

# 10

## Games That Promote Problem-Solving Skills

A note about “games”: With today’s craze for electronic toys, you might be surprised at the effectiveness of these simple, almost old-fashioned games. They are really more like educational tasks than games, but introducing them as games, either competitive or cooperative, helps kids come to love them. The games enrich the learning process, enhance understanding, and reinforce concepts taught by you.

The games featured in this chapter all have a connection to different aspects of rational problem-solving and help students to practice specific skills required to successfully solve problems, in a fun and non-threatening manner. For instance, Brain Blast explores and encourages divergent thinking, necessary for Step 2, Determining Possibilities and Choices. Similarly, by participating in Name Game, students will practice using precise words to concisely define a situation, much as they have to do in defining a problem.

The games are presented in alphabetical order. Each involves minimum preparation and equipment.

### **BRAIN BLAST**

A competitive game of both chance and divergent thinking, Brain Blast encourages groups to cooperate to come up with as many ideas related to a specific topic as possible. Although this game works well when teaching about creative ideas for solving problems, it is also useful as a prelude to many creative writing projects.

#### **Players:**

Whole class as two teams

#### **Materials:**

- One large die, which is available from dollar stores, games stores, seniors’ stores (You can use a small one, but the large ones are better.)
- List of “umbrella topics” or general theme words (See below; it is a good idea to use concepts being studied in class already as it encourages recall of facts.)

#### **Rules:**

According to the number rolled on the die, teams provide the number of correct word or phrase choices that fit the provided theme word. (Example: Number 2 equals two words provided.) If the two words are correct, the team earns two points. If the team can come up with only one correct answer, the team earns one point. The teacher keeps track of scores in some manner visible to students, perhaps using a chalkboard, whiteboard, or overhead. Usually, the first team to reach “20” wins. Sometimes, though, determining the winner is up to the teacher. If both teams end up tied at the end of a designated playing time, the

Creative thinking is encouraged. Points may be awarded for fantasy or made-up words as long as kids can justify them. For example, “plabitat” could mean plants of the habitat.

teacher may announce that the team that obviously tried harder or had “more difficult choices” than the other is the winner.

**Game at a Glance:**

As you can see, the element of luck is involved (tossing a larger number on the die) as well as memory and divergent thinking.

1. Teacher writes theme word (e.g., colors) on board.
2. Team A rolls die and gets “3.” Team A provides the words “red,” “green,” and “blue” and gets three points.
3. Team B rolls “1.” The team provides the word “orange” and gets one point.
4. Team A rolls “6,” but can provide only five color words, so gets five points. (They lose a point for the one word missed.) Team A now has seven points.
5. Team B rolls “4” and provides four words, including the made-up word “Roorange” (combination of red and orange — teacher accepts the word). Team B now has five points.]

<b>Possible Theme Words</b>		
ANIMALS	SEASONAL ACTIVITIES	COMPUTERS
PLANTS	CAMPING	BOOKS
CITIES	VACATIONS	TELEVISION
COUNTRIES	TRAVEL	FITNESS
COLORS	FINE ARTS	NUTRITION
STORIES	MATH TERMS	PLANTS
AUTHORS	FRIENDS	FRUITS
FEELINGS	PROBLEM SOLVING	DESSERTS
BEHAVIORS	WILDERNESS	BOY (GIRL) NAMES
SPORTS	HISTORY	FUTURE
CLOTHING	FARMING	TECHNOLOGY
INUIT	CANADA	POLLUTION
PIONEERS	ASTRONOMY	CARTOONS

**DISORDER**

This non-competitive, cooperative game of cognitive and creative thinking invites players to consider and appreciate correct sequence.

**Players:**

Groups of five, whole class

**Materials:**

- Index cards, each giving one step in a sequence of five directions (see “Cards for Disorder” on page 85). Color-coding the card sets, perhaps with dots, so that all five cards relating to a sequence are marked with red, for example, will allow the cards to be easily returned to the correct sets following use.
- Each set of five cards is part of a larger deck, but only one set of five, not presented in sequence, is used at a time.

