

Horse Race Activity

Overview:

Participants engage in an abbreviated learning activity (a dice game) related to the concept of probability (somewhat as students would). After this short learning experience, they are given a collection of actual student work from two different tests: one is a multiple choice test; the other is a performance test. They work in small groups to see what they can learn about students' knowledge by examining the student work. The whole group discusses the strengths and weaknesses of each method.

The presenter concludes the discussion by presenting a continuum of learning—from mastery of factual information to the understanding of complex concepts and application of thinking skills. They see how different assessment methods are appropriate depending on the type of knowledge a teacher wants to assess. The limits and benefits of standardized testing are briefly discussed.

Use:

Can serve as a stand-alone activity and discussion introducing a key purpose of assessment and contrasting two assessment types—performance test and multiple choice test.

Good follow-up to *DMV Discussion*. Provides good reinforcement of multiple measure concept while providing more depth and information about quality assessment.

Key Concepts Addressed from Public Understanding Framework:

Multiple Measures
Quality Assessment

Time Frame: 45-60 minutes

- Introducing the Horse Race Game (5 minutes)
- Playing and Debriefing the Horse Race Game (15 minutes)
- What Did Students Learn? (20 minutes)
- Reflection and Conclusion (20 minutes)

What You Need:

For the presenter:

- o 12 beans or other small counters (large lima beans, cubes, or chips work well as counters)
- o 1 each of the following 11 overhead transparencies (masters on page xx–xx):
 - 1. “Horse Race Game Board” transparency
 - 2. “Class Graph” transparency
 - 3. “How Many Ways” transparency
 - 4. “Keeping Track” transparency
 - 5. blank “Horse Race Quiz” transparency
 - 6. blank “Letter to a Jockey” transparency
 - 7. “Letter to a Jockey Scoring Guide” transparency
 - 8. “Criterion-referenced vs. Norm-referenced” transparency
 - 9. “Sample Student Rubric” transparency
 - 10. “Full Range of Learning” transparency
 - 11. “Critical Sense” transparency
- o overhead projector
- o extension cord (optional)
- o 1 large-tipped marker
- o 1 sheet of butcher paper or large graph paper
- o masking tape
- o several sheets of self adhesive (“sticky”) dots (approximately 1/2 inch in diameter)

For each participant:

- o 1 of each of the following handouts:
 - take-home handout: “Ways to Help Your Child Achieve High Standards for His/Her Work” (masters)
 - take-home handout: “Don’t Believe Everything You Read in the News” (masters)

For each pair of participants:

- o dice
- o “Horse Race Game Board” (master on page xx)
- o 2 beans or other small counters
- o __ plastic bag or other small container for the counters

For each group of 4-6 participants:

- o 2 manila folders
- o 2 sets of student work, “Horse Race Quiz” (student work masters) and “Letter to a Jockey” (student work masters)

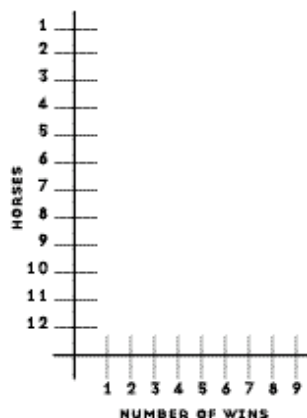
Getting Ready:

Before the Day of the Workshop:

- 1. Duplicate handouts.** Duplicate one copy of the following handout for each participant:
 - take-home handout: “Don’t Believe Everything Your Read in the News” (masters)
- 2. Make overhead transparencies.** Make one of each of the eleven overhead transparencies listed above.
- 3. Make student work folders.** Duplicate one copy of the following student work for each group of 4-6 participants:
 - “Horse Race Quiz” (student work masters)
 - “Letter to a Jockey” (student work masters)

For each group of 4-6 participants, prepare two labeled folders containing work, one labeled “Horse Race Quiz” and the other labeled “Letter to a Jockey.”

- 4. Make Horse Race Game Boards.** Duplicate a copy of the “Horse Race Game Board” for each pair of students. (master)
- 5. Make butcher paper class graph.** Make a class graph on a large piece of butcher paper or graph paper. Label one axis with numbers 1-12 for each of the horses. Label the other axis “number of wins.” (see diagram)



Immediately Before the Workshop: (20-30 minutes)

- 1. Set up the room.** Arrange the room so that groups of 4-6 participants can sit at a table together. If you are in a classroom, move desks together to make “tables.” Tables should be oriented so that all of the table groups can join a large group discussion, and see what’s projected on the overhead.
- 2. Set up overhead projector.** Set up overhead projector at the front of the room near where you will stand.

3. **Post class graph.** Use masking tape to post the butcher paper class graph in a location where all will be able to see. Set the sticky dots near by.
4. **Have materials for Horse Race demonstration on hand.** Place the materials you will use for the Horse Race demonstrations (12 counters and a pair of dice) next to the overhead projector.
5. **Have overhead transparencies on hand.** Place the 12 overhead transparencies (in numbered order) next to the overhead projector.
6. **Assemble remaining workshop materials.** Have easily accessible all of the remaining workshop materials:
 - dice
 - bags of counters
 - “Horse Race Game Boards”
 - folders of student work

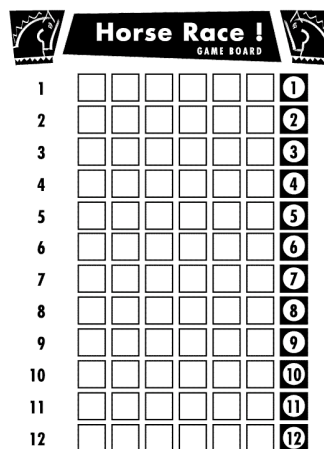
Introducing the Horse Race Game (5 minutes)

1. **Introduce the Activity.** Explain that they will participate in a shortened version of a math activity—just enough to provide the common experience of a particular learning activity. Then as a group, they’ll focus on the way students’ knowledge was assessed, and what insights one can gain by examining student work.

Provide the context for the activity—it’s a mathematics activity for 3rd–6th graders from a unit on probability. Tell them it’s called, the “Horse Race” activity and that it uses dice.

