travel times? Organize and display this information as part of the poster.
<table>
<thead>
<tr>
<th>NAVIGATOR’S GUIDE</th>
<th>A to B</th>
<th>B to C</th>
<th>A to C</th>
<th>C to D</th>
<th>B to D</th>
<th>A to D</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches on the map</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>miles in real life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time at 30 mph</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time at 15 mph</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time at 45 mph</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

1 inch: 13.5 miles
encourage the use and application of problem-solving processes by modeling:

Problem-solving processes

2. Gather data, or check resources.
3. Manipulate (mentally or physically).
4. Test or guess-and-check.
5. Reflect on the solution and the precision of results.

Heuristics

- Use scale model, drawing, map, picture, diagram, gadget.
- Use object, act out.
- Rewrite, clarify, simplify, find subgoals, subproblems, gaps, missing information; distinctions in kind of information.
- Change point of view, reevaluate assumptions; restate.

Related problems

- Pose new problems; restate.

Teaching strategies

- Present sound mathematical content in an interesting, accessible, and meaningful manner.
- Explore the place value of digits in whole numbers.
- Explore palindromes and other bases.
- Explore interpretations of fractions as numbers, ratios, parts of a whole, division, and meaning of digits in decimal numeration.

SQUARE ONE TV has three goals, which are outlined here in detail for easy reference.
Arithmetic of Rational Numbers
  Basic operations: addition, subtraction, division, multiplication, exponentiation; when and how to use operations.
  Structure: primes, factors, and multiples.
  Number theory: modular arithmetic (including parity);
  Diophantine equations; Fibonacci sequences; Pascal's triangle.
  Approximation: rounding; bounds; approximate calculation; interpolation and extrapolation; estimation.
  Ratios: use of ratios, rates, and proportions; relation to division; golden section.

Measurement
  Units: systems (English, metric, nonstandard); importance of standard units.
  Spatial: length, area, volume, perimeter, and surface area.
  Approximate nature: exact versus approximate, i.e., counting, versus measuring; calculation with approximations; margin of error; propagation of error; estimation.
  Additivity.

Numerical Functions and Relations
  Relations: order, inequalities, subset relations, additivity; infinite sets.
  Functions: linear, quadratic, exponential; rules; patterns.
  Equations: solution techniques (e.g., manipulation, guess-and-test); missing addend and factor; relation to construction of numbers.
  Formulas: integration and evaluation; algebra as generalized arithmetic.

Combinatorics and Counting Techniques
  Multiplication principle and decomposition.
  Pigeonhole principle.
  Systematic enumeration of cases.

Probability and Statistics
  Basic quantification: counting; representation by rational numbers.
  Derived measures: average, median, range.
  Concepts: independence, correlation; "Law of Averages."
  Prediction: relation to probability.
  Data processing: collection and analysis.
  Data presentation: graphs, charts, tables; construction and interpretation.

Geometry
  Dimensionality: one, two, three, and four dimensions.
  Rigid transformations: transformation in two and three dimensions; rotations, reflections, and translations; symmetry.
  Tessellations: covering the plane and bounded regions; kites, rhombuses; role of symmetry; other surfaces.
  Maps and models in scale; application of ratios.
  Perspective: rudiments of drawing in perspective; representation of three-dimensional objects in two dimensions.
  Geometrical objects: recognitions; relations among constructions; patterns.
  Topological mappings and properties: invariance.
These rules will help your class play the game shows, "Close Call" and "Piece of the Pie," just like contestants do on television! For more game show fun, try the SQUARE ONE TV Game Shows Teacher's Guide.

Sometimes in real life things aren't as exact as you want them to be—that's when estimation takes over. In this game, the host presents student contestants with a visual estimation task like one of these. How many pieces are there in this jigsaw puzzle? How many peanut-butter jars tall is that elephant on stage?

There are three rounds. After being shown an estimation task and a referent, contestants get ten seconds to write down their estimates. Then they reveal their answers one by one. Whoever makes the closest estimate in each of the first two rounds qualifies for the final championship round.

Once your class understands how the game works, try playing it for points—the better the estimate, the higher the score. The class audience can participate by voting on how close the contestants' championship estimations come to the real answer.

The above rules are used in shows numbered in the 200s. For a variation on these rules, view an episode of "Piece of the Pie" in a show numbered in the 300s.
Bring the excitement of programs from Children's Television Workshop into your classroom with the help of these materials!

**SQUARE ONE TV**

*N*ew **Curriculum Connections**

Teacher's Guide provides activities for linking SQUARE ONE TV's game shows, commercials, and Mathnet to your social studies and language arts classes @ $3.00.

The original SQUARE ONE TV Teacher's Guide offers an overview of the series, with suggestions for classroom use of segments ranging from Mathman to Backstage with Blackstone @ $2.00.

**Mathnet Teacher's Guide** provides activities linked to the weekly mysteries of Mathnet, the detective's serial that wraps up every SQUARE ONE TV program @ $3.95.

**Game Shows Teacher's Guide** offers complete rules and strategies for SQUARE ONE TV game shows, as well as activities to help students explore the mathematical concepts behind the games @ $3.25.

**3-2-1 Contact**

3-2-1 Contact Teacher's Guide provides activities for Seasons IV to VII, ranging from hands-on activities to board games @ $4.25.

3-2-1 Contact Database is a software package, available on IBM-PC and Apple II formats, that features a comprehensive subject index and textbook correlations to this award winning series @ $6.95.

To order these items, use the card enclosed in this teacher's guide. Discounts are available for bulk orders of more than 50 copies.

Don't forget to tape SQUARE ONE TV and 3 2-1 Contact off the air to use in your classroom. It's free, and it's perfectly legal as long as you erase the tapes within three years.