**Rules:**

No winner — the goal is to entertain.

**Game at a Glance:**

The activity “Posting the Letter” (below) has been used here to clarify the steps.

1. One group “performs” at a time; the rest of the class becomes an audience.

Beyond using the line master examples, teachers and students can brainstorm for common nouns that can be described in a variety of ways. For example, while “modem” is quite specific, “parent” can readily be described in five increasingly specific ways and would probably work for the game. This trial-and-error activity, by itself, can be interesting and challenging for students.

This game works well at all ages. Younger kids love the acting. Older students can take it a step further and write the action out in complete, properly sequenced form, taking note of the ambiguous wording and how it could be misinterpreted. Many kids enjoy coming up with action sequences. Disorder is an excellent creative thinking, cognitive activity.

2. The teacher holds one set of five cards like a deck of cards, blank backs facing the students. One at a time, individual group members draw a card.
3. The student conveys what is on the card either by doing charades or reading the phrase aloud. For example, if the student chose “drop it in box,” she could act this out.
4. The audience first tries to guess what the small action is. If they guess “mailing a letter,” they then try to guess where this step is in the action sequence. They are allowed a single guess only. If their answer is incorrect, the game continues with the next person drawing a card.
5. When the audience is able to identify the overall activity, allow the remaining group members to draw the other cards and present what’s on them. The audience still attempts to put all the small actions in sequence.
6. Invite students to guess the exact action title as written on the card.  
Example: (assuming that cards have been drawn in this order)  
Card 1: fold it carefully (the third action in sequence)  
Card 2: stamp it (fourth action)  
Card 3: write carefully and neatly (first action)  
Card 4: drop it in the box (fifth action)  
Card 5: lick and seal (second action)  
ACTION TITLE: Posting the Letter

You can imagine how confusing these actions would be to students who didn’t know the correct order or the title. When the actions are presented in this “Disorder,” with the words being rather ambiguous, the game becomes both a problem-solving and an “ordering” activity. The creation of a title is a closing activity; only the teacher knows the “true” title.

## NAME GAME

This game is either competitive or cooperative, depending on how the teacher wants to use it. A game of reasoning, it facilitates understanding for concise, accurate defining of words, and hence, of problem situations.

### Players:

Whole class as two teams (competitive), or individuals or partners (cooperative)

### Materials:

- Teacher information on vague-to-specific defining words (see “Possible Name Game Words and Clues” on page 86)
- A team counting list on overhead or board that allows players to see the accumulating points *or* the sheets of paper used by individuals or partners

### Rules:

If playing in teams, the team with the highest score wins; if playing as individuals or as partners, individual scores are kept only as personal challenges.

### Game at a Glance:

1. Teams determine which team starts, perhaps by playing Rock, Paper, Scissors or doing a coin flip. After the first “call,” or guess, teams alternate calling for the rest of the game.

2. The teacher provides the first “clue,” a vague, abstract, or indistinct descriptor. See “Possible Name Game Words and Clues.” Chances are players will not be able to guess, or “call,” the correct name.
3. The teacher provides the next “clue” on the list.
4. Teams alternate “calling” what they think the word is. If a team guesses correctly, that team gets the number of points listed beside the “clue.” As clues become more specific, and hence, guessing becomes easier, fewer points are awarded.

Example (based on Team A and Team B)

- Teacher provides the clue word “edible” (worth 5 points).
- Team B has won the coin toss and guesses “pizza” (0 points). (Note: If the team had guessed the word “pomegranate,” they’d have earned 5 points, and the teacher would move to the next word.)
- Team A guesses “cake” (0 points).
- Teacher provides the next clue, which is “fruit” (worth 4 points).
- Team B guesses “apple” (0 points).
- Team A guesses “orange” (0 points).
- Teacher provides the next clue, “many edible seeds” (worth 3 points).
- Team B guesses “grapes” (0 points).
- Team A guesses correctly and gets three points.