2. **Explain the Rules.** Show overhead transparency #1—the “Horse Race Game Board.” Quickly put a marker on each horse. Explain how the horses move across the track. After a player rolls the dice, he moves the horse whose number is the sum of the dice ahead ONE space. For example, if a six and a three are rolled, the player moves Horse #9 **one space** forward. The horse that crosses the finish line first wins. Emphasize that it is a race between horses, not players.

Sometimes parents wonder whether a game is a valid educational experience. If this should come up, be prepared to reassure the group that games can provide an excellent grounding in mathematics content. As they will see, the Horse Race game involves students in learning key concepts in probability.



- Demonstrate the game on the overhead.** Select two participants to model taking turns rolling the dice and moving the appropriate horses. Don't try to finish the game. Just have them play long enough so that everyone understands how to play. This might be just 4 or 5 moves.

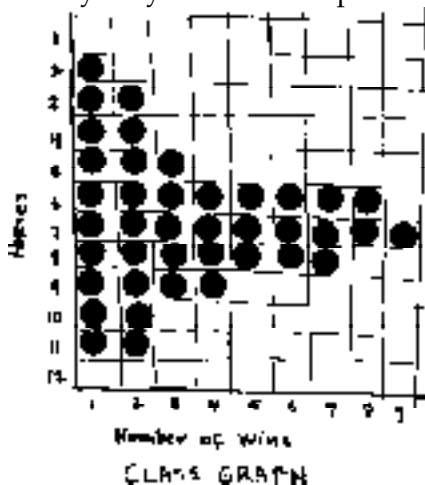
In many board games, a roll of "4" results in moving a game piece forward 4 spaces. Make sure to emphasize that in this game, a roll of a certain number causes the horse with that number to move forward ONE space.

- Explain the class graph.** Before setting the participants loose to play their own games, show how they should record the number of the winning horse with a sticky dot on the class graph that you have posted. Tell them that as soon as they finish one game, they should come up and mark their winning horse on the class data chart.

Playing and Debriefing the Horse Race Game (20 minutes)

- Have them begin the game.** Distribute game boards, beans, and dice and have them begin. Let them know they will not have as long to play as students—they should try to play as many games as they can in the next 5-10 minutes.
- Keep the group moving.** While playing the game is pleasurable, it is not the goal of the day, so it's important that you keep the session moving. After they have had about 5 minutes to play, let the group know that they should finish the game they are on, and post their results on the class data board.
- Debrief the activity.** Get the group's attention. Show overhead transparency #2—the "Class Graph" of student data. Explain that students would get to play repeatedly and would generate a set of results like this. Ask:

- What patterns do you notice?
- Why do you think this pattern occurs?



4. **Show them the next steps students would take.** Tell them that students have the chance to investigate the reason for the pattern.

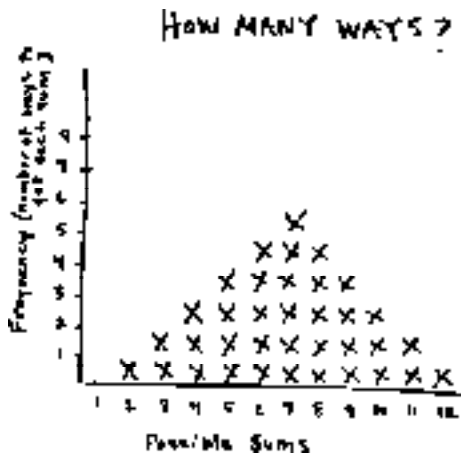
Important note: Don't attempt to actually lead the participants through steps a. and b., but rather share with them that this is what students do.

- a) First show overhead transparency #3—the “Keeping Track” chart, and note how students use this to figure out how many ways there are to get each number with two dice.
- b) Then show overhead transparency #4—the “How Many Ways” chart, and show how students discover the most probable outcomes—7, then 6 or 8.

You may want to point out that the process of making meaning of the game experience is key to cementing the learning that occurs.

Keeping Track

	2	3	4	5	6	7
	3	4	5	6	7	8
	4	5	6	7	8	9
	5	6	7	8	9	10
	6	7	8	9	10	11
	7	8	9	10	11	12



4. **Introduce their task.** Tell the participants that you will give them two folders; one with student work from the “Horse Race Quiz;” one with student work from the “Letter to a Jockey” task. Ask them to work in groups of 4-6 to look at and discuss the student work in each folder. Ask them to focus on what they can tell about what students learned by looking at the student work.
5. **Have groups begin discussing.** Distribute the two student work folders to each group. Let them know they will have about 5–10 minutes to discuss what the student work tells them about what the students learned.

Reflection (15 minutes)

1. **Lead a whole group discussion about the student work.** Get the whole group’s attention. Ask:
 - What were you able to learn from looking at the student work from the “Horse Race Quiz?”
 - From the “Letter to a Jockey?”
 - What were the strengths of each assessment method?
 - What were the weaknesses of each method?
2. **Scoring tests.** Mention that often people are concerned about how newer assessment methods can be scored objectively. Show overhead transparency #7— “Letter to a Jockey Scoring Guide.” Say that this is an example of a scoring guide that a teacher might use to objectively compare open-ended student work to specific, verifiable standards. Scoring guides are sometimes referred to as “rubrics.”

Letter to a Jockey Scoring Guide

Level Four (highest level of work)

Students selected particular horses and supported their conclusion with an extensive application of probability concepts.

Level Three

Students selected particular horses and supported their conclusion with an analysis of class data and a limited application of probability concepts.

Level Two

Students selected particular horses. They based their recommendation solely on an analysis of class data. They did not include an application of probability concepts.

Level One

Students selected particular horses. They based their recommendations on extraneous factors or the results from the few games they played in pairs. They did not support their conclusion with class data or probability concepts

Mention that research has shown that when teachers have well-constructed rubrics, and know how to use them, that there is a high degree of reliability (agreement) on how to score papers (as high as 90%). While these are a lot of “ifs,” in theory this way of assessing student work can be highly objective.

Note: The “probability concepts” referred to on the transparency are those the participants have just been introduced to by the game and especially as shown on the “Keeping Track” and “How Many Ways?” transparencies— If two standard dice are rolled, some numbers will come up more often because there are more ways to create these sums on the dice. 7 is the most likely result because there are six combinations that can add up to 7 (out of 36 possible results). The numbers 6 and 8 are next likely to result, as five possible combinations can add up to both 6 and 8. For the same reason, numbers such as 2 and 12 are less likely to result from the roll of two dice.