**Teacher Tip**

After playing this game, it is a good idea to discuss how the more succinct, concise, and accurate the clue words, the easier it is to guess the key word. Draw students’ attention to how this works when writing or stating a problem to be solved.

**PRIORITIES**

Priorities is a competitive game of problem-solving and of establishing priorities. To some degree, it is also a game of chance.

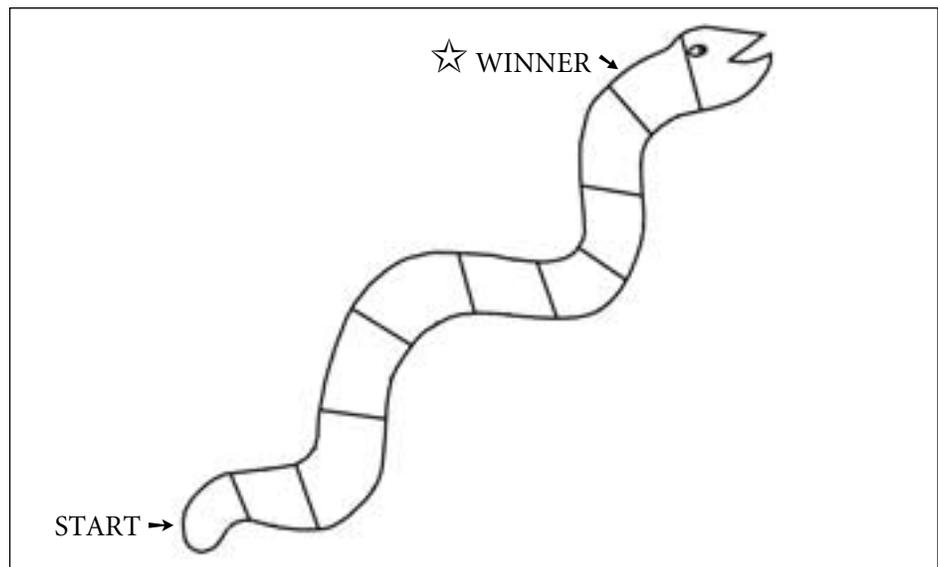
**Players:**

Two people or the whole class divided into two teams

**Materials:**

- Individual Priorities sheets or single transparency for the overhead (see graphic below)
- If using overhead, have a washable pen for reuse of transparency.
- Write problems, one per card, to create a reusable Problems Deck. (See Appendix A, Table of Possible Problems, for ideas.)

Shape of the figure is flexible, but the snake shape seems to appeal to kids. I recommend having at least 10 steps.



**Rules:**

First person (or team) to reach the Top Priority wins.

**Game at a Glance:**

1. All cards are shuffled and spread face down on a table or desk.
2. If playing in partners, each takes one card; if whole class is playing, one player from each team chooses a card in turn.
3. The two players holding cards must decide which card represents the highest priority. This card represents a single move ahead on that player's game sheet. If using an overhead for the whole class, have a different symbol (e.g., ^ or \*) for each team, and mark the team's progress with their symbol.
4. If the players cannot agree on which card represents the priority, they present their cases to the teacher (or to a predetermined "judge") who must decide who has the best case and thus will move ahead. If a decision still can't be reached, either no one moves or everyone does.
5. If the players make an obvious error in judgment and choose the wrong card as the priority, the teacher or judge can intervene and have them all move backwards one step.

**Example:**

- First cards exposed: Team A — late for curfew; Team B — have to phone friend  
Late for curfew takes priority so Team A moves ahead one space.
- Next two cards: Team A — broke my bike; Team B — forgot my homework

(Obviously, kids will have something to say about these two problems. Allow conversation between team members for up to two minutes; then, ask the players who chose the cards to explain why their problems should take priority.)

**PROTO, OR PROBLEM LOTTO**

This competitive game involves creative thinking and also lets students see that not only can problems have more than one solution, but that sometimes the same solution works for more than one problem. Many students think that there has to be "just one right way" to solve a problem so this game can be an eye-opener for them.

**Players:**

Individuals or partners

**Materials:**

- Individual sheets of paper, pens/pencils
- Visible lists of "problems" to copy (on transparencies or wall charts or handouts that can be collected afterward)
- Possible Solutions Deck: Keeping in mind the problems on the students' list, write possible solutions briefly, one per card. Many solutions will work for several problems. See Appendix B, Table of Possible "General" Solutions.

**Rules:**

The first student(s) to fill in the sheet according to teacher requirements (e.g., one solution in each quadrant *or* three solutions in three quadrants *or* two solutions in diagonal quadrants) wins the game. The design is flexible.

This game works well for any age, depending on the problems listed. For problems, you can refer to Appendix A, Table of Possible Problems, or invite students to create their own lists and print them legibly on index cards. The latter can be an ongoing project. The students are much better at identifying problems than we are; they know what problems they face.

Remember to refer to Appendix A, Table of Possible Problems, for ideas. Be sure that all problems are worded succinctly as kids tend to copy the shortest ones.

**Game at a Glance:**

1. Students divide pages into four quadrants by drawing two lines that intersect at right angles and extend to edges.
2. At the top of each quadrant, students write a problem, chosen from the provided list.
3. The teacher randomly draws cards or holds cards with backs facing the students and invites different students to pick a card.
4. The teacher or a student reads the possible solution. If students can fit that solution to one of their chosen problems, they print it in the appropriate quadrant.
5. If a solution fits more than one problem, they can print it in more than one quadrant.
6. The game continues until someone meets the criteria established by the teacher and shouts “Protto,” at which point the teacher (or a predetermined panel of student “judges”) confirms that the student has met the criteria. Example: One student has selected the following four problems to write in his quadrants:

told a lie	lost my homework
friend wants to shoplift	late for curfew

If the teacher’s requirements for this particular game were to “get one solution in each of any two diagonals,” this student, with a solution in both the top right and bottom left quadrants, could call “Protto.”

- The first solution presented was “do a thorough search.” He wrote this correctly in the top right quadrant.
- The next solution presented was “take on a paper route.” This idea doesn’t fit anywhere on his page, so he could not write it down.
- The third solution presented was “take a deep breath, hold for five seconds, and repeat three times.” This solution “step” is appropriate for any problem, so he wrote it in all quadrants (as all other students could have done, too, which means it works against winning).

**PULLING POCKETS**

This can be a game or an in-class activity. Based on the elements of chance, surprise, and quick thinking, it can be a cooperative game, with teams collaborating to come up with as lengthy a list as possible; a competitive game; or an individual challenge, where each student randomly draws or selects a different pocket — called “pulling a pocket” — and attempts to solve the problem within it.

**Players:**

Whole class divided into two or more teams approximately equal in size

**Materials:**

- “Pockets,” each filled with a different problem  
A “pocket” is anything that can be closed, such as an envelope, a small tie bag (like the ones used at weddings, available in dollar stores), a small box, an aluminum foil bundle, a newspaper stapled into squares, an empty toilet-paper tube sealed at both ends, a baby food jar, or a plastic egg as found everywhere at Easter. Basically, anything small and hollow works. Each tiny container is filled with a single problem, then closed.

“Pulling a pocket” is a way to motivate kids and keep their attention since the activity has an element of surprise. It means making a random draw from a choice of “pockets” whose contents — in this case, problems — are hidden. The pockets can be prepared easily by volunteers, aides, or other students.

**Rules:**

The team that “pulls the pocket” answers first. Teams then alternate pocket pulling.

Teams receive points for quickly providing “good” possible solutions. There is an element of subjectivity in determining the excellence of the response, so having a panel of judges who try to be objective (with the teacher’s help) is a good idea. Teams alternate giving solutions. They can’t repeat a solution already given, and when no one can come up with any more solutions, a new pocket is opened.