- 3. Norm-referenced vs. criterion-referenced scoring.** Show overhead transparency #8. Two more jargon-laden terms that we often hear are norm-referenced and criterion-referenced scoring. This scoring guide is an example of criterion-reference scoring—where student work is compared to criteria, or standards. Norm-referenced scoring refers to student work as compared to other students’ work.

Criterion-referenced scoring:
student work is compared to
specific criteria described in a scoring guide

Norm-referenced scoring:
student work is compared to
other students’ work

- 4. Students using rubrics.** Show overhead transparency #9. Say that it is more and more common for teachers to give students a scoring rubric before they do their work. In this way, students understand the work standards that are expected of them. For these students, the formula for high quality work is not a mystery. This practice also helps students start to internalize the standards for good work.

Investigation Rubric

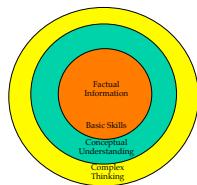
- 1) There is a good investigable question:
 - Uses available equipment and materials
 - Is safe and feasible
 - Can be answered by using the investigation (not too difficult, too easy)
 - Is a "measuring" question, a "relationship" question, or a "comparison" question (not a "how" or "why" question)
- 2) An appropriate kind of investigation was selected:
 - The kind of question is answered in the most appropriate manner (what appears to be best for the question asked)
 - Decided to do a different kind of question (comparison question was chosen) or because of time or another kind of question (not a comparison question)
- 3) The investigation is well designed:
 - For Systematic Observations:**
 - Planned the variables (variables)
 - Identified the independent variables
 - Have used and varied procedure and labels variables introduction
 - For Experiments:**
 - Identified the variables
 - Controlled variables
 - Identified the independent variables
 - Have used and varied procedure and labels variables introduction
- 4) Careful reasoning is used:
 - Use of data or facts to support conclusions
 - Suggested a well-reasoned explanation
 - Thoughtful judgment of additional questions
- 5) Ideas are well-communicated:
 - Ideas are clearly expressed through writing and diagrams so others can understand your findings in your own writing.

5. Parents role in helping students know and achieve high standards of work. Tell them that part of their role as a parent in coaching their child on his/her homework, is to help the child know what good work is. Point out that all students want to do good work, but many don't know what good work looks like and how to accomplish it.

Hold up the handout, "Ways to Help Your Child Achieve High Standards for His/Her Work." Spend just a minute explaining that there is a checklist of things to look for, questions to ask your children to help them begin to assess their own work, and other information about how to encourage and help your child in areas where frustrations exist.

6. Introduce notion of full range of learning. Show overhead transparency #10—the "Full Range of Learning."

Full Range of Learning



Point out that all kinds of learning are important, from mastery of factual information to the understanding of complex concepts and thinking skills. The kind of test or assessment method that is most appropriate depends on the kind of learning a teacher wants to assess.

Multiple choice and short answer questions are quite adequate for assessing learning related to factual information and basic skills.

Performance tasks, like “Letter to a Jockey” are better for assessing the kinds of complex reasoning and mathematical thinking that ensure that a student understands—in this case, understands why there is a greater probability for a certain number to be rolled.

7. **Preparation for life.** Mention that our education system was crafted in the 1920’s, when assembly line and other repetitive work force jobs were more the norm. Only the top of the class was prepared for college and other higher level “thinking” futures. Currently, our work force requires complex thinkers. Even factory workers have a greater role in designing their workdays, understanding what they are doing, and figuring out better ways of doing it. While our country has a long history of focusing on factual knowledge and basic skills, the urgency of preparing all students to be thinkers capable of problem solving and understanding complex concepts is now recognized. We are much newer at teaching complex thinking skills; we are really new at trying to assess for those skills.
8. **The issue with standardized tests.** Point out that one of the issues raised by many standardized tests, is that most of them are designed to assess factual knowledge and basic skills. The cost-effectiveness of machine-scoring limits the types of assessment that are usually included in these tests. Point out the danger of taking these and other test results out of context; it’s always necessary to know what the test tests for before we can conclude more generally about what it means.
9. **Assessing the meaning of test results.** Show overhead transparency #11.

<p>Bring a Critical Sense to What You Read in the News</p> <ul style="list-style-type: none">• What was the test designed to measure? Factual recall? Complex thinking?• Were students being tested on what they were taught?• Was there a connection between what was tested and what state/national standards say is important that students should know?• Were students tested in a language they understood?• Was the test measuring rapid recall or thoughtful response?• How does what was tested relate to desired work force skills?
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Tell the group that the second take-home handout you have for them is entitled, “Don’t Believe Everything You Read in the News.” Among other things, it has some questions for you to consider when you read about test results. Mention a few of the questions on the overhead.

Conclusion (5 minutes)

- 1. Reiterate the key point.** Say that in some ways today’s session just scratches the surface of testing and assessment and how it fits into the educational movement today. Emphasize that the handouts are focused on practical advice.
- 2. Distribute take-home sheets.** Set the two handouts on a table so parents can take one when they leave.



Horse Race !

GAME BOARD

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2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
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4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
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8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8
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10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
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12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12

Horse Race Game Board Master

Horse Race Quiz

1. With two dice, the most likely number(s) to roll is:
(circle 1 or more)
 - a. 5
 - b. 7
 - c. 12
 - d. 8
 - e. 1
 - f. 6
2. With two dice, the second most likely number(s) to roll is:
(circle 1 or more)
 - a. 5
 - b. 7
 - c. 12
 - d. 8
 - e. 1
 - f. 6
3. With two dice, the least likely number to roll is:
(circle 1 or more)
 - a. 5
 - b. 7
 - c. 12
 - d. 8
 - e. 1
 - f. 6
4. Horse #7 is likely to win because 7 is a lucky number.
True False
5. Horse #7 is likely to win because it is in the middle of the numbers.
 True False
6. Horse #7 is likely to win because it has the highest probability of being rolled.
True False
7. Horse #7 is likely to win because it is the sum of 4 and 3.
 True False
8. Horse #7 is likely to win because it is the sum of 5 and 2.
 True False
9. How can you be sure which horse is most likely to win?
(circle the best answer)
 - a. it depends which number is luckiest
 - b. by playing the game lots of times to see what happens
 - c. by knowing the number of different ways you can get each horse's number
 - d. it depends how good you are at playing the game
 - e. different horses are likely to win on different days

Horse Race Quiz

1. With two dice, the most likely number(s) to roll is:
(circle 1 or more)
a. 5 d. 8
b. 7 e. 1
c. 12 f. 6
2. With two dice, the second most likely number(s) to roll is:
(circle 1 or more)
a. 5 d. 8
 b. 7 e. 1
c. 12 f. 6
3. With two dice, the least likely number to roll is:
(circle 1 or more)
a. 5 d. 8
b. 7 e. 1
c. 12 f. 6
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d. it depends how good you are at playing the game
e. different horses are likely to win on different days

Horse Race Quiz (Student Work)

Horse Race Quiz

1. With two dice, the most likely number(s) to roll is:
(circle 1 or more)
a. 5 d. 8
 b. 7 e. 1
c. 12 f. 6
2. With two dice, the second most likely number(s) to roll is:
(circle 1 or more)
a. 5 d. 8
b. 7 e. 1
c. 12 f. 6
3. With two dice, the least likely number to roll is:
(circle 1 or more)
a. 5 d. 8
b. 7 e. 1
c. 12 f. 6
4. Horse #7 is likely to win because 7 is a lucky number.
True False
5. Horse #7 is likely to win because it is in the middle of the numbers.
True False
6. Horse #7 is likely to win because it has the highest probability of being rolled.
 True False
7. Horse #7 is likely to win because it is the sum of 4 and 3.
True False
8. Horse #7 is likely to win because it is the sum of 5 and 2.
True False
9. How can you be sure which horse is most likely to win?
(circle the best answer)
a. it depends which number is luckiest
b. by playing the game lots of times to see what happens
 c. by knowing the number of different ways you can get each horse's number
d. it depends how good you are at playing the game
e. different horses are likely to win on different days

Horse Race Quiz (student work)

Horse Race Quiz

1. With two dice, the most likely number(s) to roll is:
(circle 1 or more)
a. 5 d. 8
 b. 7 e. 1
c. 12 f. 6
2. With two dice, the second most likely number(s) to roll is:
(circle 1 or more)
 a. 5 d. 8
b. 7 e. 1
c. 12 f. 6
3. With two dice, the least likely number to roll is:
(circle 1 or more)
a. 5 d. 8
b. 7 e. 1
c. 12 f. 6
4. Horse #7 is likely to win because 7 is a lucky number.
True False
5. Horse #7 is likely to win because it is in the middle of the numbers.
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True False
9. How can you be sure which horse is most likely to win?
(circle the best answer)
a. it depends which number is luckiest
b. by playing the game lots of times to see what happens
 c. by knowing the number of different ways you can get each horse's number
d. it depends how good you are at playing the game
e. different horses are likely to win on different days

Horse Race Quiz (student work)

Dear Jockey,

You should choose horse 7, because it has six ways to win here they are.

WAYS TO GET SEVEN IN DICE



You should pick 6 or 8 for your second choice because there are five ways to get those numbers. Here they are.

WAYS TO GET EIGHT IN DICE



WAYS TO GET SIX IN DICE



Sincerely,
Emile

P.S. If you do this you'll be
this.



Letter to a Jockey (student work)

Dear Jockey,

I think you should pick horse number seven because there are six ways to make seven on two dice. Your next choice should either be a 6 or 8 because both of them have 5 ways to make themselves. Look at this chart explaining what I just told you.

1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

--- Robert E.

Dear Jockeys,

I think you should pick number seven for your first choice. The reason why I think you should is because if you count all the ways how to make seven you'll get 6 of them and more often you'll get seven. A nother reason is for it is in the middle of all numbers on the horse race. Now for your second choice I would pick 6. For instance it has five ways to make to make it is only one number less than seven. Hope you pick a good horse.

From
Kira

Letter to a Jockey (student work)

Steve

Dear Jocky

I think you should ride number 7 first then 6, I picked those horses because number 7 has a good pastern and a good loins and a hock and a good shank and a good fetlock.

Dear jockey,

If I where you, my first choice would be # 7 Because # 7 has the most wins. If you can't be #7, then be #6 because it has the second most wins. I hope you win.

— Robert S.



Dear Jockey,

I think you should ride on horse number seven first because it has six chances to win and that's more than the eleven other horses. The next horse you should ride on is number six or eight because it has five chances to win and that's more than the nine other horses.

In the all the races, horse number seven still has more chances.

That is why you should ride on those horses.

Sincerely,
Jack L.

Letter to a Jockey (student work)