**Game at a Glance:**

1. Students choose pockets and open. If using team approach, first one team chooses a pocket, reads the situation aloud, and then both teams are given 60 seconds to devise solutions.
2. Teams alternately give solutions, earning one point per solution.
3. The team having the most “viable” solutions — offered alternately and not repeated — will have the most points.
4. When there are no more solutions, a new pocket is opened.

**Example:**

- Team A chooses a pocket which contains “lost my cellphone.”
- At start signal, both teams brainstorm solutions to the problem. They stop at signal from the teacher. Signals can be anything familiar to the class, such as a hand clap, a whistle, a flicking of lights, or even just a loud “Stop!”
- Team A offers first solution. If acceptable, the team gets one point.
- Team B offers a different solution. If acceptable, the team gets one point.
- Team A has no more solutions, but Team B has one more, so gets one more point. (Team A has 1 point; Team B has 2.)
- Team B opens a pocket and continues as before.

There are many other ways to use pockets, too. You can stuff pockets with seasonal greetings, jokes, edibles, actions to perform, words of encouragement, silly fortunes, directions to “prizes,” marbles, and statements of appreciation, which students will find much more memorable than verbal comments. Pockets can be reusable or personalized with names and contents specific to each child. Kids love to open their own personal pockets.

**SOLUTION BEE**

Comparable to a spelling bee, this competitive game encourages students to think broadly, innovatively, and creatively. Solution Bee is a game of luck as well as of divergent thinking.

**Players:**

Whole class as two teams

**Materials:**

- Problem–Solution Deck: Use index cards to create this reusable deck; alternatively, you can use paper cut into card-size pieces. The number of cards or papers will depend on the ages of the students, but there should be at least six to begin with. If the teacher finds the game moves perhaps too quickly, more cards can be used the next time. On each card, a problem is identified on one side, with a possible solution written below it. This solution is considered to be the “winning” one, but is not necessarily the “best” one. See page 89. (See Appendixes A and B for more problem and solution ideas; of course, the teacher or students can add more situations.)

**Rules:**

Teams are required to brainstorm for all the possible solutions to a given problem. They say their solutions alternately, and if theirs is the one written on the card, they win a point. The team with the most points wins.

**Game at a Glance:**

1. One student from a team selects a card from a fanned deck. The words face the teacher so that there is no way to peek at the problem. The teacher then reads the problem on the chosen card.
2. Teams alternately suggest a possible solution.
3. When a team comes up with the solution on the card, it gets a point; the next problem card is selected randomly by a student and the same procedure is followed.
4. Point out that the solutions on the cards are *not* necessarily the best solutions. Discuss how a single problem can have many solutions, and whether or not the “winning” solution is the best one.

**SOLVE-IT-TWICE**

This competitive game calls on students to take both adaptive and innovative approaches to problem-solving. It enables players to see that there are at least two equally good, rational problem-solving techniques for a single problem. The assumption is that players know the difference between an adaptive solution and an innovative one.

**Players:**

Teams — groups, or whole class as two teams

**Materials:**

- Problems Deck (see page 79)
- Paper and pens/pencils, one for each team
- Overhead, whiteboard, or chalkboard for point counting

**Rules:**

This game can be judged either by the teacher or by a predetermined panel of student judges. The teams need to come up with two solutions for each problem — an adaptive one and an innovative one. A team receives a single point for a single response, as long as the judge or panel feels that the solution is appropriate. If the team offers a solution that the judges find particularly “amazing,” two points can be awarded for that solution. At the end of the game, the team with the most points wins.

**Game at a Glance:**

1. Each team chooses a player who does the writing and a player who reads aloud what has been written.
2. The teacher or one of the judges randomly draws and reads a card from the Problems Deck.
3. Teams are given 60 seconds (or more, depending on ages and abilities of players) to write down two solutions: one adaptive and one innovative. Talking is allowed between team members.
4. The teacher or a judge calls “stop.”
5. Teams present their solutions exactly as written. Judges determine points. The maximum number of points per problem is three: one for the adaptive

solution and one or two for the innovative solution. Teams alternate starting.