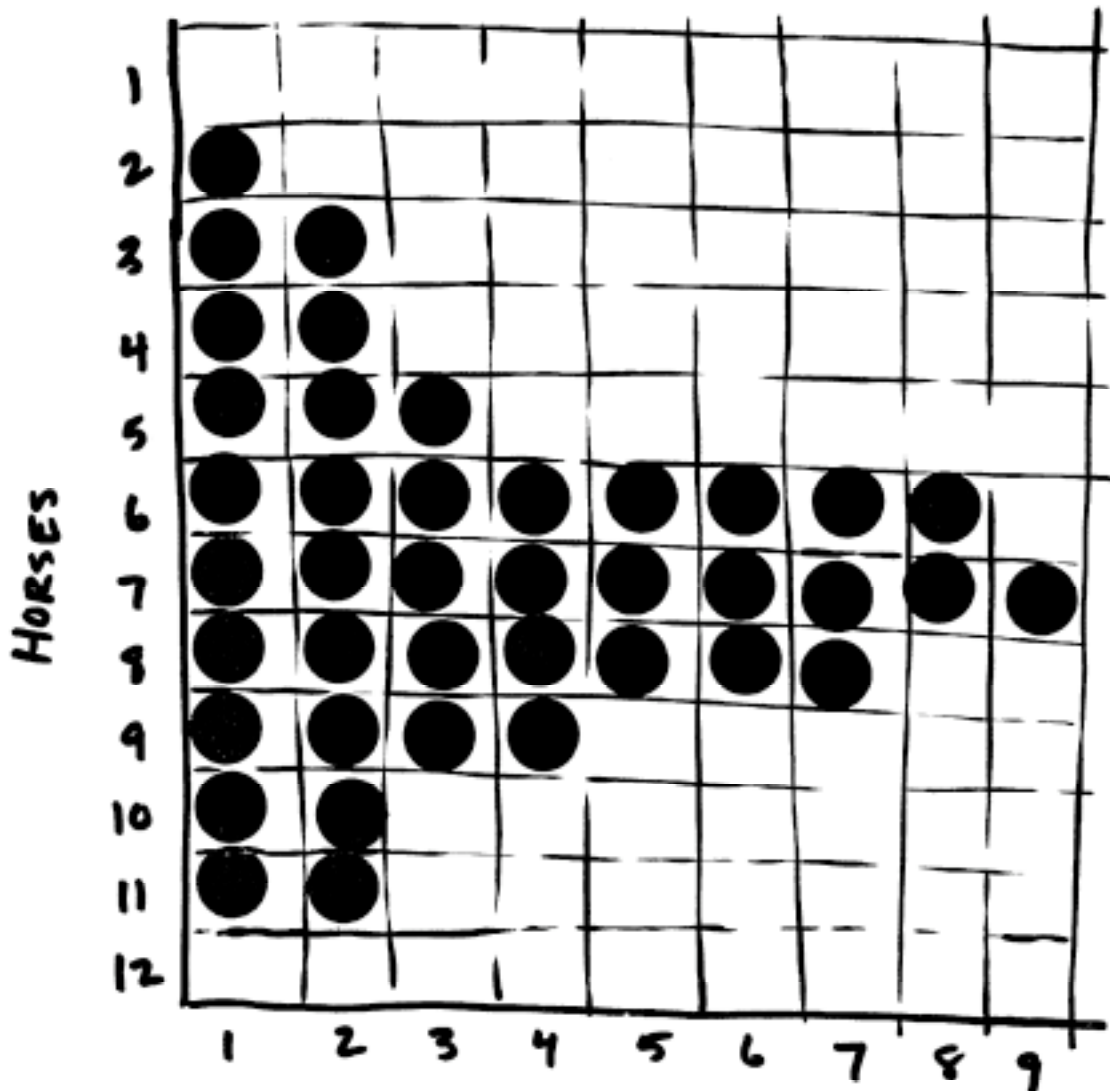


Horse Race !

GAME BOARD

1							1
2							2
3							3
4							4
5							5
6							6
7							7
8							8
9							9
10							10
11							11
12							12

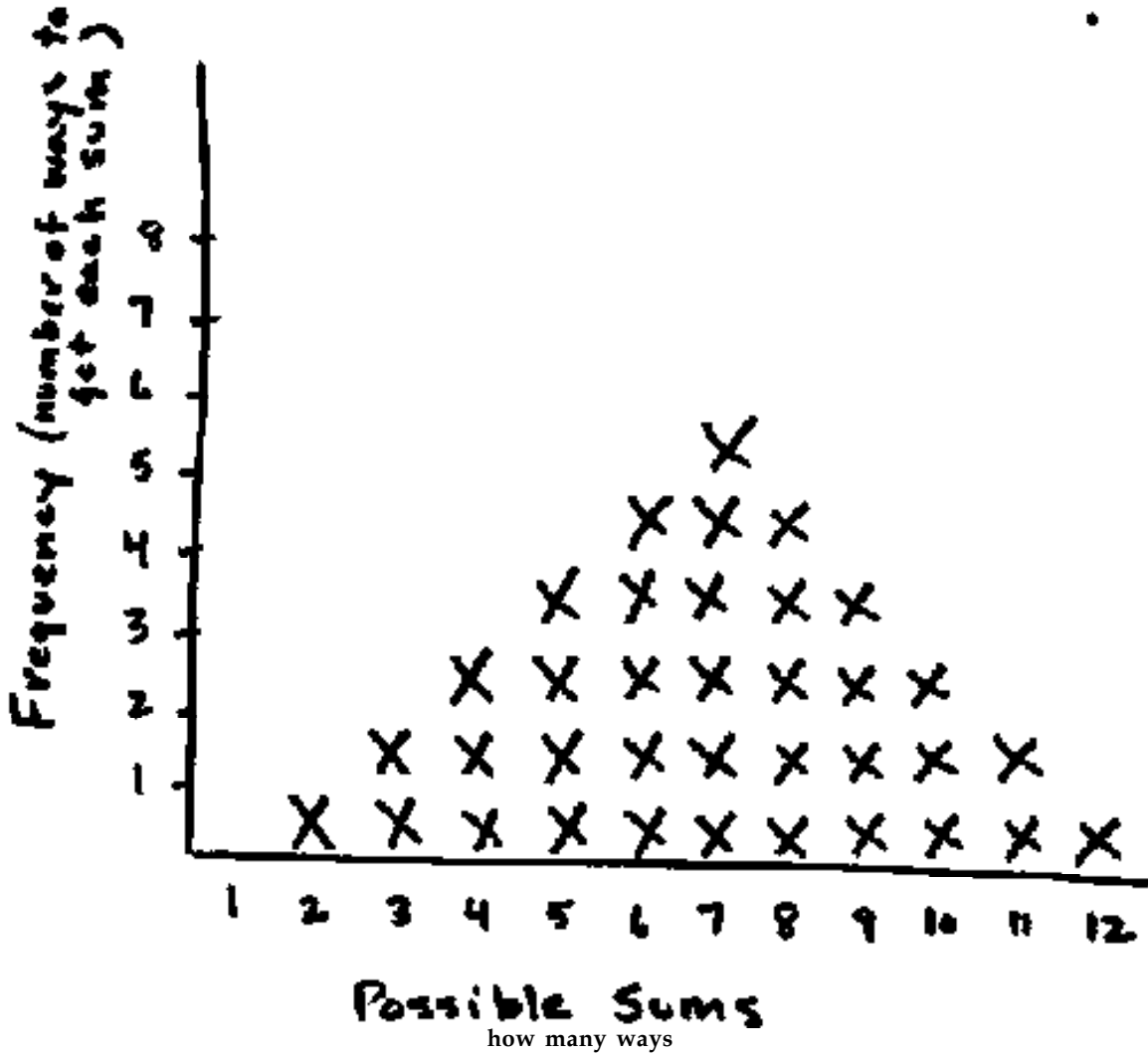
game board transparency



Number of Wins
CLASS GRAPH







class graph

HOW MANY WAYS?