Example:

- Problem card shows “got caught telling a lie.”

- Team 1 writes:

ADAPTIVE: Apologize. (Judges award 1 point.)

INNOVATIVE: Apologize, but also show the person a page you’ve downloaded about how lying has terrible effects on people and say that you have learned from your mistake. (Judges award 2 points.)

Total: 3 points.

- Team 2 writes:

ADAPTIVE: Say sorry. Accept consequences without whining. (Judges award 1 point.)

INNOVATIVE: Jokingly say that the “devil made me do it.” (Judges award 0 points because this solution is not viable.)

Total: 1 point.

## Cards for Disorder

These card steps are in correct sequence. You will need to reproduce them and glue them to cards yourself. The directions are vague for two reasons. If the student chooses to read aloud what's on the card, the words alone will not necessarily give away the final action. If the student chooses to act them out, it can be much more entertaining if he isn't quite sure what he is doing. A lot of guess work is purposefully involved.

### ACTION TITLE: BLOWING BUBBLES

1. open the cap
2. pour mixture in a bowl
3. hold the wand carefully
4. blow gently
5. touch one with your finger and watch what happens

### ACTION TITLE: WALKING THE DOG

1. attach the hook part
2. open the door, exit, walk, holding the end firmly
3. encourage sitting at the street corner
4. pick up poop and dispose of it
5. continue "controlled" walking

### ACTION TITLE: MAKING THE CAKE

1. read the directions
2. gather the ingredients
3. break eggs
4. mix it, pour it, cook it
5. eat and enjoy

### ACTION TITLE: MAKING A CHOCOLATE SUNDAE

1. scoop it out into a bowl
2. pour chocolate
3. sprinkle
4. eat and enjoy
5. lick bowl and fingers

## Possible Name Game Words and Clues

POMEGRANATE

Edible (5)

Fruit (4)

Many edible seeds (3)

Bright red (2)

Eat seeds only (1)

FOOTBALL

Sport equipment (5)

Team sport (4)

Small and brown (3)

Pigskin (2)

Oval shaped (1)

PENCIL

School tool (5)

Long or short (4)

Filled with graphite (3)

Wooden and pointy (2)

Utensil for writing (1)

TEXTBOOK

Resource (5)

Big or small (4)

Informative, portable (3)

Can be boring (2)

Hardback manuscript (1)

GRAPEFRUIT

Edible (5)

Natural (4)

Fruit (3)

Sphere (2)

Juicy (1)

SODA

Ingestible (5)

Contained (4)

Sweet (3)

Fizzy (2)

Liquid (1)

## Sample Problem/Solution Cards

**P: I “borrowed” money without asking from Mom’s purse and she found out.**

*S: Gave her my allowance for a month*

**P: I got grounded on the night of the big game.**

*S: Try to make a deal with Mom for grounding on a different day.*

**P: I forgot to pick up little sister from daycare, so they called Dad to come from work to get her**

*S: Stuck a reminder note to my backpack.*

**P: When the teacher leaves the room, \_\_\_ picks on me.**

*S: Tell \_\_\_ I’m going to beat him up at recess.*

**P: Class wants to go on an expensive field trip.**

*S: Have a class bake sale to raise money.*

**P: Friend wants to cheat from my test.**

*S: Let her cheat but talk to her later.*

**P: My best friend told the teacher a big lie and I don’t know what to do.**

*S: Tell the teacher that she lied to her.*

**P: I missed the school bus and don’t have money for a city bus.**

*S: Call Mom at work.*

**P: I lost my homework on the bus.**

*S: Call the bus company when I get home.*

**P: Friend wants me to shoplift with him.**

*S: Talk to the school counsellor about it.*