Keeping Track



	2	3	4	5	6	7
	3	4	5	6	7	8
	4	5	6	7	8	9
	5	6	7	8	9	10
	6	7	8	9	10	11
	7	8	9	10	11	12

keeping track

Horse Race Quiz

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(circle 1 or more)
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 - b. 7
 - c. 12
 - d. 8
 - e. 1
 - f. 6
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 - b. 7
 - c. 12
 - d. 8
 - e. 1
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6. Horse #7 is likely to win because it has the highest probability of being rolled.
True False
7. Horse #7 is likely to win because it is the sum of 4 and 3.
True False
8. Horse #7 is likely to win because it is the sum of 5 and 2.
True False
9. How can you be sure which horse is most likely to win?
(circle the best answer)
 - a. it depends which number is luckiest
 - b. by playing the game lots of times to see what happens
 - c. by knowing the number of different ways you can get each horse's number
 - d. it depends how good you are at playing the game
 - e. different horses are likely to win on different days

Letter to a Jockey

Write a letter to a jockey and suggest which horses should be first and second choices to ride. Be sure to explain why you've made your recommendation. Drawings and diagrams in your letter will help the jockey understand.

Letter to a Jockey Scoring Guide

Level Four (highest level of work)

Students selected particular horses and supported their conclusion with an extensive application of probability concepts.

Level Three

Students selected particular horses and supported their conclusion with an analysis of class data and a limited application of probability concepts.

Level Two

Students selected particular horses. They based their recommendation solely on an analysis of class data. They did not include an application of probability concepts.

Level One

Students selected particular horses. They based their recommendations on extraneous factors or the results from the few games they played in pairs. They did not support their conclusion with class data or probability concepts.

Criterion-referenced scoring:
student work is compared to
specific criteria described in a
scoring guide

Norm-referenced scoring:
student work is compared to
other students' work

Investigation Rubric

1) There is a good investigable question:

- Uses available equipment and materials.
- Is safe and realistic.
- Can be answered with a single investigation (not too big a question).
- Is a "measuring" question, a "what-happens-if" question, or a "comparison" question (not a "how" or "why" question).

2) An appropriate kind of investigation was selected:

- Decided to do a systematic observation because a "measuring" or "what happens-if" question was chosen.
or
- Decided to do an experiment because a "comparison" question was chosen or because we turned another kind of question into a "comparison" question.

3) The investigation is well designed:

For Systematic Observations:

- Planned the conditions (variables).
- Identified possible outcome variables.
- Have clear and careful procedure that takes variables into account.

For Experiments:

- Identified test variable.
- Controlled variables.
- Identified outcome variable.
- Have clear and careful procedure that takes variables into account.

4) Careful reasoning is used:

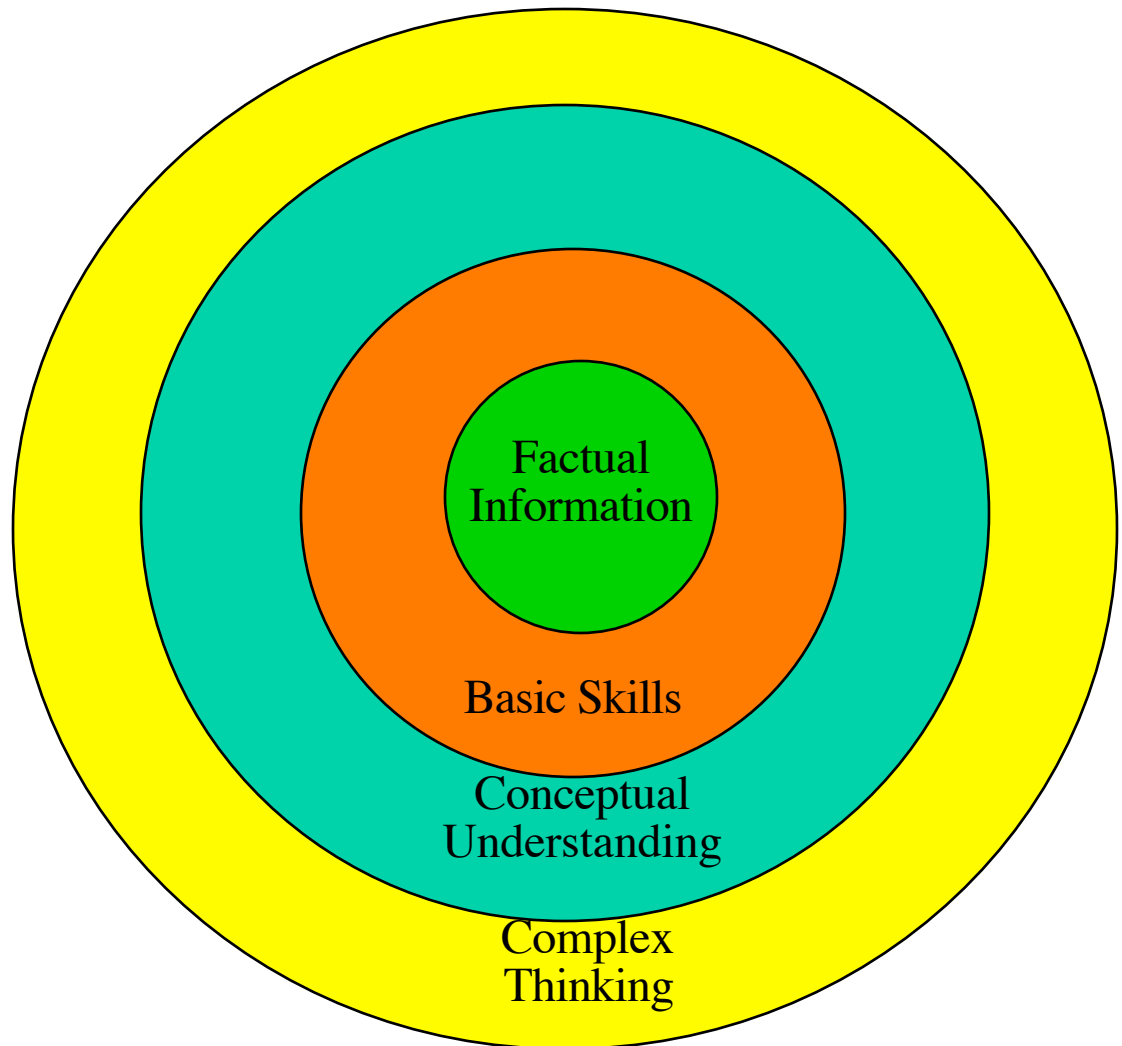
- Used data and results to support conclusions.
- Suggested a well-reasoned explanation.
- Thought through problems and additional questions.

5) Ideas are well-communicated:

- Ideas are clearly expressed through writing and diagrams so others can understand your investigation and your reasoning.

sample student rubric transparency

Full Range of Learning



Bring a Critical Sense to What You Read in the News

- What was the test designed to measure? Factual recall? Complex thinking?
- Were students being tested on what they were taught?
- Was there a connection between what was tested and what state/national standards say is important that students should know?
- Were students tested in a language they understood?
- Was the test measuring rapid recall or thoughtful response?
- How does what was tested relate to desired work force skills?

WAYS TO HELP YOUR CHILD ACHIEVE HIGH STANDARDS FOR HIS/HER WORK

Every child wants to succeed! But not all children know what they need to do to be successful. As a parent, you can help your child know how to be successful. Here are some suggestions:

Checking out your child's work: In reviewing your child's school papers or homework, ask yourself questions like:

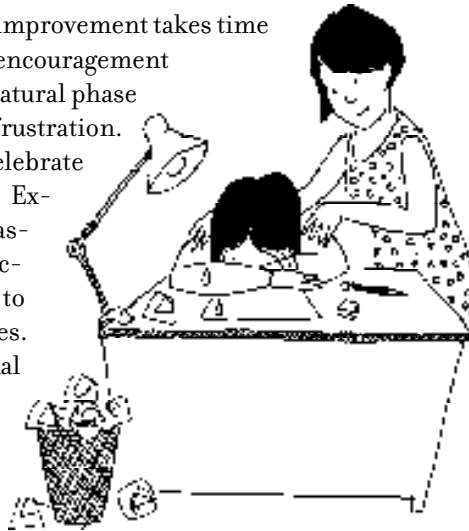
- Has he answered the question that was asked?
- Does she need to provide a more complete response?
- Do the ideas make sense? Are they presented in a logical order?
- Did she provide an explanation of how she solved the problem?
- Did he explain why he knows something to be true?
- Is there information she doesn't know which is making the task harder?
- Is he holding on to some inaccurate information that is interfering with his understanding?

Questions that can help your child begin to internalize high standards for his/her own work: Some of these questions are also good for you to ask your child as a way of helping with homework. There is lots of evidence that students who know the standards for good work themselves are best able to produce good work. Asking questions like the following can help a child begin to learn these standards. Then, when your children are working on other tasks, they may ask themselves the same kind of questions.



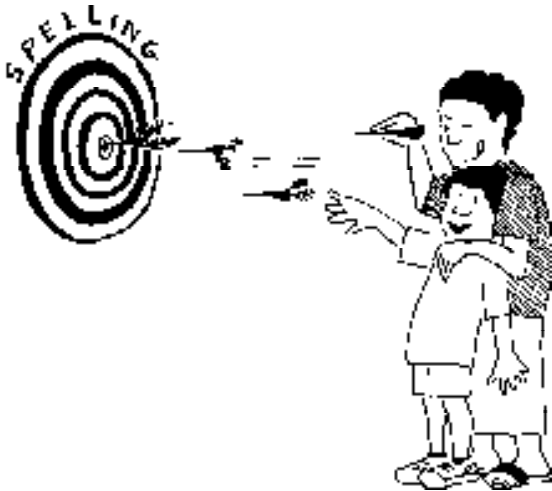
- Explain how you figured that problem out.
- How do you know that is correct?
- Why do you think that? Write your thinking down.
- Can both of these things be true?
- Can you find a better way to convince the reader of your answer?
- Can you make a drawing that shows what you mean?
- Have you labeled your drawing?
- Did you describe the units correctly? (inches, milliliters, meters, teaspoons)
- How is this similar to what you did in class?
- What part is hard for you? How could we make that part easier?
- If a child has an incorrect solution, suggest two or three other solutions and ask them to compare them. Does one look more correct than the others?

Ways to encourage your child: Recognize that improvement takes time and happens most easily in an environment of encouragement and support. Frustration is a predictable and natural phase in learning. Help your child work through her frustration. Focus on one area of improvement at a time. Celebrate your child's progress even when it seems small! Explain that every person has things they can do easily and things that they have to work harder to accomplish. Talk openly about what you perceive to be your child's strengths as well as her challenges. Talk to your child's teacher if you need additional strengths and challenges to add to your list. Share with your child what you perceive as your own strengths and challenges and discuss how you work on improving yourself.



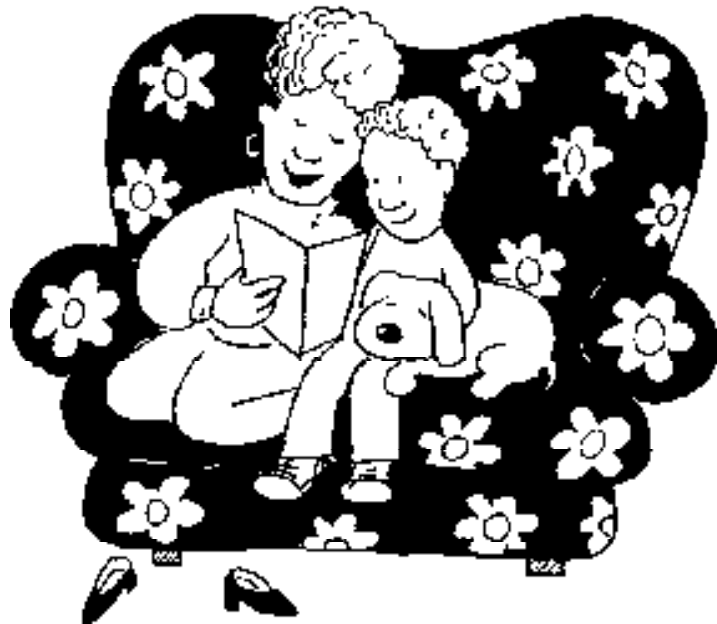
Comparing your child's performance to grade level expectations: Talk to your child's teacher about how his performance compares to other children in the class, in the grade level, the state, the nation. Report cards usually show your child's performance compared to others at the grade level. Sometimes parents' expectations for children's academic performance are unrealistically high; other times parents don't realize that their child lags behind. Keep in mind that children develop at different rates; often time will take care of certain problems. Your child's teacher is likely to recognize when this is the case. Ask for a copy of district, state, or national standards for your child's grade level, or find out where to get a copy. Standardized tests have many shortcomings, but can provide information about your child's performance in areas of basic abilities, usually letting you know if there is either high level achievement, or a serious problem. Use this information, together with your child's report card, in conversations with your child's teacher. Use your own informal assessments of your child's capabilities to advocate for and assist your child's development in those areas of greatest need.





What to do to help your child improve in a certain area: As you get a sense of your child's particular challenge (explaining her thinking, thinking logically, hates to write, doesn't understand what a complete sentence is, doesn't know math facts, doesn't think in an order that makes sense, doesn't take risks, works too fast, etc.), focus your help in this area. Write a note to your child's teacher alerting her to your perception of the problem and asking for specific ways to help your child in this particular area at home. Inquire how the teacher is helping your child in this particular area at school. She may want to schedule a meeting to talk more about it.

Work together to strike a balance: Remember that encouragement and support can set the scene for further progress. At the same time, it is important to have high expectations and make sure your child knows what kind of work meets standards of excellence. Working together, with your child, teachers, and the school, you can help your child improve and advance.



Don't Believe Everything You Read in the News

Bring a critical sense to what you read in the newspapers: When reading about test results, wonder the following:

- What was the test designed to measure? Factual recall? Complex thinking?
- Were students being tested on what they were taught?
- Was there a connection between what was tested and what state or national standards say is important that students should know?
- Were students tested in a language they understood?
- Was the test measuring rapid recall or thoughtful response?
- How does what was tested relate to desired work force skills?

Test results in the news. The results of standardized testing and international comparisons always seem to attract attention—especially when they are shocking! Reporters are often looking for attention grabbing angles so that is how this news is typically framed. It is not uncommon for news reports to make use of simplistic, or highly aggregated data to draw unwarranted conclusions. For instance, an international examination tested students for their knowledge of algebra a year before U.S. students typically study algebra in school. It's not surprising that U.S. students did not test well in algebra! Another recent report about statewide standardized test results spoke alarmingly about students' lack of knowledge as reflected by the below average test scores. Nowhere did it mention that students had 20 minutes to answer 60 questions. Rapid recall and knowledge are not the same, especially for students who are not practiced in test-taking strategy.

The value of standardized test results. When a test is well-designed, focused on highly valued knowledge and skills, and administered in a way to reduce bias, the results can provide very important information. But even then, the cause of a "bad" test result, or even the value of a test result in predicting a student's future success are not at all clear. For instance, it is well-accepted that a high score on the SAT (Scholastic Aptitude Test) is not the best predictor of future success in college. Test results should be considered as one of many things when assessing a student's knowledge and abilities. The purpose of test results should not be to brand a student or a school as "good" or "bad," but rather to know where adjustment in instruction is needed.

Consider the Source. In addition to the sometimes sensationalized and simplistic approach of the media, various interest groups may have reasons to put their own "spin" on interpreting test results. Interpretations of some reports may be slanted in defense of stakeholders in the system, such as administrators, teacher's unions, or the established bureaucracies of state education departments or large districts. Groups that don't like currently accepted approaches to education are definitely motivated to conclude that things are not good enough at present and may emphasize one finding of a test over another. Those who think current approaches make sense, but think education is vastly underfunded might also tend to conclude that things are not good enough, in the hope that

more money will be allocated. Even those who feel pleased with the progress made, but hold high standards and want to head off a natural tendency toward complacency may want to send out a somewhat critical message. In a way then, all of these negative conclusions could play a positive role, in that they would support changes in the educational system—but the real question is whether or not the changes they advocate are realistic and based upon needs and factors other than test scores. There are many credible and careful research studies that indicate problems with the U.S. educational system, and there are serious educational challenges, but it is important to find out whether or not a group may have a particular agenda or goal. It is useful to seek out those media reports that provide this level of analysis.

An example of how truth gets distorted. There is a widely publicized decline in average SAT (Scholastic Aptitude Test) scores among United States college-bound high school students since 1975. While this is a correct statement, it distorts the more complex truth of the situation. It turns out that more people in the United States are aspiring to go to college than ever before. Thus more people are taking the SAT test. Of this increasing number of test takers, a greater percentage rank in the bottom half of their high school classes. A study carried out by Sandia National Laboratories¹ compared 1975 to current SAT scores, looking at just those students from the same class rank and gender. It found that when these factors were controlled, the average SAT score for this “traditional test-taking population” actually increased by 30 points.

Don’t panic over media reports! As a parent, it is especially difficult not to react with alarm to reports that our students and schools are failing. Be sure to bring a critical sense to what you read and then draw your own conclusions. If you have questions about a test your child took, ask to speak with your principal.

How you can make a difference. It can be frustrating to read about things that relate to our children in the paper, and yet feel helpless in improving the educational system. A tremendous amount of research has been done about whether and how parents can make a difference for students.² This research strongly concludes that when parents do these things at home, their children do better in school: provide a special time and place for study; encourage the child daily through discussion; attend to the student’s progress in school; encourage the child on any gains; and cooperate with your child’s teacher.

¹ Carson, Huelskamp, and Woodall, The Sandia Report: “Perspectives on Education in America,” in *The Journal of Educational Research*, May/June 1993; Volume 86; Number 5.

² Henderson and Berla, *A New Generation of Evidence: The Family is Critical to Student Achievement*. 1994.